



NASA SP-7011 (22)

GPO PRICE \$ _____

CFSTI PRICE(S) \$ 1.00

Hard copy (HC) _____

Microfiche (MF) 1.00

653 July 65

N66-23461

(ACCESSION NUMBER)

(THRU)

176

(PAGES)

1

(CODE)

04

(CATEGORY)

(NASA CR OR TMX OR AD NUMBER)

AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY
WITH INDEXES

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

This bibliography was prepared by the Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by Documentation Incorporated.

AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY
WITH INDEXES

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA Information System during February, 1966



Scientific and Technical Information Division

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

WASHINGTON, D.C.

MARCH 1966

This document is available from the Clearinghouse for Federal Scientific and Technical Information (CFSTI), Springfield, Virginia, 22151, for \$1.00.

INTRODUCTION

Aerospace Medicine and Biology is a continuing bibliography which, by means of periodic supplements, serves as a current abstracting and announcement medium for references on this subject. The publication is compiled through the cooperative efforts of the Aerospace Medicine and Biology Bibliography Project of the Library of Congress (LC), the American Institute of Aeronautics and Astronautics (AIAA), and NASA. It assembles, within the covers of a single bibliographic announcement, groups of references that were formerly announced in separate journals, and provides a convenient compilation for medical and biological scientists. Additional background details for this publication can be found in the first issue, NASA SP-7011, which was published in July, 1964. Supplements are identified by the same number followed by two additional digits in parentheses.

In its subject coverage, *Aerospace Medicine and Biology* concentrates on the biological, physiological, psychological, and environmental effects to which man is subjected during and following simulated or actual flight in the earth's atmosphere or in interplanetary space. References describing similar effects on biological organisms of lower order are also included. Such related topics as sanitary problems, pharmacology, toxicology, safety and survival, life support systems, exobiology, and personnel factors receive appropriate attention. In general, emphasis will be placed on applied research, but references to fundamental studies and theoretical principles related to experimental development also qualify for inclusion. The contents of this issue are comprised of abstracts that were prepared by the three contributing organizations.

Each entry consists of a standard citation accompanied by its abstract. It is included in one of three groups of references that appear in the following order:

- a. NASA entries identified by their *STAR* accession numbers (N66-10000 series),
- b. AIAA entries identified by their *IAA* accession numbers (A66-10000 series); and
- c. LC entries identified by a number in the A66-80000 series.

Many of the abstracts included in this publication have been reproduced from those appearing in *STAR* and *IAA*. This procedure, adopted in the interests of economy and speed, has introduced some variation in size, style, and intensity of type.

AVAILABILITY OF DOCUMENTS

STAR Entries

NASA documents listed are available without charge to:

1. NASA Offices, Centers, contractors, subcontractors, grantees, and consultants.
2. Other U. S. Government agencies and their contractors.
3. Libraries that maintain depositories of NASA documents for public reference.
4. Other organizations having a need for NASA documents in work related to the aerospace program.
5. Foreign organizations that exchange publications with NASA or that maintain depositories of NASA documents for public use.

Non-NASA documents listed are provided by NASA without charge only to NASA Offices, Centers, contractors, subcontractors, grantees, and consultants.

Organizations and individuals not falling into one of these categories may purchase the documents listed from either of two sales agencies, as specifically identified in the abstract section:

Clearinghouse for Federal Scientific
and Technical Information (CFSTI),
Port Royal Road, Springfield, Virginia, 22151

Superintendent of Documents (GPO)
U.S. Government Printing Office
Washington, D.C. 20402

Information on the availability of this publication and other reports covering NASA scientific and technical information may be obtained by writing to:

Scientific and Technical Information Division
National Aeronautics and Space Administration
Code USS-AD
Washington, D.C. 20546

Collections of NASA documents are currently on file in the organizations listed on the inside of the back cover.

(continued)

IAA Entries

All articles listed are available from the American Institute of Aeronautics and Astronautics, Technical Information Service. Individual and Corporate AIAA Members in the United States and Canada may borrow publications without charge. Interlibrary loan privileges are extended to the libraries of government agencies and of academic non-profit institutions in the United States and Canada. Loan requests may be made by mail, telephone, telegram, or in person. Additional information about lending, photocopying, and reference service will be furnished on request. Address all inquiries to:

Technical Information Service
American Institute of Aeronautics and Astronautics, Inc.
750 Third Avenue, New York 17, New York

For further details please consult the *Introductions* to *STAR* and *IAA*, respectively.

LC Entries

Articles listed are available in the journals in which they appeared. They may be borrowed or consulted in libraries maintaining sets of these journals. In some instances, reprints may be available from the journal offices.

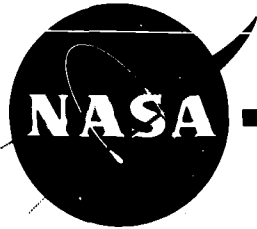
AVAILABILITY OF THIS BIBLIOGRAPHY

Copies of *Aerospace Medicine and Biology* (SP-7011) and its supplements can be obtained from NASA (Code USS-A), without charge, by NASA offices and contractors, U.S. Government agencies and their contractors, and organizations that are working in direct support of NASA programs.

Other organizations can purchase copies of the bibliography from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

TABLE OF CONTENTS

	Page
STAR Entries (N66-10000)	1
IAA Entries (A66-10000)	27
LC Entries (A66-80000)	47
Subject Index	I-1
Corporate Source Index	I-55
Personal Author Index	I-61



AEROSPACE MEDICINE AND BIOLOGY

a continuing bibliography

MARCH 1966

STAR ENTRIES

**N66-12162*# Dunlap and Associates, Inc., Darien, Conn.
APPARENT MOVEMENT PHENOMENA ON CRT DISPLAYS:
THRESHOLD DETERMINATIONS OF APPARENT MOVE-
MENTS OF PULSED LIGHT SOURCES**

H. M. Bowen, L. L. Vallerie, F. J. Affinito, and J. G. Wohl
Washington, NASA, Dec. 1965 31 p

(Contract NASw-954)

(NASA-CR-342) CFSTI: HC \$2.00/MF \$0.50 CSCL 05H

The "jump" phenomenon is due to stroboscopic interaction between saccadic eye movements (rapid movement from one fixation point to another) and pulsed light sources. The threshold for perception of a jumped image is primarily a function of the brightness of the pulse and the brightness of the background against which the jumped image is seen. In order to maintain high brightness of display, with a pulse brightness sufficiently low to avoid the jump phenomenon, PRF should be increased as far as possible. The "shift" phenomenon is believed to be due to stroboscopic interaction between small, involuntary eye movements and pulsed light sources. Experiments with the present equipment indicate that these effects are very small and, under the particular circumstances of the experiment, could not be seen by some observers. It is reasoned that special conditions (such as those existing on certain CRT displays) are required for the production of the shift phenomenon. Adequate investigation of the shift phenomenon therefore requires simulation of these conditions.

Author

N66-12177*# Naval School of Aviation Medicine, Pensacola, Fla.

EFFECTS OF PROLONGED CALORIC STIMULATION UPON OCULOMOTOR, VESTIBULOSPINAL, AND SEGMENTAL SPINAL ACTIVITY

Bo E. Gernandt, Makoto Igarashi, and Harlow W. Ades 24 Jun. 1965 19 p refs *Its Rept. No. 2*

(NASA Order R-93)

(NASA-CR-68266; NSAM-934) CFSTI: HC \$1.00/MF \$0.50 CSCL 06S

The effects of prolonged caloric stimulation with hot (45°C) or ice water have been studied upon eye movements, vestibulospinal, and segmental spinal activity. Results demonstrate that continuous irrigation with water of extreme temperatures evokes, in addition to the effects upon cupular position by endolymphatic convection currents, an initial excitatory thermal effect shown by increased afferent firing, followed by a paralyzing effect upon vestibular sensorineural structures. In

order to localize more specifically the site of action of thermal stimulation, experiments were carried out upon labyrinthectomized squirrel monkeys and monkeys with the three semicircular canals plugged. These results, and those obtained by recording the cochlear microphonic and neural components to click stimulation during maximal cold and warm irrigation of the ear, indicate the effect is upon the peripheral nerve fibers somewhere between ampulla and internal auditory meatus.

Author

**N66-12195*# Bell Helicopter Co., Fort Worth, Tex.
RESEARCH ON UTILIZATION OF PART TASK SPATIAL
ORIENTATION INFORMATION IN THE DYNAMIC SIMU-
LATOR**

C. B. Elam and Billie A. Abbott Jun. 1965 86 p refs *Its Tech. Rept.-299-099-284*

(Contract NASw-439)

(NASA-CR-68219) CFSTI: HC \$3.00/MF \$0.75 CSCL 05H

Fifteen professional pilots and a like number of R.O.T.C. students were used as subjects in establishing the relative difficulty in controlling for pitch, roll, yaw and altitude when these parameters were presented in all possible combinations with one another. The Bell simulator was used with the Norden vertical display serving as the media for information transmission. Momentary error and control position were recorded and were later converted into error and inefficiency scores. While highly significant in a statistical sense, the differences between conditions were considered to be of limited theoretical interest. The primary contribution of the study was in its comparison of the different indices of error (absolute, squared and standard deviation) and the measures of inefficiency. It was concluded that the standard deviation is the most sensitive of the error measurements and that an index of inefficiency (product of the error and the rate of control movement) is more sensitive of error alone.

Author

**N66-12198*# Chicago Univ., Ill. Dept. of Biophysics.
ELECTRON MICROSCOPIC AND BIOCHEMICAL CHAR-
ACTERIZATION OF FRACTION I PROTEIN**

R. Haselkorn, H. Fernandez-Moran, F. J. Kieras, and E. F. J. van Bruggen [1965] 17 p refs

(Grant NSG-441-63)

(NASA-CR-68099) CFSTI: HC \$1.00/MF \$0.50 CSCL 06B

High resolution electron micrographs of Fraction I protein from Chinese cabbage leaves have been obtained. The protein, which has ribulose 1, 5-diphosphate carboxylase activity, appears to be a cube with edge of about 120 Å. Substructure can be seen in individual particles, consistent with a model having 24 subunits, the number prescribed by the available physical and chemical data.

Author

**N66-12200*# Northrop Space Labs., Hawthorne, Calif.
INVESTIGATION OF PEROGNATHUS AS AN EXPERI-
MENTAL ORGANISM FOR RESEARCH IN SPACE BIOL-
OGY Progress Report, 1 Jul.-30 Sep. 1965**

J. J. Gambino and Lindberg [1965] 23 p refs
(Contract NASw-812)
(NASA-CR-68217; NSL-64-29-8) CFSTI: HC \$1.00/MF \$0.50
CSCL 06C

Pocket mice subjected to 1000 rad and 1500 rad whole body Co^{60} irradiation were sacrificed in the one week period following exposure. Histopathology of the intestinal mucosa was examined. Degenerative changes were noted within hours after irradiation, but regeneration of epithelial cells was prompt, and even at the 1500 rad dose level, was completed by about 7 days post-irradiation. Tritiated thymidine studies indicate that pocket mice have a villus transit time of 5.7 days for intestinal mucosa cells in contrast to 4.3 days and 2.1 days for germfree and conventional CFW mice, respectively. Data are presented on the growth and development of 26 individuals from 8 litters, 22 of which were the result of the first recorded matings of *Perognathus longimembris* in captivity. Semilogarithmic plots of body weight, total length, and lengths of tail, hind foot and ear showed polyphasic growth. All showed a four-part pattern with initial instantaneous percentage growth rates which varied from 4.4% for total length to 14.8% for ear. Hind foot showed the most rapid growth, reaching near adult size by 20 days.

Author

N66-12219* National Aeronautics and Space Administration, Washington, D. C.

APPLICATION OF A DIGITAL COMPUTER TO MONITOR THE CONDITION OF A COSMONAUT AND LIFE-SUPPORT SYSTEMS

R. M. Bayevskiy, V. V. Bogdanov, L. A. Kazar'yan, V. I. Yazdovskiy, and A. M. Zhdanov *In its Autom. Control and Methods of Elec. Meas.*, Vol. II Dec. 1965 p 116-122 refs (See N66-12201 03-10) CFSTI: HC \$6.00/MF \$1.50

Human performance and life support systems in space are discussed in terms of automatic monitoring with a digital computer which can simulate clinical logic. Both systems aboard spacecraft and at ground stations are considered as is the selection of physiological methods to achieve automatic clinical control. Circuits are illustrated for a pulse channel, skin temperature measurement, and conditioned motor reaction. The automatic evaluation of the information received is considered. Characteristics are given for digital computer converters for the various clinical parameters under consideration. M.W.R.

N66-12220* National Aeronautics and Space Administration, Washington, D. C.

DATA PROCESSING SYSTEMS IN SPACE BIOLOGY

R. M. Bayevskiy, A. D. Voskresenskiy, O. G. Gazenko, A. D. Yegorov, N. A. Chekhonadskiy et al *In its Autom. Control and Methods of Elec. Meas.*, Vol. II Dec. 1965 p 123-130 refs (See N66-12201 03-10) CFSTI: HC \$6.00/MF \$1.50

Investigative and control systems are differentiated in a discussion of data processing applications in space biology. The former involves the performance of the organism during space flight, while medical control is concerned with the collection of operational biological information to provide for flight safety. The mathematical simulation of reactions of the organism to factors during space flight is discussed, as are the technical problems associated with design of measuring, recording, and simulating devices. M.W.R.

N66-12221* National Aeronautics and Space Administration, Washington, D. C.

SENSORS FOR PHYSIOLOGICAL INVESTIGATIONS UNDER SPACEFLIGHT CONDITIONS

I. T. Akulinichev, R. M. Bayevskiy, O. G. Gazenko, I. S. Shadrintsev, and K. P. Zazykin *In its Autom. Control and Methods of Elec. Meas.*, Vol. II Dec. 1965 p 131-138 refs (See N66-12201 03-10) CFSTI: HC \$6.00/MF \$1.50

Methods of physiological investigations and types of sensors used in Soviet satellites are reviewed. Transformation of biological processes into electrical processes is accomplished by induction, piezoelectricity, and strain gauges. Sensors are

also tabulated for the investigation of vegetative function, working capacity, and functional state of cerebral cortex. These include electrode, piezoelectric inductive, high frequency resistance, tachometric, rheostat, and contact devices. M.W.R.

N66-12222* National Aeronautics and Space Administration, Washington, D. C.

DESIGN OF AUTOMATIC EQUIPMENT FOR ANALYZING BALLISTOCARDIOGRAMS

K. P. Buteyko, N. G. Buryy, N. V. Vas'kova, A. K. Romanov, and I. I. Smirnova *In its Autom. Control and Methods of Elec. Meas.*, Vol. II Dec. 1965 p 139-146 refs (See N66-12201 03-10) CFSTI: HC \$6.00/MF \$1.50

Sensor construction, calibration, and other aspects of design equipment are considered for the analysis of ballistocardiograms (BCG). Two methods are proposed for the analysis of BCG's, both of which can determine pathological variations in curves. Results graphed by the first method, based on the amplitude and duration investigation of the curves, compare BCG's of healthy people with those of persons exhibiting stenosis of the pulmonary artery, stencardiac, and mitral stenosis. The second method, in which the continuous curves are replaced by discrete values of amplitude, is selected because it requires less complex devices for processing the curves. At present, it is not possible to make specific diagnoses on the basis of BCG analyses; however, the curves do distinguish healthy from sick people. The proposed device may be used to accumulate data for future statistical analyses and to correlate distribution curves with types of illness. M.W.R.

N66-12250* Public Health Service, Washington, D. C. Biophysics Section.

REDUCTION OF BACTERIAL DISSEMINATION; GERMICIDAL ACTIVITY OF ETHYLENE OXIDE; REDUCTION OF BACTERIAL CONTAMINATION ON SURFACES Fifth Quarterly Summary Report

Nov. 1965 8 p

(NASA Order R-137)

(NASA-CR-68090) CFSTI: HC \$1.00/MF \$0.50 CSCL 06I

Progress is reported on the reduction of microbial dissemination from humans. Tests were made on one subject dressed in street clothing, dressed in a sterile surgical scrub suit including cap and socks, and dressed in sterile surgical scrub suit including cap, socks, and surgical mask. Preliminary data indicated that dissemination of viable microorganisms can be reduced by wearing a sterile, efficient surgical face mask. Also, methods for optimum contamination of surfaces with human microorganisms without laboratory seeding were investigated in studies on the reduction of bacterial contamination during exposure to conditions of 40% relative humidity at 50°C. Data on natural contamination of stainless-steel strips during exposure for 72 hr in an area of moderate activity and exposure for 1-hr in a dynamic exposure chamber are presented. Exposure in a dynamic exposure chamber in which human shedding is occurring appeared to be superior in that maximum microbial contamination of the surfaces occurs in a short period which is desirable in order to avoid natural selection. E.E.B.

N66-12263* National Aeronautics and Space Administration, Washington, D. C.

RESTORATION OF CONTRACTILITY AND PROSPECTS FOR TRANSPLANTATION OF HUMAN AND ANIMAL HEARTS [O VOSSTANOVLENI SOKRATITEL'NOY AKTIVNOSTI I PERSPEKTIVAKH TRANSPLANTATSII SERDTSА CHELOVEKA I ZHIVOTNYKH]

S. V. Andreyev Dec. 1965 8 p refs Transl. into ENGLISH from Eksperim. Khirur. i Anesteziol. (Moscow), v. 8, no. 4, 1964 p 32-36

(NASA-TT-F-404) CFSTI: HC \$1.00/MF \$0.50 CSCL 06E

Experiments on the restoration of contractility of the human heart after death and the possible resumption of hemodynamics in the organism are reported, based on postmortem examinations of 397 human hearts. The bioelectric activity of the myocardium and the significance of macroergic compounds (ortho- and pyrophosphoric acids, lactic acid, creatine, arginine, etc.) for the myocardial metabolism were studied to obtain data on the possibility of transplanting human hearts. Restoration of contractility, up to 5 days after death and lasting for more than 15 days, was possible in all cases of undiseased hearts. Present obstacles to human heart transplantation (such as tissue or protein incompatibility, difficulty in rapid re-innervation, etc.) are discussed briefly, and prospects for future transplantations are based on successful biosynthesis of protein molecules and polymers, including the various amino acids, to be used in constructing an artificial heart without tissue incompatibility. Author

N66-12269# Joint Publications Research Service, Washington, D. C.

MOLECULAR BASIS OF MEMORY

V. L. Ryzhkov 10 Nov. 1965 16 p refs Transl. into ENGLISH from Priroda (Moscow), no. 7, 1965 p 2-10 (JPRS-32809; TT-65-33387) CFSTI: \$1.00

A broad range of problems with respect to memory based on biological mechanisms are examined. Discussed are excitation of nerve fibers with changes in polarization of ions along the fiber; nucleic acid metabolism in nerve cells; and a protein synthesis mechanism of memory which involves DNA threads. Structural diagrams are presented for the formation of the mediator RNA, and for protein synthesis. In support of the protein synthesis mechanism, experiments on memory carryover in planarians dissected with subsequent regeneration are discussed. Also reviewed are experiments on the transmission of memory in salivary gland chromosomes of insects by administration of a hormone called ecdisone, secreted by insects. The effects of chromosome spiralization and antibodies on memory mechanisms are also considered. L.S.

N66-12271# Joint Publications Research Service, Washington, D. C.

CHANGE IN OXYGEN PRESSURE IN THE HEART MUSCLE DURING ASCENT AND ACCELERATION

Ye. A. Kovalenko and V. I. Korol'kov 29 Nov. 1965 refs Transl. into ENGLISH from Fiziol. Zh. SSSR (Moscow), v. 51, no. 8, Aug. 1965 p 966-973

(JPRS-33066; TT-65-33643) CFSTI: \$1.00

Polarographic electrodes were implanted in the heart muscles of dogs in order to study changes in myocardial oxygen pressure during ascent and acceleration. Prior to ascent, cardiac contractions taken in a pressure chamber remained fairly constant and averaged about 145 per minute; this rose to an average of 191 after exposure to rising altitude conditions. Respiration rate rose from an average of 28 to 44 per minute. In all experiments oxygen pressure fell as altitude increased; temporary stays at 2, 4, and 6 km led to approximate drops of 85%, 73%, and 64%, respectively, from initial levels. With brief stays at 8 and 12 km, these pressures decreased to about 48% and 42% and were accompanied by sharp hypoxic disorders and marked disturbances in EKG. Myocardial oxygen pressure tends to rise during the initial action of overloads from rotation in a centrifuge, but later falls in the presence of 6, 8, 10, and 12 g overloads. Oxygen pressure falls more sharply during the third minute of rotation with overloads in the head-pelvis direction than with transverse overloads. M.W.R.

N66-12273# Joint Publications Research Service, Washington, D. C.

CERTAIN PHYSIOLOGICAL REACTIONS OF MAN UNDER CONDITIONS OF BRIEF WEIGHTLESSNESS

I. I. Kas'yan, A. S. Krasovskiy, I. A. Kolosov, M. A. Lomova, V. I. Lebedev et al 1 Dec. 1965 23 p refs Transl. into ENGLISH from izv. Akad. Nauk SSSR, Ser. Biol. (Moscow), no. 5, Sep.-Oct. 1965 p 633-646

(JPRS-33115; TT-65-33692) CFSTI: \$1.00

Indices of physiological functions of 31 male subjects subjected to weightlessness conditions were recorded by means of miniature medical equipment attached to the subjects. Recordings were made of the bioelectric activity of the brain (EEG), of the heart muscles (EKG), of respiratory rates, and of vestibular coordination reactions in the initial state before weightlessness, during, and after. The physiological data obtained are tabulated, plotted, and discussed. L.S.

N66-12294# Joint Publications Research Service, Washington, D. C.

THE EFFECT OF MICROWAVES ON LIVING ORGANISMS AND BIOLOGICAL STRUCTURES

A. S. Presman 29 Nov. 1965 61 p refs Transl. into ENGLISH from Usp. Fiz. Nauk (Moscow), v. 86, no. 2, Jun. 1965 p 263-302

(JPRS-33054; TT-65-33631) CFSTI: \$3.00

Experimental and theoretical studies on the biological effect of microwaves are surveyed to familiarize physicists with the research reports published in biological and medical journals. Areas reviewed cover the electrical properties of tissues in the microwave band; absorption of microwaves in living tissues; reactions of animal organisms to irradiation with medium and high intensity microwaves; reaction of human and animal organisms to low intensity microwave irradiation; changes in animal tissues and organs caused by microwaves; effects of microwaves and electromagnetic fields of other frequencies on the cellular and molecular level; mechanism problems of the biological effect of microwaves and electromagnetic fields of other frequencies; reception and generation of electromagnetic fields in living organisms; and monitoring of microwaves to estimate their effect on people and in animal experiments. From the data, the assumption was made that the biological activity of electromagnetic fields is caused by the information interaction of these fields with the living organism, and not the conversion of electromagnetic energy into other forms. An extensive bibliography is included. M.G.J.

N66-12299# Joint Publications Research Service, Washington, D. C.

ANALYSIS OF THE EFFECT OF REPLACING NITROGEN BY HELIUM IN AIR ON THE DEVELOPMENT OF CHICK EMBRYOS

V. M. Savin, V. V. Rol'nik, P. A. Gul'tyayav, and V. V. Boriskin 17 Nov. 1965 13 p refs Transl. into ENGLISH from Biofiz. (Moscow), v. 9, no. 5, 1964 p 589-596

(JPRS-32905; TT-65-33482) CFSTI: \$1.00

In studying the influence of prolonged replacement of nitrogen in the air by helium on the vital activity of an organism, experiments with chick embryos were conducted. Results show that normal development of the chick embryo was not prevented, when 99 percent of the nitrogen was eliminated from the atmosphere and replaced by helium. It was also found that heat removal by convection increased approximately two-fold, and moisture evaporation from the egg's surface intensified by about 40 percent in the helium-oxygen medium. These phenomena were attributed to the peculiarities of the physical properties of helium. M.G.J.

N66-12345*# National Aeronautics and Space Administration, Washington, D. C.
AEROSPACE MEDICINE AND BIOLOGY A Continuing Bibliography with Indexes, Oct. 1965
 Nov. 1965 142 p refs
 (NASA-SP-1011(17)) CFSTI: HC \$1.00/MF \$1.00 CSCL 06S

N66-12346*# National Aeronautics and Space Administration, Washington, D. C.
METHOD OF DETERMINING THE PROPAGATION VELOCITY OF PULSE WAVES [K METODIKE OPREDELENIYA SKOROSTI RASPROSTRANENIYA PUL'SOVOY VOLNY]
 V. P. Medvedev Dec. 1965 7 p refs Transl. into ENGLISH from *Kardiologiya* (Moscow), vol. 4, no. 1, 1964 p 79-82 (NASA-TT-407) CFSTI: HC \$1.00/MF \$0.50 CSCL 06P

The recording of the pulse-wave velocity with a loop oscillograph converting the mechanical vibrations of the arterial walls into electrical oscillations, is described along with a sketch of the experimental setup. The velocity of the pulse was obtained by dividing the length of the aorta by the time lag of the pulse from the femoral artery with respect to the pulse from the carotid artery. The sphygmograms were analyzed through a 5 X magnifier attached to the oscillograph. Author

N66-12371 Joint Publications Research Service, Washington, D. C.
HISTOCHEMICAL USE OF FRESH CUT TISSUE SHEET
 Shih-Ho Chang, Hsiao-Mei Ch'en, and I-Yu Pao *In its* Transl. on *Communist China's Sci. and Technol.*, No. 234 8 Nov. 1965 p 57-67 (See N66-12367 03-34) CFSTI: \$3.00

The technique of freezing and cutting fresh tissue sheets is described in detail, as well as the design and manufacture of a low temperature cryostat with 58-cubic centimeter capacity. It is pointed out that the adoption of the Chinese-made cryostat in histochemical research has the following advantages: (1) Use is made of the same tissue block to be frozen for continuous sheet cutting in formulating many types of histochemical and biochemical methods, closely relating the transformation of cell forms and the various transformations in chemical and biochemical analyses. (2) The cutting is more even. (3) The temperature in the cryostat can be adjusted arbitrarily to be maintained at a constant level. (4) The mounted sheet or the covered sheets can be used to level the cut surface. R.R.D.

N66-12376# Aerospace Medical Div. Aerospace Medical Research Labs. (6570th), Wright-Patterson AFB, Ohio.
PRELIMINARY STUDY OF DIAL READING PERFORMANCE DURING SUSTAINED ACCELERATION AND VIBRATION
 Neville P. Clarke, Harvey Taub (Cornell Aeron. Labs., Inc.), Harris F. Scherer (NASA, Manned Spacecraft Center), William E. Temple, Hubert E. Vykukal (NASA, Ames Res. Center), et al Aug. 1965 16 p refs Prepared Jointly with NASA and Cornell Aeron. Labs., Inc.
 (Contract AF 33(657)-11729)
 (AMRL-TR-65-110; AD-622298)

Booster induced spacecraft vibrations occur in combination with booster induced sustained acceleration. This was a joint NASA-AF study to provide a preliminary cursory evaluation of the effects of this environment on crewmen. Six subjects were used in 60 tests to measure the decrement in dial reading ability as a function of the level of 11 cps gx vibration and the size of the dial, where a bias acceleration of 3.85 Gx was superimposed on the vibration. Dial reading errors were inversely related to the arclength of the interval between dials and directly related to the amplitude of vibration. There was approximately 50% distortion of the 11 cps vibration acceleration, which markedly influences the interpretation of results and their comparison to measurements of visual decrements from 11 cps vibrations with 1Gx bias loads. In most general terms, however, the 3.85Gx bias, and/or the unidirectional force (i.e., the

resultant acceleration was always greater than 0 G) creates a subjectively more tolerable environment than with a 1 G bias. Vibrations of 3.85Gx (3.0gx were without serious subjective effects in exposures of 90 seconds duration. Gross comparisons of dial reading performance under the two conditions provide some indication that the greater bias acceleration is associated with less visual decrement. Author (TAB)

N66-12380# Naval School of Aviation Medicine, Pensacola, Fla.
A STUDY OF STATEMENT ATTRACTIVENESS INDICES OBTAINED UNDER PERSONAL AND SOCIAL ORIENTATIONS
 Lawrence K. Waters Jul. 1965 8 p refs
 (NSAM-937; AD-622285)

Two indices for matching items on forced-choice scales for use with cadet groups were evaluated. Index deviation values for two indices of statement attractiveness, stressing either the personal or social acceptability of the statements, were correlated with each other, with four other attractiveness indices obtained previously, and with frequencies of statement choice obtained under four response sets. The correlation between the two indices and their relationship to previously obtained attractiveness indices and choice frequencies indicated the personal and socially oriented indices represented essentially the same attractiveness dimension for the cadet groups. The dimension appeared to be one of general desirability as contrasted to specific job (training program) desirability. Author (TAB)

N66-12385# Battelle Memorial Inst., Columbus, Ohio.
STUDY OF FLUORESCENT EMISSION FROM THE CAT CEREBRAL CORTEX Final Report, Jan.-Aug. 1964
 Richard M. Roppel and Arthur C. Peters Wright-Patterson AFB, Ohio, AMRL, May 1965 17 p refs
 (Contract AF 33(615)-1206)
 (AMRL-TR-65-88; AD-622273)

Experiments were conducted to investigate the existence of changes in fluorescence properties of the cat cerebral cortex during cortical and peripheral electrical stimulation. In anesthetized cats, the exposed cortex was illuminated with the light output from a monochromator and fluorescence changes were detected by use of a photomultiplier tube. Appropriate filters were used to prevent response of the photomultiplier to light from the excitation source. When electrical pulse stimulus of electroconvulsive intensity was applied by means of a wick electrode to the brain surface, there were observed signals of several millivolts amplitude from the photomultiplier tube interpreted as fluorescence changes. An interpretation is tentatively proposed which is based upon changes in relative proportions of oxidized and reduced pyridine nucleotide in the cortical tissue. Author (TAB)

N66-12387# Air Force Systems Command, Wright-Patterson AFB, Ohio, Foreign Technology Div.
INFLUENCE OF ELEVATED INTRAPULMONARY PRESSURE ON RESPIRATION AND CIRCULATION [FUNKTSII ORGANIZMA v USLOVIYAKH IZMENENNOY GAZOVOY SREDY]
 B. A. Botvinnikov, I. Sh. Ginzburg et al 17 Jun. 1965 72 p refs Transl. into ENGLISH from *Akad. Nauk SSSR. Lab. Evolyutsionnoy Fiz. (USSR)*, v 1, 1955 p 118-160
 (FTD-TT-65-154/1+2; AD-620970)

The changes in respiration under elevated intrapulmonary pressure, which take the form of an initial respiratory arrest, a subsequent retardation of respiration rate, and disruption of the normal relationships of the time and character of inhalation and exhalation (activation and intensification of exhalation), result principally from stimulation of the vagus

receptors located in the pulmonary tissue. The extent and character of the respiratory changes depend on the exhalation and inhalation pressure. The principal role in exhalation during respiration under pressure is played by the muscles of the prelum abdominale. The coordination of the functioning of the abdominal muscles and the true respiratory musculature during respiration under pressure is disrupted after bilateral vagotomy in the cervical region. At identical elevated intrapulmonary pressures the changes in circulation depend on the character of the pressure. In contrast to intermittent pressure, constant pressure causes more substantial circulatory disturbances, as manifested in a greater decrease in arterial pressure and a larger increase in venous pressure. TAB

N66-12419* Pennsylvania Univ., Philadelphia.
EXPLOITATION OF SPACE ENVIRONMENT FOR BIOLOGICAL RESEARCH

Allan H. Brown /n NASA, Washington NASA Univ. Program Rev. Conf. 1965 10 p (See N66-12401 03-34) GPO: HC \$1.50; CFSTI: MF \$2.00

The NASA Biosatellite Program is reviewed, and some of the difficulties encountered by the experimenters are identified. The phases of the program are described as an attempt to detect a synergistic effect between weightlessness and radiation exposure; experiments on plant morphogenesis and observations of the rhythmic behavior of plant and animal materials; and a study of primate physiology. Details on each phase are given. The problems involved with the program are defined as: (1) the long lead time connected with a satellite experiment; (2) the unfamiliarity of most biologists with the engineering aspects of a satellite operation; (3) the frustrations experienced when piggy-back rides were flown on vehicles intended for other purposes; and (4) the reduction of the experimenter's responsibility for his own experiment. The unfavorable image of space research in biology is also mentioned, and the possibility that the Biosatellite Program may improve this image is advanced. M.G.J.

N66-12431# Brussels Univ. (Belgium). Laboratoire de Radiobiologie et de Biophysique.

THYMECTOMY AND RADIOCANCERS, NORMAL KARYOTYPE, CHROMOSOMAL ABNORMALITIES AFTER TRITIATED THYMIDINE IN THE MOUSE C57 BL/6 [THYMECTOMIE ET RADIOCANCERS, CARYOTYPE NORMAL, ANOMALIES CHROMOSOMIQUES APRES THYMIDINE TRITIEE CHEZ LES SOURIS C57 BL/6]

D. J. Mewissen and L. E. Lagneau/ Brussels, EURATOM, Sep. 1965 12 p refs In FRENCH; ENGLISH summary (Contract EURATOM-020-12 BIOB) (EUR-2462.f) CFSTI: HC \$1.00/MF \$0.50

The incidence of tumors late-induced by X-rays was studied in mice which had undergone thymectomy and irradiation and then, in some cases only, grafting of an isogenic thymic lobe. Thymectomy has the effect not only of reducing the incidence of lymphosarcomata, as has been known for some time now, but also of that of numerous other tumors, notably hepatomata. The karyotype of mice is marked by forty chromosomes and very few spontaneous aberrations. At least six pairs are not telocentric while another pair contains a bilocular chromosome. In the mitotic chromosomes of mice injected at birth with thymidine tritiated with doses ranging from 0.5 to 2.0 mC/g, achromatic vesicular images are observed which are not superposed on the tritiated molecules detected by autoradiography. Author

N66-12444# Joint Publications Research Service, Washington, D. C.

COMBINATION OF WAVEMETER AND INTEGRATOR FOR SIMULTANEOUS EVALUATION OF QUANTITATIVE WAVE PATTERNS AND MEAN AMPLITUDE OF BRAIN POTENTIALS

A. M. Mitskis 29 Nov. 1965 5 p refs Transl. into ENGLISH from Fiziol. Zh. SSSR (Moscow), v. 51, no. 7, Jul. 1965 p 893-894

(JPRS-33055; TT-65-33632) CFSTI: \$1.00

In this analytical method, the combined use of an integrator and wavemeter is proposed for convenient and constant recording of the brain potentials over an extended time period. The integrator is used to determine changes in the mean amplitude of brain potentials; the wavemeter counts the extremes of a random process. The quantity of marks by the integrator and wavemeter is plotted on the coordinate system, where the time is designated on the axis of the abscissa and the value of the mean amplitude and quantity of wave on the axis of the ordinate. Changes in the mean amplitudes and quantities of waves, and their mutual relationship, are presented in compressed and convenient form for quantitative evaluation. It is pointed out that this combination method gives a broader idea of approaching changes than the use of the integrator alone. A schematic of the wavemeter is included. M.G.J.

N66-12451*# National Aeronautics and Space Administration, Washington, D. C.

PROBLEMS OF RADIATION SAFETY IN SPACE FLIGHTS; PHYSICAL AND BIOLOGICAL STUDIES WITH HIGH-ENERGY PROTONS

Yu. G. Nefedov, ed. Dec. 1965 245 p refs Transl. into ENGLISH of the Monograph "Problemy Radiatsionnoi Bezopasnosti Kosmicheskikh Poletov; Fizicheskiye i Biologicheskiye Issledovaniyas Protonami Bol'shikh Energiy" Moscow, Atomizdat, 1964

(NASA-TT-F-353) CSCL 06R

CONTENTS:

1. CHARACTERISTICS OF THE RADIATION EFFECT UNDER SPACE FLIGHT CONDITIONS AND WAYS TO DETERMINE ADMISSIBLE RADIATION LEVELS V. Ye. Dudkin, Yu. G. Grigor'yev, Ye. Ye. Kovalev, A. V. Lebedinskiy, S. V. Levinskiy et al p 3-20 refs (See N66-12452 03-04)

2. DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES USING THE SYNCHROCYCLOTRON OF THE JOINT INSTITUTE FOR NUCLEAR RESEARCH V. P. Afanas'yev, Yu. S. Deyev, I. B. Keirim-Markus, Ye. Ye. Kovalev, S. S. Kuznetsova et al p 21-54 refs (See N66-12453 03-04)

3. BIOLOGICAL EFFECT OF PROTONS WITH ENERGIES OF 510 MEV IN CASES OF MULTIPLE IRRADIATION A. F. Bibikova, N. G. Darenskaya, M. P. Domshlak, A. N. Ganshina, G. K. Gerasimova et al p 55-102 refs (See N66-12454 03-04)

4. BIOLOGICAL EFFECT OF PROTONS WITH ENERGIES OF 510 MEV DURING SINGLE IRRADIATION A. F. Bibikova, N. G. Darenskaya, N. A. Derbeneva, M. P. Domshlak, A. N. Ganshina et al p 103-141 refs (See N66-12455 03-04)

5. BIOLOGICAL EFFECT OF PROTONS WITH ENERGIES OF 126 MEV ON CORNEAL EPITHELIA OF MICE V. M. Mastryukova and A. D. Strzhizhovskiy p 142-150 refs (See N66-12456 03-04)

6. DETERMINATION OF THE BIOLOGICAL EFFECT OF PROTONS WITH ENERGIES OF 510 MEV AND X-RAYS WITH ENERGIES OF 180 KV ON HEREDITARY STRUCTURES Ye. D. Plotnikova and S. I. Strashnenko p 151-156 refs (See N66-12457 03-04)

7. BIOLOGICAL EFFECT OF PROTONS WITH ENERGIES OF 130 MEV, X-RAYS WITH ENERGIES OF 180 KV AND CO⁶⁰ GAMMA RADIATION ON THE VESTIBULAR APPARATUS Yu. G. Grigor'yev, A. V. Sevan'kayev, and A. A. Sveshnikov p 157-184 refs (See N66-12458 03-04)

8. BIOLOGICAL EFFECT OF MULTIPLE X-RAY IRRADIATION WITH ENERGIES OF 180 KV COMPARED WITH PROTON IRRADIATION (DOSES AND TEMPORAL DISTRIBUTION) N. G. Darenskaya, M. P. Domshlak, V. I. Grachev,

and N. I. Ryzhov p 185-193 (See N66-12459 03-04)

9. COMPARATIVE ANALYSIS OF BIOLOGICAL EFFECT OF PROTON RADIATION WITH ENERGY OF 510 MEV N. G. Darenskaya, M. P. Domshlak, Yu. G. Grigor'yev, Yu. G. Nefedov, V. A. Razorenova et al p 194-209 (See N66-12460 03-04)

10. PROPHYLAXIS AND THERAPY OF RADIATION INJURIES CAUSED BY PROTONS Yu. D. Balika, A. F. Bibikova, B. I. Lebedev, V. D. Rogozkin, and K. M. Znamenskaya p 210-238 refs (See N66-12461 03-04)

N66-12452* National Aeronautics and Space Administration, Washington, D. C.

CHARACTERISTICS OF THE RADIATION EFFECT UNDER SPACE FLIGHT CONDITIONS AND WAYS TO DETERMINE ADMISSIBLE RADIATION LEVELS

V. Ye. Dudkin, Yu. G. Grigor'yev, Ye. Ye. Kovalev, A. V. Lebedinskiy, S. V. Levinskiy et al *In its* Probl. of Radiation Safety in Space Flights Dec. 1965 p 3-20 refs (See N66-12451 03-04) CFSTI: HC \$6.00/MF \$1.50

An evaluation is presented on the characteristics of the radiation hazards under manned space flight conditions including the effects of primary cosmic radiation, radiation of solar flares, the Earth's outer and inner radiation belts, and other possible regions with high radiation in interplanetary space. As man under space flight conditions is also affected by overloads, changes of gas and chemical composition in the air medium of the manned cabin, and other factors characteristic of a sealed enclosed space, consideration is given to the effect of radiation on man's resistance to these environmental factors, the combined effect of these factors on radiation injury, and the individual radiosensitivity of man. R.N.A.

N66-12453* National Aeronautics and Space Administration, Washington, D. C.

DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES USING THE SYNCHROCYCLOTRON OF THE JOINT INSTITUTE FOR NUCLEAR RESEARCH

V. P. Afanas'yev, Yu. S. Deyev, I. B. Keirim-Markus, Ye. Ye. Kovalev, S. S. Kuznetsova et al *In its* Probl. of Radiation Safety in Space Flights Dec. 1965 p 21-54 refs (See N66-12451 03-04) CFSTI: HC \$6.00/MF \$1.50

Synchrocyclotron studies in dosimetry and shielding are described. Studies are included on the physical conditions required for irradiating animals by high energy protons, methods for measuring fluxes and doses of high energy protons, determining tissue doses, protective properties of materials in the proton beam of a synchrocyclotron, and the radiation resistance of plastic materials. R.N.A.

N66-12454* National Aeronautics and Space Administration, Washington, D. C.

BIOLOGICAL EFFECT OF PROTONS WITH ENERGIES OF 510 MeV IN CASES OF MULTIPLE IRRADIATION

A. F. Bibikova, N. G. Darenskaya, M. P. Domshlak, A. N. Ganshina, G. K. Gerasimova et al *In its* Probl. of Radiation Safety in Space Flights Dec. 1965 p 55-102 refs (See N66-12451 03-04) CFSTI: HC \$6.00/MF \$1.50

The biological effects of high energy protons were studied in cases of multiple irradiation. Mongrel dogs, rats of the Wistar species, and mongrel white rats were used as experimental animals. Radiation effects on dogs were evaluated in the general state of the animals; condition of the peripheral blood and bone marrow; data from a biochemical study of the blood serum for total protein content, individual fractions, serum mucoid, and cholinesterase; state of the cardiovascular system; state of the oxidation processes; state of the nonspecific resist-

ance to infection; and pathologic-morphological and histological characteristics of the central and peripheral nervous systems, cardiovascular system, respiration, gastro-intestinal tract, and blood generating organs. Clinical, hematological, and pathologic-morphological analyses were made on the radiation injuries in rats. Details of methods used and results are discussed. R.N.A.

N66-12455* National Aeronautics and Space Administration, Washington, D. C.

BIOLOGICAL EFFECT OF PROTONS WITH ENERGIES OF 510 MeV DURING SINGLE IRRADIATION

A. F. Bibikova, N. G. Darenskaya, N. A. Derbeneva, M. P. Domshlak, A. N. Ganshina et al *In its* Probl. of Radiation Safety in Space Flights Dec. 1965 p 103-141 refs (See N66-12451 03-04) CFSTI: HC \$6.00/MF \$1.50

Studies were conducted on the biological effects of high energy protons during a single irradiation on mongrel dogs and white rats of the Wistar breed. Radiation effects on the dog's peripheral blood, cardiovascular system, gaseous interchange in a state of relative rest, immunobiological reaction, protein composition and cholinesterase activity of the blood serum, and pathology and morphology are described in detail. Rats were tested for effects on weight, peripheral blood composition, pathology and morphology, and their general clinical picture. The results of these investigations on radiation damage are also described in detail. R.N.A.

N66-12456* National Aeronautics and Space Administration, Washington, D. C.

BIOLOGICAL EFFECT OF PROTONS WITH ENERGIES OF 126 MeV ON CORNEAL EPITHELIA OF MICE

V. M. Mastryukova and A. D. Strzhizhovskiy *In its* Probl. of Radiation Safety in Space Flights Dec. 1965 p 142-150 refs (See N66-12451 03-04) CFSTI: HC \$6.00/MF \$1.50

A detailed account is presented of the methods used, data obtained, and the conclusive results of an investigation on the biological effects of high energy proton irradiation on the corneal epithelia of mice. It was postulated that genetically damaged cells possessing high reproductive viability are retained in the irradiated tissue for a long time and are responsible for tumors. R.N.A.

N66-12457* National Aeronautics and Space Administration, Washington, D. C.

DETERMINATION OF THE BIOLOGICAL EFFECT OF PROTONS WITH ENERGIES OF 510 MeV AND X-RAYS WITH ENERGIES OF 180 KV ON HEREDITARY STRUCTURES

Ye. D. Plotnikova and S. I. Strashnenko *In its* Probl. of Radiation Safety in Space Flights Dec. 1965 p 151-156 refs (See N66-12451 03-04) CFSTI: HC \$6.00/MF \$1.50

Investigations were conducted to determine the relative biological effect (RBE) of high energy protons on the hereditary structures of white rats. Dominant lethals were used as an index of hereditary changes caused by radiation. Unirradiated females were crossbred with irradiated males, sacrificed, and data derived which characterizes the frequency of dominant lethal development. The frequency increases with the radiation dose. An exponential dependence of this frequency on irradiation dose was noted. Values were obtained of the RBE for proton irradiation and compared to those previously derived for X-radiation. The RBE value was lower which may be due to the pulsating character of the proton radiation, whereas the X-radiation is continuous. It may also be the result of the interaction of high energy protons with tissue causing nuclear

reactions which form "stars" with a high ionization density. It was noted that the RBE value is close to that obtained from a number of somatic reactions. R.N.A.

N66-12458* National Aeronautics and Space Administration, Washington, D. C.

BIOLOGICAL EFFECT OF PROTONS WITH ENERGIES OF 130 MeV, X-RAYS WITH ENERGIES OF 180 KV AND CO⁶⁰ GAMMA RADIATION ON THE VESTIBULAR APPARATUS

Yu. G. Grigor'yev, A. V. Sevan'kayev, and A. A. Sveshnikov *In its Probl. of Radiation Safety in Space Flights* Dec. 1965 p 157-184 refs (See N66-12451 03-04) CFSTI: HC \$6.00/MF \$1.50

Investigations were conducted on the character of functional changes of the vestibular apparatus under the influence of different doses of ionizing radiation from high energy protons and X-rays and cobalt-60 gamma radiation, and the possible subsequent change of the sensitivity of the vestibular apparatus to adequate irritants. Data were collected which characterize the influence of high energy protons on the vestibular apparatus, the dose dependence of the studied effects, and functional impairments of the activity of the semicircular canals during different periods of radiation sickness. The results of these experiments, conducted on rabbits and dogs, are discussed in detail. R.N.A.

N66-12459* National Aeronautics and Space Administration, Washington, D. C.

BIOLOGICAL EFFECT OF MULTIPLE X-RAY IRRADIATION WITH ENERGIES OF 180 KV COMPARED WITH PROTON IRRADIATION (DOSES AND TEMPORAL DISTRIBUTION)

N. G. Darenskaya, M. P. Domshlak, V. I. Grachev, and N. I. Ryzhov *In its Probl. of Radiation Safety in Space Flights* Dec. 1965 p 185-193 (See N66-12451 03-04) CFSTI: HC \$6.00/MF \$1.50

The relative biological effect of protons in fractional irradiation was determined by experiments with the corresponding irradiation of dogs and rats by X-rays with a production energy of 180 kv. The condition of the animals (external appearance, motor and alimentary activity, state of skin and fur, state of the mucous membranes, weight, body temperature, etc.) and the state of the peripheral blood and cardiovascular system (maximum arterial pressure, arterial tone, propagation rate of the pulse wave, electrocardiography) were observed and pathologic-morphological and histological investigations were made of the tissues and organs. The results of these observations are described in detail. R.N.A.

N66-12460* National Aeronautics and Space Administration, Washington, D. C.

COMPARATIVE ANALYSIS OF BIOLOGICAL EFFECT OF PROTON RADIATION WITH ENERGY OF 510 MeV

N. G. Darenskaya, M. P. Domshlak, Yu. G. Grigor'yev, Yu. G. Nefedov, V. A. Razorenova et al *In its Probl. of Radiation Safety in Space Flights* Dec. 1965 p 194-209 (See N66-12451 03-04) CFSTI: HC \$6.00/MF \$1.50

The relative biological effect of proton radiation with an energy of 510 MeV was determined with a comparison of the collected data with materials characterizing the effectiveness of X- and gamma radiation. The admissibility of the comparison was ensured by adherence to spatial uniformity of the distribution of X- and gamma radiation in experiments made on dogs and white rats. This, in accordance with former data, permitted an analysis relating the effectiveness of proton radiation to the effectiveness of both X- and gamma radiation. Comparative characterization of the effectiveness was based on percentage survival and on the basis of a comparison of morphological changes in the organs and tissues, and also from the depth and intensity of changes of individual physiological functions in animals subjected under identical conditions to the effect of proton, X- and gamma radiations. R.N.A.

N66-12461* National Aeronautics and Space Administration, Washington, D. C.

PROPHYLAXIS AND THERAPY OF RADIATION INJURIES CAUSED BY PROTONS

Yu. D. Balika, A. F. Bibikova, B. I. Lebedev, V. D. Rogozkin, and K. M. Znamenskaya *In its Probl. of Radiation Safety in Space Flights* Dec. 1965 p 210-238 refs (See N66-12451 03-04) CFSTI: HC \$6.00/MF \$1.50

The results of investigations of the therapeutic and prophylactic effectiveness of individual pharmacological materials and certain variants of protective therapeutic complexes showed that the best protection is provided by 5-oxytryptamin and a combination of cystamin with amigdaline. An antithemorrhagic effect of 5-oxytryptamin during proton irradiation was established. An effective protective-therapeutic complex was developed which consists of a minimum range of protective and therapeutic preparations used for the most part per os. Investigations on dogs revealed that this complex is extremely effective in fatal acute radiation injuries from multiple proton irradiations. However, the complex did not prevent the development of aplastic anemia from which the dogs eventually died. For this reason it will be necessary to develop effective methods for combating specific disorders developing a long time after irradiation by high energy protons. R.N.A.

N66-12462# Milan Univ. (Italy). Inst. of Pharmacology.
SIMULATED COSMIC-RAY IRRADIATION WITH 600 MeV PROTONS, VOLUME 1, PART 2

Antonio Pasinetti Geneva, CERN, Nov. 1965 118 p Sponsored by CERN and Natl. Res. Council of Italy (HER/AP-2-65) CFSTI: HC \$4.00/MF \$0.75

Results of experiments on the biological action of artificial cosmic radiation (600 MeV protons) are presented. The data include observations of the behavior of animals after irradiation; determination of the weight of the body and certain internal organs such as the liver, kidneys, testicles, spleen, heart, lungs, and brain; and the quantitative variation of the red and white blood cells, and also of the leucocyte formula. Results of the observations are reported in tables and graphs. A second series of tables and graphs gives the experimental results calculated as percentages of variation in respect to the controls. The appendix includes a series of graphs showing the variations in body and internal organ weights as a function of the dose at various intervals after irradiation. R.N.A.

N66-12533* # Melpar, Inc., Falls Church, Va.

DETERMINATION AND MICROBIAL SURVIVAL OF CRYOGENIC WHOLE AIR SAMPLING CONDITIONS

Washington, NASA Dec. 1965 45 p refs

(Contract NAS5-9529)

(NASA-CR-354) CFSTI: HC \$2.00/MF \$0.50 CSCL 06M

Experiments were conducted to qualitatively determine the survival of eight species of microorganisms to shock wave exposure and subsequent cryogenic whole air sampling. The eight microorganisms chosen were *Cladosporium resinae*, *Aspergillus niger*, *Penicillium notatum*, *Bacillus globigii*, *Serratia marcescens*, *Clostridium pasteurianum*, *Nocardia asteroides*, and *Streptomyces griseus*. The physical conditions to which these microorganisms were subjected were chosen from those suggested by the design of an existing collector system to be used in sampling the dust content of the upper atmosphere. This system uses a low temperature metal surface which at high speeds condenses all the air in its path. From this it was assumed that successful collection of microorganisms would be dependent on their ability to survive near vacuum in the upper atmosphere, rapid heating in passage through the shock wave generated by the sampling vehicle, high speed impaction on the metal surface, rapid cooling to a few degrees K, and rewarming to room temperature and subsequent storage for a period of time. Results showed that the majority

N66-12576

of the microorganisms survived the conditions of the shock wave and cryogenic collection. The only exception was *Serratia marcescens*.
R.N.A.

N66-12576# California Univ., Livermore. Lawrence Radiation Lab.

HAZARDS CONTROL Quarterly Report No. 21, Apr.-Jun. 1965

S. Block et al [1965] 39 p refs
(Contract W-7405-ENG-48)
(UCRL-14351) CFSTI: \$2.00

Studies in controlling or eliminating radiation hazards are presented. It is reported that a small portable, lightweight, battery operated, continuous beta air monitor was built which can detect one MPC of 131 in 10 minutes. Also, a solid state plutonium air monitor was designed which uses transistorized circuitry. Results are discussed in an experiment to determine the sensitivity of a personnel monitoring film to 14 MeV neutrons. Preparation and studies of stimulated luminescence dosimeters and the results of different sulfides are described. In an investigated cleaning technique for silver metaphosphate glass, it was found that a triple rinse of dilute HCl, water, and methanol successfully removes surface soil and improves the consistency of the readings. In order to obtain satisfactory samples for radioactivity measurements, grass was compressed to densities of about 1 g/cc. Included are brief discussions in such areas as ventilation improvements for chemistry fume hoods and fire hose friction losses.
C.T.C.

N66-12581# Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex.

SELECTIVE SUMMARY OF STUDIES ON THE FISSION PRODUCT INHALATION PROGRAM FROM JULY 1964-JUNE 1965

R. G. Thomas, ed. Sep. 1965 284 p refs
(Contract AT(29-2)-1013)
(LF-28) CFSTI: \$3.50

A gamma ray detection system for biological samples that will yield good spectral data and be insensitive to changes in sample size is being investigated. In this system, the samples are rotated around an axis parallel to the axis of a long, cylindrical NaI detector. Data obtained to date on its response to 1 ml and 1 quart samples demonstrate that this system can be made insensitive to geometry changes of this magnitude while maintaining a usable counting efficiency (3% for Cs-137). Construction details are given. Work on the spectral response is still in progress.
Author

N66-12582# AiResearch Mfg. Co., Los Angeles, Calif.

APPLICATION OF RADIOISOTOPES TO MANNED SPACECRAFT LIFE-SUPPORT SYSTEMS. VOLUME I: TECHNICAL Summary Report

G. D. Davis, ed. Jul. 1965 334 p refs
(Contract AT(04-3)-575)
(SAN-575-12; SS-3369) CFSTI: \$7.14 per set (2 vol.)

This report presents the results of a study of potential applications of radioisotopes to the operation of spacecraft life-support systems. Planned spacecraft missions and the life-support system processes they require are discussed. The integration of radioisotope thermal sources into the specific process functions is analyzed, and weight comparisons are made between isotope energy systems and systems operated by fuel cells and solar cells. Studies were made of radioisotope selection and design considerations, and tradeoffs were made between single source and multiple source systems. Detailed studies are presented on the applications of isotopes to the processes of carbon dioxide removal, refrigeration, water and oxygen recovery, spacecraft heating, contaminant control, biological systems, and lunar material processing. The program

has determined that isotope heating shows considerable promise in extended spacecraft missions for the processing of water, the regeneration of the spacecraft atmosphere, vehicle heating, and decomposition of solid wastes.
Author

N66-12592# Geoscience, Ltd., La Jolla, Calif.

THERMAL AND ELECTRICAL CONDUCTIVITIES OF BIOLOGICAL FLUIDS AND TISSUES Quarterly Report, Apr. 1-Jun. 30, 1965

H. F. Poppendiek, N. D. Greene, R. Randall, and P. M. Morehouse [1965] 15 p refs
(Contract Nonr-4095(00))
(GLR-37; AD-620916)

The results of several erythrocyte settling experiments in vertical and horizontal electrical conductivity cells indicated that removal of all cells from blood samples prior to the conductivity measurements insures removal of the settling parameter. Experimental time variations in the electrical conductivity of blood that had previously been cryogenically stored are noted to be small but as yet inconclusive. Comparison of conductivity results for plasma of blood that had been cryogenically stored with and without PVP additive were significantly different, the preserved blood having lower hemolysis and higher conductivity. The thermal conductivities of bovine brain, kidney, and liver were measured after these specimens were slowly frozen to 0° C and then slowly thawed; the conductivities increased approximately 10 percent above values obtained for corresponding unstressed specimens. The corresponding conductivity changes for samples that were cryogenically frozen and more quickly warmed were smaller. Analytical thermal conductivity models were compared to experimental data obtained previously; good correlations of the results were obtained.
Author (TAB)

N66-12607# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

THE EFFECTS OF X-IRRADIATION ON GASTRIC MOTILITY IN THE DOG

Jen-Pao Chu and Shou-Chien Shih 25 Jun. 1965 15 p refs
Transl. into ENGLISH from Sheng Li Hsueh Pao (China), v. 24, no. 3/4, 1961 p 220-226
(FTD-TT-64-910/1+2+3+4; AD-620967)

Sublethal doses of x-irradiation did not have a pronounced effect on the motility of the empty stomach in dogs. The characteristic changes were increased strength of contraction and rapid recovery. A lethal dose of radiation caused a marked change in gastric motility. Immediately after the irradiation, gastric motility disappeared. Although the motility resumed subsequently, a sustained normal state was seldom reached. If the depression occurred, in most cases chances for full recovery were nil. In a few animals, after the first depression, the gastric motility fluctuated for several months before returning to normal. If, however, a second depression occurred after an extended normalization period, death usually followed. The extent of the gastric motility alteration may be used as an index to the severity of the radiation syndrome, as a basis for understanding of the nature of the gastrointestinal disturbance in radiation sickness, and eventually for its treatment. Since gastric motility is under the regulation of the CNS, its changes may also reflect the state of the CNS.
Author (TAB)

N66-12626# Joint Publications Research Service, Washington, D. C.

TRANSLATIONS OF COMMUNIST CHINA'S SCIENCE AND TECHNOLOGY, NO. 246. COLLECTED PAPERS OF THE FIRST NATIONAL SYMPOSIUM OF BIOCHEMISTRY

23 Nov. 1965 242 p refs Transl. into ENGLISH from the Document "Ti-i-Tz'u Ch'uan-Kuo Sheng-Wu Hua-Hsueh Hsueh-Shu-Hui Hui-K'an" Peking, 1962 p 1-84, 95-162 Symp. held at Shanghai, 15-22 Jan. 1960
(JPRS-33002; TT-65-33579) CFSTI: \$6.00

CONTENTS:

1. DEVELOPMENTS AND MISSIONS OF OUR COUNTRY'S BIOCHEMISTRY Y.-l. Wang p 2-10 (See N66-12627 03-04)
2. STRUCTURE AND FUNCTION OF PROTEINS T.-g. Ts'ao p 11-87 refs (See N66-12628 03-04)
3. PRESENT STATE AND OUTLOOK OF RESEARCH IN THE ENZYME CATALYSIS MECHANISM C.-l. Tsou p 88-109 refs (See N66-12629 03-04)
4. NUCLEIC ACID AND PROTEIN BIOSYNTHESIS T.-p. Wang and W.-l. Meng p 110-124 refs (See N66-12630 03-04)
5. BIOENERGETICS C.-h. Hsu p 125-137 refs (See N66-12631 03-04)
6. CONTRIBUTIONS OF MICROBIOCHEMISTRY TO BIOLOGICAL SCIENCES S.-c. Shen p 138-142 (See N66-12632 03-04)
7. THE PRESENT TREND AND OUTLOOK OF COMPARATIVE BIOCHEMISTRY C. Chi p 143-165 refs (See N66-12633 03-04)
8. THE PRESENT STATE OF VIRUS RESEARCH S.-y. Kao p 166-180 refs (See N66-12634 03-04)
9. BIOCHEMISTRY OF CONNECTIVE TISSUE S.-c. Wang p 181-203 refs (See N66-12635 03-04)
10. BIOCHEMICAL PROBLEMS IN THE FOOD INDUSTRY p 204-210 (See N66-12636 03-04)
11. PRESENT STATE OF TUMOR IMMUNIZATION STUDIES Chih-ch'uan Liang p 211-219 refs
12. ON THE MECHANISM OF CANCER INDUCTION Shih-o Li p 220-226 refs
13. MOVEMENTS AND PREDICTIONS OF SEVERAL BIOCHEMICAL PROBLEMS IN THE LEATHER INDUSTRY p 227-231
14. TITLES OF RESEARCH PAPERS READ AT THE FIRST NATIONAL SYMPOSIUM OF BIOCHEMISTRY p 232-238

N66-12627 Joint Publications Research Service, Washington, D. C.

DEVELOPMENTS AND MISSIONS OF OUR COUNTRY'S BIOCHEMISTRY

Ying-Lai Wang *In its* Transl. of Communist China's Sci. and Technol., No. 246 23 Nov. 1965 p 2-10 (See N66-12626 03-04) CFSTI: \$6.00

An outline of the advances in biochemical research and development in mainland China during the last ten years is presented. Discussed are developments in basic theory, enzyme systems, metabolism, cancer, nutrition, and medical technology. L.S.

N66-12628 Joint Publications Research Service, Washington, D. C.

STRUCTURE AND FUNCTION OF PROTEINS

T'ien-Ch'in Ts'ao *In its* Transl. of Communist China's Sci. and Technol., No. 246 23 Nov. 1965 p 11-87 refs (See N66-12628 03-04) CFSTI: \$6.00

A detailed discussion of the chemical structure of the peptide chains of proteins is presented, with the aim of combining all known data for the purpose of finding a few roughly outlined rules governing amino acids of primary, secondary, tertiary, and quaternary structures. Tables giving the keys to the chemical structure of insulin, the tobacco virus, and other peptide chains are presented, along with a diagram showing the relationship between size and function of several extracted protein and polypeptide molecules. The discussion includes alpha helices, the energy band theory of proteins, protein energy transmission mechanisms and semiconductor properties, protein toxins, microscopic differences in proteins, and enzymes. L.S.

N66-12629 Joint Publications Research Service, Washington, D. C.

PRESENT STATE AND OUTLOOK OF RESEARCH IN THE ENZYME CATALYSIS MECHANISM

Ch'eng-Lu Tsou *In its* Transl. of Communist China's Sci. and Technol., No. 246 23 Nov. 1965 p 88-109 refs (See N66-12626 03-04) CFSTI: \$6.00

Enzyme catalyst mechanisms are discussed. The lock and key, tension, induced fitting, and induced polarization theories of action mechanism are described; and the relationship between enzyme structure and catalytic activity is discussed along with a review of the formation of enzyme intermediate products. Considered are enzyme molecular weights, chemical changes in the molecular structure, the action of radical groups, activity centers, hydrolysis, inhibition by different amines, and optical rotation. A table depicting the catalytic effectiveness of enzymes listing the catalyst, the reaction, the temperature, and the second order reaction speed constant is given. L.S.

N66-12630 Joint Publications Research Service, Washington, D. C.

NUCLEIC ACID AND PROTEIN BIOSYNTHESIS

Te-Pao Wang and Wei-Lien Meng *In its* Transl. of Communist China's Sci. and Technol., No. 246 23 Nov. 1965 p 110-124 refs (See N66-12626 03-04) CFSTI: \$6.00

The biosynthesis of proteins by the incorporation of amino acids through a three stage process is discussed. Chemical structural formulas depicting the activation stage, the action of soluble RNA, and the incorporation step are represented. Results of experimental data in which amino acids were radioactively labelled are tabulated, showing the amounts of C¹⁴ amino acid incorporated. Other protein syntheses through bacteria are discussed, and the relationship between DNA and protein biosynthesis is also considered. L.S.

N66-12631 Joint Publications Research Service, Washington, D. C.

BIOENERGETICS

Ching-Hua Hsu *In its* Transl. of Communist China's Sci. and Technol., No. 246 23 Nov. 1965 p 125-137 refs (See N66-12626 03-04) CFSTI: \$6.00

A review of basic problems in bioenergetics is given. The excitation state of electrons, Kirkwood's theory of charge motion, hydrogen bonding, London-Van der Waal forces, and other electrical attraction forces are discussed with respect to possible forms of energy transformation in living organisms. Also discussed are thermodynamical relationships with life phenomenon, including entropy and energy barriers. L.S.

N66-12632 Joint Publications Research Service, Washington, D. C.

CONTRIBUTIONS OF MICROBIOCHEMISTRY TO BIOLOGICAL SCIENCES

Shan-Chiung Shen *In its* Transl. of Communist China's Sci. and Technol., No. 246 23 Nov. 1965 p 138-142 (See N66-12628 03-04) CFSTI: \$6.00

A review of microbiological and biochemical developments during the last 20 yrs is presented. Bacteria photosynthesis, intermediate catabolism, and nitrogen catabolism studies are discussed. Also discussed are induced enzyme studies with relation to biological synthesis of proteins, and heredity. In addition, studies involving N¹⁵ labelled DNA are described. L.S.

N66-12633 Joint Publications Research Service, Washington, D. C.

THE PRESENT TREND AND OUTLOOK OF COMPARATIVE BIOCHEMISTRY

Cheng Chi *In its* Transl. of Communist China's Sci. and Technol., No. 246 23 Nov. 1965 p 143-165 refs (See N66-12626 03-04) CFSTI: \$6.00

The significance, mission, and achievements of comparative biochemistry are discussed. A review of work on protein, purine, and amino acid metabolism is given. Tabulated data showing comparisons of N-excretions for vertebrates and nonvertebrates are given, along with other tables of data listing the end products of protein metabolism in animals; and abilities of man and animal organisms to synthesize amino acids. Nitrogenous bases and proteins with respect to muscle chemistry is also discussed; and tables listing nitrogenous bases in the muscles of different animals; phosphocreatine and phosphoarginine distribution in the animal kingdom; and differences in the methionine and cystine content of myosin of various animals are given. The use of the comparative point of view for studying various biochemical problems, including the distribution, structure, physico-chemical life mechanisms such as genesis growth, heredity, mutation, adaptation, etc. is advocated. L.S.

N66-12634 Joint Publications Research Service, Washington, D. C.

THE PRESENT STATE OF VIRUS RESEARCH

Shang-Yin Kao *In its* Transl. of Communist China's Sci. and Technol., No. 246 23 Nov. 1965 p 166-180 refs (See N66-12626 03-04) CFSTI: \$6.00

Activities in virus research are reviewed. The chemotherapy of viral infections; the biological control of crop pests with viruses; the infectivity and heredity of virus nucleic acids; and the growth, multiplication, and mutations of viruses are discussed. The present state of the art indicates that the relationship between virus mutation and the protein moiety is small, if any, though it is closely related to the nucleic acid moiety of the virus. A change in the nitrogen-alkali sequence of nucleosides appears to cause changes in virus biological characteristics. L.S.

N66-12635 Joint Publications Research Service, Washington, D. C.

BIOCHEMISTRY OF CONNECTIVE TISSUE

Shih-Chung Wang *In its* Transl. of Communist China's Sci. and Technol., No. 246 23 Nov. 1965 p 181-203 refs (See N66-12626 03-04) CFSTI: \$6.00

The components and metabolism of connective tissue are discussed from a biochemical viewpoint. The properties and chemical composition of fibrous proteins such as collagen, reticular protein, and elastin; nonfibrous proteins such as plasma albumin; acid mucopolysaccharides; and polysaccharides are discussed. The amino acid composition of several fibrous proteins compared with egg albumin, and an amino acid analysis of elastin and derived α and β proteins are listed in tabular form. The role of hyaluronic acid (and its isomer chondroitin), keratin sulfate, heparitin sulfate, and water in connective tissue is discussed. Also included is a diagram illustrating the biosynthesis of collagen. L.S.

N66-12636 Joint Publications Research Service, Washington, D. C.

BIOCHEMICAL PROBLEMS IN THE FOOD INDUSTRY

In its Transl. of Communist China's Sci. and Technol., No. 246 23 Nov. 1965 p 204-210 (See N66-12626 03-04) CFSTI: \$6.00

Biochemical problems pertinent to food processing are reviewed. The problems of quality in raw materials, transportation, storage, processing techniques, and fortification and supplementation of color, smell, and taste are considered. Also discussed are the nutritional content of food, the utilization of raw materials and biochemical inspection methods. The use of enzyme preparations, vitamin preparations, plant bactericidins, and antibiotics for food processing is discussed, and ionizing radiation for sterilization is mentioned. L.S.

N66-12650 Library of Congress, Washington, D. C. Aerospace Technology Div.

HIGHLIGHTS OF SOVIET BIOASTRONAUTICS AT THE 16TH IAF CONGRESS

Boris N. Mandrovsky *In its* Foreign Sci. Bull., Vol. 1, No. 11 Nov. 1965 p 38-48 refs (See N66-12644 03-34)

Twelve Soviet papers dealing with bioastronautics, life support systems, and the Voskhod-2 flight which were presented at the 16th IAF Congress in Athens are examined. Despite the fact that the Soviet contributions were generally disappointing, they did help to clarify some details regarding the Voskhod-2 flight, they revealed Soviet concern over the effects of accelerations following weightlessness, and they provided some indications of research trends and some clues to probable future spaceflight plans. Author

N66-12657# Joint Publications Research Service, Washington, D. C.

RECENT PAPERS DELIVERED AT VARIOUS SOVIET AND INTERNATIONAL CONFERENCES ON SPACE MEDICINE

10 Nov. 1965 51 p refs Transl. into ENGLISH from Soviet Rept. Presented at 16th Intern. Astronautical Congr., Athens, 13-18 Sep. 1965 (JPRS-32808; TT-65-33386) CFSTI: \$2.00

CONTENTS:

1. PROBLEMS IN EVALUATING THE PERFORMANCE OF ASTRONAUTS F. Y. Isakov, V. A. Popov, and L. S. Khachat'ur'yants p 1-7 refs (See N66-12658 03-04)
2. RESULTS OF SOME ELECTROPHYSIOLOGICAL STUDIES ON THE "VOSKHOD" SPACECRAFT I. T. Akulnichev, V. V. Bogdanov, D. G. Maksimov, and I. I. Popov p 8-17 refs (See N66-12659 03-04)
3. CONFERENCE ON THE APPLICATION OF MATHEMATICAL METHODS IN AEROSPACE MEDICINE, 25-26 FEBRUARY 1965 p 18-48 (See N66-12660 03-04)

N66-12658 Joint Publications Research Service, Washington, D. C.

PROBLEMS IN EVALUATING THE PERFORMANCE OF ASTRONAUTS

F. Y. Isakov, V. A. Popov, and L. S. Khachat'ur'yants *In its* Recent Papers Delivered at Various Soviet and Intern. Conf. on Space Med. 10 Nov. 1965 p 1-7 refs (See N66-12657 03-04) CFSTI: \$2.00

Methods used and problems encountered in evaluating the performance of astronauts are described. The following methods are discussed relative to studying the ability of a human operator to perform under space flight conditions: graphic occupational analysis of the working operations; study of the resolving capacity of the visual analyzer; investigating visual operating capacity; the quality of the operative memory in working with the contours of regular and random lines; and study of dynamic features of a person in a modeling device control system with direct and delayed feedback. A brief consideration is included of the biomechanical analysis of the nature and features of the movements of Leonev during extravehicular activity. C.T.C.

N66-12659 Joint Publications Research Service, Washington, D. C.

RESULTS OF SOME ELECTROPHYSIOLOGICAL STUDIES ON THE "VOSKHOD" SPACECRAFT

I. T. Akulnichev, V. V. Bogdanov, D. G. Maksimov, and I. I. Popov *In its* Recent Papers Delivered at Various Soviet and Intern. Conf. on Space Med. 10 Nov. 1965 p 8-17 refs (See N66-12657 03-04) CFSTI: \$2.00

A discussion is presented of some electrophysiological studies carried out on the Voskhod spacecraft. Such experiments as work capacity, fatigue, degree of motor coordination, and the retention of the motor stereotype developed under earth conditions are considered. The apparatus used in the experiments are described, and the method of transmitting the information is included. C.T.C.

N66-12660 Joint Publications Research Service, Washington, D. C.

CONFERENCE ON THE APPLICATION OF MATHEMATICAL METHODS IN AEROSPACE MEDICINE, 25-26 FEB. 1965

In its Recent Papers Delivered at Various Soviet and Intern. Conf. on Space Med. 10 Nov. 1965 p 18-48 (See N66-12657 03-04) CFSTI: \$2.00

Summaries are given of reports delivered at a conference on the application of mathematical methods in aerospace medicine. Areas are considered such as: punched cards in the analysis of phonocardiographic data; apparatus for analyzing elicited responses; comprehensive analysis of electroencephalograms; a simplified method for measuring operator transfer functions; and the use of some statistical indices to find persons with latent forms of statokinetic disorders. C.T.C.

N66-12682 Mound Lab., Miamisburg, Ohio.
URINARY ELIMINATION FOLLOWING INHALATION OF INSOLUBLE PLUTONIUM OXIDE

W. E. Sheehan *In* AEC Bioassay and Anal. Chem. Meeting [1964] p 39-46 ref (See N66-12676 03-06) CFSTI: \$2.50 (Contract AT(33-1)-GEN-53)

From two inhalation exposure cases of plutonium oxide the urinalysis data indicate that DTPA treatments are the most effective from 100 to 300 days after exposure. Author

N66-12683 Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex.

THE PHYSICAL PARAMETERS OF PARTICULATES WHICH EFFECT RESPIRATORY TRACT DEPOSITION
Robert G. Thomas *In* AEC Bioassay and Anal. Chem. Meeting [1964] p 47-64 refs (See N66-12676 03-06) CFSTI: \$2.50

Certain physical and physiological parameters which effect the pattern of deposition are reviewed. A cross section of the nasal-pharyngeal region which indicates the anatomical regions relating to the deposition of particles within the upper respiratory tract is shown. Also shown is a cutaway view of the respiratory tract below the larynx which indicates the various branches of the air passages. It shows how the relative size of the tubes decreases, starting with the first major bifurcation and passing through the main bronchi, upper and lower bronchi and down into the bronchioles in the extremities of the lobes. The humidity of the respiratory tract is extremely high, and at the pharynx and the larynx it reaches approximately 99.5% relative. If a dry hygroscopic particle were inhaled it would increase in size considerably while traversing the respiratory tract. Therefore, the site of deposition may be difficult to predict. The deposition pattern of NaCl as a function of the particle as it was measured in the dry state was also shown. R.W.H.

N66-12684 Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex.

WHOLE BODY DEPOSITION OF PARTICLES AS A FUNCTION OF VARIOUS PHYSICAL AND CHEMICAL PARAMETERS

Randi Lie *In* AEC Bioassay and Anal. Chem. Meeting [1964] p 85-75 refs (See N66-12676 03-06) CFSTI: \$2.00

Investigations have shown that good correlation may be made between animals and man. A comparison between the rabbit and the rat of the mean uranium content of lungs at the time of terminal sacrifice following inhalation is given. The differences are small, especially with the smaller particle size. Also shown are comparisons of total retention between monkey and man, and between guinea pig and man. In both instances, the similarities are amazingly close. R.W.H.

N66-12685 Dow Chemical Co., Denver, Colo. Rocky Flats Div.

EFFECTIVENESS OF EARLY DTPA TREATMENTS IN TWO TYPES OF PLUTONIUM EXPOSURES IN HUMANS
C. R. Lagerquist, S. E. Hammond, E. A. Putzier, and C. W. Pittingsrud *In* AEC Bioassay and Anal. Chem. Meeting [1964] p 76-84 refs (See N66-12676 03-06) CFSTI: \$2.50

Two cases of plutonium exposure are reported. Both cases were given prompt DTPA (diethylenetriaminepentaacetic acid) treatments. In Case 1; an employee was sprayed with a plutonium nitrate solution. Plutonium entered his body via ingestion, inhalation, and absorption through small acid burns on the skin. In Case 2, an employee's thumb was pierced by a wire contaminated with plutonium oxide. The plutonium levels in their urine, feces, and blood were measured regularly. The effectiveness of the DTPA treatments was markedly different in the two cases. The DTPA was very successful in removing the soluble plutonium in Case 1. In Case 2, however, the effectiveness of the treatment was inconclusive. Author

N66-12686 United Kingdom Atomic Energy Authority, Harwell (England).

THE INTERPRETATION OF ANALYTICAL RESULTS FOR RADIONUCLIDES IN URINE

S. Jackson and G. W. Dolphin *In* AEC Bioassay and Anal. Chem. Meeting [1964] p 85-101 refs (See N66-12676 03-06) CFSTI: \$2.50

A brief summary is presented of the human data available on metabolism and excretion of cesium, phosphorus, plutonium, polonium, radium, strontium, sulfur, tritium and uranium. Following a recognized accidental intake of a radionuclide, it is desirable to analyze a carefully planned series of urine samples, to provide a measure of the excretion rate of the individual and to minimize the uncertainty association with single, isolated results. For assessment of routine urine analysis results from a group of personnel, the excretion data can be used to calculate the urinary concentration related to a chosen level of body content at which further investigation is required. Routine results should be carefully recorded for use in periodical reviews of their long-term significance. Author

N66-12689 Atomic Energy Commission, Washington, D. C.
PRELIMINARY RESULTS ON THE URANIUM CONTENT IN THE HUMAN DIET

George A. Welford and Ruth Baird *In its* Bioassay and Anal. Chem. Meeting [1964] p 136-141 refs (See N66-12676 03-06) CFSTI: \$2.50

Human bone, tissue, and other organs of the body were analyzed and found to contain traces of uranium, usually less than 0.02 microgram per gram of organ. Measurable quantities of uranium in urine excreted by humans with no history of industrial exposure have been reported. These results vary but are usually less than one microgram per liter of urine. Several approaches to the isolation of uranium from a food and bone matrix were investigated. Several ion exchange techniques that separate uranium and iron using a mixed solvent system were also reported. R.W.H.

N66-12728# Joint Publications Research Service, Washington, D. C.

CYBERNETICS IN MEDICINE

I. I. Pogromskiy 11 Oct. 1965 10 p Transl. into ENGLISH from Zdravookhr. Turkmenistana (Ashkhabad), no. 7, Jul. 1965 p 3-8

(JPRS-32344; TT-65-32834) CFSTI: \$1.00

The development of cybernetics is reviewed, and the concepts given to the term by various scientific specialties are defined. The cybernetic devices used in medical practice are classified as: (1) biological control—devices based upon the use of information received from the living organism; (2) biological stimulation—devices designed for introducing control information into the living organisms, and (3) functional prosthesis development—devices replacing individual organs or functional systems and having an autonomous control system which is the isomorph to the corresponding system in the living organism. Consideration is also given to the brain and the nervous system as cybernetic systems, and the scientific discipline of neurocybernetics is discussed. Recommendations are made on the application of cybernetics to diagnostics; these include devising algorithms for collecting and processing information, research on the statistical and probability distribution of medical data, and establishing the logical bases of diagnostics.

M.G.J.

N66-12752 Joint Publications Research Service, Washington, D. C.

THE DEVELOPMENT OF CYBERNETICS

Shih-Hua Hu *In its* Transl. on Communist China's Sci. and Technol., No. 244 23 Nov. 1965 p 1-16 refs Transl. into ENGLISH from K'o Hsueh T'ung Pao (Peking), no. 10, Oct. 1965 p 862-869 (See N66-12751 03-34) CFSTI: \$3.00

A general discussion of the development of cybernetics deals with three general questions. (1) What is the background for cybernetics and how was this science used to suit the needs of society? (2) How did cybernetics expand into its various research fields? (3) When did cybernetics begin to produce practical and meaningful machines?

M.W.R.

N66-12756 Joint Publications Research Service, Washington, D. C.

COMPARISON OF THE RADIATION SENSITIVITY OF CHROMOSOME IN WHITE BLOOD CELLS OF HUMAN BEINGS, MONKEYS, AND RABBITS

Hsien-Ting Chou *In its* Transl. on Communist China's Sci. and Technol., No. 244 23 Nov. 1965 p 45-50 refs Transl. into ENGLISH from K'o Hsueh T'ung Pao (Peking), no. 10, Oct. 1965 p 917-918 (See N66-12751 03-34) CFSTI: \$3.00

Blood from human beings, monkeys, and rabbits was used in an experiment to observe the chromosome mutation of white cells cultured in a short time as specimens. For men and monkeys, the blood was obtained from veins, and from hearts of the rabbits. As soon as the blood was obtained, it was irradiated with X-rays. The dosage was 0, 25, 50, 100, 200, and 300 rads, and the dose rate was 25 rads/min. The culture medium was a mixture of Eagle's solution and hydrolyzed lactoprotein, calf's serum, with a suitable amount of PHA and liver extract. From 100 to 300 cells were examined for each group of the experiment, and the results are given in tabular form. A comparison of the data between the variation analysis and the adjusted mean reveals that there is no great or distinctive difference in mutation values of chromosome between men and monkeys with respect to the dosage, but that there is a great difference between men and rabbits, and between monkeys and rabbits.

C.T.C.

N66-12762# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

EFFECT OF VESTIBULAR IRRADIATION ON ELECTRICAL ACTIVITY OF THE CORTEX AND BASAL AREAS OF THE BRAIN

Ye. A. Zhirmunskaya and F. M. Ioselevich 18 Aug. 1965 23 p refs Transl. into ENGLISH from Vestn. Oto-Pino-Laringol. (USSR) v. 13, no. 2, 1951 p 17-24

(FTD-TT-65-410/1+2+4; AD-620503) CSCL 06P

Relative investigation of electrical activity of cortex and basal sections of the brain revealed certain additional characteristics in the nature of basal electrogram in comparison with the previously described ones. Vestibular irritation causes considerably greater changes in bioelectric activity of the brain than do other afferent irritations. Electric response to irritation of the vestibular apparatus can be picked up from all areas of cortex cerebri and in a majority of cases appears to be two-sided symmetrical. Responsive reaction to vestibular irritation in basal areas is expressed much brighter, more intensive and longer lasting, than in the cortex cerebri. Duration and multiphaseness of changes in electrical activity of the brain during vestibular irritation, apparently, are connected with the involvement into responsive reaction of a series of mechanisms, including the vegetative-vascular. A very important role is played in this case by the emotional factor. The obtained data, indicating considerable functional displacements in electrical activity of basal sections of the brain under the effect of vestibular irritation in norm, give bases to assume that illnesses of the central nervous system the changed nature of its reactivity may be easier to detect with the aid of the mentioned afferent irritation.

Author (TAB)

N66-12783# Dartmouth Coll., Hanover, N. H.

[AFFECTIVE COMMUNICATION IN SPEECH AND RELATED QUANTITATIVE PROBLEMS] Final Report, 15 Apr. 1963-14 Apr. 1965

Victor E. Mc Gee 26 Jul. 1965 58 p refs

(Contract Nonr-3897(05))

(AD-620333)

The research project was designed to investigate by various means those kinds of information in speech which do not deal directly with the actual verbal message per se. The name given to this nonverbal information is 'affective information'. The work attempted to make use of the physical information in the speech processing system to predict the 'intelligibility' of the speech signal. Intelligibility as here defined is synonymous with fidelity of transmission since the subject's response is merely a repetition of the perceived input signal. With respect to affective information the goal has been to identify as far as possible the acoustical properties of the speech signal which are identified with various perceptual responses to that speech signal. The first non-verbal aspect that was considered was 'speech quality'. Since this concept is of considerable importance both in the technology of speech processing developments and from a psychological point of view, various attempts at defining psychoacoustical correspondences have been made during the term of this project. (TAB)

N66-12827# Army Chemical Center, Edgewood, Md. Chemical Research and Development Labs.

EFFECT OF PREVIOUS POSTURE ON CARDIAC ACCELERATION AT THE BEGINNING OF EXERCISE

F. N. Craig Mar. 1965 10 p refs

(CRDLR-3268; AD-621529)

Three subjects rested in the supine position, arose quickly, and ran for 1 min on a treadmill. Then they stood erect for 1 min and ran again. For the first 30 beats at the beginning of the run, their cardiac acceleration was greater after supine than after standing rest. The acceleration after supine rest then declined. The difference in cardiac rate arising from previous posture was

insignificant for the last 30 sec of the run. Environmental temperatures were 18 degrees and 46 degrees C. The initial difference in acceleration was greater at the higher temperature. The distribution of blood between the chest and the periphery contributes to the differences in the degree of acceleration of the heart at the beginning exercise. Author (TAB)

N66-12885# Aerospace Medical Div. Aerospace Medical Research Labs. (6570th), Wright-Patterson AFB, Ohio.
COMPRESSION FRACTURES OF THORACIC VERTEBRAE APPARENTLY RESULTING FROM EXPERIMENTAL IMPACT, A CASE REPORT Final Report, Jan.-Apr. 1964
 John H. Henzel, Neville P. Clarke, George C. Mohr, and Edmund B. Weis, Jr. Aug. 1965 13 p refs
 (AMRL-TR-65-134; AD-622026)

The occurrence of compression deformities of the fourth and fifth thoracic vertebrae in a human test subject (DCL) exposed in laboratory experiments to an impact acceleration profile similar to that produced by ejection seat rockets is reported. This injury was presumed to be the result of an impact profile having a peak acceleration of 18.8G, a rate of onset of 420G per second and a baseline duration of approximately 100 milliseconds. The subject's long axis was inclined backward 34 degrees from the vertical force vector. The diagnosis was established upon the subject's termination of hazardous duty and separation from the service, approximately one year after the presumptive date of injury. This documented injury represents a demonstrable endpoint in impact tolerance of a subject exposed to an acceleration environment which can be specifically described. Author (TAB)

N66-12898# Jefferson Medical Coll., Philadelphia, Pa.
[STUDIES ON METABOLIC RESEARCH] Annual Report
 F. William Sunderman 15 May 1965 57 p refs
 (Contract AT(30-1)-1397)
 (NYO-1397-1)

Metabolic research studies reported include the development of an atomic absorption procedure for the quantitative determination of Ni in urine and other biological materials; a modification of the atomic absorption spectrometric procedure for use in measurements of vanilmandelic acid in blood samples from a patient with pheochromocytoma throughout the operative period for removal of the tumor; the development of a conductivity method for the estimation of electrolyte concentration in blood serum; the modification of a cryoscopic method for use in determining the freezing point of biological fluids; and the development of a method for testing the uniformity of concentration of gases in animal exposure chambers. NSA

N66-12899# Oak Ridge National Lab., Tenn.
COMPARISON OF VARIOUS METHODS OF RATE RECORDING
 C. Craig Harris, M. M. Satterfield, P. R. Bell, and D. A. Ross [1965] 15 p refs
 (Contract W-7405-ENG-26)
 (ORNL-P-1383; Conf-650313-2)

Comparisons are made between the performances of conventional, true-average, and digital count rate meters. All three devices currently in use for count rate recording cause at least some distortion of the actual events. When the counting rate is high, all can be used properly. When it is low, none do a good job. At any counting rate the digital and true-average rate meters are slightly better than the conventional device. If the recorded trace of counting rate versus time is to be believed from any of the devices, the memory or time constant must be short enough so that statistical variations are shown on the recorded curve. However, these variations must not be so large that they totally mask real events. In this respect the digital and true-average count rate meters are superior to the conventional instrument. R.N.A.

N66-12903# Joint Publications Research Service, Washington, D. C.

INFLUENCE OF DIFFERENT GRADES OF HYPOXIA ON SENSITIVITY TO EPILEPTOGENIC AGENTS AND ON CERTAIN FUNCTIONAL PROPERTIES OF MOTOR FORMATIONS OF THE BRAIN

S. A. Doiina 29 Nov. 1965 12 p refs Transl into ENGLISH from Fiziol. Zh. SSSR (Moscow), v. 51, no. 7, Jul. 1965 p 799-805

(JPRS-33056; TT-65-33633) CFSTI: \$1.00

The dynamics of convulsive states of various origin, the excitability of motor zones in the cortex, and the effect of hypoxia on functional properties of motor formations of the brain stem are studied. The work was conducted on 267 male rats of the vistar line, 4-7 months old. Hypoxia was simulated in a pressure chamber by rapid rarefaction of the air. Carazol and electric stimulation of the cortex of the brain were used as convulsion causing agents. R.C.S.

N66-12917# California Univ., Los Angeles. Lab. of Nuclear Medicine and Radiation Biology.

A FORTRAN IV PROGRAM FOR THE EVALUATION OF POST-IRRADIATION SURVIVAL TIMES

James L. Leitch and Nancy S. Hagen Nov. 1965 41 p refs
 (Contract AT(04-1)-GEN-12)

(UCLA-12-573) CFSTI: \$2.00

A Fortran IV computer program has been developed for the rapid evaluation of post-irradiation survival times in animals. It takes into account the "cage effect" between cages within the same experiment, a factor not covered by the Litchfield time-percent effect method of analysis. The program may also be modified for evaluating drug and toxicity studies and for extended (life span) studies on both experimental (treated) and normal (untreated) animals. The terms "protection ratio" and "protection value" are defined. A new standardization procedure to allow comparison of results from different experiments is outlined and designated "survival ratio". Four appendices give the list of the program, flow diagrams for the program and the subprogram, preparation of the data deck and an output from a single experiment as illustration to assist others who may wish to follow or modify this tool for their own use. Author

N66-12951# Iowa State Univ. of Science and Technology, Ames. Coll. of Veterinary Medicine.

CRITICALLY CONTROLLED INHALATION STUDY OF PATHOGENESIS OF NEODYMIUM OXIDE IN MICE AND GUINEA PIGS

Fred C. Davison and Frank K. Ramsey Jun. 1965 80 p refs
 (Contract AT(11-1)-1170)

(COO-1170-4)

This experiment was designed to evaluate the effects of an aerosol of stable neodymium oxide (Nd_2O_3) of a known particle size range and concentration on the lungs, other major organs, blood and body weight of mice and guinea pigs when administered over various periods of time up to 120 days. Mice and guinea pigs exposed to concentrations of approximately 30 mg Nd_2O_3 /meter³ of air, in which about 60% of the mass was composed of particles less than 1 μ in diam, showed a gradual increase of neodymium in the lung as exposure time increased. This material was contained in macrophages in the alveoli and in the alveolar septa and was transported to the tracheobronchial lymph nodes. There were no granulomatous or other dramatic inflammatory reactions to the foreign material during the period of this experiment, and the other body organs which were evaluated histopathologically remained relatively normal. Changes in hematologic parameters were not remarkable. Author

N66-12957# Joint Publications Research Service, Washington, D. C.

PRINCIPLES OF SEGMENTATION OF THE SPEECH STREAM

N. I. Dukel'skiy 9 Nov. 1965 160 p refs Transl. into ENGLISH of the book "Printsiy Segmentatsiya Rechevogo Potoka" Moscow, Publishing House Acad. Sci. USSR, 1962 p 1-138 (JPRS-32790; TT-65-33368) CFSTI: \$5.00

This book treats problems of segmenting the speech stream into elementary units. These units and their properties and interrelationships in the speech stream can help to reveal a number of patterns in the conversion of the information of a continuously variable speech stream into minimum discrete elements (phonemes). The results of the research are based on a considerable amount of data, which were obtained through the use of the latest methods of experimental phonetics, including methods of transplanting and splicing sounds which were developed independently. Author

N66-12959*# American Inst. for Research, Pittsburgh, Pa. Inst. for Performance Technology.

HUMAN FACTORS INFORMATION REQUIREMENTS FOR SPACE SYSTEM DEVELOPMENT Final Report

James W. Altman Jun. 1964 173 p refs (Contract NASr-194)

(NASA-CR-68230) CFSTI: HC \$5.00/MF \$1.00 CSCL 05E

As a basis for projecting long-term requirements for human factors information in space system development, practices in existing programs were surveyed. Personal interview comments were supplemented by a literature survey and an analysis of system development decisions. A total of 74 individual requirements were identified, which can be summarized as: (1) basic data generation and dissemination—data concerning human functioning, improved availability of technical reports, development of a data storage and retrieval system, and techniques for establishing research priorities; (2) definition and control of the human factors process—improved communication between human factors and other personnel, the role of skilled operators, and integrated procedures on program planning and control; (3) function description and processing—function allocation, system, function, and task analysis; and job design and personnel forecasting; (4) human factors design—human engineering requirements; selection, training, and proficiency assessment; and informational job performance aids; and (5) design assessment—human factors evaluation and testing. Findings indicate the importance of rapprochement between theory and application. M.G.J.

N66-12972*# Naval School of Aviation Medicine, Pensacola, Fla.

THE EFFECTS OF ENVIRONMENTAL TEMPERATURE CHANGES ON THE EKG OF THE SQUIRREL MONKEY (SAIMIRI SCIUREUS)

Arnold Eskin and David C. Riccio 12 May 1965 16 p refs (NASA Order R-39)

(NASA-CR-68306; NSAM-926) CFSTI: HC \$1.00/MF \$0.50 CSCL 06S

Electrocardiograms of four monkeys were recorded during exposure of the animals to air slowly heated 5° to 8° C above room level. Neither rectal nor skin temperature was affected. Deceleration of the heart and increase in T-wave amplitude under these conditions are noteworthy phenomena. As a control, EKG records for two of the monkeys were similarly recorded during exposure to slowly cooling air. Rectal temperature showed a very small change. Heart rate and respiration rate increased and T-wave amplitude decreased considerably. Author

N66-12989*# Massachusetts Inst. of Tech., Cambridge. Alfred P. Sloan School of Management.

PROBLEM SOLVING STRATEGIES IN PARALLEL RESEARCH AND DEVELOPMENT PROJECTS

Thomas J. Allen Jun. 1965 27 p refs *Its Working Paper No. 126-65* Sponsored by NASA

(NASA-CR-68375) CFSTI: HC \$2.00/MF \$0.50 CSCL 05A

Three pairs of parallel R & D projects are examined. The data analyzed were gathered by means of Solution Development Records—a form which provides a weekly estimate of the probability of adoption of the approaches under consideration as possible solutions to a technical problem. It is found that the longer an approach is indicated by these forms to be in a favored position, the more difficult it is to reject. Furthermore, the number of alternative technical approaches considered bears a relation to judged solution quality. Groups producing higher-rated solutions generated fewer approaches during the course of the project, and they more closely approach an ideal strategy of approaches off on a two-at-a-time basis than do their poorer performing rivals. Author

N66-12994*# Massachusetts Inst. of Tech., Cambridge. Alfred P. Sloan School of Management.

CONTINUITY AND OPENNESS IN HIGH ENERGY PHYSICS GROUPS

Henry B. Eyring Sep. 1965 24 p refs *Its Working Paper No. 142-65*

(Grant NsG-235)

(NASA-CR-68303) CFSTI: HC \$1.00/MF \$0.50 CSCL 05S

Effects of organizational affiliation on high energy physics research groups were studied with emphasis on the following structural variable: whether the groups were composed of members from one organization or from more than one. It was found that both, group structure and openness of the group to take in new members, were related. A greater continuity of research relationships and an easier entry by newcomers might be achieved by encouraging formation of multi-organizational groups. Sub-groups tended to be more constant than single-organizational groups, and more constant single-organizational groups were less open. It was concluded that continuity and openness of a research group will require the categorizing of research tasks. G.G.

N66-13006# School of Aerospace Medicine, Brooks AFB, Tex.

SPACE RADIOBIOLOGY. TRAINING AND OPERATIONS: A CONCEPT

John E. Pickering Jun. 1965 15 p refs Presented at the 3d Intern. Symp. on Bioastronautics and the Exploration of Space, San Antonio, 18 Nov. 1964

(AMD-TR-65-2; AD-471731)

Public utterances clearly indicate that the United States plans to pursue scientific explorations in the infinite region of space for the expansion of knowledge and the betterment of mankind. The degree to which manned and unmanned systems will be used is conjectural at this time. Once, however, the utility of man is demonstrated for prolonged periods of time, truly proving cost effectiveness, then maximizing this flight experience and reusability requires a conservation of radiation dose. Dose schedules and rest schedules for in-space training, data gathering, application flights and space-oriented capabilities are discussed based upon the recurring requirement of a limited and highly-selected group of people-astronauts. Weekly doses for different regions of space are suggested along with finite recovery periods based upon the several mission profiles, ages of the crew members, as well as a combination of mission flying years and age. These doses are related to biological effects obtained from ten years of chronic exposure in animals. Author (TAB)

N66-13007# Public Health Service, Washington, D. C.
HEAT SYNDROME DATA FROM SELECTED HOSPITAL RECORD SURVEY Final Report

James Meyers, Mario A. Calonje, Paul S. Parrino, and Martha W. Snyder Dec. 1965 90 p
 (Contract OGD OS 62-100)
 (AD-623578)

Statistical analysis of heat syndrome causes, both environmental and human factors, with preventive and alleviating suggestions for civil defense shelters of similar situations. Useful base for clinical evaluation, for physicians and other medical personnel in emergency situations. Author (TAB)

N66-13032# Joint Publications Research Service, Washington, D. C.

ON SOME PRINCIPLES OF MACHINE DIAGNOSIS

M. I. Anokhin 6 Dec. 1965 7 p Transl. into ENGLISH from the book "Metodologicheskoye Problemy Diagnostiki" Moscow, Tr. I-Go Mosk. Ordena Lenina Med. Inst. Imeni I. M. Sechenova, v. 37, 1964 p 185-191

(JPRS-33161; TT-65-33737) CFSTI: \$1.00

The basic principles of mathematical logic and probability theory on which computers are based and their application in diagnosing diseases are discussed. In the diagnostic computer, disease symptoms are at first multiplied as variable and then grouped into syndromes and the figures on their rate of occurrence are multiplied, whereupon the median of both figures is derived. The a priori probability of a disease is used but because of the lability of an a priori probability and its contingency on many factors, it is used as a subjective component in the diagnostic computer. One other method of comparing probabilities is the logic of the phase interval. Here the sums of the squares of the probability of each disease are compared. This method alone cannot produce reliable results. Symptoms may be primary or secondary and the absence of a secondary symptom may be of no significance. That is why probabilistic logic is needed. In making its diagnosis, the computer eliminates all diseases in which the patient's symptoms are impossible by deterministic logic. A selection is made from among the remaining diseases by probabilistic logic. On the basis of the phase interval method, the previous findings are corrected.

R.N.A.

N66-13051# Presbyterian-St. Lukes Hospital, Chicago, Ill.
PERIPHERAL CIRCULATION AND BONE METABOLISM

[1964] 14 p refs
 (Contract AT(11-1)-507)
 (FID-21339)

Studies were made of the clearance rate of Ca^{45} following intravenous injection in adult dogs and studies of the blood distribution between marrow and bone. The arteriovenous differences as an indication of bone uptake of Ca^{45} was greater in the first minute and then decreased slowly during the experimental period. The average percent cleared was 53.35% of the isotope for the first 5 minutes and 47.08% for 10 min. The blood distribution was found to be from 7.1 to 20.6% in the marrow and the rest in the cortex. The bone uptake of Ca^{45} decreased continuously but was still measurable at the end of 12 hr. The average blood flow to the femur was 4.9 cc/min/100 gm of fresh bone and 3.1 cc/min/100 gm of fresh cortical bone. Average relative blood volume for cortical bone was 0.0189 cc/gm and for marrow was 0.634 cc/gm. The blood flow to the femur in dogs with unilateral femoral arteriovenous fistulae was also determined. The average blood flow values were 10.322 cc/min/100 gm of fresh cortical bone for the fistula side and 7.043 cc/min/100 gm of fresh cortical bone for the opposite side. The average difference in weight between femurs on the side of the fistula and the opposite side was 6.845 grams.

E.E.B.

N66-13061# Creighton Univ., Omaha, Nebr. School of Medicine.

Ca-45 AND Sr-85 METABOLISM IN MAN Final Progress Report, 1 May 1958-31 Mar. 1965

[1965] 13 p refs
 (Contract AT(11-1)-587)
 (OCC-597-2)

Progress is reported in studies of bone metabolism and derangements therein found in bone diseases of man in which ^{45}Ca and ^{85}Sr were used as tracers. An extremity counter utilizing a plastic scintillation detector was used in counting and data were analyzed by a computer. A technique was developed for calculation of the exchangeable Ca in a given 3-in. segment as grams of Ca and of accretion as grams of Ca per day so that the absolute contribution of individual peripheral bone regions to the total body kinetic analyses can be derived. Results show that periarticular bone usually has a higher initial uptake than normal bone, despite lower plasma specific activity, and the rate of fall of activity in arthritic bone is less rapid than in normal regions, indicating an increase in bone exchangeability and accelerated new bone formation in periarticular bone. Data are summarized from Ca balance and ^{45}Ca kinetic studies in patients with osteoporosis; calcium metabolism studies in patients with combined central osteoporosis and peripheral rheumatoid arthritis; and metabolic balance and ^{45}Ca studies in normal subjects, hypopituitary dwarfs, hypopituitary adults, and an adult with active acromegaly. A list is included of publications resulting from these studies. NSA

N66-13089*# California Univ., Los Angeles. Brain Research Inst.

MONITORING BRAIN FUNCTION AND PERFORMANCE IN THE PRIMATE UNDER PROLONGED WEIGHTLESSNESS Final Report, 15 Aug. 1963-14 Aug. 1964

W. R. Adey and J. D. French [1964] 21 p
 (Grant NsG-515)

(NASA-CR-68413) CFSTI: HC \$1.00/MF \$0.50 CSCL 06S

A summary is given of studies in the role of environmental stimuli in determining central nervous processes. These studies are then used as criteria for evaluating the changes occurring in the central nervous system of primates exposed to a weightless environment for prolonged periods. The use of computer analysis is discussed relative to the evaluation of electroencephalograms for studying a broad gamut of physiological states in the mammalian organism. The study objectives are outlined, and areas of further research are suggested. The physiological variables considered are: systemic and peripheral arterial blood pressure, venous blood pressure, brain PO_2 , intracranial pressure, GSR, heart rate, respiration, muscle tone, eye movements, and reflexes. C.T.C.

N66-13095*# Melpar, Inc., Falls Church, Va.

DETERMINATION AND MICROBIAL SURVIVAL OF CRYOGENIC WHOLE AIR SAMPLING CONDITIONS Final Report, 27 Dec. 1964-27 Jul. 1965

[1965] 47 p refs
 (Contract NAS5-9529)

(NASA-CR-68421) CFSTI: HC \$2.00/MF \$0.50 CSCL 06M

Experiments were conducted to qualitatively determine the survival of *Cladosporium resinae*, *Aspergillus niger*, *Penicillium notatum*, *Bacillus globigii*, *Serratia marcescens*, *Clostridium pasteurianum*, *Nocardia asteroides*, and *Streptomyces griseus* to shock wave exposure and cryogenic whole air sampling. The physical conditions to which these microorganisms were subjected were chosen from those suggested by the design of an existing collector system to be used in sampling the dust content of the upper atmosphere. This system uses a low temperature metal surface which at high speeds condenses all the air in its path. From this it was assumed that successful collection of microorganisms in the

upper atmosphere would be dependent on their ability to survive near vacuum, rapid heating in passage through the shock wave generated by the sampling vehicle, high speed impaction on the metal surface, rapid cooling to a few degrees K, and rewarming to room temperature and subsequent storage. The study established that the majority of microorganisms survived the conditions of shock wave and cryogenic collection. The only exception was the doubtful survival of *Serratia marcescens*. R.N.A.

N66-13097* # Naval School of Aviation Medicine, Pensacola, Fla.

OTOLITH ORGAN ACTIVITY WITHIN EARTH STANDARD, ONE-HALF STANDARD, AND ZERO GRAVITY ENVIRONMENTS

Earl F. Miller, II, Ashton Graybiel, and Robert S. Kellogg 4 Aug. 1965 14 p refs Joint rept. with NASA *Its* Rept. No. 119 (NASA Order R-93)
(NASA-CR-68391; NSAM-943) CFSTI: HC \$1.00/MF \$0.50 CSCL 06S

The objectives of the experiment are to measure otolith activity as indicated by ocular counterrolling (CR) response to body tilt within a force field of zero G, one-half and standard G, and to determine the effect of extralabyrinthine factors upon CR under these gravitational conditions. Six individuals with bilateral labyrinthine defects and seven normal persons served as subjects. Transient periods of subgravity force (0.5G, zero G) were produced by parabolic flight maneuvers in a specially equipped C-131B aircraft which accommodated a tilt chair and accessory apparatus for recording CR response upright and with body tilt ($\pm 25^\circ$, $\pm 50^\circ$). The labyrinthine-defective group revealed results qualitatively similar to those from the normal group but markedly reduced in magnitude. This demonstrated that extralabyrinthine factors were not significantly involved. In the normal subjects zero G induced a physiological deafferentation of the otolith organs. When the gravitational force equalled about 0.5G, CR was below the level midway between the zero and Earth standard gravity response. The nonlinear relationship between otolith activity and subgravity force is discussed. Author

N66-13114* # Thompson Ramo Wooldridge, Inc., Cleveland, Ohio. Equipment Labs.

CARBON DIOXIDE CONCENTRATION SYSTEM Interim Report No. 1

A. D. Babinsky, D. L. De Respiris, and S. J. Derezinski 30 Nov. 1965 48 p
(Contract NAS3-7638)
(NASA-CR-54849; TRW-ER-6661-1) CFSTI: HC \$2.00/MF \$0.50 CSCL 06K

The preliminary analysis has been completed for design, fabrication, and testing of a life support system utilizing the TRW-developed "Carbonation Cell" system of extracting CO₂ from cabin air. Stages I and II of this electrochemical carbon dioxide concentration system have been designed and fabricated. The cells use electrodes measuring 12" by 12", and plated magnesium end plates. Materials compatibility studies have also indicated the 2-mil non-porous gold plated magnesium is a suitable material to use in the third stage acid electrolyte cell. However, considering its prohibitive cost, plastic (PVDC) cells will be used for this program. These stage III cells are being designed. A test rig for small cell testing was assembled and has been used for testing of small acid stage cells. Additionally, a small carbon cell and a gold plated magnesium cell are being fabricated and assembled for use in this test rig. Design of a large test stand is completed for testing the full scale electrochemical cells, and assembly and checkout also are in progress at this writing. Author

N66-13165* # Public Health Service, Washington, D. C. Div. of Chronic Diseases.

A LONGITUDINAL STUDY OF NAVAL FLIGHT STUDENTS WITH PARTICULAR ATTENTION TO CARDIOVASCULAR DISEASE Progress Report No. 3, 1 Apr.-30 Sep. 1965

Samuel Fox et al [1965] 20 p
(NASA Order R-136)
(NASA-CR-68541) CFSTI: HC \$1.00/MF \$0.50 CSCL 06S

The medical evaluation procedures carried out during the third follow-up of the "Thousand Naval Aviators" study are described. This study began in 1940 as an attempt to evaluate the significance of psychological and physiological variables in terms of success in naval aviation. In an overall evaluation of the program, it is pointed out that originally the physiological test findings had little predictive value for success in flight training and were largely forgotten. However degenerative disease become evident after many years, and repeated follow-up studies have endorsed the value of the early medical and physiological evaluations. The prediction is made that in future follow-up studies there will be a balance of interest on the part of physicians and of those in the behavioral sciences. M.G.J.

N66-13176* # Joint Publications Research Service, Washington, D. C.

INVESTIGATING THE PHENOMENON OF SLEEP

A. Shepoval'nikov 25 Nov. 1965 6 p Transl. into ENGLISH from Izv. (Moscow), 29 Oct. 1965 p 6
(JPRS-33033; TT-65-33610) CFSTI: \$1.00

Research on the mechanisms of sleep, and the use of electro-physiological methods for studying this phenomenon are reviewed. The encephalogram of a normally sleeping person is examined, and the consecutive changes shown by the recording of the biocurrents are discussed. It was found that during restful consciousness alpha waves, with a frequency of 10 vibrations per second, usually appear; light sleep is usually accompanied by frequency rhythms of about 14 vibrations per second; further deepening of sleep shows the propagation of large slow waves, which gradually almost displace all other waves. It was noted that the internal deep sleep continues quietly for some time before the encephalogram changes sharply and approximates the pre-dormant period. This cycle, with its phases, is repeated until awakening. It is pointed out that sleep mechanism studies may prove useful for treating diseases connected with sleep disturbances, in investigating mechanisms, and for understanding the complex mechanisms at the basis of epilepsy. M.G.J.

N66-13209* # School of Aerospace Medicine, Brooks AFB, Tex.

A NOMOGRAM RELATING PO₂, pH, TEMPERATURE, AND HEMOGLOBIN SATURATION IN THE DOG Technical Report, 1 Jul.-1 Dec. 1964

Robert G. Rossing and Stephan M. Cain Jun. 1965 15 p refs (SAM-TR-65-39; AD-471848)

The data from 591 dog blood samples on which observations were made of PO₂, hemoglobin saturation, P_{CO₂}, pH, and temperature were analyzed by means of a digital computer. The Hill equation was found to fit the data well in the range from 20% to 98% saturation. Linear terms for pH and temperature effects were found to improve appreciably the prediction ability of the equation. A similar term for P_{CO₂}, although statistically significant, did not contribute enough additional precision in prediction to justify its inclusion in the final equations. The equations derived are:

$$\log(S/1 - S) = 2.5198 \log P_{O_2} + 1.1804 (pH - 7.0) - .047234T - 2.3621$$

and

$$\log P_{O_2} = .37143 \log(S/1 - S) - .48047 (pH - 7.0) + .019518T + .92247$$

A nomogram relating these variables is also presented.

Author

N66-13224# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

TENTH CONFERENCE OF THE I. P. PAVLOV ALL-UNION PHYSIOLOGICAL SOCIETY, YEREVAN, 1964. VOLUME II: TOPICS OF SCIENTIFIC PAPERS, NO. 1

E. A. Asratyan, ed. 6 Jul. 1965 781 p Transl. into ENGLISH of the book "X Sbezd Vsesoyuznogo Fiziologicheskogo Obshchestva Imeni I. P. Pavlova, Yerevan, 1964 Tom II: Tezisy Nauchnykh Soobshcheniy, Vypusk 1" Moscow, Izd. "Nauka" 1964 479 p

(FTD-TT-65-47/1+2; AD-620050)

A compilation of papers presented at a physiological conference is presented. The more than 700 topics cover such areas as anatomy, responses, and organ functions of humans and animals. C.T.C.

N66-13245 Joint Publications Research Service, Washington, D. C.

METHODS AND INSTRUMENTATION SOURCES OF GAMMA-RADIATION IN A BIOLOGICAL EXPERIMENT

A. V. Bibergal 5 Nov. 1965 7 p refs Transl. into ENGLISH from Radiobiol. (Moscow), v. 5, no. 4, 1965 p 612-615 (JPRS 32704; TT-65-33218) CFSTI: \$1.00

Gamma radiation apparatus used in biological experiments are described. The dosage range is given for each, and the areas of application are included. Equipment is considered for the irradiation of seeds before sowing, microbiological and radiochemical determinations, and chronic irradiations. C.T.C.

N66-13297# National Aeronautics and Space Administration, Washington, D. C.

NOISE PROBLEM [PROBLEMA SHUMA]

I. Borshchevskiy and E. Lapayev Dec. 1965 8 p Transl. into ENGLISH from Aviats. i Kosmonaut., (Moscow), v. 48, no. 7, 1965 p 75-77

(NASA-TT-F-9799) CFSTI: HC \$1.00/MF \$0.50 CSCL 06S

A brief general review of the detrimental effect of noise of a certain intensity on the human organism, specifically on the auditory organs, is given, with diagrams on noise levels with and without engine exhaust silencers and descriptions of earplug and earcap designs. Hearing loss of flying crews in jet aircraft and spacecraft is considered transitory, while permanent damage is expected in unprotected maintenance crews. Soundproof rooms on airfields for rest periods of crews are suggested. Author

N66-13331# American Inst. for Research, Pittsburgh, Pa. Inst. for Performance Technology.

HUMAN FACTORS INFORMATION REQUIREMENTS FOR SPACE SYSTEM DEVELOPMENT Final Report

James W. Altman Jun. 1964 173 p refs

(Contract NASr-194)

(NASA-CR-68616) CFSTI: HC \$5.00/MF \$1.00 CSCL 05E

Life scientists, human factors engineers, and other system development personnel were interviewed in a survey of practices in existing human factors programs in order to obtain data for long-term requirements in space system development. A literature survey and an analysis of system development decisions were also made. Individual requirements were organized into

the following areas: (1) basic data generation and dissemination, (2) definition and control of the human factors process, (3) function description and processing, (4) human factors design, and (5) design assessment. Of the 74 individual requirements identified in these categories, six are general to all areas of human factors activity and 68 are specific to one of eight areas. For each of the eight areas, there is a requirement to develop integrated procedures in support of more effective activity; the other 60 requirements are specific state-of-the-art improvements in the different areas. An overview of requirements is presented, and 14 requirements are discussed in detail. A bibliography is appended. M.W.R.

N66-13423# Joint Publications Research Service, Washington, D. C.

PECULIARITIES OF GAS EXCHANGE STUDIES UNDER RAREFIED ATMOSPHERIC CONDITIONS

N. A. Agadzhanian and I. R. Kalinichenko 29 Nov. 1965 9 p refs Transl. into ENGLISH from Fiziol. Zh. SSSR (Moscow), v. 51, no. 7, Jul. 1965 p 793-798

(JPRS-33057; TT-65-33634) CFSTI: \$1.00

Calculations on the indices of gas exchange values obtained from men and animals under rarefied atmospheric conditions are presented. The values of the per-minute volume of respiration must be reduced to a dry state, 0° C, and 760 mm mercury column in order to obtain the quantity of oxygen used, the amount of carbon dioxide liberated, and to determine the energy expended. For a normal oxygen supply to an organism, it is also necessary to calculate the percentage content of oxygen in the cabin under consideration of the moist inspired air. Calculations on the ratio of gases in the blood and in the cabin atmosphere showed that the partial pressure of carbon dioxide in alveolar air at an altitude of 7,000 m, with a normal oxygen supply, varies within the limits of 30 to 38 mm mercury column. Conditions of lower barometric oxygen pressure and physical labor dropped alveolar air pressure to 40 mm mercury column at altitudes of 9,000 to 11,000 m. G.G.

N66-13431# Los Alamos Scientific Lab., N. Mex. **COMPUTER REDUCTION OF METABOLIC DATA OBTAINED FROM SCINTILLATION COUNTERS**

P. N. Dean 15 Nov. 1965 24 p refs

(Contract W-7405-ENG-38)

(LA-3298) CFSTI: \$2.00

This report describes in detail the RTW series of computer programs written to analyze metabolic data. The programs calculate elapsed time between radionuclide administration and time of measurement, correct all data for changes in counting efficiency relative to measurements made on standards at zero time and for physical decay, if desired, and express the observed counting information as effective or biological retention at time of measurement. Author

N66-13481# National Aeronautics and Space Administration, Washington, D. C.

THE EFFECT OF LIGHT ON PLANT REPRODUCTION [UEBER DEN EINFLUSS DES LICHTES AUF DIE FORTPLANZUNG DER GEWACHSE]

Georg Klebs Dec. 1965 22 p refs Transl. into ENGLISH from Biologisches Centralblatt (Leipzig), v. 13, no. 21-22, 1893 p 641-656

(NASA-TT-F-9742) CFSTI: HC \$1.00/MF \$0.50 CSCL 06C

In dealing with the influence of light on the lower plants, the author first deals with the asexual reproduction of various algae, especially zoospore formation. Reproduction of various bryophytes seems to call for intense light to convert the necessary nutrients to substances that activate the dormant "rudimentum", an invisible material carrier. It is suggested that light may also alter certain physical relationships within the cell (e.g. the vacuole pressure). It is demonstrated that leaf and spore protenema act altogether differently towards light, with the former producing moss buds 8 days after exposure

to light and the latter, in 4 to 5 weeks. The author draws a definite relationship between intense light and the formation of sex organs in the lower plants. Author

N66-13484* # National Aeronautics and Space Administration, Washington, D. C.

FLUCTUATIONS IN HUMAN BODY TEMPERATURE WITH PARTICULAR CONSIDERATION ON THE EFFECT OF REVERSAL OF DAILY ACTIVITY PATTERNS [KORPERTEMPERATUR-SCHWANKUNGEN MIT BESONDERER RUKSICHT AUF DEN EINFLUSS, WELCHEN DIE UMKEHRUNG DER TÄGLICHEN LEBENSGEWÖHNHEIT BEIM MENSCHEN AUSUBT]

Francis Gano Benedict and John Ferguson Snell Dec. 1965 41 p refs Transl. into ENGLISH from Arch. Physiol. (Germany), v. 90, 1902 p 33-72

(NASA-TT-F-9796) CFSTI: HC \$2.00/MF \$0.50 CSCL 06P

A group of metabolism and energy-exchange balance studies are conducted on 4 test subjects in a respiration calorimeter to determine the relationship between body temperature and the normal fluctuations of respiration, heartbeat, oxygen consumption, CO₂ and urine production and work capability. The temperature curve recordings exhibited normal rhythm, with some deviation noted between rectal and axillary temperature. Muscular activity is shown to parallel body temperature; the temperature during nights after heavy muscular work being consistently lower than during nights after repose. The principal effect of fasting is lowering the degree of fluctuation of the curve. If heavy work was followed by fasting, the daily temperature fluctuation for long periods was reduced by approximately 0.6°C., and the average temperature by almost 1°C. No perceptible tendency toward a reversal of the temperature curve could be observed after ten consecutive days during which work was performed at night, and sleeping and resting done during the day. Author

N66-13507* # Karolinska Institutet, Stockholm (Sweden). **LIFE STRESS AND URINARY EXCRETION OF ADRENALINE AND NORADRENALINE**

Lennart Levi [1965] 15 p refs Presented at the 1st Intern. Conf. on Preventive Cardiology, Burlington, Vt., 1964 Submitted for Publication CFSTI: HC \$1.00/MF \$0.50

Results of experiments designed to investigate the extent various stimuli affect sympatho-adrenomedullary neurosecretory activity as reflected in the urinary excretion of adrenaline and noradrenaline are reported. The stress activity of 250 humans, exposed to emotional stimuli judged to be of slight to moderate intensity, was evaluated by measuring the output of catecholamines in the urine. The stimuli were selected from those we are most likely to encounter in daily life. More than 1600 urine samples were obtained and analyzed fluorimetrically. The primary aim of the experiments was to study the interrelationship between (1) type and intensity of stimuli as defined physically as well as psychologically, (2) reported subjective feelings, (3) observed behaviour, and (4) a number of autonomic and endocrine responses in different types of personalities and groups. M.R.W.

N66-13516* # Bolt, Beranek, and Newman, Inc., Cambridge, Mass.

REPORT OF THE NASA SEMINAR ON PILOT-VEHICLE SYSTEMS IDENTIFICATION

Jerome I. Elkind 1 Mar. 1964 87 p refs Seminar held at Ames Res. Center, May 1963 *Its Rept.*-1102 (Contract NASw-668)

(NASA-CR-68701) CFSTI: HC \$3.00/MF \$0.75 CSCL 05H

A discussion, from a seminar held at the NASA Ames Research Center, on pilot-vehicle system identification is presented. The seminar focused on the comparison of methods for determining human pilot dynamic response characteristics. It is shown how the paradigm of multiple regression analysis

serves as a basis for comparing all of the commonly used techniques for identifying human pilot dynamic response characteristics: cross-correlation analysis, cross-spectral analysis, orthogonalized exponential analysis, and differential equation coefficient methods. Expressions for the expected values and the variances of the measures obtained using these techniques are derived. The different analysis techniques are described and compared with respect to accuracy and precision. A method for obtaining the coefficients of the differential equation for a system from regression coefficients is given. The problem of using only signals circulating within the feedback loop to determine the open-loop describing function of the human operator is discussed. M.R.W.

N66-13520* # Argonne National Lab., Ill.

SPACE PHYSIOLOGY: SOME RESULTS AND OUTLOOKS OF EXPERIMENTAL INVESTIGATIONS [KOSMICHESKAYA FIZIOLOGIYA NEKOTORYE ITOGI PERSPEKTIVY EKSPERIMENTAL'NYKH ISSLEDOVANI]

O. G. Gzenko, V. V. Parin, V. N. Chernigovskii, and V. I. Yazdovskii Jul. 1965 12 p Transl. into ENGLISH of a report, presented at the 10th Meeting of the All-Union I. P. Pavlov Physiol. Soc., Yerevan, USSR, 22-28 Oct. 1964

(ANL-TRANS-209) CFSTI: HC \$1.00/MF \$0.50

Data are summarized from physiological studies on 6 USSR astronauts who participated in space flights varying from one orbit of the earth to 119 hr in orbit between 1961 and 1963. The studies were made before, during, and for prolonged periods after space flight. Data are included on the effects of functional stress induced by transverse accelerations, defense responses, muscular stress, weightlessness, and the effects of conditions encountered during prolonged space flight on respiration, cardiovascular systems, working ability, psychological functions, and other parameters. Data from electroencephalograms, cardiograms, and electrooculograms are presented that supplement other observations on adaptation processes of humans during the conditions of space flight of a duration of approximately 2 days. NSA

N66-13553* # Minnesota Univ., Minneapolis.

THE BACTERIOLOGY OF "CLEAN ROOMS" Progress Report, Apr. 1-Sep. 30, 1965

G. S. Michaelsen [1965] 20 p refs

(Grant NSF-643)

(NASA-CR-68729) CFSTI: HC \$1.00/MF \$0.50 CSCL 06S

Progress is reported in the four areas as follows: (1) identification of spore formers and other heat resistant microorganisms recovered from fallout strips in conventional aerospace clean room facilities; (2) experimental determination of dry heat resistance of the specifically identified spore formers with particular reference to the 135°C for 24 hrs cycle; (3) experiments related to human contact contamination of various representative materials and simulated components; and (4) the design and construction of a small laminar downflow facility for future evaluation. Species identification of spore formers isolated are tabulated. Also, the results of the determination of thermal death times of specific clean room spore formers are given. Microbial contamination detected on component materials after handling by groups of four persons are also tabulated. The room for the laminar downflow facility will be 8 ft by 10 ft with a 4 ft by 4 ft entryway. The room will be constructed and in operation in the near future. E.E.B.

N66-13560* # Naval School of Aviation Medicine, Pensacola, Fla.

PERCEPTION OF THE VISUAL HORIZONTAL IN NORMAL AND LABYRINTHINE DEFECTIVE SUBJECTS DURING PROLONGED ROTATION

Brant Clark and Ashton Graybiel 8 Jul. 1965 10 p refs *Its Rept.*-116
(NASA Order R-93)
(NASA-CR-68659; NSAM-936) CFSTI: HC \$1.00/MF \$0.50 CSCLO6S

Five normal and nine labyrinthine defective men were studied in a Slow Rotation Room which produced a change in resultant force of 20° on them. The men faced in the direction of rotation and at one minute intervals set a luminous line to the perceived horizontal in darkness for one hour. The results for the normal men confirmed an earlier study showing no systematic change in the perception of the visual horizontal after an initial lag effect. In contrast, the labyrinthine defective men showed a smaller, rapid, and then a gradual change in the perception of the visual horizontal throughout the one hour of constant rotation. At the end of one hour there was no significant difference between the two groups. These results are discussed in terms of a differential weighting of the synergistic information available to the two groups. Author

N66-13594# Massachusetts Inst. of Tech., Cambridge.
METABOLIC STUDIES OF ENERGY DENSE COMPOUNDS FOR AEROSPACE NUTRITION

S. A. Miller, H. A. Dymrza, S. R. Tannenbaum, and S. A. Goldblith Wright-Patterson AFB, Ohio, AMRL, Aug. 1965 51 p refs
(Contract AF 33(657)-7660)

(AMRL-TR-64-121; AD-623615) CFSTI: HC \$3.00/MF \$0.50

The aim of these studies was the development of model compounds with which information useful in understanding energy metabolism might be obtained to aid in development of food for space travel. Seven-month studies feeding rats with 1,3-butanediol have been completed. The results of these studies confirm the utilization of this compound as a energy source. Measurement of a number of metabolic parameters at the completion of the study support the contention that 1,3-butanediol is probably metabolized through carbohydrate rather than fat pathways. Metabolism studies with 2,4-dimethylheptanoic acid labeled with C¹⁴ in the alpha methyl group indicate that this compound as predicted is oxidized through propionate. Design and construction details of the direct animal calorimeter are presented. Results of a limited number of studies with rats fed various diets indicate that the device fulfills its design functions. Author (TAB)

N66-13595# Tech Development, Inc., Dayton, Ohio.
THE DEVELOPMENT OF GAS AND LIQUID CIRCULATING DEVICES FOR MANNED SPACE ENCLOSURES Technical Report, Feb. 1964-Feb. 1965

Joseph Platt Wright-Patterson AFB, AMRL, Aug. 1965 31 p (Contract AF 33(615)-1251)

(AMRL-TR-65-128; AD-623161) CFSTI: HC \$2.00/MF \$0.50

An analytical and experimental investigation was conducted to determine the feasibility of utilizing the energy available in breathing oxygen, when expanded from storage pressure to breathing pressure, to power two types of pumping devices; (1) an oxygen-circulating blower, and (2) a water-circulating pump. With an oxygen weight flow of 2.65 lb/hr and an ambient environmental pressure of 5 psia, the required performance of 5 cfm at 10 inches H₂O static pressure for the circulating blower and 1 lb/min at a back pressure of 10 inches H₂O for the water pump were met. Performance considerably in excess of the requirement was obtained for the water pump. Both units were powered by single-stage impulse turbines and weighed less than the 1-pound requirement. Both units operated reliably without mechanical malfunction and appear to be suited for manned aerospace enclosures. Author (TAB)

N66-13596# Aerospace Medical Div. Aerospace Medical Research Labs. (6570th), Wright-Patterson AFB, Ohio.

MANUAL CONTROL OF A PULSE-FREQUENCY MODULATED REACTION CONTROL

John P. Hornseth Aug. 1965 16 p refs

(AMRL-TR-65-145; AD-623558) CFSTI: HC \$1.00/MF \$0.50

A manual pulse frequency modulated reaction control is a control with fixed pulse width, fixed pulse amplitude, and manual control of pulse frequency. For such a control, it is possible to maintain a constant reactive force per pulse for various combinations of pulse widths and pulse amplitudes. The controlled element was a one-dimensional second order system. A semirandom sequence of three step voltages was used to displace a spot on a CRT. Subjects were required to recenter the spot as fast as possible. Manual control performance was tested under three levels (low, middle, high) of control output gain. Three pulse width-pulse amplitude combinations were tested at the low and high control output gain levels and four pulse width-pulse amplitude combinations for the middle control output gain level. Three subjects were tested under all conditions. Performance measures obtained were: integrated absolute error, integrated absolute fuel consumption, and integrated absolute stick motion. The results of this study indicate that (1) changing pulse width and pulse amplitude, but keeping control output gain fixed, does not affect manual performance; but that (2) changing control gain does. Author (TAB)

N66-13689# Stanford Univ., Calif. Inst. for Mathematical Studies in the Social Sciences.

REINFORCEMENT-TEST SEQUENCES IN PAIRED-ASSOCIATE LEARNING

Chizuko Izawa and William K. Estes 1 Aug. 1965 83 p

(Contract Nonr-22573)

(TR-76; AD-622248) CFSTI: HC \$3.00/MF \$0.75

Learning of paired-associate items was studied in relation to different repetitive sequences of reinforced (R) trials and test (T) trials. One purpose was to obtain evidence as to whether either learning or forgetting occurs on unreinforced T trials; a second was to adduce principles bearing on the problem of optimal programming of R and T trials. The four training conditions were: (1) R T R T ...; (2) R R T R R T ...; (3) R T T R T T ...; (4) R R T T R R T T Five items were assigned to each condition and the sequences were repeated till a criterion of learning was reached. Two groups of 50 subjects were run; one with nonsense syllable-number pairs and one with nonsense syllable-word pairs. Performance on tests given successively without intervening reinforcement showed no significant change in correct response probability—suggesting that neither learning nor forgetting occurred on T trials per se. The course of learning was, however, affected to a major extent by the ratio of T's to R's and by their arrangement in the various repetitive sequences. Learning curves plotted in terms of error proportion on the first T following the n(th) R trial lined up in the order: Condition 3 (lowest), 1, 4, 2. Author (TAB)

N66-13700# Naval School of Aviation Medicine, Pensacola, Fla.

AIRSICKNESS IN STUDENT AVIATORS

Gary J. Tucker, David J. Hand, Asa L. Godbey, and Roger F. Reinhardt 12 Jul. 1965 12 p refs *Its Rept.*-1

(NSAM-939; AD-622777) CFSTI: HC \$1.00/MF \$0.50

One thousand sixty-seven student Naval aviators were rated at the end of each flight during the presolo and basic acrobatic phase of training by the flight instructor for the presence or absence of nausea or vomiting during the flight. To be so rated, the airsickness had to be severe enough to cause inability to control the aircraft. In this manner, a profile of the patterns of airsickness was obtained on each student over the course of the primary flight training. The incidence of this type airsickness was 17.6 per cent (188 students out of 1,067). Correlations between incidents of airsickness per student and their ground school grades and flight grades were not

statistically significant. There are three main periods during which the majority (79 per cent) of airsickness occurs. These are the initial three training flights, the seventh, and the first three dual acrobatic flights. These periods are closely correlated with the various and different peaks of physiologic and psychologic stresses during this phase of training and provide useful baselines for the evaluation of airsickness in student aviators. Author (TAB)

N66-13711# Atomic Weapons Research Establishment, Aldermaston (England).

THE HAZARDS TO THE HUMAN EAR FROM SHOCK WAVES PRODUCED BY HIGH ENERGY ELECTRICAL DISCHARGES
Pamela M. Golden and R. Clarke London, HMSO, Aug. 1965
24 p refs
(AWRE-E-1/65) HMSO: 6s

The blast pressures developed by a high energy electrical discharge as received by a transducer mounted in a large baffle normal to the blast were measured and compared with those received by a model ear. It is shown that the pressures developed at the drum of the ear are in excess of those in air and can cause damage to the ear unless precautions are taken. There is a high proportion of large amplitude noise at audio frequencies present which many protective devices transmit. Measurements with samples of these show that there is some attenuation of pressure and it is probable that a muff protector is more efficient than an ear defender which consists of a solid plug with a small axial air channel. Author

N66-13758# Purdue Univ., Lafayette, Ind. School of Electrical Engineering.

ELECTRICAL AND ELECTRONICS ENGINEERING RESEARCH] Second Semiannual Research Summary, Jan.-Jun. 1965
[1965] 109 p refs
(AD-622202) CFSTI: HC \$6.00/MF \$1.25

Contents: Medical and life sciences, biological systems and electrophysiology; control and information systems, automata and artificial intelligence; electric power systems and energy conversion; electromagnetic fields; electronic systems research laboratory; materials. TAB

N66-13759 Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

CERTAIN PROBLEMS OF PHYSIOLOGICAL MEASUREMENT IN INTERPLANETARY FLIGHTS
R. M. Bayevskiy *In its Cosmic Res.*, Vol. 3, No. 4, 1965
18 Oct. 1965 p 223-236 refs (See N66-13776 04-30)
CFSTI: HC \$6.00/MF \$1.50

On the basis of an analysis of systems aboard the Vostok-series spacecraft, the problem of physiological measurements in interplanetary flight is discussed. The basic tasks of physiological measurements include manipulative medical monitoring; scheduled medical examinations, including diagnosis of illnesses; and medical scientific research. Transmission of the physiological information to the earth represents a special problem. Medical monitoring should take place only occasionally during the flight and with the use of a minimum of sensors and electrodes, with transmission of the information via intracabin radio link. Routine and diagnostic examinations should be conducted with the aid of a computer on board the vehicle. Studies with effective coding of generalized data acquire great importance. Certain aspects of biological control are examined as they apply to interplanetary flight. Author

N66-13790 Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

OCCURRENCE OF DOMINANT LETHALS IN DROSOPHILA UNDER THE INFLUENCE OF VIBRATION, ACCELERATION AND γ IRRADIATION
G. P. Darfenov *In its Cosmic Res.*, Vol. 3, No. 4, 1965
18 Oct. 1965 p 237-254 refs (See N66-13776 04-30)
CFSTI: HC \$6.00/MF \$1.50

This paper presents the results of laboratory studies of the influence of vibration, acceleration, γ -irradiation and the combined effects of these factors on the occurrence of dominant lethals in the primordial cells of *Drosophila* males. The study was conducted to analyze the nature of the effect obtained in *Drosophila* in a series of space flights. It was shown that vibration and acceleration may influence the final result on indication of a biological effect of ionizing radiation by means of a given test, although in all probability they produce nonnucleic modifications. Author

N66-13791 Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

INFLUENCE OF VIBRATION ON BONE-MARROW CELL DIVISION
G. L. Pokrovskaya, L. A. Belyayeva, and A. V. Golovkina *In its Cosmic Res.*, Vol. 3, No. 4, 1965
18 Oct. 1965 p 255-265 refs (See N66-13776 04-30) CFSTI: HC \$6.00/MF \$1.50

Changes in cell nuclei and suppression of mitotic activity were observed when mice were subjected to various periods of vibration. Vibrations at 35 cycles per sec did not suppress cell division until the tenth day after vibration was begun, whereas at the 70-cycle frequency there is some suppression following vibration for 60 min. In the latter, there is an increase in rate of division on the tenth day, but this increase is lower than that for the control group. Vibration at 70 cycles for 15 min raises incidence of disturbance in cell nuclei, an increase which persists for ten days. Division abnormalities are basically due to chromosome adhesion. Tables summarize frequency of chromosome abnormalities occurring from various periods of vibration. M.W.R.

N66-13814# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.

INVESTIGATION OF CHINCHILLA VESTIBULAR SYSTEM RESPONSE TO VERTICAL LINEAR ACCELERATION
Daniel William Buehler and Lucious Calvin Butt (M.S. Thesis)
[1965] 41 p refs
(GE/EE/65-6; AD-622992) CFSTI: HC \$2.00/MF \$0.50

Electronystagmus measurement of vertical eyeball displacement was used to investigate chinchilla vestibular response to vertical sinusoidal accelerations which varied incrementally from 0.5 to 20 cps in frequency and from 0.5 to 3 g, peak-to-peak, in amplitude. Frequency diagrams, plotted from data obtained from seven animals, indicated that the magnitude of the response of the vestibular apparatus is a function of frequency and g level, but that the phase lag of the response is a function of frequency only. Within the experimental frequency and acceleration limits, no resonance phenomena or hysteresis effect of vestibular response was found. Author (TAB)

N66-13830# Chicago Univ., Ill. Dept. of Biophysics.
INVESTIGATIONS IN SPACE-RELATED MOLECULAR BIOLOGY, INCLUDING CONSIDERATIONS OF THE MOLECULAR ORGANIZATION OF EXTRATERRESTRIAL MATTER Technical Progress Report

Humberto Fernandez-Moran [1965] 31 p refs
(Grant NsG-441-63)
(NASA-CR-68844) CFSTI: HC \$2.00/MF \$0.50 CSCL 06C

It is reported that development work continued on the improvement of preparation techniques and instrumentation for high resolution electron microscopy. This included further application of low temperature methods, and the design of new types of high resolution cryoelectron microscopes. These are immersed in liquid helium cryostat, and use superconducting electromagnetic lenses and image intensifiers with electronic readout. It is also reported that correlated electron microscopic and biochemical investigations were carried out on mitochondrial membranes, membrane derivatives, hemocyanins, and on associated enzyme and multienzyme complexes.

Participation in the Luster sounding rocket experiment to sample lunar dust near the earth consisted of designing and constructing a special high vacuum container for transfer of the sampling surfaces which collect extraterrestrial material.
C.T.C.

N66-13831* Teledyne Systems Corp., Hawthorne, Calif.
RESEARCH IN ADVANCED CONCEPTS IN BIOTECHNOLOGY, HUMAN ANALOGS, AND BIONICS Final Report.
30 Oct. 1964 324 p refs
(Contract NASw-780)
(NASA-CR-68777) CFSTI: HC \$7.00/MF \$2.00 CSCL 06D

Research has been conducted into the biotechnology of three of the subsystems of man: an energy input subsystem, a distribution and control subsystem, and an energy output subsystem. Human analogs are developed by the utilization of the man-machine methodology. Bionic applications using human analogs are made for each of the subsystems studied, and a bionic system, which includes an application from each of these subsystems, is suggested.
Author

N66-13833* Naval School of Aviation Medicine, Pensacola, Fla.

A COMPARISON OF EFFECTIVENESS OF SOME ANTIMOTION SICKNESS DRUGS USING RECOMMENDED AND LARGER THAN RECOMMENDED DOSES AS TESTED IN THE SLOW ROTATION ROOM

Charles D. Wood, Ashton Graybiel, and Robert S. Kennedy
16 Aug. 1965 12 p refs Joint report with NASA *Its Rept.*-121

(NASA Order R-93)

(NASA-CR-68858; NSAM-945) CFSTI: HC \$1.00/MF \$0.50
CSCL 06B

In a previous study the recommended doses of some anti-motion sickness drugs were tested on a human centrifuge. In the present study increased doses of these same drugs were used to investigate any possible increase in efficiency. Twice the dose of hyoscine (1.2 mg) failed to increase its effectiveness; however, when it was used in combination with d-amphetamine the total number of tolerated head movements exceeded the sum of that with these drugs when they were tested alone. A marked increase in effectiveness of d-amphetamine (20 mg) was noted over that in the earlier study in which a dose of 10 mg was used. Meclizine (Bonamine 150 mg), thiethylperazine (Torecan 30 mg), trimethobenzamide (Tigan 750 mg), and prochlorperazine (Compazine 15 mg) all were less effective than in the previous study when one third of these doses was used. The combination of hyoscine and d-amphetamine was the most effective drug, followed by hyoscine, d-amphetamine, and meclizine, in that order. Author

N66-13854* Atomic Energy Commission, New York. Health and Safety Lab.

HEALTH AND SAFETY LABORATORY ANALYTICAL MANUAL

Aug. 1965 100 p Revised

(NYO-4700, Suppl. 2) CFSTI: HC \$4.00/MF \$0.75

Additions and corrections made to the Health and Safety Laboratory Manual of Standard Procedures include: analytical data on fission yield and fission product decay; sampling principles, sample handling, and sampling types; the application of air sampling in the evaluation and control of the occupational environment; principles of air sampling; radiochemical determination of Pu and ²²⁶Ra in water, urine, and feces; radiochemical determination of Pu in air filters; the determination of ⁹⁰Sr and ¹³⁷Cs in large volume sea water samples; and specifications for polyethylene syringe bottles, improved plating cells, and microsorber filter paper.

Author(NSA)

N66-13897* Federal Aviation Agency, Oklahoma City, Okla. Office of Aviation Medicine.

FATIGUE IN AVIATION ACTIVITIES

Stanley R. Mohler Mar. 1965 19 p refs

(AM-65-13; AD-620022) CFSTI: HC \$1.00/MF \$0.50

The report gives a comprehensive survey of work in the field of aviation fatigue. Both current work still in process and earlier work are surveyed. The nature of fatigue itself is discussed, along with all possible factors that contribute to both physical and mental fatigue. Topics covered include flight-time limitations, indicators of excessive fatigue, new developments related to intercontinental flights and Forest Service flights, and the author's detailed comments and recommendations.
Author (TAB)

N66-13899* National Aeronautics and Space Administration, Washington, D. C.

SIGNIFICANT ACHIEVEMENTS DURING SIX YEARS OF SPACE BIOSCIENCE RESEARCH AND APPLICATIONS, 1958-1964

Jan. 1965 157 p refs

(NASA-TM-X-57051) CFSTI: HC \$5.00/MF \$1.00 CSCL 06K

Research progress in NASA's space biology program is summarized. A broad research and flight mission program in space biology was developed which includes development of life detection experiments and a concept for an automated biological laboratory for planetary exploration of life; a biosatellite program including scientific experiments to study the biological effects of weightlessness, radiation combined with weightlessness, and removal from the Earth's rotation; a recoverable biosatellite spacecraft system; and the supporting research and technology required for these flight missions as well as biological support for manned space flight. Monkeys and chimpanzees were flown in sub-orbital and orbital flights to test systems and their safety before flight of astronauts. In the exobiology field, progress was made in biosynthesis of organic life-related materials and lifelike objects and the possible origin of life, study of organic constituents of meteorites, development of life detection instruments, and a new concept of integrated life detection for unmanned spacecraft for Martian exploration. New spacecraft sterilization methods were developed. Earth organisms were subjected to simulated planetary environmental conditions and the growth or survival established.
R.N.A.

N66-13907* California Univ., Berkeley. Lawrence Radiation Lab.

FREE RADICAL INDUCED IN ENZYMES BY ELECTRONS AND HEAVY IONS

Thormod Henriksen 23 Aug. 1965 27 p refs Presented at Workshop Conf. on Space Radiation Biol., Berkeley, Calif., 7-10 Sep. 1965

(Contract W-7405-ENG-48)

(UCRL-16358; Conf-650924-2) CFSTI: HC \$2.00/MF \$0.50

Free radicals produced in three enzymes, ribonuclease, lysozyme, and trypsin, exposed to various types of radiation, were studied by ESR spectroscopy. The enzymes were irradiated in the solid state, in vacuum, at different temperatures in the range 77 to 330° K. For all three enzymes it was found that the resonance spectra at room temperature can be ascribed mainly to sulfur radicals and to a radical in which the unpaired electron is localized on an α -carbon atom in the protein backbone. However, another unidentified resonance was found in all three enzymes. The yield of secondary enzyme radicals increased with increasing irradiation temperature. Good correlation was found between the production of secondary radicals and the inactivation of the three enzymes.
NSA

N66-13926* Aviation Safety Engineering and Research, Phoenix, Ariz.

PASSENGER/CREW TEST LOAD SIMULATION CRITERION

D. F. Carroll and H. G. C. Henneberger Jun. 1964 68 p refs
(Contract FA-WA-4459)
(FAA-ADS-20)

Criteria as may be required in the future for appropriate body blocks, anthropomorphic dummies, and instrumentation for use in static and dynamic testing of civil aircraft seat systems is provided. Anthropomorphic data on airline travelers and flight crews is given along with specific recommendations for standard human body load simulators and minimum instrumentation requirements. Author

N66-13972# Applied Psychological Services, Wayne, Pa. Science Center.

COMMUNICATIONS AS A MEASURABLE INDEX OF TEAM BEHAVIOR Final Report

Philip Federman and Arthur I. Siegel Port Washington, N. Y., Naval Training Device Center, Oct. 1965 88 p refs
(Contract N61339-1537)
(NAVTRADEVCEEN-1537-1; AD-623135) CFSTI: HC \$3.00/MF \$0.75

The relationship between anti-submarine (ASW) helicopter team performance and the content and flow of communications within the team during a simulated attack was investigated. Fourteen distinct communications variables were found to be correlated with the objective performance measurement criterion (miss distance) employed. The factors were named 'probabilistic structure,' 'evaluative interchange,' 'hypothesis formulation,' and 'leadership control.' The findings of this study suggest the value of developing scaled performance measures as diagnostic devices for evaluating inflight crew behavior, as predictors of success in the Fleet, and as end-of-course measures. The implications of the findings for training devices and training device problems are developed. Author (TAB)

N66-13978# Air Force Systems Command, Wright-Patterson AFB, Ohio. Air Force Flight Dynamics Lab.
EGRESS FROM A SINGLE PLACE CREW STATION IN A WEIGHTLESS ENVIRONMENT Final Technical Report, 1 Feb. 1964-1 Apr. 1965

Edward O. Roberts Sep. 1965 40 p refs
(AFFDL-TR-65-148; AD-623120) CFSTI: HC \$2.00/MF \$0.50

The report presents the results of an in-house test program to establish design criteria for crew stations as related to crew-member egress from a single place pilot's station in a weightless environment. The objectives were to investigate the egress problems associated with the panel layout of a minimum volume crew station and to establish optimum location of an overhead hatch for crewmembers wearing regular flight suits during an emergency egress condition. A simulated single place crew station was designed and fabricated in-house and mounted in the Aeronautical Systems Division's zero gravity aircraft. An overhead hatch bulkhead was designed to be adjustable which allowed the egress task to be performed at different locations from the seat reference point (SRP). Three hatch locations were used. In the first series of tests the hatch opened outward from the crew station and was tested at the three locations; in the second series the hatch was tested at the maximum distance from the SRP but opened inward. Three times were recorded for the egress task; reaction time, egress to the hatch, and egress through the hatch. Three subjects were used to give six replications for each hatch location. The data were statistically analyzed using F ratio and t tests and the results indicated that egress through an inward opening hatch took 1 1/2 to 2 times longer than to egress through the hatch that opened outward. The time required to egress to the hatch proved to be what would be expected; the time increased as the hatch distance to the SRP increased. Author (TAB)

N66-13990# Texas Univ., Austin. Defense Research Lab.
[STUDIES OF AUDITORY INFORMATION PROCESSING EMPHASIZING THE APPLICATION OF SIGNAL DETECTABILITY THEORY TO THE AUDITORY SENSORY RESPONSES] Fifth Quarterly Progress Report, 1 Jun.-31 Aug. 1965

L. A. Jeffress 15 Oct. 1965 6 p
(NASA Order R-129; Contract Nonr-3579(04))
(NASA-CR-68881) CFSTI: HC \$1.00/MF \$0.50 CSCL 05H

The status of work progress in studies of auditory information processing emphasizing the application of signal detectability theory to the auditory sensory responses is reported. A simpler method for averaging receiver operating characteristic data for visual detection, and a method of measuring the galvanic skin response of a subject to various stimuli are described. Other studies mentioned include psychophysical and physiological investigations of brightness. L.S.

N66-14020# General Foods Corp., White Plains, N. Y. Technical Center.

FUNDAMENTAL ASPECTS OF MEAT TEXTURE Final Report, 15 Jun. 1961-15 Mar. 1965

D. De Felice, Alina Szczesniak, D. Gardner, E. Farkas, and K. Sloman Natick, Mass., Army Natick Labs., Aug. 1965 128 p refs
(Contract DA-19-129-QM-1844)
(FD-17; AD-622087) CFSTI: HC \$4.00/MF \$1.00

The report summarizes work done over a four year period on the suitability of the General Foods Texturometer (I) for meat texture description and its comparison with the Warner-Bratzler Tenderometer (II) and the Kramer Shear Press (III). Parameters of hardness, cohesiveness, elasticity, chewiness and water release measurable on I were found applicable to fresh and freeze-dehydrated meats (beef, pork, turkey, fish comminuted meat). Correlations of I with panel and with II and III varied in significance depending on variables incorporated into the sample design and were related to the range of values covered. All three instruments correlated highly significantly with sensory tenderness and with each other; however, they could not be considered good predictors of tenderness. None correlated consistently with sensory juiciness. Sensory overall texture ratings could be described in terms of tenderness and juiciness. When several parameters were combined, I was superior to the other instruments in that it could account for up to 90% variation in sensory overall texture. However, the nature of equations and contributions of individual parameters varied depending on sample set. All three instruments were able to differentiate between important sample processing variable incorporated into the experimental design. In general, I appeared to be the most, and II the least sensitive to defining these differences. Author (TAB)

N66-14021# System Development Corp., Santa Monica, Calif.
THE DETECTION OF COMPOUND MOTION
A. S. Cooperband and L. T. Alexander 30 Jul. 1965 13 p refs
Presented at 45th Ann. Western Psychological Assoc. Meeting, Honolulu, Hawaii, 1965
(SP-1946/001/00; AD-622007) CFSTI: HC \$1.00/MF \$0.50

An analysis of the geometry of the two-target collision prediction situation, and of related research, when taken together suggested that omega, the rate of change of the relative bearing between the two targets, could be a sufficient cue for collision prediction. An abstraction of the geometric situation was used to study the ability of an observer to detect a rotational motion superimposed on a translational motion. The results indicated that omega was used as the cue for detecting this rotational component of motion. Author (TAB)

N66-14028# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.
COSMONAUTS PUT ON THE PRESSURE SUITS
A. Nikolayev 12 Aug. 1965 7 p Transl. into ENGLISH from Sov. Rossiya (USSR), 19 May 1960
(FTD-TT-65-601/1+4; AD-620788) CFSTI: HC \$1.00/MF \$0.50

Problems of life support in space are reviewed briefly. The questions of weightlessness, acceleration tolerance, and food, water, and oxygen requirements are considered. TAB

N66-14029# Aerospace Medical Div. Aerospace Medical Research Labs. (6570th), Wright-Patterson AFB, Ohio.
INTERDISCIPLINARY MEASUREMENT OF HUMAN PERFORMANCE UNDER LOW AND ZERO GRAVITY CONDITIONS

Duane Frank Kasten [1964] 15 p refs
 (AD-620931) CFSTI: HC \$1.00/MF \$0.50

A discussion is presented of research techniques used by experimental psychologists, anthropologists, physiologists, and engineers in studying human performance under low and zero gravity conditions. TAB

N66-14037# American Foundation for Biological Research, Madison, Wis.

DETERMINATION OF THE AMOUNTS OF ICE FORMED IN THE FEET OF MICE FROZEN AT VARIOUS TEMPERATURES

B. J. Luyet, C. Kroener, and R. Williams Ft. Wainwright, Alaska, Arctic Aeromed. Lab., Oct. 1964 19 p refs
 (Contract AF 41(657)-343)

(AAL-TDR-63-29; AD-610407) CFSTI: HC \$1.00/MF \$0.50

The amount of ice formed in amputated feet of mice frozen at various temperatures was found, in 26 calorimetric determinations, to vary from 29.6% of the total weight at -1.5C to 46.7% at -9.5C . These figures represent, respectively, 46% and 72.5% of the water content of the limb. The average deviations from the mean percentage of ice per total weight were of the order of three units. The proportions of water frozen at given temperatures, after establishing equilibrium of ice formation, are appreciably lower in these experiments than in those of Lovelock and Smith on the hamster. There is close similarity in the ratios of electric capacitances of nonfrozen and frozen paws of mice, in the cases of amputated limbs, attached limbs in dead animals and attached limbs in living animals. This similarity justifies the use of calorimetric determinations made on amputated limbs to estimate the amounts of ice formed in living tissues or organs frozen under the same conditions, as furnished by the ratios of capacitances, after the relationship between these ratios and the calorimetric data is established.

Author (TAB)

N66-14089# Association Claude Bernard, Paris (France).
IMMUNOLOGICALLY COMPETENT CELLS [LES CELLULES IMMUNOLOGIQUEMENT COMPETENTES]

G. Mathe, J. L. Amiel, C. Brezin, and C. Choquet Brussels, EURATOM, Aug. 1965 20 p in FRENCH; ENGLISH summary European Atomic Energy Community, Brussels (Belgium). (Contract EURATOM-032-64-1 BIOF)

(EUR-2469.f) CFSTI: HC \$1.00/MF \$0.50

The subject of our research is immunologically competent cells. We have shown that in the irradiated adult animal the ability to respond to an antigenic stimulus following irradiation depends upon the number of lymphoid cells contributed by the graft. Immunization against a heterologous protein is nil if the graft is less than 10^5 cells, but normal if it is at least 2.5×10^7 cells. However, a graft of 2.5×10^7 ganglionic cells does not cause immunization of an irradiated host if it comes from previously irradiated donors who had received 10^5 ganglionic cells or less and been subjected immediately after irradiation to the same antigenic stimulus. The induction of an imbalance in the antigenic stimulus/number of immunologically competent cells ratio by a sufficient reduction of the denominator thus produces cell level, in an adult organism, lasting, graft transmissible and specific modifications. We have also shown that the injection into irradiated recipients of semi-allogenic peritoneal macrophages, which in themselves are inactive, considerably reinforces the immunizing reaction of a graft of semi-allogenic thymic cells against the host.

Author

N66-14092# Institut Pasteur, Paris (France). Service de Radiobiologie et de Cancerologie.

INTERACTION OF RADIATION WITH DEOXYRIBONUCLEIC ACIDS (SECOND YEAR OF STUDY) [INTERACTIONS DES RADIATIONS ET DES ACIDES DESOXYRIBONUCLEIQUES (DEUXIEME ANNEE D'ETUDE)]

R. Latarjet Brussels, EURATOM, Aug. 1965 6 p In FRENCH (Contract EURATOM-030-63-3 BIOF)

(EUR-2471.f) CFSTI: HC \$1.00/MF \$0.50

The effects of X- and gamma-rays on polynucleotides (U. C. A) were further studied in the presence and absence of oxygen; the quantum yields were measured in respect of the destruction of the bases and of the breaking of the phosphodiester chains. The consequences to the coding activity in the Niremberg system were measured. These ionizing-radiation effects were compared with those of nitrogen mustard. Lastly, the part played by free radicals in these reactions was partially defined by electronic paramagnetic resonance measurements. The studies were extended to cover the effects of X-rays on Pneumococcus-transforming DNA, where a "marker rescue" phenomenon was discovered, and on DNA exchanges between growing bacteria, and, lastly, on the bacterium/bacteriophage system in lysogenic bacteria. At the same time, research went forward on radioactive disintegration effects on DNA constituents (thymidine) and on certain cellular nucleic acids; in particular, the induction of a mutation aimed at radiation-resistance in yeast under the effect of P-32 disintegrations was analysed in biochemical and genetic terms. This radiation-resistance is associated with the existence of abnormal meiosis. In conclusion, the present report describes the progress of the studies of radiation effects on bacterial genetic recombination. Author

N66-14097# Atomic Weapons Research Establishment, Aldermaston (England).

A PRELIMINARY EVALUATION OF THE BIOLOGICAL MEASUREMENTS ON OPERATION ROLLER COASTER (JOINT US/UK EXPERIMENTS)

K. Stewart, D. M. C. Thomas, J. L. Terry (DASA, Washington, D. C.), and R. H. Wilson (Rochester Univ.) Jul. 1965 34 p refs

(AWRE-0-29/65) HMSO: 5s

The deposition and retention of plutonium in burros, sheep, and dogs were measured and compared with the quantities of plutonium collected by cascade impactor samplers. The animals were exposed to the cloud resulting from the nuclear explosion; details on animal exposure positions, and relationship of animal species to positions and air samplers are diagrammed. In evaluating the results, comparisons were made of the initial lung deposition with the size distribution of the aerosol inhaled, and of the mean deposition per unit lung weight or body weight for the three species. Lung clearance patterns, including translocation to other parts of the body, were also considered. Data on lung deposition and retention are tabulated for each animal. Findings indicate that the similarity between initial deposition in the animals and that expected for man can be applied in assessing the hazard to man. It was also found that simple relationships, between the median value for the initial deposition and the ratio of the breathing rate to the body and lung weights, confirm the view that the results obtained with the three animal species are comparable and compatible with the existing data for man. M. J.

N66-14151*# National Aeronautics and Space Administration, Langley Research Center, Langley Station, Va.

A WATER-IMMERSION TECHNIQUE FOR THE STUDY OF MOBILITY OF A PRESSURE-SUITED SUBJECT UNDER BALANCED-GRAVITY CONDITIONS

Otto F. Trout, Jr., Harry L. Loats, Jr., and G. Samuel Mattingly (Environ. Res. Associates) Washington, NASA, Jan. 1966 34 p refs

(NASA-TN-D-3054) CFSTI: HC \$2.00/MF \$0.50 CSCL 05E

A technique for simulating zero-gravity performance of an astronaut in a pressurized spacesuit by complete water immersion has been developed and investigated. The technique allows the pressure-suited subject to move in six degrees of freedom without the encumbrance of connecting lines or hoses or other supports and further permits performance simulation of long-duration tasks. Experiments were made to demonstrate the relationships between the maneuvers performed by a pressure-suited subject under weightless conditions produced by water-immersion and zero-gravity aircraft flights and those performed under full-gravity conditions. The tests demonstrated that the simulation technique is useful for premission determination of critical operational characteristics relating to spacecraft and spacesuit design under conditions of zero gravity. In addition, the physical capabilities of man and his ability to perform useful work and maneuvers in a pressurized suit under simulated zero-gravity conditions can be demonstrated. Comparison of the subject's motion behavior between the aircraft and water-immersion tests showed that the technique is valid where the velocities are low.

Author

N66-14160* National Aeronautics and Space Administration, Washington, D. C.

AEROSPACE MEDICINE AND BIOLOGY Bibliography with Indexes, Nov. 1965

Dec. 1965 129 p refs

(NASA-SP-7011(18)) CFSTI: HC \$1.00/MF \$1.00 CSCL 06

A selection of annotated references to unclassified reports and journal articles relating to aerospace medicine and biology that were introduced into the NASA information system during November, 1965 is given, along with subject, author, and corporate source indexes. Among the subject areas covered are the biological, physiological, psychological, and environmental effects to which man is subjected during and following simulated or actual flight in the earth's atmosphere or in interplanetary space.

LS.

N66-14197* Naval Air Development Center, Johnsville, Pa. Aviation Medical Acceleration Lab.

EQUATIONS OF MOTION IN CIRCULAR MOTION TERMS FOR THE LIMACON Report No. 3

John A. Weaver 30 Jun. 1965 35 p refs

(NADC-ML-6507; AD-623486) CFSTI: HC \$2.00/MF \$0.50

Equations of motion for the limaçon curve are developed for use in the study of vestibular function as related to vehicular motion. The equations are transformed from polar coordinate terms given in terms of the radius vector and the polar angle to circular motion terms given in terms of the radius of curvature and central angle of the circle of curvature. This permits comparison of vestibular function studies done in vehicles with those done on human centrifuges. Equations were derived from defining the accelerations of interest in studying vestibular effect on humans moving along the limaçon. While conclusions are specific to the immediate program, basic approaches were developed for defining equations of the form $\rho = f(\theta)$ in terms of circular motion.

Author (TAB)

N66-14207* Naval Radiological Defense Lab., San Francisco, Calif.

ANTIBODY PLAQUE-FORMING CELLS: KINETICS OF PRIMARY AND SECONDARY RESPONSE

J. S. Hege and L. J. Cole 2 Sep. 1965 28 p refs

(USNRDL-897; AD-623108) CFSTI: HC \$2.00/MF \$0.50

Numbers of Jerne plaque-forming cells per spleen, serum hemolysin concentrations, and the degree of resistance of the serum hemolysin to degradation by 2-mercaptoethanol have been determined in adult CBA and C3D2F1 mice as functions of time following primary or secondary intravenous sensitization with 4×10^8 sheep erythrocytes. The characteristic

secondary response yields fewer PFC and lower serum antibody concentrations than the primary response. When an adequate time interval (9 weeks or more) elapses between primary and secondary antigen injections, the magnitude of the secondary response begins to approach that of the primary. Primary serum hemolysin is mercaptoethanol sensitive (19S immunoglobulin) while secondary serum hemolysin is largely mercaptoethanol resistant (7S immunoglobulin). Generation times of 7 and 9 hours are obtained for plaque-forming cells during the first 4 days of the primary response. A mathematical model is presented which relates numbers of antibody forming cells to serum hemolysin concentrations. Using the model, together with available experimental data, it is concluded that the great majority of the cells producing 7S hemolysin probably are not detected by the Jerne technique, as applied to the spleen.

Author (TAB)

N66-14261* Deutsche Versuchsanstalt für Luft- und Raumfahrt, Bad Godesberg (West Germany).

INVESTIGATIONS ON STRESS IMPOSED ON AIRCREW IN CIVIL JET AIRCRAFT DURING LONG-RANGE FLIGHT: REPORT ON RESULTS ON THE NORTHERN ATLANTIC ROUTE [UNTERSUCHUNGEN ZUR BELASTUNG DES BORDPERSONALS AUF FERNFLUGEN MIT DÜSENMASCHINEN: BERICHT ÜBER DIE ERGEBNISSE AUF DER NORDATLANTIKROUTE]

H. Brüner, K. E. Klein, and S. Ruff Oct. 1965 67 p refs In GERMAN; ENGLISH summary

(DLR-FB-44; DVL-469) CFSTI: HC \$3.00/MF \$0.75

Investigations were performed on the stress level which affects the aircrews of airlines during long distance flights on jet aircraft. The results form the basis for evaluating the physiological work load on the investigated flight routes, and they yielded new knowledge on the influence of strenuous flights during certain day/night hours upon flight safety.

Author

N66-14290* Michigan Univ., Ann Arbor. Office of Research Administration.

[DEVELOPMENT OF ON-LINE MAN-MACHINE SYSTEM PERFORMANCE MEASUREMENT AND DISPLAY TECHNIQUES] Letter Progress Report, Jun. 1-Aug. 31, 1965

Robert M. Howe and Richard W. Pew 5 Nov. 1965 5 p /ts Rept.-06343-6-P

(Contract NASr-54(06))

(NASA-CR-68981) CFSTI: HC \$1.00/MF \$0.50 CSCL 05H

Experimental studies of human performance characteristics in manual control tasks are discussed, and the development of facilities and techniques for systems simulation and human performance data analyses is continuing. Operator performance in three-state relay control systems was investigated, with display blanking methodologies explored. Data analysis confirmed findings of a relationship between the duration of display blanking and the distribution of response times following pulses and blanking. Operator performance with predictable input signals is also discussed, and a parametric sine wave tracking study was initiated. Data analysis and simulation techniques are outlined for power spectral analysis, relay control experiment programming system, predictive display development, and simulation mechanization.

M.G.J.

N66-14315* Systems Research Labs., Inc., Dayton, Ohio. **INTEGRATED DATA COLLECTION, MONITORING, CONVERSION, AND ANALYSIS SYSTEM FOR PSYCHOPHYSIOLOGICAL STRESS RESEARCH** Final Report, 1 Jul. 1961-31 Dec. 1963

D. H. Brand, R. M. Linhart, and C. A. Burns Wright-Patterson AFB, Ohio, AMRL, Jun. 1965 103 p refs

(Contract AF 33(657)-9810)

(AMRL-TDR-64-64; AD-623126) CFSTI: HC \$4.00/MF \$0.75

The details involved in designing and executing a large-scale psychophysiological stress experiment are summarized. Design criteria and changes in experimental processes necessitated by preliminary, concurrent studies as well as instrumentation and data conversion problems are also presented. Emphasis is placed on description of the data processing routes, each of which consisted of analog tape formatting, analog to digital conversion, data reduction and editing, and data analysis techniques. Flow diagrams, computer program writeups, and examples of pictorial output formats for general, automatic, biological data handling utility are appended. Author (TAB)

N66-14320# School of Aerospace Medicine, Brooks AFB, Tex.
TRAINING THE VESTIBULE FOR AEROSPACE OPERATIONS. CENTRAL CONTROL OF VESTIBULAR FUNCTION
Kent K. Gillingham Sep. 1965 31 p refs *Its* Rev. 8-65
(AD-623676) CFSTI: HC \$2.00/MF \$0.50

Emphasis is placed on the evidence that the vestibular system is capable of being trained. One aspect of the mechanism by which training can be wrought, the vestibular efferent system, is discussed. On the basis of the understandings of the vestibular system, of spatial disorientation, and of motion sickness, one should be able to deal with operational vestibular problems by using the tools of education and training. It remains to be determined whether the most effective and economical approach to vestibular training lies in more effective didactics, more sophisticated utilization of the suppression mechanism, the actual changing of erroneous vestibular responses into correct responses, or any combination thereof. Whatever the method, the need for vestibular training persists as long as spatial disorientation wastes the lives of aircrew and motion sickness compromises military effectiveness. Author (TAB)

1966

IAA ENTRIES

A66-12352**RENAL HEMODYNAMICS - THE EFFECT OF GRAVITY ON SODIUM AND WATER EXCRETION.**

William M. Stahl (Vermont, University, College of Medicine, Dept. of Surgery, Burlington, Vt.).
Aerospace Medicine, vol. 36, Oct. 1965, p. 917-922. 42 refs.
 U. S. Public Health Service Grant No. HE-07785.

Studies of sodium and water excretion in addition to hemodynamic parameters were made in two series of anesthetized dogs. All dogs were sodium and water loaded and the second series received, in addition, supramaximal levels of 9-alpha-fluorohydrocortisone and vasopressin. In both series urine volume and sodium excretion decreased from supine control levels, with the assumption of the vertical head-up position, and returned to control levels or above in the vertical head-up position immersed in water. Changes in cardiac output, renal vascular resistance and renal tissue pressure were related to change in gravity state. The implications of these alterations in renal regulation of sodium and water are discussed. (Author)

A66-12353**THE EFFECTS OF MINIMAL DEHYDRATION UPON HUMAN TOLERANCE TO POSITIVE ACCELERATION.**

Ellen H. Taliaferro, R. R. Wempfen, and W. J. White (Douglas Aircraft Co., Inc., Advance Biotechnology Dept., Santa Monica, Calif.).

Aerospace Medicine, vol. 36, Oct. 1965, p. 922-926. 7 refs.

The responses of three groups of human subjects to positive acceleration after undergoing minimal dehydration and heat stress are presented. A decrease in acceleration tolerance of 15 to 18% is noted. It was determined that the effects of heat stress alone did not produce the observed decrease. The possible underlying mechanisms producing these effects are discussed and recommendations are made for future studies. (Author)

A66-12354**COMPARATIVE PHYSICAL PERFORMANCES OF NAVAL AVIATOR TRAINEES FROM VARIOUS PROCUREMENT SOURCES.**

James R. Berkshire (U. S. Naval School of Aviation Medicine, Pensacola, Fla.).

(Aerospace Medical Association, Annual Meeting, 36th, New York, N. Y., Apr. 26-29, 1965, Paper.)

Aerospace Medicine, vol. 36, Oct. 1965, p. 927, 928.

The Physical Training Department of the U. S. Naval School, Pre-Flight, administers a battery of physical ability tests at the beginning and at the end of pre-flight school training. The scores from two of these tests were analyzed for separate samples of students from 1963 and 1964. It was found that there were fairly consistent differences in the physical abilities of men coming from different procurement sources and that these differences persisted despite training. Also it was found that a two week shorter training syllabus, which concentrated on conditioning exercises to the exclusion of physical skills training (such as gymnastics and trampolines) resulted in as much or more improvement in test performance than did the longer mixed syllabus of 1963. (Author)

A66-12355**MEASURE OF SUSCEPTIBILITY TO PSYCHOLOGICAL STRESS.**

Patrick M. Curran and Robert J. Wherry, Jr. (U. S. Naval School of Aviation Medicine, Pensacola, Fla.).

(Aerospace Medical Association, Annual Meeting, 36th, New York, N. Y., Apr. 26-29, 1965, Paper.)

Aerospace Medicine, vol. 36, Oct. 1965, p. 929-933.

Study to determine if experimenters can actively manipulate environmental cues in order to control subjects' perceptions of such determiners of anticipatory physical threat stress (APTS) as the perceived probability of unpleasant events (P^1), the perceived

proximity of unpleasant events (X^1), and the perceived degree of unpleasantness of possible events (U^1). For this purpose 64 naval and marine cadet pilot trainees served as experimental subjects, and 24 control subjects were selected from the same group. A 4-choice, color discrimination task was employed. Instructions for experimental and control subjects structured the situation as involving information processing in a simulated aircraft mission emergency. A "subject's panel" and a "probability generator" were used to show levels of P^1 and U^1 . X^1 was also displayed on the panel. The threatening event was the possible occurrence of electric shock. Three 5-minute test sessions or "missions" were given each subject. It was found that systematic changes in environmental cues resulted in significant performance changes for the subjects, which tends to confirm previous studies. F.R.L.

A66-12356**HUMAN TOLERANCE LIMITS IN WATER IMPACT.**

Richard G. Snyder (Federal Aviation Agency, Aeromedical Service, Civil Aeromedical Research Institute, Oklahoma City, Okla.).

(Space and Flight Equipment Association, National Flight Safety, Survival, and Personal Equipment Symposium, San Diego, Calif., Oct. 28, 29, 1964, Paper.)

Aerospace Medicine, vol. 36, Oct. 1965, p. 940-947. 25 refs.

The wide but overlapping range presented between human levels of clinical impact trauma, as measured in the laboratory on volunteer subjects, and the extreme limits of survival which may occur in free-fall, has long presented a scientific enigma. This study has been an attempt to identify and evaluate factors critical to protection and survival in human water impact. Theoretical mathematical bases for impact loadings on the body were noted, along with discussion of stunt jumper techniques. Fifty (39 males, 11 females) cases of free-falls survived by individuals aged 7 to 80 years impacting water environments at over 55 ft/sec during the past three years were intensively investigated and analyzed. These represented over 25% of the 281 known water free-falls survived during this period. In addition, autopsy data in fatal falls occurring under similar environmental conditions during this time was compared. It was found that fatal cases sometimes presented a problem as to whether death was caused by drowning, and if so, whether the impact trauma could have been survivable. The most survivable body orientation, by a factor of 5-7 times, was found to be a (+ G_z) feet-first deceleration, in which critical velocity for human survival was slightly over 100 ft/sec. (116 ft/sec max.). In fatal cases a high proportion of rib fractures in lateral and transverse impact orientations was found to cause fatal penetration of the lungs and other internal organs. Patterns of injury and relationships of factors found to influence human survival tolerances are presented and compared with impact trauma on nonwater surfaces. (Author)

A66-12357**INFLUENCE OF ALVEOLAR NITROGEN CONCENTRATION AND ENVIRONMENTAL PRESSURE UPON THE RATE OF GAS ABSORPTION FROM NON-VENTILATED LUNG.**

J. Ernsting (Royal Air Force, Institute of Aviation Medicine, Farnborough, Hants., England).

Aerospace Medicine, vol. 36, Oct. 1965, p. 948-955. 18 refs.

The influence of the concentration of nitrogen (between 0 and 79%) in the previously respired gas and of environmental pressure (between 280 and 760 mm Hg) upon the rate of absorption of gas from nonventilated lung has been studied in a dog. In the initial faster phase of gas absorption the rate was found to be independent of the nitrogen concentration but increased with reduction of environmental pressure. During the final slower phase the rate of absorption decreased as the inspired nitrogen concentration was raised and as the environmental pressure was reduced. The mechanisms involved in the development of acceleration atelectasis are discussed in relation to these experimental findings. It is concluded that the effectiveness of a given inspired concentration of nitrogen in retarding the development of acceleration atelectasis should increase as the environmental pressure is reduced. (Author)

A66-12358**SELF-REPORTED STRESS-RELATED SYMPTOMS AMONG AIR TRAFFIC CONTROL SPECIALISTS (ATCS) AND NON-ATCS PERSONNEL.**

John D. Dougherty, David K. Trites, and J. Robert Dille (Federal Aviation Agency, Fort Worth, Tex.; Federal Aviation Agency, Office of Aviation Medicine, Oklahoma City, Okla.). Aerospace Medicine, vol. 36, Oct. 1965, p. 956-960.

The impact of air traffic control work on the health of Air Traffic Control Specialists (ATCS) has been of concern to the Federal Aviation Agency (FAA) for some years. Those who are engaged in the occupation, as well as external observers, have expressed the belief that the stress inherent in the occupation has an adverse effect on ATCS. Unfortunately, there is little objective evidence on which an evaluation of this belief can be based. The present investigation represents an attempt to evaluate the impact of the ATCS work on the health of those engaged in it. As part of an employee health program conducted in the southwestern states by the senior author, information about specific health problems was solicited on an anonymous basis from participants in the program. The data collected permitted comparison of ATCS personnel with personnel not engaged in ATCS work. It was felt that if the ATCS occupation was indeed stressful, then the comparisons of health information from the two groups should indicate a higher incidence of health problems among the ATCS. (Author)

A66-12359 #**UPPER THERMAL TOLERANCE LIMITS FOR UNIMPAIRED MENTAL PERFORMANCE.**

John F. Wing.

Aerospace Medicine, vol. 36, Oct. 1965, p. 960-964. 16 refs. USAF-supported research.

Fourteen experiments done in various laboratories have assessed the effects of high thermal stress on mental performance. These experiments represent different combinations of exposure time and effective temperature. When the results of these studies are reviewed, they indicate that the upper thermal limit for unimpaired mental performance varies systematically with exposure duration. Specifically, the lowest test temperatures yielding statistically reliable decrements in mental performance decline exponentially as exposure durations are increased up to 4 hr. When this temperature-duration curve for mental performance is compared with physiological tolerance curves, it is found to lie well below them at every point in time. (Author)

A66-12360**EFFICACY OF PRESSURE SUIT COOLING SYSTEMS IN HOT ENVIRONMENTS.**

James H. Veghte (USAF, Systems Command, Aerospace Medical Div., Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio).

Aerospace Medicine, vol. 36, Oct. 1965, p. 964-967. 8 refs.

Three different air distributing systems and one water-cooled system were evaluated for efficacy in cooling a person in a full pressure suit. Five subjects participated in experiments at atmospheric pressure in a 43°C environment. The pressure suit was worn unpressurized and pressurized at 192 mm Hg. The results show the separate tubular air ventilating garment to be equal to or superior in evaporative cooling efficiency to either an extremity distributing system which is an integral part of the current operational full pressure suit, or to the standard Air Force ventilating garment. The water-cooled system was superior to all air distribution systems and the subjects were comfortable for the entire two-hour test period. In control experiments with no ventilation, tolerance limits were reached before the end of two hours. On the basis of these data, serious consideration of water-cooled suit systems for maintaining a person in thermal comfort under conditions of thermal stress should be continued. (Author)

A66-12361**COMPRESSION FRACTURES OF THE SPINE DURING USAF EJECTIONS.**

Richard M. Chubb, William R. Detrick, and Robert H. Shannon (USAF, Medical Services, Life Sciences Div., Norton AFB, Calif.). Aerospace Medicine, vol. 36, Oct. 1965, p. 968-972.

A study was made of 928 USAF ejections in 1960 through 1964 to determine the most probable cause of compression fractures of the spine during ejection. Excluding multiple extreme injuries, missing persons, and downward and rotational ejections, only 729 ejections were included in the study. Factors considered were age, height, and weight of the individual; body position at the time of ejection; the type of aircraft and ejection seat catapult; tower training with a live ballistic seat; cushioning agents; and parachute landing terrain. Of the 44 individuals with compression fractures, 28 were believed to have received them during ejection and 16 during parachute landing. Sitting in the erect position, with hips and head firmly against the seat, was the most significant factor in prevention of compression fractures. Increasing age, lack of tower training, use of M-3 or rocket catapults, and ejection from bombers were interrelated factors possibly contributing to fractures. (Author)

A66-12362 #**REPEATED, PROLONGED, LOW-INTENSITY +G_z EXPOSURES - ANATOMICAL STUDIES IN DOGS.**

R. H. Murray, J. Prine, and R. P. Menninger (Indiana University, Cardiopulmonary Laboratory, Bloomington, Ind.; USAF, Systems Command, Aerospace Medical Div., Aerospace Medical Research Laboratories, Toxicology Branch, Wright-Patterson AFB, Ohio). Aerospace Medicine, vol. 36, Oct. 1965, p. 972-976. 21 refs. Contract No. AF 33(616)-8378.

Ten carefully selected dogs, anesthetized with small intravenous doses of pentobarbital and chlorpromazine, were studied. Four dogs were selected as controls and the remaining six dogs were exposed twice weekly on a four-foot radius centrifuge for one-hour periods to +2.2 G_z (positive G) at the level of the xyphoid; centrifugation was carried on for fifteen weeks for a total of thirty exposures. Four of the centrifuged dogs died, each during centrifugation (during the second, seventh, tenth and twentieth hours). At autopsy only moderate congestion in the caudal lung segments and viscera was found. The two dogs that finished the planned program, and the four control dogs were essentially normal at autopsy. Previous studies in unanesthetized animals demonstrated that similar but more frequent exposures over a period of weeks caused significant renal lesions. It seems likely that these renal changes are due to the cumulative effects of frequently repeated tissue injury; they were not seen in the present study, probably because the interval between centrifugations was 3-4 days, permitting each tissue insult to subside before re-injury. The high mortality rate in this study is not understood at present, but it seems likely that the anesthesia restricted cardiovascular compensatory efforts. (Author)

A66-12363**VESTIBULO-OCULAR DISORGANIZATION IN THE AERODYNAMIC SPIN.**

G. Melvill Jones (Royal Air Force, Institute of Aviation Medicine, Medical Research Council, Farnborough, Hants., England). (International Congress of Aviation and Space Medicine, 13th, Dublin, Ireland, Sept. 14-18, 1964, Paper.)

Aerospace Medicine, vol. 36, Oct. 1965, p. 976-983. 15 refs.

On theoretical grounds it is to be expected that disturbance of vestibular and visual perceptual mechanisms could contribute substantially to the difficulties of recovery from an aerodynamic spin. To investigate this possibility experiments were performed in which simultaneous measurements were made of aircraft and compensatory eye angular velocities in the three planes of yaw, roll and pitch. The results showed that the greatest penalty is associated with the roll plane of the skull in which there is apparently very limited capability for optokinetic following. Consequently the misleading vestibular signals which arise from continued rotation, drive an inappropriate oculomotor response which goes on virtually unchallenged by visual fixation, in this plane. Failure to fixate can even occur in the yaw plane when the discrepancy between vestibular and optokinetic drives to the oculomotor system becomes sufficiently large. The practical implications of these and other features are discussed in the context of erect and inverted spin configurations and a number of specific recommendations are made. (Author)

A66-12364**RELATIONSHIP BETWEEN PAST HISTORY OF MOTION SICKNESS AND ATTRITION FROM FLIGHT TRAINING.**

Charles W. Hutchins, Jr. and Robert S. Kennedy (U. S. Naval School of Aviation Medicine, Pensacola, Fla.).
(Aerospace Medical Association, Annual Meeting, 30th, New York, N. Y., Apr. 26-29, 1965, Paper.)

Aerospace Medicine, vol. 36, Oct. 1965, p. 984-987. 8 refs.

The Pensacola Motion Sickness Questionnaire (MSQ) was subjected to an item analysis using successful completion of the flight training program as the criterion for item selection. The resulting total score was found to be significantly correlated to completion of flight training. The scoring procedure was cross-validated and the significance of this relationship was verified. When included in the multiple prediction formulae used at this facility to predict training success, the MSQ made significant increases in the multiple validity of the formulae for predicting both successful completion of flight training and voluntary withdrawal from training. (Author)

A66-12366**SOUDAN FORMATION - ORGANIC EXTRACTS OF EARLY PRE-CAMBRIAN ROCKS.**

W. G. Meinschein (Esso Research and Engineering Co., Chemicals Research Div., Linden, N.J.).

Science, vol. 150, Oct. 29, 1965, p. 601-605. 28 refs.

Contract No. NASw-508.

Analysis of biologic-type alkanes from Precambrian rocks of the Soudan formation, St. Louis County, Minn. While some of the alkanes appear to be more than 2.7×10^9 years old, the evidence that life was present in Soudan times is marginal. The distribution of the alkanes from various regions in the Soudan indicates an indigenous origin of these compounds. Isotopic analyses do not confirm the compositional analysis, and a possible explanation of the discrepancy is noted. P.K.

A66-12544 #**AN ANALYTICAL EVALUATION OF BREATHABLE ATMOSPHERES.**

Robert W. Maddock (Douglas Aircraft Co., Inc., Aircraft Div., Thermo-Mechanical Section, Long Beach, Calif.).

American Institute of Aeronautics and Astronautics, Royal Aeronautical Society, and Japan Society for Aeronautical and Space Sciences, Aircraft Design and Technology Meeting, Los Angeles, Calif., Nov. 15-18, 1965, Paper 65-723. 22 p. 5 refs.

Members, \$0.50; nonmembers, \$1.00.

Discussion of concepts and procedures that will extend technical capabilities and improve the methodology used in the analytical evaluation of breathable atmospheres and emergency oxygen systems. The new techniques presented here focus on the use of an original concept, the "Aerospace Breathing Chart." It is essentially a nomograph which consists of a graphical presentation of the inspired tracheal gas partial pressure at different total ambient pressures. The chart further supplies information on man's physiological metabolic parameters. These are shown on the chart as the Unimpaired Performance Zone and as the Physiological Effects of Hypoxia which is a plot of "percent oxygen saturation of arterial blood" versus "geometric altitude in feet." The use of the nomograph has several important advantages over numerical analysis in solving atmosphere control problems. The principal advantage is that it substantially reduces the number of laborious calculations generally required to perform such an analysis. The chart is to atmospheric control problems what a psychrometric chart is to water vapor problems in air conditioning. A variety of sample problems are discussed and reviewed in the order of increasing complexity. (Author)

A66-12579 #**THE LANDING TASK AND PILOT ACCEPTANCE OF DISPLAYS FOR LANDING IN REDUCED WEATHER MINIMUMS.**

R. A. Behan and F. A. Siciliani (Serendipity Associates, Shastaworth, Calif.).

American Institute of Aeronautics and Astronautics, Royal Aeronautical Society, and Japan Society for Aeronautical and Space Sciences, Aircraft Design and Technology Meeting, Los Angeles, Calif., Nov. 15-18, 1965, Paper 65-722. 10 p. 12 refs.

Members, \$0.50; nonmembers, \$1.00.

Contract No. NAS 2-1346.

Discussion of criteria for display evaluation suggested by the results of an analytical study of the landing task, and of an empirical study of pilot preferences of displays for landing in reduced weather minima. It is noted that the results regarding situation displays permit the generalizations that pilots prefer a display for landing in reduced visibility which: (1) is presented on the wind-screen, (2) contains information about the position of the aircraft with respect to the glide slope, (3) presents a picture of the landing situation, and (4) contains information about airspeed. The results regarding individual information displays permit the generalizations that pilots prefer displays of altitude, airspeed, and sink rate to be presented as circular scales, with moving pointers to facilitate quick checks and to permit the noting of trends. M.M.

A66-12631 #**SPACE SUIT FOR THE MOON.**

William C. Kincaide (NASA, Manned Spacecraft Center, Crew Systems Div., Houston, Tex.).

Mechanical Engineering, vol. 87, Nov. 1965, p. 49-53.

Analysis of the basic design of the Apollo back-mounted portable life-support system (PLSS), which has been adapted to include personal liquid cooling. The operating conditions under which the spacesuit must function and its primary purpose are reviewed, and its development background is outlined. The present liquid-cooled PLSS is compared with the original gas PLSS, and both systems are illustrated schematically. Finally, construction of the liquid-cooled PLSS is described. Cooling capacity of the liquid-cooled PLSS is said to be 42% greater than that of the original gas system with only a 6 lb weight increase. B.B.

A66-12699 #**CALCULATION OF THE TRANSFER FUNCTION OF A HUMAN OPERATOR WHEN HANDLING LINEAR SYSTEMS WITH SEVERAL CONTROL PARAMETERS [BERECHNUNG DER ÜBERTRAGUNGS-FUNKTION DES MENSCHEN BEI DER HANDREGELUNG LINEARER SYSTEME MIT MEHREREN REGELGRÖSSEN].**

J. Gedeon (Budapest, Technische Universität, Lehrstuhl für Flugzeugbau, Budapest, Hungary).

Periodica Polytechnica, Engineering Series, vol. 9, no. 1, 1965,

p. 99-108. 6 refs. In German.

Derivation of a transfer function in matrix form for a human operator handling a multiparameter linear system. It is shown that the individual elements in the principal diagonal can be calculated without taking interactions into account. Nondiagonal elements are determined from the interactions, assuming that the operator endeavors to compensate for the interaction results. It is considered that a human operator cannot concentrate on more than three processes at a time, so that the problem reduces to the solution of three independent systems of matrix equations of the first rank with two unknowns. V.P.

A66-12767 #**ANIMAL TEMPERATURE SENSING FOR ORBITAL STUDIES ON CIRCADIAN RHYTHMS.**

R. G. Lindberg, G. J. De Buono, and M. M. Anderson (Northrop Corp., Northrop Space Laboratories, Bioastronautics Laboratory, Hawthorne, Calif.).

(AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS, UNMANNED SPACECRAFT MEETING, LOS ANGELES, CALIF., MARCH 1-4, 1965. AIAA Publication CP-12, p. 230-235.)

Journal of Spacecraft and Rockets, vol. 2, Nov.-Dec. 1965, p. 986-988.

Contract No. NASw-812.

[For abstract see Accession no. A65-19519 09-05]

A66-12776 #**MAN-IN-THE-LOOP SPACE STATION NAVIGATIONAL AND CONTROL SIMULATION.**

B. T. Bachofer (General Electric Co., Missile and Space Div., Orbiting Astronomical Observatory, Philadelphia, Pa.).
(American Institute of Aeronautics and Astronautics, Air Force Logistics Command, and Aeronautical Systems Division, Support for Manned Flight Conference, Dayton, Ohio, Apr. 21-23, 1965, Paper 65-277.)

Journal of Spacecraft and Rockets, vol. 2, Nov.-Dec. 1965, p. 1003-1005.

[For abstract see Accession no. A65-22167 12-05]

A66-12816**DISTINCTIVE FEATURES AND ERRORS IN SHORT-TERM MEMORY FOR ENGLISH VOWELS.**

Wayne A. Wickelgren (Massachusetts Institute of Technology, Dept. of Psychology, Cambridge, Mass.).

Acoustical Society of America, Journal, vol. 38, Oct. 1965, p. 583-588. 10 refs.

Research supported by the Department of Health, Education and Welfare and NASA.

Errors in short-term recall of six English vowels (I, E, æ, U, A, a) were tabulated and related to several distinctive-feature systems. Vowels were embedded in two contexts: /l[]k/ and /z[]k/. Subjects were instructed to copy items as they were presented, followed by recall of the entire list of (six) items. Perceptual errors were excluded from the recall error matrix by scoring for recall only correctly copied items. The rank-order frequency of different intrusions in recall of each presented vowel was almost perfectly predicted by a conventional phonetic analysis in two dimensions: place of articulation (front, back) and openness of the vocal tract (narrow, medium, and wide). The error matrix also supported the assumptions that the values of openness are ordered in short-term memory and that the correct value on the openness dimension is more likely to be forgotten than the correct value on the place dimension. The study suggests that a vowel is coded in short-term memory, not as a unit, but as a set of two distinctive features, each of which may be forgotten independently. (Author)

A66-12882**VISUAL ASPECTS OF COCKPIT MANAGEMENT.**

F. Ormonroyd (British European Airways Corp., Ruislip, Middx., England).

(Royal Aeronautical Society, All-Day Symposium on Displays, London, England, Feb. 3, 1965, Paper.)

Royal Aeronautical Society, Journal, vol. 69, Oct. 1965, p. 651-659.

Review of some cockpit display problems encountered in practice, and of methods used to correct for them in the design of the Trident aircraft. Considerations for panel layout design are discussed. The electrical panel, systems panel, radio controller, warning system, and map displays, and the indicators for the flight control system are described. Design and test procedures used in developing the cockpit layout for the Trident are outlined. P.K.

A66-12883**A PSYCHOLOGIST'S POINT OF VIEW.**

K. G. Corkindale (Ministry of Aviation, Royal Aircraft Establishment, Institute of Aviation Medicine, Farnborough, Hants., England).
Royal Aeronautical Society, Journal, vol. 69, Oct. 1965, p. 659-662. 17 refs.

Discussion of ways in which psychological research can aid in the design of aircraft cockpit displays. Psychology can contribute to display design by: (1) defining the basic operating characteristics of man, particularly the working of his perceptual mechanism; (2) defining the effect of environmental conditions on performance; (3) determining what information is required for optimal performance; and (4) deciding on man's proper role in the overall system. P.K.

A66-12884**DISPLAY RESEARCH AND ITS APPLICATION TO CIVIL AIRCRAFT. J. M. Naish (Ministry of Aviation, Royal Aircraft Establishment, Farnborough, Hants., England).**

Royal Aeronautical Society, Journal, vol. 69, Oct. 1965, p. 662-669; Discussion, p. 669-679. 6 refs.

Discussion of some problem areas in civil aviation which might be helped by applying the results of military research to aircraft cockpit design. Primary areas of interest in civil aviation include the provision of means for monitoring automatic landing, and the optimal use of the most visually accessible region of the instrument panel. Research on the head-up display (HUD) for the electronic presentation of guiding information at infinity in the line-of sight is described. The possible use of HUD for automatic landing in civil aircraft is discussed. Possible further developments of the topographical map display are considered, and its use in conjunction with the HUD concept is discussed. P.K.

A66-12886**OPERATIONAL RESEARCH AND AVIATION MANAGEMENT. III - MATHEMATICAL MODELS OF THE HUMAN CONTROLLER.**

P. A. Longton (Business Operations Research, Ltd., London, England).

Royal Aeronautical Society, Journal, vol. 69, Oct. 1965, p. 699-709. 18 refs.

Derivation, based on control and queueing theory, of a mathematical model for the human operator who controls the turn-round operations on an airport apron. Considerations for such a control system are reviewed, and the integration of this system with the Flight Control System is discussed. The role of the human operator in the Apron Control Room is described, together with his relevant physiological and psychological characteristics. A mathematical model of man as an adaptive servomechanism is constructed based on learning, forecasting, and storage concepts. The operation of the human adaptor is examined in terms of various queueing systems with constant and variable service, and single and multiple servers. P.K.

A66-12994**A CONSIDERATION OF THE BIOLOGICAL EFFECTS OF LASER.**

Alan J. McCartney (U.S. Army, Medical Research Laboratory, Div. of Biophysics, Fort Knox, Ky.).

Military Medicine, vol. 130, Nov. 1965, p. 1069-1077. 39 refs.

Description of the physical properties of laser radiation, with an attempt to correlate these properties with observed biological effects. The effects are described with reference to intact animals, primate eyes, skin, and malignant tumors of animal and human origin. It is considered that within the present state of the technology, laser radiation does not represent a lethal hazard to man. It is, however, capable of inflicting severe damage on the unprotected eye, and all due safety precautions should be observed. The rapid development of laser technology ensures an increasingly important role for the laser. In medicine, preliminary reports indicate promise in the fields of cellular research, cancer therapy, and ophthalmology. F.R.L.

A66-13175**THE EFFECT OF ACCELERATION ON FOOD-REINFORCED DRL AND FR.**

Julaine L. Beasley and Barbara L. Seldeen (NASA, Ames Research Center, Moffett Field, Calif.).

Journal of the Experimental Analysis of Behavior, vol. 8, Sept. 1965, p. 315-319. 14 refs.

Performance on DRL 10 sec and FR 5 was studied after exposure to acceleration. After four rats, two on each of the above schedules, had stabilized they were exposed to 5 hr of acceleration at 5 G immediately before daily experimental sessions. Food intake was also studied in rats given access to food daily in their home cages and exposed to acceleration immediately before the free-feeding session. Weight gain of free-feeding animals and reinforcement intake of experimental animals dropped after acceleration. Overall response rate on the FR was depressed markedly by acceleration but local response rates did not appear to be affected. IRT distributions of DRL sessions after acceleration were markedly shifted toward the

long intervals. A sequential plot of IRTs on acceleration days showed an altered, but relatively stable, temporal patterning of responses followed by an abrupt return to the normal baseline toward the end of the session. (Author)

A66-13337**PAIN MECHANISMS - A NEW THEORY.**

Ronald Melzack (McGill University, Dept. of Psychology, Montreal, Canada) and Patrick D. Wall (Massachusetts Institute of Technology, Dept. of Biology, Cambridge, Mass.).

Science, vol. 150, Nov. 19, 1965, p. 971-979. 78 refs.

Research supported by the Bell Telephone Laboratories and the Teagle Foundation; NSF Grant No. GP-2495; Grants No. MH-04737-05; No. NB-04897-02; No. NSG-496; Contracts No. AF 33(615)-1747; No. DA-36-039-AMC-03200(E); ARPA Contract No. SD-193.

Proposal of a new theory, the "gate control" system, and a review of two current opposing theories of pain, the specificity theory and the pattern theory. The specificity theory holds that pain is a specific modality like vision or hearing, with its own central and peripheral apparatus. The pattern theory maintains that the nerve impulse pattern for pain is produced by intense stimulation of nonspecific receptors since there are no specific fibers and no specific endings. Stimulation of the skin evokes nerve impulses that are transmitted to three spinal cord systems; the cells of the substantia gelatinosa in the dorsal horn, the dorsal-column fibers that project toward the brain, and the first central transmission cells in the dorsal horn. The gate control theory proposes that pain phenomena are determined by interactions among these three systems. The substantia gelatinosa is thought to function as a gate control system that modulates the afferent patterns before they influence the transmission cells. It is proposed that the presence or absence of pain is determined by the balance between the sensory and the central inputs to the gate control system. Drugs affecting excitation or inhibition of substantia gelatinosa activity may be of particular importance in future attempts to control pain.

M. F.

A66-13339**BACTERIAL CONTAMINATION OF SOME CARBONACEOUS METEORITES.**

J. Oro' and T. Tornabene (Houston, University, Dept. of Chemistry and Biology, Houston, Tex.).

Science, vol. 150, Nov. 19, 1965, p. 1046-1048. 16 refs.

Grant No. NSG-257-62.

Determination to what extent, if any, carbonaceous chondrites are contaminated by ordinary viable microorganisms. The following three meteorites were selected for investigation: the Orgueil (Wiik type I), the Murray (Wiik type II), and the Mokoia (Wiik type III). Bacterial cultures were obtained from samples of the Murray and Mokoia but no bacterial colonies were detected from samples of the Orgueil. Three types of bacteria were isolated, and were identified as *Bacillus cereus*, *B. badius*, and *Staphylococcus epidermidis*, common contaminants that are widely distributed.

M. F.

A66-13346**STUDIES OF OXYGEN TOXICITY IN THE CENTRAL NERVOUS SYSTEM.**

Lewis G. Zirkle, Jr., Betty D. Horton, Edward J. Duffy (Duke University, Medical Center, Dept. of Medicine, Durham, N.C.), and Charles E. Mengel (Ohio State University, Dept. of Medicine, Div. of Hematology and Oncology, Columbus, Ohio).

(Aerospace Medical Association, Meeting, New York, N.Y., Apr. 28, 1965, Paper.)

Aerospace Medicine, vol. 36, Nov. 1965, p. 1027-1032. 46 refs.

Mice of varying tocopherol status were exposed to oxygen under high pressure. Clinical features of oxygen toxicity in the central nervous system (seizures and death) correlated with lipid peroxidation of brain tissue which was associated with inhibition of brain acetylcholinesterase activity. Clinical and biochemical effects of hyperoxia were exaggerated in tocopherol deficient mice and were prevented by prior supplementation with tocopherol, a

specific inhibitor of lipid peroxidation. It is postulated that the primary effect of hyperoxia on the central nervous system is peroxidation of brain lipid which directly or indirectly (through interference with other metabolic systems) results in cell and tissue damage. (Author)

A66-13347 #**METHOD FOR DETERMINATION OF CALCIUM IN SERUM, PAROTID FLUID AND URINE IN THE WEIGHTLESS STATE.**

Bruce A. Butcher, Joseph F. Eastis, and Dale A. Clark (USAF, Systems Command, Aerospace Medical Div., School of Aerospace Medicine, Physiological Chemistry Section, Brooks AFB, Tex.). (Aerospace Medical Association, Meeting, New York, N.Y., Apr. 27, 1965, Paper.)

Aerospace Medicine, vol. 36, Nov. 1965, p. 1032-1035. 9 refs.

Investigation of the nuclear fast red technique (NFR) for measuring calcium concentrations in biological fluids under weightlessness. The results obtained are: (1) purification of a batch of dye proved unnecessary; (2) the color developed was relatively stable between 10 and 20 min after mixing; (3) the normal values obtained were slightly higher than those reported for classical procedures; (4) recoveries of calcium ion added to serum averaged 90% but increased with decreasing protein concentration; (5) addition of magnesium ion increased the color intensity but, on a molar basis, only 1/2 to 1/3 as efficiently as calcium ion; and (6) the color interference resulting from hemolysis can be corrected by an appropriate blank. It is considered that all steps in the described technique are compatible with performance in the weightless state. M.M.

A66-13348**STUDIES OF THE MECHANISM OF IN VIVO RBC DAMAGE BY OXYGEN.**

Charles E. Mengel (Ohio State University, Dept. of Medicine, Div. of Hematology and Oncology, Columbus, Ohio), Bert W. O'Malley, Betty D. Horton (Duke University, Medical Center, Dept. of Medicine, Durham, N.C.), and Lewis G. Zirkle.

Aerospace Medicine, vol. 36, Nov. 1965, p. 1036-1041. 47 refs.

U.S. Public Health Service Grants No. CA-06543; No. CA-08170; No. HE-07696.

Erythrocytes of dogs exposed to oxygen under high pressure showed initiation of in vivo peroxidation of erythrocyte lipid, increased osmotic fragility and decreased acetylcholinesterase activity. There were no gross evidences of hemolysis although additional studies indicated that a small population of red cells had been lost during in vivo OHP. No changes of the usual oxidation transformation systems were noted. In vitro studies showed that acetylcholinesterase was not inhibited by oxygen per se (at normal or increased pressures) but was inhibited by addition of preformed lipid peroxides. These studies suggest a role of acetylcholinesterase inhibition in the damage to red cells by hyperoxia, and demonstrate that this enzyme can be inhibited by lipid peroxides in vitro and probably in vivo. (Author)

A66-13349**EFFECTS OF CONTROL-DISPLAY DISPLACEMENT FUNCTIONS ON PURSUIT AND COMPENSATORY TRACKING.**

Edward C. Wartz, A. C. McTee, W. F. Swartz, T. W. Rheinlander, and W. A. Dalhamer (Garrett Corp., AiResearch Manufacturing Co., Los Angeles; Bunker-Ramo Corp., Canoga Park, Calif.).

Aerospace Medicine, vol. 36, Nov. 1965, p. 1042-1047. 5 refs.

An experiment was conducted to determine optimal control-display relationships in a generalized tracking task. This report contains a description of the experimental conditions, procedures and results of the experiment. Conclusions are drawn about the preferred type of display, control-display displacement function, temporal lag between operator input and feedback, and target display velocities. The conclusions are applicable to piloting and radar tracking operations. (Author)

A66-13350**SOME ASPECTS OF THE DYNAMIC BEHAVIOUR OF AIRCREW BREATHING EQUIPMENT.**

G. R. Allen, K. R. Maslen, and G. F. Rowlands (Ministry of Aviation, Royal Aircraft Establishment, Human Engineering Div., Farnborough, Hants., England).

(Aerospace Medical Association, Meeting, New York, N.Y., Apr. 27, 1965, Paper.)

Aerospace Medicine, vol. 36, Nov. 1965, p. 1047-1053. 24 refs.

Techniques necessary for accurate measurement of dynamic pressure and flow are first described. The need for cyclic flow testing for regulator response is demonstrated from basic bio-engineering considerations, and the British test is outlined. The usefulness of breathing simulators is discussed and an electronically-controlled machine developed at R.A.E. described. British problems on instability in breathing equipment, and the nature and cause of the phenomenon, are discussed. Instability is shown to be a function of the complete system, in which the impedance of the human respiratory system can play an important part. A technique for measuring this impedance is described, preliminary results are presented, and pneumatic analogues to simulate impedance considered. Preliminary work is reported on subjective perception of pressure oscillations. Brief comment is made on improvement of system dynamic behavior. (Author)

A66-13351**COMPARATIVE STUDIES ON 1285 AND 2800 MC/SEC PULSED MICROWAVES.**

Sol M. Michaelson, R. A. E. Thomson, and Joe W. Howland (Rochester, University, School of Medicine and Dentistry, Dept. of Radiation Biology, Rochester, N.Y.).

(Aerospace Medical Association, Annual Meeting, 36th, New York, N.Y., Apr. 27, 1965, Paper.)

Aerospace Medicine, vol. 36, Nov. 1965, p. 1059-1064. 18 refs. Contract No. AF 30(602)-224; AEC Contract No. W-7401-Eng-49.

Response of dogs exposed to 2800-Mc and 1285-Mc microwaves reveals a direct correlation between field intensity and body weight loss which is similar at both frequencies, at comparable field intensities. The degree and onset of leukocyte and erythrocyte increases and/or decreases is dependent on microwave frequency, field intensity and duration of exposure. Reticulocytosis during daily 20-mw/cm², 1285-Mc exposures indicate an hematopoietic effect. Signs of distress are less evident at 1285 Mc than at 2800 Mc when critical rectal temperature level (106°F or greater) are reached, and suggest that potential microwave hazards may be obscure at the lower frequency. (Author)

A66-13352**SOME OBSERVATIONS ON DOGS FOLLOWING LOWER BODY EXPOSURE TO 1000 KVP X-RAYS.**

Lawrence T. Odland (USAF, Logistics Command, Wright-Patterson AFB, Ohio) and Sol M. Michaelson (Rochester, University, Rochester, N.Y.).

Aerospace Medicine, vol. 36, Nov. 1965, p. 1064-1068. 15 refs. Research supported by the Defense Atomic Support Agency and AEC.

Studies with dogs given varying doses of 1000 KVP X rays to the lower body indicated that the 60-day median lethal dose is about 920 r; the limiting factor being the sensitivity of intestinal mucosa cells rather than those of the hematopoietic system. The acute clinical phase of lower body radiation injury is much shorter than with whole or upper body exposures, suggesting the gut and/or other abdominal viscera have a rapid component of total body recovery potential as opposed to primarily hematopoietic damage where recovery is much prolonged. Anorexia, weight loss, vomiting and hypersialosis were the most significant clinical changes, and these appeared immediately post-exposure persisting for 5-10 days. Fractionation of the single doses into four equal components given during brief sessions over as many consecutive days decreased morbidity and mortality. Erythropoiesis was relatively unimpaired by the exposure of only the lower body. (Author)

A66-13354**EFFECTS OF MODERATE PHYSICAL EXERCISE DURING FOUR WEEKS OF BED REST ON CIRCULATORY FUNCTIONS IN MAN.**

Perry B. Miller, Robert L. Johnson, and Lawrence E. Lamb (USAF, Systems Command, Aerospace Medical Div., School of Aerospace Medicine, Internal Medicine Branch, Brooks AFB, Tex.).

Aerospace Medicine, vol. 36, Nov. 1965, p. 1077-1082. 13 refs.

Various effects on circulatory functions of light to moderate physical exercise during 4 weeks of bed rest were studied in 6 subjects. During exercise narrow cuffs inflated to 60 mm Hg were worn on the upper thighs. Changes in plasma volume during and after bed rest paralleled those characteristic of simple bed rest. In contrast to simple bed rest, the major loss of red cell mass was noted at the end of bed rest and not during ambulation following bed rest. The mean resting heart rate for all subjects increased 15 beats per minute during bed rest. The degree of postural intolerance after bed rest appeared as marked as that observed after absolute bed rest. Physical endurance on the treadmill was decreased after bed rest. (Author)

A66-13355 #**EVALUATION OF PEAK VS RMS ACCELERATION IN PERIODIC LOW FREQUENCY VIBRATION EXPOSURES.**

N. P. Clarke, G. C. Mohr, J. W. Brinkley, J. H. Henzel, H. E. von Gierke (USAF, Systems Command, Aerospace Medical Div., Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio), P. J. Martin, and H. C. Wooding (Technology, Inc., Dayton, Ohio).

Aerospace Medicine, vol. 36, Nov. 1965, p. 1083-1089. 6 refs. Contract No. AF 33(615)-1894.

Subjects were exposed to vibrations with varying peak and rms accelerations and frequencies to explore the relative importance of these parameters in determining the effect of the vibration produced by turbulence in low-altitude high speed flight. For various rms acceleration levels and frequency contents, pairs of periodic vibration exposures having the same rms but different peak accelerations were evaluated using both a subjective severity rating and a measure of vibration induced hand motion. The higher peak acceleration of the various pairs having the same rms values was subjectively rated more severe in 32 of 40 observations. However, when attempting to hold the hand in a fixed position during vibration, the induced deviations from the null point, expressed either as average or peak-to-peak errors appeared to depend more on rms acceleration and frequency than on the small differences in peak acceleration studied here. (Author)

A66-13356**EFFECT OF HYPOXIC HYPOXIA ON NYSTAGMUS INDUCED BY ANGULAR ACCELERATION.**

P. D. Newberry, W. H. Johnson, and J. R. Smiley (Royal Canadian Air Force, Institute of Aviation Medicine, Toronto, Canada).

Aerospace Medicine, vol. 36, Nov. 1965, p. 1090-1093. 13 refs.

Four subjects were exposed to a horizontal angular acceleration of approximately 156°/sec² for 1 sec, while breathing air at ground level, and then while breathing air at 20,000 ft. On a different day the angular acceleration was repeated while breathing 10% oxygen at ground level, and then while breathing air at ground level. Total slow phase angular deviation of the eye, maximum slow phase angular velocity and total duration of nystagmus were used as criteria of the magnitude of the nystagmic response. There was a mean increase of 61% in the slow phase angular velocity of the nystagmus occurring while breathing 10% oxygen compared with breathing air at ground level. At 20,000 ft, however, there was a mean increase of almost 100% in total angular deviation, maximum angular velocity and total duration of nystagmus compared to breathing either 10% O₂ or air at ground level. This is attributed to the obvious anxiety displayed by the subjects at 20,000 ft. It is suggested that hypoxic hypoxia and the associated hyperventilation cause a trivial increase in the nystagmus resulting from a horizontal angular acceleration without hypoxia but that apprehension may cause a profound increase in nystagmus. (Author)

A66-13357**HUMAN FACTORS IN THE CONCORD S.S.T.**

G. Bennett (Ministry of Aviation, London, England).
(Aerospace Medical Association, Meeting, New York, N.Y., Apr. 26, 1965, Paper.)

Aerospace Medicine, vol. 36, Nov. 1965, p. 1094-1096.

Progress report on human factors investigations performed in the Concord program. To minimize sonic boom effects, the initial climb after takeoff is at subsonic speed, accelerating to M 1.3 at 35,000 ft. Above 45,000 ft the aircraft accelerates further, reaching M 2.2 at 55,000 ft. After this, the optimum profile calls for a climb-cruise at M 2.2, up to a maximum altitude of about 65,000 ft. The Concord can make an emergency descent to 40,000 ft in 3-1/2 min., and to 15,000 ft in 9 min. The Concord carries her own detecting equipment for solar flares, recording instantaneous and integrated dosage. Studies are in progress to improve the crashworthiness of passenger seating and tie-down. Delethalization of structures in the passenger environment is given particular attention, and a study is also being made of the practicability of fitting rearward-facing seating. M.M.

A66-13367**EVOLUTION OF DEHYDROGENASES.**

Nathan O. Kaplan (Brandeis University, Graduate Dept. of Biochemistry, Waltham, Mass.).

IN: EVOLVING GENES AND PROTEINS.

Edited by Vernon Bryson and H. J. Vogel.

New York, Academic Press, Inc., 1965, p. 243-277. 42 refs.
American Cancer Society Grant No. P-77G; Grant No. NSG-375.

Description of methods of comparing the relationship among enzymes that are the same, but that belong to different organisms. The significance of changes in enzyme structure during evolution is discussed. Treatment is concerned largely with the DPN-linked dehydrogenases. The examples described suggest that changes in enzyme structure may be important factors in natural selection. It is emphasized that the use of the new biochemical procedures will not supersede the classical phylogenetic and taxonomic studies but will add quantitative parameters that may be used in conjunction with the classical approach. It is considered that specific problems that the classical methods cannot resolve may be solved by the comparative enzyme techniques outlined. M.M.

A66-13369**EXPERIMENTS SUGGESTING EVOLUTION TO PROTEIN.**

S. W. Fox (Miami, University, Institute of Molecular Evolution, Coral Gables; Florida State University, Dept. of Chemistry, Tallahassee, Fla.).

IN: EVOLVING GENES AND PROTEINS.

Edited by Vernon Bryson and H. J. Vogel.

New York, Academic Press, Inc., 1965, p. 359-369. 44 refs.
Grants No. NSG-173-62; No. NSG-689.

Discussion of the relationship of the earliest proteins to the protocell, with a comparison in tabular form of the key properties of acid proteinoids with those of protein. The background of knowledge of the evolution of protein molecules in organisms, which provides clues to the conceptual origin of protein, is reviewed, and a discussion is given of the employment of knowledge of the properties of contemporary protein as a test of the validity of experimental models of primitive protein. Conceptual answers to some of the problems of primordial protein are considered. F. R. L.

A66-13370**TELEMETERING FROM WITHIN THE BODY OF ANIMALS AND MAN - ENDORADIOSONDES.**

R. Stuart Mackay.

IN: BIOMEDICAL TELEMETRY.

Edited by C. A. Caceres.

New York, Academic Press, Inc., 1965, p. 147-235. 76 refs.
Grants No. SC-5861; No. NSG-600.

Discussion regarding methods of telemetering information from within the body of animals and man with the aid of tiny transmitters called "endoradiosondes." A number of methods of modulating signals, to enable them to transmit unambiguous information, are outlined briefly. Various types of active units for transmitting biological information are discussed, and the use of pulsed-operation

and passive transmitters is described. A number of factors involved in the propagation and reception of signals from various types of transmitters are considered. Results obtained in field work with wild animals and with aquatic animals are reported. The use of permanent magnets for telemetering information from the body is noted. Certain additional applications of endoradiosondes are discussed. A. B. K.

A66-13495**SPACEFLIGHT AND CYBERNETICS [RAUMFAHRT UND KYBERNETIK].**

K. Steinbuch (Karlsruhe, Technische Hochschule, Institut für Nachrichtenverarbeitung und Nachrichtenübertragung, Karlsruhe, West Germany).

(Wissenschaftliche Gesellschaft für Luft- und Raumfahrt und Deutsche Gesellschaft für Raketentechnik und Raumfahrtforschung, Jahrestagung, Berlin, West Germany, Sept. 14-18, 1964, Paper.)

IN: SCIENTIFIC ASSOCIATION FOR AIR AND SPACE TRAVEL AND GERMAN ASSOCIATION FOR ROCKET TECHNOLOGY AND SPACE TRAVEL RESEARCH, ANNUAL MEETING, BERLIN, WEST GERMANY, SEPTEMBER 14-18, 1964, JAHRBUCH [WISSENSCHAFTLICHE GESELLSCHAFT FÜR LUFT- UND RAUMFAHRT UND DEUTSCHE GESELLSCHAFT FÜR RAKETENTECHNIK UND RAUMFAHRTFORSCHUNG, JAHRESTAGUNG, BERLIN, WEST GERMANY, SEPTEMBER 14-18, 1964, JAHRBUCH. [A66-13494 04-31]

Edited by Hermann Blenk.

Braunschweig, West Germany, Friedrich Vieweg und Sohn, 1965, p. 11-24. 109 refs. In German.

[For abstract see issue 24, page 2233, Accession no. A64-28379]

A66-13496**COMMAND BY SPEECH IN AEROSPACE AUTOMATION - METHODS OF AUTOMATIC SPEECH RECOGNITION [DIE BEFEHLSSPRACHE IN DER LUFT- UND RAUMFAHRTAUTOMATIK - ÜBER VERFAHREN DER AUTOMATISCHEN SPRACHERKENNUNG].**

Fritz Winckel (Berlin, Technische Universität, Berlin, West Germany).

(Wissenschaftliche Gesellschaft für Luft- und Raumfahrt und Deutsche Gesellschaft für Raketentechnik und Raumfahrtforschung, Jahrestagung, Berlin, West Germany, Sept. 14-18, 1964, Paper.)

IN: SCIENTIFIC ASSOCIATION FOR AIR AND SPACE TRAVEL AND GERMAN ASSOCIATION FOR ROCKET TECHNOLOGY AND SPACE TRAVEL RESEARCH, ANNUAL MEETING, BERLIN, WEST GERMANY, SEPTEMBER 14-18, 1964, JAHRBUCH [WISSENSCHAFTLICHE GESELLSCHAFT FÜR LUFT- UND RAUMFAHRT UND DEUTSCHE GESELLSCHAFT FÜR RAKETENTECHNIK UND RAUMFAHRTFORSCHUNG, JAHRESTAGUNG, BERLIN, WEST GERMANY, SEPTEMBER 14-18, 1964, JAHRBUCH. [A66-13494 04-31]

Edited by Hermann Blenk.

Braunschweig, West Germany, Friedrich Vieweg und Sohn, 1965, p. 25-32; Discussion, p. 32. 21 refs. In German.

[For abstract see issue 23, page 2093, Accession no. A64-26640]

A66-13507**CONCEIVABLE LIMITS OF MANNED SPACEFLIGHT [DIE VERMUTLICHEN GRENZEN DER BEMANNTEN RAUMFAHRT].**

H. von Diringshofen and E. H. Graul (Entwicklungsring Süd, Munich, West Germany).

(Wissenschaftliche Gesellschaft für Luft- und Raumfahrt und Deutsche Gesellschaft für Raketentechnik und Raumfahrtforschung, Jahrestagung, Berlin, West Germany, Sept. 14-18, 1964, Paper.)

IN: SCIENTIFIC ASSOCIATION FOR AIR AND SPACE TRAVEL AND GERMAN ASSOCIATION FOR ROCKET TECHNOLOGY AND SPACE TRAVEL RESEARCH, ANNUAL MEETING, BERLIN, WEST GERMANY, SEPTEMBER 14-18, 1964, JAHRBUCH [WISSENSCHAFTLICHE GESELLSCHAFT FÜR LUFT- UND RAUMFAHRT UND DEUTSCHE GESELLSCHAFT FÜR RAKETENTECHNIK UND RAUMFAHRTFORSCHUNG, JAHRESTAGUNG, BERLIN, WEST GERMANY, SEPTEMBER 14-18, 1964, JAHRBUCH. [A66-13494 04-31]

Edited by Hermann Blenk.

Braunschweig, West Germany, Friedrich Vieweg und Sohn, 1965, p. 116-121. In German.

[For abstract see issue 11, page 1518, Accession no. A65-21025]

A66-13508

TEACHING MACHINES, AND THEIR POSSIBLE APPLICATIONS IN THE FIELD OF AVIATION [LEHRMASCHINEN UND IHRE EINSATZ-MÖGLICHKEITEN IM BEREICH DER LUFTFAHRT].

Günter Emde (Bölkow GmbH, Ottobrunn, West Germany).

(Wissenschaftliche Gesellschaft für Luft- und Raumfahrt und Deutsche Gesellschaft für Raketentechnik und Raumfahrtforschung, Jahrestagung, Berlin, West Germany, Sept. 14-18, 1965, Paper.)

IN: SCIENTIFIC ASSOCIATION FOR AIR AND SPACE TRAVEL AND GERMAN ASSOCIATION FOR ROCKET TECHNOLOGY AND SPACE TRAVEL RESEARCH, ANNUAL MEETING, BERLIN, WEST GERMANY, SEPTEMBER 14-18, 1964, JAHRBUCH [WISSENSCHAFTLICHE GESELLSCHAFT FÜR LUFT- UND RAUMFAHRT UND DEUTSCHE GESELLSCHAFT FÜR RAKETENTECHNIK UND RAUMFAHRTFORSCHUNG, JAHRESTAGUNG, BERLIN, WEST GERMANY, SEPTEMBER 14-18, 1964, JAHRBUCH].

[A66-13494 04-31]

Edited by Hermann Blenk.

Braunschweig, West Germany, Friedrich Vieweg und Sohn, 1965, p. 127-127. 7 refs. In German.

[For abstract see issue 24, page 2232, Accession no. A64-28168]

A66-13787

VISION AND VISUAL PERCEPTION.

Edited by C. H. Graham (Columbia University, Dept. of Psychology, New York, N. Y.).

New York, John Wiley and Sons, Inc., 1965. 637 p.

\$23.50.

CONTENTS:

PREFACE. C. H. Graham (Columbia University, New York, N. Y.), p. v, vi.

ELECTROPHYSIOLOGY OF VISION. Lorrin A. Riggs (Brown University, Providence, R. I.), p. 81-131. 213 refs. [See A66-13788 04-04]

PHOTOCHEMISTRY OF VISION. Yun Hsia (Columbia University, New York, N. Y.), p. 132-153. 122 refs. [See A66-13789 04-04]

DARK ADAPTATION AND LIGHT ADAPTATION. N. R. Bartlett (Arizona, University, Tucson, Ariz.), p. 185-207. 65 refs. [See A66-13790 04-04]

BRIGHTNESS DISCRIMINATION AND BRIGHTNESS CONTRAST. J. L. Brown (Kansas State University of Agriculture and Applied Science, Manhattan, Kan.) and C. G. Mueller (Columbia University, New York, N. Y.), p. 208-250. 134 refs. [See A66-13791 04-04]

FLICKER AND INTERMITTENT STIMULATION. John Lott Brown (Kansas State University of Agriculture and Applied Science, Manhattan, Kan.), p. 251-320. 408 refs. [See A66-13792 04-04]

VISUAL ACUITY. Lorrin A. Riggs (Brown University, Providence, R. I.), p. 321-349. 146 refs. [See A66-13793 04-04]

AFTERIMAGES. John Lott Brown (Kansas State University of Agriculture and Science, Manhattan, Kan.), p. 479-503. 120 refs. [See A66-13794 04-04]

VISUAL SPACE PERCEPTION. C. H. Graham (Columbia University, New York, N. Y.), p. 504-547. 126 refs. [See A66-13795 04-04]

VISUAL FORM PERCEPTION. C. H. Graham (Columbia University, New York, N. Y.), p. 548-574. 98 refs. [See A66-13796 04-04]

PERCEPTION OF MOVEMENT. C. H. Graham (Columbia University, New York, N. Y.), p. 575-588. 59 refs. [See A66-13797 04-04]

AUTHOR INDEX, p. 589-603.

SUBJECT INDEX, p. 605-637.

A66-13788

ELECTROPHYSIOLOGY OF VISION.

Lorrin A. Riggs (Brown University, Walter S. Hunter Laboratory of Psychology, Providence, R. I.).

IN: VISION AND VISUAL PERCEPTION.

Edited by C. H. Graham.

New York, John Wiley and Sons, Inc., 1965, p. 81-131. 213 refs. Navy-supported research.

Comprehensive review of the current state of knowledge concerning the electrical responses manifested by different parts of the human visual system. It is shown that vision involves a com-

plicated sequence of events initiated when light shines on the sensory cells, in which photochemical processes are successively followed by neural processes in the retinal neurons, in the optic nerve fibers, and in the various centers of the brain, culminating in a discriminative motor response. The electrical properties of the nervous system are summarized, and the membrane theory of neuron transmission recapitulated. The techniques for obtaining records of electrical activity in the visual system are considered. The characteristics of the electroretinogram are analyzed, and animal and human electroretinograms are compared. The temporal and spatial aspects of the activity in the cortex of the brain are discussed, and it is suggested that the nonoptically stimulated (or spontaneous) cortical activity may have a role in relation to the high degree of redundancy that is necessary to protect signals originating from visual stimulation.

M. L.

A66-13789

PHOTOCHEMISTRY OF VISION.

Yun Hsia (Columbia University, Dept. of Psychology, New York, N. Y.).

IN: VISION AND VISUAL PERCEPTION.

Edited by C. H. Graham.

New York, John Wiley and Sons, Inc., 1965, p. 132-153. 122 refs. Navy-supported research.

Comprehensive review of the photochemical events in vision, emphasizing the role played by rhodopsin (visual purple). The methods of demonstrating and preparing rhodopsin are reviewed. Spectrophotometric analyses of rhodopsin solutions are discussed with reference to their optical density, absorbance, and quantum efficiency. The bleaching, "action," and difference spectra of rhodopsin are compared, and the chemical nature of the substance is extensively treated. Research work is recounted that established that rhodopsin is a conjugated carotenoid protein, and the analysis of the bleaching and regeneration of rhodopsin, as well as its relation to another carotenoid - vitamin A - is reviewed. The means of studying rhodopsin in vivo and in situ are compared, and the optical arrangement for measuring the density changes in animals is illustrated. Other photosensitive substances, in both human and animal retinas, are considered.

M. L.

A66-13790

DARK ADAPTATION AND LIGHT ADAPTATION.

N. R. Bartlett (Arizona, University, Dept. of Psychology, Tucson, Ariz.).

IN: VISION AND VISUAL PERCEPTION.

Edited by C. H. Graham.

New York, John Wiley and Sons, Inc., 1965, p. 185-207. 65 refs.

Comprehensive review of the temporal changes in the retinal threshold of the human eye. It is shown that the threshold depends on the preceding history of illumination, such that the thresholds with the retina illuminated are elevated over those with no prevailing illumination; the extent of elevation for any region depends on the kind and intensity of retinal illumination. It is noted that once the illumination is removed, the threshold sinks to the level of the dark-adapted eye; the change is not instantaneous, but takes an appreciable amount of time. Several parameters affecting dark adaptation are considered, including effects of luminance and duration of preadapting light, sensitivity and concentration of rhodopsin, and the size and location of the stimulus; experimental data are cited. The wavelength of both the threshold light and the preadapting light is considered, and dark adaptation in lower animals is reviewed. Light adaptation and its retinal basis are summarized.

M. L.

A66-13791

BRIGHTNESS DISCRIMINATION AND BRIGHTNESS CONTRAST.

J. L. Brown (Kansas State University of Agriculture and Applied Science, Graduate School, Manhattan, Kan.) and C. G. Mueller (Columbia University, Dept. of Psychology, New York, N. Y.).

IN: VISION AND VISUAL PERCEPTION.

Edited by C. H. Graham.

New York, John Wiley and Sons, Inc., 1965, p. 208-250. 134 refs. Navy-supported research; U.S. Public Health Service Grant No. MB 02205-04.

Review of experimental and theoretical work concerning the brightness discrimination and brightness contrast of the human and animal eyes. It is noted that while brightness discrimination refers to the discrimination in the visual field of differences based mainly

on brightness threshold changes in luminance, brightness contrast refers to a broader class of phenomena that may be considered to include brightness discrimination. However, the considered material is restricted to that dealing with suprathreshold luminance differences. Test field parameters are evaluated, including the duration of exposure, size and shape of the test field, and the spatial interaction. The size and shape of the adapting field, luminance, and the duration of adaptation are considered adapting field parameters. Theoretical and photochemical formulations are reviewed, including the applications of statistical and quantitative theory. Contrast and its parameters are also considered. M. L.

A66-13792

FLICKER AND INTERMITTENT STIMULATION.

John Lott Brown (Kansas State University of Agriculture and Applied Science, Graduate School, Manhattan, Kan.).

IN: VISION AND VISUAL PERCEPTION.

Edited by C. H. Graham.

New York, John Wiley and Sons, Inc., 1965, p. 251-320. 408 refs. Navy-supported research.

Comprehensive review of the experimental and theoretical data concerning visual flicker and the eye. One particular threshold is considered of special importance: the rate of intermittence of the stimulus that represents the point of transition from the appearance of flicker to a steady light, called the critical flicker frequency (CFF) or the flicker fusion frequency (FFF). Data are discussed in which flicker fusion has been studied with electrical as well as photic stimulation and with electrically recorded responses as well as verbal responses. The relevance of a number of experiments concerned with perceptual phenomena that occur at flicker frequencies well below the point of fusion is considered. Some theoretical formulations proposed in explanation of the results discussed are compared. M. L.

A66-13793

VISUAL ACUITY.

Lorrin A. Riggs (Brown University, Walter S. Hunter Laboratory of Psychology, Providence, R.I.).

IN: VISION AND VISUAL PERCEPTION.

Edited by C. H. Graham.

New York, John Wiley and Sons, Inc., 1965, p. 321-349. 146 refs. Navy-supported research.

Review of visual acuity, defined as the capacity of the human eye to discriminate the fine details of objects in the field of view. Visual acuity is specified in terms of the minimum dimension of some critical aspects of a test object that a subject can correctly identify, such that good visual acuity implies that a subject can discriminate fine detail, and poor acuity implies that only gross features can be seen. The specification of acuity and the means of clinically measuring it are described. The types of acuity task and the factors underlying acuity are discussed at length, including recognition, resolution, pupil size, and retinal illuminance. Data concerning acuity as a function of pupil size, intensity of illumination, and the relation between retinal illuminance and resolution are reviewed and discussed. The importance given to the relation between eye movement and acuity is emphasized, as it is pointed out that the eye is never motionless, even when fixing on an object. It is concluded that acuity is optimal only when test objects are seen within a distance of 5 min of arc from the point of fixation, and that acuity is relatively poor for a moving test object even when the eyes appear to be successfully pursuing it. It is noted that the interdependence of eye movements and visual acuity is obviously dependent on a servomechanism of incomparable efficiency and precision among human perceptual systems. M. L.

A66-13794

AFTERIMAGES.

John Lott Brown (Kansas State University of Agriculture and Science, Graduate School, Manhattan, Kan.).

IN: VISION AND VISUAL PERCEPTION.

Edited by C. H. Graham.

New York, John Wiley and Sons, Inc., 1965, p. 479-503. 120 refs. Navy-supported research.

Review of the available data on afterimages, defined as the visual effects that arise when the eye is illuminated, but which do not terminate immediately on cessation of stimulation, persisting, instead, for a definite time interval. It is noted that it is this persistence of vision that causes a moving light source to be seen as a line of light or a flashing light source to be seen as steady when the flash rate is sufficiently high. The evidences of past stimulation of the eye that continue for a relatively long time are identified as afterimages, which appear as a form of the original image and go through a wide range of qualitative changes. The characteristics of afterimages are described, including those of color and motion, and the details of the quantitative study of them are reviewed. The variables influencing the appearance of afterimages are considered, including duration of the primary stimulus, and the luminance of the projection and adjacent fields, area effects, and adaptation of the eye. Several theoretical interpretations of afterimage phenomena are discussed, but it is concluded that no one interpretation is adequate. M. L.

A66-13795

VISUAL SPACE PERCEPTION.

C. H. Graham (Columbia University, Dept. of Psychology, New York, N. Y.).

IN: VISION AND VISUAL PERCEPTION.

Edited by C. H. Graham.

New York, John Wiley and Sons, Inc., 1965, p. 504-547. 126 refs. Navy-supported research.

Comprehensive review of the data on the visual perception of space. It is noted that the specification of stimulus conditions for space perception has been formalized in terms of so-called cues, and that, in turn, these cues have been divided into two types - monocular, on the basis of vision with a single eye, and binocular, in which the coordinated activity of both eyes is involved. Seven monocular cues are discussed: relative size of an object and retinal image size; interposition (overlapping of images as related to distance); linear and aerial perspective; monocular movement parallax; light and shade; and accommodation. Convergence and stereoscopic vision are the two binocular cues considered. Discriminations of size, shape, and distance are compared. Monocular movement parallax is analyzed in detail as it applies to the situation in which a differential angular velocity is developed when a human being fixates on a moving object, or looks at a stationary object while moving, or turns his head while looking at objects that do not move. M. L.

A66-13796

VISUAL FORM PERCEPTION.

C. H. Graham (Columbia University, Dept. of Psychology, New York, N. Y.).

IN: VISION AND VISUAL PERCEPTION.

Edited by C. H. Graham.

New York, John Wiley and Sons, Inc., 1965, p. 548-574. 98 refs. Navy-supported research.

Comprehensive review of the data on the visual perception of form. It is noted that the study of form perception is concerned with the identification and specification of the conditions necessary for the naming, recognizing, denoting or discriminating of forms or their aspects. It is noted that many - but not all - discriminable aspects of form can be shown to depend on specific aspects of physical variables. Contour as a "property" of an object is considered, beginning with Mach's experiments. The effects of distance, contrast, area, and luminance, and the temporal factors affecting figural after-effects are discussed, and an account of the various theories that have been advanced is presented. Optical illusions, including parallel lines that do not appear to be parallel when crossed by radial lines (Hering's and Wundt's figures), are examined, and it is concluded that no firm theoretical basis has been found for such phenomena. M. L.

A66-13797**PERCEPTION OF MOVEMENT.**

C. H. Graham (Columbia University, Dept. of Psychology, New York, N. Y.).

IN: **VISION AND VISUAL PERCEPTION.**

Edited by C. H. Graham.

New York, John Wiley and Sons, Inc., 1965, p. 575-588. 59 refs. Navy-supported research.

Comprehensive review of the research to date on the perception of both real and apparent movement. It is emphasized that an adequate theory of movement must include both types of movement perception, but that, so far, little more can be done than systematize and summarize experimental results. For real movement, the absolute, differential, and displacement thresholds are discussed. It is noted that one chief difficulty in the experimental situation is that the subject may change the basis of his discrimination in different circumstances, making difficult or impossible the analysis of the cue variables. The approach of restricting variables to the irreducible minimum in order to be able to state the rule of discrimination as unequivocally as possible is favored over a statistical approach. The extensive work on apparent movement is summarized, including the important type of apparent movement observed when two adjacent lights are successively turned on and off. Depth cues and motion are discussed, especially in connection with Ames' trapezoid window.

M. L.

A66-13806 #**SPACE TRAVEL AND EXPLORATION. VI - EXOBIOLGY - MAN IN SPACE.**

Harrie Massey (London, University, University College, Dept. of Physics, London, England).

Contemporary Physics, vol. 6, June, 1965, p. 321-337.

Consideration of certain biological aspects of space travel and exploration. The possibilities of the existence of life in nonterrestrial environments are assessed on the basis of available knowledge. Various automatic techniques being developed for biological appraisal of planetary environments are described. The problem of sterilization of space vehicles to prevent contamination of nonterrestrial atmospheres is discussed. Certain difficulties arising in connection with manned space flight are considered, in particular, the special hazards arising from meteor impact, the presence of biologically active radiations, and the absence of gravity. The technical aspects of manned orbital flights already carried out are discussed, and some of the results obtained are summarized. Plans for a future lunar landing and more distant prospects of interplanetary journeys are discussed.

A. B. K.

A66-13897**SPACE RADIATION AND ITS BIOLOGICAL IMPACT [LA RADIATIVIDAD ESPACIAL Y SU IMPACTO BIOLOGICO].**

Ignacio Marco Moll.

Revista de Aeronáutica y Astronáutica, vol. 25, Oct. 1965,

p. 860-866. In Spanish.

General review of space radiations of both solar and cosmic origin, describing their biological effects and outlining methods of protecting astronauts from such radiations. Types of radiations and their characteristic techniques of radioactive dosimetry are briefly described. The short and long-term effects of the radiations on cell division, various organs, the nervous system, and blood are considered. Long-range results are thought to be mainly genetic, due to the effects of radiation on the DNA macromolecule. The chemical structure of DNA is described in some detail, and the mechanism by which radiation causes changes in it is discussed. It is considered that suitable shielding may adequately protect against cosmic rays.

F. R. L.

A66-14002**RHEOGRAPHIC REGIONAL METHOD FOR EVALUATION OF CEREBRAL AND OCULAR CIRCULATION IN CARDIAC AND CEREBROVASCULAR DISEASE.**

Stanley A. Ziemnowicz-Radvan (Georgetown University, Medical Center, Dept. of Neurology, Neurological Research Laboratory, Washington, D. C.).

(International Congress of Gerontology, 6th, Copenhagen, Denmark, Aug. 1963, Paper.)

American Geriatrics Society, Journal, vol. 13, Jan. 1965, p. 35-43, 25 refs.

Grant No. NsG-388.

Discussion concerning regional rheoencephalography (REG), a method for evaluating circulation in cardiac and cerebrovascular diseases. The technique consists of simultaneous rheographic tracings of symmetrical areas of blood supply in the anterior cerebral arteries, in medial cerebral arteries (proximal and distal segments), and in the left and right side of the vertebral-basilar system. The technique is described in detail and case abstracts are discussed. It is pointed out that the rheographic tracing of circulatory variations in both hemispheres of the brain has gained wider scope by the introduction of two new techniques: (1) regional rheoencephalography and (2) eye rheography. Hemispherical, standard rheographic recordings are supplemented by regional studies which supply information on flow conditions simultaneously in symmetrical areas of the anterior cerebral and medial cerebral arteries, in both sides of the vertebral-basilar system, and in both ophthalmic arteries. These data permit evaluation of the more localized and less extensive circulatory disturbances in the brain and eye. It is pointed out that simultaneous tracings of cardiac action (electrocardiogram), of cerebral pulsations (rheoencephalogram), and of ocular pulsations (rheophthalmogram) are valuable in the correlation and evaluation of cardiac and vascular factors in cerebral circulatory disturbances. It is also noted that rheographic studies extend the diagnostic and prognostic possibilities in cardiac and cerebrovascular diseases, and in these two diseases combined.

M. M.

A66-14063**INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS.**

Symposium sponsored by the International Astronautical Federation, International Academy of Astronautics, UNESCO, International Atomic Energy Agency, and the World Health Organization. Edited by Hilding Bjurst dt (Karolinska Institutet, Stockholm, Sweden).

New York, Springer-Verlag, 1965. 506 p.

\$23.75.

CONTENTS:

PREFACE. Hilding Bjurstedt (Karolinska Institutet, Stockholm, Sweden). 1 p.

OPENING REMARKS. Hilding Bjurstedt (Karolinska Institutet, Stockholm, Sweden), René Maheu (Organisation des Nations Unies pour l'Education, la Science et la Culture), E. A. Brun (Fédération Internationale d'Astronautique), and T. von Kármán, p. 1-6.

CONTRIBUTION OF THE U.S.S.R. TO THE EXPLORATION OF OUTER SPACE [VKLAD SSSR V IZUCHENIE KOSMICHESKOGO PROSTRANSTVA]. N. M. Sisakian (Akademiiia Nauk SSSR, Moscow, USSR), p. 7-21. In Russian (English Translation p. 22-34).

THE SELECTION OF ASTRONAUTS INCLUDING DYNAMIC TESTING. W. Randolph Lovelace, II, Robert Proper, Ulrich C. Luft, Albert H. Schwichtenberg, Thomas O. Nevison, Emanuel M. Roth, and G. Stanley Woodson (Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex.), p. 35-64. 34 refs. [See A66-14064 04-05]

NEUROPHYSIOLOGICAL ASPECTS OF MANNED EXTRA-TERRESTRIAL SPACE FLIGHT. W. K. Stewart (Royal Air Force, Farnborough, Hants., England), p. 65-76. [See A66-14065 04-04]

PHYSICAL CONDITIONS OF SPACEFLIGHT AND THEIR BIOLOGICAL CHARACTERISTICS [FIZICHESKIE USLOVIA KOSMICHESKOGO POLETA I IKH BIOLOGICHESKAIA KHARAKTERISTIKA]. Iu M. Volynkin and P. P. Saksonov (Akademiiia Nauk SSSR, Moscow, USSR), p. 77-91. 35 refs. In Russian (English Translation p. 92-104). [See A66-14066 04-04]

TOLERANCE TO THE COMBINED EFFECTS OF COLD AND OF ABNORMAL ATMOSPHERE. Radoslav K. Andjus (Belgrade, University, Belgrade, Yugoslavia), p. 105-131. 29 refs. [See A66-14067 04-04]

THERMAL HOMOIOSTASIS UNDER HYPOXIA IN MAN. T. P. K. Lim and U. C. Luft (Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex.), p. 132-145. 12 refs. [See A66-14068 04-04]

THE FUTURE OF ENVIRONMENTAL BIOLOGY AND THE CONTRIBUTION OF SPACE RESEARCH. O. E. Reynolds (NASA, Washington, D.C.), p. 146-152. [See A66-14069 04-05]

HEAT LOSS IN SPACE. D. McK. Kerslake (Royal Air Force, Farnborough, Hants., England), p. 153-159. [See A66-14070 04-05]

PHYSIOLOGICAL PROBLEMS OF WEIGHTLESSNESS AND BASIC RESEARCH. Otto H. Gauer (Berlin, Free University, Berlin, West Germany), p. 160-168. 12 refs. [See A66-14071 04-04]

AVOIDING PHYSICAL ATROPHY IN PROTRACTED WEIGHTLESSNESS. Erich A. Müller (Max-Planck-Institut für Arbeitsphysiologie, Dortmund, West Germany), p. 169-178. [See A66-14072 04-04]

OBSERVATIONS ON HEART RATES AND CARDIODYNAMICS DURING PROLONGED WEIGHTLESSNESS SIMULATED BY IMMERSION METHOD. Julian Walawski (Medical Academy, Warsaw, Poland) and Zbigniew Kaleta (Military Institute of Aviation Medicine, Warsaw, Poland), p. 179-185. 9 refs. [See A66-14073 04-04]

THE INFLUENCE OF THE DYNAMIC ENVIRONMENT ON MAN IN SPACE FLIGHT. Edwin P. Hiatt (Ohio State University, Columbus, Ohio), p. 186-200. 26 refs. [See A66-14074 04-04]

SOME ASPECTS OF THE MECHANICS OF BREATHING DURING TRANSVERSE ACCELERATION [ASPECTS DE LA MECANIQUE VENTILATOIRE AU COURS DES ACCELERATIONS TRANSVERSES]. Ch. Jacquemin and P. Varene (Centre d'Essais en Vol, Brétigny-sur-Orge, Seine-et-Oise, France), p. 201-217. 49 refs. In French (Discussion in English). [See A66-14075 04-04]

BIOLOGICAL AND PHYSIOLOGICAL INVESTIGATIONS IN ROCKETS AND ARTIFICIAL SATELLITES [BIOLOGICHESKIE I FIZIOLOGICHESKIE ISSLEDOVANIYA PRI POLETAKH NA RAKETAKH I ISKUSSTVENNYKH SPUTNIKAKH ZEMLI]. O. G. Gzenko, V. N. Chernigovskii, and V. I. Iazdovskii (Akademiia Nauk SSSR, Moscow, USSR), p. 218-229. In Russian (English Translation p. 230-239). [See A66-14076 04-04]

RADIOBIOLOGICAL PROBLEMS OF SPACEFLIGHTS [RADIOBIOLOGICHESKIE PROBLEMY KOSMICHESKIKH POLETOV]. G. M. Frank, P. P. Saksenov, V. V. Antipov, and N. N. Dobrov, p. 240-254. 21 refs. In Russian (English Translation p. 254-266). [See A66-14077 04-04]

BIOLOGICAL HAZARDS OF RADIATION APPLICABLE TO MAN IN SPACE. G. J. Neary and E. V. Hulse (Medical Research Council, Harwell, England), p. 267-284. 50 refs. [See A66-14078 04-04]

SOME PRINCIPLES OF THE FORMATION OF ARTIFICIAL ENVIRONMENTS IN MANNED SPACESHIPS [NEKOTORYE PRINTSIPY FORMIROVANIYA ISKUSSTVENNOI SREDY OBITANIYA V KABINAKH KOSMICHESKIKH KORABLEI]. A. M. Genin, O. G. Gzenko, and N. P. Sergeev (Akademiia Nauk SSSR, Moscow, USSR), p. 285-294. 5 refs. In Russian (English Translation p. 295-301). [See A66-14079 04-05]

SOME CHARACTERISTICS OF STRESS REACTIONS [QUELQUES DETAILS GENERAUX DES REACTIONS STRESSANTES]. Milan Morávek (Université Karlovy, Prague, Czechoslovakia), p. 302-307. In French (Discussion in English). [See A66-14080 04-04]

EVALUATION OF STRESS BY QUANTITATIVE HORMONE STUDIES. U. S. v. Euler (Karolinska Institutet, Stockholm, Sweden), p. 308-326. 29 refs. [See A66-14081 04-05]

PREDICTING THE SUSCEPTIBILITY TO VESTIBULAR SICKNESS UNDER CONDITIONS OF WEIGHTLESSNESS. Ashton Graybiel (U.S. Naval School of Aviation Medicine, Pensacola, Fla.), p. 327-344. 56 refs. [See A66-14082 04-04]

ELECTROENCEPHALOGRAPHIC RESPONSES TO SHORT PERIODS OF WEIGHTLESSNESS [REACTIONS ELECTRIQUES CEREBRALES A DE COURTES PERIODES DE NON GRAVITE]. R. Grandpierre, R. Angiboust, R. Brice, B. Cailler, G. Chatelier, and J. Rozier (Centre d'Enseignement et de Recherches de Médecine Aéronautique, Paris, France), p. 345-351. In French (Discussion in English). [See A66-14083 04-04]

PROBLEMS CONCERNING THE INTERPLAY OF PHYSIOLOGICAL SENSING MECHANISMS (ANALYZERS) DURING SPACEFLIGHT [PROBLEMA VZAIMODEISTVIA ANALIZATOROV PRIMENITEL'NO K USLOVIAM KOSMICHESKOGO POLETA]. M. D. Emel'ianov, A. G. Kuznetsov, E. M. Iuganov, and A. A. Giurdzhan (Akademiia Nauk SSSR, Moscow, USSR), p. 352-358. 6 refs. In Russian (English Translation p. 359-365). [See A66-14084 04-04]

PROBLEMS OF ENGINEERING PSYCHOLOGY AS APPLIED TO CONDITIONS OF SPACEFLIGHT [PROBLEMY INZHENERNOI PSIKHOLOGII PRIMENITEL'NO K USLOVIAM KOSMICHESKOGO POLETA]. I. T. Akulinichev and V. G. Denisov (Akademiia Nauk SSSR, Moscow, USSR), p. 366-376; Discussion, p. 376, 377. 6 refs. In Russian (Discussion in English). [See A66-14085 04-05]

ACCURACY OF ORIENTATION IN SPACE UNDER INCREASED ACCELERATION IN THE ABSENCE OF VISUAL REFERENCE FRAME. H. Kolder (Emory University, School of Medicine, Atlanta, Ga.) and G. Schubert, p. 378-394. 25 refs. [See A66-14086 04-04]

METHODS FOR SOMATIC CLASSIFICATION OF PILOTS ACCORDING TO STATUS OF FUNCTIONAL MUSCULAR, CIRCULATORY AND RESPIRATORY CAPACITIES, AND POSSIBILITIES OF FURTHER DEVELOPMENT DURING TRAINING. Gunnar Ström (Uppsala, Royal University, Hospital, Uppsala, Sweden), p. 395-405. 43 refs. [See A66-14087 04-05]

MONITORING AND PREDICTION OF NERVOUS FUNCTIONS IN SPACE. W. Ross Adey (California, University, Los Angeles, Calif.) and Don D. Flickinger, p. 406-424. 21 refs. [See A66-14088 04-04]

MEANS AND METHODS OF BIOMEDICAL EXPERIMENTS IN SPACEFLIGHT [METODY I SREDSTVA MEDITSINSKIKH I BIOLOGICHESKIKH ISSLEDOVANIY V USLOVIYAKH KOSMICHESKOGO POLETA]. I. T. Akulinichev, R. M. Baevskii, and O. G. Gzenko (Akademiia Nauk SSSR, Moscow, USSR), p. 425-440. 6 refs. In Russian (English Translation p. 440-451). [See A66-14089 04-04]

BIOMEDICAL DATA COLLECTION FOR SPACE PROGRAMS. Stanley C. White (NASA, Manned Spacecraft Center, Tex.), p. 452-462. 5 refs. [See A66-14090 04-05]

SOME PROBLEMS OF PHYSIOLOGICAL MONITORING. P. Howard (Royal Air Force, Farnborough, Hants., England), p. 463-472. [See A66-14091 04-05]

MAN OR AUTOMATION IN SPACE? K. Steinbuch (Institute of Technology, Karlsruhe, West Germany), p. 473-492. 30 refs. [See A66-14092 04-05]

DATA SENSORS AND INFORMATION ACQUISITION. A. M. Mayo, C. L. Buddecke, and G. R. Tenery (Ling-Temco-Vought, Inc., Dallas, Tex.), p. 493-506. 10 refs. [See A66-14093 04-05]

A66-14064

THE SELECTION OF ASTRONAUTS INCLUDING DYNAMIC TESTING. W. Randolph Lovelace, II, Robert Proper (Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex.), Ulrich C. Luft (Lovelace Foundation for Medical Education and Research, Dept. of Physiology, Albuquerque, N. Mex.), Albert H. Schwichtenberg, Thomas O. Nevison, Emanuel M. Roth (Lovelace Foundation for Medical Education and Research, Dept. of Aerospace Medicine and Bioastronautics, Albuquerque, N. Mex.), and G. Stanley Woodson (Lovelace Foundation for Medical Education and of adrenaline in healthy subjects causes discomfort and tenseness in the majority of cases. Proficiency seems to be increased by adrenaline during the performance of certain tasks, while a tendency in the opposite direction is noted in other tests. Habituation to certain stress-inducing situations tends to decrease the adrenaline excretion. Attempts to correlate the catecholamine excretion pattern and personality traits seem to indicate that such studies may be of value for the characterization of individuality types and as a means of predicting their reaction pattern to stress. Quantitative evaluation of stress by the catecholamine excretion tests may also provide some information on mental or bodily alterations which may affect performance. (Author)

A66-14065

NEUROPHYSIOLOGICAL ASPECTS OF MANNED EXTRATERRESTRIAL SPACE FLIGHT.

W. K. Stewart (Royal Air Force, Institute of Aviation Medicine, Farnborough, Hants., England).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 65-75; Discussion, p. 75, 76.

Formulation of techniques for orbital laboratories to aid in the further investigation of the abnormalities which man may experience in spaceflight over the next 10 to 20 yr. It is shown that neurophysiology can make definite contributions in specific areas such as the modification of motor responses by sensory inputs from angular accelerations and the study of environmental variations which affect cortical responses such as accelerations, vibration, and radiation. R.A.F.

A66-14066

PHYSICAL CONDITIONS OF SPACEFLIGHT AND THEIR BIOLOGICAL CHARACTERISTICS [FIZICHESKIE USLOVIA KOSMICHESKOGO POLETA I IKH BIOLOGICHESKAYA KHARAKTERISTIKA]. Ju. M. Volynkin and P. P. Saksonov (Akademiia Nauk SSSR, Moscow, USSR).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, IST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04] Edited by Hilding Bjurstedt. New York, Springer-Verlag, 1965, p. 77-91; Discussion, p. 103-104. 35 refs. In Russian (English Translation p. 92-104).

Since the late forties, flight conditions in outer space have been studied by direct methods, using geophysical rockets and artificial earth satellites. During this time data have been obtained on the physical state of the gaseous environment, temperature conditions, some information on meteorite material, cosmic radiation and other types of radiation; data were also obtained on flight conditions aboard rocket vehicles. Biological investigation of outer space must be based on the fullest and most detailed study of all factors which may have a detrimental effect on the living organism. In the exploration of space, the influence of a whole complex of flight factors has to be taken into account. Roughly speaking, these factors may be divided into three groups: the first group includes the extremely low barometric pressure, the change in gaseous composition in the absence of molecular oxygen, ionizing radiations (cosmic, ultraviolet and corpuscular radiation), unfavorable temperature conditions, presence of meteoric material, and so on. The second group of factors relating to rocket flight include: noise, vibration, acceleration and weightlessness. The third consists of factors governing living conditions in the space capsule (artificial atmosphere, restricted movement, feeding problems, etc.). Particularly serious attention should be paid at the present time to the study of factors the action of which is prolonged and continuous. First among these are weightlessness and cosmic radiation. Investigation of the effect of these factors on the organism is complicated by the practical impossibility of reproducing them under laboratory conditions. This makes it all the more essential to devote great attention to research with animals on experimental flights, which should take the form of biological reconnaissance of outer space. The complexity and scope of the problem that space biology and medicine have to solve require the united efforts of scientists from many countries for the joint use of space for peaceful purposes only. The paper outlines the general characteristics of the main factors as evidenced by their biological effects. (Author)

A66-14067

TOLERANCE TO THE COMBINED EFFECTS OF COLD AND OF ABNORMAL ATMOSPHERE.

Radoslav K. Andjus (Belgrade, University, Institute of Physiology, Belgrade, Yugoslavia).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, IST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04] Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 105-130; Discussion, p. 131. 29 refs.

The following types of relationship between the effects of cold (external and internal) and different forms of anoxia will be discussed on the basis of data from animal experiments, especially from the point of view of tolerance limits and with some reference to the underlying mechanisms. Resistance to external (environmental) cold is impaired by hypoxia (and hypercapnia) which interferes with thermoregulation and renders difficult the maintenance of thermal homeostasis. The critical tension of oxygen (below which oxygen consumption starts to decrease) can be taken as a measure of the resistance of the body thermostat to the hypoxic load. It is shown that this parameter is not necessarily related, as often assumed, to the overall rate of O_2 consumption (thermogenesis), but only to complementary heat production, i.e., that facultative part of total thermogenesis which is under the control of thermoregulatory centres. Hypoxia may act as a hypothermia-inducing agent in a cold environment which by itself can be tolerated without change of body temperature. On the other hand, even such changes of ambient atmosphere, which at higher environmental temperatures can be

compensated by physiological regulatory mechanisms, may induce in the cold serious disturbances of thermal homeostasis. From the point of view of homeostatic resistance, therefore, a mutual potentiation of the effects of cold and anoxia may be described. From the survival point of view, however, internal cold (hypothermia), induced by anoxia in a cold environment, may have a protective value; the fall of body temperature renders the homeotherm capable of surviving under anoxic conditions which would be lethal at normal body temperature. In other words, failure of the body thermostat to resist anoxia may be of survival value under severe anoxic conditions. This is illustrated by quantitative data on the relationship between critical and lethal oxygen tensions in different thermal environments; and conditions are described under which a decreased resistance to anoxia, as far as maintenance of thermal homeostasis is concerned, causes an increased tolerance to anoxia evaluated by survival criteria. The relationship between body temperature and tolerance to hypoxia will be analyzed with special emphasis on the relative independence of the protective effects of hypothermia from its effects on the rate of oxygen uptake. Finally, although it can protect against anoxia, internal cold (hypothermia), below a given level of body temperature, causes anoxia at the tissue level in spite of a normal or even increased oxygen tension in the ambient air. In the extreme, hypothermia through its basic inhibitory effect on life processes, causes the cessation of oxygen supply and transport (respiratory and circulatory arrest). At the same time, however, through its protective effect, it renders the organism capable of tolerating relatively long periods of such "suspended animation" (or "clinical death"). Time and temperature limits of suspended animation will be defined and correlated with data on brain metabolism. (Author)

A66-14068

THERMAL HOMOIOSTASIS UNDER HYPOXIA IN MAN.

T. P. K. Lim and U. C. Luft (Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex.).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, IST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04] Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 132-145; Discussion, p. 145. 12 refs.

The complex regulatory mechanisms involved in maintaining optimal thermal conditions for the vital functions in the homoiothermic organism provide functional integrity over a limited range of variation in the temperature of the environment. These adaptations to thermal stress are mediated by humoral and neural pathways which are known to be susceptible to oxygen deprivation. Moreover, certain physiological responses elicited by heat or cold may be in conflict with others engaged to counteract hypoxia and vice versa. Human subjects were exposed to cold (4°C RH 30%), warm (40.5°C RH 80%) and neutral (27°C RH 30%) environmental conditions for two hours while breathing gas mixtures simulating an altitude of 6000 m (inspired P_{O_2} : 65 mm Hg and for a control period of the same duration breathing air. In the cold, no difference was observed in the course of skin temperature between the hypoxic and eupoxic tests. Core temperatures were maintained constant in the presence of vigorous shivering whereby metabolic rate was increased 2 to 3 fold. In the warm environment, the core temperatures (rectal and gastric) were consistently higher with oxygen lack than in the controls, but the rate of increase in temperature was the same. At the end of the tests rectal temperature was an average 39°C. The effects of combined thermal and hypoxic stress on cardiovascular and respiratory activity appeared to be additive. Subsequently, similar experiments were performed on lightly anesthetized dogs where hypoxia of a more severe degree (inspired P_{O_2} : 52, 41 and 29 mm Hg) was employed. In these animals hypoxia invariably inhibited or entirely suppressed shivering and in the cold they suffered a more rapid fall of mean body temperature under hypoxia than on air. Experiments in which a normal partial pressure of CO_2 was maintained by partial rebreathing suggest that hypocapnia may contribute to the suppression of shivering in the cold. During the exposure to heat there was a marked facilitation of panting under hypoxia, giving rise to extreme hyperpnea with hypocapnia. The animals were sacrificed in hypoxia by progressive rebreathing to determine the critical oxygen tension. Under heat stress the animals succumbed at significantly higher oxygen tensions than in the cold or neutral environment. This may be due to the compound stress of heat, hypoxia and hypocapnia. (Author)

A66-14069

THE FUTURE OF ENVIRONMENTAL BIOLOGY AND THE CONTRIBUTION OF SPACE RESEARCH.

O. E. Reynolds (NASA, Washington, D. C.).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 146-151; Discussion, N. M. Sisakian (Academy of Sciences, Moscow, USSR), p. 152; Author's Reply, p. 152.

Study of living organisms removed from terrestrial influences, such as gravitational and magnetic fields and diurnal and other periodic influences. For the first time, the role of these environmental conditions in the evolution, physiology and behavior of earth organisms can be evaluated by a program of research. Some of the prospects for such a program are discussed. M. F.

A66-14070

HEAT LOSS IN SPACE.

D. McK. Kerslake (Royal Air Force, Institute of Aviation Medicine, Farnborough, Hants., England).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 153-159; Discussion, p. 159.

The problem of temperature regulation is most acute for the astronaut when he is outside his vehicle and therefore disconnected from the relatively bulky machinery which normally attends to his thermal needs. It is necessary to arrange that metabolic heat is transported from the skin surface to some device which will absorb it. Two heat exchangers are therefore required, one at the skin surface and one in the thermal pack, and the transport of heat from skin to absorbent must be effected optimally in terms of the weight and bulk of apparatus necessary. The properties of an existing air ventilated clothing system have been investigated using a heated dummy whose regional "tissue conductance" has been matched to that of a thermally comfortable human subject. It was found that if the complex distributions of air flow and skin temperature were ignored, the results could be expressed in terms of the performance characteristics of a simple heat exchanger having its plate surface temperature equal to the mean skin temperature. The relation between mass flow and heat exchange coefficient at the skin surface was such as to suggest that suitable characteristics could be obtained by introducing air at the four extremities and removing it at the waist. The power required to ventilate existing suits was found to be many times the theoretical minimum, and considerable improvement in this respect appeared possible.

(Author)

A66-14071

PHYSIOLOGICAL PROBLEMS OF WEIGHTLESSNESS AND BASIC RESEARCH.

Otto H. Gauer (Berlin, Free University, Physiological Institute, Berlin, West Germany).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 160-168; Discussion, p. 168. 12 refs.

Some predictions on the hazards of the weightless conditions which were made jointly with Haber twelve years ago are reviewed in the light of today's experience and recent advances in basic research. While it is now obvious that weightlessness does not produce overt short-term disturbances of the circulation or respiration, questions pertaining to the possible incidence of motion sickness and to chronic effects on the circulation are still open for discussion. An outline of recent work on the circulatory basis of fluid volume control through intravascular receptors is presented. Originally it was established that the state of filling of the intrathoracic vascular organs has a profound reflex effect on the diuretic response of the kidney mediated through changes of renal hemodynamics, ADH and corticoids. More recent work indicates that by comparison of afferent impulses from many sites of the body with

effluent orders to the heart and circulation the CNS performs an evaluation of the "competence" of the heart to deal with the load imposed on the circulation during a day. Loss of "competence" is accompanied by fluid retention, gain by diuresis. The application of this principle to the state of weightlessness as far as it could be produced in immersion experiments permits the explanation of observed changes in fluid and mineral metabolism which can in turn be related to current concepts of blood volume control.

(Author)

A66-14072

AVOIDING PHYSICAL ATROPHY IN PROTRACTED WEIGHTLESSNESS.

Erich A. Müller (Max-Planck-Institut für Arbeitsphysiologie, Dortmund, West Germany).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 169-178.

Gravity is only one possibility among others to build up a counterforce for the development of muscular tension and for the performance of muscular work. Muscular tension can be likewise developed under weightless conditions between fixed points inside or outside the body. Work can be done as well against one fixed and one elastic point or against friction. Thus even the smallest room will allow the arrangement of a sufficient training system. It has been shown recently that one daily maximum contraction of 5 sec is enough to keep a muscle strong and enduring enough for static work. In order to maintain a high capability for dynamic work, muscles have to work daily for about 1/2 hour as hard as possible. To keep the heart fit and the hemoglobin content of the blood high for short extreme stress situations, it is sufficient to raise the pulse rate once a day up to 100-200 beats/min for about 30 sec by exhausting work. This is usually achieved by standing-running under the influence of gravity. Under weightless conditions cranking seems to be the best solution for physiological and technical reasons.

(Author)

A66-14073

OBSERVATIONS ON HEART RATES AND CARDIODYNAMICS DURING PROLONGED WEIGHTLESSNESS SIMULATED BY IMMERSION METHOD.

Julian Walawski (Medical Academy, Dept. of Pathophysiology, Warsaw, Poland) and Zbigniew Kaleta (Military Institute of Aviation Medicine, Warsaw, Poland).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 179-185; Discussion, p. 185. 9 refs.

Among the numerous methods proposed for the investigation of physiological effects of weightlessness in laboratory conditions the immersion method seems to be most advantageous. Although no true state of weightlessness is attained, nevertheless long-term observations in subgravity are made possible in this way. Certain human experiments indicate that in such conditions slight disturbances in ECG and blood pressure may become manifest. These results were not confirmed by other authors. The aim of the present work was to investigate the effect of long-term weightlessness simulated by immersion on ECG and blood pressure in rabbits. The animals were under urethane narcosis to eliminate the influence of the central nervous system. The experimental animals were submerged in 1% solution of NaCl at temperatures ranging from 34 to 35°C. Respiration was made possible by tracheotomy tube connected with respiratory valve. Blood pressure from the carotid artery was registered kymographically using a mercury manometer. ECG electrodes were introduced under the skin of the fore and hind extremities. All incisions were sutured carefully to avoid contact of electrodes with the immersion fluid. The immersion period ranged from 12 to 24 hours. No apparent changes were seen in the electrocardiograms. The heart rate registered hourly was about

230 per minute and did not change during the whole observation period. No significant changes in ECG were observed. The conduction times remained in the normal range for rabbits. In some instances a slight depression of QRS complexes was noted. Sometimes QRS complexes were elevated even in final stages of the experiments. The arterial blood pressure remained during the whole experiment nearly at a constant level showing only slight deviations. The above results indicate that 24 hours weightlessness simulated by the immersion method does not induce any significant circulatory disturbances and is fairly well tolerated by rabbits. Supplementary experiments now under way using further physiological tests seem to confirm the foregoing conclusions. (Author)

A66-14074**THE INFLUENCE OF THE DYNAMIC ENVIRONMENT ON MAN IN SPACEFLIGHT.**

Edwin P. Hiatt (Ohio State University, Dept. of Physiology, Columbus, Ohio).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 186-199; Discussion, p. 200. 26 refs.

Possible stresses in spaceflight include a broad mechanical spectrum. In this paper most of the emphasis is placed on transient and prolonged linear accelerations though it is recognized that vibrations and rotations could become important. In preparing man to be exposed to the prolonged acceleration of spaceflight it was realized that his body orientation in the force field was of great importance if he was to maintain his capacity for observing and ability to perform tasks. By arranging for these forces to be applied across his body (transversely), instead of along the length of his body, circulatory difficulties can be reduced and his tolerance increased. However, at the higher accelerations tolerable in the transverse position other difficulties appear most by involving respiration. Not only is it more difficult to inspire air, but, because of a displacement of the blood perfusing the lungs, there is imperfect exchange between pulmonary air and blood. This physiological pulmonary shunt results in a reduction in the oxygen content of arterial blood. Furthermore, the inertial forces due to acceleration may cause congestion of some portions of the lungs with over-dilation of other portions with danger of atelectasis and mediastinal emphysema. It is pointed out that neither positive pressure respiration, the breathing of high oxygen pressures nor immersion in water can completely protect against these changes. The status of our knowledge of the tolerance of man to abrupt transient accelerations is reviewed with some discussion of the difficulties of investigation in this field. Though the orbital flights made to date have tended to reassure us that man can tolerate the dynamic environment of spaceflight, there are possible deviations from normal flight plans which could involve dangerous forces. Some of these are described. (Author)

A66-14075

SOME ASPECTS OF THE MECHANICS OF BREATHING DURING TRANSVERSE ACCELERATION [ASPECTS DE LA MECANIQUE VENTILATOIRE AU COURS DES ACCELERATIONS TRANSVERSEES]. Ch. Jacquemin and P. Varene (Centre d'Essais en Vol, Laboratoire Médico-Physiologique, Brétigny-sur-Orge, Seine-et-Oise, France).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 201-216; Discussion, p. 217. 49 refs. In French (Discussion in English).

The purpose of the paper is to attempt to sum up the experiments and measurements made on man during transverse acceleration (+G_x). The results are discussed in the light of the most widely accepted data and theories relative to the mechanics of breathing. Clinical exploration of the respiratory function allows us to group all the results, apart from the arterial desaturation, in a restrictive respiratory syndrome, based on a reduction of the vital capacity, with the maintenance of the MEVS/VS (maximum expiratory volume per second/vital capacity) ratio and a decrease in the maximum breathing capacity per minute (MBC). However, a thorough analy-

sis will have to be made of the physiological mechanics of this syndrome. The difficulty of making an accurate estimate of intrathoracic pressures (oesophageal pressures) makes such analysis a tricky problem. Failing this, other methods enable us to confirm that it is definitely a restrictive syndrome that develops in such circumstances and not an obstructive syndrome. Forces of inertia cause no change - either in the dynamic work of breathing during artificial respiration (less than or equal to 4G) - or in air way resistance measured by the interrupter method (less than or equal to 7G). However, these are overall results and do not allow us to dissociate the regional differences (posterior atelectasis) revealed by radiography. Assuming a similarity of effects between transverse acceleration and negative pressure breathing one can then make use of theoretical diagrams. These are of assistance in understanding the mechanisms, but mainly serve to emphasize the inadequacy of the data so far collected. In particular, anomalies which are difficult to explain are to be observed on these diagrams in the curves for total respiratory compliance, measured by the relaxation method. Finally, attention is drawn to the lack of information on the behavior of the thoracoabdominal respiratory motor system. (Author)

A66-14076

BIOLOGICAL AND PHYSIOLOGICAL INVESTIGATIONS IN ROCKETS AND ARTIFICIAL SATELLITES [BIOLOGICHESKIE I FIZIOLOGICHESKIE ISSLEDOVANIYA PRI POLETAKH NA RAKETAKH I ISSUSTVENNYKH SPUTNIKAKH ZEMLI].

O. G. Gazenko, V. N. Chernigovskii, and V. I. Iazdovskii (Akademiia Nauk SSSR, Moscow, USSR).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 218-229; Discussion, p. 238, 239. In Russian (English Translation p. 230-237).

A large number of biological experiments has been carried out in the Soviet Union to determine the effects of spaceflight factors on living organisms and to devise the systems required to preserve vital activity intact during rocket flight. The paper presents the results of biological experiments conducted with the second, third, fourth and fifth Sputniks, and the scientific investigations made during the manned flights of the Vostok spaceships. The nonpathological character of the physiological reactions to stress factors during flight is stressed. During the postflight period, no deterioration in the health of any of the cosmonauts or the experimental animals was observed. At the same time, certain peculiarities which appeared during analysis of the physiological reactions and of a whole range of biological data, require further investigation. The most important lines for future research are: to study the influence of prolonged weightlessness, the biological effects of cosmic radiation, the effects of G-stress after a period of weightlessness and, of course, to analyze the influence on the organism of the entire complex of spaceflight factors, including the emotional state. The experience gained allows us to make a broader approach to the problem of man's medical protection during spaceflight, and to indicate more adequate ways and means of guaranteeing his safety. (Author)

A66-14077

RADIOBIOLOGICAL PROBLEMS OF SPACEFLIGHTS [RADIOBIOLOGICHESKIE PROBLEMY KOSMICHESKIKH POLETOV].

G. M. Frank, P. P. Saksonov, V. V. Antipov, and N. N. Dobrov (Akademiia Nauk SSSR, Moscow, USSR)

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 240-254; Discussion, p. 265, 266. 21 refs. In Russian (English Translation p. 254-264).

The biological effects of cosmic radiation were studied both under laboratory conditions with models reproducing the different components of cosmic radiation, and under flight conditions on various types of craft (high-altitude balloons, rockets, satellites and spacecraft). Experiments were conducted on a variety of biological subjects, using different research methods. Analysis of the material showed that flight of short duration on orbits below the radiation belts, in the absence of intense solar activity, present

no radiation hazard. This was confirmed by the flights of Soviet and American cosmonauts. For long flights on orbits passing through the radiation belts near the earth, particularly during outbursts of solar activity generating protons, cosmic radiation will be one of the major obstacles to man's conquest of space. In this connection the most urgent problems are as follows: to determine the relative biological efficiency, and to study the biophysical characteristics, of the action of the different components of cosmic radiation; to determine the specific role of cosmic radiation in the biological effects of the complex of space flight factors; to work out principles and methods for the physical and pharmacological protection of man and the whole biocomplex; to explore the genetic dangers of spaceflight; to study the biological effects of the ionizing radiation due to the operation of atomic power units, against the background of the effects of the various space flight factors; to devise methods of physical and biological dosimetry; to establish basic principles for forecasting radiation under the actual conditions of spaceflight (forecasting solar flares, measuring levels of cosmic radiation in the upper layers of the atmosphere, etc.). The criterion for radiation safety can be expressed as a permissible radiation dose, established in the light of the fact that cosmic radiation occurs in a complex, or against a background, of other flight factors, which probably alter the effectiveness of ionizing radiation. If nuclear power sources are used, the total permissible dose will consist of the dose produced by the action of cosmic radiation and the dose released by the nuclear reactor. It is assumed that for a spaceflight lasting for a period of several days up to a year, the maximum permissible dose rate can be set at 25 rem, and for a flight of several years at 50 rem per year. In working out the actual measures for pharmacological and biological protection a considerably greater maximum permissible dose may, of course, be taken. (Author)

A66-14078

BIOLOGICAL HAZARDS OF RADIATION APPLICABLE TO MAN IN SPACE.

G. J. Neary and E. V. Hulse (Medical Research Council, Radiobiological Research Unit, Harwell, England).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]
 Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 267-283; Discussion, p. 283, 284. 50 refs.

The wide range of possible radiation exposure of man in space is noted, and the biological effects of radiation exposure in general are summarized. It appears that among the early effects, the prodromal symptoms such as nausea and vomiting may be the limiting factors for an astronaut. The concept of recovery from radiation injury is discussed and it is concluded that there is no simple correlation between degree of recovery from early effects and the risk of delayed effects. Detailed data for recovery from early effects is available only for gross injury. The concept of relative biological effectiveness (RBE) of different types of ionizing particle is discussed. Although RBE varies with dose and dose rate, it probably assumes a constant value for any one effect at low doses or dose rates. The best estimate of the values for man are those given by the International Commission on Radiological Protection for use in the range of permissible exposures. Data relevant to high energy protons are given. The special problem of very heavy particles in space is noted and it is concluded that they are unlikely to be a limiting hazard. The delayed effects of radiation are reviewed. Chemical preprotection of an astronaut appears to be undesirable. Treatment of radiation injury is summarized. It is concluded that both on general grounds and avoidance of early adverse reactions in flight, the permissible and emergency exposure levels suggested by the International Commission on Radiological Protection for occupationally exposed persons offer a reasonable guide for planning exposure to man in space. (Author)

A66-14079

SOME PRINCIPLES OF THE FORMATION OF ARTIFICIAL ENVIRONMENTS IN MANNED SPACESHIPS [NEKOTORYE PRINTSIPY FORMIROVANIIA ISKUSSTVENNOI SREDY OBITANIYA V KABINAKH KOSMICHESKIKH KORABLEI].

A. M. Genin, O. G. Gizenko, and N. P. Sergeev (Akademiia Nauk SSSR, Moscow, USSR).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]
 Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 285-294. 5 refs. In Russian (English Translation. p. 295-301).

The problem of creating an artificial environment suitable for man is not altogether new. This problem has been, and is now being, solved in connection with housing and industrial premises, means of transport, defensive installations, the cabins of balloons and aeroplanes, submarines, and so on. As far as space capsules are concerned, the problem of creating a tolerable environment has its own specific features which are determined by the conditions peculiar to spaceflight. The following are of great importance: The fact that there are no materials or substances in the external surroundings which could be used to form an artificial environment in the space capsule; man's continuous occupation of the capsule's artificial environment for a lengthy period; the strict limitations on power supplies, weight and dimensions of the cabin and all its parts; the practical impossibility of securing complete protection from certain cosmic flight factors (primary cosmic radiation, etc.). The conditions peculiar to space travel impose a certain degree of compromise between the need to create a comfortable environment for members of the crew and the technical possibilities of achieving it. At the present stage of astronautical development, it is hardly appropriate to draw up strict limits for permissible variations in the parameters of the artificial environment, irrespective of the kind of spaceship that has been evolved. The need is beginning to be felt to establish positive standards, closely coordinated with the preparation of measures to increase man's resistance to the effects of certain flight factors, and with the selection and training of cosmonauts. However, certain principles of standardization, even though framed in the most general terms, should be laid down immediately. The efficiency of the systems used to regenerate and condition supplies of air, food and water is the decisive factor in maintaining optimum conditions in the artificial environment of the space capsule. The paper describes in broad outline theoretically feasible systems for preserving human life, on the basis of physical, chemical and biological processes, and makes a comparative appraisal of them. (Author)

A66-14080

SOME CHARACTERISTICS OF STRESS REACTIONS [QUELQUES DETAILS GENERAUX DES REACTIONS STRESSANTES].

Milan Morávek (Univerzita Karlovy, Institut de Médecine Aéronautique, Prague, Czechoslovakia).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]
 Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 302-307; Discussion, p. 307. In French (Discussion in English).

In recent years we have studied some aspects of the influences of certain strain factors on the human organism. All these factors may be regarded as stresses. However, the fact that we use the term "stress" does not mean that we agree with all of Selye's conclusions and opinions. The term "stress" is therefore used to cover strain in general and does not imply the highly specific types of strain by which Selye qualifies the term in his works. Our study covered the following influences: (1) a 100-km march lasting three days (100 subjects); (2) sleep deprivation for 48 to 105 hours (7 subjects); (3) a short period of sleep deprivation (up to 48 hours) under strong emotional strain (10 subjects); (4) a 5-day starvation (8 subjects); (5) oxygen starvation induced by simulating an altitude of 5000 to 8000 meters (700 subjects). The paper is almost entirely concerned with the changes occurring in the higher functions of the central nervous system. Here are some of the main conclusions reached: (a) the changes caused by the strains in question are generally specific in character; (b) reactions vary considerably from individual to individual, the difference in many cases being greater than between the same individual's reactions to various stresses; (c) the changes provoked by strain of longer duration do not follow a simple linear course; the intensity of changes is rhythmic and the fluctuations appear to be influenced by an as yet unidentified rhythm; (d) all changes occurring in higher nervous activity under

stress are identical in form with those observed in neurotics: (e) the most typical feature is a disturbance in internal inhibition (as reported by Pavlov); (f) there is no simple correlation between biochemical reactions and reactions in higher nervous activity; in many cases the relationship between the biochemical situation and the higher nervous activity reaction does not tally with clinical experience; (g) exposure to prolonged strain lowers resistance to a superimposed strain of short duration. However, this circumstance is not a precise reflection of the state of the adaptational reserves.

(Author)

A66-14081

EVALUATION OF STRESS BY QUANTITATIVE HORMONE STUDIES. U. S. v. Euler (Karolinska Institutet, Dept. of Physiology, Stockholm, Sweden).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 308-324; Discussion, p. 324-326. 29 refs.

Research supported by the Swedish State Research Committee on Aviation and Naval Medicine, and USAF.

Data in the literature and own investigations indicate a correlation between the degree of stress in a subject and the excretion of free adrenaline and noradrenaline in urine. Catecholamine excretion is preferably expressed as ng/min, to allow comparison between excretion at rest and during stimuli of various lengths. Noradrenaline excretion is mainly correlated to the degree of activation of the vasomotor system and is increased in erect position, during exposure to other gravitational forces, during muscular work, and under certain conditions of stress associated with aggressiveness and anger. Adrenaline excretion is increased in a variety of conditions of mental stress, e.g., during performance of certain tasks, examinations, excitation by external stimuli, fear, pain, or other disagreeable conditions, and anticipation of such states, particularly when involving competition or possible dangers. Increased catecholamine excretion has been observed during aircraft transportation, advanced flying including supersonic flights, manned suborbital flights, parachute jumping, and runs in the human centrifuge. Infusion of adrenaline in healthy subjects causes discomfort and tenseness in the majority of cases. Proficiency seems to be increased by adrenaline during the performance of certain tasks, while a tendency in the opposite direction is noted in other tests. Habituation to certain stress-inducing situations tends to decrease the adrenaline excretion. Attempts to correlate the catecholamine excretion pattern and personality traits seem to indicate that such studies may be of value for the characterization of individuality types and as a means of predicting their reaction pattern to stress. Quantitative evaluation of stress by the catecholamine excretion tests may also provide some information on mental or bodily alterations which may affect performance.

(Author)

A66-14082

PREDICTING THE SUSCEPTIBILITY TO VESTIBULAR SICKNESS UNDER CONDITIONS OF WEIGHTLESSNESS.

Ashton Graybiel (U.S. Naval School of Aviation Medicine, Pensacola, Fla.).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 327-344. 56 refs.

NASA Grant No. R-47.

The fact that Russian scientists considered the labyrinth played an etiological role in the symptoms Titov experienced during his orbital flight was justified not only on theoretical ground but also on the basis of Titov's account. The fact that other cosmonauts and astronauts did not report similar symptoms can be explained on the basis of individual susceptibility. This poses a problem in predicting susceptibility, a problem made difficult by the inability to simulate zero G for long periods under terrestrial conditions. However, there is good evidence that susceptibility to symptoms in one type of gravitational-inertial force environment has predictive value for exposure to another type. This formed the point of departure in our studies to clarify the role of the vestibular

organs in causing functional disturbances. We compared the symptomatology of persons with labyrinthine defects with normal subjects under a variety of environmental conditions. Our studies, though far from complete, indicate that persons with labyrinthine defects are relatively unsusceptible to psychic insults and bizarre or noceptive stimuli, which may cause symptoms in healthy subjects. Two explanations may be advanced. First, the mere presence of the vestibular organs contributes to the complexity of the integrative patterns in the central nervous system, the disturbance of which gives rise to symptoms of functional origin. Second, episodes of vestibular sickness lead to psychological and physiological conditioning which renders a person susceptible to the conditioned stimulus. This greatly complicates the task of predicting susceptibility to weightlessness, a task which will be even more difficult when not only test pilots but also scientists go aloft.

(Author)

A66-14083

ELECTROENCEPHALOGRAPHIC RESPONSES TO SHORT PERIODS OF WEIGHTLESSNESS [REACTIONS ELECTRIQUES CEREBRALES A DE COURTES PERIODES DE NON GRAVITE].

R. Grandpierre, R. Angiboust, R. Brice, B. Cailler, G. Chatelier, and J. Rozier (Centre d'Enseignement et de Recherches de Médecine Aéronautique, Paris, France).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 345-350; Discussion, p. 351.

In French (Discussion in English).

The authors carried out a number of experiments on white Wistar rats carried in an aeroplane following parabolic flight paths, in order to produce by the classical method a state of weightlessness lasting some thirty or forty seconds. The animals' heart and breathing rate, and the electrical activity in their neck muscles, cerebral cortex and mesencephalic reticular formation were recorded. Zero gravity was obtained during four to six successive periods of from 33 to 45 seconds, for each animal; eight animals were tested in this way. Taken as a whole, the results obtained show no change in the spontaneous electrical activity of the cerebral zones investigated during periods of zero gravity. However, in certain animals which spontaneously displayed very discrete electrical signs of cortical irritability, large bursts of synchronous activity or slow waves were observed. The authors attempt to interpret these results and to arrive at theoretical and practical conclusions.

(Author)

A66-14084

PROBLEMS CONCERNING THE INTERPLAY OF PHYSIOLOGICAL SENSING MECHANISMS (ANALYZERS) DURING SPACEFLIGHT [PROBLEMA VZAIMODEISTVIA ANALIZATOROV PRIMENITEL'NO K USLOVIAM KOSMICHESKOGO POLETA].

M. D. Emel'ianov, A. G. Kuznetsov, E. M. Iuganov, and A. A. Giurdzhian (Akademiia Nauk SSSR, Moscow, USSR).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 352-358. 6 refs. In Russian (English Translation p. 359-365).

Disturbances in the pilot's spatial orientation and vegetative disorders, common in aviation and reminiscent of the symptoms of seasickness, may also occur in cosmonauts during certain stages of spaceflight. Evidence is produced to support the assumption that these phenomena arise as a result of disturbances in the physiological interplay of the sensing mechanisms governing the perception of space. The authors' opinion was confirmed by experimental investigations of the physiological mechanisms governing the interplay of visual, vestibular and motor mechanisms, and of the appearance of spatial illusions. Methodical research procedures are suggested. It is explained that vestibular reaction thresholds vary within wide limits under the influence of certain visual excitations or static and dynamic muscular tensions. Static muscular tension and visual concentration on a fixed object considerably inhibit the appearance of these phenomena. The degree to which disorders in the perception of space are expressed

depends also on the individual peculiarities of the subject. The most frequent spatial illusions and their accompanying vegetative reactions appear as a result of excitations of the vestibular apparatus when the subject is in a state of balance on an unstable support, or when his eyes follow continuously moving objects. The scientific selection and training of cosmonauts are the most effective countermeasures against these disorders. (Author)

A66-14085

PROBLEMS OF ENGINEERING PSYCHOLOGY AS APPLIED TO CONDITIONS OF SPACEFLIGHT [PROBLEMY INZHENERNOI PSIKHologii PRIMENITEL'NO K USLOVIAM KOSMICHESKOGO POLETA].

I. T. Akulinichev and V. G. Denisov (Akademiia Nauk SSSR, Moscow, USSR).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 366-376; Discussion, p. 376, 377. 6 refs. In Russian (Discussion in English).

The basic psychological engineering problem consists in studying ways of rationally harmonizing man's psychophysiological capacities with the engineering solutions adopted for the cybernetic aspect, i.e. the man-machine relationship. The first tentative results from investigations into the specific conditions of spaceflight enable us to establish the limits of the cosmonaut's potentialities with regard to speed, accuracy and the range of information from the vessel's control systems that he can take in and process, and also to collect time-and-motion data on the cosmonaut's manual control of the spaceship and its apparatus. Information on the accuracy and speed with which information is received, and data on the use made by the cosmonaut of this information, make it possible to determine the efficiency of the information coding system under actual flight conditions. The results obtained from laboratory experiments and during the first spaceflights must be defined in greater detail in the course of more extensive space research. Prolonged flights in space and the vessel's slow response to control signals place the cosmonaut in "surplus time" conditions. Thus, in order to increase the efficiency of the control system, it would be useful to conduct further research with a view to producing a suitable information coding system. In building systems for coding information and carrying out control commands when the cosmonaut is confronted with "deficit time" conditions (particularly in certain emergency situations), the well tried principles used in aviation can be successfully employed. To develop the professional skill of the cosmonaut and to evolve efficient systems for coding information and selecting the optimum parameters for manual control systems, simulation training equipment is set up. The operational characteristics and practical possibilities of the various types of simulation trainers are based on psychological engineering methods as applied to actual operating conditions. (Author)

A66-14086

ACCURACY OF ORIENTATION IN SPACE UNDER INCREASED ACCELERATION IN THE ABSENCE OF VISUAL REFERENCE FRAME.

H. Kolder (Emory University, School of Medicine, Dept. of Physiology, Atlanta, Ga.) and G. Schubert.

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 378-394; Discussion, p. 394. 25 refs.

The perception of the apparent vertical without visual cues depends on the position of the longitudinal axes of body and head to the direction of the resultant acceleration above 1 G. With dissociation of the direction of the longitudinal axes of body and head, and exposing them separately in varying angles to the direction of the resultant acceleration, information is obtained on the contribution of systems involved in the perception of the vertical. Conclusions are derived from results of experiments on 15 volunteers subjected to a total of 397 different combinations of body and head

positions with resultant accelerations between 1.0 and 3.0 G. The position of the longitudinal axis of body or head influences the direction of the apparent vertical. The effect of the position of body and head is additive. The accuracy of estimation of the direction of the resultant acceleration is optimal up to 1.5 G, when body and head are held in the direction of the resultant acceleration. Above 1.5 G the direction of the resultant acceleration is underestimated when the vector of forces moved transiently through a frontal plane to its final position. The direction of the resultant acceleration is increasingly overestimated when the vector of forces moved transiently through a sagittal plane to its final position. The precision of estimation of the apparent vertical is higher during lateral acceleration than during backward acceleration. The precision decreases slightly with tilt of body and head away from the direction of gravity. (Author)

A66-14087

METHODS FOR SOMATIC CLASSIFICATION OF PILOTS ACCORDING TO STATUS OF FUNCTIONAL MUSCULAR, CIRCULATORY AND RESPIRATORY CAPACITIES, AND POSSIBILITIES OF FURTHER DEVELOPMENT DURING TRAINING.

Gunnar Ström (Uppsala, Royal University, Hospital, Dept. of Clinical Physiology, Uppsala, Sweden).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 395-404; Discussion, p. 404, 405. 43 refs.

In the Swedish Defence Forces, especially the Air Force, testing of the physical capability of personnel at different ages has been carried out systematically for a number of years. A full series of measurements would appraise (a) certain body dimensions, such as height, weight, adipose tissue and lean body mass, skeletal length and breadth, total heart volume in the horizontal body position, and total blood volume; (b) functional muscular capacity, judged from the maximal isometric force of contraction in representative muscle groups; (c) functional circulatory and respiratory capacities, judged from the ventilation; oxygen uptake, heart rate, respiratory rate, blood lactate concentration and Ecg reaction, etc., under steady-state conditions during stepwise increasing work loads of submaximal intensity and under nonsteady-state conditions during maximum work load; from the circulatory responses to orthostatic testing; and from vital capacity and maximal ventilatory volume; (d) some index of endurance for work of very long duration. The results of the dynamic tests are evaluated as indices of maximal functional output and of maximal steady-state level. These indices of physical capability depend on the dimensional prerequisites as well as on the efficacy of the homeostatic regulative functions. The different indices are mutually interrelated, to a greater or lesser degree, in the normal individual. Appraisal of these interrelationships is an important part of the testing procedure. Results from testing large personnel groups with some of the above-mentioned methods are mentioned. Physical training of the circulatory system results in e.g. increased circulatory dimensions and increased maximal functional output, and apparently also in a higher efficacy of the homeostatic regulation - the orthostatic circulatory changes are less pronounced, and a higher proportion of the maximal output can be used under conditions of steady state. Results from longitudinal studies of physical capability in large personnel groups during periods of physical training are mentioned. (Author)

A66-14088

MONITORING AND PREDICTION OF NERVOUS FUNCTIONS IN SPACE.

W. Ross Adey (California, University, Center for Health Sciences, Brain Research Institute, Los Angeles, Calif.) and Don D. Flickinger.

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]

Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 406-423; Discussion, p. 424. 21 refs.

NASA-supported research; Grant No. AF AFOSR 61-81.

Initial results obtained from monitoring human performance, during manned orbital flight of 9 hours duration (U.S.) and 96 hours duration (USSR) indicate little, if any, demonstrable degradation from these levels achieved during ground-based simulator runs. With available biomedical instrumentation in current use, however, no critical assessment of central nervous system function has been possible during the U.S. missions. Recognizing the extreme importance of monitoring and evaluating alertness, judgment, purposeful motor responsiveness during critical stages of future space missions, we have developed prototype EEG recording equipment which meets the unique and rigid requirements imposed during spaceflight. Concomitantly with the required equipment and test and development there have been conducted a series of studies in animals exposed to simulated stresses of spaceflight up to 14 days duration. These studies have included the effects of acceleration, vibration, sensory deprivation, hallucinogenic drugs on discriminative performance, alertness and sleep-wakefulness cycles; with concomitant assays being made of steroid and catechol amine metabolism. As a basic keystone around which our final objective could be realized, the UCLA Space Biology Laboratory has pioneered in the application of three complex computer techniques to the analysis of the EEG data recorded. Differences in these various quantitative and qualitative functions analyzed have been seen in many of the responses studied and the results thus far encourage the view that these techniques are more revealing of early significant changes than most others in current use.

(Author)

A66-14089

MEANS AND METHODS OF BIOMEDICAL EXPERIMENTS IN SPACE FLIGHT [METODY I SREDSTVA MEDITSINSKIKH I BIOLOGICHESKIKH ISSLEDOVANIY V USLOVILAKH KOSMICHESKOGO POLETA]. I. T. Akulinichev, R. M. Baevskii, and O. G. Gazenko (Akademiia Nauk SSSR, Moscow, USSR).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04] Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 425-440; Discussion, p. 450, 451. 6 refs. In Russian (English Translation p. 440-449).

Research work in space biology and medicine includes the theoretical analysis of factors effecting the living organisms, laboratory investigations with models of particular factors or a complex of factors, and finally experiments under flight conditions. Flight experiments of more vital significance are those performed with artificial earth satellites and spaceships. The purpose and program of the research work determine the choice of biological subjects, some of which are more sensitive than others to the influence of particular flight factors. Soviet biomedical research in space will cover a wide variety of representatives of organic life on earth, ranging from biochemical structures and the most rudimentary organisms to the highest vertebrates. Biological telemetry has been widely used to obtain the necessary scientific information. Biological measurements during flight can be roughly divided into three categories: medical monitoring, medical research and the collection of biological data. The latest achievements in biology, electronics and computing techniques must be applied in order to ensure the high quality and necessary range or results. Pre- and postflight examinations are also extremely important; they should cover a very wide range, designed to extract the maximum biological and medical information from every flight experiment. Lengthy observation of cosmonauts and biological subjects during the postflight period is of considerable importance in this respect. The prospect of increasing the duration and range of spaceflights poses extremely serious problems as regards the devising of new ways and means of conducting biomedical research and dynamic medical monitoring. These principles are illustrated by concrete examples drawn from biotelemetric measurements made in the course of biomedical research on the 2nd, 3rd, 4th and 5th Sputniks and the Vostok spaceships.

(Author)

A66-14090

BIOMEDICAL DATA COLLECTION FOR SPACE PROGRAMS. Stanley C. White (NASA, Manned Spacecraft Center, Houston, Tex.).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04] Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 452-460; Discussion, p. 460-462. 5 refs.

Man has demonstrated his ability to survive in the space environment. The tasks now underway in the manned spaceflight programs of the United States are directed toward the proper integration of the crewman into the vehicle and the flight operations in such a manner that the advantages which man offers can be used. This paper devotes itself to a discussion of the biomedical data system first used in manned spaceflight and the approaches now being developed for future flights. The discussion reviews the philosophy and events which led to the early program of data collection and how present events have changed the approach. The biomedical data-gathering system first used in the United States was directed toward the question of answering whether man could survive in spaceflight. Flight safety was of prime importance. This objective dictated the requirement for animals to precede man in flight. Additional information which could be gleaned from the mission directed data system was gratefully accepted but did not dictate the choice of instruments or the methods of data handling. Gross screening studies were carried out in an attempt to identify body system problems. The goals of the biomedical data gathering systems have shifted to the objective of gathering information which will permit better integration of man into a useful position in the spacecraft operation. The system still must meet the flight safety requirements; however, the instruments must search for the mechanisms by which the body systems meet spaceflight. The large payloads and the shifting to the new spacecraft permit the use of the full spectrum of data sources. Not only can biosensors placed on the man be used, but now the use of small inflight experiments, the obtaining of special samples and the more elaborate inflight data available through direct study become possible.

(Author)

A66-14091

SOME PROBLEMS OF PHYSIOLOGICAL MONITORING.

P. Howard (Royal Air Force, Institute of Aviation Medicine, Farnborough, Hants., England).

IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04] Edited by Hilding Bjurstedt.

New York, Springer-Verlag, 1965, p. 463-471; Discussion, p. 471, 472.

Measurement of the physiological responses of an astronaut to the conditions of spaceflight may be employed for clinical or for experimental purposes, although no clear distinction between the two is usually attempted. The primary object of the former is the detection and diagnosis of disease or frank illness; the ultimate purpose is to ascertain the cause of death of the astronaut. Experimental observations, on the other hand, are concerned with the effects of the special conditions existing in space on the normal mechanisms of the body, and with the altered responses evoked by known stimuli applied in a strange and ill-defined environment. These two types of monitoring require different methods, but certain basic problems are common to both. In the first place, it is often difficult to decide on the physiological variables which will give the desired information. Secondly, both the physician and the physiologist may be severely handicapped by the absence of techniques of measurement which can safely be used. Thirdly, it may be impossible to relay the information obtained to the ground-based laboratory. Another problem is that of ensuring a uniform interpretation of any abnormal responses observed at widely scattered monitoring stations, to which is allied the question of deciding upon the action to be taken should such an abnormality occur. Finally the collection, storage, and analysis of large quantities of recorded data presents difficulties which will become more acute as longer flights are made. It is probable that recent developments in electronics and in computer techniques will help to solve some of these problems, and some promising approaches will be discussed in

this paper. For the most part, however, progress in the field of physiological monitoring must depend upon new ideas from the research worker and the clinician. (Author)

A66-14092

MAN OR AUTOMATON IN SPACE?

K. Steinbuch (Institute of Technology, Karlsruhe, West Germany).
IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]
Edited by Hilding Bjurstedt.
New York, Springer-Verlag, 1965, p. 473-491; Discussion, p. 491, 492. 30 refs.

Pushing forward into space can be accomplished either by manned or by unmanned space vehicles (automata). Spaceflight in manned vehicles is difficult because of the fact that the human organism can only bear small amounts of acceleration, irradiation and changes of temperature. For automata the corresponding ranges are larger. Further, it is difficult to secure respiration and nutrition for a man aboard a space vehicle, to eliminate his excrements, to control the physiological results of weightlessness on muscles and circulation, and to secure that he does not break down psychically. On the other hand, men are less sensitive than automata with respect to the perception of mechanical or electromagnetic vibrations. Only in the relatively small ranges of frequency which are adequate to the human ear and eye a comparable sensitivity of man exists. In spite of these numerous disadvantages of human constitution it is planned to send manned vehicles into space. This is due to the fact that a large part of "functions of intelligence" cannot yet be realized by automatic systems. The basic problem is less the question of "higher" intellectual functions than to perform relatively simple functions reliably at the right moment. Connected herewith is the important problem of recognizing "patterns" independent of their relative position in which they are presented, of their size, of whether they are upright or twisted, etc. It is supposed that most of the "functions of intelligence" essential for spaceflight will be realized by technical systems within some decades. To reach this aim two problems are especially important: (1) the development of a "technical perceptor" (solving the problem of automatic pattern recognition); and (2) the development of electronic systems with a considerably higher package density and the ability of self-correction. These problems being "solved" there will no longer be technical reasons to equip space vehicles with human pilots. (Author)

A66-14093

DATA SENSORS AND INFORMATION ACQUISITION.

A. M. Mayo, C. L. Budden and G. R. Tenery (Ling-Temco-Vought, Inc., LTV Astro Div., Advanced Systems Dept., Dallas, Tex.).
IN: INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE, 1ST, PARIS, FRANCE, OCTOBER 29-NOVEMBER 2, 1962, PROCEEDINGS. [A66-14063 04-04]
Edited by Hilding Bjurstedt.
New York, Springer-Verlag, 1965, p. 493-506. 10 refs.

Much of the knowledge potential from space exists as energy patterns not directly accessible through the human sense organs to the intellect. Accelerated effort toward the acquisition of information in a form directly comparable to existing knowledge shows promise of improved effectiveness of space exploration. Transformations used in improving the intelligibility of information include: (1) energy-frequency transforms exemplified by the shift of frequency occurring when certain minerals, exposed to ultraviolet energy, radiate various colors of visible light; (2) the amplification of energy patterns as exemplified by radio and television reception; (3) temporal transforms as exemplified by ultra-high-speed and time lapse photography; (4) sensor modality transforms exemplified by the increased use of hearing and touch senses of the blind; and (5) classification transforms exemplified by the "self-programming" computer techniques of organizing geometric and temporal sensed energy patterns. The transformation processes are explored as a means to stimulate ingenuity in instrumenting scientific payloads for improved effectiveness. Improved understanding of human and other biosensory and cognitive functions is fundamental to effective progress. (Author)

A66-14386

NOISE DAMAGE TO TECHNICAL PERSONNEL OF A MILITARY AIRFIELD [LÄRM - SCHÄDIGUNGEN DES TECHNISCHEN PERSONALS EINES HEERESFLUGPLATZES].

F. A. Schiechel.
Zentralblatt für Verkehrs-Medizin, Verkehrs-Psychologie, Luft- und Raumfahrt-Medizin, vol. 11, June 1965, p. 65-68. 6 refs.
In German.

Investigation of 195 soldiers and civilian employees ranging from 20 to 60 yr of age, employed at a military airfield, as to the extent of hearing damage resulting from exposure to high noise levels. The results obtained with an Atlas EM 42 audiometer indicate that more than two-thirds of the over fifty age group sustain heavy hearing damage after prolonged exposure periods. For younger individuals, the hearing damage, though of lighter nature, is percentage-wise unexpectedly high. Light C⁵ damage is relatively frequent among individuals of up to 40 yr of age, while heavy C⁵ damage increases progressively with age. V.P.

A66-14387

CORONARY SCLEROSIS, CORONARY INFARCT AND FLIGHT SAFETY [KORONARSKLEROSE, KORONARINFARKT UND FLUGSICHERHEIT].

H. W. Kirchoff (Luftwaffe, Flugmedizinisches Institut, Fürstentfeldbruck, West Germany).
Zentralblatt für Verkehrs-Medizin, Verkehrs-Psychologie, Luft- und Raumfahrt-Medizin, vol. 11, June 1965, p. 72-76. 14 refs.
In German.

Survey of the literature describing cases in which a coronary disease of the pilot resulted in the crash of his plane. Some preventive and rehabilitative measures are discussed. V.P.

LC ENTRIES

A66-80147

EFFECTS OF BETA-ADRENERGIC BLOCKADE ON THE CARDIAC RESPONSE TO MAXIMAL AND SUBMAXIMAL EXERCISE IN MAN.

Stephen E. Epstein, Brian F. Robinson, Richard L. Kahler, and Eugene Braunwald (Natl. Heart Inst., Cardiol. Branch, Bethesda, Md.)
Journal of Clinical Investigation, vol. 44, Nov. 1965, p. 1745-1753. 23 refs.

The effect of β -adrenergic blockade on the circulatory response to maximal and submaximal exercise was studied in seven normal subjects and in nine patients with cardiac disorders. Beta-adrenergic blockade invariably caused a reduction in heart rate, cardiac output, mean arterial pressure, and left ventricular minute work; arteriovenous O_2 difference increased and there was a small rise in central venous pressure. As an apparent consequence of the impaired circulatory response to exercise, both maximal oxygen consumption and capacity for strenuous exertion were reduced. However, even after β -adrenergic blockade, cardiac output still rose substantially during exercise. We conclude that sympathetic nervous stimulation of the heart plays a significant, although quantitatively limited, role in mediating the normal response to exercise in man.

A66-80148

A HUMAN-FACTORS EVALUATION OF SWITCH ACTUATORS FOR USE IN SPACECRAFT.

Donald H. Schuster (Collins Radio Co., Cedar Rapids, Iowa)
IEEE Transactions on Human Factors in Electronics, vol. HFE-6, Sep. 1965, p. 33-42. 11 refs.

The characteristics of switch actuators for communications equipment to be used in spacecraft are investigated. Subjects operated common switch actuators with space suit gloves, under both atmospheric pressure and two-psi pressure differential. The independent variables studied were type of actuator, direction of operation, actuating torque, number of switch positions, effect of pressure, practice effect, and position on the panel. The dependent variables (criteria) were operating time, errors, and ranks. Switch actuators, in general, were operated more slowly and with more errors under simulated spacecraft conditions than under ordinary conditions. It was found that multiposition switches must have firm detent or interlocking features to prevent overshoot or accidental reversal. The best switch actuator under all circumstances combined is described.

A66-80149

MATHEMATICAL MODELS OF HUMAN OPERATORS IN SIMPLE TWO-AXIS MANUAL CONTROL SYSTEMS.

G. A. Bekey (Southern Calif. U., Los Angeles), H. F. Meissinger, and R. E. Rose (TRW Space Technol. Labs., Redondo Beach, Calif.)
IEEE Transactions on Human Factors in Electronics, vol. HFE-6, Sep. 1965, p. 42-52. 16 refs.

NASA/Langley Contract NAS1-2582.

An application of continuous parameter optimization techniques to the synthesis of a model of human tracking behavior in a simple two-axis task is presented. Considerable emphasis is placed on the measurement of performance criteria for estimating the relative difficulty of single-axis and two-axis tasks as well as for evaluation of the validity of mathematical models. It is shown that the modeling technique can be used to yield a quantitative indication of the degree of cross coupling between axes introduced by the operator.

A66-80150

THE EFFECTS OF PERFORMANCE-SCORING CRITERIA ON COMPENSATORY TRACKING BEHAVIOR.

Duncan C. Miller (Bolt Beranek and Newman, Inc., Cambridge, Mass.)
IEEE Transactions on Human Factors in Electronics, vol. HFE-6, Sep. 1965, p. 62-65.
 Contract AF 33(657)10124.

A compensatory tracking experiment was performed in which a subject received continuous feedback of his performance as measured by scoring criterion. Several such criteria were investigated, each consisting of a weighted sum of mean-squared error and mean-squared stick movement. The subject changed his tracking behavior to suit the scoring criterion. These changes were manifested primarily as changes in the gain of the subject's describing function. It appears that a well-trained subject is good at optimizing his behavior to suit a scoring criterion, and that the design and feedback of such scoring criteria should receive greater consideration in tracking experiments.

A66-80151

HUMAN USE OF SHORT-TERM MEMORY IN PROCESSING INFORMATION ON A CONSOLE.

B. P. Zeigler (Natl. Res. Council, Ottawa, Ontario, Canada) and T. B. Sheridan (Mass. Inst. of Technol., Dept. of Mech. Eng., Cambridge).

IEEE Transactions on Human Factors in Electronics, vol. HFE-6, Sep. 1965, p. 74-83. 13 refs.
 Contract AF 19(628)-3317.

The role of a human operator performing an information-processing task at a console is studied. Specifically explored are: (1) the role of the console as a form of memory, and (2) the ways in which this memory interacts with the human memory during a simple list-processing task. Times for various phases of the task are measured under four experimental conditions which systematically constrain the use of human or console memory. Three conceptual models are proposed: two characterize the structure of, and retrieval from, human and or console memory when these are freely used together; the third characterizes the use of human memory when visual search of the console memory is very limited.

A66-80152

METABOLISM OF CARNITINE IN COLD-ACCLIMATED RATS.

D. G. Therriault and M. A. Mehman (U. S. Army Res. Inst. of Environ. Med., Natick, Mass.)
 (Symposium on Carnitine, MIT, Cambridge, Mass., Jul. 24, 1964).

Canadian Journal of Biochemistry, vol. 43, 1965, p. 1437-1443. 22 refs.
 The body pool, half-life, and turnover time of carnitine in rats maintained at 25°C, and in rats exposed to 5°C for a period of 6 weeks were measured. The level of free and lipid-bound carnitine in striated muscle of these animals was also determined. Results show that the body pool of carnitine is eight times greater in cold-acclimated rats than in rats maintained at 25°C. On the other hand, the half-life and turnover time of carnitine in cold-acclimated rats is only one-half of that of rats kept at 25°C. Analysis of striated muscle showed a parallel increase of carnitine in cold-acclimated rats. This increase in carnitine was accompanied by a corresponding increase in acylcarnitine.

A66-80153

EXPERIMENTS ON THE FOUR-EARED MAN.

Neville Moray, A. Bates, and T. Barnett (Sheffield U., Dept. of Psychol., Great Britain).

Journal of the Acoustical Society of America, vol. 38, Aug. 1965, p. 196-201. 6 refs.
 Min. of Aviation supported research.

Subjects were required to listen to messages consisting of 1, 2, 3, or 4 letters of the alphabet over each of 1, 2, 3, or 4 channels. It was found that increasing the number of channels above 2 had a markedly deleterious effect upon recall of the messages, 2 letters over each of four channels being less well recalled than 4 letters over each of two channels. In a second experiment, it was found that, providing only one channel was required in recall, and this one was indicated by a light immediately after the stimuli had been presented, then the decrement could be largely offset and the total number of signals stored held constant at about 8 regardless of how many channels were used. However, if the letters had to be recalled in exactly the correct order in which they arrived, performance dropped to almost zero. The results are discussed in terms of the channel capacity of the nervous system and in relation to corresponding findings in other sense modalities.

A66-80154

CONTINUITY EFFECTS WITH ALTERNATELY SOUNDED NOISE AND TONE SIGNALS AS A FUNCTION OF MANNER OF PRESENTATION.

Lloyd Elfner (Kent State U., Ohio) and William E. Caskey (Hawthornden State Hosp., Macedonia, Ohio).

Journal of the Acoustical Society of America, vol. 38, Oct. 1965, p. 543-547. 6 refs.

An experiment is reported on continuity effects produced in a longer-duration, less-intense noise signal alternating with a shorter-duration, higher-intensity tonal signal. The perceived continuity in the noise signal is demonstrated to be affected by the following: (1) the frequency of the tonal signal (200, 400, 1000, 2000, and 4000 c.p.s.), (2) the duration of the noise signal (70, 250, and 950 msec.), and (3) the manner of presentation (monaural versus dichotic). Monaural thresholds were found to be larger than dichotic continuity thresholds. Continuity effects were demonstrated under dichotic presentation. That is, the noise signal was reported as continuous when interrupted for periods of time that would be clearly perceived if no tonal signal were interpolated in the interruptions of the noise. A two-factor theory is forwarded to explain the dichotic and monaural continuity effects. The monaural effects are discussed in terms of rate of decay of auditory sensation. The dichotic effects are discussed in terms of facilitation of ongoing neural discharge somewhat more central than the first-order neurons.

A66-80155

CONTRIBUTIONS OF THE USSR TO THE EXPLORATION OF OUTER SPACE [VKLAD SSR V IZUCHENIE KOSMICHESKOGO PROSTRANSTVA].

N. M. Sitakian (USSR, Acad. of Sci., Moscow).

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962, Wien, Springer-Verlag, 1965, p. 7-33; discussion p. 33-34. In Russian and English.

The most important result of scientific and technical development in recent years has been the projection of man into space. The solution of this exceptionally difficult and inherently complex problem depended on the successful development of technology and the biological sciences. The work of K. E. Tsiolkovsky on rocket flight is of outstanding significance in the history of astronautical research and space biology. The last ten years have seen the gradual creation of a new branch of natural science with its own clearly defined aims, subject matter and research methods. That new branch is space biology and its fundamental problems are as follows: to study the effect of the extreme conditions of outer space on living terrestrial organisms; to discover and formulate the fundamental biological principles governing space flight and life on the planets; to study conditions and forms of life outside the earth. Progress in physical research in space is an important prerequisite for, and at the same time a stimulus to the successful development of biological investigation. The five main lines along which bio-medical research is conducted in order to ensure the cosmonauts' safety during flight are described. The present state of space biology is illustrated from the investigations conducted in the Soviet Union.

A66-80156**THE FUTURE OF ENVIRONMENTAL BIOLOGY AND THE CONTRIBUTION OF SPACE RESEARCH.**

O. E. Reynolds (NASA, Biosci. Programs, Washington, D. C.)

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 146-151; discussion, p. 152.

The study of living organisms removed from terrestrial influences, such as gravitational and magnetic fields and diurnal and other periodic influences, becomes possible with present space technology. For the first time, the role of these environmental conditions in the evolution, physiology and behavior of earth organisms can be evaluated by an imaginative program of research. Some of the prospects for such a program will be discussed.

A66-80157**HEAT LOSS IN SPACE.**

D. McK. Kerslake (Roy. AF, Inst. of Aviation Med., Farnborough, Hants, Great Britain).

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 153-159.

The problem of temperature regulation is most acute for the astronaut when he is outside his vehicle and therefore disconnected from the relatively bulky machinery which normally attends to his thermal needs. It is necessary to arrange that metabolic heat is transported from the skin surface to some device which will absorb it. Two heat exchangers are therefore required, one at the skin surface and one in the thermal pack, and the transport of heat from skin to absorbent must be effected optimally in terms of the weight and bulk of apparatus necessary. The properties of an existing air ventilated clothing system were investigated using a heated dummy whose regional "tissue conductance" was matched to that of a thermally comfortable human subject. It was found that if the complex distributions of air flow and skin temperature were ignored, the results could be expressed in terms of the performance characteristics of a simple heat exchanger having its plate surface temperature equal to the mean skin temperature. The relation between mass flow and heat exchange coefficient at the skin surface was such as to suggest that suitable characteristics could be obtained by introducing air at the four extremities and removing it at the waist. The power required to ventilate existing suits was found to be many times the theoretical minimum, and considerable improvement in this respect appeared possible.

A66-80158**AVOIDING PHYSICAL ATROPHY IN PROTRACTED WEIGHTLESSNESS.**

Erich A. Müller (Max-Planck Inst. für Arbeitsphysiol., Dortmund, West Germany).

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 169-178.

Gravity is only one possibility among others to build up a counterforce for the development of muscular tension and for the performance of muscular work. Muscular tension can be likewise developed under weightless conditions between fixed points inside or outside the body. Work can be done as well against one fixed and one elastic point or against friction. Thus even the smallest room will allow the arrangement of a sufficient training system. It has been shown recently that one daily maximum contraction of 5 sec. is enough to keep a muscle strong and enduring enough for static work. In order to maintain a high capability for dynamic work, muscles have to work daily for about 1/2 hour as hard as possible. To keep the heart fit and the hemoglobin content of the blood high for short extreme stress-situations, it is sufficient to raise the pulse-rate once a day up to 100-200 beats/min. for about 30 sec. by exhausting work. This is usually achieved by standing-running under the influence of gravity. Under weightless conditions cranking seems to be the best solution for physiological and technical reasons.

A66-80159**THE INFLUENCE OF THE DYNAMIC ENVIRONMENT ON MAN IN SPACE FLIGHT.**

Edwin P. Hiatt (Ohio State U., Dept. of Physiol., Columbus).

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 186-199; discussion, p. 200. 26 refs.

In preparing man to be exposed to the prolonged accelerations of space flight it was realized that his body orientation in the force field was of great importance if he was to maintain his capacity for observing and his ability to perform tasks. By arranging for these forces to be applied across his body (transversely), instead of along the length of his body, circulatory difficulties can be reduced and his tolerance increased. However, at the higher accelerations tolerable in the transverse position other difficulties appear, most of them involving respiration. Not only is it more difficult to inspire air, but, because of a displacement of the blood perfusing the lungs, there is imperfect exchange between pulmonary air and blood. This physiological pulmonary shunt results in a reduction in the oxygen content of arterial blood. Furthermore, the inertial forces due to acceleration may cause congestion of some portions of the lungs with overdistention of other portions with danger of atelectasis and mediastinal emphysema. Neither positive pressure respiration, the breathing of high oxygen pressures, nor immersion in water can completely protect against these changes. Though the orbital flights made to date have given reassurance that man can tolerate the dynamic environment of space flight, there are possible deviations from normal flight plans which could involve dangerous forces. Some of these are described.

A66-80160**BIOLOGICAL AND PHYSIOLOGICAL INVESTIGATIONS IN ROCKETS AND ARTIFICIAL SATELLITES [BIOLOGICHESKIE I FIZIOLOGICHESKIE ISSLEDOVANIYA PRI POLETAKH NA RAKETAKH I ISKUSSTVENNYKH SPUTNIKAKH ZEMLI].**

O. G. Gzenko, V. N. Chernigovskii, and V. L. Lazdovskii (USSR, Acad. of Sci., Moscow).

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 218-237; discussion, p. 238-239. In Russian and English.

A large number of biological experiments were carried out in the Soviet Union to determine the effects of space flight factors on living organisms and to devise the systems required to preserve vital activity intact during rocket flight. Results of biological experiments conducted with the second, third, fourth and fifth Sputniks, and the scientific investigations made during the manned flight of the "Vostok" space ships are presented. The non-pathological character of the physiological reactions to stress factors during flight is stressed. During the post-flight period, no deterioration in the health of either the cosmonauts or the experimental animals was observed. At the same time, certain peculiarities which appeared during analysis of the physiological reactions and of a whole range of biological data, require further investigation. The most important lines for future research are: to study the influence of prolonged weightlessness, the biological effects of cosmic radiation, the effects of g-stress after a period of weightlessness and, of course, to analyze the influences on the organism of the entire complex of space flight factors, including the emotional state. The experience gained leads toward a broader approach to the problem of man's medical protection during space flight and indicates more adequate ways and means of guaranteeing his safety.

A66-80161**ELECTRO-ENCEPHALOGRAPHIC RESPONSES TO SHORT PERIODS OF WEIGHTLESSNESS [REACTIONS ELECTRIQUES CEREBRALES A DE COURTES PERIODES DE NON GRAVITE].**

R. Grandpierre, R. Angiboust, R. Brice, B. Caillet, G. Chatelier, and J. Rozier (Centre d'Enseignement et de Rech. de Méd. Aéron., Paris, France).

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 345-350; discussion, p. 351. In French.

Experiments on white Wistar rats were carried out in an aircraft following parabolic flight paths that produced weightlessness lasting about thirty or forty seconds. The animals' heart and breathing rate and the electrical activity in their neck muscles, cerebral cortex, and mesencephalic reticular formation were recorded. Zero gravity was obtained during four to six successive periods of from 33 to 45 seconds, for each animal; eight animals were tested in this way. No change was observed in the spontaneous electrical activity of the cerebral zones investigated during periods of zero gravity. However, in certain animals, which spontaneously displayed very discrete electrical signs of cortical irritability, large bursts of synchronous activity or slow waves were observed. Some changes were observed in electrical potentials of the neck muscles, which appeared to be related to the posture of the animal.

A66-80162**EVALUATION OF STRESS BY QUANTITATIVE HORMONE STUDIES.**

U. S. von Euler (Karolinska Inst., Dept. of Physiol., Stockholm, Sweden).

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 308-324; discussion, p. 324-326. 29 refs.

Data in the literature and investigations indicate a correlation between the degree of stress in a subject and the excretion of free adrenaline and noradrenaline in urine. Noradrenaline excretion is mainly correlated to the degree of activation of the vasomotor system and is increased in erect position, during exposure to other gravitational forces, during muscular work, and under certain conditions of stress associated with aggressiveness and anger. Adrenaline excretion is increased in a variety of conditions of mental stress; e.g., during performance of certain tasks, examinations, excitation by external stimuli, fear, pain, or other disagreeable conditions, and anticipation of such states, particularly when involving competition and or possible dangers. Habituation to certain stress-inducing situations tends to decrease the adrenaline excretion. Attempts to correlate the catecholamine excretion pattern and personality traits seem to indicate that such studies may be of value for the characterization of individual types and as a means of predicting their reaction pattern to stress. Quantitative evaluation of stress by the catecholamine excretion tests may also provide some information on mental or bodily alterations which may affect performance.

A66-80163

ACCURACY OF ORIENTATION IN SPACE UNDER INCREASED ACCELERATION IN THE ABSENCE OF VISUAL REFERENCE FRAME.

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 378-394. 25 refs.

The perception of the apparent vertical without visual cues depends on the position of the longitudinal axes of body and head to the direction of the resultant acceleration above 1 g. With dissociation of the direction of the longitudinal axes of body and head, and exposing them separately in varying angles to the direction of the resultant acceleration, information is obtained on the contribution of systems involved in the perception of the vertical. Conclusions are derived from results of experiments on 15 volunteers subjected to a total of 397 different combinations of body and head position with resultant accelerations between 1.0 and 3.0 g. The position of the longitudinal axis of body or head influences the directions of the apparent vertical. The effect of the position of body and head is additive. The accuracy of estimation of the direction of the resultant acceleration is optimal up to 1.5 g, when body and head are held in the direction of the resultant acceleration. Above 1.5 g, the direction of the resultant acceleration is underestimated when the vector of forces moved transiently through a frontal plane to its final position. The direction of the resultant acceleration is increasingly overestimated when the vector of forces moved transiently through a sagittal plane to its final position. The precision of estimation of the apparent vertical is higher during lateral acceleration than during backward acceleration. The precision decreases slightly with tilt of body and head away from the direction of gravity.

A66-80164

METHODS FOR SOMATIC CLASSIFICATION OF PILOTS ACCORDING TO STATUS OF FUNCTIONAL MUSCULAR, CIRCULATORY AND RESPIRATORY CAPACITIES, AND POSSIBILITIES OF FURTHER DEVELOPMENT DURING TRAINING.

Gunnar Ström (Uppsala U. Hosp., Dept. of Clin. Physiol., Sweden).

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 395-404; discussion, p. 404-405. 43 refs.

Results of testing of the physical capability of Swedish Air Force personnel of different ages carried out systematically for a number of years are presented. Physical capability depends on the dimensions of different body organs and systems and on their dynamic functions. Dimensions as well as dynamic function may be modulated by several factors, such as growth and aging, physical training, dysfunction and disease, and state of nutrition. Different aspects of physical capability can be defined, though with somewhat arbitrary borderlines, such as muscular, circulatory, respiratory, and metabolic-regulatory capacity. The results are evaluated as indices of maximal functional output and of maximal steady-state level. These indices of physical capability depend on the dimensional prerequisites as well as on the efficacy of the homeostatic regulative functions. The different indices are mutually interrelated, to a greater or lesser degree, in the normal individual. Appraisal of these interrelationships is an important part of the testing procedure.

A66-80165

MONITORING AND PREDICTION OF NERVOUS FUNCTIONS IN SPACE.

W. Ross Adey (Calif. U., Brain Res. Inst., Space Biol. Lab., Los Angeles) and Don D. Flickinger.

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 406-423; discussion, p. 424. 21 refs.

Recognizing the extreme importance of monitoring and evaluating alertness, judgment, purposeful motor responsiveness during critical stages of future space missions, a prototype EEG recording equipment was developed

which meets the unique and rigid requirements imposed during space flight. Concomitantly with the required equipment and test and development a series of studies was conducted in animals exposed to simulated stresses of space flight up to 14 days duration. These studies included the effects of acceleration, vibration, sensory deprivation, hallucinogenic drugs on discriminative performance, alertness, and sleep-wakefulness cycles; with concomitant assays being made of steroid and catechol amine metabolism. As a basic keystone around which our final objective could be realized, the University of California at Los Angeles Space Biology Laboratory has pioneered in the application of 3 complex computer techniques to the analysis of the EEG data recorded. Differences in these various quantitative and qualitative functions analyzed have been seen in many of the responses studied, and the results thus far encourage the view that these techniques are more revealing of early significant changes than most others in current use.

A66-80166

S-R RELATIONSHIPS AND TRANSFER OF TRAINING.

E. C. Wortz and A. C. McTee (Garrett Corp., Air Research Manuf. Co., Los Angeles, Calif.)

Journal of Psychology, vol. 60, Jul. 1965, p. 277-282. 7 refs.

Thirty-five subjects participated in a simple stimulus-response task on a visual display. The problem involved the effects of training and test similarity on the difficulty of transfer for a paradigm in which test stimuli and responses are not new but are only simple rearrangements of previously learned S-R relationships. The difficulty of transfer (response reversal) is as follows: (1) Transfer for the 20% reversal group was significantly faster than for the 40% or 60% groups but not significantly faster than that for the 80% or 100% reversal groups. (2) The 100% reversal group was significantly faster than the 40% or 60% group. Therefore, a curvilinear function characterizes the relation between transfer difficulty and the number of S-R relationships altered. The data are discussed with respect to the Skaggs-Robinson hypothesis of a curvilinear relationship between similarity and facilitation (Robinson, E. S., 1927), Osgood's third law of transfer of training (1953), and the discrimination hypothesis formulated by Mowrer (1945).

A66-80167

PROGRESS IN THE NEW BIOLOGY OF DREAMING.

Frederick Snyder (Natl. Inst. of Mental Health, Sect. on Psychophysiol. of Sleep, Bethesda, Md.)

(Am. Psychiat. Assoc., 121st Ann. Meeting, New York, N. Y., May 3-7, 1965). American Journal of Psychiatry, vol. 122, Oct. 1965, p. 377-391. 150 refs.

Dreaming is presented as the subjective concomitant of a physiological state distinct from sleep and wakefulness. The physiological phenomenon associated with dreaming reports in man is the rapid eye movement state (REMS) which has been demonstrated in all mammals including opossum. Other characteristics include shallow, irregular respiration; diffuse, twitch-like muscular movement with some gross movement of extremities; increased respiratory and pulse rate; increased systolic pressure in man; and 2-3/sec. "saw-tooth" shaped waves on the electroencephalogram preceding or overlapping clusters of eye movements in man. REMS resembles arousal except for differences in the brain motor function. Periodic occurrences of REMS is dependent upon certain nuclei of the rhombencephalon. Locus coeruleus of the pons is necessary for the tonic motor inhibition associated with REMS. Its ablation results in release of rage-like motor behavior. Induction may be amoral, with experimental support for either a cholinergic or an adrenergic mechanism. Deficit in REMS is made up quantitatively. REMS deprivation is reflected by increased cortical excitability, completely reversible upon recovery. A possible adaptive function of REMS is hypothesized and certain implications drawn for clinical and mental disorders (narcolepsy, nocturnal angina, duodenal ulcer attacks, schizophrenia, sleep deprivation).

A66-80168

RECENT STUDIES ON THE BIOLOGICAL ROLE OF RAPID EYE MOVEMENT SLEEP.

William C. Dement (Stanford U. School of Med., Palo Alto, Calif.)

(Am. Psychiat. Assoc., 121st Ann. Meeting, New York, N. Y., May 3-7, 1965). American Journal of Psychiatry, vol. 122, Oct. 1965, p. 404-408. 15 refs. Grant Natl. Inst. of Mental Health MH-08185.

Behavioral and physiological effects of rapid eye movement sleep (REMS) deprivation were investigated in human and animal experiments. REMS is maintained by a homeostatic mechanism, and is characterized by a constancy surpassing that of sleep. Recovery from REMS deprivation in form of a compensatory rise occurs in a highly quantitative manner even after a 5 day delay in which REMS is held to a baseline amount. In cats, extended deprivation of 30 to 70 consecutive days shows a cumulative effect up to 30 days, but very little change thereafter. This is interpreted in favor of a biochemical regulatory mechanism where a certain enzyme system secretes an instigating compound that is used by REMS. In REMS deprivation it accumulates to a certain level at which it begins to leak out of the nervous system. In support of this hypothesis, injections of cerebral spinal fluid from REMS deprived cats cause a rise in REMS in recipients. Convulsive experience (electro-shock) abolishes compensatory rise after REMS deprivation. Behavioral manifestations of REMS deprivation

are: restlessness, prowling, abnormal appetite after starvation, and increase in sexual behavior. REMS primary role may be to provide needed activity in terms of primitive or instinctual behavior for the developing nervous system in the neonatal and/or embryonic period. In contrast to adult animals which rarely suffer from insomnia, disturbance of this system may occur in man. Efficacy of electroconvulsive therapy may be due to its property to reverse REMS deprivation effects.

A66-80169

SIMILARITY OF RADIATION PROTECTION MECHANISM OF AMINO THIOLS AND ANOXIA [OB OBSHCHESTNI MEKHAHIZMA RADIOZASHCHITNOGO DEISTVIA AMINOTIOLOV I ANOKSII].

E. I. A. Graevskii, M. M. Konstantinova, O. M. Sokolova, and A. G. Tarasenko. *Doklady Akademii Nauk SSSR*, vol. 164, no. 2, Sep. 11, 1965, p. 441-444. 16 refs. In Russian.

The similarity in radiation-protection mechanisms of two amino thiols, an indole-derivative, and anoxia was studied in albino mice, who were subjected to gamma-radiation. The protection was evaluated by the ability of the animals to survive 30 days after exposure. The level of the sulfhydryl group in spleen tissues was determined. All factors (serotonin, cystamine, cysteamine, and anoxia) caused a definite increase in the sulfhydryl group content. After injections of amino thiols, this increase was greater than could be expected from the simple chemical action of these compounds. In fact, their concentration in the spleen was decreased. The reason for the sulfhydryl increase must be sought not in the simple macromolecular reaction, but rather in a catalytic action, which can cause formation of endogenous sulfhydryl-containing compounds other than glutathione, in which the thiol hydrogen has great reactivity. These compounds must be of low molecular weight and can form metabolically stable compounds with biomacromolecules, possibly, through bisulfide coupling. Also, these sulfhydryl compounds could react with free radicals by inactivating them and interrupting the damage process. This point of view could explain the high effect of anoxia, which is always greater than that of chemical radiation-protectors.

A66-80170

REGULATION OF OXIDATION AND PHOSPHORYLATION CORRELATION IN CEREBRAL TISSUES IN OVERCOOLING AND HEATING [REGULIATSIIA SOPRIAZHENIIA OKISLENIIA I FOSFORILIROVANIIA V TKANIAXH GOLOVNOGO MOZGA PRI PEREOKHLAZHDENII I SOGREVANII].

I. A. I. Veksler and Z. S. Gershenovich (State U., Dept. of Biochem., Rostov on Don, Russia).

Biokhimiia, vol. 30, May-Jun, 1965, p. 449-456. 27 refs. In Russian.

In animal experiments respiration and phosphorylation in brain tissues were not correlated in vivo at some stages of hypothermy induced by 2,4-dinitrophenol. Injection of the solution greatly affected the metabolism of macroergic phosphate compounds by the effect varied with the stage of overcooling. At the first stages and during rewarming, oxidation and phosphorylation activity was separate while final stages were accompanied by a high degree of oxidative-phosphorylation with intensive resynthesis of macroergic compounds. The stages in dynamics of labile phosphate in the brain, so characteristic for hypothermy, are largely conditioned by periodic reshuffling of oxidation from the phosphorylating to the non-phosphorylating pathway. These interrelations have been confirmed in in vitro experiments of the brain cortex of hypothermic animals.

A66-80171

THE STRUCTURE AND COMPOSITION OF FATTY ACIDS OF THE ALGAE CHLORELLA LIPIDS [STROENIE I KOLICHESTVENNYI SOSTAV ZHIRNYKH KISLOT LIPIDOV VODOROSLI CHLORELLA].

A. G. Vereshchagin and G. L. Klitchko-Gurvich (USSR, Acad. of Sci., K. A. Timiriadze Inst. of Plant Physiol., Moscow).

Biokhimiia, vol. 30, May-Jun, 1965, p. 543-550. 22 refs. In Russian.

Dry cells of algae *Chlorella pyrenoidosa* 82 and *Chlorella* sp. K. harvested during the logarithmic phase of the culture growth contain 27% (dry weight) benzene-soluble lipids. The lipids have 12% (by weight) unsaponifiable, 21% fatty acids and some 65% water-soluble lipid constituents. Sterols, alcohols, and aliphatic hydrocarbons were found in the unsaponifiable fraction. Fatty acid methyl esters were separated, identified, and quantitatively estimated by gas-liquid chromatography, reversed-phase partition chromatography, and partition chromatography in a system containing silver ions. The two algae strains cited above have the following fatty acid composition: myristic, 9-tetradecenoic, palmitic, 9-hexadecenoic, 7,10-hexadecadienoic, 7,10,13-hexadecatrienoic, heptadecenoic, stearic, oleic, linoleic, linolenic acids. The role of internal and external factors in the higher fatty acid biosynthesis by algae cells is discussed.

A66-80172

SOME PHYSIOLOGICAL REACTIONS OF MAN UNDER CONDITIONS OF WEIGHTLESSNESS (NEKOTORYE FIZIOLOGICHESKIE REAKTSII CHELOVEKA V USLOVIAXH KRA TKOVREMENNOI NEVESOMOSTI).

I. I. Kas'tan, A. S. Krasovskii, I. A. Kolosov, M. A. Lomova, V. I. Lebedev, and B. N. Iurov.

Izvestia Akademii Nauk SSSR, Seriya Biologicheskaya, no. 5, Sep.-Oct, 1965, p. 633-646. 36 refs. In Russian.

In 120 parabolic flights, physiological responses of men to acceleration and weightlessness were studied. Parabolic flights were shown not to induce pathological changes in the organism, or in the morphology and biochemical values of blood and urine. Concentrations of non-esterized fatty acids after the first parabolic flight significantly increased in the majority of cases. Sufficient tolerance of the effects of weightlessness may be indicated by: (1) insignificant changes in pulse frequency in the weightless state; (2) adaptability to illusions of counterrotation and afterrotational nystagmus after a series of parabolic flights and (3) absence of unfavorable sensory and vestibular reactions (space illusions, dizziness, and motion sickness).

A66-80173

STABILIZED RETINAL IMAGES AND DISAPPEARANCE TIME.

Michel Millodot (Ind. U., Div. of Optometry, Bloomington).

British Journal of Physiological Optics, vol. 22, 1965, p. 148-152. 9 refs.

Experiments are presented attempting (1) to study the effect of stabilizing retinal images on disappearance time, and (2) to quantify this effect as a function of the size of the stimulus (Landolt rings). The subject, wearing a contact lens and viewing monocularly through the optical system, used to provide stabilization of the image, tapped lightly on a table when the previously presented Landolt ring had completely disappeared. The disappearance occurred within a few seconds and was related directly to the size of the stimulus. No reappearance occurred if nothing else was changed.

A66-80174

THE STATE OF THE INTRAORGANIC BLOOD SUPPLY OF THE LIMB MUSCLES DURING INTENSE PHYSICAL LOADS [PRO STAN INTRAORGANNOGO KROVOPOSTACHANNIA M'IAZIV KINTSIVOK PRY INTENSIVNYKH FIZYCHNYKH NA VANTAZHENIIAXH].

P. Z. Gud'z' (Kiev Inst. of Phys. Culture, Dept. of Functional Anat., Ukr. SSR). *Fiziologichnyi Zhurnal*, vol. 11, Jul.-Aug. 1965, p. 477-484. 18 refs. In Ukrainian.

During elevated physical loads, the functional capacity of the muscles depends to a great extent on the adaptability of the vascular system to the new physiological conditions. In an experiment on albino rats it was found that during the hypodynamic state many capillaries of the muscles are collapsed. The dilating arterio-venous anastomoses then let part of the arterial blood pass into the vein, bypassing the capillaries. In animals, in a state of high working capacity (training), the capillary network of the limbs is considerably dilated and new capillaries develop. The arterio-venous anastomoses contract, which secures the supply of the entire arterial blood to the capillary network of the muscles. Not only is hypertrophy of the muscle fibers noted, but their quantity is increased by longitudinal splitting of previously existing ones. This process is preceded by a rearrangement of the motor innervation of the muscles-hypertrophy of the elements of the motor disks and development of additional motor nerve endings. Thus, a myoneural synapsis develops on each of the parts of the dividing muscle fiber. Under conditions of chronic fatigue the arterio-venous anastomoses dilate, and because of this, part of the arterial blood goes into the vein without reaching the capillary network of the working muscle. This is one of the causes of disturbance of the ratio of loss to supply of energetic substances. Many muscle and nerve fibers are subjected to dystrophic and destructive changes under these conditions.

A66-80175

THRESHOLDS FOR NEGATIVE AFTER-IMAGES.

F. H. C. Marriott (U. Lab. of Physiol., Oxford, Great Britain).

Journal of Physiology, vol. 180, Oct. 1965, p. 888-892. 12 refs. Grant PHS B-1810 and Med. Res. Council supported research.

After-images produced by black and light targets 4° in diameter in peripheral vision with very low illumination are described. The thresholds for the appearance of these after-images were measured and found to be almost the same as the thresholds for detection of the targets. These after-images are ascribed to neural effects and associated with reactions described in electrophysiological experiments on the mammalian eye.

A66-80176

SOME SPECULATIONS ON THE MARTIAN CANALS.

Dean Jamison (Stanford U., Palo Alto, Calif.)

Publications of the Astronomical Society of the Pacific, vol. 77, Oct. 1965, p. 394-395. 7 refs.

A geothermal analogy is made between fault lines on Earth and the canals of Mars. This would in turn lead to speculating that these canals being of a warm, humid environment would be the most likely place to find life. This theory makes four predictions of the environmental conditions of the canals. The author proposes methods of verifying these predictions including use of the *Martiner* and *Voyager* projects.

A66-80177

NOTE ON DELAYED AUDITORY FEEDBACK, EXPOSURE TIME AND RETENTION.

David J. King (Albion Coll., Mich.)
Perceptual and Motor Skills, vol. 21, Oct. 1965, p. 497-498. 6 refs.
 Grant NSF GB-2845.

Two groups of subjects, matched on reading rate, were exposed to the learning material for the same length of time. The experimental group practiced under conditions of delayed auditory feedback, the control group did not. The immediate retention of learned material was significantly poorer in the experimental group. The inhibition of immediate recall of connected meaningful material by delayed auditory feedback cannot be accounted for as a function of the decreased reading rate and resultant greater exposure duration to the learning material.

A66-80178

ORGANISMIC VARIABLES AS PREDICTORS OF VIGILANCE BEHAVIOR.
 Charles G. Halcomb and Roger E. Kirk (Baylor U., Waco, Dallas, and Houston, Tex.)

Perceptual and Motor Skills, vol. 21, Oct. 1965, p. 547-552. 10 refs.
 Baylor Graduate Fac. Res. Fund supported research.

This research was designed to test the hypothesis that certain organismic variables are related to vigilance behavior. The vigilance task consisted of a cathode ray tube display which was monitored by 40 subjects for a period of 4 hr. Several of the organismic variables (personality and intelligence test data) were related to monitoring behavior. These were self-control and flexibility as measured by the California Psychological Inventory (CPI). Those subjects who scored high on both the intelligence test and the Achievement via Independence scale of the CPI showed no decline in their performance during the long monitoring session. These results suggest the feasibility of predicting subjects performance on a vigilance task from psychological measures.

A66-80179

THE VISUAL RESPONSE COMPONENT OF ROTARY PURSUIT TRACKING.
 Henry S. Rosenquist (Tulane U., New Orleans, La.)

Perceptual and Motor Skills, vol. 21, Oct. 1965, p. 555-560. 10 refs.

Adams (1955) found that watching the rotary pursuit affected subsequent performance. Since this finding disagrees with reports by Melton (1947), Ammons (1951), and Duncan (1957), the present experiment set out to test Adams' watching procedure for reliability and generality. Each of 198 subjects tracked the rotary pursuit for 5 min. with the right hand, next received one of 11 different treatments consisting of various durations of watching, resting or both and finally resumed tracking for another 5 min., using the left hand. After statistical adjustment of lefthand scores to the expected post-rest level, the results showed a decremental effect, supporting Adams, and indicated that the effect was functionally related to various durations of watching and resting.

A66-80180

NUMBER OF ALTERNATIVES AND SEQUENCE LENGTH IN ACQUISITION OF A STEP-FUNCTION TRACKING TASK.

Don Trumbo, Merrill Noble, and Lynn Ulrich (Kan. State U., Manhattan).
Perceptual and Motor Skills, vol. 21, Oct. 1965, p. 563-569. 7 refs.
 Grant AF-AFOSR 526-64.

The roles of two task parameters, sequence length (N) and number of alternatives in the population from which the sequence was drawn (K), were examined in a tracking task. The tasks were irregular step-function inputs wherein N was defined as the number of targets (steps) in a repeating sequence and K was defined as the number of alternative target positions. N and K were varied independently in a 3 x 3 factorial design with 9 subjects per cell. The major findings were that tracking performance, as measured by integrated error scores, is affected by increases in N, but not proportionately, while neither K nor the N x K interaction was significant. Relations of the results to verbal learning data are discussed.

A66-80181

SOME TASK PARAMETERS IN SIMPLE PATTERN RECOGNITION.

Thornton B. Roby (Tufts U., Medford, Mass.) and Lorraine Low (Boston U. School of Med., Mass.)

Perceptual and Motor Skills, vol. 21, Oct. 1965, p. 607-617.
 Contracts ONR 494(15) and AF 19(628)-2450.

The task presented to individual subjects required identification of a particular set of two digit numbers that was wholly contained in a larger set of displayed elements. Five stimulus factors were experimentally manipulated. Size of the display set, number of presumptive pattern sets, and density of display elements in the incorrect presumptive pattern sets were negatively related to accuracy of identification. The size of the pattern sets and the spatial distribution of pattern elements in the display were not related clearly to performance. The relevance of these studies to pattern identification in small group situations is discussed and illustrated.

A66-80182

SOME IMPLICATIONS OF MUSCLE TENSION CHANGES DURING DESYNCHRONIZED SLEEP.

Roy Yensen (New South Wales U., Australia).

Perceptual and Motor Skills, vol. 21, Oct. 1965, p. 627-634. 47 refs.

From a brief review of studies of muscle tension during sleep it is concluded that the widely accepted positive correlation between cerebral and psychological activity and muscle tension does not hold during desynchronized sleep (DS). Some similarities between DS and extreme relaxation are postulated, and a check of this hypothesis is suggested. Possible peripheral mechanisms involved in changes in muscle tension are discussed, and a technique of investigation is suggested whereby further insight into these mechanisms may be gained.

A66-80183

PERCEPTION BIBLIOGRAPHY: XXII. PSYCHOLOGICAL INDEX, NO. 18, 1911.

R. B. Ammons and C. H. Ammons (Mont. U., Missoula).

Perceptual and Motor Skills, vol. 21, Oct. 1965, p. 667-670. 104 refs.

This is an alphabetical listing of 104 references on perception, selected from Psychological Index, XXII, no. 18, 1911.

A66-80184

TELLING A COMPUTER HOW TO EVALUATE MULTIDIMENSIONAL SITUATIONS.

D. B. Yntema and L. Klem (Mass. Inst. of Technol., Lincoln Lab., Lexington).
IEEE Transactions on Human Factors in Electronics, vol. HFE-6, Sep. 1965, p. 3-13.

If a person could tell a computer exactly how he would evaluate every alternative that might arise, the machine could decide between any two alternatives as the person himself would. A fairly realistic experiment was done to test the feasibility of "interpolation between corners" as a psychological method for telling a machine how to compute the worths of multidimensional alternatives. The results were satisfactory. A statistic called fractional disagreement is proposed as the proper measure of the machine's success in mimicking the man's decisions. The concept of conflict between the dimensions of two alternatives is explained. The size of the conflict and the size of the difference between the worths that the machine ascribed to the alternatives were found to help to predict the correctness of the machine's decision. Conflict and difference in computed worth should, therefore, be useful in defining regions where the machine should give the decision back to the man and tell him to make the choice.

A66-80185

A THEORY FOR OPTIMAL DETERMINISTIC CHARACTERIZATION OF TIME-VARYING HUMAN OPERATOR DYNAMICS.

Walter W. Wierwille (Cornell U., Cornell Aeron Lab., Inc., Buffalo, N.Y.)
 (IEEE Intern. Convention, March 22-26, 1965, New York, N.Y.)

IEEE Transactions on Human Factors in Electronics, vol. HFE-6, Sep. 1965, p. 53-61. 16 refs.

NASA Contract NAS1-3485.

A deterministic theory of characterization is presented which can be used to determine the time-varying dynamics of the human operator engaged in a tracking task. With this theory it is possible to obtain a time-varying impulse response function and a time varying transfer function which represent the action of a human operator in an open- or closed-loop control system. No special form of input is required. The characterization, that may be in either real-time or nonreal-time, is based upon an exact theory of fixed-form optimization. A strongly convergent, definitely stable iteration technique can be used to realize the optimal characterization filter. The theory takes the time variation of the impulse response or transfer function into account, so that it is unnecessary to make the assumption of slowly varying dynamics. An uncertainty or compromise exists between the error, i.e., the error between the output of the human operator and that of the optimal characterizing filter, and the degree of variability of the optimal characterizing filter. This uncertainty is fundamental, and therefore cannot be circumvented. Although the theory has been verified by extensive experimental study, emphasis here is placed upon presentation of the theory.

A66-80186

A SAMPLED-DATA PURSUIT TRACKING MODEL.

John G. Kreifeldt (Case Inst. of Technol., Eng. Design Center, Cleveland, Ohio).

IEEE Transactions on Human Factors in Electronics, vol. HFE-6, Sep. 1965, p. 65-73. 6 refs.

NASA Grant Nsg 107-61.

A sampled-data pursuit hand tracking model for the human operator is developed and tested. The model embodies the simplest a priori assumptions about human tracking behavior. The analytical model is presented along with the experimentally determined frequency transfer characteristics of an analog computer built to have the same transfer function as the mathematical model. Generally, good agreement was obtained in matching the model's frequency- and time-domain responses to those of a well trained human, tracking in pursuit fashion an input power spectrum flat to 0.64 c.p.s.

A66-80187

THE SELECTION OF ASTRONAUTS INCLUDING DYNAMIC TESTING.

W. Randolph Lovelace II, Ulrich C. Luft, Albert H. Schwichtenberg, Thomas O. Newison, Robert Proper, Emanuel M. Roth, and G. Stanley Woodson (Lovelace Found., Albuquerque, N. Mex.)

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 35-63; discussion, p. 63-64. 34 refs.

The present status of a continuing thirteen-year problem of comprehensive special examination and evaluation procedures for the determination of the physical, mental, and social well-being, of preselected, highly motivated, and experienced test pilots and astronauts is reviewed. These subjects repeatedly had proven their ability to withstand the stresses of flight while performing their missions. During these years a group of clinicians and scientists have acquired a broad-interdisciplinary approach to such examinations. It is anticipated that highly trained and proven scientists will ultimately become one of the members of a spacecrew. Of necessity they will need to participate in a fairly large portion of the astronaut training program. Prior to their examination and selection these men will not have been exposed to the stresses of flight so that their reaction to such stresses will be unknown. The Gemini program will be most helpful in the final selection, indoctrination, and training of scientists as they can go along on orbital flights with an experienced astronaut.

A66-80188

THERMAL HOMOIOSTASIS UNDER HYPOXIA IN MAN.

T. P. K. Lim and U. C. Luft (Lovelace Found for Med. Educ. and Res., Albuquerque, N. Mex.)

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 132-145. 12 refs.

Human subjects were exposed to cold (4°C. relative humidity (RH) 30%), warm (40.5°C., RH 80%) and neutral (27°C. RH 30%) environmental conditions for two hours while breathing gas mixtures simulating an altitude of 6000 m. (inspired PO₂: 65 mm. Hg.) and for a control period of the same duration breathing air. In the cold, no difference was observed in the course of skin temperature between the hypoxic and eupoxic tests. Core temperatures were maintained constant in the presence of vigorous shivering whereby metabolic rate was increased 2 to 3 fold. In the warm environment, the core temperatures (rectal and gastric) were consistently higher with oxygen lack than in the controls, but the rate of increase in temperature was the same. At the end of the tests rectal temperature was at an average 39°C. The effects of combined thermal and hypoxic stress on cardiovascular and respiratory activity appeared to be additive. Subsequently, similar experiments were performed on lightly anesthetized dogs, where hypoxia of a more severe degree (inspired PO₂: 52, 41 and 29 mm. Hg) was employed. In these animals hypoxia invariably inhibited or entirely suppressed shivering, and in the cold they suffered a more rapid fall of mean body temperature under hypoxia than on air. Experiments in which a normal partial pressure of CO₂ was maintained by partial rebreathing suggest that hypocapnia may contribute to the suppression of shivering in the cold. During the exposure to heat there was a marked facilitation of panting under hypoxia, giving rise to extreme hyperpnea with hypocapnia.

A66-80189

TOLERANCE TO THE COMBINED EFFECTS OF COLD AND OF ABNORMAL ATMOSPHERE.

Radoslav K. Andjus (Belgrade U., Fac. of Sci., Inst. of Physiol., Yugoslavia).

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 105-130; discussion, p. 131. 29 refs.

The relationship between the effects of cold (external and internal) and different forms of anoxia is discussed on the basis of data from animal experiments, especially from the point of view of tolerance limits and with some reference to the underlying mechanisms. Resistance to external (environmental) cold is impaired by hypoxia (hypercapnia) which interferes with thermoregulation and renders difficult the maintenance of thermal homeostasis. Hypoxia may act as a hypothermia-inducing agent in a cold environment which by itself can be tolerated without change of body temperature. On the other hand, even such changes of ambient atmosphere, which at higher environmental temperatures can be compensated by physiological regulatory mechanisms, may induce in the cold serious disturbances of thermal homeostasis. From the point of view of homeostatic resistance, therefore, a mutual potentiation of the effects of cold and anoxia may be described. From the survival point of view, however, internal cold (hypothermia), induced by anoxia in a cold environment, may have a protective value; the fall of body temperature renders the homeotherm capable of surviving under anoxic conditions which would be lethal at normal body temperature.

A66-80190

SOME PRINCIPLES OF THE FORMATION OF ARTIFICIAL ENVIRONMENTS IN MANNED SPACE SHIPS [NEKOTORYE PRINTSIPIY FORMIROVANIA ISKUSSTVENNOI SREDY OBITANIA V KABINAKH KOSMICHESKIKH KORABLEI].

A. M. Genin, O. G. Gazznko, and N. P. Sergeev (USSR, Acad. of Sci., Moscow).

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 285-301. 5 refs. In Russian and English.

The problem of creating a tolerable environment has its own specific features which are determined by the conditions peculiar to space flight. The following are of great importance: (1) there are no materials or substances in the external surroundings which could be used to form an artificial environment in the space capsule; (2) man's continuous occupation of the capsule's artificial environment for a lengthy period; (3) the strict limitations on power supplies, weight and dimensions of the cabin and all its parts; and (4) the practical impossibility of securing complete protection from certain cosmic flight factors (primary cosmic radiation, etc.). The efficiency of the systems used to regenerate and condition for consumption supplies of water, air, and food, is the decisive factor in maintaining optimum conditions in the artificial environment of the space capsule. Theoretically feasible systems for preserving human life on the basis of physical, chemical and biological processes are presented and appraised.

A66-80191

SOME CHARACTERISTICS OF STRESS REACTIONS [QUELQUES DETAILS GENERAUX DES REACTIONS STRESSANTES].

Milan Moravec (Karlovy U., Inst. de Med. Aeron., Prague, Czechoslovakia).

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 302-307. In French.

The following stresses were investigated: (1) A 100 km. march lasting three days (100 subjects), (2) sleep deprivation for 48 to 105 hours (7 subjects), (3) a short period of sleep deprivation (up to 48 hours) under strong emotional strain (10 subjects), (4) 5-day starvation (8 subjects), and (5) oxygen starvation induced by simulating an altitude of 5,000 to 8,000 m. (700 subjects). Some of the main conclusions reached are: (a) the changes caused by stresses in question are generally specific in character; (b) reactions vary considerably from individual to individual, the difference in many cases being greater than between the same individual's reactions to various stresses; (c) the changes provoked by strain of longer duration do not follow a simple linear course; (d) all changes occurring in higher nervous activity under stress are identical in form with those observed in neurotics; (e) the most typical feature is a disturbance in internal inhibition (as reported by Pavlov); (f) there is no simple correlation between biochemical reactions and reactions in higher nervous activity; and (g) exposure to prolonged stress lowers resistance to superimposed stress of short duration.

A66-80192

OBSERVATIONS ON HEART RATES AND CARDIODYNAMICS DURING PROLONGED WEIGHTLESSNESS SIMULATED BY IMMERSION METHOD.

Julian Walawski and Zbigniew Kaleta (Med. Acad. and Mil. Inst. of Aviation Med., Dept. of Pathophysiol., Warsaw, Poland).

IN: PROC. FIRST INTERN. SYMP. ON BASIC ENVIRON. PROBL. OF MAN IN SPACE, PARIS, 1962.

Wien, Springer-Verlag, 1965, p. 179-185. 9 refs.

The effect of long-term weightlessness, simulated by immersion on the electrocardiogram (ECG) and blood pressure was studied in rabbits. The animals were under urethane narcosis to eliminate the influence of the central nervous system. The experimental animals were submerged in 1% solution of NaCl at temperatures ranging from 34 to 35°C. Respiration was made possible by tracheotomy tube connected with a respiratory valve. Blood pressure from the carotid artery was registered kymographically using a mercury manometer. ECG electrodes were introduced under the skin of the fore and hind extremities. All incisions were sutured carefully to avoid contact of electrodes with the immersion fluid. The immersion period ranged from 12 to 24 hours. No significant change was observed in either ECG or blood pressure.

A66-80193

PROBLEMS IN AIR TRAFFIC MANAGEMENT. VII. JOB AND TRAINING PERFORMANCE OF AIR TRAFFIC CONTROL SPECIALISTS— MEASUREMENT, STRUCTURE, AND PREDICTION.

David K. Trites, Bart B. Cobb (FAA, Office of Aviation Med., Oklahoma City, Okla.), and M. Clinton Miller (Okla. U., Med. Center, Biostatist. Unit, Oklahoma City).

Aerospace Medicine, vol. 36, Dec. 1965, p. 1131-1138. 13 refs.

Contract FA/AC-4-730.

A statistical study of training and job performance measures of several hundred Air Traffic Control Specialists (ATCS) representing Enroute, Terminal, and Flight Service Station specialties revealed that training performance measures reflected (1) performance in the training laboratories, (2) academic performance, and (3) instructors' opinions. In the job performance area, supervisors seemed to be evaluating (1) overall performance of an ATCS, (2) his interpersonal orientation, (3) job orientation, (4) job potential, (5) job performance and (6) emotional stability. By examining the predictability of the job performance measures by training performance, aptitude tests, previous job relevant experience, and demographic characteristics, evidence was elicited

that (1) the ATCS specialties differ in the characteristics required for job performance, (2) terminal supervisors more consistently evaluate their ATCS in comparison with enroute supervisors, (3) opinions of the ATCS training course instructors are the best predictors of subsequent job performance, and (4) aptitude tests, previous job-relevant experience, and age at entry into training are related to job performance but not at very high levels.

A66-80194

ENDOCRINE AND METABOLIC RESPONSE OF DOGS TO WHOLE BODY VIBRATION.

Ben B. Blivaiss, Renato Litta-Modignani, Giorgio Galansino, and Piero P. Foa (Chicago Med. School, Dept. of Physiol., Ill.)

Aerospace Medicine, vol. 36, Dec. 1965, p. 1138-1144. 45 refs. Contract AF 33(616)6889.

To determine the endocrine and metabolic response of restrained dogs to whole body vibration, pentobarbital anesthetized and non-anesthetized dogs were vibrated horizontally. After vibration of anesthetized dogs at either 4 c.p.s., 0.4 g for 30 minutes or 2 hours, or at 10 c.p.s., 2.3 g for 2 hours, there was an average increase of 4.08 mcg, 17-hydroxycorticosteroids (17-OH-CS) per 100 ml. plasma and a significant increase in blood epinephrine but not serotonin or norepinephrine. Shaking at 4 c.p.s., 1.7 g for 30 minutes produced less of a change in plasma 17-OH-CS than at 0.4 g. However, shaking at 4 c.p.s for 6 hours led to greater increase in plasma 17-OH-CS at 1.7 g than at 0.4 g. Non-anesthetized dogs shaken at 4 c.p.s. for 30 minutes had a greater increase of plasma 17-OH-CS than similarly shaken anesthetized dogs, thus showing a greater sensitivity of kinesthetic receptors to vibratory stimuli. Possible mechanisms for alterations in endocrine function are discussed.

A66-80195

INFLUENCE OF LOWER BODY NEGATIVE PRESSURE ON THE LEVEL OF HYDRATION DURING BED REST.

Lawrence E. Lamb and Paul M. Stevens (Aerospace Med. Div., USAF School of Aerospace Med., Brooks AFB, Tex.)

Aerospace Medicine, vol. 36, Dec. 1965, p. 1145-1151. 8 refs.

In four subjects bed rest was used to induce recumbency diuresis. This was manifested by a decrease in fluid balance, body weight, and plasma volume, accompanied with an increase in hematocrit. After the changes from bed rest had occurred, the use of low body negative pressure (LBNP) over a two-day period resulted in rehydration manifested by an increase in fluid balance, body weight, and plasma volume, accompanied with a decrease in hematocrit. The use of LBNP is an effective means to restore hydration, after recumbency diuresis has occurred. This has important applications to manned space flight when it is desirable to maintain the level of hydration.

A66-80196

EFFECTS OF 9-ALPHAFLUOROHYDROCORTISONE ON DEHYDRATION DUE TO PROLONGED BED REST.

Paul M. Stevens and Theodore N. Lynch (USAF School of Aerospace Med., Internal Med. Branch Aerospace Med. Sci. Div., Brooks AFB, Tex.)

Aerospace Medicine, vol. 36, Dec. 1965, p. 1151-1156. 19 refs.

The effects of 9-alpha-fluorohydrocortisone on the metabolic changes which occur during six days of bed rest were studied in four healthy subjects. During the first 24-hours of bed rest a loss of weight and an increase in urinary water and sodium excretion was noted in all subjects. By the end of the sixth day of bed rest the hematocrit had increased while the plasma volume had decreased by a mean of 560 cc. The experimental protocol was then repeated, but 9-alpha-fluorohydrocortisone, 2 mg./day, was given during the last two days of bed rest. During this time, the weight increased, water and sodium retention occurred, the hematocrit decreased and the plasma volume showed a significant increase of 239 cc. by the end of the sixth day of bed rest. It is suggested that part of the "orthostatic deconditioning" described following prolonged bed rest is due to plasma volume loss and that treatment with two days of 9-alpha-fluorohydrocortisone is a simple and efficient way to replete plasma volume losses due to prolonged bed rest.

A66-80197

USAF AIRCRAFT ACCIDENTS INVOLVING TEN OR MORE FATALITIES.

Anchard F. Zeller (Deputy The Inspector Gen., Life Sci. Div., Norton AFB, Calif.)

Aerospace Medicine, vol. 36, Dec. 1965, p. 1156-1159. 5 refs.

Disaster accidents, defined as those involving ten or more fatalities, are not an inconsequential part of the total Air Force aircraft accident picture. Yet, despite their spectacular nature and the great amount of public interest which they arouse, they are not the major source of accident loss to the Air Force in material, money, or lives. Of the 14,166 accidents experienced during the period 1953 through 1962, 81 fell into the disaster category. These resulted in 1,641 fatalities. An additional 2,461 fatal accidents involved 5,989 casualties. Disaster accidents are notable for the number of instances in which the cause of the accident cannot be determined. When the cause is determined, the pattern is quite comparable to that for the less severe accidents, with error on the part of the pilot being most frequently assessed. As it is not possible to predict when a potentially insignificant occurrence may degenerate into a tragedy, there are no remedial measures unique to the prevention of disasters.

A66-80198

COMPARATIVE EFFECTS OF PROLONGED ROTATION AT 10 RPM ON POSTURAL EQUILIBRIUM IN VESTIBULAR NORMAL AND VESTIBULAR DEFECTIVE HUMAN SUBJECTS.

Alfred R. Fregly and Robert S. Kennedy (U.S. Naval School of Aviation Med., Pensacola, Fla.)

(Aerospace Med. Assoc. Meeting, New York City, Apr. 26, 1965).

Aerospace Medicine, vol. 36, Dec. 1965, p. 1160-1167. 24 refs.

NASA supported research.

As a means of better understanding the role of the vestibular organs in relation to ataxic responses to prolonged rotation, two contrasting groups of subjects were utilized to (1) determine quantitatively to what extent two visually-enhanced postural equilibrium test performances of labyrinthine defective subjects (L-D's) on a single rail of optimum difficulty become disturbed along the time axis of rotation (Experiment A), and (2) compare the performances of these L-D subjects with those of normal subjects in terms of postrotation effects as studied with a new standardized ataxia test battery (Experiment B). Rotation-induced ataxia was superimposed to an appreciable extent upon the previously present and characteristic vestibular ataxia in the L-D's (Exp. A), and upon cessation of rotation (Experiment B), there were significant decrements on all Test Battery performances of the normal group, whereas in the L-D group significant decrements were observed only on the two visually-enhanced tests. Other findings, which were considered tentative, are discussed in terms of several unresolved methodological problems in such experiments.

A66-80199

VERBAL COMMUNICATION INTELLIGIBILITY IN OXYGEN-HELIUM, AND OTHER BREATHING MIXTURES, AT LOW ATMOSPHERIC PRESSURES.

Julian P. Cooke and Sarah E. Beard (Aerospace Med. Div., USAF School of Aerospace Med., Brooks AFB, Tex.)

Aerospace Medicine, vol. 36, Dec. 1965, p. 1167-1172. 16 refs.

AF Systems Command supported research.

Thirteen simulated flights with 25 subjects and 4 chamber operators were performed using some 8,300 numbers and words and 2,200 words in sentences to help evaluate communication intelligibility in oxygen at 5 and 3.5 p.s.i.a., in oxygen-and-nitrogen at 7 p.s.i.a., and in oxygen-and-helium at 7 p.s.i.a., and to compare these findings with those obtained in room air at ground level. Three-way communication was carried out between chamber subjects, and ground level operators in room air. No statistically significant differences could be detected in test results when either words within sentences or random numbers were employed, but unrelated words resulted in statistically significant differences in some cases. The same order of magnitude or less of errors resulted in a reduced oxygen-and-helium environment as in an oxygen environment at the same oxygen partial pressure, thus indicating no new communication intelligibility problems are created by the addition of helium. Also, the effects due to tiring or lack of alertness create as many problems in room air as do the reduced pressures if subjects are alert. More errors result between subjects in test environments than between subjects and operators, in which case phone communications equipment is necessary. Most errors are of the rhyming type.

A66-80200

VALIDITY OF THE OCULOGRAVIC ILLUSION AS A SPECIFIC INDICATOR OF OTOLITH FUNCTION.

Ashton Graybiel and Brant Clark (U.S. Naval School of Aviation Med., Pensacola, Fla.)

Aerospace Medicine, vol. 36, Dec. 1965, p. 1173-1181. 18 refs.

NASA Grant R-37.

In experiments carried out on a human centrifuge, normal subjects perceived the oculogravic illusion in both its dynamic and static aspects, while the typical illusion was not seen by any of the subjects with loss of labyrinthine function. Only two of these ten subjects described the dynamic characteristics of the illusion and none responded consistently in a normal manner. It is concluded that the typical oculogravic illusion is a valid indicator of otolith function. Arguments are presented for concluding that nonotolith cues may evoke an atypical illusory response. Explanatory material on the nature of the oculogravic illusion is included as an introduction.

A66-80201

EFFECTS OF ADRENALIN OR INSULIN ON THE PERFORMANCE OF WORKING AND RESTING SUBJECTS.

Clayton R. Coler, William A. McLaurin, and Donald R. Young (NASA, Ames Res. Center, Moffett Field, Calif.)

Aerospace Medicine, vol. 36, Dec. 1965, p. 1181-1186.

The performance and physiological effects of adrenalin or insulin were studied in human subjects. After approximately eight hours of enforced work or rest, one group of nine subject received insulin, and another group of nine subjects received adrenalin. The subjects in each drug group participated in both a working condition and a resting condition on separate occasions. Short-term memory, choice reaction time, and steadiness tests were used to evaluate subject performance. Ten preinjection and seven postinjection sessions of performance testing were given. Postinjection performance decrements occurred

on all three tests for all subjects, both working and resting, in the insulin group. Fewer decrements occurred in the adrenalin group. For the insulin group, postinjection decrements were most frequent in the working condition. However, for the adrenalin group, postinjection decrements were most frequent in the resting condition. Three hours after injection, performance had not recovered to preinjection levels in the working condition of the insulin group, while recovery had occurred in all other conditions.

A66-80202**SURVEY OF SOVIET ACTIVITY IN THE USE OF ACTIVE CHEMICALS FOR SPACE CABIN AIR REVITALIZATION.**

A. W. Petrocelli (Gen. Dyn./Elec. Boat Div., Groton, Conn.)

Aerospace Medicine, vol. 36, Dec. 1965, p. 1187-1191. 63 refs.

The Soviet manned space flights have relied on an "active chemical" for the maintenance of a habitable cabin atmosphere. The "active chemical" has not been specifically identified in the available Soviet published literature. However, reasonably detailed descriptions of the properties of the "active chemical" have been given and, on the basis of those descriptions, it is concluded that the material employed was an alkali metal superoxide. Soviet scientists have been active for many years in the study of inorganic peroxides, superoxides, and ozonides as air revitalization materials. This activity is reviewed and the significance of current Soviet basic chemical studies to future chemical air revitalization systems is analyzed.

A66-80203**BEHAVIOR OF SERUM LACTIC DEHYDROGENASE IN MEN EXPOSED TO BRIEF, INTENSE THERMAL IMPULSES.**

Duncan E. McVean and Leandro Rendon (Aerospace Med. Div., Aerospace Med. Res. Labs., Wright-Patterson AFB, Ohio).

Aerospace Medicine, vol. 36, Dec. 1965, p. 1192-1193.

AF Systems Command supported research.

Lactic dehydrogenase isozyme patterns in serum obtained from human subjects exposed to brief, intense thermal impulses were determined by electrophoresis on acrylamide gel. Total lactic dehydrogenase activity of the serum was also determined using a standard clinical method. No change was observed in either the serum lactic dehydrogenase isozyme pattern or in the total lactic dehydrogenase activity.

A66-80204**RADIATION HAZARDS IN OUTER SPACE.**

Victor Bazykin (USSR, Acad. of Sci., Astronomy and Geodesy Soc., Moscow).

Aerospace Medicine, vol. 36, Dec. 1965, p. 1194-1195.

Radiation hazards encountered by Russian astronauts are described and discussed. The astronauts' names, flight duration, and average dose radiation received are included. Radiation detection devices to warn the astronauts of impending danger are also discussed, as well as medicines provided for their use in emergencies to prevent radiation injury. None of the Russians had to use these protective medicines during flights of the spaceships Vostok and Voskhod.

A66-80205**DIAGNOSTIC CRITERIA FOR GLAUCOMA AND THE PILOT.**

John R. Finlay.

Aerospace Medicine, vol. 36, Dec. 1965, p. 1196-1199. 18 refs.

The FAA examination does not detect early glaucoma—only blindness due to glaucoma. Statistics suggest a significant amount of undetected glaucoma in pilots. Glaucoma should not be disqualifying. The standards regarding glaucoma should be made more realistic to reject only those patients who present hazard of sudden incapacitation or functional disability during their period of licensure. To detect glaucoma and prevent blindness, instrument tonometry should be a requisite part of the FAA examination in pilots over 35 years of age.

A66-80206**AIRSICKNESS IN STUDENT AVIATORS.**

G. J. Tucker, D. J. Hand, A. L. Godbey, and R. F. Reinhardt (U.S. Naval School of Aviation Med., Sect. on Neuropsychiat., Pensacola, Fla.)

Aerospace Medicine, vol. 36, Dec. 1965, p. 1200-1202.

One thousand sixty-seven student naval aviators were rated at the end of each flight during the pre- solo and basic acrobatic phase of training by the flight instructor for the presence or absence of nausea or vomiting during the flight. To be so rated, the airsickness had to be severe enough to cause inability to control the aircraft. In this manner, a profile of the patterns of airsickness was obtained on each student over the course of the primary flight training. The incidence of this type airsickness was 17.6% (188 students out of 1,067). Correlations between incidents of airsickness per student and their ground school grades and flight grades were not statistically significant. There are three main periods during which the majority of airsickness occurs (79%). These are the initial three training flights, the seventh, and the first three dual acrobatic flights. These periods are closely correlated with the various and

different peaks of physiologic and psychological stresses during this phase of training and provide useful baselines for the evaluation of airsickness in student aviators.

A66-80207**EXERCISE AND THE PATELLAR REFLEX.**

Charles M. Tipton and Peter V. Karpovich (Springfield Coll., Physiol. Res. Lab., Mass.)

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 15-18. 29 refs.

Grant Natl. Inst. of Arthritis and Metabolic Diseases AM 06724-01 555.

The relationship between muscular activity and patellar reflex time (the time from the striking of the patellar tendon to the beginning of leg extension) of the right leg was investigated on male subjects between the ages of 17 and 50 yrs. Riding a friction bicycle for 5 or more min, or performing 600 or more ipsilateral or contralateral extensions was associated with shortened times; but only the former was changed significantly. The Jendrassik maneuver before and after exhaustive exercise shortened reflex time; however, the post-exercise readings did not approach pre-exercise times. Reflex times tended to shorten with training. The results demonstrated that reflex time will shorten or lengthen, depending upon the amount of exercise performed.

A66-80208**BEHAVIORAL THERMOREGULATION IN YOUNG AND OLD RATS.**

Leonard F. Jakubczak (Veterans Admin. Hosp., Gerontol. Psychol. Lab., Jefferson Barracks, St. Louis, Mo.)

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 19-21. 10 refs.

Grant NIH HD-18208-03.

The purpose of this experiment was to determine whether there were age differences in thermoregulatory behavior, and to relate these differences to age differences in rate of loss of body heat in a cold environment. Thirty male Sprague-Dawley rats, evenly divided among three age groups, 7, 12, and 28 months of age, were placed in an experimental chamber within a refrigerator for 16 hrs. and were given access to a lever that turned on a heat lamp. The ambient temperature within the refrigerator was set at 2°C., the output of the heat lamp was 250 watts, and the duration of each heat burst was 2 sec. Previous to this experimental session, determinations had been made of the effects of this low ambient temperature on the rectal temperature of the rats. Over the age range investigated, the rats learned and performed thermoregulatory lever-pressing behavior equally well, and showed equal heat loss as measured by rectal temperature.

A66-80209**ROLE OF HYPOCAPNIA IN THE CIRCULATORY RESPONSES TO ACUTE HYPOXIA IN MAN.**

David W. Richardson, Hermes A. Kontos, William Shapiro, and John L. Patterson, Jr. (Va., Med. Coll., Dept. of Med., Richmond).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 22-26. 23 refs.

Grants Natl. Heart Inst. H-3361 and HTS-5573 and DA MD 49-193-65-G153.

The role of hypocapnia in the circulatory response to acute hypoxia was investigated in 18 healthy men. Cardiac output increased by 76%, heart rate increased by 25%, and arterial pressure did not change significantly in 9 subjects who breathed 8% oxygen in nitrogen for 7-8 min. Addition to this inspired gas mixture of sufficient carbon dioxide to raise arterial pCO₂ to its control value reduced the circulatory changes, but raised arterial oxygen tension from an average of 37 to 52 mm. Hg as a result of increased ventilation. Abolition of hypocapnia without change in arterial oxygen tension, by reducing oxygen concentration from 9 to 7% when CO₂ was added to inspired gas, produced no change in the circulatory responses to hypoxia in 12 subjects. Thus, hypocapnia does not appear to be responsible for the increase in cardiac output, heart rate, and forearm blood flow which accompany acute arterial hypoxia.

A66-80210**CIRCULATORY RESPONSES TO IMMERSING THE FACE IN WATER.**

I. Brick (Belfast, Queen's U., Dept. of Physiol., Northern Ireland).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 33-36. 20 refs.

Simultaneous measurements were made of heart rate and forearm blood flow in man during 1-min. periods of breath holding while immersing the face in water, breath holding alone, and immersion of the face alone while continuing to breathe through a breathing tube. Breath holding while immersing the face in water and breath holding alone resulted in almost identical responses. In each case heart rate fell by about 15% and forearm blood flow fell by about 20%. The response to water touching the face was similar but smaller, heart rate and forearm blood flow both falling by about 10%. It was concluded that both water touching the face and breath holding contribute toward the reduction in heart rate and forearm blood flow found on immersing the face in water, the major contribution coming from the breath holding.

A66-80211**CIRCULATORY ADAPTATION TO ARM AND LEG EXERCISE IN SUPINE AND SITTING POSITION.**

Sture Bevegård, Ulla Freyschuss, and Tore Strandell (Karolinska Sjukhuset, Thoracic Clin., Dept. of Clin. Physiol. and Lab. of Clin. Physiol., Stockholm, Sweden).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 37-46. 31 refs. Karolinska Inst. supported research.

In six healthy, young males the adaptation to arm, leg, and combined arm and leg exercise was studied by cardiac catheterization in supine and sitting position. The hemodynamic and ventilatory responses were equal during leg exercise and when more muscle groups participated as during combined arm and leg exercise. During exercise with the arms, however, total ventilation, heart rate, and lactate formation were significantly higher for a given oxygen uptake. With arm exercise the systolic, diastolic, and mean pressures in the aorta increased more in relation to the cardiac output than when the legs participated in the work. The observed differences in circulatory adaptation during arm versus leg exercise indicate higher sympathetic tone during arm exercise. The effect of body position was more pronounced during arm exercise only when the legs took part in the work. In the sitting position the stroke volume did not increase on transition from rest to arm exercise when the legs were passive.

A66-80212

RESPONSE OF CAPACITY VESSELS IN HUMAN LIMBS TO HEAD-UP TILT AND SUCTION ON LOWER BODY.

Shlomo L. Samuelfoff, Norman L. Browne, and John T. Shepherd (Mayo Clin. and Mayo Found., and Mayo Graduate School of Med., Rochester, Minn.)
Journal of Applied Physiology, vol. 21, Jan. 1966, p. 47-54. 31 refs. Grant NIH HE-05883.

The "occluded" limb technique was used for continuous monitoring of reflexly mediated changes in venous tone in 10 normal subjects. Tilting to 70° head up and exposure of the lower part of the body to subatmospheric pressure (60 mm. Hg) caused a transient increase in venous pressure in the hand, foot, and forearm whose circulation was arrested, in contrast to a maintained decrease in forearm blood flow. On return to the horizontal or release of suction, another transient rise in venous pressure often occurred in association with an increase in forearm blood flow. The transient venous responses could not be related to the redistribution of blood caused by these procedures. It seems that reflex changes in tone of the capacity vessels in the limbs are not an essential part of the compensatory vascular responses for maintenance of systemic arterial blood pressure in the upright position, although the transient increase in tension of the walls of the capacity vessels may aid the resistance vessels in reducing the rate of pooling of blood in dependent parts.

A66-80213

INFLUENCE OF AGE ON THE CARDIOVASCULAR AND RENAL RESPONSES TO TILTING.

T. David Lee, Jr., Robert D. Lindeman, Marvin J. Ytengst, and Nathan W. Shock (NIH, Natl. Heart Inst., Gerontol. Branch, Bethesda; and Baltimore City Hosp., Md.)

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 55-61. 29 refs.

Healthy male subjects, age 19 to 82, had simultaneous measurements of cardiac and renal function preceding, during, and following 45° head-up tilt. Both cardiac output and renal blood flow decreased with age in the resting supine position. The decrease in the renal fraction of the cardiac output with age was small and not statistically significant. Fifteen of twenty-one subjects tolerated 1 hr. of head-up tilt. Urine flow, glomerular filtration rate, renal blood flow, and electrolyte excretion fell with tilting in both young and old subjects. Stroke volume fell and heart rate, diastolic arterial pressure, and peripheral vascular resistance increased in both age groups. Cardiac index fell significantly only in the old subjects while systolic and mean arterial pressures increased with tilt only in the young subjects. No significant differences in response to tilt were observed between the young and old subjects.

A66-80214

EARLY ERYTHROPOIETIN, BLOOD, AND PHYSIOLOGICAL RESPONSES TO SEVERE HYPOXIA IN MAN.

William E. Sirt, Donald C. Van Dyke, H. Saul Winchell, Myron Pollycove, Howard G. Parker, and Anne S. Cleveland (Calif. U., Donner Lab. and Donner Pavilion, Berkeley).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 73-80. 24 refs. AEC supported research.

Serum and urinary erythropoietin, plasma-iron turnover, and various physiological parameters were systematically measured in a human subject exposed 4 days to 405.8 mm. Hg (stimulated 16,400 ft.) following rapid decompression. Serum erythropoietin became detectable at 12 hr., reached maximum concentration on the 3rd day, and fell to low levels on the 4th. Plasma-iron turnover and hemoglobin synthesis followed a similar pattern, although elevated rates persisted for some time after return to sea-level pressure. The rise and fall in serum erythropoietin correlated with other physiological changes occurring during acute acclimatization, including marked changes in cardiac and pulmonary function, subsidence of severe hypoxic symptoms, and increased serum protein-bound iodine, oxygen consumption, urinary excretion of adrenocortical steroids, and concentration of all blood cells except erythrocytes in peripheral blood.

A66-80215

PHYSIOLOGICAL ROLE OF THE ADRENAL MEDULLA IN THE PALMAR ANHIDROTIC RESPONSE TO STRESS.

J. Harrison and P. C. B. MacKinnon (Roy. Free Hosp. School of Med., Dept. of Anat., London, Great Britain).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 88-92. 22 refs. Med. Res. Council supported research.

Previous work showed that epinephrine, administered systemically, produces palmar anhidrosis by nonperipheral mechanisms; ACTH produced the same effect. A simple experimental stress is described which activates the adrenal medulla and cortex and also reduces the number of active palmar sweat glands. Prior administration of an epinephrine-blocking agent prevented this palmar anhidrotic effect in most subjects. The effect of the stress (straight leg raising) and of epinephrine was investigated in hypophysectomized patients. Although not all of these exhibited the usual palmar response to stress, they did so to epinephrine. The findings suggest that the effect on the palmar glands of stress is primarily due to circulating catecholamines, independent of pituitary-adrenocortical activation; the role of the latter mechanism remains uncertain.

A66-80216

WATER CONSUMPTION BY MAN IN A WARM ENVIRONMENT: A STATISTICAL ANALYSIS.

J. E. Greenleaf, E. G. Averkin, and Frederick Sargent II (NASA, Ames Res. Center, Moffett Field, Calif.; and Ill. U., Dept. of Physiol. and Biophys., Urbana).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 93-98. 28 refs.

Twenty-two metabolic variables were examined using stepwise linear regression analysis for their possible relationship to voluntary water consumption in 87 young men. Six variables: (1) mean daily urinary vol., (2) serum osmolality, (3) lying pulse rate, (4) mean daily urinary Cl, (5) mean daily urinary K, and (6) rate of sweating accounted for 62% of the variation in water intake. The addition of the remaining 16 variables accounted for only 71% of the variation. An equation was constructed that estimated water intake from these six variables. The anions, particularly Cl, might be of greater importance in influencing drinking than has been previously realized. The data suggest that some combination of body osmolality and body fluid volume is associated with voluntary water intake in man.

A66-80217

SWEAT CHLORIDE CONCENTRATION: SWEAT RATE, METABOLIC RATE, SKIN TEMPERATURE, AND AGE.

D. B. Dill, F. C. Hall, and W. Van Beaumont (Ind. U., Dept. of Anat. and Physiol., Bloomington).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 99-106. 18 refs. Grant PHS CD 00056-01.

The concentration of chloride in sweat was studied in 12 men and 31 boys at Boulder City, Nevada, in June and July 1964. Five of the men had participated in similar studies at Boulder City in 1932 or 1937. Chloride concentration tended to increase with sweat rate but bore little relation, if any, to skin and rectal temperatures. In most subjects it was lower after acclimatization than it was in winter or spring at Bloomington, Indiana, or Santa Barbara, California. Individuals walking under the same conditions with the same sweat rate vary widely in chloride concentration in sweat. This is clearly directly related to age, as indicated by both cross-sectional and longitudinal observations. There are wide differences at the same age that may be inborn: One subject and his son have unusually high sweat chloride while another subject and his son have unusually low sweat chloride.

A66-80218

FATIGUE OF THE SWEAT GLAND RESPONSE.

C. H. Wyndham, N. B. Strydom, J. F. Morrison, C. G. Williams, G. A. G. Bredell, and J. Peter (Transvaal and Orange Free State Chamber of Mines, Human Sci. Lab., Johannesburg, South Africa).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 107-110. 12 refs.

Sweat rates and rectal temperatures were measured on 10 men at the end of each of the 5 hr. of exposure to 10 different environmental conditions and 5 different rates of metabolic heat production, i.e., a total of 50 different experimental conditions. The mean sweat rates were plotted against the mean rectal temperatures of the 10 men for each hr., and curves with a double exponential function were found to be a good fit to the data. From these curves it is clear that the duration of exposure to heat has the effect of (1) diminishing the sensitivity of the sweat rate response to rise in internal body temperature and (2) decreasing markedly the maximum capacity of the sweat response to a relatively high increase in internal body temperature, i.e., 103°F. These two response characteristics, a diminution in sensitivity and a decrease in maximum capacity, are unequivocal evidence of fatigue of the sweat glands.

A66-80219

USE OF SWEATING RATE TO PREDICT OTHER PHYSIOLOGICAL RESPONSES TO HEAT.

The effects of exercise at increased ambient pressure were investigated in four young men working on a bicycle ergometer in a recompression chamber. At each of 1, 2, 3, and 4 atm. abs. ambient pressure each subject worked at 300, 573, and 846 kg.-m./min. for 6 min. with equal intervening rest periods. Five parameters were continuously recorded; expired P_{CO_2} (by mass spectrometer), inspiratory flow (by strain-gauge transducer), inspired volume (by integration of flow), mask pressure, and electrocardiogram. End-tidal P_{CO_2} rose as the pressure increased at constant work rates, reaching levels above 70 mm. Hg in some cases. This rise was quantitatively related to the simultaneously recorded fall in alveolar ventilation. Subjects with diving experience showed lower alveolar ventilation than did nondivers, with correspondingly higher end-tidal P_{CO_2} . The cause of the reduced alveolar ventilation is discussed, as are the possible effects of the carbon dioxide retention on oxygen poisoning, nitrogen narcosis, and decompression sickness.

A66-80227**EFFECTS OF VARIOUS GASES ON HANDGEAR INSULATION.**

John F. Hall, W. W. Strobl, and W. B. Buehring (Aerospace Med. Res. Labs., Biomed. Lab., Wright-Patterson AFB, Ohio).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 163-166. 7 refs.

The effect of gases having different thermal conductivities on the thermal insulation of handgear was investigated. Experimental mittens with special plastic spacer interliners of various thicknesses were sealed between gas-impermeable outer and inner shells and filled, first with room air (as control), then various experimental gases, and thermal insulation was measured on a copper hand. Experimental gases included carbon dioxide, Freon 12, and helium. Comparative results are presented in terms of percentage insulation change; clo/Anch; conductivity (K) values; and the measured thermal insulation (clo) values. Prior to all tests each mitten was evacuated (13 cm. Hg) to remove all entrapped air, then filled without contamination with the control or experimental gas. Gas within the handgear was maintained at a constant positive pressure (5 cm. water) throughout each experiment. Mean measurements show significant increases (13-32%) of thermal insulation for Freon 12 and carbon dioxide, with decreased insulation observed with helium. Significance and some practical application of these results for protective clothing design are shown.

A66-80228**DETERMINATION OF HUMAN BODY VOLUME FROM HEIGHT AND WEIGHT.**

Julius Sendroy, Jr. and Harold A. Collison (Natl. Naval Med. Center, U. S. Naval Med. Res. Inst., Div. of Chem., Bethesda, Md.)

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 167-172. 40 refs. Navy Dept. supported research.

A previously developed method of graphical determination of human body volume from measurements of height and weight was extended for utilization from a limited range to one spanning the development of the male and female form from infant to adult. Equations best suited to express the relations of weight and height to show body volume and surface area over the periods of the life span are presented. A statistical evaluation and comparison with results of almost 1900 physical measurements taken from the literature indicate that this approach provides results acceptable for most clinical purposes, and is much more convenient and rapid than other, conventional methods of arriving at indices of body composition (volume, specific gravity, density, and body fat). The method permits the simultaneous determination of human body surface area as previously described.

A66-80229**KINETICS OF O_2 UPTAKE BY ERYTHROCYTES AS A FUNCTION OF CELL AGE.**

Miles J. Edwards and Norman C. Staub (Calif. U. Med. Center, Cardiovascular Res. Inst. and Dept. of Physiol., San Francisco).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 173-176. 14 refs. Grant PHS HE-06285.

The kinetics of O_2 uptake by human erythrocytes was studied to determine if the known structural and biochemical changes that occur in aging red cells affect the respiratory function of blood. Freshly drawn heparinized human blood was centrifuged to separate the older cells from the younger ones. Using a modified Hartridge-Roughton rapid reaction apparatus the rate of association of O_2 with each cell population was measured. In five of six experiments the older cells took up O_2 more slowly. The association velocity constant K_{O_2} averaged 115 $mm.^{-1}sec.^{-1}$ for old cells and 147 $mm.^{-1}sec.^{-1}$ for young cells. Although the results are statistically significant it is doubted that they have any physiologic significance in O_2 exchange in capillary beds.

A66-80230**PULMONARY GAS EXCHANGE IN DOGS VENTILATED WITH HYPERBARICALLY OXYGENATED LIQUID.**

J. A. Kylstra, C. V. Paganelli, and E. H. Lanphier (N. Y. State U., Dept. of Physiol., Buffalo).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 177-184. 18 refs. Contract Nonr 969(03).

Anesthetized dogs were ventilated with a hyperbarically oxygenated modified Ringer solution at 37°C. Minute volumes of ventilation ranged from 1 to 4 liters at respiratory frequencies of 6-21 breaths/min. Liquid ventilation resembled pump ventilation with air except that volume displacements occurred by gravity instead of a piston. $P_{I_{O_2}}$ ranged from 1,380 to 3,640 mm. Hg. V_{O_2} varied from 31 to 93 ml./min. Elimination of dissolved CO_2 through the lungs was generally deficient, with R ranging from 0.3 to 0.7 at $P_{a_{CO_2}}$ from 43 to 80 mm. Hg. The duration of liquid ventilation varied from 26 to 43 min. The partial pressures of oxygen in liquid exhaled into a long sampling tube were progressively higher and the carbon dioxide tensions were progressively lower at increasing distances from the lung. It is concluded that pulmonary gas exchange in liquid-ventilated dogs is diffusion limited and can be described mathematically in terms of radial diffusion in a sphere. Six out of sixteen dogs tolerated liquid ventilation without grossly apparent adverse sequelae.

A66-80231**THEORY AND CLINICAL APPLICATION OF A DIGITAL NITROGEN WASH-OUT COMPUTER.**

Tamotsu Shinozaki, John C. Abajian, Jr., Burton S. Tabakin, and John S. Hanson (Vt. U. Coll. of Med., Mary Fletcher Hosp., Dept. of Med., Cardio-pulmonary Lab., and Dept. of Surg., Div. of Anesthesiol., Burlington).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 202-208. 6 refs. Contract AF 33(6570-10899).

PHS supported research.

The basis for the on-line study of pulmonary nitrogen washout by digital computation techniques is presented. The instrument described produces a semilogarithmic plot of nitrogen concentration in expired gas versus cumulative alveolar ventilatory volume. Simultaneous measurements of functional residual capacity and main conducting airway volume are also achieved. Application of the method to a model revealed differences between known and determined total and conducting airway volumes of only 2%. Determinations in 35 normal subjects and 36 patients with pulmonary disease verified the increased ease and accuracy of performing duplicate studies as compared with conventional methods. Numerous possible sources of error and correction factors are eliminated by the technique, and the on-line inscription of the washout curve greatly facilitates intelligent evaluation of normal and abnormal pulmonary gas distribution.

A66-80232**DISTRIBUTION FUNCTION OF THE CLEARANCE TIME CONSTANT IN LUNGS.**

Takashi Nakamura, Tamotsu Takishima, Takao Okubo, Takao Sasaki, and Hiroshi Takahashi (Tohoku U., School of Med., First Dept. of Internal Med., Sendai, Japan).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 227-232. 15 refs.

In healthy subjects and patients with chronic obstructive lung disease intrapulmonary helium clearance was measured by the open-circuit method after 20 min. of helium breathing. The clearance curve was found to be expressed in the Laplace transform of the distribution function of the clearance time constant. The distribution function was obtained graphically, using an approximation method to solve the inverse Laplace transform. In normal subjects the log distribution function curve had maximum peak point in time constant about 0.5 min. with roughly symmetrical shape with respect to the time constant of the maximum, whereas the spectra in emphysematous patients showed much flat function with one or two maximum points of much higher time constant.

A66-80233**MEASUREMENT OF FUNCTIONAL RESIDUAL CAPACITY IN THE RAT.**

T. K. C. King (Belfast, Queen's U., Dept. of Therap., Northern Ireland).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 233-236. 11 refs.

Wellcome Found. and Northern Ireland Hospital Authority sponsored research.

A nitrogen closed-circuit method was used for the determination of the functional residual capacity (FRC) in the rat. Measurements were obtained in specific-pathogen-free (SPF) rats, which do not suffer from the specific endemic chronic bronchial disease that affects all ordinary rat colonies, and in ordinary laboratory rats (non-SPF). The range of FRC in tracheostomized rats was 3-6 ml. There was a high degree of correlation between FRC and the body weight in both the SPF and the non-SPF colonies. Age also correlated with FRC because it is related to weight. Comparison showed no significant difference in the relationship between FRC and body weight in the two colonies, so that animals of the same weight from either colony would have about the same FRC. Comparing the animals at the same age showed that FRC of the non-SPF animals are smaller because they weigh less at the same age.

A66-80234**EFFECT OF STIMULATION OF MUSCLE AFFERENTS ON VENTILATION OF DOGS.**

J. M. Senapati (All India Inst. of Med. Sci., Physiol. Dept. and V. Patel Chest Inst., New Delhi, India).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 242-246. 15 refs.

Respiratory effects of stimulation of the central end of the lateral gas-trocnemius-soleus nerve at multiples of threshold (motor twitch) were determined in dogs anesthetized with Na pentobarbital. The nature of the fiber stimulated was deduced from the strength of the stimulus used. Stimulation at threshold and up to 5 times threshold produced 3.6–13.1% augmentation of ventilation. These impulses probably originate in group I and group II fibers of muscle spindles and tendon organs. Stimulation of the nerve at 10, 20, and 40 times threshold produces increase in ventilation due to the stimulation of group III afferents which are known to be connected to pressure receptors, and the excitatory effect persists for a while after the stimulus is over. Natural stimulation of these endings by pressure of the order of 1 kg./cm.² to 5 kg./cm.² also produces hyperventilation.

A66-80235
ARTERIAL CO₂ TENSION ADJUSTMENT RATES FOLLOWING HYPERVENTILATION.

S. F. Sullivan, R. W. Patterson, and E. M. Papper (Columbia U., Coll. of Physicians and Surg., Dept. of Anesthesiol., New York City, N. Y.)
Journal of Applied Physiology, vol. 21, Jan. 1966, p. 247–250. 9 refs. Grant NIH GM-09069-03.

Anesthetized, curarized human subjects were hyperventilated for 2 hr. At the end of this period, arterial CO₂ tension, PaCO₂, changed less than 1 mm. in 15 min. Following a step decrease in ventilation, PaCO₂ was measured serially until the change was less than 1 mm. in 10 min. i.e., for periods up to 70 min. An equilibrium value was not reached in the limited duration of these studies, however, an estimate of this value can be made. The data are represented as the sum of two exponential functions, with rate constants k₁ and k₂ whose average values are 0.46 min⁻¹ and 0.30 min⁻¹.

A66-80236
RESPIRATORY MECHANICS DURING SUBMERSION AND NEGATIVE-PRESSURE BREATHING.

E. Agostoni, G. Gurtner, G. Torri, and H. Rahn (N. Y. State U., Dept. of Physiol., Buffalo; and Milan, U., Ist. di Fisiol. Umana, Italy).
Journal of Applied Physiology, vol. 21, Jan. 1966, p. 251–258. 34 refs. Contracts AF 33(616)-6823 and AF 61(052)867.

During submersion up to the neck the expiratory reserve volume of the sitting subject is reduced to 11% of the vital capacity in air, the same decrease is obtained breathing from a tank at -20.5 cm. H₂O. The decrease in lung volume is mainly due to the cranial displacement of the abdomen; although at the end of spontaneous expirations during submersion the diaphragm is stretched almost as far as at full expiration, it is relaxed, whereas during a full expiration it contracts. The end-expiratory pressures across the rib cage, the diaphragm, and the abdominal wall are: -19, -14, and -13 cm. H₂O during submersion, and -23.5, -11.5 and -12 during negative pressure breathing. Notwithstanding the lack of the gravitational effect of the abdomen during submersion, the shape of the chest wall is almost the same as during negative-pressure breathing because of the low compliance of the rib cage. During submersion the airways resistance increases by 58% because of the lung volume decrease; during negative-pressure breathing it increases by 157%, the extra increase being due to the compression of the extrathoracic airways.

A66-80237
MECHANICAL PROPERTIES OF THE LUNGS IN THE RAT.

T. K. C. Ing (Belfast, Queen's U., Dept. of Therap., Northern Ireland).
Journal of Applied Physiology, vol. 21, Jan. 1966, p. 259–264. 12 refs. Wellcome Found and Northern Ireland Hosp. Authority supported research.

A study of the mechanical properties of the lungs in specific pathogen-free (SPF) rats and ordinary (non-SPF) rats was carried out using anesthetized animals. Pulmonary compliance was measured under static conditions, the measured pulmonary resistance was that offered by the airway and tissues during flow. In the SPF rats, the mean pulmonary compliance was 0.25 ml./cm. H₂O (sd = 0.04) and the mean pulmonary resistance in tracheostomized animals was 0.14 cm. H₂O/ml. per sec. (sd = 0.04). Upper airway resistance was estimated to be 53% of the total pulmonary flow resistance. For the purposes of comparison between the SPF and non-SPF groups, the animals were arbitrarily divided into two subgroups (young and old) using 12 months as the dividing line. Pulmonary resistance was compared in tracheostomized animals because upper airway resistance accounts for a large part of the total resistance, and changes in resistance in the lower airways would not be easily detected if total resistances were compared. It was found that old non-SPF animals had significantly higher pulmonary resistances than the SPF as well as the young non-SPF rats.

A66-80238
A NEW METHOD OF ANALYZING THE DISTRIBUTION OF MECHANICAL TIME CONSTANTS IN THE LUNGS.

Takashi Nakamura, Tamotsu Takishima, Yasuo Sagi, Takao Sasaki, and Takao Okubo (Tohoku U. School of Med., First Dept. of Internal Med., Sendai, Japan).
Journal of Applied Physiology, vol. 21, Jan. 1966, p. 265–270. 8 refs.

When a sinusoidally varying pressure is applied to a system possessing an extremely large number of parallel pathways (assumed to be analogous to the lung), each with its own mechanical time constant (compliance x resistance), the complex compliance will be expressed in the integral transform of the distribution function of the mechanical time constant. The distribution function was obtained graphically using an approximation method to solve the integral transform. In normal subjects the log distribution function curve had a maximum point at a time constant of about 0.2 sec. and had a narrow and roughly symmetrical shape with respect to the time constant of the maximum, while the spectra in emphysematous patients showed a flat or trapezoidlike function with a maximum at a much higher time constant, about 1 sec. or more.

A66-80239
MECHANICS OF WALKING.

G. A. Cavagna and R. Margaria (Milan, U., Ist. di Fisiol. Umana, Italy).
Journal of Applied Physiology, vol. 21, Jan. 1966, p. 271–278. 6 refs. Ital. Natl. Res. Council supported research.

The vertical and the frontal components of the push exerted by the foot on the ground, walking at different speeds (3–12 km./hr.), were measured by means of a sensitive platform: the work against gravity, W_v, and the work due to velocity changes in forward direction, W_F, were calculated. The characteristic patterns of W_v and W_F as a function of speed were analyzed. The external work per step, W_{tot} = W_v + W_F, must be sustained by muscular activity; both W_v and W_F alone, on the contrary, are not directly related with muscular activity, as the rigid skeletal structures make possible the transformation of kinetic energy into potential, and vice versa. Two phases, in which the muscles perform external positive work, are evidence in the step cycle; these are separated by two interposed phases in which negative work is performed.

A66-80240
BREATH-BY-BREATH MEASUREMENT OF RESPIRATORY FUNCTIONS: INSTRUMENTATION AND APPLICATIONS.

Christian J. Lambertsen and Robert Gelfand (Pa. U. School of Med., Labs. of Pharmacol., Philadelphia).
Journal of Applied Physiology, vol. 21, Jan. 1966, p. 282–290. 20 refs. Contract Nonr 551(14) and Grant NIH MH-00692.

Study of dynamic as well as stable-state ventilatory responses to changes in respiratory stimuli is becoming increasingly important in attempts to explore the control of pulmonary ventilation. Instrumentation is described for accurate automatic measurement of breath-by-breath respiratory minute volume (V_E), respiratory frequency (f), and tidal volume (V_T). Use of the instrument in the study of pharmacological actions and in the investigation of physiological mechanisms is described. The action of a recycling, water-sealed, dual spirometer unit upon a potentiometer provides a voltage accurately proportional, to tidal volume. An electromechanical divider unit simultaneously measures the period (P) of a respiration and computes respiratory minute volume and respiratory frequency on a breath-by-breath basis as the ratios V_T/P = V_E and 1/P = f. Appropriate voltages are sampled and clamped at the end of each breath for recording. As described, tidal volumes in the range 0–4 liters and respiratory frequencies from 7–110 breaths/min. can be measured with an accuracy of ± 2% of full scale easily attainable. Also described is an electronic tidal volume accumulator which permits measurement of time-averaged values.

A66-80241
A RECORDING BAG-IN-A-BOX SPIROMETER.

Gordon Cumming (Birmingham U., Dept. of Med., Great Britain).
Journal of Applied Physiology, vol. 21, Jan. 1966, p. 291–292.

A system, usable in ventilatory function studies in health and disease, is described. The latter consists of a square box of 325-liters capacity containing four plastic bags, and changes in box volume are measured by a Krogh spirometer. The system measures the following three aspects of ventilation: tidal volume, initial volume of nitrogen in the lungs, and pattern of distribution of inspired gas. The technique for using the system is also described. The apparatus is unsuitable for following slow, continuous changes in lung volume, and for this purpose a body plethysmograph is preferable. Changes produced rapidly as in the assumption of a new rate or tidal volume are detected.

A66-80242
MINIATURE LONG-LIFE TEMPERATURE TELEMETRY SYSTEM.

Thomas B. Fryer, Gordon J. Debo, and Charles M. Winget (NASA, Ames Res. Center, Environ. Biol. Div., Instr. Div., Moffett Field, Calif.).
Journal of Applied Physiology, vol. 21, Jan. 1966, p. 295–298.

A miniature telemetry system including transmitter and sensor suitable for implanting in small animals to measure their deep body temperature was designed. A compensating bridge circuit is used to achieve a stable and accurate measurement system. The high performance, coupled with the small

size and long battery life, makes the device valuable for long-term observation of an animal's temperature rhythms. The device has a self-contained miniature battery that provides approximately 3,600 hr. operation.

A66-80243**QUANTITATIVE RADIOMETRIC MEASUREMENT OF SKIN TEMPERATURE.**

W. C. Kaufman and James C. Pittman, Jr. (6570th Aerospace Med. Res. Lab., Biomed. Lab., Wright-Patterson AFB, Ohio).

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 302-304. 7 refs.

Although infrared thermograms have been employed for assessing skin temperatures for some time, precise quantitative measurements have been lacking. A simple radiometer has been constructed and a method devised by which the surface temperature of the forearm and hand can be precisely measured. The instrument has a precision of $\pm 0.1^\circ\text{C}$. Measurements show the variation of the front surface of the forearm in neutral thermal conditions to be, at extremes, $+1.7^\circ\text{C}$, and -2.3°C , from the mean. Temperature patterns vary to some degree when the hand is heated or cooled. The magnitude of the variations is essentially unchanged during heating but is approximately doubled during cooling.

A66-80244**COMPARISONS OF DIRECT AND INDIRECT BLOOD PRESSURE WITH PRESSURE-FLOW DYNAMICS DURING EXERCISE.**

Francis J. Nagle, John Naughton, and Bruno Balke (Okla. U. Med. Center, Neurocardiol. Res. Program and Depts. of Med. and Physiol., Oklahoma City; and Civil Aeromed. Res. Inst., Biodyn. Branch, Oklahoma City, Okla.)

Journal of Applied Physiology, vol. 21, Jan. 1966, p. 317-320. 13 refs.

Grant Natl. Heart Inst. HE-06286-05.

Two healthy men, 40 and 57 years of age, underwent right-sided cardiac catheterization and retrograde supra-aortic catheterization (1) to compare direct intra-aortic blood pressures with those recorded simultaneously by auscultation of the brachial artery; and (2) to study the pattern of pressure and flow dynamics during work at moderate, strenuous, and maximal intensities. In most instances systolic pressures measured by auscultation were in close agreement with the directly recorded measurements. The indirectly measured diastolic pressures were consistently higher than the directly recorded values in one subject and they were consistently lower than the directly measured diastolic pressures for the other subject. Neither the muffling nor the cessation of sound could be closely identified with minimal intra-aortic pressures. Systolic and mean pressures, minute flow, stroke volume, and A-V oxygen difference increased with greater work intensities.

A66-80245**THE EFFECT OF GLUCAGON ON BLOOD SUGAR AND INORGANIC PHOSPHORUS LEVELS IN NORMOTHERMIC AND HYPOTHERMIC RATS.**

Anne L. Crawford, Margaret J. Henderson, Rosemary D. Hawkins, and R. E. Halst (Toronto U., Dept. of Physiol., Ontario, Canada).

Canadian Journal of Physiology and Pharmacology, vol. 43, 1965, p. 601-610. 18 refs.

Defence Res. Board, Canada supported research.

Injection of glucagon into normothermic rats led to hyperglycemia, and a significant fall in blood inorganic phosphorus levels. In hypothermic rats (25°C), the injection of glucagon did not produce hyperglycemia but the reduction in blood inorganic phosphorus levels was still obtained. Following the administration of glucagon, an increase in the excretion of inorganic phosphorus in the urine was observed in both normothermic and hypothermic rats. The fall in blood inorganic phosphorus level was considered to be due, in part at least, to the effect of glucagon in increasing the excretion of phosphorus in the urine.

A66-80246**LIGHT INDUCED CHANGES IN THE LIPIDS OF *CHLORELLA VULGARIS*.**

B. W. Nichols (Colworth House, Unilever Res. Lab., Sharnbrook, Bedford, Great Britain).

Biochimica et Biophysica Acta, vol. 106, Oct. 4, 1965, p. 274-279. 15 refs.

Detailed fatty acid analyses have been carried out on the isolated lipids of *Chlorella vulgaris* grown on a purely inorganic medium in the light and on an organic medium both in the light and in the dark. Cells grown in the light on an inorganic medium contain more α -linolenic acid than those grown on an organic medium. Light has little effect on the fatty acid composition of cells grown on an organic medium. The isolated lipids of *Chlorella* are similar to those occurring in the leaves of higher plants, and the proportion of those polar lipids associated with leaf chloroplasts [the galactosyl diglycerides, sulphoquinovosyl diglyceride (sulpholipid), phosphatidyl glycerol] increases when purely photosynthetic cell growth is increased. Each lipid possesses a distinctive pattern of fatty acids. The fatty acid composition of the lipids isolated from cells grown under conditions favoring photosynthesis are comparable to those found in leaves, the polyunsaturated acids being predominantly concentrated in the galactosyl diglycerides and trans- Δ^3 -hexadecenoic acid occurring only in the phosphatidyl glycerol fraction. Trans- Δ^3 -hexadecenoic acid is almost entirely absent when cells are grown on an organic medium both in the light and in darkness.

A66-80247**THE EFFECTS OF HEAT AND HUMIDITY ON THE HUMAN SKIN.**

Marion B. Sulzberger (Letterman Gen. Hosp., Dermatol. Res. Sect., San Francisco, Calif.)

(Symp. on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965).

Archives of Environmental Health, vol. 11, Oct. 1965, p. 400-406. 9 refs.

In his concern with the effects of heat and humidity on human skin, the author briefly reviews some of the morphological aspects of the cutaneous system, especially the outermost layer of the skin surface. The functions of this outermost layer termed the ectomembrane are discussed. The relationships of the skin surface to heat and humidity are analyzed from a military medicine viewpoint. Various conditions and diseases are discussed. These conditions are listed and classified as factors of humidity. The author further reviews the U. S. Army's present program in dermatological research, which stresses therapeutic methods in combating such things as blistering, and miliaria as well as basic research in sweating and skin permeability.

A66-80248**SWEAT-GLAND TRAINING BY DRUGS AND THERMAL STRESS.**

K. J. Collins, G. W. Crookford, and J. S. Weiner (Med. Res. Council Environ. Physiol. Res. Unit, London School of Trop. Med., Great Britain).

(Symp. on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965).

Archives of Environmental Health, vol. 11, Oct. 1965, p. 407-422. 37 refs.

Adaptive changes take place in the human sweating mechanism as the result of repeated episodes of thermal stimulation. A given thermal strain then produces an augmented response and the enhanced sweating capacity serves to improve heat regulation during the acclimatization process. When body temperature is repeatedly elevated, only minimal changes occur in sweating capacity if at the same time sweat-gland activity is inhibited by indirect cooling. These observations support the concept of a peripheral training phenomenon; but the possibility that concurrent changes occur in central nervous excitability cannot be entirely discounted in view of the reported earlier initial response of the sweat glands in the acclimatized state. However, the lack of any change in sensitivity to neurohumoral agents at the periphery suggests that neural changes, if they occur, are more likely to be associated with central responsiveness. Glandular training may also be artificially induced by repeated direct chemical stimulation, and the characteristics of the enhanced responses are generally consistent with the events in heat acclimatization. These facts have been utilized to demonstrate that the local response to a standard injection of sudorific drug can be used to monitor changes in sweat output in groups of persons undergoing heat acclimatization. Some of the events at the peripheral site which bring about sweat-gland training are recognized, but their relative importance cannot yet be identified. There is no evidence that the number of active glands multiply; the increased sweat output appears to derive from a series of events at first involving metabolic changes in the glands and improvement in vascular supply and leading possibly to an eventual hypertrophy of the glandular elements.

A66-80249**THE HUMAN ECCRINE SWEAT GLAND: STRUCTURAL AND FUNCTIONAL INTERRELATIONSHIPS.**

Richard L. Dobson (Ore. U. Med. School, Div. of Dermatol., Portland).

(Symp. on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965).

Archives of Environmental Health, vol. 11, Oct. 1965, p. 423-427; discussion p. 428-429. 25 refs.

Contract DA-193-MD-2176; Grants PHS AM-05635; and 5-TI-AM-5300.

A review is presented on various aspects of the human eccrine sweat gland. These include morphological description of the gland, a comparison of the renal tubule to the function of the sweat gland, cytological changes in the sweat gland due to sweating, electrolyte excretion, glycogen relation to sodium reabsorption and reaction of sweating to hormones. Using the results of these morphological and functional studies, a model of the eccrine sweat gland is proposed. Basically the model pictures a gland actively secreting sodium in isotonic fluid. Glycogen depletion in the secretory cells is variable with time, and cannot be used as an index of sweat formation. Some sodium reabsorption takes place in the duct while sweat rate remains unaffected. This indicates that some action must be exchanged for the sodium. Glycogen continuously depleted in the duct cells, indicates sodium reabsorption activity. Mineralocorticoids facilitate sodium reabsorption. Furthermore, acclimatization at the sweat gland level may be an indication of the lack of adaptation of the duct to aldosterone. This being in contrast to the kidney, the sweat gland can be used in cooling the body with minimal loss of sodium.

A66-80250**VASCULAR AND SWEATING RESPONSES TO REGIONAL HEATING.**

W. C. Randall, R. D. Wurster, R. D. McCook, and J. E. Brockhouse (Sutch School of Med. Dept. of Physiol.; and Loyola U., Graduate School, Chicago, Ill.)

(Symposium on Cutaneous Response to Thermal Stress, Chicago U., Feb. 20-22, 1965).
Archives of Environmental Health, vol. 11, Oct. 1965, p. 430-441. 19 refs.
Grant NIH NE 08682.

Employing twin climate chambers in which a copper screen bed may be rapidly moved from one chamber to the other, each maintained at different ambient temperatures, functional responses of normal human subjects to varying thermal stress were examined. The functions studied included multiple channels of sweating, cutaneous and deep body temperatures, cutaneous vascular pulses, ECG, blood pressure, etc. Major conclusions include the following: (1) The onset of sweating and vasodilatation during progressive elevation of ambient temperature is influenced by both surface and internal body temperatures, but is not controlled exclusively by either. It appears that both internal and skin temperatures must be elevated to elicit maximal responses. (2) Temperature of the head and the air breathed plays a significant role in the onset and intensity of sweating and vasodilatation. (3) Sweating decreases very quickly or ceases entirely when a subject is rapidly moved from an ambient temperature of 60°C. or less into a cool environment, while volume pulse amplitudes return to control levels very slowly. However, sweating is sustained for more prolonged periods when body storage of heat is greater as a result of exposure to extremely high (90°C.) ambient temperatures.

A66-80251 HIDROMELIOSIS.

William K. Brown and Frederick Sargent, II (Ill. U., Dept. of Physiol. and Biophys., Urbana).
(Symposium on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965).
Archives of Environmental Health, vol. 11, Oct. 1965, p. 442-452; discussion, p. 452-453. 36 refs.
Grants NSF GB-967 and Natl. Inst. of Arthritis and Metab. Diseases A-4210.

Hidromeliosis is a decrement of the rate of thermally-induced sweating. Alternative hypotheses proposed to explain the latter are examined and problems which remain unsolved are indicated. The following conclusions are drawn from experiments and observations presented: (1) at vapor pressures less than that of the skin, the sweat rate must exceed a threshold value for the process of hidromeliosis to be initiated; (2) once initiated hidromeliosis proceeds exponentially to a limiting sweat rate which is approximately that of the threshold; (3) females have a lower threshold and a higher rate constant for hidromeliosis than males; (4) hidromeliosis may be reversed by exposing wetted skin to dry air, by stripping wetted stratum corneum, and by rapidly drinking large volumes of water; (5) hidromeliosis may be prevented by bathing subjects in 10%-15% NaCl or by removing the stratum corneum prior to exposure to moist heat; (6) the primary mechanism for hidromeliosis seems to involve the skin; and (7) adaptation of thermal receptors and fatigue of the eccrine sweat gland are not processes related to hidromeliosis.

A66-80252 MECHANISM OF SWEATING IN WORK.

Sid Robinson (Ind. U., School of Med., Dept. of Anat. and Physiol., Bloomington).
(Symposium on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965).
Archives of Environmental Health, vol. 11, Oct. 1965, p. 454-459. 12 refs.
Grants U. S. Army Res. and Develop. Command MD-60-10 and MD-193-G91.

Experiments were planned to determine the relations of the sweating responses of men during work on the treadmill to corresponding changes in temperature of the (a) skin, (b) rectum, (c) gastrocnemius muscles, (d) femoral vein draining blood from the working leg muscles, and (e) the long saphenous vein draining the skin of the leg. In one series of experiments the subjects worked on the treadmill at three different rates, and the environmental temperature was the same. In another series of four experiments on subject A the room temperature was varied and the subject worked at the same rate in all four experiments. In final analysis the data of these experiments indicate that the regulation of sweat rate involves the integration of a number of factors. No one thermal sense organ could account for the sweating responses which these subjects made in relation to independent variations of environmental temperature and work intensity as discussed above. Factors which may participate in this regulation include (a) reflexes originating from cutaneous thermoreceptors, (b) increased sensitivity and activity of the hypothalamic center as its temperature increases, (c) possible thermoreceptors located in the muscles themselves, or in the veins draining blood from the working muscles, and (d) neuromuscular influences on the hypothalamic center.

A66-80253

MILIARIA.
Walter C. Lobitz, Jr. and Richard L. Dobson (Ore. U. Med. School, Div. of Dermatol., Portland).

(Symposium on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965).
Archives of Environmental Health, vol. 11, Oct. 1965, p. 460-464. 15 refs.
Contract DA-49-193-MD-2184; and Grant PHS 5 TI AM 5300.

Miliaria is the generic name given for diseases occurring when the free flow of sweat to the surface is impeded, and sweat is retained in the skin. Data on various forms of miliaria (crystallina, rubra, pustulosa, profunda) are reviewed. The morphological changes that develop in the skin and the symptoms that arise therefrom depend entirely on what level in the skin the obstruction occurs and at what level the sweat is retained. The etiologic problems are far from settled. Nor are the mechanisms of the disease completely understood. However, it is generally agreed that the primary disease is an isolated one that takes place in the skin at the sweat pore and duct. Any systematic reactions of clinical, biochemical, or endocrinological import that occur are secondary to this initial local event and are only severe when severe inflammation of the skin occurs and/or when the needed evaporative heat loss is impaired and acclimatization is interfered with.

A66-80254

PHARMACOLOGICALLY ACTIVE AND LETHAL SUBSTANCES FROM SKIN.
Sol Roy Rosenthal (Ill. U. Coll. of Med., Dept. of Prevent. Med., Chicago).
(Symposium on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965).
Archives of Environmental Health, vol. 11, Oct. 1965, p. 465-475; discussion, p. 475-476. 19 refs.

Pharmacologically active substances are released from the thermally injured skin of human and animal subjects. Among others there are histamine, bradykinin, adenylic compounds, and possibly serotonin. The amount of pharmacologically active substances released is directly related to the degree of injury. Following burning of the skin, degradation products are released that are toxic and lethal to the host. This toxin or toxins are to be differentiated from the pharmacologically active substances described above. It is postulated that a true burn toxin or toxins exist. The release of histamine from the skin of animals and man begins at threshold stimuli and the amount released is directly related to the stimulus. It is postulated that histamine is the chemical mediator for cutaneous pain.

A66-80255

THE FACTOR OF TEMPERATURE IN ULTRAVIOLET INJURY.
Robert C. Freeman and John M. Knox (Baylor U. Coll. of Med., Depts. of Dermatol. and Pathol., Houston, Tex.)
(Symposium on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965).
Archives of Environmental Health, vol. 11, Oct. 1965, p. 477-481; discussion, p. 481-483. 13 refs.
Contract DA-49-007-MD-953.

Heat enhances the injurious effect of exposure to ultraviolet light. This was shown in mice subjected to acute ultraviolet burns and in mice killed by continuous exposure to ultraviolet. Irradiated mice did not live as long in a heated environment as they did at room temperature. The rate of developing skin tumors was higher in mice exposed to ultraviolet light and kept in a hot environment than in mice similarly exposed but kept at room temperature. Preliminary investigations indicate that enhancement of ultraviolet by heat also occurs in man.

A66-80256

COLD INJURY OF THE SKIN: THE PATHOGENIC ROLE OF MICROCIRCULATORY IMPAIRMENT.
J. Peter Kulka (Harvard Med. School, Depts. of Pathol. and Physiol.; and Robert B. Brigham Hosp., Boston, Mass.)
(Symposium on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965).
Archives of Environmental Health, vol. 11, Oct. 1965, p. 484-496; discussion, p. 496-497. 16 refs.
Contracts DA-49-007-MD-342; DA-49-007-MD-645; and DA-49-193-MD-2007; and Grant PHS A-2349.

Studies on the injurious effects of cold involving a freezing injury in feet of rabbits, and a nonfreezing cold injury in ears of mice are presented. The findings presented indicate that both freezing and non-freezing cold injury of the skin are direct consequences of progressive microcirculatory dysfunction. This dysfunction is initiated by vasospasm, but the development of tissue damage parallels neither the distribution of vasoconstriction nor a cooling gradient but corresponds closely to the extent of secondary erythrocytostasis. The basis is a result of endogenously mediated venular-capillary dilation and leakage with consequent hemoconcentration and increased frictional resistance to flow leading to a critical slowing of the circulation through the venular drainage bed. If the circulatory obstruction remains confined to the terminal vascular plexus, the corresponding epidermal necrosis may be repaired by regeneration. Irreversible tissue damage (gangrene) is associated with the occurrence of widespread necrotizing angitis and thrombosis which gradually extend from the microvasculature into the major veins and arteries.

A66-80257**RESPONSE OF HUMAN EPIDERMIS TO GRADED THERMAL STRESS: A MORPHOLOGIC COMPARISON OF BURNS, COLD-INDUCED BLISTERS, AND PEMPFIGUS VULGARIS.**

Roger W. Pearson (Chicago U., Dept. of Med., Sect. of Dermatol., Ill.)
(Symp. on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965.)

Archives of Environmental Health, vol. 11, Oct. 1965, p. 498-507. 7 refs.
Grants PHS 5-K3-GM-21,859 and AM 05794.

Graded thermal injury to the skin was produced by application of a flat-headed soldering iron over a 3 mm. diameter hole in an asbestos sheet. The most severely injured epidermis separated from the dermis as a result of coagulation necrosis of the epidermis. "Moderate" injury induces primarily acantholytic, suprabasilar blisters, resembling the blisters of pemphigus vulgaris in some respects but also showing some features of other acantholytic processes. In contrast, cold-induced blisters develop in the plane of the "space" between the plasma membrane of the basal cells and the basement membrane. These blisters closely resemble the blisters of epidermolysis bullosa hereditaria letalis.

A66-80258**STRESS-RELAXATION OF STRETCHED CALLUS STRIPS: INFLUENCE OF VARIOUS SOLVENT AND SOLUTION ENVIRONMENT ON MECHANOElastic PROPERTIES OF CORNIFIED EPITHELIUM.**

Takeru Higuchi and William J. Tillman (Wis. U., School of Pharm., Madison).
(Symp. on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965.)

Archives of Environmental Health, vol. 11, Oct. 1965, p. 508-521. 9 refs.

Data are presented suggesting that the cornified epithellum responds sensitively to changes in solution environment. Although the exact nature of their mechanoelastic behavior depends apparently on the varying amount of etherwater extractables present, these measurements reflect in a general sense the ability of the tissue specimen to react to changes in environmental conditions. From the results it would appear that the outermost layer of skin behaves in a manner very much like other proteinaceous material of similar nature. Apparently the tissue sample reacts to changes in environment qualitatively in the same fashion as, for example, wool and hair fibers, an altogether not unexpected relationship. The stress relaxation responses to salt solutions, to varying pH conditions, to presence of different cations, etc., all suggest that the observed pattern in all of these systems is a net result of several processes working with and against each other with varying time constants.

A66-80259**KERATIN AND THE BARRIER: A HUMAN EPIDERMAL PHOSPHOLIPID-PROTEIN WITH WATER BARRIER PROPERTIES.**

Robert G. Crouse (Miami U. School of Med., Dept. of Dermatol., Fla.)
(Symp. on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965.)

Archives of Environmental Health, vol. 11, Oct. 1965, p. 522-526; discussion, p. 527-528. 32 refs.

Grants Natl. Inst. of Arthritis and Metab. Diseases A6096 and 2A5262.
Dept. of Army supported research.

A phospholipoprotein was extracted from human epidermal tissues which can be precipitated in a form that exhibits water vapor barrier properties comparable to intact epidermis. Closely related epidermal protein fractions contain neither phospholipids nor barrier properties. The concept of a lipid-keratin barrier can now be tested in vitro, and compared extensively with in vivo events.

A66-80260**THE EFFECTS OF WETTING ON CUTANEOUS VULNERABILITY.**

R. R. Suskind and M. Ishihara (Ore. U. Med. School, Divs. of Environ. Med. and Dermatol., Portland).

(Symp. on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965.)

Archives of Environmental Health, vol. 11, Oct. 1965, p. 529-536; discussion, p. 536-537. 8 refs.

Contract DA 49-139, M. D. 2184; and Grant NIH OH 00137-01.

Clinical evidence indicated that frequent daily exposure to water, which results in skin irritation, may involve other factors. These would be low ambient temperature and humidity, organic substances present in aqueous mixtures used in household and industry, chemical agents irritating to the skin, and intactness of the skin. Observations on humans and experiments on albino guinea pigs showed that high ambient temperature inhibits to some degree the reaction of skin to irritants. Mineral oil, kerosene, soaps, and alkyl benzene sulfonate appeared to increase the skin reaction to the experimental sensitizer, 2-4 dinitrochlorobenzene. Prolonged and frequent immersion of shaved guinea pigs in water showed no histological changes. Continuous application of edible oils produced only mild reaction, but the combined effect of water and oil resulted in severe inflammatory reaction. Changes in the histological picture were also noted. Further studies showed

that normal barrier defenses against penetration of applied substances were altered by water immersion but restored within a few hours. The repeated wetting enhanced the percutaneous penetration, and the effect may be cumulative. The conclusion may be drawn that materials containing oils, waxes and fatty acids are possibly acanthogenic, but clinically innocuous, although these compounds may cause dermatitis in repeatedly wetted skin.

A66-80261**INDUSTRIAL PROBLEMS RELATING TO THE STRATUM CORNEUM.**

Frederick D. Malkinson (Chicago U., Dept. of Med., Sect. of Dermatol., Ill.)
(Symp. on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965.)

Archives of Environmental Health, vol. 11, Oct. 1965, p. 538-545. 63 refs.

An attempt is made to define the role of the stratum corneum in the body's defense and mediation of industrial injury. Percutaneous absorption is discussed, and factors which may alter the skin's permeability in industrial working conditions are analyzed separately. These are hydration, dehydration, chemical or mechanical injury, and thermal injuries. Defense mechanisms against colonization of the skin by microorganisms such as shedding and desiccation are summarized. Hyperkeratinization of the stratum corneum is discussed in light of protection from dermatitis, chemical injury, and ultraviolet irradiation.

A66-80262**ENVIRONMENTAL INFLUENCES ON THE MICROBIOLOGY OF THE SKIN.**

David Taplin, Nardo Zaias, and Gerbert Rebell (Miami U., School of Med., Dept. of Dermatol., Fla.)

(Symp. on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965.)

Archives of Environmental Health, vol. 11, Oct. 1965, p. 546-550. 9 refs.

Grant Natl. Inst. of Arthritis and Metab. Diseases 2A5262.
Dept. of Army supported research.

The effects of a tropical jungle environment on the microbial flora of the skin was studied in a group of military personnel. Men with pre-existing microbial skin disorders became worse in the jungle. There was a high incidence of tinea pedis and erythrasma of the feet in this group before entering the tropics and this incidence remained unchanged. Tinea corporis, candidiasis, and staphylococcal infections increased in the jungle. The clinical appearance and incidence of *P. aeruginosa* infections in the toe webs is reported. The importance of correct diagnosis to prevent dermatological casualties in the tropics is stressed.

A66-80263**PERCUTANEOUS ABSORPTION: INFLUENCE OF TEMPERATURE AND HYDRATION.**

Richard B. Stoughton (Western Reserve U., Cleveland, Ohio).

(Symp. on Cutaneous Responses to Thermal Stress, Chicago U., Feb. 20-22, 1965.)

Archives of Environmental Health, vol. 11, Oct. 1965, p. 551-553; discussion, p. 553-554. 30 refs.

The author reviews some of the methods and results of experiments studying the influence of hydration and temperature on percutaneous absorption. Using the percent penetration of ethyl nicotinate as an index of absorption, it was shown that hydration of the skin in cool water allowed a greater percent penetration than in dry skin. When the water was warm, percent penetration was about the same as cool water. The changes in percutaneous absorption due to hydration appear to have come from permeability changes in the stratum corneum. The use of this increased skin penetration is discussed in light of drug absorption for treating skin conditions.

A66-80264**PULMONARY DYNAMICS AND RETENTION OF TOXIC GASES. I. SULFUR DIOXIDE: CONCENTRATION AND DURATION EFFECTS IN RATS.**

K. J. Leong and N. MacFarland (Dept. of Natl. Health and Welfare, Occupational Health Div., Ottawa, Canada).

Archives of Environmental Health, vol. 11, Oct. 1965, p. 555-563. 23 refs.
Grant Dept. of Natl. Health and Welfare, Canada 605-7-216.

A method is presented which combines a respirographic technique with an analytical method and furnishes results obtained in rats undergoing inhalation exposure to sulfur dioxide. The effects of changes in concentration of the gas and in duration of exposure on pulmonary retention, tidal volume, and respiratory rate are described. This new methodology permits a more accurate description of the events which occur when an animal is exposed to an airborne toxicant and may be useful in overcoming some of the anomalies noted when an attempt is made to relate biological response to an inadequate measure of exposure, and concentration-time product.

A66-80265**SIGNAL-DETECTION THEORY AND SHORT-TERM MEMORY.**

Bennet B. Murdock, Jr. (Vt. U., Burlington).

Journal of Experimental Psychology, vol. 70, Nov. 1965, p. 443-447. 11 refs.
Grant PHS MH 03,330.

This study attempted to apply signal-detection theory to short-term memory by testing the high-threshold concept of associative strength. On each trial a list of 6 A-B pairs was presented once, then 1 of these 6 pairs was tested for recognition. On the recognition tests either A-B (a proper pair) or A-X (an improper pair) was presented; subject had to make a binary (yes-no) decision plus a confidence rating. From these data ROC curves were plotted, and they resembled the curvilinear functions of signal-detection theory more than the linear function required by the high-threshold concept. These results call into question the use of a high-threshold concept to explain findings from studies of 1-trial learning.

A66-80266

INTERACTION OF TIME-UNCERTAINTY AND RELATIVE SIGNAL FREQUENCY IN DETERMINING CHOICE REACTION TIME.

Paul Bertelson and Jacques Barzelee (Bruxelles, Free U., Belgium).

Journal of Experimental Psychology, vol. 70, Nov. 1965, p. 448-451. 13 refs.

Belgian Fonds Natl. de la Rech. Sci. supported research.

Choice reaction times (RT) to two signals of relative frequencies .2 and .8 were measured under two time-uncertainty conditions: constant foreperiods of either .5 or 5.0 sec. The RT to the more frequent signal is more affected by time uncertainty than the RT to the less frequent one. This result shows that "preparation," a hypothetical state which has often been postulated to account for time-uncertainty effects, is at least in part specific to one particular signal-response pair, or, alternatively, that the well-known effect of signal relative frequency is affected by very short-term fluctuations.

A66-80267

DETECTION OF A VISUAL SIGNAL WITH LOW BACKGROUND NOISE: AN EXPERIMENTAL COMPARISON OF TWO THEORIES.

Raymond H. Hohle (Iowa U., Inst. of Child Behavior and Develop., Iowa City).

Journal of Experimental Psychology, vol. 70, Nov. 1965, p. 459-463. 6 refs.

Yes-no responses were obtained from each of 5 subjects under different conditions of induced response bias during nine 300-trial sessions (plus nine extra sessions for one subject) where a low-intensity stimulus was present or absent in a random sequence. Least-squares curves relating probabilities of a "yes" response with the stimulus present to probabilities of a "yes" with the stimulus absent were determined for each set of data, assuming (a) the theory of signal detection (TSD), and (b) the fixed-criterion hypothesis. The latter theory afforded a closer fit for each of the 6 sets of data when compared to the simplest form of TSD. A more general form of TSD led to curves which fit as well as those from the fixed-criterion theory, but this form has other, undesirable, implications.

A66-80268

SHORT-TERM RECOGNITION MEMORY FOR SINGLE DIGITS AND PAIRS OF DIGITS.

Donald A. Norman (Harvard U., Cambridge, Mass.) and Wayne A. Wickelgren (Mass. Inst. of Technol., Cambridge).

Journal of Experimental Psychology, vol. 70, Nov. 1965, p. 479-489. 8 refs. Grant Natl. Inst. of Mental Health MH 08890-01.

The operating characteristic is used to examine the relation between the recognition of a single item and the recognition of a pair of items. Twenty-nine subjects listened to a sequence of 5 digits, and then copied a sequence of 8 digits. Then they were given a test of recognition memory for one or two digits from the original sequence. The operating characteristic for single digits is a smooth function that is symmetrical about the major diagonal, whereas the curve for pairs is highly asymmetrical. False-recognition rates for test pairs containing one digit from the original sequence are only slightly greater than false-recognition rates for completely new pairs. Recognition of a pair does not appear to result from independent recognition of each digit. A mathematical model is developed in which the strength of the memory trace has a continuous distribution which is incremented in a probabilistic fashion upon presentation of an item or pair.

A66-80269

EFFECT OF SIZE AND LOCATION OF INFORMATIONAL TRANSFORMS UPON SHORT-TERM RETENTION.

Michael I. Posner and Ellen Rossman (Wis. U., Madison).

Journal of Experimental Psychology, vol. 70, Nov. 1965, p. 496-505. 17 refs.

Contract AF 49(638)-1235.

Wis. U. supported research.

This series of studies investigates the effect of informational transformations of various levels of difficulty, as indicated by the amount of information reduction required, upon material in short-term storage at the time of the transform. Experiment I shows that with number of similarity of interpolated items held constant, the greater the difficulty of a transform the more forgetting will result from it. Experiments II and III show that these effects cannot be attributed entirely to increases in the time an item remains in store. Rather, time in store and difficulty of transform both contribute to

determining the amount of forgetting. Experiment IV shows that the loss of material in store is a decreasing function of its distance prior to the transform, but that the transformed material itself shows no decline in retention. These results point to an operational definition of rehearsal as a process requiring part of the limited central capacity of subject.

A66-80270

USE OF NEGATIVE SLOPE TRANSFORMATIONS OF KNOWLEDGE OF RESULTS ON A SIMPLE MOTOR RESPONSE.

Donald A. Schumsky (Tulane U., New Orleans, La.)

Journal of Experimental Psychology, vol. 70, Nov. 1965, p. 534-536.

Bilodeau (1953) studies a series of transformations of knowledge of results (KR) which had slope and intercept constants varying inversely with one another making it impossible to partition their separate effects. The present study, by employing transformations with both positive and negative slopes, had comparable groups equated for slope constant but varying intercept values. Eighty subjects were given 16 discrete trials to learn a simple knob-turning response. Each response was followed by an appropriately transformed KR. Results revealed that subjects' initial responding is related to the value of the intercept constant of the transformation equation. Subsequently, the speed of learning is directly related to the absolute size of the slope constant of the transformation equation.

A66-80271

SEX DIFFERENCES IN ADAPTATION OF THE GSR UNDER REPEATED APPLICATIONS OF A VISUAL STIMULUS.

H. D. Kimmel and Ellen Kimmel (Fla. U., Gainesville).

Journal of Experimental Psychology, vol. 70, Nov. 1965, p. 536-537.

Grants PHS MH-06060-02 and MH-16798-02.

Eight men and eight women came to the laboratory on 3 occasions, 1 week apart, to receive presentations of a visual stimulus on each occasion. The average galvanic skin response (GSR) to the light showed an intrasession (but no intersession) adaptation effect for both sexes but this effect was almost gone for the males on the last session. In addition, the males made significantly larger GSRs than the women on all 3 sessions, especially on the last session. It was conjectured that the men were familiar with the procedure and anticipated the end of the 3rd session by making larger GSRs, but that the women did not.

A66-80272

EFFECTS OF SEVERAL SCHEDULES OF KNOWLEDGE OF RESULTS ON MATHEMATICS ACHIEVEMENT.

Edward H. Rosenstock, J. William Moore, and Wendell I. Smith (Bucknell U., Lewisburg, Pa.)

Psychological Reports, vol. 17, Oct. 1965, p. 535-541. 14 refs.

Grant AF-AFOSR-61-54.

Four forms of a program in mathematics, each varying in the amount of confirmation provided, were utilized in an investigation of scheduling knowledge of results for learners. The schedules were unrelated to achievement.

A66-80273

BEHAVIORAL EFFECTS OF STIMULATION BY UHF RADIO FIELDS.

Susan Korbel Eakin and William D. Thompson (Baylor U., Waco, Tex.)

Psychological Reports, vol. 17, Oct. 1965, p. 595-602. 12 refs.

Grant Natl. Inst. of Mental Health MH-07223.

Twenty male albino rats were used as subjects in determining behavioral effects of ultra high frequency radiation. Experimental subjects were exposed to low intensity (50,000 mV), low frequency (300 mc. to 920 mc.) UHF radio waves for 47 consecutive days. Radiated rats were more active than non-radiated rats during the early part of the experiment, but became less active as the days of radiation increased. The UHF group was more emotional than the non-UHF group and showed a gradual increase in the latency of recovery from electroshock convulsion. No differences were found for weight, autogenic seizures, and water consumption. Results suggest that (a) some time is required for UHF to have a consistent effect on behavior, and (b) the effects on behavior may be non-thermal and related to neurophysiological substrates.

A66-80274

EFFECTS OF TWO SOURCES OF UNCERTAINTY IN DECISION MAKING.

James M. Driscoll and John T. Lanzetta (Dartmouth Coll., Hanover, N. H.)

Psychological Reports, vol. 17, Oct. 1965, p. 635-648. 9 refs.

Grant NSF GS-311 and Contract AF 49(638)-1441.

The effects of variation in the stimulus and response uncertainty of a decision task on the decision maker's subjective uncertainty, amount of information search, and information processing were examined. Results indicated that: (a) information search tended to continue until one bit of stimulus and/or response uncertainty remained, independent of the level of initial uncertainty; (b) the higher the stimulus uncertainty of the decision task, the faster the subject began seeking information; and (c) subjective uncertainty increased with both stimulus and response uncertainty. Unfortunately, the data precluded adequate examination of the possible relationship between subjective uncertainty and search behavior, but the latency of search was

negatively correlated with the magnitude of subjective uncertainty across subjects, suggesting that a more extensive examination of the motivational effects of subjective uncertainty would be of value.

A66-80275**AUTONOMIC COMPONENTS OF ORIENTING BEHAVIOR.**

Tadao Uno and William W. Grings (Long Beach Veterans Adm. Hosp., and Southern Calif. U., Los Angeles).

Psychophysiology, vol. 1, Apr. 1965, p. 311-321. 18 refs.

Grant Natl. Inst. of Mental Health M-3916.

Changes in skin conductance (GSR), skin potential (SP), heart rate (HR), finger blood volume (BV), and pulse volume (PV) were recorded in 24 subjects in response to 2-sec. bursts of white noise. Five intensity levels of sound (60, 70, 80, 90, and 100 db.) were presented over 5 repetitions. Results showed that: (1) response magnitudes and latencies were directly related to stimulus intensity and inversely related to number of repetitions; (2) for BV, SP, and GSR the effect of repetition varied with stimulus intensity; (3) HR changes were primarily monophasic; and (4) BV and PV were more sensitive to stimulus intensity differences than were the electrodermal responses.

A66-80276**ECCRINE SWEAT GLAND ACTIVITY AND RACIAL DIFFERENCES IN RESTING SKIN CONDUCTANCE.**

Laverne C. Johnson and Marvin M. Landon (U. S. Navy Med. Neuropsychiat. Res. Unit, San Diego).

Psychophysiology, vol. 1, Apr. 1965, p. 322-329. 17 refs.

Dept. of Navy supported research.

Active eccrine sweat gland activity was measured in 30 Negro and 29 Caucasian male subjects to determine whether sweat gland activity was a possible factor in racial differences in skin conductance. Basal skin conductance, heart rate, respiratory rate, finger skin temperature and blood pressure were also obtained. Negro subjects had significantly lower skin conductance but no other significant physiological differences were found. While there was no significant difference in number of active sweat glands between the races, the intragroup relationship between sweat gland count and skin conductance was significantly higher for the Negro subjects. The two groups did not differ in number of nonspecific galvanic skin responses (GSRs) but the Caucasian subjects showed greater change in skin conductance to an initial tone stimulus. When differences in prestimulus levels were taken into account, the group differences in response to stimuli were no longer significant.

A66-80277**INTERAREA ELECTROENCEPHALOGRAPHIC PHASE RELATIONSHIPS FOLLOWING SENSORY AND IDEATIONAL STIMULI.**

Chester W. Darrow and Ronald G. Hicks (Inst. for Juvenile Res., Dept. of Res., Div. of Psychophysiol., Chicago, Ill.)

(Midwestern Psychol. Assoc., St. Louis, Mo., Apr. 1964; and Soc. for Psychophysiol. Res., Washington, D. C., Oct. 1964).

Psychophysiology, vol. 1, Apr. 1965, p. 337-346. 13 refs.

Moment-by-moment changes in the phase or relative timing of electroencephalographic (EEG) patterns in different brain areas show great lability and psychological responsiveness, and are studied as possible correlates of peripheral psychophysiological reaction. Relative leading, lagging, and in-phase relationships between EEGs of different brain areas are automatically recorded, and stimuli classed as simple sensory, indifferent-ideational, disturbing-ideational, and adaption routines are employed. EEG leading in anterior and central brain areas is found to characterize conditions of arousal. Rapid diphasic reversals of interarea EEG phase relationship during mental activity is possibly symptomatic of interaction between brain areas. Effects of familiarity and adaptation are evaluated.

A66-80278**BEHAVIORAL EFFECTS OF IONIZED AIR ON RATS.**

R. A. Duffee and R. H. Koontz (Battelle Mem. Inst., Columbus, Ohio).

Psychophysiology, vol. 1, Apr. 1965, p. 347-359. 16 refs.

Battelle Mem. Inst. supported research.

The primary purpose of the experiments was to determine whether stress is a necessary precondition for ionized air to affect behavior. A secondary objective was to investigate the relationship between ion polarity and subject age. Thirty-six male albino rats of the Wistar strain were used as subjects, divided into 2 groups according to age; one group was 3 months, and the other 14 months, old. Animals were exposed in environmental chambers in which the ion concentrations were 2.9×10^5 positive ions/cc., 1.4×10^5 negative ions/cc., or 600 positive and negative ions/cc. (control). Criteria for evaluating behavioral effects were rate of learning of a water maze and performance in the maze after learning was complete. Half of the subjects were subjected to a 60-v., 0.7-sec. electrical shock prior to maze trials. Stress was not a necessary precondition for air ions to affect behavior. Learning of the maze was enhanced by both ion polarities, particularly by negatively ionized air. Performance of the older animals living in a negatively ionized atmosphere was significantly improved.

A66-80279**IDENTIFICATION OF SEQUENTIAL AUDITORY AND VISUAL STIMULI.**

Arthur S. Kamlet (Mich. U., Ann Arbor).

Psychonomic Science, vol. 3, Nov. 15, 1965, p. 419-420.

Contract AF 49(638)-1235.

Two subjects identified pairs of 15 msec. one-bit auditory and visual stimuli when the interval between the stimuli varied from 0 to 500 msec. The auditory judgments were better when the auditory and visual signals were separated by 500 msec. than when the two signals were presented simultaneously, and were also better when the auditory stimulus followed the visual stimulus than when the visual stimulus was delayed.

A66-80280**DETERIORATION OF SIGNAL DETECTABILITY DURING A VIGILANCE TASK AS A FUNCTION OF BACKGROUND EVENT RATE.**

Jane F. Mackworth (Defence Res. Med. Labs., Toronto, Canada).

Psychonomic Science, vol. 3, Nov. 15, 1965, p. 421-422. 12 refs.

In the course of a 30 min. session a significant decrease was found in detection and detectability (d') of a slightly brighter flash against a background flash rate of 200/min. No such decrement occurred when the background flash rate was 40/min. In both cases the signal rate was 6/min.

A66-80281**ROLE OF ADAPTATION LEVEL IN STIMULUS INTENSITY DYNAMISM.**

Harry G. Murray and David L. Kohfeld (Ill. U., Urbana).

Psychonomic Science, vol. 3, Nov. 15, 1965, p. 439-440. 8 refs.

Grant NIH MH-08033.

Thirty female college students were first adapted to either a 40 db. tone, a 100 db. tone, or to silence ($N=10$), then given 48 reaction time (RT) trials with randomly ordered presentations of 40, 60, 80, and 100 db. auditory signals. RT at all levels of signal intensity was fastest for subjects adapted at 40 db., slowest for subjects adapted at 100 db., and intermediate for subjects adapted to silence. These findings are predicted by Helson's adaptation-level theory (1964) but not by Hullian Theory (1949).

A66-80282**AGE IN RELATION TO PART AND WHOLE LEARNING.**

Sylvia Downs (U. Coll., Res. Unit into Probl. of Ind. Retraining, London, Great Britain).

Journal of Gerontology, vol. 20, Oct. 1965, p. 479-482. 9 refs.

Dept. of Sci. and Ind. Res., Great Britain; and Ford Found. supported research.

An experiment was conducted on four groups of trainee postal sorters to examine the relationship between age and progressive part and whole learning methods. The median age of the older groups was 42.5 and those of the younger groups were 26.5 and 27. The younger group, which learned by the progressive part method, had significantly higher scores than the younger group, which learned by the whole method. There was no significant difference between the two methods for the older groups. It is suggested that the performance difference between young and old individuals using progressive part learning was due to the increased effects with age of interference and unlearning difficulties.

A66-80283**THE CHARACTERISTICS OF LIPID MOBILIZATION AND PERIPHERAL DISPOSITION IN AGED INDIVIDUALS.**

Carl Eisdorfer, Albert H. Powell, Jr., Gilbert Silverman, and Morton D. Bogdonoff (Duke U. Med. Center, Depts. of Med., Psychiat., and Psychol., Durham, N. C.)

Journal of Gerontology, vol. 20, Oct. 1965, p. 511-518. 21 refs.

Grants PHS H-3502, M-2109, HE 08571-01, AM-05509, 2M-8000, MSP 18,193, and AM Heart Assoc. 64 G 159.

Life Insurance Med. Res. Fund supported research.

The peripheral characteristics of free fatty acids (FFA) utilization for young and old subjects have been described. The aged individual mobilized FFA in response to norepinephrine in a pattern comparable to that of the young individual; similarly, the aged individual removed injected albumin-bound palmitic acid- $1-C^{14}$ at a rate equal to that of the young individual. Any difference in muscle-activity performance between the two age groups would not seem to depend upon significant differences in the peripheral mobilization and disposition of lipid substrate.

A66-80284**LEVEL OF SKIN POTENTIAL IN HEALTHY MALES AND THE INFLUENCE OF AGE.**

Walter W. Surwillo (NIH, Natl. Heart Inst., Gerontol. Branch, Bethesda, Md., and Baltimore City Hosp., Md.)

Journal of Gerontology, vol. 20, Oct. 1965, p. 519-521. 9 refs.

Skin potential (Tarchanoff effect of the galvanic skin resistance) was recorded by Ag-AgCl electrodes, which were attached to the palm and ventral surface of the forearm, in 122 healthy males aged 22-85 years. Subjects

performed a watch-keeping task while the recordings were made. In all cases the palm proved to be electrically negative with respect to the forearm. Average level of skin potential for the group was -31.5 mV., and individual values ranged from -12.3 to -56.8 mV. A low but statistically significant negative correlation was found between age and skin potential level.

A66-80285

CRITICAL FLICKER FUSION FREQUENCY AS A FUNCTION OF EXPOSURE TIME IN TWO DIFFERENT AGE GROUPS.

Jane M. Huntington and Ernest Simonson (Minn. U., Lab. of Physiol. Hyg., Minneapolis).

Journal of Gerontology, vol. 20, Oct. 1965, p. 527-529. 15 refs.

Grants NIH NB-01859 and HE-04997.

The effect of exposure times varying between 900 and 100 msec. on the critical frequency of fusion (CFF) was studied in 15 young and 13 older healthy men, at a light:dark ratio of 1.9. In both age groups, the CFF dropped from the high to low exposure times by 5-8 c.p.s. The curves of two age groups, however, were not parallel along their entire length. The drop of CFF at shorter exposures was significantly greater for older than younger men. At all exposure times, the CFF was significantly higher in the younger group than in the older group ($P < .001$).

A66-80286

THE PSYCHOLOGY OF TIME.

M. Treisman.

Discovery, vol. 26, Oct. 1965, p. 40-45.

Human estimation of temporal intervals is usually inaccurate. It seems to depend on the psychological state of the person. Although it is generally assumed that an uninteresting occupation "makes time drag", while persons absorbed in work do not notice the passage of time, experimental investigations have indicated the reversed effect. The same paradox was noted when individuals were isolated for a long period of time. The explanation may lie in a hypothesis postulated by Dr. Hudson Hoagland, who proposed that nervous systems may contain "pace-maker" cells, which regulate normal physiological activities, such as respiration and cardiac contractions, and that the rate at which they produce impulses may be affected by the body temperature and apparently depends on chemical processes. The use of a model consisting of a Pacemaker, a Counter and a Store produced results which indicate the presence of an internal clock, which generates temporal information. Some evidence indicates that the possible location of this unit may be certain small areas of the thalamus, but more information is necessary to fully answer the question of time judgment.

A66-80287

DO CELLS HAVE CLOCKS?

B. M. Sweeney.

Discovery, vol. 26, Oct. 1965, p. 34-39.

Observations of plant and animal physiology and behavior disclosed a circadian rhythm with a period of about 24 hrs. Some animals and plants show definite seasonal variations in growth and behavior. Several factors were noted, which may influence biological rhythms. The axial and orbital rotation of the earth has been established as one. Variations in temperature have been noted to affect the activity of some organisms. Light is the most important factor, which not only affects the behavior or physiological and biochemical activity, but, in some experimental cases, light stimulation can shift the circadian rhythm. None of these factors can account completely for biological periodicity. The governing unit must be some form of a biological clock which operates on a biochemical basis regulated by a feedback system. There is some evidence indicating the role of ribonucleic acid in equilibrating the continuous biological time keeping.

A66-80288

CONVERGENCE AND STEREOSCOPIC VISION.

I. G. H. Ishak, M. H. S. Radwan, and M. M. Ibrahim (Nat. Res. Centre, Cairo, Egypt).

Optica Acta, vol. 12, Jul. 1965, p. 213-221. 9 refs.

Stereoscopic acuity measurements for eleven observers, under three different conditions of observation, were taken using a semi-automatic instrument, which is a modification of Wright's instrument. The apparatus provides two circular targets seen against a black background. The results of the eleven observers, together with those of three observers for whom similar measurements were taken in a previous investigation, are statistically studied. The analysis of the results supports the view that convergence is a factor contributing to stereoscopic vision.

A66-80289

PHOTOINDUCED ABSORPTION CHANGES AT 520 NM IN CHLORELLA AND THEIR RELATIONSHIP TO THE TWO-PIGMENT SYSTEM OF PHOTOSYNTHESIS.

Daniel Rubinstein (Charles F. Kettering Res. Lab., Yellow Springs, Ohio).

Biochimica et Biophysica Acta, vol. 109, Sep. 27, 1965, p. 41-44. 11 refs.

The appearance of the 520 nm. absorption band upon illumination of an aerobic cell suspension of *Chlorella* is partially inhibited by DCMU (3-(3,4-dichlorophenyl)-1,1-dimethylurea). In the presence of background light, this absorption change is sensitized by short-wave excitation and is completely inhibited by DCMU. In a similar sample made anaerobic by its own respiration or by the addition of an oxygen-scavenging system, the appearance of the 520 nm. band is not inhibited by DCMU. This band is now sensitized by light of long wavelength. It is postulated that the absorption change at 515-520 nm. is composed of two components: one related to pigment system I, the other to pigment system II.

A66-80290

A STUDY OF THE MODE OF ACTION OF 3-(4-CHLOROPHENYL)-1,1-DIMETHYLUREA ON PHOTOSYNTHESIS.

G. Gingras and C. Lemasson (C.N.R.S., Lab. de Photosyn., Gif-sur-Yvette (S and O), France).

Biochimica et Biophysica Acta, vol. 109, Sep. 27, 1965, p. 67-78. 25 refs.

The inhibition of steady-state photosynthetic oxygen evolution by 3-(4-chlorophenyl)-1,1-dimethylurea was studied in *Chlorella* as a function of light intensity, wavelength and temperature. The results of this study were taken to indicate that the inhibition is located very close to photochemical System II. The site of inhibition was determined more accurately by making use of the phenomenon of activation by a background light of the oxygen evolution produced by a single brief flash of white light. This activation was interpreted as being the result of oxidation of the primary substrate of photochemical Reaction II. The inhibitor appears to block oxygen evolution by inactivating this primary substrate.

A66-80291

SIMPLE OSCILLATIONS IN PHOTOSYNTHETIC OXYGEN EVOLUTION.

T. T. Bannister (Rochester U., Biol. Dept., N.Y.)

Biochimica et Biophysica Acta, vol. 109, Sep. 27, 1965, p. 97-107. 22 refs. NSF supported research.

With *Chlorella pyrenoidosa* strain 3, changes in white illumination within the range $(4-40) \cdot 10^5$ erg \cdot cm $^{-2}$ \cdot sec $^{-1}$ provoke oscillations in the rate of net O_2 evolution, provided the steady-state evolution is partially inhibited by a low concentration of CO_2 or by poisoning with KCN or iodoacetamide. The maximum amplitude of the oscillation is small: less than 1 ul O_2 /ul cells \cdot h; hence the oscillations could occur in either O_2 production or in light-stimulated O_2 uptake. The period of the oscillations has varied between 4 and 60 sec. in different experiments and is shorter the stronger the illumination. The intensity of damping has also varied; with weak damping up to 12 successive maxima have been seen. The oscillations disappear in the presence of $3 \mu M$ 3-(4-chlorophenyl)-1,1-dimethylurea and tend to be restored by $40 \mu M$ KCN. From the fact that the time-average rate of O_2 evolution during oscillation can be the same as in the steady state, a conserved catalyst reaction cycle is inferred. Such a cycle, lying somewhere between a photosynthetic photoreaction and the inhibited steps in the carbon cycle, seems able to explain all characteristics of the oscillations.

A66-80292

SERUM CALCIUM ESTIMATION: AN EVALUATION OF A NEW METHOD.

Subhadra R. Shah, R. C. Master, and R. C. Shah (K. M. School of Post-Graduate Med. and Res., and Sheth Vadilal Sarabhai Gen. Hosp., Ahmedabad, India).

Indian Journal of Pathology and Bacteriology, vol. 8, Oct. 1965, p. 280-284. 7 refs.

M/s. Sandoz India Ltd. supported research.

Blood serum calcium was estimated by the method of Clark and Collip, and the method of Mills and Leaf on 122 different blood samples. The latter method was very quick, perfectly reliable, and constantly reproducible. It utilizes a titrimetric procedure, using Disodium EDTA (sodium salt of ethylenediamine-tetra-acetic acid) against blood serum. The method, therefore, promises to be a useful adjunct when time saving devices must be used either due to heavy work load or emergency conditions when the life of the patient may hang in balance pending the result of such tests.

A66-80293

MODIFICATIONS OF SERUM PROTEIN IODINE IN MAN EXPOSED TO POLAR CLIMATE [MODIFICATIONS DE L'IODE PROTIDIQUE DU SERUM CHEZ L'HOMME EXPOSE A UN CLIMAT POLAIRE].

Maurice Staquet.

Journal de Physiologie, vol. 57, July-Aug. 1965, p. 499-502. 14 refs. In French.

Centre Natl. de Rech. Polaires de Belgique supported research.

The stress produced by exposure to cold causes a fall in serum protein-bound iodine during the early days. In some subjects this initial fall is followed, in succeeding days, by a return to normal, or even raised, levels. These changes can be explained by an increased peripheral thyroxine consumption provoking pituitary-thyroid hyperfunction.

A66-80294

THE ROLE OF ADIPOSE TISSUE IN DECOMPRESSION SICKNESS [IMPORTANZA DEL TESSUTO ADIPOSO NEL' AEROEMBOLISMO DISBARICO]. G. Viotti (Genova U., Ist. di Med. del Lavoro, Italy) and D. N. Walder (Newcastle upon Tyne U., Med. School, Dept. of Surgery, Great Britain). *Lavoro e Medicina*, vol. 19, Jul.-Aug. 1965, p. 81-83. 9 refs. In Italian.

Experiments investigating the effects of adipose tissue on the susceptibility of decompression sickness are presented. Two groups of guinea pigs were used as subjects. One group of animals was starved, while the other group was starved until 25% body weight loss occurred. All animals were subjected to a pressure of 6 atmospheres absolute for 2 hours, followed by decompressions for 3 minutes. The unstarved animals all died after decompression at times varying from 6 minutes to 10 minutes 10 sec. Dissection showed bubbles in the inferior vena cava, aorta, right and left heart components, and sometimes in the coronary and intestinal vessels. The starved animals all survived decompression. On dissection, no bubbles or fat tissue could be seen. It appears that the amount of fat tissue present in the animal is an important factor in the genesis of decompression sickness. It is possible that decompression sickness might be prevented by eliminating as far as possible fat tissue from the animals.

A66-80295

MODIFICATION OF RADIATION "CEREBRAL DEATH" BY HOPOXIA. E. A. Wright and Jennifer Shewell (St. Mary's Hosp. Med. School, Dept. of Pathol., London, Great Britain). *Nature*, vol. 208, Nov. 27, 1965, p. 904-905. 12 refs. British Empire Cancer Campaign for Res. supported research.

Experiments on albino mice show that nitrogen breathing produces a marked change in radiosensitivity to massive doses of radiation. The mechanism by which this change is brought about is not yet understood, and probably awaits greater knowledge of the fluctuations in available tissue oxygen in the brain.

A66-80296

EQUIPMENT FOR TRAINING ASTRONAUTS FOR CONTROL OF SPACECRAFT AND ITS SYSTEMS [TRENAZHERY DLIA PODGOTOVKI KOSMONAVTOV K PROFESSIONAL'NOI DEIATEL'NOSTI PO UPRAVLENIU KORABLEM I EGO SISTEMAMI].

N. N. Gurovskii, V. G. Denisov, A. P. Kuz'minov, and M. M. Sil'vestrov. *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 3-9. In Russian.

All devices used for cosmonaut training fall into one of three groups: (1) those for physiological training to increase resistance of adaptation to extremal flight factors; (2) those for occupational training in flight operations; and (3) those which combine physiological with occupational training. The present article discusses various types of devices designed to provide training in spacecraft piloting and systems control. Depending on the number of systems, flight stages, and flight tasks to be modeled, trainers may be classed as (1) universal, (2) complex, (3) specialized, or (4) functional. Since cosmonauts are trained for specific ships and specific tasks on a given ship, three types of trainers suffice: complex, specialized, and functional.

A66-80297

BASIC PRINCIPLES OF SPECIAL TRAINING OF ASTRONAUTS [OSNOVNYE PRINTSIPY SPETSIAL'NOI TRENIROVKI KOSMONAVTOV].

N. N. Gurovskii, M. D. Emel'ianov, and E. A. Karpov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 10-16. In Russian.

Biomedical training of astronauts must include stimulation of factors which may be encountered during the actual space mission. With the exception of sustained parabolic flight, all conditions and factors can be simulated in training on the ground, either in specially constructed chambers and suitable devices or in mock-ups. The simulations include: (1) physical conditions peculiar to outer space, such as total vacuum, ionizing radiation, low temperature, and weightlessness; (2) the dynamic state of flight, including noise, vibration, and acceleration, which may affect the vestibular apparatus, and (3) the static state of the space cabin interior, including air conditioning, variation of temperature, lack of locomotion, limited type of diet, and limitations of the space suit. Monotony of work performance, newness of the situation, and psychological stress—all these are factors that may affect the physiological state of the astronaut, if pre-flight adaptation training were omitted. After a complete course of training, no particular problems in the medical areas have been so far noted during actual flights.

A66-80298

EXPERIMENTAL PSYCHOLOGICAL EXAMINATION OF A GROUP OF ASTRONAUTS [EKSPERIMENTAL'NO-PSIKHOLOGICHESKOE ISSLEDOVANIE GRUPPY KOSMONAVTOV].

F. D. Gorbov and M. A. Novikov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 17-26. In Russian.

An experimental battery of test stressors modeling one or another factor of dangerous or unrepeatable situations (e.g. plane crashes) was devised

in consultation with experienced air crews. The first step in this work was to isolate the psychological factors and to devise rigorously reproducible methods for studying them. Suggestibility studies are cited as one example. Group studies were undertaken to explore: (1) psychological aspects of pilot interaction during interdependent activity, and (2) psychological aspects of cohabitation under complex conditions of prolonged group isolation. The integrative action was studied by means of a "homeostat" device for modeling and solving problems of varying degrees of difficulty. It is controlled by a number of interconnected inputs of equal strength. Work indices of each operator are automatically recorded and the dynamics of his activities evaluated during the experiment, making it possible to discern and follow the formulation of individual strategies. Some of the findings concern emergent leadership and transfer of learning. Parallels are drawn between Sherrington's funnel concept of the competition of reflexes for a final common path and the types of interaction in group problem solving.

A66-80299

EFFECT OF EIGHT-HOUR ISOLATION AND HYPOKINESIA ON CERTAIN PHYSIOLOGICAL AND BIOCHEMICAL DATA IN MAN [VLIANIE VOS'MI-CHASOVOI IZOLIATSII I GIPOKINEZII NA NEKOTORYE FIZIOLOGICHESKIE I BIOKHEMICHESKIE POKAZATELI U CHELOVEKA].

V. S. Georgievskii, L. I. Kakurin, A. N. Kalitina, B. S. Katkovskii, V. V. Kustov, V. I. Mikhailov, Z. I. Piliptuk, and I. U. N. Tokarev.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 27-30. 6 refs. In Russian.

Ten young men were kept for 8 hours in a sitting position in a hermetically sealed chamber with forced ventilation of atmospheric air. The oxygen content was 20-21%, and the CO₂ content was 0.01-0.03%. The temperature varied between 20-22°C, and the relative humidity between 50-60%. The parameters measured included the standard electrocardiogram, pulse rate, arterial blood pressure, stroke volume, heart minute volume, peripheral resistance, cardiac index, respiratory rate, respiratory amplitude, respiratory minute volume, oxygen consumption, coefficient of oxygen utilization, pulmonary vital capacity, etc. In general, 8 hours of isolation and hypokinesia did not lead to any substantial functional shift in the human organism. Statistically significant findings included a fall in carboxyhemoglobin from 1.48±0.48 to 0.51±0.26, and increased catalyzing activity of blood.

A66-80300

EFFECT OF PROLONGED ISOLATION IN A SMALL CLOSED CABIN ON THE HUMAN ORGANISM [O VLIANII NA ORGANIZM CHELOVEKA KLIT'NOGO PREBYVANIA V ZAMKNUTOI KAMERE MALOGO OB'EMA].

N. A. Agadzhanian, I. U. P. Bizin, G. P. Doronin, E. A. Il'in, A. G. Kuznetsov, and N. I. Ezepechuk.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 31-43. 16 refs. In Russian.

Two subjects underwent a long-term stay in a pressure chamber of 7 m³ capacity, with a partial oxygen pressure of 155-165 mm. Hg, CO₂ content below 2 mm. Hg, air temperature of 19.5 to 23.5°C., and relative humidity at 40-70%. Psychomotor performance deteriorated with respect to time but not to quality. Coordination and problem-solving was not affected. Loss of interest, irritability, and emotional lability appeared in the second half of the experiment. Electroencephalogram toward the end registered a decrease in the alpha wave concomitant with a predominance of 4-6 c.p.s. waves interspersed with 0.5-2 c.p.s. wave. At the end of 60 days, the pulse rate dropped by 20%, the systolic pressure by 10-16%, the diastolic pressure by 7-8%, the heart minute volume and the stroke volume increased, the peripheral vascular resistance decreased, and the vasomotor latency increased. Post-experiment tests showed a decreased capacity for adaptation, circulatory lability, and a decreased heart size. Oxygen consumption fell by 32%, CO₂ expiration by 26%, and pulmonary ventilation by 2-2.5 liters per min. Total energy expenditure dropped to 20.85 kcal/kg. per diem. Certain changes in the hematocrit were also noted. Recommendations are made for a more varied, stimulating environment for the astronaut.

A66-80301

EFFECT OF VARIOUS TYPES OF ACCELERATION ON HUMAN ORGANISM DURING LANDING OF SPACECRAFT [REAKTSIIA ORGANIZMA CHELOVEKA NA DEISTVIE PEREGRUZOK PRIZEMLENIIA, DEISTVUIUSHCHIKH V RAZLICHNYKH NAPRAVLENIYAKH].

C. P. Mitrolov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 44-53. 27 refs. In Russian.

Experiments were conducted with the help of a special device for studying means of protecting spacecraft crews from the effects of forced landing. Both pneumatic (PN-1, PN-2) and mechanical (Mekh) shock absorbers were used. The acceleration of the PN-1 and PN-2 was 400-500 and 1000-2000 units/sec., respectively, with the force dependent on the velocity of the cabin. The acceleration force of the "Mekh" shock absorber was 10-12 (700-1000 units/sec.), independent of cabin velocity. All subjects were given cardiographic arterial pressure, respiration, and motor reaction tests which did not reveal any significant deviations from normal following impacts. Subjects endured along the longitudinal axis of the body with greater difficulty than transverse

impacts. It was concluded that fairly high magnitudes of impact can be withstood without any pathological consequences or lowered working ability. The use of safety belts, harnesses, shock absorbers, etc. makes it possible to construct aircraft capable of landing at velocities of 8-10 m./sec.

A66-80302

CHANGES IN FUNCTION AND RECIPROCAL ACTION OF THE OTOLITHS AND CUPULA OF THE VESTIBULAR APPARATUS DURING CHANGES IN GRAVITATIONAL FORCE IN MAN [K PROBLEME OSOBENOSTEI FUNKTSII I VZAIMODEISTVIA OTOLITOVOGO I KUPULIARNOGO APPARATOV VESTIBULIARNOGO ANALIZATORA CHELOVEKA V USLOVIAKH IZMENENNOI VESOMOSTI].

E. M. Iuganov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 54-69. 22 refs. In Russian.

Investigations with decreasing and increasing gravity loads and weightlessness were conducted to determine whether weightlessness acts as a unique stimulus of the otolithic mechanism specifically exciting its neuroreceptor mechanisms or whether it leads to a functional elimination of the otoliths ("physiological delabyrinthization"). To elucidate the functional condition of the otolithic mechanism, the following indices were studied: (1) the duration of post-rotational nystagmus, (2) the duration of counter-rotational illusion, (3) the magnitude of the latent developmental period of rolling or rocking illusions, and (4) the threshold duration of recovery from leaning. Tables with results of these and other studies are given. Analysis of the data indicates that weightlessness does not lead to a functional elimination of the otolithic mechanism or to so-called physiological delabyrinthization, but rather, that weightlessness is a negative stimulus leading to the development of specific vestibular reactions. It should be noted that not only the absolute value of gravitational change, but the process of the change itself and the direction of force on the body dictate the degree and nature of the nystagmic reaction, e.g., a lessening of load leads to retardation of the nystagmic reaction.

A66-80303

HUMAN TOLERANCE OF LARGE ANGULAR ACCELERATION STRESS DURING SHORT PERIODS OF TIME [K VOPROSU OB USTOICHIVOSTI CHELOVEKA K VOZDEISTVIU KRATKOVREMENNYKH UGLOVYKH USKORENII BOL'SHIKH VELICHIN].

V. M. Tardov, B. V. Ustiushin, and S. F. Orlov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 70-74. In Russian.

The effect of various large angular accelerations was studied using 6 healthy male subjects 22-25 yr. of age. Rotation took place around the longitudinal axis of the body. The following physiological indices were studied: electro-nystagmogram, electrocardiogram, arterial pressure, respiration rate, and electroencephalogram. Subjective illusions during rotation were characteristic of those experienced when the semi-circular canals were stimulated. The cardiovascular system reacted sharply to short-term rotation, reflected in an increase in pulse rate after the chair had been stopped. In some cases, after exposure to the angular accelerations the rate was 125 beats/min., quickly returning to normal and sometimes subnormal levels. Systolic and diastolic pressure was increased. Cardiac activity respiration rate increased immediately after exposure, quickly returning to normal levels. It is observed that the reactions of the organism to short-term rotations were not specific and were attributed to neuropsychic responses, i.e., to emotional strains such as those encountered in catapult tests. This was substantiated in a test in which a subject was given a false command that the chair was ready to revolve and did not. The same physiological reactions as those observed during rotation occurred, though not to as great a degree.

A66-80304

CHANGES IN THE PHYSIOLOGICAL AND BIOCHEMICAL STATE OF MAN AFTER AN EXPOSURE TO SMALL CONCENTRATIONS OF CARBON MONOXIDE [IZMENENIE NEKOTORYKH FIZIOLOGICHESKIKH I BIOKHEMICHESKIKH POказATELEI U CHELOVEKA POSLE VOZDEISTVIA OKISLUGLERODA V MALYKH KONTSENTRATSIIAKH].

V. V. Kustov, V. I. Mikhailov, Z. I. Pliptuk, I. N. Tokarev, V. S. Georgievskii, B. S. Katkovskii, and A. N. Kaltina.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 75-79. 10 refs. In Russian.

Human subjects inhaling an air mixture containing 0.012 mg./l. CO in 8 hrs. showed some changes in physiological and biochemical data. In the electrocardiogram the P, R, and T waves had lower amplitudes and an elongation of the QRS complex. The respiration data showed a slight decrease in the O₂ intake, the coefficient of O₂ utilization, and an increase in minute volume and rate of ventilation. The carboxyhemoglobin concentration increases by about 0.8%. The cholinesterase activity was slightly elevated. The performance capacity showed no arithmetically detectible change, but the number of errors increased. The changes could not be accounted for by hypoxemia alone, because of its rise. The effect, therefore, must be due also to the changes in the tissue.

A66-80305

EFFECT OF ACCLIMATIZATION TO HIGH ALTITUDES ON HUMAN TOLERANCE TO HYPOXIA [VLIANIE AKKLIMATIZATSII V VYSOKOGORNYKH USLOVIAKH NA USTOICHIVOST' CHELOVEKA K GIPOKSII].

E. N. Salatsinskaja.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 80-86. 9 refs. In Russian.

Experiments were performed with 38 (21 acclimatized, 17 non-acclimatized) mountain climbers to high altitude (1650 m.) at the beginning of the experiment. To detect differences between the two groups in their abilities to withstand hypoxia and to tolerate fatigue during ascents was attempted. After 20 days the non-acclimatized group had achieved a degree of acclimatization comparable to that which the first group had at the beginning of the 20-day period. Actual tests for determining resistance to hypoxia were based on duration of respiration in a Krogh apparatus filled with air. The acclimatized group showed a slight, but not statistically significant, rise in tolerance to hypoxia. The nonacclimatized group showed a statistically significant (21.3%) drop in tolerance to hypoxia. Toward the end of the 20-day period in camp the acclimatized group showed a rise of 19.9%, and the non-acclimatized group showed a 20.4% increase in tolerance to hypoxia. When tested for tolerance to hypoxia in the Krogh apparatus, both groups showed a rise in pulmonary ventilation up to the 7th minute. After the 7th minute pulmonary ventilation continued to rise in the acclimatized group, but fell off in the non-acclimatized group. This drop in pulmonary ventilation in the non-acclimatized group is apparently due to acute fatigue of respiratory muscles. Blood oxygen saturation and hemoglobin content of both groups were compared before and after ascent to high altitude. Variations between the two groups for these parameters are described.

A66-80306

INVESTIGATION OF HUMAN VISUAL PERCEPTION RATE [ISLEDOVANIE PROPUKNOI S POSOBNOSTI ZRITEL'NOI SISTEMY CHELOVEKA].

A. A. Nevskaja.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 87-101. 7 refs.

Experiments were conducted on human subjects to determine the reaction time of visual perception by presenting briefly charts with outlines of familiar objects. Subsequent series were complicated by masking the design by a number of randomly distributed black dots. The results showed that recognition of design was slower when the size of the object was decreased. The masking of the design with 100-200 dots per cm. did not change the reaction rate; greater masking increased the time. The decrease of illumination also decreased the reaction time. In general, the change in stimulus to noise ratio did not affect the reaction time to a certain limit, but the results indicated the existence of a sharp threshold for each system and individual.

A66-80307

AUDITORY PERCEPTION IN MAN UNDER CONDITIONS OF PROLONGED CONTINUOUS NOISE OF MEDIUM INTENSITY [OSOBENOSTI SLUKHOVOI CHUVSTVITEL'NOSTI V USLOVIAKH NEPRERYVNOGO I DLITEL'NOGO DEISTVIA NA CHELOVEKA SHUMA SREDNEI INTENSIVNOSTI].

I. U. V. Krylov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 102-106. 25 refs. In Russian.

During spaceflight various life-support systems such as ventilators generate constant noise. Under certain conditions, this noise factor can be expected to have an unfavorable effect on astronauts. To test this possibility, the auditory sensitivity was studied in 8 subjects kept in a small hermetic chamber for 27-60 days. These subjects were exposed to constant noise with a maximum intensity of 60-65 db. (800-1800 c.p.s.) and minimum intensity of 4-5 db. (one octave higher). Hearing tests were conducted with an AU-5 audiometer and a telephone located in the chamber. Hearing thresholds were determined at 125, 250, 500, 1000, 3000, and 8000 c.p.s. In all, 350 hearing tests were conducted. Hearing thresholds were characterized by the following stages during the experiment: During the first stage, there was a maximum increase in hearing sensitivity especially during the first day. The second stage was characterized by high stability of hearing sensitivity during the 23rd and 24th day of 30-day experiments. The third stage was characterized by a further decrease in hearing thresholds, which reflected an improvement in hearing. It is suggested that the progressive improvement in hearing following prolonged exposure to noise reflects an intensified excitatory process in the cerebral cortex. Restoration of auditory sensitivity took place 10-15 min. after the termination of the experiment; full restoration was observed a few months later.

A66-80308

ANIMAL LINK IN FOOD SUPPLY IN A CLOSED ECOLOGICAL SYSTEM [NEKOTORYE DANNYE PO ZVENU ZHIVOTNYKH V ZAMKNUTOI EKOLOGICHESKOI SISTEME].

I. A. Abakumova, K. S. Akhlebintskii, V. P. Bychkov, N. G. Demochkina, I. U. Kondrat'ev, and A. S. Ushakov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 107-118. 15 refs. In Russian.

Data on the use of animals for food in a closed ecological system, such as might be used in spaceflight (based on unicellular algae, higher plants, animals, and man), are presented. Most of the information concerns chickens and ducks—good choices because they mature fast, produce a sufficient quantity of nutritious food, and have a high yield of meat and eggs per unit of feed. Calculations are made of the number of ducks required to provide an astronaut with his daily requirement of animal protein (40–45 g.), and tables showing turnover of the flock are given. Analogous comparative data are listed for chickens. Charts of the nutritive content and caloric value of the food produced by chickens and ducks are included. More information must be collected about these and other animals, and many experiments must be conducted with each in a closed ecological system.

A66-80309

POSSIBILITIES OF PHARMACEUTICAL AND CHEMICAL PROTECTION AGAINST RADIATION INJURIES DURING SPACE FLIGHTS [PERSPEKTIVY FARMAKOKHIMICHESKOI ZASHCHITY OT RADIATSIONNYKH PORAZHENII PRI KOSMICHESKIKH POLETAKH].

P. P. Saksonov, V. V. Antipov, N. N. Dobrov, V. S. Shashkov, V. A. Kozlov, V. S. Parshin, B. I. Davydov, B. L. Razgovorov, V. S. Morozov, M. D. Nikitin. *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 119–126. 68 refs. In Russian.

Space crews are exposed to corpuscular radiation of the radiation belts surrounding the earth, protons of solar flares, and heavy nuclei of primary cosmic radiation. Damage which may be caused by these types of ionizing radiations can be prevented either by suitable shielding of the craft or by direct radiation protection drugs. Animal experiments indicate that cystamine, distaphene, and isothipene give adequate protection against ionizing radiation. As a rule, pharmaceutical protection seems to be sufficient in cases of scattered radiation but has little effect against hard radiation. Aminothioli compounds (cystamine, cysteamine, serotonin, and aminoethylisothiuronium) have protected experimental animals against protons of 120–660 Mev. energy. Very hard radiation, which may be encountered in extraterrestrial space, is difficult to produce in ground laboratories; therefore no complete data are available. In addition, the ionizing effect may be complicated by such factors as acceleration, vibration, weightlessness, noise and ambient conditions of pressure and humidity. Another factor is duration of mission. The problem of chemical protection can not as yet be considered as solved, but this method seems to have great possibilities.

A66-80310

BIOLOGICAL FACTOR UNDER RADIATION CONDITIONS DURING EARTH-MOON MISSION [BIOLOGICHESKAIA OTSENKA RADIATSIONNYKH USLOVIV NA TRASSE ZEMLIA-LUNA].

I. U. M. Volynkin, V. V. Antipov, V. A. Guda, M. D. Nikitin, and P. P. Saksonov. *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 127–138. 41 refs. In Russian.

Estimation of the primary cosmic radiation dose which an astronaut venturing beyond the earth's magnetic field may receive produced the following results: The intensity of the primary cosmic radiation was accepted as 2.24 particles/cm²/sec. The coefficient of the relative biological effect was calculated from the graphs determined by the linear energy expenditure. Assuming constant composition of the primary cosmic radiation, the daily dose in 125–270 mrem. This dose exceeds 7–16 times the limit of man's tolerance. The protection shielding of the spacecraft, with a thickness of 1–2 g./cm², does not alter this value. The distribution of the ionizing effect of the primary cosmic radiation was found to be: protons-5.0 mrem., alpha-particles 5.5 mrem., L-0.5 mrem., M-33.0 mrem., and H-96.0 mrem. per 24 hrs. Cosmic radiation also contains about 1% electrons, and traces of gamma-rays. The data were estimated at near-earth level. Since the earth's magnetic field deflects some of the radiation, it may be twice this value in space. Solar flares create outbursts of ionizing radiation consisting of 90% protons, 10% alpha particles, and traces of heavy nuclei including Z 18. The shielding, therefore, must be increased to 3 g./cm². Even this may not prevent the crew members from receiving a lethal dose, which is about 200 rem. Heavier shielding, however, presents technical difficulties in construction of a spacecraft.

A66-80311

ANTIRADIATION PROTECTION IN CONNECTION WITH THE RELATIVE BIOLOGICAL EFFECT OF LOW-ENERGY IONIZING RADIATION [PROTIVOLUCHEVAIA ZASHCHITA V SVIAZI S PROBLEMOI OTNOSITEL' NOI BIOLOGICHESKOI EFFEKTIVNOSTI REDKOIONIZIRUIUSHCHIKH IZLUCHENII].

S. P. Iarmonenko and A. G. Konopliannikov. *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 139–164. 124 refs. In Russian.

Results of 74 Soviet and 50 Western studies on the effects of ionizing radiation (gamma, proton, and X-ray) and means of protection are presented in figural and tabular form. The following are included: (1) the relative biological effect (RBE) of radiations of low specific ionization (linear energy transfer (LET) in kev per 1 micron of passage); (2) dependence of RBE on the hardness of

radiation and species of animal; (3) the RBE of high-energy particles (LET in Kev/micron); (4) viability of rats exposed to proton irradiation according to different Soviet researchers; (5) determination of the constant K for different radiations of low specific ionization; (6) comparative radioprotective effect of some agents during radiations of low specific ionization, including tryptamine chlorhydrate, cystamine dichlorhydrate, and testosterone propionate; and (7) effectiveness of combined radioprotectors (mercamine and 5 methoxytryptamine, mercamine and serotonin, hydroxylamine and AET). Suggestions for further studies of the relation between LET and biological effects of high-energy particles are outlined.

A66-80312

NEW ASPECTS OF PERSONAL HYGIENE [NOVYE ASPEKTY LICHNOI GIGIENY].

V. V. Levashov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 165–168. In Russian.

Hygienic control in space flight will require study of the functions of the skin and the role of skin processes in vital activity. Optimal and permissible values must be established for the biological, physical, and chemical indices of the skin under normal conditions and during exposure to various flight stressors. Results of some studies already made are reported. Included are the following: (1) deprivation of customary washing arrangements for two weeks had an adverse effect on general well-being; deprivation for longer periods had still more severe effects, including development of skin pathologies; (2) the elasticity of certain portions of the skin was changing by a factor of 2 to 3 during exposures in pressure-, echoless-, and thermochambers under conditions of artificial lighting and restricted movement; (3) experimental removal of underwear for 5 days resulted in greatly increased accumulation of sebum (440 to 470 mg./cm²); and (4) confinement was found to reduce the bactericidal effectiveness of the skin. It is suggested that possible correlations of indices such as nonspecific skin reactivity and changes in the chemical composition of sebum with bactericidal properties of the skin must not be overlooked.

A66-80313

CERTAIN PROBLEMS OF HUMAN ECOLOGY IN CLOSED SYSTEMS OF CHEMICAL CYCLES [NEKOTORYE PROBLEMY EKOLOGII CHELOVEKA V USLOVIAKH ZAMKNUTYKH SISTEM KRUGOVOROTA VESHCHESTV].

E. I. A. Shepelev.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 169–179. 24 refs. In Russian.

The author gives a preliminary survey of some of the problems which may confront man in the closed system of the spacecraft cabin. Weight considerations prohibit an excess supply of life-supporting items, making the cycling of oxygen, water and food all important. Oxygen can be regenerated by the use of photosynthetic systems of green plants of different species. However, CO₂ is not the only product of animal and plant respiration. Traces of other gaseous contaminants may be present, such as carbon monoxide, nitrogen oxides, volatile oils, methane, acetone, and alcohols. Some bacteria can be employed in assimilating these products and purify the atmosphere. Some gaseous waste products of plant metabolism may be even beneficial, such as phytoncides, which are lethal to some microorganisms. Redistillation of urine and condensed water is feasible; but repeated distillation may lead to the removal of all mineral traces essential for human metabolism. Changes in the duration of day-night periods during space flights may affect the circadian rhythm of man, lower the metabolic processes, and result in reducing the daily vital requirements.

A66-80314

STUDY OF COMFORTABLE CLOTHING FOR ASTRONAUTS IN SMALL AIR-CONDITIONED CABINS [GIGIENICHESKIE ISSLEDOVANIYA ODEZHDI KOSMONAVTOV DLIA NOSHENIIA V KABINE MALOGO OB'EMA PRI KOMFORTNYKH MIKROKLIMATICHESKIKH USLOVIAKH].

I. G. Popov, V. I. Krichagin, V. V. Borshchenko, and F. K. Sabinich.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 180–187. In Russian.

Experiments are described investigating materials suitable for use in space cabin atmospheres of about 63°F. In space the main contaminants of skin and clothing are the products of human vital activity (skin gland secretions, sloughed epidermis, falling hair, and particles of urine and feces). Weight penalties make the carrying of changes of underwear or their cleaning impracticable. Therefore, ways must be found to enhance the skin-cleaning capability of these garments. Knitted fabric has a number of advantages: (1) better fit, (2) economy of space in packing, and (3) convenience in placing biological sensors. Chamois slippers were used. Samples of the clothing were worn in a thermochamber, a cabin mock-up, and during Vostok flight tests. Methods were devised to measure the degree of soiling by analyzing bath and wash water. Skin condition of subjects following 30-day tests without washing remained wholly satisfactory. Hyperkeratosis, scaling, some folliculitis simplex, isolated boils, dermatitis, and acne vulgaris were observed, but none of these conditions interfered with work capacity of subjects or prevented completion of the experimental program. The knitted underwear developed by such methods was worn by Gagarin, Titov, Nikolayev, Popovich, Bykovskiy, and Tereshkova during the first spaceflights.

A66-80315

THEORETICAL CONSIDERATIONS OF THE REQUIREMENTS FOR THE SPACE CABIN ATMOSPHERE IN INTERPLANETARY SPACECRAFTS, AND POSSIBILITIES OF UTILIZATION OF HELIUM-OXYGEN MIXTURES FOR THIS PURPOSE [TEORETICHESKOE OBOSNOVANIE MIKROATMOSFERY KABIN PLANETARNYKH KOSMICHESKIKH KORABLEI I PERSPEKTIVY IS POL'ZOVANIYA DLIYA ETIKH TSELEI GELIOKISLORODNYKH SMESI]. B. M. Sabin. *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 188-195. 13 refs. In Russian.

Since a helium-oxygen mixture possesses a number of advantages over a nitrogen-oxygen mixture in a space cabin environment, Soviet scientists have been conducting experiments to assure themselves that prolonged respiration in a helium-oxygen environment, and the absence of nitrogen for prolonged periods of time, does not have any harmful biological effect. Chick embryos allowed to develop in a helium-oxygen mixture developed normally. However, in order to achieve normal development, the temperature and humidity of the surrounding environment had to be somewhat higher than normal. Experiments performed with developing frog eggs also indicated that the only effects of high partial pressures of helium are due to its physical properties (specific heat and thermal conductivity). In short, it was shown that substituting helium for nitrogen was not an obstacle to normal embryonic development. Experiments performed with chickens and mice indicated that prolonged exposures to a helium-oxygen environment do not cause any physiological disruptions. However, the reactions and general behavior of the animals indicate that physiological processes are much more sensitive to the temperature of the surrounding gas mixture than they are to a normal oxygen-nitrogen atmosphere. The temperature comfort zone in helium-oxygen atmospheres is 3-3.5°C. higher than in normal atmospheres. It is, therefore, concluded that helium can be used as one of the components of the microatmosphere of spaceship cabins.

A66-80316

EFFECT OF PROLONGED HYPOKINESIA ON HUMAN TOLERANCE OF ACCELERATION [VLIANIE DLITEL'NOI GIPOKINEZII NA USTOICHIVOST' CHELOVEKA K PEREGRUZHANI]. A. R. Kotovskaya, L. I. Kakurin, N. I. Konnova, S. F. Simpura, and I. S. Grishina. *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 333-342. 10 refs. In Russian.

The effects of various durations of hypokinesia on the resistance of 5 male subjects to centrifugation were studied. The direction of force was chest-spine in a semi-prone position (25° from horizontal). The duration of hypokinesia was 3 days for 2 men and 20 days for 3 men. The basic indices of human resistance to acceleration after hypokinesia were changes in maximum endurance time and the degree of changes in basic physiological reactions. Subjective illusions were also considered. In general, 3-day hypokinesia did not noticeably alter physiological reactions to 7-g centrifugation; the duration of exposure was 4 min. After a 20-day period of hypokinesia, subjects were pale, irritable, nervous, and tense, although they were able to withstand 4 g for 30 sec. without difficulty. It took longer (5-10 min.) for cardiovascular and respiratory indices to return to normal following 20 days of hypokinesia and 7-g runs than during control runs (1-3 min.). Hypokinesia did not alter motor reactions or peripheral blood indices in response to centrifugation. Petechiae due to acceleration were more commonly encountered and more pronounced after 20 days of hypokinesia and persisted for 2-3 days after centrifugation. In conjunction with these effects, there was a tendency for small vessels to become more brittle after bedrest (positive endothelial syndrome). In general, it was observed that a 20-day period of hypokinesia lowered human endurance to acceleration, whereas a 3-day period did not have this effect. Individual response to the experiment was pronounced. It was concluded that prolonged restriction of motor activity and decreased hydrostatic pressure of the blood are the main pathogenic factors determining lowered human tolerance to acceleration.

A66-80317

EFFECT OF SLIGHT CORIOLIS ACCELERATION ON THE FUNCTIONAL STATE OF THE HUMAN HEART [VLIANIE MALYKH VELICHIN USKORENII KORIOLOSA NA FUNKTSIONAL'NOE SOSTOYANIE SERDITSA CHELOVEKA]. R. A. Vartbaronov. *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 343-348. 18 refs. In Russian.

The chronic effects of small magnitudes (0, 5.3, 10.6, and 21.2°/sec.) of Coriolis accelerations on human cardiac activity were analyzed for 4 subjects. The vestibular sensitivity of the subjects varied. The cumulative effects of small Coriolis accelerations did not produce any pathological changes, and any deviations observed were judged to be within physiological norms. Magnitudes of 10.6°/sec. had a sympathetic influence on cardiac activity, while the effects of 21.2°/sec. were mainly parasympathetic, changing to a pronounced sympathetic effect during functional tests. This effect was probably due to decreased cardiac functional ability induced by extracardial factors. Even when nausea set in, physiological deviations in cardiac activity were not great. This reflects a nonspecific stress reaction to rotation in the higher autonomic centers. It is concluded that the human heart muscle shows a high adaptability to vestibular stimuli.

A66-80318

THE CHARACTER OF THE ELECTROENCEPHALOGRAPH AND THE WORK CAPACITY IN MAN DURING CORIOLIS ACCELERATION DIRECTED BACK-TO-CHEST [KHARAKTER ELEKTROENTSEFALOGRAMMY I RABOTOSPOSOBNOST' CHELOVEKA PRI DEISTVII USKORENII NAPRAVLENNYKH PO OSI "SPINA-GRUD"]. A. S. Barer and V. B. Zubavin. *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 349-360. 16 refs. In Russian.

Experiments were conducted on 18 subjects aged 24-34 years. In three series of tests the acceleration force vectors were 65°, 78°, and 90° to the longitudinal axis of the body on a large-radius centrifuge. Acceleration stress began at 6 g's and increased by 2 g's, with the duration varied according to the individual's tolerance. Both unipolar and bipolar electroencephalograms (EEG) were taken with open and closed eyes. At 6 g's and a 65° angle the tolerance time was 635 sec.; and 8 g's it was 186 sec.; at 10 g's it was 58 sec.; at 12 g's it was 28 sec.; and at 14 and 15 g's it was an average of 18 and 10 sec. respectively. EEG changes were similar at 12, 14, and 15 g's. Reaction time increased parallel to an increase in g. Tolerance was improved at 12 g's at an angle of 78°, probably due to a better blood supply to vital organs at that angle. An angle of 90° lowered tolerance with displacement of internal organs, disruption of breathing, and nausea.

A66-80319

EFFECTS OF THE COMBINED ACTION OF ACCELERATION, VIBRATION, AND RADIATION ON CELL NUCLEI OF THE BONE MARROW IN MICE [VLIANIE KOMBINIROVANNOGO DEISTVIA USKORENII VIBRATSII I RADIATSII NA YADRA KLETOK KOSTNOGO MOZGA MYSHEI]. M. A. Arsen'eva, L. A. Beltaeva, and A. V. Golobkina. *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 373-390. 15 refs. In Russian.

The mitotic activity of the bone marrow cells of mice exposed to the individual and combined effects of acceleration (8-10 g for 5-15 min.), vibration (700 c.p.s.), and radiation (100 r. for 1 hr.) was studied. The experimental parameters of the tests and their quantitative results are tabulated. The changes in mitotic activity in bone marrow cell mitosis observed are assumed to reflect altered oxygen metabolism on the macro or cellular level as well as effects on the sympathetic system and the secretion of adrenalin or noradrenalin. These two hormones tend to protect the organism from radiation but also depress mitotic activity. It is also possible that the physical factors themselves had a direct effect on the cellular mechanism. In general, however, it was felt that the various physiological changes occurring as a result of acceleration or vibration lead to disruptions of mitotic activity which may reflect a unique protective effect from radiation.

A66-80320

ADAPTATIONAL REARRANGEMENTS IN MOUSE ORGANISM DURING AND AFTER EXPOSURE TO HIGH CONCENTRATIONS OF CARBON DIOXIDE [ADAPTAZIONNYE PERESTROIKI V ORGANIZME MYSHEI VO VREMIA I POSLE DEISTVIA POVYSHENNYKH KONTSENTRATSII DVUOKSIYA UGLERODA]. A. I. Koreshkin. *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 391-400. 18 refs. In Russian.

Experiments were conducted to determine the ability of animals to adapt to high carbon dioxide environments. Laboratory mice were placed in an environment containing 7.5% CO₂. Oxygen content ranged between 18 and 30%. Control animals were kept in a similar chamber but with a normal air composition. To test the degree of adaptation acquired, animals were placed in a special chamber with a hypercapnic environment consisting of 70% CO₂ and 30% O₂. After being kept in an environment of 7.5% CO₂, experimental animals showed a distinctly higher resistance to the hypercapnic environment than controls. The difference in survival time between the two groups was 38.4 ± 9.6 min. (83.8 ± 7.2 min. for experimental animals and 45.4 ± 7.8 min. for controls). At the end of the second day, however, and for 48 hours after that, the difference between the two groups was very slight. After the third day, the survival time of control animals exceeded that of experimental ones by 19.1 ± 14.7 min. The experimental animals showed a significant increase in respiration rate. This rise in the latter declined somewhat after the first 24 hours but stabilized at about 20% above the rate of the control animals. Motor activity in the experimental animals was below that of the controls.

A66-80321

THE IMPORTANCE OF THE POST-RADIATIONAL REGENERATION OF GENETIC STRUCTURES IN THE STATE OF CELLULAR RADIO-SENSITIVITY. REPORT 1. QUANTITATIVE PROCESS OF POST-RADIATIONAL REGENERATION OF YEAST CELLS [OZNACHENII PROTESSA POSTRADIATSIONNOGO VOSSTANOVLENIIA GENETICHESKIKH STRUKTUR DLIYA RADIOCHUVSTVITEL'NOSTI KLETOK, SOOBSHCHENIE 1. KOLICHES'TVENNYE ZAKONOMETRNOСТИ POSTRADIATSIONNOGO VOSSTANOVLENIIA DROZHZHEVYKH KLETOK].

V. S. Barsukov, O. V. Malinovskii, and N. M. Mitiushova.
Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 451-460, 13 refs. In Russian.

Experiments with yeast cells showed that the damage caused by ionizing radiation to dominant factors was reversible. Chromosomal breakage can be restored by recombination of fragments in the process of mitosis. These findings indicate that similar processes may occur in tissues of higher organisms. Possibly pharmaceutical measures of prophylaxis and therapy could be directed to this particular phase.

A66-80322

THE IMPORTANCE OF POST-RADIATIONAL REGENERATION OF GENETIC STRUCTURES IN THE STATE OF CELLULAR RADIO-SENSITIVITY. REPORT 2. RADIO-SENSITIVITY OF YEAST CELLS IN DIPLOID OR HAPLOID STATES [O ZNACHENII PROTSESSA POSTRADIATSIONNOGO VOSSTANOVLEENIIA GENETICHESKIKH STRUKTUR DLA RADIOCHUVSTVITEL'NOSTI KLETOK. SOBSCHENIE 2. RADIOCHUVSTVITEL'NOST' DROZHZHEVYKH KLETOK RAZNOI PLOIDNOSTI].

V. S. Barsukov, O. V. Malinovskii, and N. M. Mitiushova.
Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 461-468, 11 refs. In Russian.

Studies of yeast cells grown on a nutrient medium disclosed that reconstructions of the mitotic apparatus damaged by gamma radiation proceeded slower than in the water medium. The experiments conducted on the culture medium showed that cell viability does not depend on the haploid or diploid states but on the degree of damage to cytoplasm, which takes part in reconstruction. Because the whole organism can withstand higher doses than isolated cellular tissues, it may be concluded that the viability of an organism depends not on the number of undamaged cells, but, rather, on the reconstruction of the damaged cells.

A66-80323

ELIMINATION OF THE INJURIOUS EFFECT OF BETA-RADIATION ON THE SEEDS OF CULTURED PLANTS BY THE USE OF PHYSIOLOGICALLY ACTIVE COMPOUNDS [SNIATIE VREDNOGO DEISTVIA BETA-IZLUCHENIA NA SEMENA KUL' TURNYKH RASTENII PRI POMOSHCHI FIZIOLOGICHESKI AKTIVNYKH SOEDINENII].

IU. I. Shaidarov.
Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 469-473, 9 refs. In Russian.

Exposure of corn seeds to beta-radiation (P32) lowered green mass weight of the plants. However, the injurious effect was eliminated (in some cases the harvest was even increased) by application (soaking for 2 days in 0.01% solutions) of the following protective preparations: N-(2-pyridyl)-N4-(2"-1", 4"-naphthoquinon)-4-sulfanilamide (designated P-46), 44-dl-(trichloroacetyl)di(aminodiphenyl)sulfone, and 2-ketnonanoic acid. Lupine was less responsive than corn to the effects of both beta-radiation or protective preparations. When radiation-exposed wheat plants were sown the following year, it was found that the harmful effects of ionizing radiation were retained in the second generation. However, preparation P-46 completely removed the injurious radiation effect in that generation.

A66-80324

THE PROBLEM OF ULTRAVIOLET IRRADIATION OF PLANTS IN SPACE PHYTOPHYSIOLOGY [UL'TRAVIOLETOVOE OBLUCHENIE RASTENII KAK PROBLEMA KOSMICHESKOI FITOFIZIOLOGII].

A. A. Shakhov, S. V. Shishchenko, S. A. Stanko, V. S. Shaidurov, and B. M. Golubkova.
Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 474-486, 22 refs. In Russian.

Plants grown in Arctic regions under conditions of normal polar illumination were irradiated additionally with ultraviolet and infrared light, in most cases simultaneously. Electron microscopy of chloroplasts separated from these plants showed that UV-irradiation changes the submicroscopic structure of chloroplasts. But, owing to the photoreactivation capacity of plants, some recovery from injuries occurs. Thus chloroplasts of some plants are fairly resistant to artificial UV-irradiation during the polar day. When, at an altitude of 3200 m., radishes were subjected to additional artificial UV-irradiation daily for 10 minutes, changes in chloroplast structure and pigment content were observed. Changes in the pigment content, determined by paper chromatography and spectrophotometry, depend on the ultraviolet wavelength, the duration of irradiation, stage of development of the plant, etc. Preliminary studies had indicated that plants growing in extreme conditions (such as spaceflight) use radiant energy in a wider spectral band for their vital activity, and that with sufficiently intense, around-the-clock illumination, plants in spaceflight conditions may not require protection for the entire ultraviolet spectrum.

A66-80325

ACTIVE SELECTION OF AIR WITH VARIOUS OXYGEN CONTENT BY ANIMALS WHO HAD BEEN EXPOSED TO NORMAL CONDITIONS AND THE AIR WITH A HIGH OXYGEN CONTENT [OB AKTIVNOM VIBORE ZHIVOTNYMI GAZOVYKH STED S RAZLICHNYM SODERZHANIEM KISLORODA V OBYCHNYKH USLOVIYAKH I POSLE VOZDEISTVIA GIPEROKSICHESKOI ATMOSFERY].

I. S. Breslav.
Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 487-491, 14 refs. In Russian.

Experiments were performed to determine voluntary preference of mice to atmospheres containing various amounts of oxygen. When normal white laboratory mice were placed in a "gas-selection ladder" experimental chamber, they selected an atmosphere of 34.5% O₂ when the high-oxygen end contained 60%; and an atmosphere of 42.4% oxygen when the high end contained 90% oxygen. After these norms were established, a special series of experiments was conducted in which white mice were kept for a period of 6-10 days in a chamber containing 60% oxygen and 40% nitrogen. Mice kept in a chamber containing normal air served as controls. After being kept in the high-oxygen atmosphere for various lengths of time, experimental animals as well as control animals were permitted to make their atmosphere selection in the "gas-preference ladder." The high end of the "ladder chamber" contained a 60% oxygen atmosphere, i.e., the same atmosphere in which the experimental animals had been kept. It was found that mice which had spent six or eight days in a 60% oxygen atmosphere prefer an oxygen concentration considerably higher than that selected by control animals. Three days after the experimental animals had been transferred to a chamber with a normal atmospheric composition, a reverse effect was observed.

A66-80326

THE STATE OF EXCITABILITY OF THE VOMITING CENTER IN CASES OF MOTION SICKNESS [K VOPROSU O SOSTOIANII VOZBUDIMOSTI RVOTNOGO TSENTRA PRI BOLEZNI DVIZHENIIA].

L. D. Pestov.
Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 535-542, 12 refs. In Russian.

It was the purpose of this study to establish whether extra-labyrinthine mechanisms play a role in motion sickness. Eight dogs, 3 of which had been delabyrinthed either chemically or surgically were used. Some tests were carried out on vertically oscillating stands. A total of 140 tests were carried out, along with 413 apomorphine tests (threshold doses 0.02 mg./kg.). It was established that, depending on magnitude and duration of rotation, progressively less apomorphine was required to provoke nausea in intact dogs. In the labyrinthectomized dogs, resistance varied, but the paradoxical effect of apomorphine was unchanged (reversal of effect as the duration of rotation increased). Exposure to vertical oscillation showed no emetic effects in the labyrinthectomized animals when sub-threshold doses of apomorphine were administered; and even 100% doses had a delayed effect (20 min.). In the intact dogs, 50-60% of the test dose sufficed to induce nausea. In both types of oscillation, test and control animals showed a significant decrease of 2 min. in the mean values of latent periods of nausea attacks as compared with attacks during rest. It was observed that increases in pulse rate (to an average of 260 beats/min.) can be used as indices that nausea is occurring.

A66-80327

AN ELEMENTARY MODEL OF THE VESTIBULAR APPARATUS [ELEMENTARNIA MODEL' VESTIBULIARNOGO APPARATA].

O. G. Gizenko, N. A. Chekhonadskii, A. N. Razumeev, and B. B. Egorov.
Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 543-554. In Russian.

The purpose of this investigation was to develop an elementary model of the vestibular apparatus to elucidate some functional features of this organ under conditions of a variable gravitational field. A hypothesis is presented that the otolithic receptors react to the angle of head inclination relative to the vertical axis when changes in the magnitude of weight-component forces of the otolith take place along or across an afferent fiber. The transformers of these changes in magnitude into impulse frequencies are sensory cells. Thus, the receptor will react both to the angle of head inclination and to acceleration forces which take place when the organism is moving as a function of changes in otolithic weight. Results of an investigation of the rhythmic activity of 100 neurons in the giant cell nucleus of the reticular formation of a cat during 5-g acceleration are given. It is shown that the aggregate curve of neuron impulse frequency is sufficiently close to the experimental curve. The problem of the dynamic nature of "channels" of the otolithic portion of the vestibular analyzer is discussed. It is proposed that a model of a so-called receptor-neuron channel would be a circuit with constant resistance, inductance, and capacitance, successively switched on. The acceleration acting on the organism is likened to the circuit voltage, and the current is analogous to the electrical activity of a receptor-neuron system. A diagrammatic representation of the so-called summing device which compares the coupled signals from the left and right utricle and the sacculus, demonstrates that the summing device, working according to the proposed systems, excellently reflects the features of the

movements of birds and animals with removed right and left otoliths. It is concluded that the proposed principles of modeling the otolithic portion of the vestibular apparatus can be used to explain some general features of this important organ.

A66-80328

SEMICONDUCTOR COOLING DEVICE FOR SMALL ANIMALS [POLU-PROVODNIKOVYI OKHLADITEL' DLIA MELKIKH ZHIVOTNYKH].

IU, N. Logunov and IU, S. Alitkhin, *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 555-559. 14 refs. In Russian.

A device is described which can be used for creating hypothermia in small experimental animals. It consists of a chamber with a built-in semiconductor thermocouple. It can be regulated for various degrees of hypothermia. It has been tested on albino rats and found satisfactory.

A66-80329

AN ELECTRIC METHOD FOR REGISTERING THE TONGUE MOTION DURING ARTICULATION OF CONSONANTS [O ELEKTRICHESKOM METODE REGISTratsii DVIZHENIIazyka pri artikulatsii soglasnykh].

Iu, I. Kuz'min, *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 560-572. 14 refs. In Russian.

A method of palatography was investigated which (unlike the classical palatograph of phoneticians) would permit continuous recording of running speech, and which (unlike Stetson's rubber bulb palatogram) would give a complete picture, not only of the duration, but also the exact location of tongue-palate contacts. A sensor, consisting of prosthetically fitted artificial palate with imbedded electrodes, was devised for this purpose. Objective data are obtained from palatograms for studying the temporal structure and physical articulation of consonants in various phonetic environments (alone and in combination with other elements) in initial, medial, and final position. The amount and nature of these data require data processing. It was found that not only the shape, size, and location of tongue-palate contacts, but also their relationship to each other in time during the production of a given consonant, were essential elements of the distinctive and unambiguous palatographic signature of that sound. The signatures of different sounds obtained by this method are often similar. Dynamic palatography shows this similarity to be an artifact, since it does not reflect the all-important time relationships of the steps in the complex process of speech sound formation. Dynamic palatography may also be useful materials for psychophysical study by making it possible to discover the boundaries of natural articulatory segments of running speech.

A66-80330

AUTOMATIC DEVICE FOR INDUCING REVERSIBLE AND CONTROLLED HYPOTHERMIA WHICH CAN BE UTILIZED DURING SPACE FLIGHTS [AVTOMATICHESKAI A USTANOVKA DLIA SOZDANI A OBRATIMO I REGULIRUEMO I GIPOTERMII DLIA VOZMOZHNOGO ISPOL'ZOVANI A V USLOVII AKH KOSMICHESKOGO POLETA].

E. V. Maistrakh G. N. Il'utkin, V. A. Konstantinov, I. V. Eremenko, S. A. Krasil'nikov, O. IU. Lysenko, V. F. Matsatsa, and V. I. Prtvezentsev.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 573-580. In Russian.

The authors describe a device constructed by them for inducing and regulating hypothermia. The device was tested on dogs in whom the body temperature was maintained at 22°-25°C. for 120 hrs. This automatic device can eventually be used in hospitals during human surgery.

A66-80331

A METHOD FOR REGISTERING POTENTIALS OF THE AUTONOMIC NERVES IN A CONTINUOUS EXPERIMENT [METODIKA REGISTRATSII TOKOV DEISTVIA V VEGETATIVNYKH NERVAKH V USLOVII AKH KHROICHESKOGO EKSPERIMENTA].

A. D. Nozdachev, *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 581-586. In Russian.

A method of implanting electrodes in the pre- and post-ganglionic branch of the caudal mesenteric node and in sinus and splanchnic nerves of the dog is described. A 10 mm., 0.1 mm.² platinum lead is employed and is soldered to flexible insulated copper wires. Diagrams showing the configuration of electrodes and nerves and the collector setup are presented. A detailed description of the surgical methods used in implanting the electrodes is given. During the first day after implantation, nerve current deviations may be observed due to inflammation around the implantation zone; but these disturbances usually disappear as the electrodes become fully grounded. After a few days, a strong connective tissue sheath forms which rigidly fixes the capsule. The formation of the sheath and proper fixation of electrodes assure that the character of action currents will be consistent over a long period of time. In the author's experiments, the neurograms of dogs were unchanged after 10 months. To test the reliability of these methods, the author conducted a brief experiment on the nerves in question and found that the oscillograms of both briefly and chronically studied specimen were analogous.

A66-80332

A METHOD FOR REGISTERING THE VENOUS FLOW IN BLOOD VESSELS OF THE BRAIN OF ANIMALS SUBJECTED TO ACCELERATION [METODIKA REGISTRATSII VENOZNOGO OTTOKA V SOSUDAKH GOLOVNOGO MOZGA ZHIVOTNYKH V USLOVII AKH DEISTVIA USKORENII].

V. IA. Klimovitskit and V. F. Nikolaev, *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 587-592. 20 refs. In Russian.

A method is described which allows continuous recording of the volume circulating through the large surface veins and sinuses of the brain during acceleration. All measurements were taken in chronic experiments on rabbits which the sensors attached to veins along the anterior longitudinal sinus or the sinus itself. The rabbits were placed in a head to tail position on the centrifuge (135 r.p.m.) whereby g forces were distributed as follows: head-5 g, thorax-8 g, tail-10 g. During the first day rabbits were centrifuged four times, 30 sec. each. On the first day during the initial exposures venous flow increased in the thermal cycle. With subsequent exposures venous pressure and temperature decreased, and the initial increase of the venous flow in the first thermal cycle declined. During the 4th exposure to centrifugation, the decrease in venous flow coincided with the first thermal cycle. One day intermission or longer durations of centrifugation did not influence this decrease. Respiration of 5 to 10% CO₂ results in a similar response of cerebral circulation.

A66-80333

THE COURSE AND AFTEREFFECTS OF BODY COOLING DETERMINED BY THE METHOD OF CONTROLLED HYPOTHERMIA [TECHENIE I POSLEDSTVIA OKHLAZHDENIA TELA PO METODIKE REGULIRUEMO I GIPOTERMII].

G. N. Il'utkin, *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 593-604. In Russian.

Special equipment was designed for automatic induction of hypothermia and rearming during space flight. It consists of a FAK-07 cooling unit. Ethylene glycol is cooled to a temperature of -25°C., circulated through the thermal suit, and then returned to the cooling tank. Within-suit temperature may be decreased to -10°C. For rearming the temperature of ethylene glycol is raised to +45°C. The equipment can be actuated manually or automatically by solenoid valves. Experiments were performed on 46 dogs, of which 31 were manually controlled and 15 automatic. Thirteen of the dogs were subjected to repeated hypothermia. Before the experiment, during hypothermia, and at various stages of rearming clinical observations were made. Physiological indices registered were: body weight, body temperature, hematocrit, pulse and respiratory rates, pulmonary ventilation, arterial pressure, electrocardiogram, and rectal temperature. Although there were behavioral and physiological deviations from the normal upon rearming, by the third day all dogs had returned to normal condition. Continuing observation for a year after hypothermia failed to reveal any abnormality. It is concluded that reduction of body temperature to 22-23°C. for 3 to 5 hours does not result in any permanent pathological changes in dogs. Any deviations (lethargy, leukocytosis) were temporary, and disappeared 3 to 5 days after the experiment.

A66-80334

SOME POSSIBILITIES IN PHYSIOLOGICAL INVESTIGATION OF SPEECH IN ASSURING COMMUNICATION OF MAN WITH MACHINES [NEKOTORYE VOZMOZHNO I FIZIOLOGICHESKIKH ISSLEDOVANI I RECHEVOGO PROTSESSA V SVIAZI S VOPROSAMI OBESPECHENIA RECHEVO I SVIAZI CHELOVEKA S MASHINO I].

V. A. Kozhevnikov and L. A. Chistovich, *Problemy Kosmicheskoi Biologii*, vol. 4, 1965, p. 605-613. 30 refs. In Russian.

Low information transmission capacity and high susceptibility to error are just two of the many disadvantages of conventional man-to-machine input links based on switches, pushbuttons, and knobs. Creation of a direct man-machine link based on human speech resolution and analysis would eliminate these and other limitations of present systems. There are at least two ways in which the essential features of speech signals may be sought: (1) detailed study of the strategy by which a human, hearing a sound, discovers what articulatory movements he must make to initiate it; and (2) statistical (computerized) analysis to isolate the acoustic signs corresponding to a given stance of the articulatory organs and to transitions from one stance to another. The latter line of attack requires synchronous recording of articulatory parameters and speech signals. Essential information on closure of the lips and exact location of changing contact of the tongue with the palate, necessary to understanding the formation of consonants, can now be obtained by means of the artificial palate. The distribution of basic sensors of articulatory speech parameters is given in tabular form. Data can be recorded with a multi-channel penwriter or input into a computer. Information can be obtained with the artificial palate in binary form and lends itself easily to computer processing. Computer analysis facilitates the identification of complex articulatory features.

A66-80335

AN EXPERIMENT CONCERNING MAINTENANCE OF FISH IN AIR-TIGHT AQUARIUMS CONTAINING CHLORELLA AND WITHOUT IT (OPYT SODER-ZHANIIA RYB V GERMETICHESKIKH AKVARIUMAKH S KHLORELOI I BEZ NEE).

L. M. Antsyshkina, N. S. Kirilenko, V. I. Mamontov, G. B. Mel'nikov, and F. P. Riabov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 646-654. In Russian.

Shiners (*Notropis*) kept in air-tight aquariums died within a day. If the fish were kept in one compartment connected with a second chamber containing *Chlorella pyrenoidosa*-82 by an air layer, they lived about nine days. Optimal conditions were noted when the crowding rate of the fish was equivalent to the *Chlorella* concentration (million/ml.). In a second series of experiments, the fish were kept together with algae. The life duration in this case was about 26 days and was inversely proportional to crowding. The weight of the fish was kept almost constant, because the shiners used *Chlorella* as a source of food.

A66-80336

A VARIANT IN DETERMINATION OF MAXIMAL PHOTOSYNTHESIS IN CHLORELLA [VARIANT OPREDELENIIA MAKSIMAL'NOGO FOTOSINTEZA KHLORELLY].

E. A. Ivanov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 655-669. 10 refs. In Russian.

Experiments and theoretical considerations indicate that, in order to satisfy human oxygen requirement, one liter of *Chlorella* suspension is sufficient. But in order to achieve such conditions, a very efficient system of *Chlorella* culture is necessary, such as optimal illumination, sufficient amount of carbon dioxide concentration, and mineral requirements.

A66-80337

ABDOMINAL MUSCLE INVOLVEMENT DURING THE PERFORMANCE OF VARIOUS FORMS OF SIT-UP EXERCISE: AN ELECTROMYOGRAPHIC STUDY.

M. Marilyn Fling (Calif. U., Dept. of Phys. Educ., Santa Barbara). *American Journal of Physical Medicine*, vol. 44, Oct. 1965, p. 224-234. 9 refs.

Grant Calif. U. 140

Electromyographic recordings were obtained on the rectus abdominis and external oblique muscles during the performance of 10 variations of the sit-up from the supine position. Analysis of data showed that the upper and lower sections of the rectus abdominis recorded a difference in magnitude of potential under the following circumstances: (a) the magnitude of action potential was considerably higher for the lower section of the rectus when the feet were supported; (b) the magnitude of action potential was higher for the upper section of the rectus during the performance of sit-ups when the feet were not supported; (c) the lower section of the rectus remained in partial contraction during the 60- to 90-degree phases in an attempt to maintain trunk position. The upper rectus relaxed during this time permitting the pull of gravity to support the upper trunk. Trunk flexion upward from 45 degrees to the perpendicular showed a decrease in muscle activity. The exercises performed with knees flexed and back curled appeared to elicit the greatest action potential from the abdominals. However, because of the lack of a clearly defined and consistent pattern of high potential readings, no definite conclusion can be drawn favoring one position over another at this time. Concentric contraction (trunk raising) elicited greater action potential than eccentric contraction (trunk lowering). The favored exercises for the abdominals are: trunk curl, knees flexed 45 degrees with body twist, either with or without support to the feet; trunk curl, knees flexed 45 degrees, feet supported; and sit-up, knees flexed 45 degrees, feet supported.

A66-80338

SPACEMEN IN MATS.

Harold C. George (Kirtland AFB, N. Mex.) and Clyde R. Young (Headquart. Air Weather Serv., Scott AFB, Ill.)

Mats Flyer, vol. 12, Nov. 1965, p. 4-6.

Human factors problems concerning flying personnel of the Military Air Transport Service (MATS) are discussed. Good cabin pressurization and reliable full pressure suits are just as important for a man who ascends 6-7 miles, as for an astronaut who exceeds 50 miles. The full pressure suit maintains 3.5 lb/sq. in., which is adequate for 35,000 ft. altitude. MATS provides individual, custom-made suits for each aviator. The suit is adjusted before flying by a trained technician. Flight medical officers supervise physical fitness, diet and physiological training. Special attention is paid to ear, nose and throat conditions, because they are important in a pressurized system. Body-water balance is carefully checked to assure comfort and prevent fatigue. The men receive sufficient periods of rest between flights. Adequate care of the flying crew is absolutely essential in order to achieve perfect performance during each mission.

A66-80339

INTERACTION OF CENTRAL AND FLASH NYSTAGMUS.

Felix Bergmann, Anatol Costin, and Moshe Chalmovitz (Hebrew U.-Hadassah Med. School, Dept. of Pharmacol., Jerusalem, Israel).

Experimental Neurology, vol. 13, Nov. 1965, p. 317-329. 17 refs.

Central nystagmus is evoked in the rabbit by electrical stimulation of one optic pathway. The response is strongest in the dark and is depressed by illumination of the heterologous retina. Flash nystagmus results from intermittent photic stimulation of one eye. Combination of central nystagmus with synergistic flashing potentiates the response markedly. Combination with antagonistic flashing at a rate of 25-30/sec. depresses central nystagmus strongly, but at 5-10/sec. it breaks the inhibitory effect of illumination on central nystagmus and may raise the response to the level of the dark control.

A66-80340

GENERATION AND TRANSMISSION OF PRESSURE PULSES IN AN ELASTIC TUBULAR SYSTEM IMPACTED BY A FALLING STEEL WEIGHT.

Gustav Hellström and Arne Jönsson (Uppsala U. Hosp., Dept. of Surg.; and Res. Inst. of Natl. Defence I, Sundbyberg, Sweden).

Acta Societatis Medicorum Upsaliensis, vol. 70, 1965, p. 135-151. 9 refs.

Pressures were recorded by means of piezoelectric transducers in plastic and latex tubes placed on compressible material and subjected to impulsive force by freely falling spherical weights of 290, 540 or 900 g. and with an impact velocity of up to 10 m./sec. The inner diameters of the tubes used were between 8 and 15 mm. and the wall thicknesses were between 1 and 2 mm. The main purpose of the investigation was to correlate the pressures in the tubes to the impact velocity of the falling weight and to the deformation at the point of impact, which was recorded by a mechano-electric motion transducer. It was demonstrated that the impact velocity, when a certain amount of energy was delivered to the system, was of great importance as far as pressure pulses in the tube and deformation at the point of impact were concerned. An increment of the impact velocity caused higher pressure amplitudes and steeper pulse fronts in the tube and at the same time less deformation at the point of impact. The generation and transmission of the pressure pulses were also studied in a number of modified systems with varied physical constants.

A66-80341

RELATIONSHIPS BETWEEN EMG GRADIENTS: INDICES OF EFFICIENCY AND VELOCITY-PRECISION ATTITUDES IN AN GRAPHOMOTORIC TASK [RELAZIONI TRA GRADIENTI EMG: INDICI DI EFFICIENZA E ATTEGGIAMENTI VELOCITA-PRECISIONE IN UN COMPITO GRAFOMOTORIO].

Mario Zucchi and Giorgio Alcardi (Genova U., Fac. Med., Ist. di Psicol., Italy). *Archivio di Psicologia Neurologia e Psichiatria*, vol. 25, Sep.-Oct. 1964, p. 421-443. 14 refs. In Italian.

The increase in muscular tension, electromyographically recorded during a mental task (EMG gradient), was studied in 32 subjects executing a series of circles before a mirror. The importance of gradients calculated by means of an index not directly related to performance time is related to experimentally determine non-precise speed and slowness-precision behavior, and to efficiency indexes (time and errors) in both groups of subjects. The results suggest the necessity for new criteria in evaluating gradient importance when the latter is related to speed with which a mental task is performed. The results also confirm the opportunity to study better the possible significant differences between the various muscular gradients involved in the mental task studied, and on the whole, conform the validity of the relation between efficiency gradients and gradients and motivational aspects of total behavior.

A66-80342

ON OXYGEN DIFFUSION IN THE BRAIN. I. SPATIAL MODEL AND CALCULATION OF THE OXYGEN DIFFUSION [UBER DIE SAUERSTOFFDIFFUSION IM GEHIRN. I. MITTEILUNG: RAUMLICHE VORSTELLUNG UND BERECHNUNG DER SAUERSTOFFDIFFUSION].

Karl Dlemer (U.-Kinderklin., Bonn; and Max Planck-Inst., Deutsche Forschungsanstalt für Psychiatrie, Munich, West Germany). *Pflügers Archiv für die gesamte Physiologie*, vol. 285, Aug. 6, 1965, p. 99-108. In German.

On the basis of anatomic findings and theoretical calculations a new "cone" model is developed for the oxygen diffusion in the brain. It is hypothesized that the distance of diffusion is a function of the difference between the oxygen partial pressure prevailing at each point within the capillaries and the lowest oxygen partial pressure within the tissue. The beginning of capillaries near the artery with its high O_2 partial pressure services a greater area than the venous end. Boundary of the tissue area serviced by a single capillary is formed by the isobars of the lowest tissue oxygen partial pressure, which has a variable course and is influenced by a number of factors. Theoretically it is conceivable that oxygen diffuses also from the venous end of capillaries, thus having a conical area serviced by a single capillary. Under normal conditions, however, intercapillary space is more or less identical with the area of oxygen diffusion at the arterial end of the capillary, while at the venous end oxygen diffusion is negligible.

A66-80343

ON OXYGEN DIFFUSION IN THE BRAIN. II. OXYGEN DIFFUSION IN STATES OF O₂ DEFICIENCY [UBER DIE SAUERSTOFFDIFFUSION IN GEHIRN. II. MITTEILUNG: DIE SAUERSTOFFDIFFUSION BEI O₂-MANGELZUSTANDEN].

Karl Diemer (U.-Kinderklin., Bonn; and Max Planck-Inst., Deutsche Forschungsanstalt für Psychiatrie, Munich, West Germany).

Pflügers Archiv für die gesamte Physiologie, vol. 285, Aug. 6, 1965, p. 109-118. 33 refs. In German.

Under normal conditions the brain operates with an excess of oxygen in the amount of 9 mm. Hg. Within these limits a fall in the arterial or venous oxygen partial pressure merely shifts the various isobars in the tissue. Slight alterations in oxygen partial pressure of the blood are compensated for by shifting and regrouping the tissue areas serviced by each capillary—compensation accomplished solely on the basis of altered oxygen conditions. Oxygen partial pressure in tissue is thus preserved at the highest level possible; under normal conditions the lowest oxygen pressure may be as high as the venous oxygen pressure, which is the highest level possible. There is a basic difference in the action of arterial and of venous hypoxia on the brain. At the same tissue threshold value the threshold values of the venous oxygen pressure are lower with venous hypoxia than with arterial hypoxia. Changes in the diffusion conditions by both types of hypoxia are effected in a different manner.

A66-80344

REACTION PATTERN OF THE HUMAN MUSCULATURE WITHIN THE FRAMEWORK OF THERMOREGULATION [DAS REAKTIONSMUSTER DER MENSCHLICHEN MUSKULATUR IM RAHMEN DER THERMOREGULATION].

Klaus Golenhofen (Marburg/Lahn U., Physiol. Inst., West Germany).

Pflügers Archiv für die gesamte Physiologie, vol. 285, Aug. 6, 1965, p. 128-146. 52 refs. In German.

The electrical activity of forearm, shoulder, thigh and calf muscles, the rectal temperature and the metabolic rate were recorded in 10 men during sudden cooling by uncovering at 10°C. for 1 hour. Responses to cooling were compared to those during a mental arithmetic test. In the initial phase of cooling, the pattern of muscular activity may be very similar to the emotional stress, where the activation was confined mainly to the forearm. Progressively less activity was found in calf, shoulder, thigh, in that sequence. With prolonged cooling the pattern shifted to a more centralized activity, and the above sequence was often reversed during the late phases, especially when visible shivering appeared. The localization determines the efficiency of shivering for heating the body core. A decrease of shivering during acclimatization can be stimulated by shifts of shivering from peripheral to central muscles. The distribution of muscular activity during cold exposure allows a differentiation to be made between more emotional components, with predominantly peripheral sites of action, and more thermoregulatory components concerned in heating the body core. The significance of the results is discussed in relation to descriptions of human thermoregulation in terms of technical control systems.

A66-80345

CARDIAC METABOLISM AT REST AND DURING HEART ARREST [STILLSTANDSUMSATZ UND RUHFUMSATZ DES HERZENS].

W. Lochner and R. Dudziak (Med. Akad., Physiol. Inst., Düsseldorf, West Germany).

Pflügers Archiv für die gesamte Physiologie, vol. 285, Aug. 6, 1965, p. 169-177. 13 refs. In German.

Deutsche Forschungsgemeinschaft supported research.

The oxygen consumption of the isolated perfused rat heart was investigated. Cardiac arrest was accomplished by: NaCl-depletion, Na⁺ depletion, KCl with NaCl-depletion, KCl with procaine, KCl with procaine and NaCl-depletion, NaCl-depletion with CA⁺⁺-depletion and procaine. The metabolism of the arrested heart depended on the way the heart was stopped. The lowest O₂ consumption, that allowed resuscitation after a 30 min. arrest, amounted to 1.2 ± 0.11 ml./min. × 100 g. wet weight. Therefore, the metabolism for maintenance of life is not higher than 1.2 ml. O₂/min. The heart arrested by Na⁺-depletion, with the oxygen consumption amounting to 0.42 ml./min., could not be resuscitated. This O₂-consumption probably was too low to preserve life. Basal metabolism of the heart was defined as the metabolism during the diastole; normally it is higher than the metabolism for maintenance of life.

A66-80346

DETERMINATION OF THE O₂ DESATURATION AND SATURATION TIMES IN THE CARDIAC MUSCLE AND THEIR COMPARISON WITH THE CALCULATION ACCORDING TO KROGH'S SUPPLY MODEL [ERMITTLUNG DER O₂-ENTSÄTTIGUNGS- UND AUFSÄTTIGUNGSZEITEN AM HERZMUSKEL UND IHR VERGLEICH MIT BERECHNUNGEN NACH DEM KROGH'SCHEN VERSORGNUNGSMODELL].

K. Schmidt, W. Niesel and D. Bickel (Kiel U., Physiol. Inst., West Germany).

(Deutsche Physiol. Ges., 29. Tagung, Tübingen, West Germany)

Pflügers Archiv für die gesamte Physiologie, vol. 285, Aug. 6, 1965, p. 178-192. 23 refs. In German.

Deutsche Forschungsgemeinschaft supported research.

The myocardial surface was uncovered in cats under artificial respiration. A clamping device was applied to the coronary arteries and reflection spectra recorded via a movable light-guide by the "Apidspektroskop". Changes in the average capillary oxygen saturation following the closing and the reopening of the coronary circulation were determined from the reflection spectra. It was found that the time course of de-saturation is considerably longer than that of re-saturation. In a theoretical part, a method approximation is developed for calculation of the stationary and non-stationary release of oxygen to the tissue by the capillaries. From the contradiction between experimental and theoretical results it is concluded that Krogh's supply model, which provides most unfavorable O₂ supply, gives an inadequate approximation of the average mode of supply of oxygen to the heart muscle. Alternative supply models with capillaries beginning and ending on different levels are discussed since they fit the experimental results better.

A66-80347

RESPIRATORY ACIDOSIS.

Frank M. MacDonald (Minneapolis Veterans Hosp., Pulmonary Disease Serv.; and Minn. U., Minneapolis).

Archives of Internal Medicine, vol. 116, Nov. 1965, p. 689-698. 100 refs.

In respiratory acidosis, the dissolved CO₂ penetrates the cells and cerebrospinal fluid more rapidly than ions. Consequently, intracellular acidosis occurs more rapidly. Clinical cases with chronic obstructive lung diseases, primary hypoventilation, and cases of obesity show serious respiratory acidosis. Patients with respiratory acidosis show a subnormal ventilatory response to inhalation of carbon monoxide air. The reason for this may be complex. Elevation of arterial CO₂ pressure results in increased reabsorption of bicarbonate and a higher bicarbonate level of the blood. Respiratory acidosis affects potassium changes and pH, which are manifested in various ways in individual cases. Severe respiratory acidosis affects the nervous system, and in some cases progressing coma may occur. Short periods of hypercapnia do not interfere with mental performance, but prolonged inhalation of 4-5% CO₂ may affect physiological functions and reduce efficiency. Therapy consists of control of bronchial infection with suitable drugs and active ventilatory assistance by means of pressure breathing devices.

A66-80348

RESPIRATORY ALKALOSIS.

Alfred Eichenholz (Minneapolis Veterans Hosp., Clin. Radioisotope Sect.; and Minn. U., Minneapolis).

Archives of Internal Medicine, vol. 116, Nov. 1965, p. 699-708. 40 refs. Grant PHS HE-0575-04.

Hyperventilation usually results in primary respiratory alkalosis, which may be compensated or uncompensated. Renal physiology during respiratory alkalosis shows the following changes: increase in urine volume, decrease in phosphate and ammonia excretion, reduction in titratable acidity, increase in sodium and potassium excretion, and a sharp rise in pH. The bicarbonate loss is noted not only through the urine, but by the way of the lungs. Lactic and pyruvic acid concentrations increase in the blood. Progressive respiratory alkalosis may lead to metabolic acidosis, which can be detected by pH values. Serum electrolyte values may vary. Tetany is usually manifested. Marked cerebral vasoconstriction, reduced pulmonary vascular resistance with increased pulmonary and cardiac output flow, and increase in cardiac output result in fall of blood pressure and reduced cerebral circulation. The electrocardiogram may be abnormal. Psychomotor performance may be impaired. The electroencephalogram may have an epileptic pattern. A number of clinical episodes may show respiratory alkalosis, including those which lead to hyperthermia. Therapeutically the patient's acid-base balance must be assessed, and bicarbonate deficit must be initially corrected.

A66-80349

THE EFFECT OF CAFFEINE ON FREE FATTY ACIDS: A PRELIMINARY REPORT.

Samuel Bellier, Alfred Kershbaum, and Julio Aspe (Philadelphia Gen. Hosp., Div. of Cardiol., Pa.)

Archives of Internal Medicine, vol. 116, Nov. 15, 1965, p. 750-752. 9 refs.

The effect of caffeine in the form of caffeine sodium benzoate and coffee on serum free fatty acids (FFA) was studied in a group of human subjects. The FFA were found to be significantly elevated after coffee. Significant elevation in FFA was similarly observed after caffeine sodium benzoate administered intramuscularly. These findings are of interest in view of the suggested relationship of FFA elevation to that of other lipid fractions, notably triglycerides and cholesterol.

A66-80350

REFLEX EFFECTS OF CEPHALIC HYPOXIA, HYPERCAPNIA, AND ISCHEMIA UPON VENTRICULAR CONTRACTILITY.

Hiläire DeGeest, Matthew N. Levy, and Harrison Zieske (St. Vincent Charity Hosp., Res. Div., Cleveland, Ohio).

(Conf. on Eng. in Med. and Biol., Cleveland, Nov. 1965).

Circulation Research, vol. 17, Oct. 1965, p. 349-358. 29 refs.

Grant NIH HE-07724 and Heart Assoc., Northeastern Ohio supported research.

The effects of brief periods of cephalic hypoxia, hypercapnia, and ischemia upon the contractility of the normally oxygenated ventricular myocardium were studied in an innervated, isovolumetric, canine left ventricle preparation. The majority of responses to cephalic hypoxia were of two types in preparations with vagi and carotid sinus nerves still intact. (a) More frequently, peak left ventricular pressure changed in biphasic fashion, consisting of an initial depression of contractility followed by subsequent augmentation. (b) Less frequently, a monophasic enhancement of contractility appeared. After transection of either the vagi or the carotid sinus nerves, a monophasic facilitation of contractility was usually evoked by cephalic hypoxia. It was concluded that two opposing influences act simultaneously upon the ventricular myocardium during cephalic hypoxia in preparations with intact vagi and carotid sinus nerves. Central nervous system hypoxia enhances myocardial contractility; its effect is mediated principally via sympathetic pathways. Hypoxia at the level of the carotid chemoreceptors depresses contractility reflexly; the efferent limb of this reflex is mediated chiefly via the vagi. At any moment in time, the effect upon ventricular contractility is the result of these opposing influences. Cephalic hypercapnia produced effects similar to those of hypoxia. Cephalic ischemia always evoked a marked, positive inotropic effect upon the ventricles.

A66-80351
PREDICTING PRODUCTION IN LIGHT-LIMITED CONTINUOUS CULTURES OF ALGAE.

Richard W. Eppley and Denzel L. Dyer (Calif. U., Inst. of Marine Resources, La Jolla; and Northrop Space Labs., Bioastronautics Lab., Hawthorne, Calif.) *Applied Microbiology*, vol. 13, Nov. 1965, p. 833-837. 16 refs. Contracts AF 41(609)-1608 and AEC AT (11-1)-34.

Equations relating productivity, growth rate, cell concentration, and light absorption lead to the prediction that, when incident light is below saturating intensity, maximal productivity will occur at half the maximal growth rate. The freshwater alga *Chlorella pyrenoidosa* TX71105 and the marine alga *Dunaliella tertiolecta* were grown in a small continuous culture apparatus with turbidostatic control. With both cultures, the cell concentration showed a linear decrease with dilution rate. Productivity was maximal at about one-half the maximal dilution rate. Average mass per cell increased near the maximal dilution rate, causing some asymmetry in the productivity versus dilution rate curve. The chlorophyll content per unit mass decreased in this region, but the chlorophyll content per cell remained constant. Best production rate in a light-limited algal culture was obtained when the growth rate at very low cell concentration was determined in the apparatus and the dilution rate was set at one-half that value.

A66-80352
HETEROGENEOUS NATURE OF SLOW WAVES OF DELTA RANGE OCCURRING IN ANOXIC AND POST-ANOXIC STATES [O GETEROGENNOSTI MED-LENNYKH VOLN DELTA-DIA PAZONA, NABLIUDAEMYKH V ANOKSICHESKIKH I POSTANOKSICHESKIKH SOSTOIANIYAKH].
A. M. Gurvich (USSR, Acad. of Med. Sci., Lab. of Exptl. Physiol. of Revival of the Organism, Moscow).
Fiziolicheski Zhurnal SSSR, vol. 51, Oct. 1965, p. 1210-1219. 13 refs. In Russian.

In dogs, clinical death due to blood loss, cardiac fibrillation, and asphyxiation, which lasted 12 min, resulted in two types of slow delta rhythm in the electroencephalogram: (1) varying intensity delta waves, 1-3 per sec., asynchronous in various areas of the cortex and sub-cortical nuclei, and (2) slow components consisting of first negative and second positive phases, which were synchronous in various areas of the cortex. The delta waves may have originated as a result of excitation of the cortex with a primary response accompanied by local discharges of high frequency. The slow components originate only in subcortical zones, and are propagated under the influence of the physiological functions and the potentials of the conductors. The subcortical centers of the slow components, which generate asynchronous delta waves, have various degrees of sensitivity toward hypoxia. The slow waves, therefore, can be noted only during certain conditions of clinical death and reanimation. Because slow waves are synchronous in character, the electroencephalogram must be taken with monopolar leads.

A66-80353
OXYGEN CONSUMPTION RATE AND ELECTROENCEPHALOGRAPHIC STAGE OF SLEEP.

D. Robert Brebbia and Kenneth Z. Altshuler (Rockland State Hosp., Res. Center, Respirat. and Metab. Lab., Orangeburg, N. Y.) *Science*, vol. 150, Dec. 17, 1965, p. 1621-1623. 13 refs. Grants PHS MH 05333-04 and MH 07292.

In five male subjects, and a total of 15 man-nights, oxygen consumption rate (V_{O_2}) was related to stage of sleep, as defined by electroencephalograms. Gross periodic variations which paralleled change in stage of sleep were discernible in analogue metabolic records. Computations revealed significant differences ($P < .01$) between all stages with V_{O_2} highest in stage I REM (dreaming sleep), least in stages III and IV (deep sleep), and intermediate in stage II (light sleep).

A66-80354
DETECTION THRESHOLDS AS A FUNCTION OF INTERVAL SEPARATION BETWEEN TWO SUCCESSIVE TARGETS.

Harold Schuckman and J. Orbach (Inst. for Psychosomat. and Psychiat. Res. and Training, Michael Reese Hosp., Chicago, Ill.) *Science*, vol. 150, Dec. 17, 1965, p. 1623-1625. 11 refs. Grant PHS MH-03830; and State of Ill. Mental Health Fund supported research.

Detection thresholds for two successive targets varied systematically with the interval between the two pulses. At intervals of 10 to 30 milliseconds, and again at 80 to 200 milliseconds, the threshold was lowered as compared to that for a single target, while at a separation of 50 to 60 milliseconds, the threshold was raised.

A66-80355
JUDGMENTS OF SAMENESS AND DIFFERENCE: EXPERIMENTS ON DECISION TIME.

Dalbir Bindra, Judith A. Williams, and Jack S. Wise (McGill U., Dept. of Psychol., Montreal, Canada). *Science*, vol. 150, Dec. 17, 1965, p. 1625-1627. 5 refs. Grant Defence Res. Board of Canada 9425-10.

When asked to judge whether two stimuli (tones) were the "same" or "different," subjects took longer to decide that two identical stimuli were the same than to decide that two dissimilar stimuli were different. Thus these judgments are not equivalent obverse aspects of a unitary judgmental process. While decision theory can be extended to deal with the obtained data, a model based on an analogy with a statistical computer is more directly applicable.

A66-80356
INFLUENCE OF SEVERAL PHYSICAL ACTIVITIES ON SERUM CHOLESTEROL CONCENTRATIONS IN YOUNG MEN.

Donald E. Campbell (Tex. U., Dept. of Phys. and Health Educ., Austin). *Journal of Lipid Research*, vol. 6, Oct. 1965, p. 478-480. 19 refs.

An attempt has been made to determine the influence of several physical activities upon the serum cholesterol of 133 young adult males, who were randomly selected to participate in 10-week programs of cross-country running, golf, tennis, tumbling-gymnastics, wrestling, and weight training, and whose cholesterol values were compared with those of a control group. The findings as examined by analysis of variance suggest that different types of physical activity influence cholesterol concentrations in different degrees: subjects who participated in a vigorous and dynamic type of activity showed a significant decrease, whereas subjects who participated in a vigorous but static type of activity experienced no significant reduction during the experimental period.

A66-80357
VISUAL PROBLEMS ASSOCIATED WITH LOW ALTITUDE FLIGHT.

Robert W. Bailey (U. S. Army Aeromed. Res. Unit, Tech. Operations Div., Fort Rucker, Ala.) (Amer. Acad. of Optometry, Annual Meeting, Columbus, Ohio, Dec. 12, 1964). *American Journal of Optometry and Archives of American Academy of Optometry*, vol. 42, May 1965, p. 288-293. 5 refs.

The major sensory input for the complex task of flying nap-of-the-earth is vision. It is also apparent that in spite of the visual handicaps pilots are able to perform their jobs and missions in an outstanding manner. However, by presenting some of the visual problems associated with low altitude flight it is desirable to stimulate interest in this problem area. For those already interested in the eye as an information receiving mechanism this interest will surely manifest itself as an improvement of the system.

A66-80358
HYPOGLYCEMIA AND SICKNESS IN THE AVIATOR [HYPOGLYCEMIE ET MALAISES CHEZ L'AVIATEUR].

L. Tabusse, R. Pannier, and P. Courves (Hôp. Mil. d'Instruction Dominique-Larrey, Serv. de Méd. Aéron., Versailles, France). (Congr. de Méd. Aéron. et Spatiale, Dublin, Sep. 1964). *Revue des Corps de santé des armées terre, mer, air*, vol. 7, Oct. 1965, p. 623-637. 17 refs. In French.

The occurrence of hypoglycemia during flight produces physical and mental changes, especially episodes of unconsciousness, in flying personnel endangering flight safety. Blood sugar is regulated by the liver, adrenal medulla, pituitary gland, and pancreas. In man the physical (hypoxia, cold, etc.) and psychic factors of flight tend to elevate blood sugar due to pituitary-adrenal stimulation. Insulin secretion is increased by hypoxia, thereby affecting the blood sugar level. Reviewed are the clinical manifestations (neurological digestive, vasomotor, cardiovascular) of hypoglycemia, and the biological methods used to diagnose it. These include nutritional, hormonal, and hypoglycemic tests. Flying personnel presenting hypoglycemia are considered unfit for flight duty, especially when the etiology is attributed to liver and pancreatic disorders, renal diabetes, hypoglycemic drugs (insulin, sulfamides), hypothyroidism, and pituitary or adrenal insufficiency. Three case histories are reported of hypoglycemia in pilots.

A66-80359

HEAT EXCHANGE IN AEROSPACE PHYSIOLOGY [LES ECHANGES CALORIQUES EN PHYSIOLOGIE AEROSPATIALE].

R. Lemaire.

Revue des Corps de santé des armées terre, mer, air, vol. 6, Oct. 1965, p. 575-587. 11 refs. In French.

The physiological aspects of heat exchange in the aviator by means of convection or radiation are discussed in relation to aircraft speed and altitude. At low-altitude atmosphere, aircraft speed can produce heat which interferes with the environmental cold. At high-altitude atmosphere, radiations assume the same role. Maintaining the aviator in a temperature comfort zone may be achieved either by ventilated clothing or cabin climatization. Consideration is given to the problems of heat exchange in supersonic and commercial aircraft and in spacecraft, to temperature variations in the troposphere and stratosphere, and to the comparative effects of direct solar energy at ground level and at atmospheric limits.

A66-80360

PROTECTION OF THE AVIATOR AGAINST HIGH AMBIENT TEMPERATURES [PROTECTION DE L'AVIATEUR CONTRE LES AMBIANCES THERMIQUES ELEVEES].

J. Collin and Y. Houdas (Centre d'Essais on Vol, Lab. de Méd. Aéro-Spatial, Brétigny-sur-Orge, France).

Revue des Corps de santé des armées terre, mer, air, vol. 6, Oct. 1965, p. 589-611. 41 refs. In French.

Following an outline of the methods (convection, radiation, evaporation, conduction) utilized by the body in controlling exposure to high temperatures, a description is presented of protective clothing developed in France against the heat. Included are the ventilated EFA-25 undergarment, the pressurized-ventilated EFA-12 helmet, and the ventilated suit. Experimental studies on the effectiveness of these items of clothing at high temperatures indicates that up to 50-70°C, good results may be obtained. Also discussed are the physiological concepts governing the average body, skin, and central temperatures, along with the methods of measuring these temperatures.

A66-80361

NUTRITIONAL PROBLEMS POSED BY GLYCOREGULATION IN AVIATION [PROBLEMES NUTRITIONNELS POSES PAR LA GLYCOREGULATION EN AERONAUTIQUE].

J. Fabre, P. M. Pinganaud, and P'h. Lasseur (Centre d'Enseignement et de Rech. de Méd. Aeron., Paris, France).

Revue des Corps de santé des armées terre, mer, air, vol. 6, Oct. 1965, p. 613-622. 16 refs. In French.

For the period of a month, one group of 65 female Wistar rats received an experimental diet containing 90% sugar, and another group of 25 rats received a normal diet containing 55% sugar. Each rat was subjected to the induced hyperglycemia, insulin, and tolbutamide tests. During induced hyperglycemic diet was characterized by a hyperglycemic peak whose amplitude greatly exceeded that of the control group. A greater sensitivity to insulin was observed in rats on the hyperglycemic diet. Rats subjected to the experimental diet were more sensitive to synthetic hypoglycemia even though the decreased blood sugar was total in control rats indicating a pronounced and prolonged activity of tolbutamide. The results of the hyperglycemic test suggest a decreased glucose tolerance in animals subjected to a hyperglycemic diet. A questionnaire was distributed to 121 student pilots concerning their breakfast diet. It was found that 7 subjects ate little or nothing at all; 71 ate food containing a maximum of 100 grams of sugar; and 43 subjects ate food containing over 100 grams of sugar. These findings indicate that diets are frequently unbalanced in flying personnel and that greater attention of diet is needed in order to prevent hypoglycemic incidents in flight.

A66-80362

SOME ELECTROCARDIOGRAPHIC ANOMALIES AND PHYSICAL FITNESS IN AVIATION PERSONNEL [QUELQUES ANOMALIES ELECTROCARDIOGRAPHIQUES ET APTITUDE AUX EMPLOIS DU PERSONNEL NAVIGANT].

L. Tabusse, R. Pannier, and Cl. Poujol (Hôp. Mil. d'Instruction Dominique-Larrey, Serv. de Méd. Aeron., Versailles, France).

(Congr. de Méd. Aeron. et Spatiale, Dublin, Sep. 1964).

Revue des Corps de santé des armées terre, mer, air, vol. 6, Oct. 1965, p. 639-651. In French.

The following electrocardiographic abnormalities observed in French Air Force personnel are outlined and described: (1) ectopic rhythms (extrasystoles, flutter, and atricular fibrillation and fibrillo-flutter); (2) conduction disorders (auriculo-ventricular blocks); and (3) changes in terminal phase (primary disorders of repolarization). Examples of these abnormalities in flying personnel are provided by 11 representative case histories. Ventricular extrasystoles and ventricular repolarization occurring in personnel during their term of service are compatible with flying activity pending proof of their service are compatible with flying activity pending proof of their benignity during various tests (hypoxia, effort, pharmacodynamic tests). The discovery of most other types of abnormalities render personnel as unfit for flight duty.

A66-80363

STATISTICAL DATA CONCERNING GASTRO-DUODENAL ULCERS IN FLYING PERSONNEL OF THE AIR FORCE [DONNEES STATISTIQUES CONCERNANT LES ULCERES GASTRO-DUODENALES CHEZ LES MEMBRES DU PERSONNEL NAVIGANT DE L'ARMEE DE L'AIR].

J. Sais and P. Galban (Aéron., Centre Principal d'Expertise Med. du Personnel Navigant, Paris, France).

(Congr. de Méd. Aeron. et Spatiale, Dublin, Sep. 1964).

Revue de Corps de santé des armées terre, mer, air, vol. 6, Oct. 1965, p. 653-658. In French.

The average annual incidence of gastroduodenal ulcers (G.D.U.) (recent or previous) in French Air Force personnel during the period of 1959-1963 was 13.6%. Fifty cases were diagnosed in 1959, and 60 during 1959-1963, 25% being gastric ulcers and 75% duodenal ulcers. An average annual level of 1.47 G.D.U. was discovered in 1000 personnel between 20-25 years of age; 1.73 between 26-31 years of age; 3.27 between 32-37 years of age; and 1.09 between 38-44 years. The average yearly occurrence for the various specialties was 1.55 G.D.U. for 1000 pilots and 2.80 for non-pilots, indicating a higher incidence in the non-pilot category. Within the different pilot categories there occurred 1.58 G.D.U. for 1000 fighter, reconnaissance and bomber pilots; 1.50 for 1000 transport pilots; and 1.45 for 1000 pilots in other categories. Of the various non-pilot categories, 2.50 G.D.U. occurred for 1000 aircraft navigators or radiotelegraphers and 3.58 G.D.U. for 1000 mechanics. Out of 110 ulcers, 19 were treated surgically, and 91 medically. The diagnosis of G.D.U. in flying personnel renders them, in most cases, temporarily unfit for flight duty. Medical treatment resulted in an average period of unfitness of 13.2 months over a six year period, whereas surgery showed a 21 month period of unfitness for a three year period.

A66-80364

THE NASA BIOSATELLITE PROGRAM.

Joseph F. Saunders, Dale W. Jenkins, and Thomas P. Dallow (NASA Office of Space Science and Applications, Washington, D. C.)

Astronautics and Aeronautics, vol. 4, Jan. 1966, p. 48-52.

Out of 185 experiment proposals submitted to NASA on the agency's request, 20 high-priority experiments for biosatellites were selected. The common aim is to collect unique data on the effects of the space environment on biological functions in plants and animals, in particular the following: (1) Effects of prolonged weightlessness on the functional state of the organism and the extent of difficulties encountered during re-adaptation to normal gravity environment. (2) Effects of radiation on embryonic development and genetic factors. (3) Effects of zero-gravity on gravity-dependent (frog eggs) as against gravity independent organisms (sea urchin eggs). (4) A 21-day biosatellite mission will include experiments on structural, development and functional patterns that are depending on gravity in plants. (5) Circadian rhythms will be subjected to a series of studies in rats. (6) In a 30-day flight, primates with electrodes implanted in the brain will be subjected to a detailed study of space flight effects on the central nervous system, behavior and performance. The results of these studies are expected to provide valuable information toward improvement of spacecraft life support systems and will open new vistas into a variety of basic biological problems.

A66-80365

SUCCINATE: PROTECTIVE AGENT AGAINST HYPERBARIC OXYGEN TOXICITY.

Aaron P. Sanders, I. H. Hall, and Barnes Woodhall (Duke U. Med. Center, Depts. of Radiol. and Neurosurg., Durham, N. C.)

Science, vol. 150, Dec. 31, 1965, p. 1830-1831. 10 refs.

Grants NIH CA-07581-02 and 5-T-1-MH-8394-02; and UMRF No. 123.

When succinate is used to protect rats against the toxicity of oxygen at high pressure (5 atm.), 100% survive, with normal or above normal concentrations of adenosine triphosphate being present in the cerebral hemisphere, liver, and kidney. In contrast, 90% of the nonprotected animals died during exposure. In corresponding tissues of surviving nonprotected animals adenosine triphosphate concentrations are markedly reduced.

A66-80366

CYBERNETICS AND SPACE BIOLOGY [KIBERNETIKA I KOSMICHESKAIA BIOLOGIJA].

N. A. Chekhonadskii.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 196-205. 19 refs. In Russian.

In space biology the voluminous data on physiological and psychological functions, particularly those received by telemetry, require extensive processing in order to visualize complex relationships of various factors and responses. Computers have been employed for various biological projects such as studies of nervous activity, of the vestibular apparatus, and of the effects of mechanical factors (vibration, weightlessness, and radial acceleration) on the functional state of the human organism. The results make possible the establishment of limits of human tolerance required to avoid extended or permanent disturbances

in the vital processes. The effects of temperature, pressure, and radial acceleration on the cardiovascular and respiratory systems are vital in the closed system of the spacecraft cabin, and the results of ground studies can be used in providing a suitable ambient environment for the astronauts. The degree of visual perception is essential in space missions. Therefore, the results of training studies should be applied during actual flight. The value of experimental or in-flight function studies depends on statistical data obtained by the use of electronic computers.

A66-80367

APPLICATION OF SOME ASPECTS OF INFORMATION THEORY IN THE ANALYSIS OF PHYSIOLOGICAL DATA RECEIVED DURING SPACE FLIGHTS [PRILozHENIE NEKOTORYKH PONIATII TEORII INFORMATSII DLIYA ANALIZA FIZIOLOGICHESKIKH DANNYKH, POLUCHAEMYKH VO VREMIA KOSMICHESKIKH POLETOV].

A. D. Egorov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 206-216. 7 refs. In Russian.

The equation

$$H(X) = \sum_{i=1}^n P_i \log_2 P_i H(X)$$

being the entropy and P_i the probability for the values of the random variables was applied to the calculation of entropies for different physiological indices including the entropy for G. S. Titov's heart rate during his orbital flight. The variation of the entropy is analyzed. It is concluded, that in processing of spaceflight data, calculation of entropy aids in the evaluation of physiological function. By using the methods of the information theory, the joint entropy of an entire group of indices characterizing the state of one or several systems of the organism can be calculated. Numerical results obtained show that the values of the joint entropy calculated during the space flight have a tendency to decrease. This is interpreted as a sign of adaptation of weightlessness.

A66-80368

POSSIBILITY OF APPLICATION OF ELECTRONIC LOGIC SCHEMES IN THE AUTOMATIC MEDICAL CONTROL [O VOZMOZHNOСТИ PRIMENENIYA ELEKTRONNYKH LOGICHESKIKH SKHEM DLIYA AVTOMATICHESKOGO VRACHEBNOGO KONTROLIA].

V. I. A. Kostikova, R. M. Baevskii, A. P. Kalinovskii, and B. A. Soshin.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 217-226. In Russian.

On-board electronic computers are required whenever telemetric communication between a space craft and ground proves to be inadequate for the computation and processing of physiological data. Various types of computers are described and their specific use is identified.

A66-80369

CERTAIN PHYSIOLOGICAL DATA IN APPRAISING GENERAL STATE AND WORK CAPABILITY OF ASTRONAUTS DURING ORBITAL FLIGHTS [NEKOTORYE FIZIOLOGICHESKIE DANNYE PO OTSENKE SOSTOYANIYA I RABOTOSPOBNOСТИ KOSMONAVTOV V USLOVIYAKH ORBITAL'NOGO POLETA].

A. D. Voskresenskiĭ, O. G. Gizenko, G. V. Izosimov, Kopanov, D. G. Maksimov, and V. I. Iazdovskii.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 227-236. 15 refs. In Russian.

During the first hours and days of the Vostok 5 and 6 flights electroencephalograms revealed an increase in the index of high-frequency waves without any increase in the index of low-frequency waves. Also characteristic were a heightened oculomotor activity (EOG) and rapid changes in the galvanic skin response (GSR). These reactions probably reflected the emotional tension in the initial flight stages. Adaptation to flight conditions became apparent in the significant decreases in EOG activity and fluctuations of the galvanic skin response. It is felt that EEG changes and a fall in EOG may be used to assess progressive fatigue. Also, EOG data can be used to judge the effect of weightlessness on the vestibular function. It is noted that the objective changes in these indices did not correspond to subjective feelings of fatigue, vestibular symptoms, or a decrease in the working ability.

A66-80370

CERTAIN RESULTS OF MEDICAL AND BIOLOGICAL EXPERIMENTS DURING TRAINING AND ACTUAL SPACE FLIGHT OF THE SOVIET ASTRONAUTS, V. F. BYKOVSKII AND V. V. TERESHKOVA [NIKOTORYE REZULTATY MEDIKO-BIOLOGICHESKIKH ISSLEDOVANIĖ, PRAVEDENNYKH PRI PODGOTOVKE I POLETAKH KOSMONAVTOV V. F. BYKOVSKOGO I V. V. TERESHKOVOI].

V. I. Iazdovskii, M. D. Emel'yanov, P. V. Vasil'ev, and V. I. Kopanov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 237-247. In Russian.

During the orbital flights of the Soviet astronauts V. F. Bykovskii (Vostok V) and V. V. Tereshkova (Vostok VI) comparisons of physiological changes, during all phases of the mission, between the male and female astronaut were of

interest. Both received similar ground training. Four hours prior to lift-off, the pulse rate of Bykovskii was 68 and that of Tereshkova-84. During lift-off it increased: Bykovskii-154, Tereshkova-156. Normalization took place 5-6 hours after the beginning of flight in Bykovskii, and 18-20 hrs. in Tereshkova. During reentry, Bykovskii's pulse rate reached 157, Tereshkova's-184. The respiration rate did not appreciably change throughout the flight in both astronauts. The electrocardiograms and seismograms (body vibration) showed a decrease in time intervals before flight. During flight, the electrocardiograms showed an increase in time intervals. The electroencephalograms of Bykovskii showed an increase in brain potentials. In Tereshkova's tracings low-frequency waves were noted. In both sexes weightlessness produced no effects on the degree of performance. The flights proved that both men and women can tolerate the conditions of extraterrestrial missions.

A66-80371

RESULTS OF BIOLOGICAL EXPERIMENTS DURING SPACE MISSION OF THE SOVIET SPACECRAFTS "VOSTOK" WITH ASTRONAUTS A. G. NIKOLAEV, P. R. POPOVICH AND V. F. BYKOVSKII ON BOARD [REZULTATY BIOLOGICHESKIKH EKSPERIMENTOV, PRAVEDENNYKH V USLOVIYAKH POLETA NA KORABLIKHX "VOSTOK" S UCHASTIEM KOSMONAVTOV A. G. NIKOLAEVA, P. R. POPOVICH I V. F. BYKOVSKOGO]. V. V. Antipov, N. L. Delone, G. P. Partenov, and V. G. Vysotskiĭ.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 248-260. 6 refs. In Russian.

Studies of the effects of space flight factors on the reproduction of fruit fly, *Drosophila melanogaster*, and the genetic apparatus of a plant, *Tradescantia paludosa*, were carried out during space flights of the Soviet spacecraft "Vostok-3", "Vostok-4" and "Vostok-5". The results show that during the first four days of weightlessness no changes in the reproductive process were noted. The image formation in series, which were studied after reentry, was slightly delayed. The number of females predominated in all series. This finding may indicate the damaging effect to the male spermatozoa which contain the Y-chromosomes. This damage could also account for some malformation noted in some individuals, which occurred only on one side of the body. No permanent mutations were observed on close examination. The cytological study of *Tradescantia* microspores disclosed recombination of chromosomes, disturbance in mitosis, and suppression of growth. These changes could be due to acceleration stress during lift-off and reentry. Exposure to cosmic radiation was small during these missions. It is possible that the combined effects of acceleration stress, weightlessness, and ionizing radiation may produce greater changes in the animal and plant reproductive system; but, so far, the data received are insufficient to allow any definite conclusions.

A66-80372

RESULTS OF MICROBIOLOGICAL AND CYTOLOGICAL RESEARCH ON THE SOVIET SPACECRAFT "VOSTOK" [ITOGI MIKROBIOLOGICHESKIKH I TSITOLOGICHESKIKH ISSLEDOVANIĖ NA KOSMICHESKIKH KORABLIKHX "VOSTOK"].

N. N. Zhukov-Verezchnikov, N. I. Rybakov, V. A. Kozlov, P. P. Saksonov, N. N. Dobrov, V. V. Antipov, I. I. Podoplev, and G. P. Partenov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 261-269. 11 refs. In Russian.

Experiments studying the effects of space flight stresses on normal and cancerous human cells and on phage production in cultures of *Escherichia coli*-12 during the Vostok spaceflight series are presented. Human cell samples did not differ substantially from control samples on earth. However, some tendency to intensification of phage production was observed in cultures of *E. coli* in this series (an increase by a factor of 1.2 on Vostok-2, 4.6 on Vostok-3, and 1.96 on Vostok-4). The following derived values of induced phage production were calculated: 3 for Vostoks-3 and 5 (corresponding to the inducing effect of 3.2 r. of gamma rays), and 1.8 for Vostoks-4 and 6 (comparable to 0.8 r. of gamma rays). Since the doses quoted are higher than those encountered in spaceflight, the observed genetic effect must be partially due to other factors (such as weightlessness, acceleration, vibration, etc.). To study the operation of one of these factors, *E. coli* were subjected to vibrations of 18, 35, 75, 100, and 700 c.p.s. for 15 to 30 min, and, in another series of experiments, to vibration in connection with Co^{60} gamma irradiation (dose, 100 r.; dose power, 21 r./min.). The results showed that vibration alone does not induce phage production but does increase the sensitivity of lysogenic bacteria to the subsequent influence of gamma irradiation. It is suggested that vibration helps sensitize cells of a lysogenic culture to the influence of cosmic radiation, although it is also possible that the cause of genetic changes is weightlessness in combination with radiation.

A66-80373

RESPONSE OF ASTRONAUTS TO STATE OF WEIGHTLESSNESS [REAKTSII KOSMONAVTOV V USLOVIYAKH NEVESOMOSTI].

I. I. Kas'tan, V. I. Kopanov, and V. I. Iazdovskii.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 270-289. 45 refs. In Russian.

The authors review and consolidate data obtained from the flights of Vostoks 2-6. The following graphs and tables are given: Table 1.—Changes

in pulse rate (beats/min.) during various Vostok flight stages under conditions of weightlessness; Table 2.—Changes in respiratory rate (cycles/min.) during various Vostok flight stages under conditions of weightlessness (average) figures 1, 2, 3, 4, 5. Changes in duration of the electrocardiogram (QT and PQ intervals, amplitudes of the T and R, spikes, and the systolic index) in Vostok cosmonauts: G. S. Titov, A. G. Nikolaev, P. R. Popovich, V. F. Bykovskii, V. V. Tereshkova. An important experimental problem in the future will be to establish optimum magnitude of artificial gravity to overcome deleterious effects of weightlessness during prolonged space flights.

A66-80374

SOME FACTORS OF NATURAL IMMUNITY AND THE STATE OF ENDOGENOUS MICROORGANISMS OF ASTRONAUTS DURING TRAINING AND AFTER THE MISSIONS ON SPACECRAFTS "VOSTOK", "VOSTOK - 2", "VOSTOK - 3", AND "VOSTOK - 4" [SOSTOIANIE NEKOTORYKH FAKTOROV ESTESTVENNOGO IMMUNITETA I AUTOFLORY KOSMONAVTOV V PERIOD PODGO-TOVKI I POSLE POLETA NA KOSMICHESKIKH KORABLIKHX "VOSTOK", "VOSTOK - 2", "VOSTOK - 3", I "VOSTOK - 4"].

A. G. Alekseeva.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 290-303. 5 refs. In Russian.

Tests used to determine changes in the immunological reactivity of astronauts in spaceflight (Vostok series) are described and results are presented. Three groups of tests were conducted in flight and before and after flight. The methods and materials used are described in detail. Bactericidal properties of all four astronauts (Gagarin, Titov, Popovich and Nikolayev) usually remained within physiological norms during the entire investigation period, and were only occasionally activated. In the case of phagocytosis of coliform bacteria by neutrophils, the intensity of the reaction clearly depended on the time of observation. It was concluded that the immunological shifts noted were minor and transient, since they did not weaken the resistance of astronauts to microbes. The fact that these shifts were less expressed for Nikolayev and Popovich shows some adaptation in the course of their 3-4 day flight.

A66-80375

THE USE OF HIGHER PLANTS AS MODELS IN THE STUDY OF THE EFFECT OF RADIATION UNDER FLIGHT CONDITIONS ON THE LIVING CELLS ON BOARD OF ORBITAL SPACECRAFTS [O PRIMENENII VYSSHIKH RASTENII V KACHESTVE INDIKATOROV PRI IZUCHENII DEISTVIA NA ZHVUUU KLETKU FAKTOROV POLETA NA KORABLIKHX-SPUTNIKAKHX].

N. L. Delone.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 304-307. 7 refs. In Russian.

The effect of space flight factors on living cells can be studied in higher plants. The criterion for such effect taken by the authors was: (1) chromosome recombinations; (2) disturbance of mitosis and (3) disturbance of growth. Several higher plants were studied by histological methods.

A66-80376

EFFECT OF PARTIAL LIMITATION OF MOTOR ACTIVITY ON THE BASIC PHYSIOLOGICAL PROCESSES IN MONKEYS [VLIANIE CHASTICHNOGO ORGANICHENIIA DVIKATEL'NOI AKTIVNOSTI NA OSNOVNYE FIZIOLOGICHESKIE PROTSESSY U OBEZ'YAN].

I. D. Bogina, N. A. Pokotova, E. S. Pogovenko, and R. L. Sheikin.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 308-315. 7 refs. In Russian.

The effects of prolonged partial restraint were explored in two series of experiments. In the first series, four monkeys were restrained for a period ranging from 10 days to 4 months and the effects noted on the circadian rhythms of behavior, appetite, and the orienting reflex. The second series studied diurnal variations in the respiratory rhythm, the cardiac activity, and the brain bioelectric activity in two capuchin and one macaque monkey under restraint. The data indicated that respiration, heart rate and brain bioelectric activity remain within normal limits for the period of restraint. A comparison with other data published leads to the conclusion that prolonged restraint has certain advantages over short-term restraint. The relative stability of the physiological indices during prolonged restraint allows the use of animals in limited restraint systems as subjects in spaceflight experiments.

A66-80377

EFFECT OF PROLONGED OPTOKINETIC STIMULATION ON THE ORGANISM [O DEISTVII DLITEL'NYKH OPNOKINETICHESKIKH RAZDRAZHENII NA ORGANIZM].

V. P. Neverov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 316-321. 20 refs. In Russian.

A study was made of the optokinetic nystagmus (OKN), postoptokinetic nystagmus (PKN) and the reverse postoptokinetic nystagmus (RPN). Five rabbits were immobilized within a rotating drum painted with black stripes. Frequency of the OKN was always less (67 to 111 movements/min.) than stimulus frequency (132 stripes/min.). Each nystagmic movement seemed to

be a reaction to a group of stripes. OKN frequency decreased with prolonged stimulation. After 90 min. the cylinder was stopped and a screen placed between the animal and the stripes. Deprived of visual reference, the rabbits developed a reverse ocular and cephalic nystagmus and leaned against the direction of rotation. Duration of RPN was 35-45 min.; amplitude was less than that of OKN; and frequency equal or greater than OKN frequency. Omission of the screen suppressed the RPN. However, if the screen was set up after a 60 min. delay RPN still appeared. The results demonstrate the persistence of traces of optokinetic stimulus in the central nervous system. Optokinetic and vestibular nystagmus have common nervous mechanisms, which may be localized in the reticular formation and in the mesencephalic nystagmogenic zone. RPN is evidently related to the prolonged circulation of stimulus in these structures after stimulus cessation, and delayed RPN to the prolonged retention of stimulus traces in these structures.

A66-80378

EFFECT OF TRANSVERSE ACCELERATION ON THE ORGANISM OF FEMALE MONKEYS [O VLIANII POPERECHNOAPRAVLENNYKH PEREGRUZOK NA ORGANIZM OBEZ'YAN-SAMOK].

A. R. Kotovskaya, P. V. Vasil'ev, B. A. Lapin, S. F. Stimpura, V. A. Shakhlov, and N. S. Artem'eva.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 322-332. 8 refs. In Russian.

Tests were conducted on 16 half-grown female monkeys. Acceleration took place on a centrifuge with an arm radius of 7.25 m. in a chest-back position. The behavior of the animals was monitored by TV, and cardiovascular and respiratory activity were used as criteria for the resistance of animals to acceleration. Electrocardiograms of animals exposed to acceleration revealed sinus tachycardia, shortened T-P intervals, and ventricular and atrioventricular extrasystole. Cardiac activity in general returned to normal 10-20 min. after centrifugation. It was found that endurance of female monkeys to 12 g ranged from 1 to 4.5 min. A histological analysis of the ovaries of monkeys examined 10 min., 1 hr, 24 hr., and 72 hr. after termination of acceleration revealed deviations from normal in the proliferation phase, ovulation, secretory phase, and desquamative phase. It was apparent that acceleration had its greatest deleterious effect during ovulation and its minimum effect during proliferation. The observed deviations probably reflected neuroendocrine processes associated with stress reactions to acceleration. The long-term effects of acceleration were not evident one month after acceleration, demonstrating the ability of the ovaries to regenerate after various injuries.

A66-80379

EFFECT OF ROTATION ON HUMAN ORGANISM AT VARIOUS ANGLES OF BODY POSITION [VLIANIE VRASHCHENII NA ORGANIZM CHELOVEKA PRI RAZLICHNYKH UGLAKH NAKLONA TULOVISHCHA].

A. R. Mansurov and S. S. Markarian.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 361-366. 10 refs. In Russian.

The physiological effects of various rotational magnitudes as a function of human sitting position were studied with 11 male subjects. One group experienced 30, 40, 60, and 120°/sec.² at an angular rate of 1 rev./sec. Each experiment consisted of 4 rotations for 5 min. with a 10 to 20-min. interval between them. The other group experienced 15, 30, 45, 60, 180, and 240°/sec at rates of 0.5, 1.0, 1.5, and 2.0 rev./sec. The duration of each test was 1.5 min with a 15 to 20-min. interval between tests. Sitting positions during the rotation tests were 0°, 20°, 30°, 45°, 65°, 80°, and 90°. In the majority of cases of rotation, pulse rate increased by 10 beats/min. During rotation at constant rates, this index returned to normal or sometimes decreased below normal. The maximal arterial pressure decreased by 9 mm. Hg, and the minimum increased by 12 mm. Hg. At angles beginning with 65°, and especially at 80° and 90°, subjects experienced illusions of internal organ displacement and throat constriction. After these tests, hyperemia of the eyelid was prevalent and the eyes were bloodshot. At angles of 0-30° (1.5-2.0 rev./sec) the head and legs felt heavy and movement of extremities was restricted. Repeated rotations at 20-65° disrupted the circulatory system in the vicinity of the lungs and heart. These symptoms were reversible and disappeared after 5-7 days. In general it was concluded that the observed reversible cardiovascular changes were due to vestibular lability in response to angular accelerations.

A66-80380

THE NATURE OF BIOLOGICAL EFFECTS OF VIBRATION [K PRIRODE BIOLOGICHESKOGO DEISTVIA VIBRATSII].*

S. N. Romanov, R. A. Romanova, and E. I. Monastyrshina.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 367-372. 13 refs. In Russian.

The effects of vibration on mouse tissue cells in situ and in vitro were investigated. For the in situ experiments, 6 mice were placed in individual compartments of a metal container which was then vibrated at 25 to 75 c.p.s. for 30 min. with a vibration amplitude of 2 mm. A 6.5% neutral red solution was injected prior to vibration. The in vitro studies involved tissue staining under the same vibration conditions. For the in situ studies, the following results were obtained: (1) mouse cells exposed to vertical vibration showed a change

in ability to absorb tissue stain, and (2) cells of different organs showed varied sensitivity to vibration. The most noticeable reactions took place in the kidneys and cerebellum, while less noticeable reactions were exhibited by subcortical and muscle cell nuclei. Tissue cells studied *in vitro* also showed different sensitivity to vibration. It is concluded that, regardless of the presence or absence of a specific receptor, all cells are able to react nonspecifically to vibration as they are able to respond to any other stimulus of sufficient intensity. It is suggested that the cellular approach to the effects of vibration is important in isolating primary foci associated with the pathogenesis.

A66-80381

IONIZING EFFECT OF HIGH ENERGY PROTONS OF 660 AND 120 MEV, AND VALUE OF PHARMACEUTICAL PROTECTION. [PORAZHAIUSHCHEE DEISTVIE PROTONOV S ENERGIIEI 660 I 120 MEV I EFEKTIVNIOS' FARMAKOKHIMICHESKOI ZASHCHITY].

V. S. Shashkov and V. S. Morozov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 401-410. 40 refs. In Russian.

Male white mice weighing 18-21 g. were subjected to Co⁶⁰ gamma-rays (dose power, 264 r./min.) and 120- and 660-Mev protons (dose power, 500-700 r.). The experiments were also designed to test chemical agents with a known radioprotective effect against X-rays and gamma-rays during proton irradiation. The animals were irradiated in plastic chambers in groups of 10-5 controls and 5 protected mice. The LD_{50/30} for Co⁶⁰ gamma-rays was calculated to be 600 r., and for 660-Mev protons, 900 r. Thus, the relative biological effectiveness (RBE) of 660-Mev protons, according to the LD₁₀₀ index, is 0.73. The comparative radioprotective effect of various substances (cystamine, AET, serotonin, 5-methoxytryptamine, tryptamine, and 5-hydroxytryptophan) are given in tabular form. Experimental results showed that the RBE of both 660- and 120-Mev protons for mice, as compared with electromagnetic radiation, does not exceed 1. Furthermore, the known radioprotective substances retain their effectiveness during irradiation with high-energy protons.

A66-80382

THE EFFECT OF SCREENING VARIOUS AREAS OF ANIMAL BODY ON THE COURSE OF RADIATION SICKNESS CAUSED BY GAMMA-RAYS AND HIGH-ENERGY PROTONS [VLIANIE EKSRANIROVANIYA OTDEL'NYKH OBLASTEI TELA ZHIVOTNYKH NA IZMENENIE LUCHEVOI REAKTSII PRI VOZDEISTVII GAMMA-SUCHEI I PROTONOV VYSOKIKH ENERGI].

B. L. Razgovorov, V. S. Morozov, V. S. Shashkov, V. V. Antipov, N. N. Dobrov, N. I. Konnova, T. S. L'vova, and P. P. Saksonov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 411-429. 21 refs. In Russian.

Three series of experiments were conducted to determine the effect of screening during irradiation of animals with gamma-rays and 120-Mev protons. White rats of both sexes were used. In the first group of experiments, proton irradiation was conducted through lead-shielded polyethylene blocks to lower the dose (dose power 800 ± 10 r./min.). During gamma irradiation, parts of the body were screened with steel plates (15 cm. thick) of different widths. The biological effect of radiation under these conditions was determined by the survival rate of the animals during a 30-day period after irradiation. Localized shielding during gamma irradiation of rats in a dose of 930 r. produced a definite increase in survival rate, which was most effective during screening of the abdomen (80% survival rate as compared with 6% in the control). In the second series of experiments, the abdomen of rats was shielded with plexiglas blocks of different widths during irradiation with protons and with gamma-rays. It was found that screening the abdomen with a block 6 cm. wide during proton irradiation with 800-1050 r. increased the survival rate to 86.4% (as compared with 19.4% in the control). A high survival rate (96.7-100%) was also observed when the abdomen was screened with blocks of various widths during gamma irradiation (930 r.). Preliminary experiments were also conducted to show the effect of screening under the influence of protons and acceleration or vibration. Results showed that neither 30 min. of acceleration (10 g) nor 1 hr. of vibration (700 c.p.s., amplitude 0.005 min.) altered the effectiveness of screening during proton irradiation (doses 750-1100 r. and 1050-1300 r., respectively).

A66-80383

MORPHOLOGICAL CHANGES IN THE HEMATOPOIETIC ORGANS OF MICE DURING EXPOSURE TO HIGH-ENERGY PROTON RADIATION [MORFOLOGICHESKIE IZMENENIYA V KROVOTVORNYYKH ORGANAKH MYSHEI POSLE OBLUCHENIYA PROTONAMI VYSOKIKH ENERGI].

N. A. Gaidamakina, V. G. Petrukhtin, V. S. Shashkov, V. V. Antipov, and P. P. Saksonov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 430-436. 17 refs. In Russian.

Pathological changes in the morphology of the hematopoietic organs of male mice were studied after proton and gamma-irradiation. Some animals were subjected once to proton irradiation (dose, 830 rad; dose power, 400-600 rad/mn.), and others were irradiated from a Co⁶⁰ source (dose, 650 r.; dose power, 273 r./min.). The mice were killed with ether 3, 7, 15, 30, and 60

days after irradiation, and cells of the spleen, thymus gland, and bone marrow of the femur were examined microscopically. In animals that died from radiation sickness (9-12 days after irradiation), hemorrhages in the lungs and intestine were frequently observed. Comparison of the weight coefficients of the spleen and thymus (both showing a two-phase increase) did not reveal any statistically reliable differences in the effects of the two different types of irradiation on these organs. Observation of animals and comparative study of hematopoietic organs show that changes due to irradiation with protons and gamma-rays are similar. In the first few days after irradiation, the volume of follicles in the spleen decreased, and areas of myelopoiesis disappeared from the pulp. In the thymus gland, depletion of the cortical substance of lymphocytes were observed, and in the bone marrow destruction of the reticular stroma occurred. It must be noted that changes were less severe during irradiation with protons than with gamma-rays. However, complete recovery of the spleen did not occur in either case until the 60th day after irradiation. In general, it was concluded that restorative processes in all three structures studied proceeded more slowly in the gamma-irradiated animals.

A66-80384

TOLERANCE OF RATS TO ACUTE OXYGEN INSUFFICIENCY DURING RADIATION SICKNESS [USTOICHIVOS' KRYS K OSTROI KISLORODNOI NEDOSTATOCHNOSTI PRI LUCHEVOI BOLEZNI].

S. V. Gasteva, K. P. Ivanov, and D. A. Chetverkov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 437-444. 16 refs. In Russian.

Experiments were conducted to determine the effect of ionizing radiation on oxidizing systems in living tissues by showing whether the resistance of rats to acute hypoxia changes in the course of severe radiation sickness. Male white rats weighing 200-250 g. were subjected to a dose of X-rays (750 r.) sufficient to cause mass death 80 hours after irradiation. Immediately after irradiation, and then at intervals of 3, 6, 12, 24, 28, 72, and 96 hours, groups of experimental and control rats were placed in an altitude chamber and subjected to a rarefied atmosphere (140 mm. Hg). The resistance of irradiated rats to hypoxia, evident 6 hours after irradiation, was most pronounced after 72 hours. In order to determine whether a decrease in the intensity of metabolic processes is the chief cause of resistance to hypoxia, the rectal temperature and oxygen consumption of irradiated rats were measured in the designated time intervals. The absence of essential changes in these indices showed that the decrease in the intensity of metabolic processes in irradiated rats is not the sole cause of increased resistance to hypoxia. Another series of experiments tested oxygen consumption of animals directly under hypoxic conditions. Gas-exchange studies under normal atmospheric and hypoxic conditions were compared, and it was concluded that the mechanism of increased resistance to hypoxia is different at different stages of radiation sickness.

A66-80385

NEW AVENUES OF STUDY OF CHEMICAL PROTECTION AGAINST GENETIC MUTATIONS [POVYE PUTI IZUCHENIYA KHIMICHESKOI ZASHCHITY OT GENETICHESKIKH IZMENENII].

N. N. Zhukov-Verezhnikov, M. N. Volkov, N. I. Rybakov, P. P. Saksonov, V. A. Kozlov, P. A. Konstantinov, V. V. Antipov, N. N. Dobrov, and E. D. Antskln.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 445-450. 16 refs. In Russian.

Aminothiols and some pyrimidine analogs were tested for their ability to block development of infectious phage from prophage after induction of *Escherichia coli* K-12 (λ) with X-rays. Doses with a previously established nontoxic effect (0.05% concentration) were used. The desired chemical preparation was added to a bacterial culture diluted in a physiological medium. Experimental and control samples were subjected to X-ray irradiation (dose, 15,000 r.) and then cultured on agar. The number of induced phage particles in irradiated samples with and without each preparation was then compared. 2-Mercaptopyrimidine hydrochloride was most effective; cultures treated with it produced 119 times fewer phage particles than control samples. Other good inhibitors of induced phage formation were 2-(gamma-aminopropyl) disulfide dihydrobromide, sodium diethylthiocarbamate and ammonium dithiocarbamate, which reduced phage production 76.3-70.1 times. The experimental data show the essential connection between the chemical structure of the tested preparations and their ability to block the development of infectious phage. It was found that the antigenetic effect of β-mercaptoethylamine preparations can be determined by their acid radicals as well as by their base. It may be possible to obtain even more effective preparations of this compound by forming salts with other acids.

A66-80386

EFFECT OF HIGH OXYGEN PARTIAL PRESSURE ON THE MORPHOLOGY OF THE PERIPHERAL BLOOD IN ANIMALS K VLIANIU POVYSHENNOGO PARTSIAL'NOGO DAVLENIA KISLORODA NA MORFOLOGICHESKII SOSTAV PERIFERICHESKOI KROVI ZHIVOTNYKH].

I. S. Breslav and A. M. Shemeleva.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 492-501. 25 refs. In Russian.

Experiments were performed to determine the effect of high partial pressures of oxygen on the morphological composition of peripheral blood of animals. Two series of experiments were performed on white laboratory mice aged two to three months. In the first series of experiments the effect of a 60% oxygen atmosphere for 36 hours, of a 90% oxygen atmosphere also for 36 hours, and 100% oxygen at a pressure of 2.5 atm. for 1 1/2 hours was tested. In the second series of experiments, the effects of relatively prolonged (up to 10 days) exposure of animals to a gas mixture composed of 60% oxygen and 40% nitrogen were tested. The results of the two series on red blood corpuscles and on white blood corpuscles are presented in tabular form. These results make it possible to regard the morphological composition of the blood as a sensitive index which can be used for evaluation of the physiological effect of increased partial pressure of oxygen on the organism.

A66-80387

VARIOUS FORMS OF HYPOXIA AND ADAPTATION TO THEM. REPORT I. THE EFFECT OF GRADUAL AND SUDDEN ONSET OF HYPOXIA [K VOPROSU O RAZLICHNYKH FORMAKH GIPOKSII I ADAPTATSII K NIM. SOOBSHCHENIE 1. VLIANIE POSTEPENNO RAZVIVAIUSHCHEISIA I VNEZAPNOI GIPOKSII].

V. A. Konstantinov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 502-511. 22 refs. In Russian.

Experiments on cats and rats showed that in hypoxia the velocity of changes in the exhaled air determined the degree of physiological effect. The gradual development of hypoxia leads to better tolerance of minimal oxygen content of the inhaled air, because it allows sufficient time for development of adaptive mechanisms and for lowering the oxygen demand by the tissues. Gradual onset of hypoxia does not affect the body temperature, while sudden onset results in hypothermia. During space flights, individuals adapted to gradual hypoxia would require less oxygen than individuals without this experience.

A66-80388

VARIOUS FORMS OF HYPOXIA AND ADAPTATION TO THEM. REPORT 2. PECULIAR COURSE OF EXPERIMENTAL HYPOXIA [K VOPROSU O RAZLICHNYKH FORMAKH GIPOKSII I ADAPTATSII K NIM. SOOBSHCHENIE 2. OB OSOBNOSTYAKH TECHENIIA EKSTREMAL'NOI GIPOKSII].

V. A. Konstantinov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 512-517. 10 refs. In Russian.

In cats inhalation of pure nitrogen intermittent with inhalation of pure oxygen produced acute hypoxia, which resulted in leucocytosis. This was caused by a sudden depletion of tissue oxygen; however, the oxygen blood level remained fairly constant. The amplitude and frequency of respiration increased, which accomplished no functional purpose because of lack of oxygen in the inhaled air. Tolerance of hypoxia of this type could be explained by hemoglobin and tissue mechanisms which can regulate the amount of available oxygen for a short period.

A66-80389

EFFECT OF PROLONGED EXPOSURE OF ANIMALS TO AIR WITH HIGH OXYGEN CONCENTRATION ON CERTAIN PHYSIOLOGICAL FUNCTIONS [VLIANIE DLITEL'NOGO PREBYVANIYA ZHIVOTNYKH V USLOVIYAKH VOZDUSHNOI SREDY, OBOGASHCHENNOI KISLORODOM, NA NEKOTORYE FIZIOLOGICHESKIE FUNKTSII].

A. G. Zhironkin, I. S. Brestav, E. A. Konza, A. D. Nozdrachev, E. N. Salatsinskaya, G. V. Troshikhin, L. D. Fedorova, and A. M. Shmeleva.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 518-530. 56 refs. In Russian.

Experiments on mice indicated that a ten-day period of breathing a mixture containing 63% oxygen can be considered safe. But toward the end of this period certain pathological effects were noted in the lungs and in the blood. Prolonged exposure to high concentrations of oxygen can not be considered optimal.

A66-80390

AMMONIA, AS ONE OF THE COMPONENTS OF AIR IN CLOSED BUILDINGS [AMMIK KAK ODIN IZ KOMPONENTOV VOZDUSHNOI SREDY ZAKRYTYKH POMESHCHENII].

V. I. Mikhailov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 531-534. 14 refs. In Russian.

Experiments for determining lethal concentrations of ammonia were performed on 170 white mice exposed to concentrations of 2.38-6.3 mg./liter in a glass chamber with an 8-liter volume. The animals exhibited irritation of the eyes and of the upper respiratory passages, accompanied by copious foam production from the mouth, nervous movements, and respiration difficulties. Further exposure resulted in the appearance of tremor, discoordination of movements, and toxic cramps before death occurred. Autopsy of the animals showed edema of the lungs and bloated condition of the stomach and

intestines. The average lethal dose was established as 3.31 mg./liter. Ammonia concentration from 0.0072 to 0.0081 mg./liter caused a statistically significant diminution of oxygen consumption. Changes in resistance of animals to static muscular loading appeared with ammonia concentrations of 0.0072 to 0.0081 mg./liter. Another group was exposed to ammonia concentrations of 0.31 mg./liter for two hours per day for fifteen days. On the sixteenth day both the control and experimental groups were exposed to lethal concentrations of ammonia (3.31 mg./liter). On the basis of the results, it can be assumed that ammonia has a cumulative effect.

A66-80391

DEGRADATION OF HUMAN WASTE BY THE USE OF NATURAL ALGAE-BACTERIAL SYMBIOSIS [PERERABOTKA VYDELENNI CHELOVEKA S POMOSHCH'U ESTESTVENNO SKLADYVAIUSHCHEGOSIA AL'GO-BAKTERIAL'NOGO SOOBSHCHES TVA].

M. S. Rerberg, T. I. Vorob'eva, R. I. Kuz'mina, and I. M. Barkhatova.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 598-604. In Russian.

An attempt was made to devise a method for bioprocessing human wastes to reclaim water. Naturally occurring populations of *Chlorella vulgaris* and bacteria were chosen as agents by which it was hoped to achieve a higher degree of efficiency than is usual with phytoplankton and bacteria flora in sewage basins. A three-step culture process, affording sufficient mineralization of excreted organic matter, the creation of algae biomass, and production of secondary, humus-type organic matter, was used. Results show that the regenerated water conforms to most international standards. Organic matter, mostly humus (as is characteristic of aerobic processing) can easily be precipitated by the addition of Fe and Al cations. Further physical and chemical purification is simple, without significant loss of water from the system. The most serious disadvantage is that 1 to 2 months are required to process and regenerate water from the normal excretion of 24 hr. Culture intensification (dilution of 1:40 instead of 1:80, with 8 hr. of illumination in 24 hr.) cut this time to 72 hr. Excessive amounts of certain mineral salts interfered with the activity of the system. It is suggested that the alteration of the human diet to bring the composition of the excreta more closely in line with the requirements of algal-bacterial link may help solve the problem. For instance, the human diet might be enriched with nitrogen, phosphorus, and magnesium to combine with excess sulfur and potassium to form compounds more easily assimilated by the system.

A66-80392

CERTAIN METHODS OF RECORDING AND PROCESSING INFORMATION DURING STUDY OF ARTICULATION DATA OF SPEECH [NEKOTORYE PRIEMY REGISTRATSII OBRABOTKI INFORMATSII PRI ISSLEDOVANII ARTIKULIATORNYKH POKAZATELEI RECHI].

V. S. Shupliakov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 614-618. In Russian.

Speech dynamics were studied by means of electrical recordings of a number of indices of speech organ activity with a 16-channel pen-writing recorder. The complex of articulatory parameters was compared with records of the speech itself. To improve this analysis, a system was devised for automatic time measurement and data reduction to give a complex of signals, which reflects all phonetically important features of speech. This was done by transforming the signals into square pulses with an amplitude selector and shaping circuit. All measured parameters treated in this way were obtained in binary form, processable by binary logic to yield arrays or rules of occurrence for the articulatory phenomena studied.

A66-80393

THE ROLE OF VISIBLE ARTICULATION IN SPEECH RECOGNITION [ROL' VIDIMOI ARTIKULIATSII V RASPOZNAVANII RECHI].

V. V. Aliakrinski.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 619-630. 14 refs. In Russian.

Visual recognition of speech articulation was studied with six deaf subjects in order to investigate the processing of speech information when phoneme recognition must be based on visual articulatory features characteristic of more than one phoneme. The experimental material consisted of 250 meaningless syllables including all phoneme combinations in Russian and 200 non-sense words of two open syllables, half of which accented on the first syllable and half on the second. A single speaker pronounced the words. Subjects wrote down what they thought they saw pronounced. One group of subjects saw the words pronounced once, the other group saw them twice. In a second experiment a month later, all subjects saw the words pronounced only once. It was found that all phonemes fall into visually identifiable groups. A given phoneme is identified visually as belonging to a certain group but identification within that group is done unconsciously on the basis of probability. Visual speech features are stored as a sequence of the person's own articulatory imitation.

A66-80394

MODES OF FORMING CONSECUTIVE ACTIONS IN MAN [K VOPROSU O SPOSOBAKH FORMIROVANIYA CHELOVEKOM POSLEDOVATEL'NOSTI DEISTVII].

N. A. Pokotova.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 631-641. 5 refs. In Russian.

The author describes a series of experiments in which responses of man were registered upon presentation to a subject of some visual or verbal instructions. The number of errors were computed, and the ability of organization of information was analyzed. The author states that no conclusion could be reached, because the results, which will be stated in a separate publication, were not completely satisfactory.

A66-80395

AUTOMATIC STUDY OF DIURNAL PERIODIC CHANGES IN THE HUMAN ELECTROENCEPHALOGRAM [AVTOMATICHESKII ANALIZ SUTOCHNYKH PERIODICHESKIKH IZMENENII ELEKTROENTSEFALOGRAMMY CHELOVEKA] D. I. Ivanov, V. B. Malkin, V. L. Popkov, E. O. Popova, and I. N. Cherniakov. Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 642-645. 9 refs. In Russian.

In the present study, electroencephalograms (EEG) were taken of healthy male subjects 4 times daily (10:00 a.m., 5:00 p.m., 1:00 a.m., and 5:00 a.m.) for 10 to 30 days. Bipolar leads (frontal and occipital) were used. Frequency analysis of EEG's showed delta and theta waves present in the waking state—a fact not uncovered by visual analyses because of the masking by alpha and beta rhythms. The observation of delta and theta waves in pathological conditions is due to increased amplitude of the slower rhythms and reduced alpha and beta activity. The general EEG picture over a 24-hr. period is thus not determined by the alternation of rhythms. The alpha rhythm is most nearly characteristic of the overall circadian EEG picture. No clearcut dependence could be established between the number of delta and theta waves and the time of the day. Lowest EMFs (total bioelectric intensity) were noted in the morning and the highest EMFs appeared at night during sleep.

A66-80396

SENSORS FOR THE AUTOMATIC CONTROL AND REGULATION OF PHYSIOLOGICAL PROCESSES OF PLANTS IN CLOSED SYSTEMS [DATCHIKI DLIYA AVTOMATICHESKOGO KONTROLIA I REGULIROVANIYA FIZIOLOGICHESKIKH PROTSES SOV RASTENII V ZAMKNUTYKH SISTEMAKHI]. V. I. Rozhdestvenskii and V. G. Chuchkin.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 658-669. 10 refs. In Russian.

In future, extended spaceflights, higher plants will constitute links in closed life-support systems. To control the rate (intensity) of plant physiological processes, devices must be developed to indicate and record the intensity of absorption and generation of CO_2 , O_2 , H_2O , and various mineral elements included in plant nutrition. Systems designed to accomplish these tasks are proposed. Equations able to determine CO_2 and air inflow and outflow, photosynthetic intensity, CO_2 concentration, and change in CO_2 content in the growing chamber are given. Figures describing these various determinations are also given.

A66-80397

CHARACTERISTICS OF NUTRITION OF PLANTS DURING THEIR GROWTH IN AIR CULTURE IN CLOSED SYSTEMS [OB OSOBNOSTIAKH PITANIYA RASTENII PRI VYRASHCHIVANII IKH V VOZDUSHNOI KUL'TURE DLIYA ZAMKNUTOI SISTEMY].

I. V. Tsvetkova, I. I. Shaidarov, and V. M. Abramova.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 670-683. 8 refs. In Russian.

To grow higher plants in closed ecological systems, it is necessary to use mineralized products of human waste. To evaluate the hazard of NaCl toxicity, experiments were performed at the Artificial Climate Station of the Institute of Plant Physiology of the Academy of Sciences, U.S.S.R. Chinese cabbage sprouts were grown aeroponically. Their roots, suspended in air in a closed compartment, were automatically sprayed with nutrient solutions for 30 sec. every 20 min. Aeroponics, with its absence of a substrate, has weight-saving advantages for spaceflight purposes. Three types of nutrient solutions were used: a normal one without additional salts, the same with NaCl added (0.2-2.0% Cl ions), and those composed of mineralized products of human metabolism to which corrective amounts of nitrogen, phosphorus, and calcium were added. The pH of the solution was maintained at 5.8. The temperature of the chamber ranged from 20 to 25°C, and the humidity from 70 to 80%. Cabbage plants grown aeroponically were found to possess a higher degree of resistance to salt, apparently because of better aeration and water supply of the root systems. Tests indicated that even significant concentrations of chlorine in an aeroponic culture do not have a toxic effect on the plants. Consequently, the amount of chlorides in the mineralized products of human metabolism will not result in the death of plants, provided they are grown aeroponically.

A66-80398

CONDITIONS OF CARBON NUTRITION OF CHLORELLA DURING INTENSIFIED GROWTH [USLOVIA UGLERODNOGO PITANIYA KHLORELLY V INTENSIVNOI KUL'TURE].

G. I. Meleshko and L. M. Krasotchenko.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 676-682. 8 refs. In Russian.

In order to determine optimum amounts of CO_2 required for maximum production of oxygen, a previously grown culture of a thermophilic strain of *Chlorella* suspended in a Tamiya medium was supplied with mixtures of air and diminishing concentrations of CO_2 (from 13% to the point where photosynthesis apparently ceased [pH 5.5 to 6.0]). The *Chlorella* densities varied as follows: 0.5-0.6x10⁹, 3-4x10⁹, and 8-10x10⁹ cells per cc. The results in all three tests were quite similar. Photosynthesis intensity increased sharply as the amount of CO_2 was increased to 1.5-1.8%. Further increases did not augment photosynthesis intensity until 4.5-5.5% was reached, at which point another sharp increase of intensity was observed. Another plateau extended to the point when CO_2 concentration reached 5.0-7.5%, when another sharp increase in photosynthesis occurred. A third plateau was reached only at a concentration of 8-10x10⁹ cells per cc. Lower concentration of *Chlorella* provided only two step increases. The step-like nature of photosynthesis intensity is apparently explained by factors which delay the arrival of CO_2 to the point where it can be utilized by the cell. This explains the presence of the third plateau in high-density cultures. The exchange rate of air and liquid phases, the area of contact, the ability of CO_2 to dissolve, the CO_2 capacity of the medium, the rate of diffusion of molecules in the nutrient medium, and the motility of the medium itself—all these are factors to be considered in designing photosynthesis reactors. Concentration of CO_2 dissolved in the zone of cells in the medium rather than concentration of CO_2 in the air determines the rate at which CO_2 passes into the cells.

A66-80399

UTILIZATION OF NUTRITIONAL MINERAL ELEMENTS BY CELLS OF CHLORELLA IN INTENSIFIED CULTURES [POTREBLENIE ELEMENTOV MINERAL'NOGO PITANIYA KLETKAMI KHLORELLY V INTENSIVNOI KUL'TURE].

E. K. Lebedeva, G. I. Meleshko, and A. N. Shakhova.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 687-693. 22 refs. In Russian.

Thermophilic *Chlorella pyrenoidosa* cultures were grown on a Tamiya medium containing KH_2PO_4 , MgSO_4 , KH_2PO_4 , Fe^{+2} , and microelements as prescribed by Arnon, in a closed-air cultivator containing 3-5% CO_2 . The pH was kept constant by addition of nitric acid between 6 and 7. During the process of cultivation, the amounts of nitrogen, phosphorus, sulfur, and calcium remained relatively stable (within 7%). Iron was the most variable element. The data obtained in this study make it possible to estimate the amount of corrective action on the medium required for prolonged cultivation of *Chlorella pyrenoidosa*. Little correlation was observed between removal of nitrogen from the medium and its accumulation in the biomass. Removal of magnesium was quite unstable in the different experiments while that of phosphorus was more stable. The amounts of elements and compounds which must be added to the neutral medium in order to correct it for proper concentration of elements and pH are tabulated. Another tabulation makes it possible to calculate the composition of solutions required for prolonged intensive cultivation of *Chlorella pyrenoidosa*, so that optimal concentrations of macroelements can be maintained in the mineral nutrition.

A66-80400

CONTINUOUS HEAVY CULTURES OF CHLORELLA UNDER VARIOUS ILLUMINATION [PLOTNOSTNOE NEPREYVNOE KUL'TIVIROVANIE KHLORELLY PRI RAZLICHNYKH OSVESHCHENNIYAKHI].

I. A. Terskov, L. I. Gitel'man, F. Ia. Sid'ko, V. N. Belianin, B. G. Kovrov, I. S. Eroshin, and V. A. Batov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 683-686. In Russian.

Experiments were performed with a thermophilic strain of *Chlorella vulgaris* in order to determine optimal lighting conditions for high concentrations of cells during intensive, continuous cultivation. Concentrations equivalent to 20, 30, and 40 g of the dry biomass per liter of suspension were used. Air containing 5% CO_2 was bubbled through the culture medium. The mm.-thick layer of culture was equally illuminated from both sides by gas-discharge lamps, which produced favorable illumination for photosynthesis. In the experiments, 6 levels of illumination intensity were used, ranging from 0.260 up to 1.202 cal/cm²/min. As a rule the light intensity was changed from minimum to maximum and then back to minimum. The duration of the experiments was 6 days. In all cases the intensity of production tended to increase with the intensity of illumination up to a certain point. After that, additional increases in illumination failed to bring about additional increases in productivity. It is interesting to note that the productivity for different densities was also most identical: ranging from 36-38 g. of dry weight per liter of suspension per diem. The almost identical maximum productivity of the various cultures may be explained by the fact that high concentrations of cells make the medium

optically very dense. It was found that the intensity of biosynthesis of cells at 20 g./liter is nearly three times as great as that of cells at 43 g./liter. Consequently, the total productivity of high-density cultures at high illumination can be increased only by increasing the surface area accepting the light.

A66-80401

CHANGES IN HEMATOCRIT AND GASEOUS CONTENTS OF ARTERIAL BLOOD IN ALBINO RATS DURING ARTIFICIAL HYPOTHERMIA [IZMENENIYA POKAZATELIA GEMATOKRITA I GAZOVOGO SOS TAVA ARTERIAL'NOI KROVI U BELYKH KRYIS PRI ISKUSSTVENNOI GIPOTERMII].

G. D. Glod.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 694-700. 6 refs. In Russian.

Hypothermia was induced in 60 albino rats by three different methods: (1) chilling in a closed space of limited volume under conditions of increasing hypercapnia and hypoxia; (2) chilling while breathing a gas mixture of 15% CO₂, 40% O₂, and 45% N₂; and (3) by intramuscular injection of a mixture of aminazine (chlorpromazine), pipolphone, and promedol (1,2,5-trimethyl-4-phenyl-4-propionoxy-piperidine hydrochloride). In the first and second series, a reduction in body temperature to 23-19°C, caused an increase in hematocrit index from 45.1±1.09 to 50.5±1.66. Further reduction of the body temperature to 19-15°C, reduced the hematocrit to 40.3±2.8, and a temperature below 15°C, reduced it to 36.4±2.55. In the third series, reduction in body temperature to 35-31°C, caused the hematocrit to diminish to 42.3±3.29; at a temperature of 27-23°C, the hematocrit was 41.0±3.64, at 23-19°C, 41.±2.82, and at 19-15°C, 40.0±1.81. All three methods led to the appearance of arterial hypoxemia, most markedly manifested in the third series. Arterial hypoxemia was accompanied by an increase in CO₂ from an initial 40% to as high as 61.2% in the second series when hypoxemia became marked. The data obtained indicate that artificial hypothermia can be induced in rats by all three methods, but that the physiological indices differ. In the first two series there was a tendency for the blood to condense as body temperature dropped, while in the third series the appearance of hydremia was indicated.

A66-80402

SIMULATION OF RADIATION CONDITIONS CAUSED BY SUN FLARES DURING AN ORBITAL FLIGHT AROUND THE MOON [MODELIROVANIYE RADIATSIONNYKH USLOVII PRI VOZNIKNOVENII SOLNECHNOI VS PYHKI NA TRAEKTORII OBLETA LUNY].

V. S. Morozov, V. S. Shashkov, B. I. Davydov, V. V. Antipov, P. P. Saksonov, and N. N. Dobrov.

Problemy Kosmicheskoi Biologii, vol. 4, 1965, p. 701-708. 12 refs. In Russian.

White mice fed a special food and kept in a biological unit were subjected to gamma-irradiation. Acute irradiation of other animals was conducted in plexiglas cages. In all cases the radiation dose was 900 to 920 r. Dose power during acute irradiation was 18 r./min. and during "solar flare" a maximum of 2.5 r./min. (duration of flare, 24 hr.). On a simulated lunar trajectory, the animals received a dose of 60 to 80 r. while passing through the "radiation belts." Before the solar flare, the mice were injected with the following radio-protective agents: cystamine dihydrochloride, AET (β -aminoethylisothioronium bromide hydrobromide), and 5-methoxytryptamine hydrochloride. Results showed that the effects of this pharmacological protection were slight as compared with that of unprotected animals. AET was the most effective radio-protective agent during both "lunar flight" and acute irradiation. On the lunar flight the animals were subjected to an acceleration of 20 g for 5 min. before irradiation and at the end of the flight. It is suggested that the observed lowering of the biological effect of radiation during lunar flight (only 33% of the mice died, as against 90% after acute irradiation) is due not only to the lowered dose power, but also to acceleration. It was concluded that modeling of radiation conditions for any spaceflight trajectory should be possible.

A66-80403

FUNCTIONAL MECHANISM OF THE LABYRINTHINE EPITHELIUM. II. AUTHOR'S THEORY.

S. H. Mygind.

Archives of Otolaryngology, vol. 82, Dec. 1965, p. 579-590.

The author outlines his theory of functional mechanism of the labyrinthine epithelium. In essence, hearing stimulation does not depend on pressure causing deformation of a hair cell and producing a piezo-electrical effect. It is induced by pressure on the hair cells causing a dislocation downward in relation to its phalanx head. Molecular curving is produced, and the sensory cells are stimulated by the electrical output. Ultramicroscopic studies carried out by other investigators show that only at the border of the sensory cells seems to be the space required for the crossing molecule-bridges (about one-half micron in length).

A66-80404

THE EFFECT OF ANGIOTENSIN ON RENAL CIRCULATION.

G. Kover, M. Malyusz, Erzsebet Ello, and Eva Szocs (Budapest U. Med. School, Inst. of Physiol., Budapest, Hungary).

Acta Physiologica

Acta Physiologica Academiae Scientiarum Hungaricae, vol. 28, 1965, p. 53-57. 9 refs.

The effect of angiotensin II on "in situ" and "isolated" kidneys of dogs was studied. When infused into the renal artery of the kidney in situ, angiotensin increased renal resistance and decreased RBF_{dir} (renal blood flow, measured directly), C_{PAH} (para-amino hippuric acid clearance), and C_{creat} (creatinine clearance). E_{creat} (creatinine extraction) and E_{PAH} (para-amino hippuric acid extraction) increased significantly. In the isolated kidney, angiotensin increased renal resistance and diminished RBF_{dir}. C_{PAH} and C_{creat} did not change, whereas E_{creat} and E_{PAH} increased significantly. The increase of E_{PAH} in response to angiotensin may be ascribed to an improvement in the PAH-secreting activity of tubular cells. Another possibility is that there are shunts in the kidney, and angiotensin constricts them to a greater extent than it constricts the blood vessels of the functioning renal substance.

A66-80405

SPACE MEDICINE.

George E. Ruff (Pa. U., School of Med., Dept. of Psychiat., Philadelphia), Resident Physician, vol. 11, Nov. 1965, p. 65-79.

Space medicine is concerned largely with the effects of the following factors on man: (1) acceleration during take-off and reentry; (2) noise and vibration due to mechanical functions of the spacecraft; (3) sudden and sustained temperature variations inside the cabin and during extra-vehicular activity; (4) cosmic radiation; (5) gaseous equilibrium of the ambient atmosphere; (6) food and water supply and waste disposal; (7) toxic gases generated by mechanical systems and out-gassing of furnishings; (8) changes in circadian rhythms; and (9) psychological stress. Studies pertinent to these factors are designed to aid in personnel selection and training, and in support of space personnel during actual flights.

A66-80406

AIR IONIZATION IN THE ENVIRONMENT OF FARM ANIMALS.

R. H. Brown and B. J. Stone (Ga. U., Athens).

(Am. Soc. of Agr. Engrs., Ann. Meeting, Miami Beach, Fla., Jun. 1963). *Transactions of the ASAE*, vol. 8, 1965, p. 15-17. 11 refs.

Results of a study designed to determine the effects of negative ions in the environment of weanling pigs are reported. Two tests involving the following are included: (1) negative air ions were applied for 8 hr. out of each 24 hr., and (2) negative ions were applied 24 hr. out of 24, except for about 40 min. each morning during the cleaning operation. Each test had its controls. Data from these two tests do not indicate any advantage in providing negative air ions in the environment of weanling, healthy pigs. No differences were found during the tests nor were any noted in the weight gains or feed efficiency of the pigs 4 weeks after the test.

Subject Index

AEROSPACE MEDICINE AND BIOLOGY / a continuing bibliography

MARCH 1966

Listing of Subject Headings of Reports

A Notation of Content, rather than the title of the document, appears under each subject heading; it is listed under several headings to provide multiple access to the subject content. The accession number is located beneath and to the right of the Notation of Content, e.g., N66-12345. Under any one subject heading, the accession numbers are arranged in sequence.

A

- ABSORPTION**
TEMPERATURE AND HYDRATION FACTORS AFFECTING CUTANEOUS BARRIERS TO PENETRATION
A66-80263
- ABSORPTION SPECTRUM**
METABOLIC RESEARCH - ATOMIC ABSORPTION SPECTROMETRY USED FOR MEASURING NICKEL IN BIOLOGICAL MATERIALS, SERUM CA, MG, ACIDITY, AND CONDUCTIVITY - FREEZING POINT METHOD NYO-1397-1
N66-12898
- ACCELERATION**
DOMINANT LETHALS IN DROSOPHILA MALES EXPOSED TO VIBRATION, ACCELERATION, AND GAMMA IRRADIATION DURING SPACE FLIGHTS
N66-13790
- ELECTRONYSTAGNUS MEASUREMENT OF VERTICAL EYEBALL DISPLACEMENT TO INVESTIGATE CHINCHILLA VESTIBULAR SYSTEM RESPONSE TO VERTICAL LINEAR ACCELERATION
GE/EE/65-6
N66-13814
- REVIEW OF LIFE SUPPORT PROBLEMS IN SPACE - FOOD, WATER, OXYGEN, WEIGHTLESSNESS, AND ACCELERATION
FTD-TT-65-601/164
N66-14028
- ACCELERATION STRESS**
POSTURE, RESPIRATION, AND PULMONARY FUNCTION IN RELATION TO PROLONGED ACCELERATION EXPOSURE IN SPACE FLIGHT
A66-80159
- SPATIAL ORIENTATION AND PERCEPTION OF SUBJECTS ASSUMING VARIOUS HEAD AND BODY POSITIONS UNDER INCREASED ACCELERATION WITHOUT VISUAL REFERENCE FRAME
A66-80163
- CHANGES IN FUNCTION AND RECIPROCAL ACTION OF VESTIBULAR APPARATUS COMPONENTS, OTOLITHS AND CUPULA, OF MAN DURING GRAVITATIONAL CHANGES INCLUDING WEIGHTLESSNESS
A66-80302
- COMBINED ACCELERATION, VIBRATION, AND RADIATION EFFECTS ON MITOTIC ACTIVITY OF BONE MARROW CELLS IN MICE
A66-80319
- CEREBRAL VENOUS FLOW IN RABBITS DURING ACCELERATION WITH EMPHASIS ON METHOD OF REGISTRATION
A66-80332
- SURVIVAL DURING SCREENING OF VARIOUS AREAS OF RAT BODY TO GAMMA RAYS AND HIGH ENERGY PROTONS AS AFFECTED BY VIBRATION OR ACCELERATION STRESS
A66-80382
- BIOLOGICAL EFFECT IN MOUSE OF GAMMA IRRADIATION AS AFFECTED BY SOLAR FLARE, RADIOPROTECTIVE DRUGS, AND ACCELERATION STRESS DURING SIMULATION OF RADIATION CONDITIONS OF SPACEFLIGHT
A66-80402
- CHANGES IN MYOCARDIAL OXYGEN PRESSURE OF DOGS DURING ASCENT AND ACCELERATION DETERMINED BY POLAROGRAPHIC ELECTRODES IMPLANTED IN HEART MUSCLES
JPRS-33066
N66-12271
- ACCELERATION TOLERANCE**
HEAT STRESS AND MINIMAL DEHYDRATION EFFECT UPON HUMAN TOLERANCE TO POSITIVE ACCELERATION
A66-12353
- ACCELERATION EFFECT ON FOOD REINFORCED DRL AND FR SCHEDULES
A66-13175
- VIBRATION EXPOSURE WITH VARYING PEAK AND RMS ACCELERATION AND FREQUENCY IN LOW ALTITUDE HIGH-SPEED FLIGHT
A66-13355
- BREATHING MECHANICS DURING TRANSVERSE ACCELERATION, DISCUSSING EXPERIMENTS AND MEASUREMENTS MADE ON MAN
A66-14075
- PROLONGED HYPOKINESIA EFFECT ON ACCELERATION TOLERANCE OF HUMAN
A66-80316
- HUMAN ELECTROENCEPHALOGRAM, REACTION TIME, AND TOLERANCE DURING CORIOLIS ACCELERATION DIRECTED BACK TO CHEST
A66-80318
- HISTOLOGICAL CHANGES IN OVARIES AND RESISTANCE TO TRANSVERSE ACCELERATION REVEALED BY CARDIOVASCULAR AND RESPIRATORY ACTIVITY OF YOUNG FEMALE MONKEYS
A66-80378
- DIAL READING ABILITY OF SPACECRAFT CREW DURING PROLONGED ACCELERATION AND VIBRATION
AMRL-TR-65-110
N66-12376
- ACCIDENT PREVENTION**
PLANE CRASH AS RESULT OF PILOTS CORONARY DISEASE, DISCUSSING PREVENTION AND REHABILITATION
A66-14387
- USAF AIRCRAFT ACCIDENTS INVOLVING TEN OR MORE FATALITIES FOR 1953 TO 1962 PERIOD IN RELATION TO ACCIDENT PREVENTION PROGRAM
A66-80197
- ACIDOSIS**
CLINICAL MANIFESTATIONS AND THERAPY OF RESPIRATORY ACIDOSIS
A66-80347
- ACOUSTICS**
AFFECTIVE COMMUNICATION IN SPEECH AND RELATED QUANTITATIVE PROBLEMS - HUMAN PERCEPTION AND RESPONSE TO VOICE COMMUNICATION /SPEECH SIGNAL/ ACOUSTICAL PROPERTIES
AD-620333
N66-12783
- ACTIVITY /BIOL/**
FOOD INTAKE, BODY WEIGHT, AND ACTIVITY OF RAT EXERCISING IN HOT ENVIRONMENT
A66-80220
- ADAPTATION, SURVIVAL, RESPIRATORY RATE, AND MOTOR ACTIVITY OF MICE IN PROLONGED EXPOSURE TO HIGH CONCENTRATIONS OF CARBON DIOXIDE

- A66-80320
EFFECT OF VESTIBULAR IRRITATION ON ELECTRICAL ACTIVITY OF CORTEX AND BASAL AREAS OF BRAIN
FTD-TT-65-410/1&2&4 N66-12762
- ACTIVITY CYCLE /BIOL/**
METABOLISM AND ENERGY EXCHANGE BALANCE TESTS IN RESPIRATION CALORIMETER TO DETERMINE RELATION BETWEEN BODY TEMPERATURE AND FLUCTUATIONS OF OTHER BODY FUNCTIONS
NASA-TT-F-9796 N66-13484
- ADAPTATION**
SEX DIFFERENCES IN ADAPTATION OF GALVANIC SKIN RESPONSE TO REPETITION OF VISUAL STIMULUS
A66-80271
- REACTION TIME TO AUDITORY STIMULI OF DIFFERENT INTENSITIES AT DIFFERENT ADAPTATION LEVELS
A66-80281
- ADAPTATION, SURVIVAL, RESPIRATORY RATE, AND MOTOR ACTIVITY OF MICE IN PROLONGED EXPOSURE TO HIGH CONCENTRATIONS OF CARBON DIOXIDE
A66-80320
- ADENINE**
PHARMACOLOGICALLY ACTIVE AND LETHAL SUBSTANCES RELEASED FROM THERMALLY INJURED SKIN OF HUMAN AND ANIMAL SUBJECTS INCLUDING HISTAMINE, BRADYKININ, ADENYLIC COMPOUNDS, AND POSSIBLY SEROTONIN
A66-80254
- ADENOSINE TRIPHOSPHATE /ATP/**
SUCCINATE-PROTECTIVE AGENT AGAINST HIGH PRESSURE OXYGEN TOXICITY IN RAT
A66-80365
- ADIPOSE TISSUE**
ROLE OF ADIPOSE TISSUE OF WELL-FED AND STARVED GUINEA PIGS IN DECOMPRESSION SICKNESS
A66-80294
- ADRENAL GLAND**
PHYSIOLOGICAL ROLE OF ADRENAL MEDULLA IN PALMAR ANHIDROTIC RESPONSE TO STRESS
A66-80215
- AEROSPACE MEDICINE**
SPACE BIOLOGY AND MEDICINE RESEARCH, STRESSING FLIGHT EXPERIMENTS PERFORMED WITH RUSSIAN SATELLITES AND SPACECRAFT
A66-14089
- USE OF ELECTRONIC COMPUTERS IN SPACE BIOLOGY
A66-80366
- REVIEW OF PROBLEMS FOR PHYSICIAN IN AEROSPACE MEDICINE
A66-80405
- BIBLIOGRAPHY OF AEROSPACE MEDICINE AND BIOLOGY
NASA-SP-7011/17/ N66-12345
- CONFERENCES ON AEROSPACE MEDICINE - ASTRONAUT PERFORMANCE, ELECTROPHYSIOLOGICAL STUDIES ON VOSKHOD MANNED SPACECRAFT, AND MATHEMATICAL METHODS
JPRS-32808 N66-12657
- SUMMARIES OF REPORTS GIVEN AT CONFERENCE ON APPLICATION OF MATHEMATICAL METHODS IN AEROSPACE MEDICINE
N66-12660
- AEROSPACE MEDICINE - COMPRESSION DEFORMITIES OF THORACIS VERTEBRAE IN HUMAN TOLERANCE TEST DURING EXPOSURE TO SIMULATED ESCAPE SYSTEM ROCKET THRUST VECTOR
AMRL-TR-65-134 N66-12885
- CARDIOVASCULAR AND RESPIRATORY DISEASE IN FORMER FLIGHT STUDENTS - AEROSPACE MEDICINE
NASA-CR-68541 N66-13165
- NASA SPACE BIOLOGY PROGRAM - EXOBIOLGY, ENVIRONMENTAL AND BEHAVIORAL BIOLOGY, MOLECULAR BIOLOGY AND INSTRUMENTATION, FLIGHT PROGRAMS, AND MANNED SPACE FLIGHT
NASA-TM-X-57051 N66-13899
- ANNOTATED BIBLIOGRAPHY OF AEROSPACE MEDICINE AND BIOLOGY WITH SUBJECT, AUTHOR, AND CORPORATE
- SOURCE INDEXES - PHYSIOLOGICAL, PSYCHOLOGICAL, AND SPACE ENVIRONMENT EFFECTS ON MAN
NASA-SP-7011/18/ N66-14160
- CONTROL OF VESTIBULAR APPARATUS BY CENTRAL NERVOUS SYSTEM - PREVENTION OF MOTION SICKNESS - AEROSPACE MEDICINE
AD-623676 N66-14320
- AFTERIMAGE**
CHARACTERISTICS OF AFTERIMAGES PRODUCED BY PERSISTING VISUAL EFFECT AFTER TERMINATION OF ILLUMINATION
A66-13794
- AFTERIMAGES PRODUCED BY BLACK AND LIGHT TARGETS VIEWED PERIPHERALLY BY DARK ADAPTED SUBJECTS
A66-80175
- AGE FACTOR**
METHODS FOR SOMATIC CLASSIFICATION OF PILOTS OF DIFFERENT AGES ACCORDING TO STATUS OF FUNCTIONAL MUSCULAR, CIRCULATORY, AND RESPIRATORY CAPACITIES AS RELATED TO TRAINING
A66-80164
- MEASUREMENT, STRUCTURE, AND PREDICTION OF JOB AND TRAINING PERFORMANCE OF AIR TRAFFIC CONTROL SPECIALISTS OF DIFFERENT AGES
A66-80193
- PATELLAR REFLEX TIME OF OLD AND YOUNG MALE SUBJECTS AS AFFECTED BY EXERCISE
A66-80207
- BEHAVIORAL THERMOREGULATION IN YOUNG AND OLD RATS IN COLD ENVIRONMENT
A66-80208
- INFLUENCE OF AGE ON CARDIOVASCULAR AND RENAL RESPONSES TO TILTING
A66-80213
- SWEAT CHLORIDE CONCENTRATION AND RATE, METABOLIC RATE, SKIN AND BODY TEMPERATURES OF YOUNG AND OLD MALES WALKING IN DESERT ENVIRONMENT
A66-80217
- KINETICS OF OXYGEN UPTAKE BY ERYTHROCYTES OF DIFFERENT AGES AS RELATED TO RESPIRATORY FUNCTION OF BLOOD
A66-80229
- MEASUREMENT OF FUNCTIONAL RESIDUAL CAPACITY OF RATS VARYING IN AGE AND WEIGHT
A66-80233
- EFFECT OF AGE ON PART AND WHOLE LEARNING IN MAIL SORTERS
A66-80282
- CHARACTERISTICS OF LIPID MOBILIZATION AND PERIPHERAL DISPOSITION IN AGED INDIVIDUALS
A66-80283
- LEVEL OF SKIN POTENTIAL IN HEALTHY MALES AND EFFECT OF AGE
A66-80284
- CRITICAL FLICKER FUSION FREQUENCY AS FUNCTION OF EXPOSURE TIME IN TWO DIFFERENT AGE GROUPS
A66-80285
- AIR CONDITIONING**
STUDY OF COMFORTABLE CLOTHING FOR ASTRONAUTS DURING 30-DAY TESTS WITHOUT WASHING IN AIR CONDITIONED SPACE CABINS IN RELATION TO SKIN CONDITION
A66-80314
- AIR PURIFICATION**
SURVEY OF SOVIET USE OF ACTIVE CHEMICALS FOR SPACE CABIN AIR REVITALIZATION
A66-80202
- ELECTROCHEMICAL CARBON DIOXIDE CONCENTRATION SYSTEM FOR PURIFYING SPACE CABIN ATMOSPHERE
NASA-CR-54849 N66-13114
- AIR SAMPLING**
SURVIVAL OF MICROORGANISMS EXPOSED TO SHOCK WAVE AND CRYOGENIC TEMPERATURES DURING UPPER ATMOSPHERIC AIR SAMPLING
NASA-CR-354 N66-12533
- SURVIVAL OF MICROORGANISMS EXPOSED TO SHOCK WAVE AND CRYOGENIC TEMPERATURE DURING WHOLE AIR SAMPLING OF UPPER ATMOSPHERE
NASA-CR-68421 N66-13095

- ANALYTICAL DATA ON FISSION YIELD AND FISSION PRODUCT DECAY, AIR SAMPLING TECHNIQUES, RADIOCHEMICAL DETERMINATION OF RADIOISOTOPES IN WATER, FECES, AND URINE
NYO-4700, SUPPL. 2 N66-13854
- AIR TRAFFIC CONTROL**
SELF-REPORTED STRESS-RELATED SYMPTOMS AMONG AIR TRAFFIC CONTROL SPECIALISTS / ATCS/ AND NON- ATCS PERSONNEL A66-12358
- MEASUREMENT, STRUCTURE, AND PREDICTION OF JOB AND TRAINING PERFORMANCE OF AIR TRAFFIC CONTROL SPECIALISTS OF DIFFERENT AGES A66-80193
- AIRCRAFT ACCIDENT**
USAF AIRCRAFT ACCIDENTS INVOLVING TEN OR MORE FATALITIES FOR 1953 TO 1962 PERIOD IN RELATION TO ACCIDENT PREVENTION PROGRAM A66-80197
- AIRCRAFT HAZARD**
HUMAN FACTORS IN CONCORDE SST PROGRAM A66-13357
- AIRCRAFT MAINTENANCE**
TRAINING AND INSTRUCTION BY MEANS OF TEACHING MACHINES IN FIELD OF AVIATION A66-13508
- AIRCRAFT PERFORMANCE**
THERMOREGULATION - HEAT EXCHANGE IN FLYING PERSONN RELATED TO ALTITUDE AND AIRCRAFT VELOCITY A66-80359
- AIRCRAFT SAFETY**
CRITERIA FOR BODY BLOCKS, ANTHROPOMORPHIC DUMMIES, AND INSTRUMENTATION FOR USE IN STATIC AND DYNAMIC TESTING OF CIVIL AIRCRAFT SEAT SYSTEMS FAA-ADS-20 N66-13926
- AIRCRAFT STABILITY**
VESTIBULO-OCULAR DISORGANIZATION IN AERODYNAMIC SPIN, NOTING ROLL PLANE OF SKULL A66-12363
- AIRCREW**
STRESS IMPOSED ON AIRCREW IN CIVIL JET AIRCRAFT DURING LONG FLIGHT
DLR-FB-65-44 N66-14261
- AIRPORT PLANNING**
MATHEMATICAL MODEL BASED ON CONTROL AND QUEUEING THEORY FOR HUMAN CONTROLLER FOR TURN-ROUND OPERATIONS ON AIRPORT APRON A66-12886
- ALKALOSIS**
CLINICAL MANIFESTATIONS OF RESPIRATORY ALKALOSIS A66-80348
- ALKANE**
BIOLOGIC-TYPE ALKANES OF INDIGENOUS ORIGIN MORE THAN 2.7 BILLION YEARS OLD PRESENT IN PRECAMBRIAN ROCKS OF SOUDAN FORMATION A66-12366
- ALTITUDE**
THERMOREGULATION - HEAT EXCHANGE IN FLYING PERSONN RELATED TO ALTITUDE AND AIRCRAFT VELOCITY A66-80359
- ALTITUDE ACCLIMATIZATION**
RESISTANCE TO HYPOXIA AND FATIGUE OF RESPIRATORY MUSCLE DURING ASCENT TO HIGH ALTITUDE AS AFFECTED BY ACCLIMATIZATION A66-80305
- AMINO ACID**
RELATION OF EARLIEST PROTEINS TO PROTOCELL, WITH TABULATED COMPARISON OF KEY PROPERTIES OF ACID PROTEINOIDS AND PROTEIN A66-13369
- MOLECULAR STRUCTURE OF PEPTIDE CHAINS OF PROTEINS TO FIND RULES GOVERNING AMINO ACIDS
N66-12628
- PROTEIN BIOSYNTHESIS BY INCORPORATION OF AMINO ACIDS AND ACTION OF SOLUBLE RIBONUCLEIC ACID
N66-12630
- AMMONIA**
AMMONIA EFFECTS ON PHYSIOLOGICAL FUNCTIONS OF MICE IN CLOSED ENVIRONMENT A66-80390
- AMPLITUDE**
WAVEMETER AND INTEGRATOR FOR EVALUATION OF WAVE PATTERNS AND AMPLITUDE OF BRAIN POTENTIALS - ELECTROPHYSIOLOGY
JPRS-33055 N66-12444
- ANALYTIC FUNCTION**
COMPUTER ANALYSIS OF ELECTROENCEPHALOGRAPHIC RECORDING DURING ENVIRONMENTAL STRESSES OF SPACE FLIGHT A66-80165
- USING COMPUTER ANALYZED SPEECH SIGNALS FACILITATING BETTER COMMUNICATION OF MAN WITH MACHINES A66-80334
- ANALYTICAL CHEMISTRY**
ANALYTICAL DATA ON FISSION YIELD AND FISSION PRODUCT DECAY, AIR SAMPLING TECHNIQUES, RADIOCHEMICAL DETERMINATION OF RADIOISOTOPES IN WATER, FECES, AND URINE
NYO-4700, SUPPL. 2 N66-13854
- ANESTHESIOLOGY**
ANATOMICAL STUDIES IN DOG ANESTHETIZED WITH PENTOBARBITAL AND CHLORPROMAZINE AND SUBJECTED TO REPEATED PROLONGED POSITIVE G A66-12362
- ANGIOSPERM**
PROTECTION OF CORN, WHEAT, AND LUPINE SEEDS AGAINST BETA-RADIATION BY TREATMENT WITH SULFANILAMIDE AND NONANDIC ACID DERIVATIVES A66-80323
- ULTRAVIOLET RADIATION EFFECTS ON VARIOUS FLOWERING PLANTS UNDER NEAR SPACE CONDITIONS SUCH AS ARCTIC AND HIGH ALTITUDE A66-80324
- CHINESE CABBAGE SPROUTS GROWN AEROPONICALLY IN CLOSED ECOLOGICAL SYSTEM AS AFFECTED BY MINERALIZED PRODUCTS OF HUMAN WASTE A66-80397
- ANGULAR ACCELERATION**
HYPOXIC HYPOXIA AND HYPERVENTILATION EFFECT ON NYSTAGMUS INDUCED BY ANGULAR ACCELERATION A66-13356
- ARTERIAL PRESSURE, RESPIRATORY RATE, ELECTROCARDIOGRAM, AND ELECTROENCEPHALOGRAPHY OF YOUNG MEN DURING SHORT TERM ANGULAR ACCELERATIONS A66-80303
- CARDIOVASCULAR AND VESTIBULAR RESPONSE OF HUMAN BODY EXPOSED AT VARIOUS POSITIONS TO ROTATIONAL STRESS A66-80379
- ANIMAL STUDY**
ALVEOLAR NITROGEN CONCENTRATION AND ENVIRONMENTAL PRESSURE INFLUENCE UPON RATE OF GAS ABSORPTION FROM NONVENTILATED LUNG IN DOG A66-12357
- ANATOMICAL STUDIES IN DOG ANESTHETIZED WITH PENTOBARBITAL AND CHLORPROMAZINE AND SUBJECTED TO REPEATED PROLONGED POSITIVE G A66-12362
- ANIMAL TEMPERATURE SENSING FOR STUDYING EFFECT OF PROLONGED ORBITAL FLIGHT ON CIRCADIAN RHYTHMS OF POCKET MICE A66-12767
- HEART AND BREATHING RATE AND ELECTROENCEPHALOGRAPHIC RESPONSES OF RATS DURING WEIGHTLESSNESS A66-14083
- MONITORING HUMAN PERFORMANCE DURING MANNED ORBITAL FLIGHT FOR ASSESSMENT OF CENTRAL NERVOUS SYSTEM FUNCTION, NOTING ANIMAL STUDIES DURING SIMULATED STRESSES OF SPACE FLIGHT A66-14088
- INVESTIGATIONS OF PHYSIOLOGICAL RESPONSES OF ANIMALS AND MAN TO STRESSES IN VOSTOK SPACECRAFT A66-80160
- LONG-LIFE PHYSIOLOGICAL TELEMETRY APPARATUS FOR BODY TEMPERATURE MEASUREMENT IN SMALL ANIMALS A66-80242
- RADIATION PROTECTION OF ANIMALS BY VARIOUS DRUGS DURING EXPOSURE TO GAMMA, PROTON, AND X-RAY IRRADIATION AS RELATED TO RELATIVE BIOLOGICAL

- EFFECT A66-80311
- SEMICONDUCTOR DEVICE FOR SUBJECTING SMALL EXPERIMENTAL ANIMALS TO HYPOTHERMIA A66-80328
- AUTOMATIC DEVICE FOR PRODUCING CONTROLLED HYPOTHERMIA IN ANIMALS AND HUMANS A66-80330
- RESTORATION OF CONTRACTILITY, RESUMPTION OF HEMODYNAMICS, AND TRANSPLANTATION PROSPECTS IN HUMAN AND ANIMAL HEARTS NASA-TT-F-404 N66-12263
- FLUORESCENT EMISSION FROM CAT CEREBRAL CORTEX AMRL-TR-65-88 N66-12385
- RADIATION SAFETY IN SPACE FLIGHTS - BIOLOGICAL EFFECT OF HIGH ENERGY PROTON IRRADIATION ON ANIMALS AND RADIATION PROTECTION AND THERAPY NASA-TT-F-353 N66-12451
- DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES USING SYNCHROCYCLOTRON - IRRADIATION OF ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION RESISTANCE OF PLASTICS N66-12453
- ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY PROTONS IN MULTIPLE IRRADIATION N66-12454
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON DOGS AND WHITE RATS N66-12455
- BIOLOGICAL EFFECT OF DIFFERENT DOSES OF IONIZING RADIATION ON VESTIBULAR APPARATUS N66-12458
- RELATIVE BIOLOGICAL EFFECT OF PROTONS IN FRACTIONAL IRRADIATION COMPARED WITH MULTIPLE X-RAY IRRADIATION OF DOGS AND RATS N66-12459
- COMPARISON OF BIOLOGICAL EFFECTS OF PROTON, X-RAY, AND GAMMA IRRADIATIONS ON DOGS AND WHITE RATS N66-12460
- FORTRAN COMPUTER PROGRAM FOR EVALUATION OF POST IRRADIATION SURVIVAL TIMES - ANIMAL STUDY UCLA-12-573 N66-12917
- INHALATION STUDY OF NEODYMIUM OXIDE PATHOGENESIS IN MICE AND GUINEA PIGS - ANIMAL STUDY COD-1170-4 N66-12951
- ENVIRONMENTAL TEMPERATURE EFFECTS ON EKG OF SQUIRREL MONKEY - ANIMAL STUDY OF HEART RATE AND T-WAVE AMPLITUDE NASA-CR-68306 N66-12972
- CALORIMETRIC DETERMINATION OF ICE FORMED IN FEET OF MICE FROZEN AT VARIOUS TEMPERATURE AAL-TDR-63-29 N66-14037
- COMPARISON OF MEASURED LUNG BURDEN IN ANIMAL SPECIES WITH AMOUNTS OF PLUTONIUM COLLECTED BY CASCADE IMPACTOR SAMPLERS AWRE-O-29/65 N66-14097
- ANOXIA**
- EFFECTS OF COLD AND ABNORMAL ATMOSPHERE DISCUSSING TOLERANCE LIMITS TO HYPERCAPNIA, ANOXIA INDUCED HYPOTHERMIA AND HYPOXIA A66-14067
- BIOCHEMICAL EVIDENCE OF SIMILARITY OF RADIATION PROTECTION MECHANISMS OF CYSTAMINE, CYSTEAMINE, SEROTININ, AND ANOXIA IN ALBINO MICE A66-80169
- ANTHROPOMETRY**
- DETERMINATION OF MALE AND FEMALE BODY VOLUME FROM HEIGHT AND WEIGHT USING GRAPHICAL METHOD A66-80228
- CRITERIA FOR BODY BLOCKS, ANTHROPOMORPHIC DUMMIES, AND INSTRUMENTATION FOR USE IN STATIC AND DYNAMIC TESTING OF CIVIL AIRCRAFT SEAT SYSTEMS FAA-ADS-20 N66-13926
- ANTIADRENERGICS**
- SYMPATHETIC NERVOUS STIMULATION OF HEART - BETA ADRENERGIC BLOCKING CARDIAC FUNCTION, CIRCULATORY RESPONSE AND PHYSICAL EXERCISE A66-80147
- ANTIBODY**
- ANTIBODY PLAQUE FORMING CELLS - KINETICS OF PRIMARY AND SECONDARY IMMUNE HEMOLYSIN RESPONSE USNRDL-897 N66-14207
- ANTIGEN**
- IMMUNOLOGICALLY COMPETENT CELL RESPONSE TO ANTIGEN AND COMPARATIVE STUDY OF LYMPHOID CELLS EUR-2469.F N66-14089
- ANTIBODY PLAQUE FORMING CELLS - KINETICS OF PRIMARY AND SECONDARY IMMUNE HEMOLYSIN RESPONSE USNRDL-897 N66-14207
- ANTIRADIATION DRUG**
- BIOCHEMICAL EVIDENCE OF SIMILARITY OF RADIATION PROTECTION MECHANISMS OF CYSTAMINE, CYSTEAMINE, SEROTININ, AND ANOXIA IN ALBINO MICE A66-80169
- RADIATION HAZARDS, DETECTION DEVICES, AND MEDICINES TO PREVENT INJURY DURING FLIGHTS OF VOSTOK AND VOSKHOZ SPACESHIPS A66-80204
- POSSIBILITIES OF PHARMACEUTICAL AND CHEMICAL PROTECTION OF HUMAN SUBJECTS AGAINST RADIATION INJURIES DURING OUTER SPACE FLIGHTS A66-80309
- RADIATION PROTECTION OF ANIMALS BY VARIOUS DRUGS DURING EXPOSURE TO GAMMA, PROTON, AND X-RAY IRRADIATION AS RELATED TO RELATIVE BIOLOGICAL EFFECT A66-80311
- RADIOPROTECTIVE EFFECT OF VARIOUS DRUGS AGAINST X - RAYS AND GAMMA RAYS DURING PROTON IRRADIATION MICE A66-80381
- BIOLOGICAL EFFECT IN MOUSE OF GAMMA IRRADIATION AS AFFECTED BY SOLAR FLARE, RADIOPROTECTIVE DRUGS, AND ACCELERATION STRESS DURING SIMULATION OF RADIATION CONDITIONS OF SPACEFLIGHT A66-80402
- ANTISUBMARINE WARFARE AIRCRAFT**
- RELATIONSHIP BETWEEN ANTISUBMARINE HELICOPTER TEAM PERFORMANCE AND COMMUNICATIONS FLOW WITHIN TEAM DURING SIMULATED ATTACK NAVTRADEVCE-1537-1 N66-13972
- ANXIETY**
- AIRSICKNESS IN STUDENT AVIATORS DURING FLIGHT TRAINING AS RELATED TO VESTIBULAR AND VISUAL STIMULI AND ANXIETY A66-80206
- APOLLO PROJECT**
- APOLLO SPACE SUIT DESIGN DISCUSSING CONSTRUCTION, PURPOSE AND OPERATING CONDITIONS OF LIQUID-COOLED LIFE SUPPORT SYSTEM A66-12631
- ARCTIC**
- ULTRAVIOLET RADIATION EFFECTS ON VARIOUS FLOWERING PLANTS UNDER NEAR SPACE CONDITIONS SUCH AS ARCTIC AND HIGH ALTITUDE A66-80324
- ARTERY**
- DETERMINATION OF PROPAGATION VELOCITY OF PULSE WAVES FROM HUMAN ARTERIES BY CONVERTING MECHANICAL VIBRATIONS INTO ELECTRICAL OSCILLATIONS NASA-TT-F-407 N66-12346
- ASTRONAUT**
- EXPERIMENTAL PSYCHOLOGICAL EXAMINATION OF COSMONAUTS A66-80298
- ASTRONAUT PERFORMANCE**
- ASTRONAUT SELECTION INCLUDING DYNAMIC TESTING, DISCUSSING EXAMINATION METHODS, BIOLOGICAL PARAMETERS, LABORATORY AND RADIOLOGICAL PROCEDURES, BLOOD CHEMISTRY TECHNIQUES, ETC A66-14064
- BIOLOGICAL HAZARDS OF RADIATION EXPOSURE OF MAN IN

SUBJECT INDEX

BACTERIA

- SPACE DISCUSSING RECOVERY, DELAYED EFFECT, INJURY
TREATMENT AND DOSE A66-14078
- VESTIBULAR SICKNESS SUSCEPTIBILITY UNDER
CONDITIONS OF WEIGHTLESSNESS A66-14082
- SPATIAL ORIENTATION DISTURBANCES AND VEGETATIVE
DISORDERS OCCURRING IN COSMONAUTS DURING SPACE
FLIGHT DUE TO DISTURBANCES IN PHYSIOLOGICAL
INTERPLAY OF SENSING MECHANISMS GOVERNING SPACE
PERCEPTION A66-14084
- MAN-MACHINE RELATIONSHIP DURING SPACE FLIGHT
A66-14085
- PERCEPTION OF APPARENT VERTICAL WITHOUT VISUAL
CUES DEPENDING ON LONGITUDINAL AXES OF BODY AND
HEAD TO DIRECTION OF RESULTANT ACCELERATION ABOVE
1 G A66-14086
- SPACE BIOLOGY AND MEDICINE RESEARCH, STRESSING
FLIGHT EXPERIMENTS PERFORMED WITH RUSSIAN
SATELLITES AND SPACECRAFT A66-14089
- ASTRONAUT PHYSIOLOGICAL RESPONSES TO SPACE FLIGHT
CONDITIONS MEASURED FOR CLINICAL OR EXPERIMENTAL
PURPOSES A66-14091
- COMPARISON OF MANNED AND UNMANNED SPACECRAFT
A66-14092
- CONFERENCES ON AEROSPACE MEDICINE - ASTRONAUT
PERFORMANCE, ELECTROPHYSIOLOGICAL STUDIES ON
VOSKHOD MANNED SPACECRAFT, AND MATHEMATICAL
METHODS JPRS-32808 N66-12657
- METHODS USED AND PROBLEMS ENCOUNTERED IN
EVALUATING PERFORMANCE OF ASTRONAUTS IN SPACE
FLIGHT ENVIRONMENT N66-12658
- PHYSIOLOGICAL RESPONSES TO AND BIOLOGICAL EFFECTS
OF SPACE FLIGHT STRESS - ASTRONAUT PERFORMANCE
ANL-TRANS-209 N66-13520
- WATER IMMERSION TECHNIQUE FOR SIMULATING ZERO
GRAVITY MOBILITY PERFORMANCE OF ASTRONAUT IN
PRESSURIZED SPACESUIT NASA-TN-D-3054 N66-14151
- ASTRONAUT TRAINING
SIMULATORS USED IN TRAINING ASTRONAUTS FOR
SPACEFLIGHT A66-80296
- BASIC PRINCIPLES OF SPECIAL TRAINING OF ASTRONAUTS
BY SIMULATION OF SPACE FLIGHT FACTORS A66-80297
- IMMUNITY TO INDOGENOUS MICROORGANISM IN ASTRONAUTS
DURING TRAINING AND BEFORE AND AFTER VOSTOK SERIES
SPACE FLIGHT A66-80374
- ATMOSPHERIC COMPOSITION
AEROSPACE BREATHING CHART USED IN ANALYTICAL
EVALUATION OF BREATHABLE ATMOSPHERES AND EMERGENCY
OXYGEN SYSTEMS AIAA PAPER 65-723 A66-12544
- ACTIVE SELECTION OF AIR WITH VARIOUS OXYGEN
CONTENT BY MICE PREVIOUSLY EXPOSED IN CHAMBER TO
NORMAL CONDITIONS AND AIR WITH HIGH OXYGEN CONTENT
A66-80325
- ATMOSPHERIC IONIZATION
BEHAVIORAL EFFECTS OF IONIZED AIR ON RATS A66-80278
- WEIGHT GAIN AND FEED EFFICIENCY IN WEANLING,
HEALTHY PIG AS AFFECTED BY EXPOSURE TO NEGATIVE
AIR IONIZATION FOR DIFFERENT DURATIONS A66-80406
- ATMOSPHERIC TURBULENCE
VIBRATION EXPOSURE WITH VARYING PEAK AND RMS
ACCELERATION AND FREQUENCY IN LOW ALTITUDE HIGH-
SPEED FLIGHT A66-13355
- ATTACK AIRCRAFT
RELATIONSHIP BETWEEN ANTISUBMARINE HELICOPTER
- TEAM PERFORMANCE AND COMMUNICATIONS FLOW WITHIN
TEAM DURING SIMULATED ATTACK
NAVTRADEVCE-1537-1 N66-13972
- AUDIOLOGY
MEASUREMENTS OF HEARING SENSITIVITY OF MEN DURING
PROLONGED ISOLATION IN SMALL CHAMBER UNDER
CONDITIONS OF CONSTANT NOISE A66-80307
- AUDITORY PERCEPTION
CONTINUITY EFFECT WITH ALTERNATELY SOUNDED NOISE
AND TONE SIGNALS AS FUNCTION OF MANNER OF
PRESENTATION A66-80154
- DELAYED AUDITORY FEEDBACK, EXPOSURE TIME AND
RETENTION A66-80177
- IDENTIFICATION OF SEQUENTIAL AUDITORY AND VISUAL
STIMULI A66-80279
- MEASUREMENTS OF HEARING SENSITIVITY OF MEN DURING
PROLONGED ISOLATION IN SMALL CHAMBER UNDER
CONDITIONS OF CONSTANT NOISE A66-80307
- JUDGMENTS OF SAMENESS OF TONES AND TONE
DIFFERENCE - EXPERIMENTS ON DECISION TIME A66-80355
- AUDITORY SIGNAL
SIGNAL DETECTION OF AUDITORY SENSORY RESPONSES TO
STIMULI - AUDITORY INFORMATION PROCESSING
NASA-CR-68881 N66-13990
- AUDITORY STIMULUS
REACTION TIME TO AUDITORY STIMULI OF DIFFERENT
INTENSITIES AT DIFFERENT ADAPTATION LEVELS A66-80281
- AUTOMATIC CONTROL
CYBERNETICS ROLE IN SPACE FLIGHT INCLUDING CONTROL
CIRCUITS FOR GUIDANCE AND ELECTRONIC EQUIPMENT
AUTOMATION AND DEVELOPMENT A66-13495
- AUTOMATIC COMMAND CONTROL SYSTEM USING PHONETIC
VOICE PATTERN RECOGNITION A66-13496
- AUTOMATIC DEVICE FOR PRODUCING CONTROLLED
HYPOTHERMIA IN ANIMALS AND HUMANS A66-80330
- SENSORS FOR AUTOMATIC CONTROL AND REGULATION OF
PHYSIOLOGICAL PROCESSES OF PLANTS IN CLOSED
SYSTEMS A66-80396
- INVESTIGATIVE AND AUTOMATIC CONTROL DATA
PROCESSING APPLICATIONS IN BIOASTRONAUTICS N66-12220
- DESIGN, CALIBRATION, AND SENSOR CONSTRUCTION OF
AUTOMATIC EQUIPMENT FOR ANALYZING
BALLISTOCARDIOGRAMS - BIOASTRONAUTICS N66-12222
- AUTOMATIC LANDING SYSTEM
HEAD-UP DISPLAY / HUD/ DEVELOPED FOR AUTOMATIC
LANDING IN CIVIL AIRCRAFT A66-12884
- AUTOMATON
COMPARISON OF MANNED AND UNMANNED SPACECRAFT
A66-14092
- AUTONOMIC NERVOUS SYSTEM
AUTONOMIC COMPONENTS OF HUMAN ORIENTING BEHAVIOR
IN RESPONSE TO WHITE NOISE A66-80275
- METHOD FOR REGISTERING POTENTIALS OF AUTONOMIC
NERVES DURING CONTINUOUS EXPERIMENT IN DOGS A66-80331

B

- BACTERIA
CONTAMINATION OF CARBONACEOUS CHONDRITES BY
ORDINARY VIABLE MICROORGANISMS, ISOLATING THREE
TYPES OF BACTERIA ON VARIOUS METEORITES A66-13339
- METHOD FOR PROCESSING HUMAN WASTE TO RECLAIM
WATER USING CHLORELLA - BACTERIA SYSTEM

- A66-80391
- BACTERIOLOGY**
REDUCTION OF BACTERIAL DISSEMINATION FROM HUMANS AND SURFACE CONTAMINATION BY MICROORGANISMS
NASA-CR-68090 N66-12250
- CLEAN ROOM BACTERIOLOGY - HEAT RESISTANCE OF SPORE FORMERS, MICROORGANISM IDENTIFICATIONS, HUMAN CONTACT CONTAMINATION
NASA-CR-68729 N66-13553
- BALLISTOCARDIOGRAM**
DESIGN, CALIBRATION, AND SENSOR CONSTRUCTION OF AUTOMATIC EQUIPMENT FOR ANALYZING BALLISTOCARDIOGRAMS - BIOASTRONAUTICS
N66-12222
- BED REST**
EXERCISE TOLERANCE, PLASMA VOLUME, RED CELL MASS, TOTAL BLOOD VOLUME AND ORTHOSTATIC TOLERANCE DURING FOUR WEEKS OF BED REST
A66-13354
- HYDRATION DURING BED REST IN RESPONSE TO LOWER BODY NEGATIVE PRESSURE AS RELATED TO MANNED SPACE FLIGHT
A66-80195
- DEHYDRATION OF SUBJECTS DURING PROLONGED BED REST AS AFFECTED BY 9 ALPHAFLUOROHYDROCORTISONE
A66-80196
- SHORT-TERM MEMORY, CHOICE REACTION TIME, AND HAND STEADINESS OF EXERCISING AND RESTING SUBJECTS IN RESPONSE TO EPINEPHRINE OR INSULIN ADMINISTRATION
A66-80201
- BEHAVIOR**
SPACE EXPLORATION AND STUDY OF ROLE OF EARTH ENVIRONMENTAL CONDITIONS IN EVOLUTION, PHYSIOLOGY, AND BEHAVIOR OF TERRESTRIAL ORGANISMS
A66-80156
- BEHAVIORAL THERMOREGULATION IN YOUNG AND OLD RATS IN COLD ENVIRONMENT
A66-80208
- BEHAVIORAL EFFECTS IN RATS OF PROLONGED EXPOSURE TO ULTRA HIGH FREQUENCY RADIATION
A66-80273
- MOTOR RESTRAINT EFFECT ON BEHAVIOR RESPIRATION, HEART FUNCTION, AND BRAIN BIOELECTRIC ACTIVITY IN MONKEY
A66-80376
- SUMMARY OF PROGRAM FOR MONITORING BRAIN FUNCTION AND PERFORMANCE IN PRIMATE UNDER PROLONGED WEIGHTLESSNESS
NASA-CR-68413 N66-13089
- BETA RADIATION**
PROTECTION OF CORN, WHEAT, AND LUPINE SEEDS AGAINST BETA-RADIATION BY TREATMENT WITH SULFANILAMIDE AND NONANOIC ACID DERIVATIVES
A66-80323
- BETAINE**
METABOLISM OF CARNITINE IN MUSCLE OF COLD ACCLIMATED RAT
A66-80152
- BIBLIOGRAPHY**
SELECTED BIBLIOGRAPHY ON PERCEPTION
A66-80183
- BIBLIOGRAPHY OF AEROSPACE MEDICINE AND BIOLOGY
NASA-SP-7011/17/ N66-12345
- ANNOTATED BIBLIOGRAPHY OF AEROSPACE MEDICINE AND BIOLOGY WITH SUBJECT, AUTHOR, AND CORPORATE SOURCE INDEXES - PHYSIOLOGICAL, PSYCHOLOGICAL, AND SPACE ENVIRONMENT EFFECTS ON MAN
NASA-SP-7011/18/ N66-14160
- BIOASTRONAUTICS**
INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE AT PARIS, FRANCE IN OCTOBER 1962
A66-14063
- BIOLOGICAL CHARACTERISTICS AND PHYSICAL CONDITIONS OF SPACE FLIGHTS, SUCH AS LOW PRESSURE, IONIZING RADIATION, NOISE, ACCELERATION, WEIGHTLESSNESS,
- ARTIFICIAL ATMOSPHERE, FEEDING PROBLEMS, ETC
A66-14066
- SOVIET BIOLOGICAL AND PHYSIOLOGICAL INVESTIGATIONS IN ROCKETS AND SATELLITES, PARTICULARLY NONPATHOLOGICAL CHARACTER OF PHYSIOLOGICAL REACTIONS TO STRESS FACTORS
A66-14076
- SPACE BIOLOGY AND MEDICINE RESEARCH, STRESSING FLIGHT EXPERIMENTS PERFORMED WITH RUSSIAN SATELLITES AND SPACECRAFT
A66-14089
- TECHNOLOGICAL AND BIOLOGICAL CONTRIBUTIONS OF SOVIET UNION TO SPACE EXPLORATION
A66-80155
- HUMAN PERFORMANCE AND LIFE SUPPORT SYSTEMS IN SPACE MONITORED BY DIGITAL COMPUTER WHICH CAN SIMULATE CLINICAL LOGIC - BIOASTRONAUTICS
N66-12219
- INVESTIGATIVE AND AUTOMATIC CONTROL DATA PROCESSING APPLICATIONS IN BIOASTRONAUTICS
N66-12220
- SENSORS FOR PHYSIOLOGICAL INVESTIGATIONS UNDER SPACE FLIGHT CONDITIONS - BIOASTRONAUTICS
N66-12221
- DESIGN, CALIBRATION, AND SENSOR CONSTRUCTION OF AUTOMATIC EQUIPMENT FOR ANALYZING BALLISTOCARDIOGRAMS - BIOASTRONAUTICS
N66-12222
- SOVIET PAPERS DEALING WITH BIOASTRONAUTICS, LIFE SUPPORT SYSTEMS, AND VOSKHOD II FLIGHT
N66-12650
- N ASA SPACE BIOLOGY PROGRAM - EXO BIOLOGY, ENVIRONMENTAL AND BEHAVIORAL BIOLOGY, MOLECULAR BIOLOGY AND INSTRUMENTATION, FLIGHT PROGRAMS, AND MANNED SPACE FLIGHT
NASA-TM-X-57051 N66-13899
- BIOCHEMISTRY**
HISTOCHEMICAL USE OF FRESH CUT TISSUE SHEET - CUT SHEET ATTACHMENT IN LOW TEMPERATURE CRYOSTAT, AND FREEZING AND CUTTING TECHNIQUE
N66-12371
- SYMPOSIUM ON BIOCHEMICAL RESEARCH IN MAINLAND CHINA
JPRS-33002 N66-12626
- BIOCHEMICAL RESEARCH IN CHINA AND DEVELOPMENT IN AREAS OF ENZYME SYSTEMS, METABOLISM, NUTRITION, CANCER, AND MEDICAL TECHNOLOGY - SYMPOSIUM
N66-12627
- MOLECULAR STRUCTURE OF PEPTIDE CHAINS OF PROTEINS TO FIND RULES GOVERNING AMINO ACIDS
N66-12628
- ENZYME CATALYST MECHANISMS, RELATIONSHIP BETWEEN ENZYME MOLECULAR STRUCTURE AND CATALYTIC ACTIVITY, AND FORMATION OF ENZYME INTERMEDIATE PRODUCTS
N66-12629
- PROTEIN BIOSYNTHESIS BY INCORPORATION OF AMINO ACIDS AND ACTION OF SOLUBLE RIBONUCLEIC ACID
N66-12630
- BIOENERGETIC STUDIES OF ENERGY TRANSFERS, THERMODYNAMICS, AND ENTROPY IN LIVING ORGANISMS
N66-12631
- MICROBIOCHEMICAL CONTRIBUTIONS TO BIOLOGY - BACTERIAL PHOTOSYNTHESIS, CATABOLISM, INDUCED ENZYMES
N66-12632
- COMPARATIVE BIOCHEMICAL METHOD FOR STUDYING METABOLISM, NUTRITION, AND BODY FLUIDS AND TISSUES
N66-12633
- CHEMOTHERAPY OF VIRUS INFECTIONS, BIOLOGICAL PEST CONTROL, VIRUS NUCLEIC ACIDS, AND VIRAL GROWTH
N66-12634
- METABOLISM AND CHEMICAL COMPOSITION OF CONNECTIVE

- TISSUE - FIBROUS AND NONFIBROUS PROTEINS
N66-12635
- BIOCHEMICAL PROBLEMS PERTINENT TO FOOD INDUSTRY
AND NUTRITION
N66-12636
- BIOELECTRIC POTENTIAL
ELECTROENCEPHALOGRAPHIC RESPONSES AND CHANGES IN
ELECTRIC POTENTIALS IN NECK MUSCLES OF RAT DURING
SHORT PERIODS OF WEIGHTLESSNESS
A66-80161
- LEVEL OF SKIN POTENTIAL IN HEALTHY MALES AND
EFFECT OF AGE
A66-80284
- METHOD FOR REGISTERING POTENTIALS OF AUTONOMIC
NERVES DURING CONTINUOUS EXPERIMENT IN DOGS
A66-80331
- BIOELECTRICITY
BIOELECTRIC RECORDINGS OF MALE SUBJECTS SUBJECTED
TO WEIGHTLESSNESS - INDICES OF PHYSIOLOGICAL
FUNCTIONS - ELECTROENCEPHALOGRAM / EEG/, AND
VESTIBULAR COORDINATION REACTIONS
JPRS-33115
N66-12273
- BIOINSTRUMENTATION
BREATH BY BREATH MEASUREMENT OF RESPIRATORY
FUNCTIONS - INSTRUMENTATION AND APPLICATIONS
A66-80240
- PHYSIOLOGICAL MEASUREMENTS DURING INTERPLANETARY
FLIGHT FOR MEDICAL MONITORING, EXAMINATIONS AND
DIAGNOSES, AND SCIENTIFIC RESEARCH - ANALYSIS OF
VOSTOK SPACECRAFT BIOINSTRUMENTATION
N66-13789
- BIOLOGICAL CELL
IMMUNOLOGICALLY COMPETENT CELL RESPONSE TO ANTIGEN
AND COMPARATIVE STUDY OF LYMPHOID CELLS
EUR-2469-F
N66-14089
- ANTIBODY PLAQUE FORMING CELLS - KINETICS OF
PRIMARY AND SECONDARY IMMUNE HEMOLYSIN RESPONSE
USNRDL-897
N66-14207
- BIOLOGICAL EFFECT
BIOLOGICAL EFFECTS OF LASER RADIATION WITH
REFERENCE TO INTACT ANIMALS, PRIMATE EYES AND SKIN
AND MALIGNANT TUMORS OF ANIMAL AND HUMAN ORIGIN
A66-12994
- SPACE RADIATION OF SOLAR AND COSMIC ORIGIN AND
BIOLOGICAL EFFECTS, EXAMINING DNA STRUCTURE AND
RADIATION INDUCED CHANGES
A66-13897
- BIOLOGICAL EFFECTS OF COSMIC RADIATION UNDER
LABORATORY AND FLIGHT CONDITIONS ON VARIOUS CRAFT
TO STUDY MEASURES FOR PHARMACOLOGICAL AND
BIOLOGICAL PROTECTION
A66-14077
- BIOLOGICAL HAZARDS OF RADIATION EXPOSURE OF MAN IN
SPACE DISCUSSING RECOVERY, DELAYED EFFECT, INJURY
TREATMENT AND DOSE
A66-14078
- BIOLOGICAL EFFECT IN MOUSE OF GAMMA IRRADIATION
AS AFFECTED BY SOLAR FLARE, RADIOPROTECTIVE DRUGS,
AND ACCELERATION STRESS DURING SIMULATION OF
RADIATION CONDITIONS OF SPACEFLIGHT
A66-80402
- BIOLOGICAL EFFECTS OF MICROWAVE RADIATION
JPRS-33054
N66-12294
- EFFECT OF REPLACING ATMOSPHERIC NITROGEN BY
HELIUM ON DEVELOPMENT OF CHICK EMBRYOS
JPRS-32905
N66-12299
- RADIATION SAFETY IN SPACE FLIGHTS - BIOLOGICAL
EFFECT OF HIGH ENERGY PROTON IRRADIATION ON
ANIMALS AND RADIATION PROTECTION AND THERAPY
NASA-TT-F-353
N66-12451
- ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY
PROTONS IN MULTIPLE IRRADIATION
N66-12454
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON
DOGS AND WHITE RATS
N66-12455
- BIOLOGICAL EFFECT OF HIGH ENERGY PROTON
IRRADIATION ON CORNEAL EPITHELIA OF MICE
N66-12456
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTON AND
X-RAY IRRADIATION ON HEREDITY STRUCTURES OF
RATS
N66-12457
- BIOLOGICAL EFFECT OF DIFFERENT DOSES OF IONIZING
RADIATION ON VESTIBULAR APPARATUS
N66-12458
- RELATIVE BIOLOGICAL EFFECT OF PROTONS IN
FRACTIONAL IRRADIATION COMPARED WITH MULTIPLE
X-RAY IRRADIATION OF DOGS AND RATS
N66-12459
- COMPARISON OF BIOLOGICAL EFFECTS OF PROTON,
X-RAY, AND GAMMA IRRADIATIONS ON DOGS AND WHITE
RATS
N66-12460
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTON
IRRADIATION ON MICE
HER/AP-2-65
N66-12462
- FISSION PRODUCT INHALATION PROGRAM - GAMMA RAY
DETECTION SYSTEM FOR BIOLOGICAL SAMPLES
LF-28
N66-12581
- SPACE RADIOBIOLOGY TRAINING AND OPERATIONS -
RADIATION ZONES AND EXPOSURE, BIOLOGICAL
EFFECTS RADIATION, DOSE RATES, AND RECOVERY
AMD-TR-65-2
N66-13006
- PHYSIOLOGICAL RESPONSES TO AND BIOLOGICAL EFFECTS
OF SPACE FLIGHT STRESS - ASTRONAUT PERFORMANCE
ANL-TRANS-209
N66-13520
- BIOLOGICAL MODEL
EVALUATION OF SAMPLED DATA PURSUIT TRACKING MODEL.
A66-80186
- MORPHOLOGICAL AND FUNCTIONAL ASPECTS OF
SWEATING-SODIUM SECRETION REABSORPTION AND
BIOLOGICAL MODEL OF SWEAT GLAND
A66-80249
- MODEL OF VESTIBULAR APPARATUS DEMONSTRATING ITS
FUNCTIONS UNDER CONDITIONS OF VARIABLE
GRAVITATIONAL FIELD
A66-80327
- OXYGEN DIFFUSION IN BRAIN TISSUE CALCULATED ON
BASIS OF CONICAL SPATIAL MODEL
A66-80342
- OXYGEN SATURATION AND DESATURATION TIMES IN
CARDIAC MUSCLE AND CORRESPONDING VALUES CALCULATED
FROM KROGH SUPPLY MODEL
A66-80346
- BIOLOGICAL RHYTHM
ANIMAL TEMPERATURE SENSING FOR STUDYING EFFECT OF
PROLONGED ORBITAL FLIGHT ON CIRCADIAN RHYTHMS OF
POCKET MICE
A66-12767
- RAPID EYE MOVEMENT STATE /DREAMING/ DIFFERENTIATED
BIOLOGICALLY FROM SLEEP AND WAKEFULNESS
A66-80167
- HUMAN ESTIMATION OF TIME INTERVALS AND RELATION TO
BIOLOGICAL RHYTHM
A66-80286
- BIOLOGY /GEN/
BIOLOGICAL MECHANISMS FOR MEMORY - NEURON
EXCITATION, NUCLEIC ACID METABOLISM, AND PROTEIN
SYNTHESIS MECHANISM - DEOXYRIBONUCLEIC ACID
JPRS-32809
N66-12269
- BIBLIOGRAPHY OF AEROSPACE MEDICINE AND BIOLOGY
NASA-SP-7011/17/
N66-12345
- LABORATORY APPARATUS FOR BIOLOGICAL EXPERIMENT
GAMMA RADIATION SOURCES
JPRS 32704
N66-13245
- SPACE RELATED MOLECULAR BIOLOGY AND MOLECULAR
ORGANIZATION OF EXTRATERRESTRIAL MATTER - DESIGN
AND CONSTRUCTION OF HIGH VACUUM CONTAINER FOR
TRANSFER OF EXTRATERRESTRIAL COLLECTING SURFACES
NASA-CR-68844
N66-13830

- ANNOTATED BIBLIOGRAPHY OF AEROSPACE MEDICINE AND BIOLOGY WITH SUBJECT, AUTHOR, AND CORPORATE SOURCE INDEXES - PHYSIOLOGICAL, PSYCHOLOGICAL, AND SPACE ENVIRONMENT EFFECTS ON MAN
NASA-SP-7011/18/ N66-14160
- BIONICS**
ADVANCED CONCEPTS IN BIOTECHNOLOGY, HUMAN ANALOGS, AND BIONICS
NASA-CR-68777 N66-13831
- BIOPHYSICS**
GATE CONTROL SYSTEM ROLE IN PAIN MECHANISM, NOTING SPECIFICITY AND PATTERN THEORIES
A66-13337
- BIOREGENERATION**
PROBLEMS OF SPACECRAFT PERSONNEL LIFE SUPPORT BY RECONVERSION OF WASTE PRODUCTS OF METABOLISM
A66-80313
- SENSORS FOR AUTOMATIC CONTROL AND REGULATION OF PHYSIOLOGICAL PROCESSES OF PLANTS IN CLOSED SYSTEMS
A66-80396
- BIOSATELLITE**
NASA BIOSATELLITE PROGRAM - PURPOSES AND PROPOSED EXPERIMENTS
A66-80364
- BIOSATELLITE PROGRAM - EXPLOITATION OF SPACE ENVIRONMENT FOR BIOLOGICAL RESEARCH
N66-12419
- BIOTECHNOLOGY**
ADVANCED CONCEPTS IN BIOTECHNOLOGY, HUMAN ANALOGS, AND BIONICS
NASA-CR-68777 N66-13831
- BIRD**
FEASIBILITY OF USING CHICKEN AND DUCK FOR ASTRONAUT FOOD IN CLOSED ECOLOGICAL SYSTEM
A66-80308
- BLOOD**
KINETICS OF OXYGEN UPTAKE BY ERYTHROCYTES OF DIFFERENT AGES AS RELATED TO RESPIRATORY FUNCTION OF BLOOD
A66-80229
- ADJUSTMENT IN NORMAL SUBJECTS OF ARTERIAL CARBON DIOXIDE TENSION FOLLOWING HYPERVENTILATION.
A66-80235
- NEW METHOD FOR BLOOD SERUM CALCIUM ESTIMATION IN PATIENTS
A66-80292
- EFFECT OF CAFFEINE ON BLOOD SERUM FREE FATTY ACIDS IN NORMAL HUMAN SUBJECTS
A66-80349
- INFLUENCE OF SEVERAL PHYSICAL ACTIVITIES ON BLOOD SERUM CHOLESTEROL CONCENTRATION IN YOUNG MEN
A66-80356
- MORPHOLOGY OF PERIPHERAL BLOOD IN MICE AS INDEX TO PHYSIOLOGICAL EFFECT OF EXPOSURE TO HIGH OXYGEN PARTIAL PRESSURE
A66-80386
- EFFECT OF PROLONGED EXPOSURE TO HIGH CONCENTRATION OF OXYGEN ON LUNGS AND BLOOD IN MICE
A66-80389
- ARTIFICIAL HYPOTHERMIA EFFECTS ON ARTERIAL BLOOD IN ALBINO RATS
A66-80401
- CLEARANCE RATE OF CALCIUM-45 IN DOGS AFTER INTRAVENOUS INJECTION AND BLOOD DISTRIBUTION BETWEEN MARROW AND BONE
TID-21339 N66-13051
- PARTIAL PRESSURE OF OXYGEN AND CARBON DIOXIDE, HYDROGEN ION CONCENTRATION, HEMOGLOBIN SATURATION, AND TEMPERATURE OF DOG BLOOD ANALYZED USING DIGITAL COMPUTER
SAM-TR-65-39 N66-13209
- BLOOD CIRCULATION**
SYMPATHETIC NERVOUS STIMULATION OF HEART - BETA ADRENERGIC BLOCKING CARDIAC FUNCTION, CIRCULATORY RESPONSE AND PHYSICAL EXERCISE
A66-80147
- BLOOD SUPPLY OF EXTREMITY MUSCLES DURING INTENSE PHYSICAL WORK IN ALBINO RATS
A66-80174
- HEART RATE AND FOREARM BLOOD FLOW OF MAN WITH AND WITHOUT BREATH HOLDING DURING FACE IMMERSION IN WATER
A66-80210
- MEASUREMENT OF REACTION IN MAN OF RESISTANCE AND CAPACITY VESSELS IN FOREARM AND HAND TO LEG EXERCISE
A66-80221
- PATHOGENIC ROLE OF MICROCIRCULATORY IMPAIRMENT DURING COLD INJURY OF SKIN OF RABBIT AND MOUSE.
A66-80256
- RENAL CIRCULATION OF DOG AS AFFECTED BY ANGIOTENSIN
A66-80404
- PRECEDING POSTURE AND AMBIENT TEMPERATURE EFFECTS ON HEART AND BLOOD CIRCULATION ACCELERATION AT INITIATION OF EXERCISE
CROLR-3268 N66-12827
- BLOOD PLASMA**
EXERCISE TOLERANCE, PLASMA VOLUME, RED CELL MASS, TOTAL BLOOD VOLUME AND ORTHOSTATIC TOLERANCE DURING FOUR WEEKS OF BED REST
A66-13354
- BLOOD PRESSURE**
ELECTROCARDIOGRAM AND BLOOD PRESSURE OF RABBIT DURING PROLONGED WEIGHTLESSNESS SIMULATED BY IMMERSION METHOD
A66-80192
- ROLE OF HYPOCAPNIA IN CARDIAC OUTPUT, HEART RATE AND BLOOD PRESSURE RESPONSES TO ACUTE HYPOXIA IN MAN
A66-80209
- RESPONSE OF CAPACITY VESSELS IN HUMAN LIMBS TO HEAD-UP TILT AND SUBATMOSPHERE PRESSURE ON LOWER BODY
A66-80212
- MEASUREMENT OF REACTION IN MAN OF RESISTANCE AND CAPACITY VESSELS IN FOREARM AND HAND TO LEG EXERCISE
A66-80221
- COMPARISON OF METHODS OF BLOOD PRESSURE MEASUREMENTS AND PRESSURE FLOW DYNAMICS DURING VARIOUS CONDITIONS OF PHYSICAL EXERCISE
A66-80244
- ARTERIAL PRESSURE, RESPIRATORY RATE, ELECTROCARDIOGRAM, AND ELECTROENCEPHALOGRAM OF YOUNG MEN DURING SHORT TERM ANGULAR ACCELERATIONS
A66-80303
- EFFECT OF ELEVATED INTRAPULMONARY PRESSURE ON RESPIRATION AND CIRCULATION
FTD-TT-65-154/1&2 N66-12387
- BODY FLUID**
NUCLEAR FAST RED TECHNIQUE OF CALCIUM IN SERUM, PAROTID FLUID AND URINE IN WEIGHTLESS STATE
A66-13347
- BODY MEASUREMENT /BIOL/**
RESEARCH TECHNIQUE USED IN MEASUREMENT OF HUMAN PERFORMANCE UNDER LOW OR ZERO GRAVITY CONDITIONS
AD-620931 N66-14029
- BODY SIZE /BIOL/**
DETERMINATION OF MALE AND FEMALE BODY VOLUME FROM HEIGHT AND WEIGHT USING GRAPHICAL METHOD
A66-80228
- BODY TEMPERATURE /BIOL/**
ANIMAL TEMPERATURE SENSING FOR STUDYING EFFECT OF PROLONGED ORBITAL FLIGHT ON CIRCADIAN RHYTHMS OF POCKET MICE
A66-12767
- BODY TEMPERATURE AND CARDIOVASCULAR AND RESPIRATORY ACTIVITY OF MAN AND DOG UNDER HYPOXIA AND HOT AND COLD TEMPERATURE EXPOSURE
A66-80188
- SWEAT CHLORIDE CONCENTRATION AND RATE, METABOLIC RATE, SKIN AND BODY TEMPERATURES OF YOUNG AND OLD MALES WALKING IN DESERT ENVIRONMENT
A66-80217

- SWEAT GLAND FATIGUE AS REFLECTED BY SWEAT RATES AND RECTAL TEMPERATURES DURING EXPOSURE TO HOT ENVIRONMENT A66-80218
- HEART RATE AND OUTPUT AND BODY TEMPERATURE OF ACCLIMATIZED MALE DURING EXERCISE IN HOT ENVIRONMENT A66-80219
- COMPARISON OF HUMAN RESPONSES TO PULSED AND UNPULSED ENVIRONMENTAL HEAT AND PHYSICAL EXERCISE A66-80222
- LONG-LIFE PHYSIOLOGICAL TELEMETRY APPARATUS FOR BODY TEMPERATURE MEASUREMENT IN SMALL ANIMALS A66-80242
- VASCULAR AND SWEATING RESPONSES OF MAN TO VARYING TEMPERATURE EXPOSURES A66-80250
- MECHANISMS OF SWEATING IN WORK-SWEATING RESPONSES IN PHYSICAL EXERCISE RELATED TO CHANGES IN BODY TEMPERATURE A66-80252
- METABOLISM AND ENERGY EXCHANGE BALANCE TESTS IN RESPIRATION CALORIMETER TO DETERMINE RELATION BETWEEN BODY TEMPERATURE AND FLUCTUATIONS OF OTHER BODY FUNCTIONS
NASA-TT-F-9796 N66-13484
- BODY VOLUME /BIOL/**
DETERMINATION OF MALE AND FEMALE BODY VOLUME FROM HEIGHT AND WEIGHT USING GRAPHICAL METHOD A66-80228
- BODY WEIGHT**
FOOD INTAKE, BODY WEIGHT, AND ACTIVITY OF RAT EXERCISING IN HOT ENVIRONMENT A66-80220
- DETERMINATION OF MALE AND FEMALE BODY VOLUME FROM HEIGHT AND WEIGHT USING GRAPHICAL METHOD A66-80228
- MEASUREMENT OF FUNCTIONAL RESIDUAL CAPACITY OF RATS VARYING IN AGE AND WEIGHT A66-80233
- WEIGHT GAIN AND FEED EFFICIENCY IN WEANLING, HEALTHY PIG AS AFFECTED BY EXPOSURE TO NEGATIVE AIR IONIZATION FOR DIFFERENT DURATIONS A66-80406
- BONE**
URANIUM CONTENT IN HUMAN DIET - BONE, TISSUE, AND OTHER ORGANS OF BODY N66-12689
- BONE MARROW**
COMBINED ACCELERATION, VIBRATION, AND RADIATION EFFECTS ON MITOTIC ACTIVITY OF BONE MARROW CELLS IN MICE A66-80319
- PROTON AND GAMMA IRRADIATION EFFECTS ON SPLEEN, THYMUS AND BONE MARROW IN MICE A66-80383
- CLEARANCE RATE OF CALCIUM-45 IN DOGS AFTER INTRAVENOUS INJECTION AND BLOOD DISTRIBUTION BETWEEN MARROW AND BONE
TID-21339 N66-13051
- EFFECT OF VIBRATION ON CELL DIVISION IN BONE MARROW OF MOUSE N66-13791
- BRADYKININ**
PHARMACOLOGICALLY ACTIVE AND LETHAL SUBSTANCES RELEASED FROM THERMALLY INJURED SKIN OF HUMAN AND ANIMAL SUBJECTS INCLUDING HISTAMINE, BRADYKININ, ADENYLIC COMPOUNDS, AND POSSIBLY SEROTONIN A66-80254
- BRAIN**
RAPID EYE MOVEMENT STATE /DREAMING/ DIFFERENTIATED BIOLOGICALLY FROM SLEEP AND WAKEFULNESS A66-80167
- OXIDATION AND PHOSPHORYLATION CORRELATION IN BRAIN TISSUES DURING OVERCOOLING AND REWARMING IN EXPERIMENTAL ANIMALS. A66-80170
- OXYGEN DIFFUSION IN BRAIN TISSUE CALCULATED ON BASIS OF CONICAL SPATIAL MODEL A66-80342
- REFLEX EFFECTS OF CEPHALIC HYPOXIA, HYPERCAPNIA, AND ISCHEMIA UPON VENTRICULAR CONTRACTILITY IN DOGS. A66-80350
- MOTOR RESTRAINT EFFECT ON BEHAVIOR RESPIRATION, HEART FUNCTION, AND BRAIN BIOELECTRIC ACTIVITY IN MONKEY A66-80376
- WAVEMETER AND INTEGRATOR FOR EVALUATION OF WAVE PATTERNS AND AMPLITUDE OF BRAIN POTENTIALS - ELECTROPHYSIOLOGY
JPRS-33055 N66-12444
- EFFECT OF VESTIBULAR IRRITATION ON ELECTRICAL ACTIVITY OF CORTEX AND BASAL AREAS OF BRAIN
FTD-TT-65-410/1&2&4 N66-12762
- SUMMARY OF PROGRAM FOR MONITORING BRAIN FUNCTION AND PERFORMANCE IN PRIMATE UNDER PROLONGED WEIGHTLESSNESS
NASA-CR-68413 N66-13089
- BRAIN CIRCULATION**
RHEOGRAPHIC REGIONAL METHOD FOR EVALUATION OF CEREBRAL AND OCULAR CIRCULATION IN CARDIAC AND CEREBROVASCULAR DISEASE A66-14002
- CEREBRAL VENOUS FLOW IN RABBITS DURING ACCELERATION WITH EMPHASIS ON METHOD OF REGISTRATION A66-80332
- OXYGEN DIFFUSION IN BRAIN IN VENOUS OR ARTERIAL HYPOXIA A66-80343
- BRAIN STEM**
HYPOXIA EFFECTS ON SENSITIVITY TO EPILEPTOGENIC AGENTS AND ON FUNCTIONAL PROPERTIES OF MOTOR FORMATIONS OF BRAIN
JPRS-33056 N66-12903
- BREATHING MODE**
DYNAMIC BEHAVIOR OF AIRCREW BREATHING EQUIPMENT CONSIDERING CYCLIC FLOW RESPONSE TESTS, STABILITY PROBLEMS, MEASUREMENT TECHNIQUES AND HUMAN RESPIRATORY IMPEDANCE A66-13350
- BRIGHTNESS DISCRIMINATION**
BRIGHTNESS DISCRIMINATION AND BRIGHTNESS CONTRAST OF HUMAN AND ANIMAL EYES IN SUPRATHRESHOLD LUMINANCE DIFFERENCE A66-13791
- C**
- CAFFEINE**
EFFECT OF CAFFEINE ON BLOOD SERUM FREE FATTY ACIDS IN NORMAL HUMAN SUBJECTS A66-80349
- CALCIUM**
NEW METHOD FOR BLOOD SERUM CALCIUM ESTIMATION IN PATIENTS A66-80292
- CLEARANCE RATE OF CALCIUM-45 IN DOGS AFTER INTRAVENOUS INJECTION AND BLOOD DISTRIBUTION BETWEEN MARROW AND BONE
TID-21339 N66-13051
- CALCIUM-45 AND STRONTIUM-85 METABOLISM IN HUMANS
COO-587-2 N66-13061
- CALCIUM METABOLISM**
NUCLEAR FAST RED TECHNIQUE OF CALCIUM IN SERUM, PAROTID FLUID AND URINE IN WEIGHTLESS STATE A66-13347
- CALORIMETRY**
CALORIMETRIC DETERMINATION OF ICE FORMED IN FEET OF MICE FROZEN AT VARIOUS TEMPERATURE
AAL-TDR-63-29 N66-14037
- CAPILLARY**
OXYGEN DIFFUSION IN BRAIN TISSUE CALCULATED ON BASIS OF CONICAL SPATIAL MODEL A66-80342
- CARBOHYDRATE METABOLISM**
EFFECT OF GLUCAGON ON BLOOD SUGAR AND INORGANIC PHOSPHORUS LEVELS IN NORMOTHERMIC AND HYPOTHERMIC RATS A66-80245
- HYPOGLYCEMIA IN FLYING PERSONNEL - CASE HISTORIES

- A66-80358
 NUTRITIONAL PROBLEMS OF SUGAR REGULATION IN AVIATION MEDICINE - HYPERGLYCEMIA IN RATS AND SURV OF NUTRITIONAL HABITS OF FLYING PERSONNEL A66-80361
- CARBON DIOXIDE**
 HANDBEAR INSULATION EFFECTIVENESS OF FREON 12, CARBON DIOXIDE, AND HELIUM A66-80227
 BREATH BY BREATH MEASUREMENT OF RESPIRATORY FUNCTIONS - INSTRUMENTATION AND APPLICATIONS A66-80240
 ADAPTATION, SURVIVAL, RESPIRATORY RATE, AND MOTOR ACTIVITY OF MICE IN PROLONGED EXPOSURE TO HIGH CONCENTRATIONS OF CARBON DIOXIDE A66-80320
 PARTIAL PRESSURE OF OXYGEN AND CARBON DIOXIDE, HYDROGEN ION CONCENTRATION, HEMOGLOBIN SATURATION, AND TEMPERATURE OF DOG BLOOD ANALYZED USING DIGITAL COMPUTER SAM-TR-65-39 N66-13209
- CARBON DIOXIDE CONCENTRATION**
 PHOTOSYNTHESIS INTENSITY IN CHLORELLA CULTURE AS DETERMINED BY SUSPENSION DENSITY, CARBON DIOXIDE CONCENTRATION, AND OTHER FACTORS A66-80398
 ELECTROCHEMICAL CARBON DIOXIDE CONCENTRATION SYSTEM FOR PURIFYING SPACE CABIN ATMOSPHERE NASA-CR-54849 N66-13114
- CARBON DIOXIDE TENSION**
 ALVEOLAR CARBON DIOXIDE TENSION OF SUPINE SUBJECTS EXERCISING ON BICYCLE ERGOMETER AT INCREASED PRESSURE. A66-80226
 ADJUSTMENT IN NORMAL SUBJECTS OF ARTERIAL CARBON DIOXIDE TENSION FOLLOWING HYPERVENTILATION. A66-80235
- CARBON MONOXIDE**
 CHANGES IN PHYSIOLOGICAL AND BIOCHEMICAL STATE OF MAN AFTER EXPOSURE TO SMALL CONCENTRATIONS OF CARBON MONOXIDE - HEART FUNCTION, RESPIRATION AND CHOLINESTERASE BLOOD LEVEL A66-80304
- CARDIOVASCULAR SYSTEM**
 OBSERVATIONS ON HEART RATES AND CARDIODYNAMICS DURING PROLONGED WEIGHTLESSNESS, DISCUSSING IMMERSION EXPERIMENT ON ANIMALS A66-14073
 BODY TEMPERATURE AND CARDIOVASCULAR AND RESPIRATORY ACTIVITY OF MAN AND DOG UNDER HYPOXIA AND HOT AND COLD TEMPERATURE EXPOSURE A66-80188
 PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS IN MAN OF LONG TERM STAY IN CABIN SIMULATING SPACEFLIGHT ENVIRONMENT A66-80300
 CARDIOVASCULAR AND VESTIBULAR RESPONSE OF HUMAN BODY EXPOSED AT VARIOUS POSITIONS TO ROTATIONAL STRESS A66-80379
 CARDIOVASCULAR AND RESPIRATORY DISEASE IN FORMER FLIGHT STUDENTS - AEROSPACE MEDICINE NASA-CR-68541 N66-13165
- CASE HISTORY**
 HYPOGLYCEMIA IN FLYING PERSONNEL - CASE HISTORIES A66-80358
- CAT**
 BIOLOGICAL ROLE OF RAPID EYE MOVEMENT STATE A66-80168
 OXYGEN SATURATION AND DESATURATION TIMES IN CARDIAC MUSCLE AND CORRESPONDING VALUES CALCULATED FROM KROGH SUPPLY MODEL A66-80346
 EFFECTS OF GRADUAL OR SUDDEN ONSET OF HYPOXIA ON OXYGEN DEMAND A66-80387
- HYPOXIA PRODUCED BY INHALATION OF PURE NITROGEN AND INTERMITTENT OXYGEN BREATHING IN CATS A66-80388
- CATALYTIC ACTIVITY**
 ENZYME CATALYST MECHANISMS, RELATIONSHIP BETWEEN ENZYME MOLECULAR STRUCTURE AND CATALYTIC ACTIVITY, AND FORMATION OF ENZYME INTERMEDIATE PRODUCTS N66-12629
- CATECHOLAMINE**
 EVALUATION OF STRESS BY QUANTITATIVE CATECHOLAMINE A66-80162
- CATHODE RAY TUBE**
 APPARENT MOVEMENT PHENOMENA ON CATHODE RAY TUBE DISPLAYS - THRESHOLD DETERMINATIONS OF APPARENT MOVEMENTS OF PULSED LIGHT SOURCES NASA-CR-342 N66-12162
- CELL DIVISION**
 EFFECT OF VIBRATION ON CELL DIVISION IN BONE MARROW OF MOUSE N66-13791
- CENTRAL NERVOUS SYSTEM**
 HUMAN STRESS REACTIONS TO THREE-DAY MARCH, SLEEP DEPRIVATION, FOOD AND OXYGEN STARVATION, NOTING CHANGES IN CENTRAL NERVOUS SYSTEM FUNCTIONS A66-14080
 CENTRAL NERVOUS SYSTEM FUNCTION OF HUMAN SUBJECTS EXPOSED TO PHYSICAL EXERCISE, SLEEP DEPRIVATION, STARVATION, AND HYPOXIA A66-80191
 CONTROL OF VESTIBULAR APPARATUS BY CENTRAL NERVOUS SYSTEM - PREVENTION OF MOTION SICKNESS - AEROSPACE MEDICINE AD-623676 N66-14320
- CENTRIFUGAL STRAIN**
 ANATOMICAL STUDIES IN DOG ANESTHETIZED WITH PENTOBARBITAL AND CHLORPROMAZINE AND SUBJECTED TO REPEATED PROLONGED POSITIVE G A66-12362
- CENTRIFUGE**
 ACCELERATION EFFECT ON FOOD REINFORCED DRL AND FR SCHEDULES A66-13175
- CEREBRAL CORTEX**
 FLUORESCENT EMISSION FROM CAT CEREBRAL CORTEX AMRL-TR-65-88 N66-12385
 EFFECT OF VESTIBULAR IRRITATION ON ELECTRICAL ACTIVITY OF CORTEX AND BASAL AREAS OF BRAIN FTD-TT-65-410/1&2&4 N66-12762
- CHEMICAL COMPOSITION**
 METABOLISM AND CHEMICAL COMPOSITION OF CONNECTIVE TISSUE - FIBROUS AND NONFIBROUS PROTEINS N66-12635
- CHEMICAL COMPOUND**
 METABOLIC STUDIES OF ENERGY DENSE COMPOUNDS FOR AEROSPACE NUTRITION AMRL-TR-64-121 N66-13594
- CHEMOTHERAPY**
 PROPHYLAXIS AND THERAPY OF RADIATION INJURIES CAUSED BY HIGH ENERGY PROTON IRRADIATION N66-12461
 CHEMOTHERAPY OF VIRUS INFECTIONS, BIOLOGICAL PEST CONTROL, VIRUS NUCLEIC ACIDS, AND VIRAL GROWTH N66-12634
- CHICKEN**
 EMBRYONIC DEVELOPMENT OF CHICK AND FROG EGGS AND RESPIRATION OF CHICKEN AND MOUSE IN SIMULATED SPACE CABIN ATMOSPHERE CONSISTING OF HELIUM AND OXYGEN A66-80315
 EFFECT OF REPLACING ATMOSPHERIC NITROGEN BY HELIUM ON DEVELOPMENT OF CHICK EMBRYOS JPRS-32905 N66-12299
- CHLORELLA**
 QUANTITATIVE ANALYSIS OF LIPID CONSTITUENTS IN CHLORELLA CELLS A66-80171

- LIGHT INDUCED CHANGES IN LIPIDS OF CHLORELLA VULGARIS A66-80246
- LIGHT INDUCED ABSORPTION CHANGES AT 520 NM IN CHLORELLA PYRENOIDOSA AND THEIR RELATIONSHIP TO TWO PIGMENT SYSTEM OF PHOTOSYNTHESIS A66-80289
- STUDY OF MODE OF ACTION OF 3-/4-CHLOROPHENYL/-1, 1-DIMETHYLUREA ON PHOTOSYNTHESIS AND OXYGEN PRODUCTION IN CHLORELLA PYRENOIDOSA AS FUNCTION OF LIGHT AND TEMPERATURE A66-80290
- SIMPLE OSCILLATIONS IN PHOTOSYNTHETIC OXYGEN EVOLUTION IN CHLORELLA PYRENOIDOSA A66-80291
- CHLORELLA AS SOURCE OF OXYGEN AND FOOD IN SHINER, NOTROPIS A66-80335
- OPTIMAL SYSTEM OF CHLORELLA CULTURE FOR HUMAN OXYGEN REQUIREMENTS A66-80336
- PREDICTING PRODUCTION IN LIGHT LIMITED CONTINUOUS CULTURES OF ALGAE, CHLORELLA PYRENOIDOSA AND DUNALIELLA TERTIOLECTA A66-80351
- METHOD FOR PROCESSING HUMAN WASTE TO RECLAIM WATER USING CHLORELLA - BACTERIA SYSTEM A66-80391
- PHOTOSYNTHESIS INTENSITY IN CHLORELLA CULTURE AS DETERMINED BY SUSPENSION DENSITY, CARBON DIOXIDE CONCENTRATION, AND OTHER FACTORS A66-80398
- UTILIZATION OF MINERAL COMPONENTS IN THE MEDIUM OF CHLORELLA PYRENOIDOSA CULTURES A66-80399
- ILLUMINATION AND CELL DENSITY EFFECTS ON GROWTH RATE OF CHLORELLA VULGARIS CULTURE A66-80400
- CHOLESTEROL**
INFLUENCE OF SEVERAL PHYSICAL ACTIVITIES ON BLOOD SERUM CHOLESTEROL CONCENTRATION IN YOUNG MEN A66-80356
- CHONDRITE**
CONTAMINATION OF CARBONACEOUS CHONDRITES BY ORDINARY VIABLE MICROORGANISMS, ISOLATING THREE TYPES OF BACTERIA ON VARIOUS METEORITES A66-13339
- CHROMOSOME**
TUMORS IN MICE AFTER THYMECTOMY AND X-RAY IRRADIATION, AND CHROMOSOME ANOMALIES FROM TRITIATED THYMIDINE - RADIOBIOLOGY EUR-2462.F N66-12431
- BIOLOGICAL EFFECTS OF HIGH ENERGY PRUTON AND X-RAY IRRADIATION ON HEREDITY STRUCTURES OF RATS N66-12457
- RADIATION SENSITIVITY OF CHROMOSOME MUTATION IN WHITE BLOOD CELLS OF HUMANS, MONKEYS, AND RABBITS N66-12756
- CIRCUIT**
MEDICAL AND LIFE SCIENCES, ELECTRIC POWER SYSTEMS, ENERGY CONVERSION, ELECTROMAGNETIC FIELDS, COMMUNICATION, NONLINEAR CIRCUITS, MATERIALS, AND CONTROL AND INFORMATION SYSTEMS AD-622202 N66-13758
- CIRCULATOR**
FEASIBILITY OF USING ENERGY IN BREATHING OXYGEN WHEN EXPANDED FROM STORAGE PRESSURE TO BREATHING PRESSURE TO POWER OXYGEN-CIRCULATING BLOWER AND WATER CIRCULATING PUMP AMRL-TR-65-128 N66-13595
- CIRCULATORY SYSTEM**
EXERCISE TOLERANCE, PLASMA VOLUME, RED CELL MASS, TOTAL BLOOD VOLUME AND ORTHOSTATIC TOLERANCE DURING FOUR WEEKS OF BED REST A66-13354
- PHYSIOLOGICAL PROBLEMS OF WEIGHTLESSNESS
- DISCUSSING MOTION SICKNESS, FLUID VOLUME CONTROL AND CHRONIC EFFECTS ON CIRCULATORY SYSTEM A66-14071
- METHODS FOR SOMATIC CLASSIFICATION OF PILOTS OF DIFFERENT AGES ACCORDING TO STATUS OF FUNCTIONAL MUSCULAR, CIRCULATORY, AND RESPIRATORY CAPACITIES AS RELATED TO TRAINING A66-80164
- CIVIL AVIATION**
HEAD-UP DISPLAY / HUD/ DEVELOPED FOR AUTOMATIC LANDING IN CIVIL AIRCRAFT A66-12884
- CRITERIA FOR BODY BLOCKS, ANTHROPOMORPHIC DUMMIES, AND INSTRUMENTATION FOR USE IN STATIC AND DYNAMIC TESTING OF CIVIL AIRCRAFT SEAT SYSTEMS FAA-ADS-20 N66-13926
- STRESS IMPOSED ON AIRCREW IN CIVIL JET AIRCRAFT DURING LONG FLIGHT DLR-FB-65-44 N66-14261
- CIVIL DEFENSE**
STATISTICAL ANALYSIS OF HEAT SYNDROME CAUSES - ENVIRONMENTAL AND HUMAN FACTORS, AND PREVENTION AND ALLEVIATION IN CIVIL DEFENSE SHELTERS AND IN EMERGENCY SITUATIONS AD-623578 N66-13007
- CLEAN ROOM**
CLEAN ROOM BACTERIOLOGY - HEAT RESISTANCE OF SPORE FORMERS, MICROORGANISM IDENTIFICATIONS, HUMAN CONTACT CONTAMINATION NASA-CR-68729 N66-13553
- CLOSED ECOLOGICAL SYSTEM**
FEASIBILITY OF USING CHICKEN AND DUCK FOR ASTRONAUT FOOD IN CLOSED ECOLOGICAL SYSTEM A66-80308
- AMMONIA EFFECTS ON PHYSIOLOGICAL FUNCTIONS OF MICE IN CLOSED ENVIRONMENT A66-80390
- SENSORS FOR AUTOMATIC CONTROL AND REGULATION OF PHYSIOLOGICAL PROCESSES OF PLANTS IN CLOSED SYSTEMS A66-80396
- CHINESE CABBAGE SPROUTS GROWN AEROPONICALLY IN CLOSED ECOLOGICAL SYSTEM AS AFFECTED BY MINERALIZED PRODUCTS OF HUMAN WASTE A66-80397
- CLOTHING**
STUDY OF COMFORTABLE CLOTHING FOR ASTRONAUTS DURING 30-DAY TESTS WITHOUT WASHING IN AIR CONDITIONED SPACE CABINS IN RELATION TO SKIN CONDITION A66-80314
- COCHLEA**
CHANGES IN FUNCTION AND RECIPROCAL ACTION OF VESTIBULAR APPARATUS COMPONENTS, OTOLITHS AND CUPULA, OF MAN DURING GRAVITATIONAL CHANGES INCLUDING WEIGHTLESSNESS A66-80302
- COCKPIT**
COCKPIT DISPLAY CORRECTION METHODS USED IN DESIGN OF TRIDENT AIRCRAFT A66-12882
- HUMAN PERCEPTUAL MECHANISM DEFINED BY PSYCHOLOGICAL RESEARCH AND APPLIED TO AIRCRAFT COCKPIT DISPLAY DESIGN A66-12883
- COLD ACCLIMATIZATION**
METABOLISM OF CARNITINE IN MUSCLE OF COLD ACCLIMATED RAT A66-80152
- COLD TOLERANCE /BIOL/**
EFFECTS OF COLD AND ABNORMAL ATMOSPHERE DISCUSSING TOLERANCE LIMITS TO HYPERCAPNIA, ANOXIA INDUCED HYPOTHERMIA AND HYPOXIA A66-14067
- TOLERANCE RELATIONSHIP BETWEEN EFFECTS OF INTERNAL AND EXTERNAL COLD AND DIFFERENT FORMS OF ANOXIA IN RAT A66-80189
- COLORIMETRY**
NUCLEAR FAST RED TECHNIQUE OF CALCIUM IN SERUM, PAROTID FLUID AND URINE IN WEIGHTLESS STATE A66-13347

- COMMAND CONTROL**
AUTOMATIC COMMAND CONTROL SYSTEM USING PHONETIC VOICE PATTERN RECOGNITION A66-13496
- COMMUNICATION**
USING COMPUTER ANALYZED SPEECH SIGNALS FACILITATING BETTER COMMUNICATION OF MAN WITH MACHINES A66-80334
LIPREADING AS VISUAL METHOD OF SPEECH RECOGNITION AND COMMUNICATION A66-80393
MEDICAL AND LIFE SCIENCES, ELECTRIC POWER SYSTEMS, ENERGY CONVERSION, ELECTROMAGNETIC FIELDS, COMMUNICATION, NONLINEAR CIRCUITS, MATERIALS, AND CONTROL AND INFORMATION SYSTEMS AD-622202 N66-13758
- COMMUNICATION SYSTEM**
HUMAN FACTORS EVALUATION OF COMMUNICATIONS EQUIPMENT SWITCH ACTUATORS UNDER SIMULATED SPACE CRAFT AND ORDINARY CONDITIONS A66-80148
VERBAL COMMUNICATION INTELLIGIBILITY IN OXYGEN-HELIUM AND OTHER BREATHING MIXTURES IN LOW PRESSURE CHAMBER A66-80199
RELATIONSHIP BETWEEN ANTISUBMARINE HELICOPTER TEAM PERFORMANCE AND COMMUNICATIONS FLOW WITHIN TEAM DURING SIMULATED ATTACK NAVTRADEVCE-1537-1 N66-13972
- COMPENSATORY TRACKING**
MATHEMATICAL MODEL OF HUMAN COMPENSATORY TRACKING BEHAVIOR A66-80149
COMPENSATORY TRACKING BEHAVIOR AS AFFECTED BY KNOWLEDGE OF PERFORMANCE LEVEL A66-80150
THEORY FOR DETERMINISTIC CHARACTERIZATION OF TIME VARYING DYNAMICS OF HUMAN OPERATOR PERFORMANCE TRACKING TASK. A66-80185
- COMPUTER**
PRINCIPLES OF MATHEMATICAL LOGIC AND PROBABILITY THEORY IN COMPUTER DIAGNOSIS OF DISEASES JPRS-33161 N66-13032
- COMPUTER METHOD**
HUMAN USE OF SHORT-TERM MEMORY IN PROCESSING INFORMATION ON COMPUTER CONSOLE A66-80151
COMPUTER ANALYSIS OF ELECTROENCEPHALOGRAPHIC RECORDING DURING ENVIRONMENTAL STRESSES OF SPACE FLIGHT A66-80165
TELLING COMPUTER HOW TO EVALUATE MULTIDIMENSIONAL SITUATIONS AND TERMINOLOGY AND STATISTICS FOR DETERMINING PERFORMANCE OF DECISION MAKER A66-80184
USING COMPUTER ANALYZED SPEECH SIGNALS FACILITATING BETTER COMMUNICATION OF MAN WITH MACHINES A66-80334
USE OF ELECTRONIC COMPUTERS IN SPACE BIOLOGY A66-80366
POSSIBILITIES OF UTILIZATION OF ELECTRONIC LOGICAL SYSTEMS FOR AUTOMATIC MEDICAL CONTROL OF SPACECRAFT PERSONNEL A66-80368
- COMPUTER PROGRAM**
FORTRAN COMPUTER PROGRAM FOR EVALUATION OF POST IRRADIATION SURVIVAL TIMES - ANIMAL STUDY UCLA-12-573 N66-12917
COMPUTER PROGRAMS FOR REDUCING METABOLIC DATA OBTAINED BY SCINTILLATION COUNTERS LA-3298 N66-13431
- CONCORDE AIRCRAFT**
HUMAN FACTORS IN CONCORDE SST PROGRAM A66-13357
- CONFERENCE**
INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE AT PARIS, FRANCE
- IN OCTOBER 1962 A66-14063
- SYMPOSIUM ON BIOCHEMICAL RESEARCH IN MAINLAND CHINA JPRS-33002 N66-12626
- CONFERENCES ON AEROSPACE MEDICINE - ASTRONAUT PERFORMANCE, ELECTROPHYSIOLOGICAL STUDIES ON VOSKHOD MANNED SPACECRAFT, AND MATHEMATICAL METHODS JPRS-32808 N66-12657
- SUMMARIES OF REPORTS GIVEN AT CONFERENCE ON APPLICATION OF MATHEMATICAL METHODS IN AEROSPACE MEDICINE N66-12660
- COMPILATION OF PAPERS PRESENTED AT PHYSIOLOGY CONFERENCE FTD-TT-65-47/162 N66-13224
- CONNECTIVE TISSUE**
METABOLISM AND CHEMICAL COMPOSITION OF CONNECTIVE TISSUE - FIBROUS AND NONFIBROUS PROTEINS N66-12635
- CONTAINER**
SPACE RELATED MOLECULAR BIOLOGY AND MOLECULAR ORGANIZATION OF EXTRATERRESTRIAL MATTER - DESIGN AND CONSTRUCTION OF HIGH VACUUM CONTAINER FOR TRANSFER OF EXTRATERRESTRIAL COLLECTING SURFACES NASA-CR-68844 N66-13830
- CONTAMINATION**
CONTAMINATION OF CARBONACEOUS CHONDRITES BY ORDINARY VIABLE MICROORGANISMS, ISOLATING THREE TYPES OF BACTERIA ON VARIOUS METEORITES A66-13339
REDUCTION OF BACTERIAL DISSEMINATION FROM HUMANS AND SURFACE CONTAMINATION BY MICROORGANISMS NASA-CR-68090 N66-12250
CLEAN ROOM BACTERIOLOGY - HEAT RESISTANCE OF SPORE FORMERS, MICROORGANISM IDENTIFICATIONS, HUMAN CONTACT CONTAMINATION NASA-CR-68729 N66-13553
- CONTROL DEVICE**
HUMAN FACTORS EVALUATION OF COMMUNICATIONS EQUIPMENT SWITCH ACTUATORS UNDER SIMULATED SPACE CRAFT AND ORDINARY CONDITIONS A66-80148
- CONTROL SIMULATOR**
NAVIGATION AND CONTROL SIMULATION PORTION OF OVERALL MANNED SPACE CABIN TEST PROGRAM AIAA PAPER 65-277 A66-12776
ERROR AND CONTROL EFFICIENCY ANALYSIS OF PILOTS EXPOSED TO SIMULATED PITCH, ROLL, YAW, AND ALTITUDE VARIATIONS NASA-CR-68219 N66-12195
- CONTROL SYSTEM**
MATHEMATICAL MODEL OF HUMAN COMPENSATORY TRACKING BEHAVIOR A66-80149
- CONVERGENCE**
ROLE OF CONVERGENCE IN STEREOSCOPIC VISION A66-80288
- COOLING SYSTEM**
THREE AIR-COOLED AND ONE WATER-COOLED PRESSURE SUIT EVALUATED IN HOT ENVIRONMENTS A66-12360
EVALUATION OF AIR VENTILATED CLOTHING SYSTEM REGULATING HEAT LOSS DURING EXTRAVEHICULAR ACTIVITY IN SPACE A66-80157
SEMICONDUCTOR DEVICE FOR SUBJECTING SMALL EXPERIMENTAL ANIMALS TO HYPOTHERMIA A66-80328
AUTOMATIC DEVICE FOR PRODUCING CONTROLLED HYPOTHERMIA IN ANIMALS AND HUMANS A66-80330
AUTOMATIC INDUCTION OF HYPOTHERMIA IN DOGS, ITS COURSE, REWARMING, AND AFTEREFFECTS

	A66-80333		A66-80399
CORIOLIS EFFECT		ILLUMINATION AND CELL DENSITY EFFECTS ON GROWTH	
CORIOLIS ACCELERATION EFFECT ON HUMAN HEART		RATE OF CHLORELLA VULGARIS CULTURE	
	A66-80317		A66-80400
HUMAN ELECTROENCEPHALOGRAM, REACTION TIME, AND TOLERANCE DURING CORIOLIS ACCELERATION DIRECTED BACK TO CHEST	A66-80318	CUTTING	
		HISTOCHEMICAL USE OF FRESH CUT TISSUE SHEET - CUT SHEET ATTACHMENT IN LOW TEMPERATURE CRYOSTAT, AND FREEZING AND CUTTING TECHNIQUE	N66-12371
CORNEA		CYBERNETICS	
BIOLOGICAL EFFECT OF HIGH ENERGY PROTON IRRADIATION ON CORNEAL EPITHELIA OF MICE	N66-12456	CYBERNETICS ROLE IN SPACE FLIGHT INCLUDING CONTROL CIRCUITS FOR GUIDANCE AND ELECTRONIC EQUIPMENT AUTOMATION AND DEVELOPMENT	A66-13495
CORONARY CIRCULATION		CYBERNETIC DEVICES USED IN MEDICAL PRACTICE, AND CYBERNETIC SYSTEMS FOR NEUROLOGICAL STUDIES AND DIAGNOSTIC TECHNIQUES	JPRS-32344 N66-12728
PLANE CRASH AS RESULT OF PILOTS CORONARY DISEASE, DISCUSSING PREVENTION AND REHABILITATION	A66-14387	DEVELOPMENT OF CYBERNETICS AS SCIENCE TO PRODUCE PRACTICAL MACHINES AND TO BENEFIT SOCIETY - COMMUNIST CHINA	N66-12752
OXYGEN SATURATION AND DESATURATION TIMES IN CARDIAC MUSCLE AND CORRESPONDING VALUES CALCULATED FROM KROGH SUPPLY MODEL	A66-80346	CYTOLOGY	
COSMIC RADIATION		HUMAN CELLS AND GENETIC CHANGES IN ESCHERICHIA DURING EXPOSURE STRESSES OF SPACE FLIGHT ON VOSTOK SPACECRAFT	A66-80372
BIOLOGICAL CHARACTERISTICS AND PHYSICAL CONDITIONS OF SPACE FLIGHTS, SUCH AS LOW PRESSURE, IONIZING RADIATION, NOISE, ACCELERATION, WEIGHTLESSNESS, ARTIFICIAL ATMOSPHERE, FEEDING PROBLEMS, ETC	A66-14066		
BIOLOGICAL EFFECTS OF COSMIC RADIATION UNDER LABORATORY AND FLIGHT CONDITIONS ON VARIOUS CRAFT TO STUDY MEASURES FOR PHARMACOLOGICAL AND BIOLOGICAL PROTECTION	A66-14077	D	
RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS, DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION LEVEL DETERMINATION	N66-12452	DARK ADAPTION	
COUNTING RATE COMPUTER		AFTERIMAGES PRODUCED BY BLACK AND LIGHT TARGETS VIEWED PERIPHERALLY BY DARK ADAPTED SUBJECTS	A66-80175
NUCLEAR RADIATION MEDICINE - METHODS OF RECORDING COUNTING RATE		DATA ACQUISITION	
ORNL-P-1383	N66-12899	MANNED SPACE FLIGHT PROGRAM WITH BIOMEDICAL DATA COLLECTION FOR INTEGRATION OF CREWMAN INTO SPACECRAFT OPERATION	A66-14090
CROSS CORRELATION		ENERGY PATTERNS FROM SPACE ACCESSIBLE TO HUMAN SENSES THROUGH DATA SENSORS AND INFORMATION ACQUISITION	A66-14093
COMPARISON OF CROSS CORRELATION AND ORTHOGONALIZED EXPONENTIAL ANALYSES BY REGRESSION ANALYSIS FOR IDENTIFICATION OF HUMAN PILOT DYNAMIC RESPONSE CHARACTERISTICS	NASA-CR-68701 N66-13516	DATA ACQUISITION, CONVERSION, HANDLING, ANALYSIS, AND RECORDING SYSTEM FOR PSYCHOPHYSIOLOGICAL STRESS	AMRL-TDR-64-64 N66-14315
CRYOGENIC TEMPERATURE		DATA ANALYSIS	
SURVIVAL OF MICROORGANISMS EXPOSED TO SHOCK WAVE AND CRYOGENIC TEMPERATURE DURING WHOLE AIR SAMPLING OF UPPER ATMOSPHERE	NASA-CR-68421 N66-13095	DATA ACQUISITION, CONVERSION, HANDLING, ANALYSIS, AND RECORDING SYSTEM FOR PSYCHOPHYSIOLOGICAL STRESS	AMRL-TDR-64-64 N66-14315
CRYOSTAT		DATA CONVERSION	
HISTOCHEMICAL USE OF FRESH CUT TISSUE SHEET - CUT SHEET ATTACHMENT IN LOW TEMPERATURE CRYOSTAT, AND FREEZING AND CUTTING TECHNIQUE	N66-12371	DATA ACQUISITION, CONVERSION, HANDLING, ANALYSIS, AND RECORDING SYSTEM FOR PSYCHOPHYSIOLOGICAL STRESS	AMRL-TDR-64-64 N66-14315
CULTURE /BIOL/		DATA HANDLING SYSTEM	
PREDICTING PRODUCTION IN LIGHT LIMITED CONTINUOUS CULTURES OF ALGAE, CHLORELLA PYRENOIDOSA AND DUNALIELLA TERTIOLECTA	A66-80351	DATA ACQUISITION, CONVERSION, HANDLING, ANALYSIS, AND RECORDING SYSTEM FOR PSYCHOPHYSIOLOGICAL STRESS	AMRL-TDR-64-64 N66-14315
CULTURE TECHNIQUE		DATA PROCESSING	
OPTIMAL SYSTEM OF CLORELLA CULTURE FOR HUMAN OXYGEN REQUIREMENTS	A66-80336	TELLING COMPUTER HOW TO EVALUATE MULTIDIMENSIONAL SITUATIONS AND TERMINOLOGY AND STATISTICS FOR DETERMINING PERFORMANCE OF DECISION MAKER	A66-80184
METHOD FOR PROCESSING HUMAN WASTE TO RECLAIM WATER USING CHLORELLA - BACTERIA SYSTEM	A66-80391	AUTOMATIC RECORDING AND PROCESSING OF DATA REGARDING ARTICULATION OF SPEECH	A66-80392
CHINESE CABBAGE SPROUTS GROWN AEROPONICALLY IN CLOSED ECOLOGICAL SYSTEM AS AFFECTED BY MINERALIZED PRODUCTS OF HUMAN WASTE	A66-80397	INVESTIGATIVE AND AUTOMATIC CONTROL DATA PROCESSING APPLICATIONS IN BIOASTRONAUTICS	N66-12220
PHOTOSYNTHESIS INTENSITY IN CHLORELLA CULTURE AS DETERMINED BY SUSPENSION DENSITY, CARBON DIOXIDE CONCENTRATION, AND OTHER FACTORS	A66-80398	DATA RECORDING	
UTILIZATION OF MINERAL COMPONENTS IN THE MEDIUM OF CHLORELLA PYRENOIDOSA CULTURES		DATA ACQUISITION, CONVERSION, HANDLING, ANALYSIS, AND RECORDING SYSTEM FOR PSYCHOPHYSIOLOGICAL STRESS	AMRL-TDR-64-64 N66-14315

DATA REDUCTION

SUBJECT INDEX

- DATA REDUCTION**
COMPUTER PROGRAMS FOR REDUCING METABOLIC DATA OBTAINED BY SCINTILLATION COUNTERS LA-3298 N66-13431
- DE HAVILLAND DH-121 AIRCRAFT**
COCKPIT DISPLAY CORRECTION METHODS USED IN DESIGN OF TRIDENT AIRCRAFT A66-12882
- DEATH**
HETEROGENOUS CHARACTER OF SLOW WAVES OF DELTA RHYTHM OCCURRING DURING ANOXIC CLINICAL DEATH AND REANIMATION IN DOGS A66-80352
- DECISION**
TELLING COMPUTER HOW TO EVALUATE MULTIDIMENSIONAL SITUATIONS AND TERMINOLOGY AND STATISTICS FOR DETERMINING PERFORMANCE OF DECISION MAKER A66-80184
- DECISION MAKING**
DECISION MAKING EFFECTS OF TWO SOURCES OF UNCERTAINTY DECISION A66-80274
JUDGMENTS OF SAMENESS OF TONES AND TONE DIFFERENCE - EXPERIMENTS ON DECISION TIME A66-80355
- DECOMPRESSION SICKNESS**
ROLE OF ADIPOSE TISSUE OF WELL-FED AND STARVED GUINEA PIGS IN DECOMPRESSION SICKNESS A66-80294
- DEHYDRATION**
HEAT STRESS AND MINIMAL DEHYDRATION EFFECT UPON HUMAN TOLERANCE TO POSITIVE ACCELERATION A66-12353
DEHYDRATION OF SUBJECTS DURING PROLONGED BED REST AS AFFECTED BY 9 ALPHAFLUOROHYDROCORTISONE A66-80196
SUITABILITY OF TEXTUROMETER FOR MEAT TEXTURE DESCRIPTION - HARDNESS, COHESIVENESS, ELASTICITY, CHEWINESS, AND WATER RELEASE OF FRESH AND FREEZE DEHYDRATED MEATS FD-17 N66-14020
- DEHYDROGENATION**
COMPARISON METHODS FOR RELATIONSHIP AMONG ENZYMES THAT ARE SAME BUT BELONG TO DIFFERENT ORGANISMS A66-13367
- DEOXYRIBONUCLEIC ACID /DNA/**
SPACE RADIATION OF SOLAR AND COSMIC ORIGIN AND BIOLOGICAL EFFECTS, EXAMINING DNA STRUCTURE AND RADIATION INDUCED CHANGES A66-13897
BIOLOGICAL MECHANISMS FOR MEMORY - NEURON EXCITATION, NUCLEIC ACID METABOLISM, AND PROTEIN SYNTHESIS MECHANISM - DEOXYRIBONUCLEIC ACID JPRS-32809 N66-12269
EFFECTS OF IONIZING X- AND GAMMA RADIATION ON DEOXYRIBONUCLEIC ACID EUR-2471.F N66-14092
- DEPOSITION**
WHOLE BODY DEPOSITION OF PARTICLES AS FUNCTION OF VARIOUS PHYSICAL AND CHEMICAL PARAMETERS N66-12684
- DESERT ADAPTATION**
SWEAT CHLORIDE CONCENTRATION AND RATE, METABOLIC RATE, SKIN AND BODY TEMPERATURES OF YOUNG AND OLD MALES WALKING IN DESERT ENVIRONMENT A66-80217
- DETECTION**
FISSION PRODUCT INHALATION PROGRAM - GAMMA RAY DETECTION SYSTEM FOR BIOLOGICAL SAMPLES LF-28 N66-12581
- DIAGNOSIS**
DIAGNOSIS CRITERIA FOR GLAUCOMA IN PILOTS AND FLIGHT FITNESS. A66-80205
CYBERNETIC DEVICES USED IN MEDICAL PRACTICE, AND CYBERNETIC SYSTEMS FOR NEUROLOGICAL STUDIES AND
- DIAGNOSTIC TECHNIQUES**
JPRS-32344 N66-12728
PRINCIPLES OF MATHEMATICAL LOGIC AND PROBABILITY THEORY IN COMPUTER DIAGNOSIS OF DISEASES JPRS-33161 N66-13032
- DIGITAL COMPUTER**
HUMAN PERFORMANCE AND LIFE SUPPORT SYSTEMS IN SPACE MONITORED BY DIGITAL COMPUTER WHICH CAN SIMULATE CLINICAL LOGIC - BIOASTRONAUTICS N66-12219
- DIGITAL TECHNIQUE**
APPLICATION OF DIGITAL COMPUTATION TECHNIQUES FOR ON LINE DISPLAY OF PULMONARY NITROGEN WASHOUT AND COMPARISON OF DATA WITH CONVENTIONAL TECHNIQUES A66-80231
- DISEASE**
DERMATOLOGICAL CONDITIONS OF HUMAN SKIN AS RESULTS OF HEAT AND HUMIDITY A66-80247
INCIDENCE, MORPHOLOGY, AND ETIOLOGY OF MILIARIA OCCURRING DURING EXPOSURE TO HOT ENVIRONMENT A66-80253
PRINCIPLES OF MATHEMATICAL LOGIC AND PROBABILITY THEORY IN COMPUTER DIAGNOSIS OF DISEASES JPRS-33161 N66-13032
CARDIOVASCULAR AND RESPIRATORY DISEASE IN FORMER FLIGHT STUDENTS - AEROSPACE MEDICINE NASA-CR-68541 N66-13165
- DISPLAY SYSTEM**
LANDING TASK AND PILOT ACCEPTANCE OF DISPLAYS FOR LANDING IN REDUCED WEATHER MINIMUMS AIAA PAPER 65-722 A66-12579
COCKPIT DISPLAY CORRECTION METHODS USED IN DESIGN OF TRIDENT AIRCRAFT A66-12882
HUMAN PERCEPTUAL MECHANISM DEFINED BY PSYCHOLOGICAL RESEARCH AND APPLIED TO AIRCRAFT COCKPIT DISPLAY DESIGN A66-12883
HEAD-UP DISPLAY / HUD/ DEVELOPED FOR AUTOMATIC LANDING IN CIVIL AIRCRAFT A66-12884
OPTIMAL CONTROL DISPLAY RELATIONSHIPS IN GENERAL TRACKING INCLUDING PILOTING AND RADAR TRACKING OPERATION A66-13349
HUMAN PERFORMANCE CHARACTERISTICS IN MANUAL CONTROL TASKS, AND TECHNIQUES FOR DATA ANALYSIS AND SYSTEMS SIMULATION NASA-CR-68981 N66-14290
- DISTRIBUTION FUNCTION**
DISTRIBUTION FUNCTION OF HELIUM CLEARANCE TIME CONSTANT IN HEALTHY AND DISEASED LUNGS OF HUMAN SUBJECTS A66-80232
NEW METHOD FOR ANALYSIS OF DISTRIBUTION OF MECHANICAL TIME CONSTANTS IN LUNG A66-80238
- DIURNAL RHYTHM**
BIOLOGICAL CLOCKS AND ENVIRONMENTAL INFLUENCES A66-80287
FREQUENCY ANALYSIS OF DIURNAL PERIODICITY IN HUMAN ELECTROENCEPHALOGRAM A66-80395
- DOG**
ENDOCRINE AND METABOLIC RESPONSE OF DOGS TO WHOLE BODY VIBRATION A66-80194
PULMONARY GAS EXCHANGE IN DOGS DURING LIQUID BREATHING UNDER HYPERBARIC OXYGENATION A66-80230
VENTILATION OF DOGS IN RESPONSE TO PRESSURE AND ELECTRIC STIMULATION OF MUSCLE AFFERENTS A66-80234
EMETIC EFFECT OF APOMORPHINE AS RELATED TO DURATION OF ROTATION OR OSCILLATION EXPOSURE IN

- DOGS A66-80326
- METHOD FOR REGISTERING POTENTIALS OF AUTONOMIC NERVES DURING CONTINUOUS EXPERIMENT IN DOGS A66-80331
- AUTOMATIC INDUCTION OF HYPOTHERMIA IN DOGS, ITS COURSE, REWARMING, AND AFTEREFFECTS A66-80333
- CLINICAL MANIFESTATIONS OF RESPIRATORY ALKALOSIS A66-80348
- REFLEX EFFECTS OF CEPHALIC HYPOXIA, HYPERCAPNIA, AND ISCHEMIA UPON VENTRICULAR CONTRACTILITY IN DOGS. A66-80350
- HETEROGENOUS CHARACTER OF SLOW WAVES OF DELTA RHYTHM OCCURRING DURING ANOXIC CLINICAL DEATH AND REANIMATION IN DOGS A66-80352
- RENAL CIRCULATION OF DOG AS AFFECTED BY ANGIOTENSIN A66-80404
- CHANGES IN MYOCARDIAL OXYGEN PRESSURE OF DOGS DURING ASCENT AND ACCELERATION DETERMINED BY POLAROGRAPHIC ELECTRODES IMPLANTED IN HEART MUSCLES JPRS-33066 N66-12271
- DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES USING SYNCHROCYCLOTRON - IRRADIATION OF ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION RESISTANCE OF PLASTICS N66-12453
- PATHOLOGICAL EFFECTS OF X-RAY IRRADIATION ON GASTROINTESTINAL SYSTEM IN DOGS - RADIATION SICKNESS FTD-TT-64-910/1&2&3&4 N66-12607
- CLEARANCE RATE OF CALCIUM-45 IN DOGS AFTER INTRAVENOUS INJECTION AND BLOOD DISTRIBUTION BETWEEN MARROW AND BONE TID-21339 N66-13051
- PARTIAL PRESSURE OF OXYGEN AND CARBON DIOXIDE, HYDROGEN ION CONCENTRATION, HEMOGLOBIN SATURATION, AND TEMPERATURE OF DOG BLOOD ANALYZED USING DIGITAL COMPUTER SAM-TR-65-39 N66-13209
- DOSIMETER
RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS, DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION LEVEL DETERMINATION N66-12452
- DOSIMETRY
DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES USING SYNCHROCYCLOTRON - IRRADIATION OF ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION RESISTANCE OF PLASTICS N66-12453
- RADIATION HAZARDS CONTROL - AIR MONITORS, FILM SENSITIVITY, STIMULATED EMISSION DOSIMETRY, GLASS CLEANING TECHNIQUES, HIGH DENSITY GRASS SAMPLES, AND FIRE HOSE FRICTION LOSSES UCRL-14351 N66-12576
- DROSOPHILA
EFFECT OF SPACE FLIGHT FACTORS ON REPRODUCTIVE SYSTEM OF DROSOPHILA AND GENETIC APPARATUS OF TRADESCANTIA A66-80371
- DOMINANT LETHALS IN DROSOPHILA MALES EXPOSED TO VIBRATION, ACCELERATION, AND GAMMA IRRADIATION DURING SPACE FLIGHTS N66-13790
- DRUG
ACCLIMATIZATION AND SWEATING-EFFECT OF DRUGS AND THERMAL STRESS A66-80248
- SUCCINATE-PROTECTIVE AGENT AGAINST HIGH PRESSURE OXYGEN TOXICITY IN RAT A66-80365
- DUMMY
CRITERIA FOR BODY BLOCKS, ANTHROPOMORPHIC DUMMIES, AND INSTRUMENTATION FOR USE IN STATIC AND DYNAMIC TESTING OF CIVIL AIRCRAFT SEAT SYSTEMS FAA-ADS-20 N66-13926
- DUNALIELLA
PREDICTING PRODUCTION IN LIGHT LIMITED CONTINUOUS CULTURES OF ALGAE, CHLORELLA PYRENOIDOSA AND DUNALIELLA TERTIOLECTA A66-80351
- DYNAMIC PRESSURE
DYNAMIC BEHAVIOR OF AIRCREW BREATHING EQUIPMENT CONSIDERING CYCLIC FLOW RESPONSE TESTS, STABILITY PROBLEMS, MEASUREMENT TECHNIQUES AND HUMAN RESPIRATORY IMPEDANCE A66-13350
- DYNAMIC ENVIRONMENTAL INFLUENCES ON MAN DURING SPACE FLIGHT COVERING FORCE FIELDS, INERTIAL FORCES DUE TO ACCELERATION AND METHODS OF PROTECTION A66-14074
- DYNAMIC RESPONSE
COMPARISON OF CROSS CORRELATION AND ORTHOGONALIZED EXPONENTIAL ANALYSES BY REGRESSION ANALYSIS FOR IDENTIFICATION OF HUMAN PILOT DYNAMIC RESPONSE CHARACTERISTICS NASA-CR-68701 N66-13516
- DESIGN CRITERIA FOR CREW STATIONS AS RELATED TO CREW MEMBER EGRESS FROM SINGLE PLACE PILOT STATION IN WEIGHTLESS ENVIRONMENT - HUMAN ENGINEERING AND FLIGHT DYNAMICS AFFDL-TR-65-148 N66-13978
- E**
- EAR
CONTINUITY EFFECT WITH ALTERNATELY SOUNDED NOISE AND TONE SIGNALS AS FUNCTION OF MANNER OF PRESENTATION A66-80154
- HAZARDS TO HUMAN EAR FROM SHOCK WAVES OF HIGH ENERGY ELECTRIC DISCHARGES AWRE-E-1/65 N66-13711
- EAR PROTECTOR
TOLERANCE OF JET AND ROCKET ENGINE EXHAUST NOISE AND EAR PROTECTION DEVICES FOR PILOTS AND GROUND CREWS NASA-TT-F-9799 N66-13297
- EARTH
SPACE EXPLORATION AND STUDY OF ROLE OF EARTH ENVIRONMENTAL CONDITIONS IN EVOLUTION, PHYSIOLOGY, AND BEHAVIOR OF TERRESTRIAL ORGANISMS A66-80156
- EJECTION INJURY
CAUSES OF COMPRESSION FRACTURES OF SPINE DURING LARGE NUMBER OF USAF EJECTIONS A66-12361
- ELASTIC PROPERTY
MECHANOElastic PROPERTIES OF CORNIFIED EPITHELIUM AS AFFECTED BY VARIOUS SOLVENT AND SOLUTION ENVIRONMENTAL CHANGES A66-80258
- ELECTRIC CONDUCTIVITY
THERMAL AND ELECTRIC CONDUCTIVITY OF BODY FLUIDS AND TISSUES GLR-37 N66-12592
- ELECTRIC DISCHARGE
HAZARDS TO HUMAN EAR FROM SHOCK WAVES OF HIGH ENERGY ELECTRIC DISCHARGES AWRE-E-1/65 N66-13711
- ELECTRIC POWER CONVERSION
MEDICAL AND LIFE SCIENCES, ELECTRIC POWER SYSTEMS, ENERGY CONVERSION, ELECTROMAGNETIC FIELDS, COMMUNICATION, NONLINEAR CIRCUITS, MATERIALS, AND CONTROL AND INFORMATION SYSTEMS AD-622202 N66-13758
- ELECTRIC STIMULUS
VENTILATION OF DOGS IN RESPONSE TO PRESSURE AND ELECTRIC STIMULATION OF MUSCLE AFFERENTS A66-80234
- INTERACTION OF CENTRAL AND FLASH NYSTAGMUS IN RABBITS A66-80339
- ELECTROCARDIOGRAM
ELECTROCARDIOGRAM AND BLOOD PRESSURE OF RABBIT

- DURING PROLONGED WEIGHTLESSNESS SIMULATED BY IMMERSION METHOD A66-80192
- ARTERIAL PRESSURE, RESPIRATORY RATE, ELECTROCARDIOGRAM, AND ELECTROENCEPHALOGRAPH OF YOUNG MEN DURING SHORT TERM ANGULAR ACCELERATIONS A66-80303
- CHANGES IN PHYSIOLOGICAL AND BIOCHEMICAL STATE OF MAN AFTER EXPOSURE TO SMALL CONCENTRATIONS OF CARBON MONOXIDE - HEART FUNCTION, RESPIRATION AND CHOLINESTERASE BLOOD LEVEL A66-80304
- SOME ELECTROCARDIOGRAPHIC ABNORMALITIES AND PHYSICAL FITNESS OF FLYING PERSONNEL A66-80362
- REACTION TO WEIGHTLESSNESS OF ASTRONAUTS PARTICIPATING IN VOSTOK FLIGTS II TO VI INCLUSIVELY A66-80373
- ENVIRONMENTAL TEMPERATURE EFFECTS ON EKG OF SQUIRREL MONKEY - ANIMAL STUDY OF HEART RATE AND T-WAVE AMPLITUDE NASA-CR-68306 N66-12972
- ELECTROCARDIOGRAPHY**
OBSERVATIONS ON HEART RATES AND CARDIODYNAMICS DURING PROLONGED WEIGHTLESSNESS, DISCUSSING IMMERSION EXPERIMENT ON ANIMALS A66-14073
- ELECTROCHEMISTRY**
ELECTROCHEMICAL CARBON DIOXIDE CONCENTRATION SYSTEM FOR PURIFYING SPACE CABIN ATMOSPHERE NASA-CR-54849 N66-13114
- ELECTRODERMAL RESPONSE**
SEX DIFFERENCES IN ADAPTATION OF GALVANIC SKIN RESPONSE TO REPETITION OF VISUAL STIMULUS A66-80271
- AUTONOMIC COMPONENTS OF HUMAN ORIENTING BEHAVIOR IN RESPONSE TO WHITE NOISE A66-80275
- ECCRINE SWEAT GLAND ACTIVITY AND RACIAL DIFFERENCES IN RESTING SKIN CONDUCTANCE A66-80276
- HUMAN INTERAREA ELECTROENCEPHALOGRAPHIC PHASE RELATIONSHIPS FOLLOWING SENSORY AND IDEATIONAL STIMULI A66-80277
- PHYSIOLOGICAL DATA FOR EVALUATION OF HEALTH AND WORK CAPABILITY OF ASTRONAUT DURING ORBITAL FLIGHTS A66-80369
- ELECTROENCEPHALOGRAPH**
PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS IN MAN OF LONG TERM STAY IN CABIN SIMULATING SPACEFLIGHT ENVIRONMENT A66-80300
- OXYGEN CONSUMPTION RATE AND ELECTROENCEPHALOGRAPHIC STAGE OF SLEEP A66-80353
- ELECTROENCEPHALOGRAPH /EEG/**
ELECTROENCEPHALOGRAPHIC RESPONSES AND CHANGES IN ELECTRIC POTENTIALS IN NECK MUSCLES OF RAT DURING SHORT PERIODS OF WEIGHTLESSNESS A66-80161
- COMPUTER ANALYSIS OF ELECTROENCEPHALOGRAPHIC RECORDING DURING ENVIRONMENTAL STRESSES OF SPACE FLIGHT A66-80165
- RAPID EYE MOVEMENT STATE /DREAMING/ DIFFERENTIATED BIOLOGICALLY FROM SLEEP AND WAKEFULNESS A66-80167
- HUMAN INTERAREA ELECTROENCEPHALOGRAPHIC PHASE RELATIONSHIPS FOLLOWING SENSORY AND IDEATIONAL STIMULI A66-80277
- ARTERIAL PRESSURE, RESPIRATORY RATE, ELECTROCARDIOGRAM, AND ELECTROENCEPHALOGRAPH OF YOUNG MEN DURING SHORT TERM ANGULAR ACCELERATIONS A66-80303
- HUMAN ELECTROENCEPHALOGRAPH, REACTION TIME, AND TOLERANCE DURING CORIOLIS ACCELERATION DIRECTED BACK TO CHEST A66-80318
- HETEROGENOUS CHARACTER OF SLOW WAVES OF DELTA RHYTHM OCCURRING DURING ANOXIC CLINICAL DEATH AND REANIMATION IN DOGS A66-80352
- PHYSIOLOGICAL DATA FOR EVALUATION OF HEALTH AND WORK CAPABILITY OF ASTRONAUT DURING ORBITAL FLIGHTS A66-80369
- FREQUENCY ANALYSIS OF DIURNAL PERIODICITY IN HUMAN ELECTROENCEPHALOGRAPH A66-80395
- BIOELECTRIC RECORDINGS OF MALE SUBJECTS SUBJECTED TO WEIGHTLESSNESS - INDICES OF PHYSIOLOGICAL FUNCTIONS - ELECTROENCEPHALOGRAPH / EEG/, AND VESTIBULAR COORDINATION REACTIONS JPRS-33115 N66-12273
- ELECTROENCEPHALOGRAPHY**
RHEOGRAPHIC REGIONAL METHOD FOR EVALUATION OF CEREBRAL AND OCULAR CIRCULATION IN CARDIAC AND CEREBROVASCULAR DISEASE A66-14002
- HEART AND BREATHING RATE AND ELECTROENCEPHALOGRAPHIC RESPONSES OF RATS DURING WEIGHTLESSNESS A66-14083
- ELECTROLYTE METABOLISM**
SWEAT CHLORIDE CONCENTRATION AND RATE, METABOLIC RATE, SKIN AND BODY TEMPERATURES OF YOUNG AND OLD MALES WALKING IN DESERT ENVIRONMENT A66-80217
- MORPHOLOGICAL AND FUNCTIONAL ASPECTS OF SWEATING-SODIUM SECRETION REABSORPTION AND BIOLOGICAL MODEL OF SWEAT GLAND A66-80249
- ELECTROMAGNETIC FIELD**
MEDICAL AND LIFE SCIENCES, ELECTRIC POWER SYSTEMS, ENERGY CONVERSION, ELECTROMAGNETIC FIELDS, COMMUNICATION, NONLINEAR CIRCUITS, MATERIALS, AND CONTROL AND INFORMATION SYSTEMS AD-622202 N66-13758
- ELECTROMYOGRAM**
ELECTROMYOGRAPHIC STUDY OF ABDOMINAL MUSCLE INVOLVEMENT DURING PERFORMANCE OF VARIOUS FORMS OF SIT UP EXERCISE A66-80337
- ELECTROMYOGRAPHIC GRADIENTS AS INDICANTS OF EFFICIENCY AND VELOCITY PRECISION IN MIRROR TRACING A66-80341
- ELECTRON**
INDUCED FREE RADICALS IN ENZYMES BY ELECTRONS AND HEAVY IONS UCRL-16358 N66-13907
- ELECTRON MICROSCOPY**
HIGH RESOLUTION ELECTRON MICROSCOPY OF FRACTION I PROTEIN FROM PLANT LEAVES NASA-CR-68099 N66-12198
- ELECTRONYSTAGMOGRAPHY**
ELECTRONYSTAGNUS MEASUREMENT OF VERTICAL EYEBALL DISPLACEMENT TO INVESTIGATE CHINCHILLA VESTIBULAR SYSTEM RESPONSE TO VERTICAL LINEAR ACCELERATION GE/EE/65-6 N66-13814
- ELECTROPHYSIOLOGY**
ELECTROPHYSIOLOGY OF VISION DESCRIBING NEURAL AND PHOTOCHEMICAL PROCESSES AND MOTOR RESPONSE A66-13788
- WAVEMETER AND INTEGRATOR FOR EVALUATION OF WAVE PATTERNS AND AMPLITUDE OF BRAIN POTENTIALS - ELECTROPHYSIOLOGY JPRS-33055 N66-12444
- CONFERENCES ON AEROSPACE MEDICINE - ASTRONAUT PERFORMANCE, ELECTROPHYSIOLOGICAL STUDIES ON VOSKHOD MANNED SPACECRAFT, AND MATHEMATICAL METHODS JPRS-32808 N66-12657

- ELECTROPHYSIOLOGICAL STUDIES ON VOSKHOD MANNED SPACECRAFT N66-12659
- ELECTROPHYSIOLOGY AND PSYCHOPHYSIOLOGY OF SLEEP JPRS-33033 N66-13176
- EMBRYO**
EFFECT OF REPLACING ATMOSPHERIC NITROGEN BY HELIUM ON DEVELOPMENT OF CHICK EMBRYOS JPRS-32905 N66-12299
- EMBRYOLOGY**
EMBRYONIC DEVELOPMENT OF CHICK AND FROG EGGS AND RESPIRATION OF CHICKEN AND MOUSE IN SIMULATED SPACE CABIN ATMOSPHERE CONSISTING OF HELIUM AND OXYGEN A66-80315
- EMOTIONAL FACTOR**
HUMAN INTERAREA ELECTROENCEPHALOGRAPHIC PHASE RELATIONSHIPS FOLLOWING SENSORY AND IDEATIONAL STIMULI A66-80277
- ENDOCRINE SYSTEM**
PHYSIOLOGICAL RESPONSES OF ENDOCRINE SYSTEM TO PHYSICAL AND MENTAL STRESS - URINARY EXCRETION OF ADRENALINE AND NORADRENALINE N66-13507
- ENDORADIOSONDE**
TELEMETERING INFORMATION FROM WITHIN BODY OF ANIMALS AND MAN, USING TINY TRANSMITTERS CALLED ENDORADIOSONDES A66-13370
- ENERGY**
FEASIBILITY OF USING ENERGY IN BREATHING OXYGEN WHEN EXPANDED FROM STORAGE PRESSURE TO BREATHING PRESSURE TO POWER OXYGEN-CIRCULATING BLOWER AND WATER CIRCULATING PUMP AMRL-TR-65-128 N66-13595
- ENERGY CONVERSION**
MEDICAL AND LIFE SCIENCES, ELECTRIC POWER SYSTEMS, ENERGY CONVERSION, ELECTROMAGNETIC FIELDS, COMMUNICATION, NONLINEAR CIRCUITS, MATERIALS, AND CONTROL AND INFORMATION SYSTEMS AD-622202 N66-13758
- ENERGY DENSITY**
METABOLIC STUDIES OF ENERGY DENSE COMPOUNDS FOR AEROSPACE NUTRITION AMRL-TR-64-121 N66-13594
- ENERGY EXCHANGE**
METABOLISM AND ENERGY EXCHANGE BALANCE TESTS IN RESPIRATION CALORIMETER TO DETERMINE RELATION BETWEEN BODY TEMPERATURE AND FLUCTUATIONS OF OTHER BODY FUNCTIONS NASA-TT-F-9796 N66-13484
- ENERGY TRANSFER**
BIDENERGETIC STUDIES OF ENERGY TRANSFERS, THERMODYNAMICS, AND ENTROPY IN LIVING ORGANISMS N66-12631
- ENTROPY**
APPLICATION OF INFORMATION THEORY CONCEPTS TO ANALYSIS OF PHYSIOLOGICAL DATA DURING SPACE FLIGHTS A66-80367
- BIDENERGETIC STUDIES OF ENERGY TRANSFERS, THERMODYNAMICS, AND ENTROPY IN LIVING ORGANISMS N66-12631
- ENVIRONMENT**
MECHANOElastic PROPERTIES OF CORNIFIED EPITHELIUM AS AFFECTED BY VARIOUS SOLVENT AND SOLUTION ENVIRONMENTAL CHANGES A66-80258
- BIOLOGICAL CLOCKS AND ENVIRONMENTAL INFLUENCES A66-80287
- STATISTICAL ANALYSIS OF HEAT SYNDROME CAUSES - ENVIRONMENTAL AND HUMAN FACTORS, AND PREVENTION AND ALLEVIATION IN CIVIL DEFENSE SHELTERS AND IN EMERGENCY SITUATIONS AD-623578 N66-13007
- ENVIRONMENT SIMULATION**
ARTIFICIAL ENVIRONMENT IN MANNED SPACECRAFT FOR PRESERVING HUMAN LIFE, COMPARING PHYSICAL, CHEMICAL AND BIOLOGICAL PROCESSES A66-14079
- ENVIRONMENTAL TEMPERATURE**
BODY TEMPERATURE AND CARDIOVASCULAR AND RESPIRATORY ACTIVITY OF MAN AND DOG UNDER HYPOXIA AND HOT AND COLD TEMPERATURE EXPOSURE A66-80188
- PULMONARY DIFFUSING CAPACITY IN SUBJECTS AT REST AND DURING EXERCISE AS AFFECTED BY INCREASED ENVIRONMENTAL TEMPERATURE A66-80224
- THERMOREGULATORY METABOLIC RESPONSE OF COLD AND HEAT EXPOSED SQUIRREL MONKEYS /SAIMIRI SCIUREA/ AS COMPARED TO SIMILARLY TREATED RODENTS A66-80225
- TEMPERATURE AND HYDRATION FACTORS AFFECTING CUTANEOUS BARRIERS TO PENETRATION A66-80263
- STUDY OF MODE OF ACTION OF 3-/4-CHLOROPHENYL/-1, 1-DIMETHYLUREA ON PHOTOSYNTHESIS AND OXYGEN PRODUCTION IN CHLORELLA PYRENOIDOSA AS FUNCTION OF LIGHT AND TEMPERATURE A66-80290
- ENVIRONMENTAL TEMPERATURE EFFECTS ON EKG OF SQUIRREL MONKEY - ANIMAL STUDY OF HEART RATE AND T-WAVE AMPLITUDE NASA-CR-68306 N66-12972
- ENVIRONMENTAL TESTING**
BIOSATELLITE PROGRAM - EXPLOITATION OF SPACE ENVIRONMENT FOR BIOLOGICAL RESEARCH N66-12419
- ENZYME**
COMPARISON METHODS FOR RELATIONSHIP AMONG ENZYMES THAT ARE SAME BUT BELONG TO DIFFERENT ORGANISMS A66-13367
- SYMPOSIUM ON BIOCHEMICAL RESEARCH IN MAINLAND CHINA JPRS-33002 N66-12626
- BIOCHEMICAL RESEARCH IN CHINA AND DEVELOPMENT IN AREAS OF ENZYME SYSTEMS, METABOLISM, NUTRITION, CANCER, AND MEDICAL TECHNOLOGY - SYMPOSIUM N66-12627
- ENZYME CATALYST MECHANISMS, RELATIONSHIP BETWEEN ENZYME MOLECULAR STRUCTURE AND CATALYTIC ACTIVITY, AND FORMATION OF ENZYME INTERMEDIATE PRODUCTS N66-12629
- MICROBIOCHEMICAL CONTRIBUTIONS TO BIOLOGY - BACTERIAL PHOTOSYNTHESIS, CATABOLISM, INDUCED ENZYMES N66-12632
- INDUCED FREE RADICALS IN ENZYMES BY ELECTRONS AND HEAVY IONS UCRL-16358 N66-13907
- ENZYME ACTIVITY**
MECHANISM, PREVENTION AND TREATMENT OF OXYGEN TOXICITY IN CENTRAL NERVOUS SYSTEM, NOTING ACETYLCHOLINESTERASE ACTIVITY A66-13346
- MECHANISM OF IN VIVO RBC DAMAGE BY OXYGEN, NOTING EFFECT ON CANINE ERYTHROCYTES A66-13348
- BEHAVIOR OF SERUM LACTIC DEHYDROGENASE IN MEN EXPOSED TO BRIEF, INTENSE THERMAL IMPULSES A66-80203
- CHANGES IN PHYSIOLOGICAL AND BIOCHEMICAL STATE OF MAN AFTER EXPOSURE TO SMALL CONCENTRATIONS OF CARBON MONOXIDE - HEART FUNCTION, RESPIRATION AND CHOLINESTERASE BLOOD LEVEL A66-80304
- EPILEPSY**
HYPOXIA EFFECTS ON SENSITIVITY TO EPILEPTOGENIC AGENTS AND ON FUNCTIONAL PROPERTIES OF MOTOR FORMATIONS OF BRAIN JPRS-33056 N66-12903

EPINEPHRINE

- DEGREE OF MENTAL STRESS CORRELATED WITH EXCRETION OF CATECHOLAMINE, FREE ADRENALINE AND NORADRENALINE IN URINE A66-14081
- SHORT-TERM MEMORY, CHOICE REACTION TIME, AND HAND STEADINESS OF EXERCISING AND RESTING SUBJECTS IN RESPONSE TO EPINEPHRINE OR INSULIN ADMINISTRATION A66-80201
- PHYSIOLOGICAL RESPONSES OF ENDOCRINE SYSTEM TO PHYSICAL AND MENTAL STRESS - URINARY EXCRETION OF ADRENALINE AND NORADRENALINE N66-13507
- ERROR FUNCTION**
ERROR AND CONTROL EFFICIENCY ANALYSIS OF PILOTS EXPOSED TO SIMULATED PITCH, ROLL, YAW, AND ALTITUDE VARIATIONS NASA-CR-68219 N66-12195
- ERYTHROCYTE**
KINETICS OF OXYGEN UPTAKE BY ERYTHROCYTES OF DIFFERENT AGES AS RELATED TO RESPIRATORY FUNCTION OF BLOOD A66-80229
- ESCHERICHIA**
HUMAN CELLS AND GENETIC CHANGES IN ESCHERICHIA DURING EXPOSURE STRESSES OF SPACE FLIGHT ON VOSTOK SPACECRAFT A66-80372
- AMINOTHIOALS AND PYRIMIDINE ANALOGS TESTED FOR PROTECTIVE EFFECTS AGAINST GENETIC MUTATIONS IN ESCHERICHIA COLI EXPOSED TO X-RAY IRRADIATION A66-80385
- EVOLUTION**
SPACE EXPLORATION AND STUDY OF ROLE OF EARTH ENVIRONMENTAL CONDITIONS IN EVOLUTION, PHYSIOLOGY, AND BEHAVIOR OF TERRESTRIAL ORGANISMS A66-80156
- EXERCISE**
PRECEDING POSTURE AND AMBIENT TEMPERATURE EFFECTS ON HEART AND BLOOD CIRCULATION ACCELERATION AT INITIATION OF EXERCISE CRDLR-3268 N66-12827
- EXTRATERRESTRIAL ENVIRONMENT**
PHYSIOLOGICAL PROBLEMS OF WEIGHTLESSNESS DISCUSSING MOTION SICKNESS, FLUID VOLUME CONTROL AND CHRONIC EFFECTS ON CIRCULATORY SYSTEM A66-14071
- DYNAMIC ENVIRONMENTAL INFLUENCES ON MAN DURING SPACE FLIGHT COVERING FORCE FIELDS, INERTIAL FORCES DUE TO ACCELERATION AND METHODS OF PROTECTION A66-14074
- SPACE EXPLORATION AND STUDY OF ROLE OF EARTH ENVIRONMENTAL CONDITIONS IN EVOLUTION, PHYSIOLOGY, AND BEHAVIOR OF TERRESTRIAL ORGANISMS A66-80156
- EXTRATERRESTRIAL LIFE**
SPACE TRAVEL AND EXPLORATION COVERING BIOLOGICAL AND TECHNICAL DIFFICULTIES SUCH AS RADIATION, METEOR IMPACT, VEHICLE STERILIZATION, ETC A66-13806
- NEUROPHYSIOLOGICAL ASPECTS OF MANNED EXTRATERRESTRIAL SPACE FLIGHTS SUCH AS MOTOR RESPONSES BY SENSORY INPUTS, CORTICAL RESPONSES, ETC A66-14065
- BIOLOGICAL CHARACTERISTICS AND PHYSICAL CONDITIONS OF SPACE FLIGHTS, SUCH AS LOW PRESSURE, IONIZING RADIATION, NOISE, ACCELERATION, WEIGHTLESSNESS, ARTIFICIAL ATMOSPHERE, FEEDING PROBLEMS, ETC A66-14066
- FUTURE OF ENVIRONMENTAL BIOLOGY, DISCUSSING SPACE RESEARCH ON LIVING ORGANISMS IN EXTRATERRESTRIAL ENVIRONMENT A66-14069
- HEAT LOSS IN SPACE, DISCUSSING TEMPERATURE REGULATION DURING SPACE WALK VIA HEAT EXCHANGERS IN AIR VENTILATED SPACE SUIT A66-14070

ENVIRONMENT OF MARTIAN CANALS AND EXTRATERRESTRIAL LIFE A66-80176

N ASA SPACE BIOLOGY PROGRAM - EXOBIOLGY, ENVIRONMENTAL AND BEHAVIORAL BIOLOGY, MOLECULAR BIOLOGY AND INSTRUMENTATION, FLIGHT PROGRAMS, AND MANNED SPACE FLIGHT NASA-TM-X-57051 N66-13899

EXTRATERRESTRIAL MATTER
SPACE RELATED MOLECULAR BIOLOGY AND MOLECULAR ORGANIZATION OF EXTRATERRESTRIAL MATTER - DESIGN AND CONSTRUCTION OF HIGH VACUUM CONTAINER FOR TRANSFER OF EXTRATERRESTRIAL COLLECTING SURFACES NASA-CR-68844 N66-13830

EXTRAVEHICULAR OPERATION
EVALUATION OF AIR VENTILATED CLOTHING SYSTEM REGULATING HEAT LOSS DURING EXTRAVEHICULAR ACTIVITY IN SPACE A66-80157

EYE MOVEMENT
VISUAL ACUITY DEFINITION AND CLINICAL MEASUREMENT OF RELEVANT FACTORS A66-13793

PHYSIOLOGICAL DATA FOR EVALUATION OF HEALTH AND WORK CAPABILITY OF ASTRONAUT DURING ORBITAL FLIGHTS A66-80369

APPARENT MOVEMENT PHENOMENA ON CATHODE RAY TUBE DISPLAYS - THRESHOLD DETERMINATIONS OF APPARENT MOVEMENTS OF PULSED LIGHT SOURCES NASA-CR-342 N66-12162

PROLONGED HOT OR COLD STIMULATION EFFECTS ON EYE MOVEMENTS, VESTIBULOSPINAL, AND SEGMENTAL SPINAL ACTIVITIES IN MONKEYS NASA-CR-68266 N66-12177

ELECTRONYSTAGNUS MEASUREMENT OF VERTICAL EYEBALL DISPLACEMENT TO INVESTIGATE CHINCHILLA VESTIBULAR SYSTEM RESPONSE TO VERTICAL LINEAR ACCELERATION GE/EE/65-6 N66-13814

F

FACE
HEART RATE AND FOREARM BLOOD FLOW OF MAN WITH AND WITHOUT BREATH HOLDING DURING FACE IMMERSION IN WATER A66-80210

FATIGUE /BIOL/
SWEAT GLAND FATIGUE AS REFLECTED BY SWEAT RATES AND RECTAL TEMPERATURES DURING EXPOSURE TO HOT ENVIRONMENT A66-80218

FLIGHT FATIGUE AND STRESS OF PILOTS AM-65-13 N66-13897

FATTY ACID
EFFECT OF CAFFEINE ON BLOOD SERUM FREE FATTY ACIDS IN NORMAL HUMAN SUBJECTS A66-80349

FECES
TWO TYPES OF PLUTONIUM EXPOSURE IN URINE, FECES, AND BLOOD OF HUMAN BODY, AND EFFECTIVENESS OF DIETHYLENTRIAMINEPENTAACETIC ACID TREATMENTS N66-12685

FISH
CHLORELLA AS SOURCE OF OXYGEN AND FOOD IN SHINER, NOTROPIS A66-80335

FISSION PRODUCT
FISSION PRODUCT INHALATION PROGRAM - GAMMA RAY DETECTION SYSTEM FOR BIOLOGICAL SAMPLES LF-28 N66-12581

ANALYTICAL DATA ON FISSION YIELD AND FISSION PRODUCT DECAY, AIR SAMPLING TECHNIQUES, RADIOCHEMICAL DETERMINATION OF RADIOISOTOPES IN WATER, FECES, AND URINE NYO-4700, SUPPL. 2 N66-13854

FLICKER FUSION FREQUENCY
REVIEW OF DATA ON VISUAL FLICKER FUSION AND INTERMITTENT STIMULATION A66-13792

- CRITICAL FLICKER FUSION FREQUENCY AS FUNCTION OF EXPOSURE TIME IN TWO DIFFERENT AGE GROUPS
A66-80285
- FLIGHT CONTROL**
MATHEMATICAL MODEL BASED ON CONTROL AND QUEUEING THEORY FOR HUMAN CONTROLLER FOR TURN-ROUND OPERATIONS ON AIRPORT APRON
A66-12886
- FLIGHT FITNESS**
DIAGNOSIS CRITERIA FOR GLAUCOMA IN PILOTS AND FLIGHT FITNESS.
A66-80205
- FLIGHT SAFETY**
PLANE CRASH AS RESULT OF PILOTS CORONARY DISEASE, DISCUSSING PREVENTION AND REHABILITATION
A66-14387
- HIGH ALTITUDE FLYING IN MILITARY AIR TRANSPORT SERVICE AND PROTECTIVE MEASURES FOR PILOT
A66-80338
- FLIGHT FATIGUE AND STRESS OF PILOTS
AM-65-13
N66-13897
- FLIGHT SIMULATION**
MONITORING HUMAN PERFORMANCE DURING MANNED ORBITAL FLIGHT FOR ASSESSMENT OF CENTRAL NERVOUS SYSTEM FUNCTION, NOTING ANIMAL STUDIES DURING SIMULATED STRESSES OF SPACE FLIGHT
A66-14088
- FLIGHT STRESS**
FLIGHT FATIGUE AND STRESS OF PILOTS
AM-65-13
N66-13897
- STRESS IMPOSED ON AIRCREW IN CIVIL JET AIRCRAFT DURING LONG FLIGHT
DLR-FB-65-44
N66-14261
- FLIGHT TRAINING**
AIRSICKNESS IN STUDENT AVIATORS DURING FLIGHT TRAINING AS RELATED TO VESTIBULAR AND VISUAL STIMULI AND ANXIETY
A66-80206
- FLOW MEASUREMENT**
COMPARISON OF METHODS OF BLOOD PRESSURE MEASUREMENTS AND PRESSURE FLOW DYNAMICS DURING VARIOUS CONDITIONS OF PHYSICAL EXERCISE
A66-80244
- FLUID**
THERMAL AND ELECTRIC CONDUCTIVITY OF BODY FLUIDS AND TISSUES
GLR-37
N66-12592
- FLUORESCENT EMISSION**
FLUORESCENT EMISSION FROM CAT CEREBRAL CORTEX
AMRL-TR-65-88
N66-12385
- FLYING**
VISUAL PROBLEMS ASSOCIATED WITH LOW ALTITUDE FLIGHT
A66-80357
- FLYING PERSONNEL**
METHODS FOR SOMATIC CLASSIFICATION OF PILOTS OF DIFFERENT AGES ACCORDING TO STATUS OF FUNCTIONAL MUSCULAR, CIRCULATORY, AND RESPIRATORY CAPACITIES AS RELATED TO TRAINING
A66-80164
- DIAGNOSIS CRITERIA FOR GLAUCOMA IN PILOTS AND FLIGHT FITNESS.
A66-80205
- HYPOGLYCEMIA IN FLYING PERSONNEL - CASE HISTORIES
A66-80358
- THERMOREGULATION - HEAT EXCHANGE IN FLYING PERSONNEL RELATED TO ALTITUDE AND AIRCRAFT VELOCITY
A66-80359
- FRENCH DEVELOPED PROTECTIVE CLOTHING FOR FLYING PERSONNEL AGAINST HIGH ENVIRONMENTAL TEMPERATURES
A66-80360
- NUTRITIONAL PROBLEMS OF SUGAR REGULATION IN AVIATION MEDICINE - HYPERGLYCEMIA IN RATS AND SURV OF NUTRITIONAL HABITS OF FLYING PERSONNEL
A66-80361
- SOME ELECTROCARDIOGRAPHIC ABNORMALITIES AND PHYSICAL FITNESS OF FLYING PERSONNEL
A66-80362
- GASTRODUODENAL ULCERS IN FRENCH AIR FORCE PERSONNEL - STATISTICAL ANALYSIS
A66-80363
- FOOD**
CHLORELLA AS SOURCE OF OXYGEN AND FOOD IN SHINER, NITROPIIS
A66-80335
- WEIGHT GAIN AND FEED EFFICIENCY IN WEANLING, HEALTHY PIG AS AFFECTED BY EXPOSURE TO NEGATIVE AIR IONIZATION FOR DIFFERENT DURATIONS
A66-80406
- BIOCHEMICAL PROBLEMS PERTINENT TO FOOD INDUSTRY AND NUTRITION
N66-12636
- SUITABILITY OF TEXTUROMETER FOR MEAT TEXTURE DESCRIPTION - HARDNESS, COHESIVENESS, ELASTICITY, CHEWINESS, AND WATER RELEASE OF FRESH AND FREEZE DEHYDRATED MEATS
FD-17
N66-14020
- FOOD INTAKE**
FOOD INTAKE, BODY WEIGHT, AND ACTIVITY OF RAT EXERCISING IN HOT ENVIRONMENT
A66-80220
- FORM PERCEPTION**
VISUAL PERCEPTION OF FORMS AND RELEVANT FACTORS
A66-13796
- FREE RADICAL**
INDUCED FREE RADICALS IN ENZYMES BY ELECTRONS AND HEAVY IONS
UCRL-16358
N66-13907
- FREEZING**
HISTOCHEMICAL USE OF FRESH CUT TISSUE SHEET - CUT SHEET ATTACHMENT IN LOW TEMPERATURE CRYOSTAT, AND FREEZING AND CUTTING TECHNIQUE
N66-12371
- SUITABILITY OF TEXTUROMETER FOR MEAT TEXTURE DESCRIPTION - HARDNESS, COHESIVENESS, ELASTICITY, CHEWINESS, AND WATER RELEASE OF FRESH AND FREEZE DEHYDRATED MEATS
FD-17
N66-14020
- FREON 12**
HANDGEAR INSULATION EFFECTIVENESS OF FREON 12, CARBON DIOXIDE, AND HELIUM
A66-80227
- FROG**
EMBRYONIC DEVELOPMENT OF CHICK AND FROG EGGS AND RESPIRATION OF CHICKEN AND MOUSE IN SIMULATED SPACE CABIN ATMOSPHERE CONSISTING OF HELIUM AND OXYGEN
A66-80315
- FUNCTION TEST**
METHODS FOR SOMATIC CLASSIFICATION OF PILOTS OF DIFFERENT AGES ACCORDING TO STATUS OF FUNCTIONAL MUSCULAR, CIRCULATORY, AND RESPIRATORY CAPACITIES AS RELATED TO TRAINING
A66-80164
- VALIDITY OF OCULOGRAVIC ILLUSION AS SPECIFIC INDICATOR OF OTOLITH FUNCTION
A66-80200
- KINETICS OF OXYGEN UPTAKE BY ERYTHROCYTES OF DIFFERENT AGES AS RELATED TO RESPIRATORY FUNCTION OF BLOOD
A66-80229
- G**
- G FORCE**
PERCEPTION OF APPARENT VERTICAL WITHOUT VISUAL CUES DEPENDING ON LONGITUDINAL AXES OF BODY AND HEAD TO DIRECTION OF RESULTANT ACCELERATION ABOVE 1 G
A66-14086
- GAMMA RADIATION**
RADIATION PROTECTION OF ANIMALS BY VARIOUS DRUGS DURING EXPOSURE TO GAMMA, PROTON, AND X-RAY IRRADIATION AS RELATED TO RELATIVE BIOLOGICAL EFFECT
A66-80311
- RADIOPROTECTIVE EFFECT OF VARIOUS DRUGS AGAINST X - RAYS AND GAMMA RAYS DURING PROTON IRRADIATION

- MICE A66-80381 A66-80228
- SURVIVAL DURING SCREENING OF VARIOUS AREAS OF RAT BODY TO GAMMA RAYS AND HIGH ENERGY PROTONS AS AFFECTED BY VIBRATION OR ACCELERATION STRESS A66-80382
- PROTON AND GAMMA IRRADIATION EFFECTS ON SPLEEN, THYMUS AND BONE MARROW IN MICE A66-80383
- BIOLOGICAL EFFECT IN MOUSE OF GAMMA IRRADIATION AS AFFECTED BY SOLAR FLARE, RADIOPROTECTIVE DRUGS, AND ACCELERATION STRESS DURING SIMULATION OF RADIATION CONDITIONS OF SPACEFLIGHT A66-80402
- COMPARISON OF BIOLOGICAL EFFECTS OF PROTON, X-RAY, AND GAMMA IRRADIATIONS ON DOGS AND WHITE RATS N66-12460
- FISSION PRODUCT INHALATION PROGRAM - GAMMA RAY DETECTION SYSTEM FOR BIOLOGICAL SAMPLES LF-28 N66-12581
- LABORATORY APPARATUS FOR BIOLOGICAL EXPERIMENT GAMMA RADIATION SOURCES JPRS 32704 N66-13245
- DOMINANT LETHALS IN DROSOPHILA MALES EXPOSED TO VIBRATION, ACCELERATION, AND GAMMA IRRADIATION DURING SPACE FLIGHTS N66-13790
- EFFECTS OF IONIZING X- AND GAMMA RADIATION ON DEOXYRIBONUCLEIC ACID EUR-2471.F N66-14092
- GAS EXCHANGE**
- ALVEOLAR NITROGEN CONCENTRATION AND ENVIRONMENTAL PRESSURE INFLUENCE UPON RATE OF GAS ABSORPTION FROM NONVENTILATED LUNG IN DOG A66-12357
- PULMONARY GAS EXCHANGE IN DOGS DURING LIQUID BREATHING UNDER HYPERBARIC OXYGENATION A66-80230
- CALCULATIONS ON GAS EXCHANGE VOLUMES IN MAN UNDER RAREFIED ATMOSPHERIC CONDITIONS JPRS-33057 N66-13423
- GAS EXPANSION**
- FEASIBILITY OF USING ENERGY IN BREATHING OXYGEN WHEN EXPANDED FROM STORAGE PRESSURE TO BREATHING PRESSURE TO POWER OXYGEN-CIRCULATING BLOWER AND WATER CIRCULATING PUMP AMRL-TR-65-128 N66-13595
- GASTROINTESTINAL SYSTEM**
- PATHOLOGICAL EFFECTS OF X-RAY IRRADIATION ON GASTROINTESTINAL SYSTEM IN DOGS - RADIATION SICKNESS FTD-TT-64-910/1&2&3&4 N66-12607
- GENETICS**
- HUMAN CELLS AND GENETIC CHANGES IN ESCHERICHIA DURING EXPOSURE STRESSES OF SPACE FLIGHT ON VOSTOK SPACECRAFT A66-80372
- GEOCHEMISTRY**
- BIOLOGIC-TYPE ALKANES OF INDIGENOUS ORIGIN MORE THAN 2.7 BILLION YEARS OLD PRESENT IN PRECAMBRIAN ROCKS OF SOUDAN FORMATION A66-12366
- GEOMETRY**
- EQUATIONS OF MOTION IN CIRCULAR MOTION TERMS FOR LIMACON CURVE - GEOMETRY - VESTIBULAR EFFECT ON HUMANS MOVING ALONG LIMACON NADC-ML-6507 N66-14197
- GLAUCOMA**
- DIAGNOSIS CRITERIA FOR GLAUCOMA IN PILOTS AND FLIGHT FITNESS. A66-80205
- GNOTOBIOTICS**
- MECHANICAL PROPERTIES OF LUNG IN PATHOGEN FREE AND NORMAL RATS A66-80237
- GRAPH**
- DETERMINATION OF MALE AND FEMALE BODY VOLUME FROM HEIGHT AND WEIGHT USING GRAPHICAL METHOD
- GRAVITATIONAL EFFECT**
- GRAVITY EFFECT ON HEMODYNAMIC FACTORS AND SODIUM AND WATER EXCRETION IN TWO DOGS SUBJECTED TO CHANGE FROM SUPINE TO ERECT POSITION AND WATER IMMERSION A66-12352
- MEASUREMENT OF OTOLITH ACTIVITY AS INDICATED BY OCULAR COUNTERROLLING IN RESPONSE TO BODY TILT WITHIN FORCE FIELD OF ZERO G, ONE-HALF G, AND STANDARD G - EXTRALABYRINTHINE FACTORS NASA-CR-68391 N66-13097
- WATER IMMERSION TECHNIQUE FOR SIMULATING ZERO GRAVITY MOBILITY PERFORMANCE OF ASTRONAUT IN PRESSURIZED SPACESUIT NASA-TN-D-3054 N66-14151
- GRAVITY**
- MODEL OF VESTIBULAR APPARATUS DEMONSTRATING ITS FUNCTIONS UNDER CONDITIONS OF VARIABLE GRAVITATIONAL FIELD A66-80327
- GROUND CREW**
- TOLERANCE OF JET AND ROCKET ENGINE EXHAUST NOISE AND EAR PROTECTION DEVICES FOR PILOTS AND GROUND CREWS NASA-TT-F-9799 N66-13297
- GROUP BEHAVIOR**
- SIMPLE PATTERN RECOGNITION IN SMALL GROUP SITUATION A66-80181
- EXPERIMENTAL PSYCHOLOGICAL EXAMINATION OF COSMONAUTS A66-80298
- GROUP THEORY**
- EFFECTS OF ORGANIZATIONAL AFFILIATION ON HIGH ENERGY PHYSICS RESEARCH GROUPS - PSYCHOLOGICAL FACTOR OF GROUP BEHAVIOR NASA-CR-68303 N66-12994
- GROWTH**
- PREDICTING PRODUCTION IN LIGHT LIMITED CONTINUOUS CULTURES OF ALGAE, CHLORELLA PYRENOIDOSA AND DUNALIELLA TERTIOLECTA A66-80351
- ILLUMINATION AND CELL DENSITY EFFECTS ON GROWTH RATE OF CHLORELLA VULGARIS CULTURE A66-80400
- GUINEA PIG**
- ROLE OF ADIPOSE TISSUE OF WELL-FED AND STARVED GUINEA PIGS IN DECOMPRESSION SICKNESS A66-80294
- INHALATION STUDY OF NEODYMIUM OXIDE PATHOGENESIS IN MICE AND GUINEA PIGS - ANIMAL STUDY COO-1170-4 N66-12951
- GULLIVER PROGRAM**
- FUTURE OF ENVIRONMENTAL BIOLOGY, DISCUSSING SPACE RESEARCH ON LIVING ORGANISMS IN EXTRATERRESTRIAL ENVIRONMENT A66-14069
- GUST LOAD**
- VIBRATION EXPOSURE WITH VARYING PEAK AND RMS ACCELERATION AND FREQUENCY IN LOW ALTITUDE HIGH-SPEED FLIGHT A66-13355
- H**
- HABITUATION**
- AUTONOMIC COMPONENTS OF HUMAN ORIENTING BEHAVIOR IN RESPONSE TO WHITE NOISE A66-80275
- ACTIVE SELECTION OF AIR WITH VARIOUS OXYGEN CONTENT BY MICE PREVIOUSLY EXPOSED IN CHAMBER TO NORMAL CONDITIONS AND AIR WITH HIGH OXYGEN CONTENT A66-80325
- HAND**
- SHORT-TERM MEMORY, CHOICE REACTION TIME, AND HAND STEADINESS OF EXERCISING AND RESTING SUBJECTS IN RESPONSE TO EPINEPHRINE OR INSULIN ADMINISTRATION A66-80201
- HANDGEAR INSULATION EFFECTIVENESS OF FREON 12,

- CARBON DIOXIDE, AND HELIUM A66-80227
- HANDLING QUALITY**
THREE INDEPENDENT SYSTEMS OF MATRIX EQUATIONS FOR SOLVING TRANSFER FUNCTION OF MULTIPARAMETER LINEAR SYSTEM HANDLING BY HUMAN OPERATOR A66-12699
- HAZARD**
HAZARDS TO HUMAN EAR FROM SHOCK WAVES OF HIGH ENERGY ELECTRIC DISCHARGES AWRE-E-1/65 N66-13711
- HEARING**
NEW THEORY OF FUNCTIONAL MECHANISM OF LABYRINTHINE EPITHELIUM A66-80403
- HEARING LOSS**
HIGH NOISE LEVELS EFFECT ON HEARING DAMAGE OF TECHNICAL PERSONNEL OF MILITARY AIRFIELD A66-14386
- HEART**
MOTOR RESTRAINT EFFECT ON BEHAVIOR RESPIRATION, HEART FUNCTION, AND BRAIN BIOELECTRIC ACTIVITY IN MONKEY A66-80376
- HEART DISEASE**
PLANE CRASH AS RESULT OF PILOTS CORONARY DISEASE, DISCUSSING PREVENTION AND REHABILITATION A66-14387
- SOME ELECTROCARDIOGRAPHIC ABNORMALITIES AND PHYSICAL FITNESS OF FLYING PERSONNEL A66-80362
- HEART FUNCTION**
SYMPATHETIC NERVOUS STIMULATION OF HEART - BETA ADRENERGIC BLOCKING CARDIAC FUNCTION, CIRCULATORY RESPONSE AND PHYSICAL EXERCISE A66-80147
- AVOIDING MUSCULAR ATROPHY AND HEMOGLOBIN LOSS IN PROTRACTED WEIGHTLESSNESS THROUGH PHYSICAL EXERCISE A66-80158
- ROLE OF HYPOCAPNIA IN CARDIAC OUTPUT, HEART RATE AND BLOOD PRESSURE RESPONSES TO ACUTE HYPOXIA IN MAN A66-80209
- INFLUENCE OF AGE ON CARDIOVASCULAR AND RENAL RESPONSES TO TILTING A66-80213
- HEART RATE AND OUTPUT AND BODY TEMPERATURE OF ACCLIMATIZED MALE DURING EXERCISE IN HOT ENVIRONMENT A66-80219
- CORIOLIS ACCELERATION EFFECT ON HUMAN HEART A66-80317
- CARDIAC METABOLISM AT REST AND DURING HEART ARREST A66-80345
- REFLEX EFFECTS OF CEPHALIC HYPOXIA, HYPERCAPNIA, AND ISCHEMIA UPON VENTRICULAR CONTRACTILITY IN DOGS. A66-80350
- EFFECT OF SPACE FLIGHT FACTORS ON HEART ACTIVITY, RESPIRATION AND ELECTROENCEPHALOGRAM OF ASTRONAUTS B. F. BYKOVSKII AND V. V. TERESHKOVA A66-80370
- RESTORATION OF CONTRACTILITY, RESUMPTION OF HEMODYNAMICS, AND TRANSPLANTATION PROSPECTS IN HUMAN AND ANIMAL HEARTS NASA-TT-F-404 N66-12263
- HEART RATE**
ROLE OF HYPOCAPNIA IN CARDIAC OUTPUT, HEART RATE AND BLOOD PRESSURE RESPONSES TO ACUTE HYPOXIA IN MAN A66-80209
- HEART RATE AND FOREARM BLOOD FLOW OF MAN WITH AND WITHOUT BREATH HOLDING DURING FACE IMMERSION IN WATER A66-80210
- VENTILATION, HEART RATE, LACTATE FORMATION, AND OXYGEN CONSUMPTION DURING ARM AND LEG EXERCISE IN SUPINE AND SITTING POSITION A66-80211
- COMPARISON OF HUMAN RESPONSES TO PULSED AND UNPULSED ENVIRONMENTAL HEAT AND PHYSICAL EXERCISE A66-80222
- HISTOLOGICAL CHANGES IN OVARIES AND RESISTANCE TO TRANSVERSE ACCELERATION REVEALED BY CARDIOVASCULAR AND RESPIRATORY ACTIVITY OF YOUNG FEMALE MONKEYS A66-80378
- CHANGES IN MYOCARDIAL OXYGEN PRESSURE OF DOGS DURING ASCENT AND ACCELERATION DETERMINED BY POLAROGRAPHIC ELECTRODES IMPLANTED IN HEART MUSCLES JPRS-33066 N66-12271
- PRECEDING POSTURE AND AMBIENT TEMPERATURE EFFECTS ON HEART AND BLOOD CIRCULATION ACCELERATION AT INITIATION OF EXERCISE CRDLR-3268 N66-12827
- ENVIRONMENTAL TEMPERATURE EFFECTS ON EKG OF SQUIRREL MONKEY - ANIMAL STUDY OF HEART RATE AND T-WAVE AMPLITUDE NASA-CR-68306 N66-12972
- HEAT**
STATISTICAL ANALYSIS OF HEAT SYNDROME CAUSES - ENVIRONMENTAL AND HUMAN FACTORS, AND PREVENTION AND ALLEVIATION IN CIVIL DEFENSE SHELTERS AND IN EMERGENCY SITUATIONS AD-623578 N66-13007
- HEAT ACCLIMATIZATION**
HEART RATE AND OUTPUT AND BODY TEMPERATURE OF ACCLIMATIZED MALE DURING EXERCISE IN HOT ENVIRONMENT A66-80219
- ACCLIMATIZATION AND SWEATING-EFFECT OF DRUGS AND THERMAL STRESS A66-80248
- HEAT EXCHANGER**
HEAT LOSS IN SPACE, DISCUSSING TEMPERATURE REGULATION DURING SPACE WALK VIA HEAT EXCHANGERS IN AIR VENTILATED SPACE SUIT A66-14070
- THERMOREGULATION - HEAT EXCHANGE IN FLYING PERSONNEL RELATED TO ALTITUDE AND AIRCRAFT VELOCITY A66-80359
- HEAT RESISTANCE**
CLEAN ROOM BACTERIOLOGY - HEAT RESISTANCE OF SPORE FORMERS, MICROORGANISM IDENTIFICATIONS, HUMAN CONTACT CONTAMINATION NASA-CR-68729 N66-13553
- HEAT TOLERANCE**
UPPER THERMAL TOLERANCE LIMITS FOR UNIMPAIRED MENTAL PERFORMANCE A66-12359
- HEAVY ION**
INDUCED FREE RADICALS IN ENZYMES BY ELECTRONS AND HEAVY IONS UCRL-16358 N66-13907
- HELIUM**
VERBAL COMMUNICATION INTELLIGIBILITY IN OXYGEN-HELIUM AND OTHER BREATHING MIXTURES IN LOW PRESSURE CHAMBER A66-80199
- HANDGEAR INSULATION EFFECTIVENESS OF FREON 12, CARBON DIOXIDE, AND HELIUM A66-80227
- DISTRIBUTION FUNCTION OF HELIUM CLEARANCE TIME CONSTANT IN HEALTHY AND DISEASED LUNGS OF HUMAN SUBJECTS A66-80232
- EMBRYONIC DEVELOPMENT OF CHICK AND FROG EGGS AND RESPIRATION OF CHICKEN AND MOUSE IN SIMULATED SPACE CABIN ATMOSPHERE CONSISTING OF HELIUM AND OXYGEN A66-80315
- HEMATOPOIETIC SYSTEM**
PULSED MICROWAVE IRRADIATION OF DOGS NOTING BODY WEIGHT, RECTAL TEMPERATURE AND HEMATOLOGIC RESPONSE A66-13351
- PARTIAL CANINE BODY EXPOSURE TO IONIZATION RADIATION NOTING ANOREXIA, WEIGHT LOSS, VOMITING AND HYPERSIALOSIS DUE TO 1000 KVP X-RAY EXPOSURE

- A66-13352
- HEMODYNAMIC RESPONSE**
GRAVITY EFFECT ON HEMODYNAMIC FACTORS AND SODIUM AND WATER EXCRETION IN TWO DOGS SUBJECTED TO CHANGE FROM SUPINE TO ERECT POSITION AND WATER IMMERSION A66-12352
- RESTORATION OF CONTRACTILITY, RESUMPTION OF HEMODYNAMICS, AND TRANSPLANTATION PROSPECTS IN HUMAN AND ANIMAL HEARTS
NASA-TT-F-404 N66-12263
- HEMOGLOBIN**
AVOIDING MUSCULAR ATROPHY AND HEMOGLOBIN LOSS IN PROTRACTED WEIGHTLESSNESS THROUGH PHYSICAL EXERCISE A66-80158
- PARTIAL PRESSURE OF OXYGEN AND CARBON DIOXIDE, HYDROGEN ION CONCENTRATION, HEMOGLOBIN SATURATION, AND TEMPERATURE OF DOG BLOOD ANALYZED USING DIGITAL COMPUTER
SAM-TR-65-39 N66-13209
- HEMOLYSIS**
MECHANISM OF IN VIVO RBC DAMAGE BY OXYGEN, NOTING EFFECT ON CANINE ERYTHROCYTES A66-13348
- ANTIBODY PLAQUE FORMING CELLS - KINETICS OF PRIMARY AND SECONDARY IMMUNE HEMOLYSIS RESPONSE
USNRDL-897 N66-14207
- HIGH ALTITUDE**
ULTRAVIOLET RADIATION EFFECTS ON VARIOUS FLOWERING PLANTS UNDER NEAR SPACE CONDITIONS SUCH AS ARCTIC AND HIGH ALTITUDE A66-80324
- HIGH ALTITUDE FLYING**
HIGH ALTITUDE FLYING IN MILITARY AIR TRANSPORT SERVICE AND PROTECTIVE MEASURES FOR PILOT A66-80338
- HIGH PRESSURE OXYGEN**
PULMONARY GAS EXCHANGE IN DOGS DURING LIQUID BREATHING UNDER HYPERBARIC OXYGENATION A66-80230
- SUCCINATE-PROTECTIVE AGENT AGAINST HIGH PRESSURE OXYGEN TOXICITY IN RAT A66-80365
- HIGH TEMPERATURE ENVIRONMENT**
WATER CONSUMPTION BY MAN IN WARM ENVIRONMENT ANALYZED STATISTICALLY AND RELATED TO METABOLIC VARIABLES A66-80216
- SWEAT GLAND FATIGUE AS REFLECTED BY SWEAT RATES AND RECTAL TEMPERATURES DURING EXPOSURE TO HOT ENVIRONMENT A66-80218
- FOOD INTAKE, BODY WEIGHT, AND ACTIVITY OF RAT EXERCISING IN HOT ENVIRONMENT A66-80220
- COMPARISON OF HUMAN RESPONSES TO PULSED AND UNPULSED ENVIRONMENTAL HEAT AND PHYSICAL EXERCISE A66-80222
- DERMATOLOGICAL CONDITIONS OF HUMAN SKIN AS RESULTS OF HEAT AND HUMIDITY A66-80247
- VASCULAR AND SWEATING RESPONSES OF MAN TO VARYING TEMPERATURE EXPOSURES A66-80250
- SEX DIFFERENCES, INCIDENCE, REVERSAL, AND PREVENTION OF HIDROMEIOSIS-DECREMENT OF RATE OF THERMALLY INDUCED SWEATING A66-80251
- INCIDENCE, MORPHOLOGY, AND ETIOLOGY OF MILIARIA OCCURRING DURING EXPOSURE TO HOT ENVIRONMENT A66-80253
- PHARMACOLOGICALLY ACTIVE AND LETHAL SUBSTANCES RELEASED FROM THERMALLY INJURED SKIN OF HUMAN AND ANIMAL SUBJECTS INCLUDING HISTAMINE, BRADYKININ, ADENYLIC COMPOUNDS, AND POSSIBLY SEROTONIN A66-80254
- ULTRAVIOLET INJURY IN MOUSE AS AFFECTED BY HOT ENVIRONMENT A66-80255
- RESPONSE OF HUMAN EPIDERMIS TO GRADED THERMAL AND COLD STRESS. A66-80257
- FRENCH DEVELOPED PROTECTIVE CLOTHING FOR FLYING PERSONNEL AGAINST HIGH ENVIRONMENTAL TEMPERATURES A66-80360
- HIGH VACUUM**
SPACE RELATED MOLECULAR BIOLOGY AND MOLECULAR ORGANIZATION OF EXTRATERRESTRIAL MATTER - DESIGN AND CONSTRUCTION OF HIGH VACUUM CONTAINER FOR TRANSFER OF EXTRATERRESTRIAL COLLECTING SURFACES
NASA-CR-68844 N66-13830
- HISTAMINE**
PHARMACOLOGICALLY ACTIVE AND LETHAL SUBSTANCES RELEASED FROM THERMALLY INJURED SKIN OF HUMAN AND ANIMAL SUBJECTS INCLUDING HISTAMINE, BRADYKININ, ADENYLIC COMPOUNDS, AND POSSIBLY SEROTONIN A66-80254
- HISTOLOGY**
HISTOLOGICAL CHANGES IN OVARIES AND RESISTANCE TO TRANSVERSE ACCELERATION REVEALED BY CARDIOVASCULAR AND RESPIRATORY ACTIVITY OF YOUNG FEMALE MONKEYS A66-80378
- HISTOCHEMICAL USE OF FRESH CUT TISSUE SHEET - CUT SHEET ATTACHMENT IN LOW TEMPERATURE CRYOSTAT, AND FREEZING AND CUTTING TECHNIQUE N66-12371
- HISTORY**
TECHNOLOGICAL AND BIOLOGICAL CONTRIBUTIONS OF SOVIET UNION TO SPACE EXPLORATION A66-80155
- HISTORY OF ASTRONAUT SELECTION PROCEDURES AS RELATED TO SELECTION OF SCIENTISTS BECOMING MEMBERS OF SPACECREW A66-80187
- USAF AIRCRAFT ACCIDENTS INVOLVING TEN OR MORE FATALITIES FOR 1953 TO 1962 PERIOD IN RELATION TO ACCIDENT PREVENTION PROGRAM A66-80197
- HORMONE**
EFFECT OF GLUCAGON ON BLOOD SUGAR AND INORGANIC PHOSPHORUS LEVELS IN NORMOTHERMIC AND HYPOTHERMIC RATS A66-80245
- HORMONE METABOLISM**
DEGREE OF MENTAL STRESS CORRELATED WITH EXCRETION OF CATECHOLAMINE, FREE ADRENALINE AND NORADRENALINE IN URINE A66-14081
- EVALUATION OF STRESS BY QUANTITATIVE CATECHOLAMINE A66-80162
- ENDOCRINE AND METABOLIC RESPONSE OF DOGS TO WHOLE BODY VIBRATION A66-80194
- PHYSIOLOGICAL ROLE OF ADRENAL MEDULLA IN PALMAR ANHIDROTIC RESPONSE TO STRESS A66-80215
- CHANGES IN SERUM PROTEIN-IODINE IN MEN EXPOSED TO POLAR CLIMATE A66-80293
- HUMAN**
CALCIUM-45 AND STRONTIUM-85 METABOLISM IN HUMANS
COO-587-2 N66-13061
- ADVANCED CONCEPTS IN BIOTECHNOLOGY, HUMAN ANALOGS, AND BIONICS
NASA-CR-68777 N66-13831
- HUMAN BEHAVIOR**
TELLING COMPUTER HOW TO EVALUATE MULTIDIMENSIONAL SITUATIONS AND TERMINOLOGY AND STATISTICS FOR DETERMINING PERFORMANCE OF DECISION MAKER A66-80184
- EFFECTS OF ORGANIZATIONAL AFFILIATION ON HIGH ENERGY PHYSICS RESEARCH GROUPS - PSYCHOLOGICAL FACTOR OF GROUP BEHAVIOR
NASA-CR-68303 N66-12994
- HUMAN BODY**
RESTORATION OF CONTRACTILITY, RESUMPTION OF HEMODYNAMICS, AND TRANSPLANTATION PROSPECTS IN

SUBJECT INDEX

HYDRATION

HUMAN AND ANIMAL HEARTS
NASA-TT-F-404 N66-12263

DETERMINATION OF PROPAGATION VELOCITY OF PULSE WAVES FROM HUMAN ARTERIES BY CONVERTING MECHANICAL VIBRATIONS INTO ELECTRICAL OSCILLATIONS
NASA-TT-F-407 N66-12346

WHOLE BODY DEPOSITION OF PARTICLES AS FUNCTION OF VARIOUS PHYSICAL AND CHEMICAL PARAMETERS
N66-12684

TWO TYPES OF PLUTONIUM EXPOSURE IN URINE, FECES, AND BLOOD OF HUMAN BODY, AND EFFECTIVENESS OF DIETHYLENTRIAMINEPENTAACETIC ACID TREATMENTS
N66-12685

METABOLISM AND EXCRETION OF CESIUM, PHOSPHORUS, PLUTONIUM, TRITIUM AND RADIATION, STRONTIUM, SULFUR, TRITIUM AND URANIUM FROM HUMAN BODY
N66-12686

URANIUM CONTENT IN HUMAN DIET - BONE, TISSUE, AND OTHER ORGANS OF BODY
N66-12689

HUMAN CENTRIFUGE
COMPARISON OF EFFECTIVENESS OF ANTIMOTION SICKNESS DRUGS TESTED IN HUMAN CENTRIFUGE
NASA-CR-68858 N66-13833

HUMAN ENGINEERING
MAN-MACHINE RELATIONSHIP DURING SPACE FLIGHT
A66-14085

HUMAN FACTORS EVALUATION OF COMMUNICATIONS EQUIPMENT SWITCH ACTUATORS UNDER SIMULATED SPACE CRAFT AND ORDINARY CONDITIONS
A66-80148

HANDGEAR INSULATION EFFECTIVENESS OF FREON 12, CARBON DIOXIDE, AND HELIUM
A66-80227

DESIGN CRITERIA FOR CREW STATIONS AS RELATED TO CREW MEMBER EGRESS FROM SINGLE PLACE PILOT STATION IN WEIGHTLESS ENVIRONMENT - HUMAN ENGINEERING AND FLIGHT DYNAMICS
AFFDL-TR-65-148 N66-13978

HUMAN FACTOR
HUMAN FACTORS IN CONCORDE SST PROGRAM
A66-13357

ENERGY PATTERNS FROM SPACE ACCESSIBLE TO HUMAN SENSES THROUGH DATA SENSORS AND INFORMATION ACQUISITION
A66-14093

HUMAN FACTORS INFORMATION REQUIREMENTS FOR SPACE SYSTEM DEVELOPMENT
NASA-CR-68230 N66-12959

STATISTICAL ANALYSIS OF HEAT SYNDROME CAUSES - ENVIRONMENTAL AND HUMAN FACTORS, AND PREVENTION AND ALLEVIATION IN CIVIL DEFENSE SHELTERS AND IN EMERGENCY SITUATIONS
AD-623578 N66-13007

HUMAN FACTORS INFORMATION REQUIREMENTS FOR SPACE SYSTEMS ENGINEERING - SURVEY AND BIBLIOGRAPHY
NASA-CR-68616 N66-13331

HUMAN PERFORMANCE
UPPER THERMAL TOLERANCE LIMITS FOR UNIMPAIRED MENTAL PERFORMANCE
A66-12359

HUMAN PERCEPTUAL MECHANISM DEFINED BY PSYCHOLOGICAL RESEARCH AND APPLIED TO AIRCRAFT COCKPIT DISPLAY DESIGN
A66-12883

MATHEMATICAL MODEL BASED ON CONTROL AND QUEUEING THEORY FOR HUMAN CONTROLLER FOR TURN-ROUND OPERATIONS ON AIRPORT APRON
A66-12886

MONITORING HUMAN PERFORMANCE DURING MANNED ORBITAL FLIGHT FOR ASSESSMENT OF CENTRAL NERVOUS SYSTEM FUNCTION, NOTING ANIMAL STUDIES DURING SIMULATED STRESSES OF SPACE FLIGHT
A66-14088

MATHEMATICAL MODEL OF HUMAN COMPENSATORY TRACKING BEHAVIOR
A66-80149

HUMAN USE OF SHORT-TERM MEMORY IN PROCESSING INFORMATION ON COMPUTER CONSOLE
A66-80151

THEORY FOR DETERMINISTIC CHARACTERIZATION OF TIME VARYING DYNAMICS OF HUMAN OPERATOR PERFORMANCE TRACKING TASK.
A66-80185

HUMAN PERFORMANCE AND LIFE SUPPORT SYSTEMS IN SPACE MONITORED BY DIGITAL COMPUTER WHICH CAN SIMULATE CLINICAL LOGIC - BIOASTRONAUTICS
N66-12219

DIAL READING ABILITY OF SPACECRAFT CREW DURING PROLONGED ACCELERATION AND VIBRATION
AMRL-TR-65-110 N66-12376

COMPARISON OF CROSS CORRELATION AND ORTHOGONALIZED EXPONENTIAL ANALYSES BY REGRESSION ANALYSIS FOR IDENTIFICATION OF HUMAN PILOT DYNAMIC RESPONSE CHARACTERISTICS
NASA-CR-68701 N66-13516

FLIGHT FATIGUE AND STRESS OF PILOTS
AM-65-13 N66-13897

DETECTION OF COMPOUND MOTION IN TWO-TARGET COLLISION PREDICTION SITUATION
SP-1946/001/00 N66-14021

RESEARCH TECHNIQUE USED IN MEASUREMENT OF HUMAN PERFORMANCE UNDER LOW OR ZERO GRAVITY CONDITIONS
AD-620931 N66-14029

HUMAN PERFORMANCE CHARACTERISTICS IN MANUAL CONTROL TASKS, AND TECHNIQUES FOR DATA ANALYSIS AND SYSTEMS SIMULATION
NASA-CR-68981 N66-14290

HUMAN REACTION
METABOLISM AND ENERGY EXCHANGE BALANCE TESTS IN RESPIRATION CALORIMETER TO DETERMINE RELATION BETWEEN BODY TEMPERATURE AND FLUCTUATIONS OF OTHER BODY FUNCTIONS
NASA-TT-F-9796 N66-13484

HUMAN TOLERANCE
HEAT STRESS AND MINIMAL DEHYDRATION EFFECT UPON HUMAN TOLERANCE TO POSITIVE ACCELERATION
A66-12353

HUMAN TOLERANCE LIMITS IN WATER IMPACT, IDENTIFYING ENVIRONMENTAL AND TRAUMA CHARACTERISTICS
A66-12356

BIOLOGICAL STRESSES OF MANNED SPACE FLIGHT IN LIMITING FLIGHT DURATION, NOTING ISOLATION EFFECT
A66-13507

BREATHING MECHANICS DURING TRANSVERSE ACCELERATION, DISCUSSING EXPERIMENTS AND MEASUREMENTS MADE ON MAN
A66-14075

HUMAN STRESS REACTIONS TO THREE-DAY MARCH, SLEEP DEPRIVATION, FOOD AND OXYGEN STARVATION, NOTING CHANGES IN CENTRAL NERVOUS SYSTEM FUNCTIONS
A66-14080

HIGH NOISE LEVELS EFFECT ON HEARING DAMAGE OF TECHNICAL PERSONNEL OF MILITARY AIRFIELD
A66-14386

AEROSPACE MEDICINE - COMPRESSION DEFORMITIES OF THORACIS VERTEBRAE IN HUMAN TOLERANCE TEST DURING EXPOSURE TO SIMULATED ESCAPE SYSTEM ROCKET THRUST VECTOR
AMRL-TR-65-134 N66-12885

HUMIDITY
DERMATOLOGICAL CONDITIONS OF HUMAN SKIN AS RESULTS OF HEAT AND HUMIDITY
A66-80247

HYDRATION
HYDRATION DURING BED REST IN RESPONSE TO LOWER BODY NEGATIVE PRESSURE AS RELATED TO MANNED SPACE FLIGHT
A66-80195

TEMPERATURE AND HYDRATION FACTORS AFFECTING CUTANEOUS BARRIERS TO PENETRATION

- A66-80263
- HYGIENE**
SKIN FUNCTION AND PROCESSES IN VITAL ACTIVITY AS RELATED TO PERSONAL HYGIENE DURING EXPOSURE TO SPACE FLIGHT STRESSES A66-80312
- HYPERCAPNIA**
EFFECTS OF COLD AND ABNORMAL ATMOSPHERE DISCUSSING TOLERANCE LIMITS TO HYPERCAPNIA, ANOXIA INDUCED HYPOTHERMIA AND HYPOXIA A66-14067
REFLEX EFFECTS OF CEPHALIC HYPOXIA, HYPERCAPNIA, AND ISCHEMIA UPON VENTRICULAR CONTRACTILITY IN DOGS. A66-80350
- HYPERTENSIN**
RENAL CIRCULATION OF DOG AS AFFECTED BY ANGIOTENSIN A66-80404
- HYPERVERTILATION**
ADJUSTMENT IN NORMAL SUBJECTS OF ARTERIAL CARBON DIOXIDE TENSION FOLLOWING HYPERVENTILATION. A66-80235
- HYPOCAPNIA**
ROLE OF HYPOCAPNIA IN CARDIAC OUTPUT, HEART RATE AND BLOOD PRESSURE RESPONSES TO ACUTE HYPOXIA IN MAN A66-80209
- HYPOTHERMIA**
EFFECTS OF COLD AND ABNORMAL ATMOSPHERE DISCUSSING TOLERANCE LIMITS TO HYPERCAPNIA, ANOXIA INDUCED HYPOTHERMIA AND HYPOXIA A66-14067
OXIDATION AND PHOSPHORYLATION CORRELATION IN BRAIN TISSUES DURING OVERCOOLING AND REWARMING IN EXPERIMENTAL ANIMALS. A66-80170
TOLERANCE RELATIONSHIP BETWEEN EFFECTS OF INTERNAL AND EXTERNAL COLD AND DIFFERENT FORMS OF ANOXIA IN RAT A66-80189
EFFECT OF GLUCAGON ON BLOOD SUGAR AND INORGANIC PHOSPHORUS LEVELS IN NORMOTHERMIC AND HYPOTHERMIC RATS A66-80245
SEMICONDUCTOR DEVICE FOR SUBJECTING SMALL EXPERIMENTAL ANIMALS TO HYPOTHERMIA A66-80328
AUTOMATIC DEVICE FOR PRODUCING CONTROLLED HYPOTHERMIA IN ANIMALS AND HUMANS A66-80330
AUTOMATIC INDUCTION OF HYPOTHERMIA IN DOGS, ITS COURSE, REWARMING, AND AFTEREFFECTS A66-80333
ARTIFICIAL HYPOTHERMIA EFFECTS ON ARTERIAL BLOOD IN ALBINO RATS A66-80401
- HYPOXIA**
EFFECTS OF COLD AND ABNORMAL ATMOSPHERE DISCUSSING TOLERANCE LIMITS TO HYPERCAPNIA, ANOXIA INDUCED HYPOTHERMIA AND HYPOXIA A66-14067
THERMAL HOMEOSTASIS UNDER HYPOXIA IN MAN, DISCUSSING THERMAL STRESS ADAPTATION AND PHYSIOLOGICAL RESPONSES IN OXYGEN-DEFICIENT ENVIRONMENT A66-14068
BODY TEMPERATURE AND CARDIOVASCULAR AND RESPIRATORY ACTIVITY OF MAN AND DOG UNDER HYPOXIA AND HOT AND COLD TEMPERATURE EXPOSURE A66-80188
TOLERANCE RELATIONSHIP BETWEEN EFFECTS OF INTERNAL AND EXTERNAL COLD AND DIFFERENT FORMS OF ANOXIA IN RAT A66-80189
CENTRAL NERVOUS SYSTEM FUNCTION OF HUMAN SUBJECTS EXPOSED TO PHYSICAL EXERCISE, SLEEP DEPRIVATION, STARVATION, AND HYPOXIA A66-80191
ROLE OF HYPOCAPNIA IN CARDIAC OUTPUT, HEART RATE AND BLOOD PRESSURE RESPONSES TO ACUTE HYPOXIA IN MAN A66-80209
- ERYTHROPOIETIN, ACTIVITY, BLOOD, AND PHYSIOLOGICAL RESPONSES TO SEVERE HYPOXIA IN MAN A66-80214
- RESISTANCE TO HYPOXIA AND FATIGUE OF RESPIRATORY MUSCLE DURING ASCENT TO HIGH ALTITUDE AS AFFECTED BY ACCLIMATIZATION A66-80305
- OXYGEN DIFFUSION IN BRAIN IN VENOUS OR ARTERIAL HYPOXIA A66-80343
- REFLEX EFFECTS OF CEPHALIC HYPOXIA, HYPERCAPNIA, AND ISCHEMIA UPON VENTRICULAR CONTRACTILITY IN DOGS. A66-80350
- HETEROGENOUS CHARACTER OF SLOW WAVES OF DELTA RHYTHM OCCURRING DURING ANOXIC CLINICAL DEATH AND REANIMATION IN DOGS A66-80352
- TOLERANCE OF RAT TO HYPOXIA DURING RADIATION SICKNESS CAUSED BY X-RAY IRRADIATION A66-80384
- EFFECTS OF GRADUAL OR SUDDEN ONSET OF HYPOXIA ON OXYGEN DEMAND A66-80387
- HYPOXIA PRODUCED BY INHALATION OF PURE NITROGEN AND INTERMITTENT OXYGEN BREATHING IN CATS A66-80388
- HYPOXIA EFFECTS ON SENSITIVITY TO EPILEPTOGENIC AGENTS AND ON FUNCTIONAL PROPERTIES OF MOTOR FORMATIONS OF BRAIN JPRS-33056 N66-12903
- I
- ICE**
CALORIMETRIC DETERMINATION OF ICE FORMED IN FEET OF MICE FROZEN AT VARIOUS TEMPERATURE AAL-TDR-63-29 N66-14037
- ILLUMINATION**
AFTERIMAGES PRODUCED BY BLACK AND LIGHT TARGETS VIEWED PERIPHERALLY BY DARK ADAPTED SUBJECTS A66-80175
PREDICTING PRODUCTION IN LIGHT LIMITED CONTINUOUS CULTURES OF ALGAE, CHLORELLA PYRENOIDOSA AND DUNALIELLA TERTIOLECTA A66-80351
ILLUMINATION AND CELL DENSITY EFFECTS ON GROWTH RATE OF CHLORELLA VULGARIS CULTURE A66-80400
- IMMERSION**
HEART RATE AND FOREARM BLOOD FLOW OF MAN WITH AND WITHOUT BREATH HOLDING DURING FACE IMMERSION IN WATER A66-80210
PRESSURE FLOW RELATIONSHIP OF AIRWAYS IN SITTING SUBJECT UNDER NORMAL CONDITIONS. IMMersed IN WATER TO NECK LEVEL, AND DURING NEGATIVE PRESSURE BREATHING SUFFICIENT TO REDUCE LUNG VOLUME AS DURING IMMERSION. A66-80236
WATER IMMERSION TECHNIQUE FOR SIMULATING ZERO GRAVITY MOBILITY PERFORMANCE OF ASTRONAUT IN PRESSURIZED SPACESUIT NASA-TN-D-3054 N66-14151
- IMMUNITY**
IMMUNITY TO INDOGENOUS MICROORGANISM IN ASTRONAUTS DURING TRAINING AND BEFORE AND AFTER VOSTOK SERIES SPACE FLIGHT A66-80374
ANTIBODY PLAQUE FORMING CELLS - KINETICS OF PRIMARY AND SECONDARY IMMUNE HEMOLYSIN RESPONSE USNRDL-897 N66-14207
- IMMUNOLOGY**
COMPARISON METHODS FOR RELATIONSHIP AMONG ENZYMES THAT ARE SAME BUT BELONG TO DIFFERENT ORGANISMS A66-13367
IMMUNOLOGICALLY COMPETENT CELL RESPONSE TO ANTIGEN AND COMPARATIVE STUDY OF LYMPHOID CELLS EUR-2469.F N66-14089

- IMPACT DECELERATION**
 PHYSIOLOGICAL RESPONSE OF MAN TO IMPACT DECELERATIONS ACTING IN VARIOUS DIRECTIONS DURING SPACECRAFT LANDING AS AFFECTED BY SAFETY BELTS, HARNESSSES, AND SHOCK ABSORBERS A66-80301
- IMPACT PRESSURE**
 GENERATION AND TRANSMISSION OF PRESSURE PULSES IN TUBULAR SYSTEM IMPACTED BY FALLING STEEL WEIGHT RELATED TO IMPACT INJURY A66-80340
- IMPACT TOLERANCE**
 HUMAN TOLERANCE LIMITS IN WATER IMPACT, IDENTIFYING ENVIRONMENTAL AND TRAUMA CHARACTERISTICS A66-12356
- IMPACTOR**
 COMPARISON OF MEASURED LUNG BURDEN IN ANIMAL SPECIES WITH AMOUNTS OF PLUTONIUM COLLECTED BY CASCADE IMPACTOR SAMPLERS AWRE-0-29/65 N66-14097
- INERT ATMOSPHERE**
 EFFECT OF REPLACING ATMOSPHERIC NITROGEN BY HELIUM ON DEVELOPMENT OF CHICK EMBRYOS JPRS-32905 N66-12299
- INFECTION**
 SKIN DISORDERS DUE TO MICROBIAL INFECTIONS IN MILITARY PERSONNEL LIVING IN TROPICS A66-80262
- CHEMOTHERAPY OF VIRUS INFECTIONS, BIOLOGICAL PEST CONTROL, VIRUS NUCLEIC ACIDS, AND VIRAL GROWTH N66-12634
- INFORMATION**
 HUMAN FACTORS INFORMATION REQUIREMENTS FOR SPACE SYSTEM DEVELOPMENT NASA-CR-68230 N66-12959
- HUMAN FACTORS INFORMATION REQUIREMENTS FOR SPACE SYSTEMS ENGINEERING - SURVEY AND BIBLIOGRAPHY NASA-CR-68616 N66-13331
- INFORMATION PROCESSING**
 ENERGY PATTERNS FROM SPACE ACCESSIBLE TO HUMAN SENSES THROUGH DATA SENSORS AND INFORMATION ACQUISITION A66-14093
- HUMAN USE OF SHORT-TERM MEMORY IN PROCESSING INFORMATION ON COMPUTER CONSOLE A66-80151
- SHORT TERM MEMORY AS FUNCTION OF NUMBER OF ITEMS SENT AND NUMBER OF CHANNELS IN MULTICHANNEL LISTENING EXPERIMENT A66-80153
- EFFECT OF SIZE AND LOCATION OF INFORMATIONAL TRANSFORMS UPON SHORT-TERM RETENTION A66-80269
- DECISION MAKING EFFECTS OF TWO SOURCES OF UNCERTAINTY DECISION A66-80274
- IDENTIFICATION OF SEQUENTIAL AUDITORY AND VISUAL STIMULI A66-80279
- EXPERIMENTAL STUDY OF ORGANIZATION OF INFORMATION IN VISUAL TASK IN MAN A66-80394
- SIGNAL DETECTION OF AUDITORY SENSORY RESPONSES TO STIMULI - AUDITORY INFORMATION PROCESSING NASA-CR-68881 N66-13990
- INFORMATION THEORY**
 APPLICATION OF INFORMATION THEORY CONCEPTS TO ANALYSIS OF PHYSIOLOGICAL DATA DURING SPACE FLIGHTS A66-80367
- INHALATION**
 FISSION PRODUCT INHALATION PROGRAM - GAMMA RAY DETECTION SYSTEM FOR BIOLOGICAL SAMPLES LF-28 N66-12581
- URINARY ELIMINATION FOLLOWING INHALATION OF INSOLUBLE PLUTONIUM OXIDE N66-12682
- INHALATION STUDY OF NEODYMIUM OXIDE PATHOGENESIS
- IN MICE AND GUINEA PIGS - ANIMAL STUDY COO-1170-4 N66-12951
- INJURY**
 PHARMACOLOGICALLY ACTIVE AND LETHAL SUBSTANCES RELEASED FROM THERMALLY INJURED SKIN OF HUMAN AND ANIMAL SUBJECTS INCLUDING HISTAMINE, BRADYKININ, ADENYLIC COMPOUNDS, AND POSSIBLY SEROTONIN A66-80254
- ULTRAVIOLET INJURY IN MOUSE AS AFFECTED BY HOT ENVIRONMENT A66-80255
- PATHOGENIC ROLE OF MICROCIRCULATORY IMPAIRMENT DURING COLD INJURY OF SKIN OF RABBIT AND MOUSE. A66-80256
- RESPONSE OF HUMAN EPIDERMIS TO GRADED THERMAL AND COLD STRESS. A66-80257
- ROLE OF STRATUM CORNEUM IN BODY DEFENSE AGAINST VARIOUS TYPES OF INJURY AND INFECTION A66-80261
- PHYSIOLOGICAL RESPONSE OF MAN TO IMPACT DECELERATIONS ACTING IN VARIOUS DIRECTIONS DURING SPACECRAFT LANDING AS AFFECTED BY SAFETY BELTS, HARNESSSES, AND SHOCK ABSORBERS A66-80301
- REVERSIBLE PROCESS OF CHROMOSOME DAMAGE DURING MITOSIS BY IONIZING RADIATION IN YEAST A66-80321
- GENERATION AND TRANSMISSION OF PRESSURE PULSES IN TUBULAR SYSTEM IMPACTED BY FALLING STEEL WEIGHT RELATED TO IMPACT INJURY A66-80340
- INPUT**
 TELLING COMPUTER HOW TO EVALUATE MULTIDIMENSIONAL SITUATIONS AND TERMINOLOGY AND STATISTICS FOR DETERMINING PERFORMANCE OF DECISION MAKER A66-80184
- INSTRUMENTATION**
 CRITERIA FOR BODY BLOCKS, ANTHROPOMORPHIC DUMMIES, AND INSTRUMENTATION FOR USE IN STATIC AND DYNAMIC TESTING OF CIVIL AIRCRAFT SEAT SYSTEMS FAA-ADS-20 N66-13926
- INSULIN**
 SHORT-TERM MEMORY, CHOICE REACTION TIME, AND HAND STEADINESS OF EXERCISING AND RESTING SUBJECTS IN RESPONSE TO EPINEPHRINE OR INSULIN ADMINISTRATION A66-80201
- INTEGRATOR**
 WAVEMETER AND INTEGRATOR FOR EVALUATION OF WAVE PATTERNS AND AMPLITUDE OF BRAIN POTENTIALS - ELECTROPHYSIOLOGY JPRS-33055 N66-12444
- INTERPLANETARY FLIGHT**
 PHYSIOLOGICAL MEASUREMENTS DURING INTERPLANETARY FLIGHT FOR MEDICAL MONITORING, EXAMINATIONS AND DIAGNOSES, AND SCIENTIFIC RESEARCH - ANALYSIS OF VOSTOK SPACECRAFT BIOINSTRUMENTATION N66-13789
- INTESTINE**
 HISTOPATHOLOGY OF POCKET MOUSE INTESTINE MUCOUS AFTER IRRADIATION - GROWTH AND DEVELOPMENT DATA ON LABORATORY POCKET MOUSE NASA-CR-68217 N66-12200
- IODINE**
 CHANGES IN SERUM PROTEIN-IODINE IN MEN EXPOSED TO POLAR CLIMATE A66-80293
- IONIZING RADIATION**
 SPACE RADIATION-RELATIVE BIOLOGICAL EFFECTIVENESS AND PROBLEMS OF SHIELDING DURING MOON MISSION A66-80310
- REVERSIBLE PROCESS OF CHROMOSOME DAMAGE DURING MITOSIS BY IONIZING RADIATION IN YEAST A66-80321
- IMPORTANCE OF RECONSTRUCTION OF CELLS DAMAGED BY IONIZING RADIATION ON TOTAL VIABILITY OF ORGANISM

- A66-80322 A66-80270
- BIOLOGICAL EFFECT OF DIFFERENT DOSES OF IONIZING RADIATION ON VESTIBULAR APPARATUS A66-80272
- N66-12458
- EFFECTS OF IONIZING X- AND GAMMA RADIATION ON DEOXYRIBONUCLEIC ACID A66-80278
- EUR-2471.F N66-14092
- IRRADIATION**
- FORTRAN COMPUTER PROGRAM FOR EVALUATION OF POST IRRADIATION SURVIVAL TIMES - ANIMAL STUDY A66-80282
- UCLA-12-573 N66-12917
- ISCHEMIA**
- REFLEX EFFECTS OF CEPHALIC HYPOXIA, HYPERCAPNIA, AND ISCHEMIA UPON VENTRICULAR CONTRACTILITY IN DOGS. N66-80350
- ISOTOPE**
- POTENTIAL APPLICATIONS OF RADIOISOTOPES TO OPERATION OF MANNED SPACECRAFT LIFE SUPPORT SYSTEMS N66-12582
- SAN-575-12 N66-12582
- J**
- JET AIRCRAFT**
- STRESS IMPOSED ON AIRCREW IN CIVIL JET AIRCRAFT DURING LONG FLIGHT N66-14261
- DLR-FB-65-44 N66-14261
- JET NOISE**
- TOLERANCE OF JET AND ROCKET ENGINE EXHAUST NOISE AND EAR PROTECTION DEVICES FOR PILOTS AND GROUND CREWS N66-13297
- NASA-TT-F-9799 N66-13297
- K**
- KIDNEY**
- RENAL CIRCULATION OF DOG AS AFFECTED BY ANGIOTENSIN A66-80404
- L**
- LABORATORY APPARATUS**
- LABORATORY APPARATUS FOR BIOLOGICAL EXPERIMENT GAMMA RADIATION SOURCES N66-13245
- JPRS 32704 N66-13245
- LABYRINTH**
- NEW THEORY OF FUNCTIONAL MECHANISM OF LABYRINTHINE EPITHELIUM A66-80403
- MEASUREMENT OF OTOLITH ACTIVITY AS INDICATED BY OCULAR COUNTERROLLING IN RESPONSE TO BODY TILT WITHIN FORCE FIELD OF ZERO G, ONE-HALF G, AND STANDARD G - EXTRALABYRINTHINE FACTORS N66-13097
- NASA-CR-68391 N66-13097
- LACTATE**
- VENTILATION, HEART RATE, LACTATE FORMATION, AND OXYGEN CONSUMPTION DURING ARM AND LEG EXERCISE IN SUPINE AND SITTING POSITION A66-80211
- LANDING AID**
- LANDING TASK AND PILOT ACCEPTANCE OF DISPLAYS FOR LANDING IN REDUCED WEATHER MINIMUMS A66-12579
- AIAA PAPER 65-722 A66-12579
- LASER**
- BIOLOGICAL EFFECTS OF LASER RADIATION WITH REFERENCE TO INTACT ANIMALS, PRIMATE EYES AND SKIN AND MALIGNANT TUMORS OF ANIMAL AND HUMAN ORIGIN A66-12994
- LEADERSHIP**
- EXPERIMENTAL PSYCHOLOGICAL EXAMINATION OF COSMONAUTS A66-80298
- LEARNING**
- ACQUISITION OF STEP FUNCTION TRACKING TASK AS FUNCTION OF ALTERNATIVES AND SEQUENCE LENGTH A66-80180
- USE OF NEGATIVE SLOPE TRANSFORMATIONS OF KNOWLEDGE OF RESULTS ON SIMPLE MOTOR RESPONSE
- ACHIEVEMENT IN PROGRAMMED MATHEMATICS AS FUNCTION OF DIFFERENTIAL KNOWLEDGE OF RESULTS A66-80272
- BEHAVIORAL EFFECTS OF IONIZED AIR ON RATS A66-80278
- EFFECT OF AGE ON PART AND WHOLE LEARNING IN MAIL SORTERS A66-80282
- LEARNING SYSTEM**
- TRAINING AND INSTRUCTION BY MEANS OF TEACHING MACHINES IN FIELD OF AVIATION A66-13508
- LEARNING OF PAIRED-ASSOCIATE ITEMS RELATED TO DIFFERENT REPETITIVE REINFORCEMENT AND TESTING SEQUENCES N66-13689
- TR-76 N66-13689
- LEUKOCYTE**
- RADIATION SENSITIVITY OF CHROMOSOME MUTATION IN WHITE BLOOD CELLS OF HUMANS, MONKEYS, AND RABBITS N66-12756
- LIFE**
- SPACE EXPLORATION AND STUDY OF ROLE OF EARTH ENVIRONMENTAL CONDITIONS IN EVOLUTION, PHYSIOLOGY, AND BEHAVIOR OF TERRESTRIAL ORGANISMS A66-80156
- LIFE DETECTOR**
- FUTURE OF ENVIRONMENTAL BIOLOGY, DISCUSSING SPACE RESEARCH ON LIVING ORGANISMS IN EXTRATERRESTRIAL ENVIRONMENT A66-14069
- LIFE SCIENCE**
- MEDICAL AND LIFE SCIENCES, ELECTRIC POWER SYSTEMS, ENERGY CONVERSION, ELECTROMAGNETIC FIELDS, COMMUNICATION, NONLINEAR CIRCUITS, MATERIALS, AND CONTROL AND INFORMATION SYSTEMS N66-13758
- AD-622202 N66-13758
- LIFE SUPPORT SYSTEM**
- APOLLO SPACE SUIT DESIGN DISCUSSING CONSTRUCTION, PURPOSE AND OPERATING CONDITIONS OF LIQUID-COOLED LIFE SUPPORT SYSTEM A66-12631
- PRINCIPLES FOR CREATING SYSTEMS CAPABLE OF MAINTAINING OPTIMUM CONDITIONS IN SPACE CAPSULE ENVIRONMENT A66-80190
- SURVEY OF SOVIET USE OF ACTIVE CHEMICALS FOR SPACE CABIN AIR REVITALIZATION A66-80202
- PROBLEMS OF SPACECRAFT PERSONNEL LIFE SUPPORT BY RECONVERSION OF WASTE PRODUCTS OF METABOLISM A66-80313
- HUMAN PERFORMANCE AND LIFE SUPPORT SYSTEMS IN SPACE MONITORED BY DIGITAL COMPUTER WHICH CAN SIMULATE CLINICAL LOGIC - BIODASTRONAUTICS N66-12219
- POTENTIAL APPLICATIONS OF RADIOISOTOPES TO OPERATION OF MANNED SPACECRAFT LIFE SUPPORT SYSTEMS N66-12582
- SAN-575-12 N66-12582
- SOVIET PAPERS DEALING WITH BIODASTRONAUTICS, LIFE SUPPORT SYSTEMS, AND VOSKHOD II FLIGHT N66-12650
- ELECTROCHEMICAL CARBON DIOXIDE CONCENTRATION SYSTEM FOR PURIFYING SPACE CABIN ATMOSPHERE N66-13114
- NASA-CR-54849 N66-13114
- REVIEW OF LIFE SUPPORT PROBLEMS IN SPACE - FOOD, WATER, OXYGEN, WEIGHTLESSNESS, AND ACCELERATION N66-14028
- FTD-TT-65-601/164 N66-14028
- LIGHT ABSORPTION**
- LIGHT INDUCED ABSORPTION CHANGES AT 520 NM IN CHLORELLA PYRENOIDOSA AND THEIR RELATIONSHIP TO TWO PIGMENT SYSTEM OF PHOTOSYNTHESIS A66-80289

- LIGHT ADAPTATION**
HUMAN EYE ADAPTATION TO DARK AND LIGHT, NOTING THRESHOLD DEPENDENCE ON PREVIOUS HISTORY OF ILLUMINATION A66-13790
- LIGHT INTENSITY**
EFFECT OF LIGHT ON LOWER PLANT REPRODUCTION NASA-TT-F-9742 N66-13481
- LIGHT SOURCE**
APPARENT MOVEMENT PHENOMENA ON CATHODE RAY TUBE DISPLAYS - THRESHOLD DETERMINATIONS OF APPARENT MOVEMENTS OF PULSED LIGHT SOURCES NASA-CR-342 N66-12162
- LIMB**
BLOOD SUPPLY OF EXTREMITY MUSCLES DURING INTENSE PHYSICAL WORK IN ALBINO RATS A66-80174
HYDRATION DURING BED REST IN RESPONSE TO LOWER BODY NEGATIVE PRESSURE AS RELATED TO MANNED SPACE FLIGHT A66-80195
VENTILATION, HEART RATE, LACTATE FORMATION, AND OXYGEN CONSUMPTION DURING ARM AND LEG EXERCISE IN SUPINE AND SITTING POSITION A66-80211
RESPONSE OF CAPACITY VESSELS IN HUMAN LIMBS TO HEAD-UP TILT AND SUBATMOSPHERE PRESSURE ON LOWER BODY A66-80212
MEASUREMENT OF REACTION IN MAN OF RESISTANCE AND CAPACITY VESSELS IN FOREARM AND HAND TO LEG EXERCISE A66-80221
- LINEAR SYSTEM**
THREE INDEPENDENT SYSTEMS OF MATRIX EQUATIONS FOR SOLVING TRANSFER FUNCTION OF MULTIPARAMETER LINEAR SYSTEM HANDLING BY HUMAN OPERATOR A66-12699
- LIPID**
QUANTITATIVE ANALYSIS OF LIPID CONSTITUENTS IN CHLORELLA CELLS A66-80171
- LIPID METABOLISM**
MECHANISM OF IN VIVO RBC DAMAGE BY OXYGEN, NOTING EFFECT ON CANINE ERYTHROCYTES A66-13348
METABOLISM OF CARNITINE IN MUSCLE OF COLD ACCLIMATED RAT A66-80152
LIGHT INDUCED CHANGES IN LIPIDS OF CHLORELLA VULGARIS A66-80246
CHARACTERISTICS OF LIPID MOBILIZATION AND PERIPHERAL DISPOSITION IN AGED INDIVIDUALS A66-80283
- LIQUID BREATHING**
PULMONARY GAS EXCHANGE IN DOGS DURING LIQUID BREATHING UNDER HYPERBARIC OXYGENATION A66-80230
- LIQUID COOLING**
APOLLO SPACE SUIT DESIGN DISCUSSING CONSTRUCTION, PURPOSE AND OPERATING CONDITIONS OF LIQUID-COOLED LIFE SUPPORT SYSTEM A66-12631
- LOW ALTITUDE**
VISUAL PROBLEMS ASSOCIATED WITH LOW ALTITUDE FLIGHT A66-80357
- LOW PRESSURE CHAMBER**
VERBAL COMMUNICATION INTELLIGIBILITY IN OXYGEN-HELIUM AND OTHER BREATHING MIXTURES IN LOW PRESSURE CHAMBER A66-80199
- LOW TEMPERATURE ENVIRONMENT**
TOLERANCE RELATIONSHIP BETWEEN EFFECTS OF INTERNAL AND EXTERNAL COLD AND DIFFERENT FORMS OF ANOXIA IN RAT A66-80189
BEHAVIORAL THERMOREGULATION IN YOUNG AND OLD RATS IN COLD ENVIRONMENT A66-80208
PATHOGENIC ROLE OF MICROCIRCULATORY IMPAIRMENT DURING COLD INJURY OF SKIN OF RABBIT AND MOUSE. A66-80256
- RESPONSE OF HUMAN EPIDERMIS TO GRADED THERMAL AND COLD STRESS. A66-80257
CHANGES IN SERUM PROTEIN-IODINE IN MEN EXPOSED TO POLAR CLIMATE A66-80293
THERMOREGULATION RESPONSES OF HUMAN MUSCULATURE TO SUDDEN COOLING AND TO EMOTIONAL STRESS A66-80344
- LUNG**
EFFECT OF PROLONGED EXPOSURE TO HIGH CONCENTRATION OF OXYGEN ON LUNGS AND BLOOD IN MICE A66-80389
COMPARISON OF MEASURED LUNG BURDEN IN ANIMAL SPECIES WITH AMOUNTS OF PLUTONIUM COLLECTED BY CASCADE IMPACTOR SAMPLERS AWRE-0-29/65 N66-14097
- LYMPH**
IMMUNOLOGICALLY COMPETENT CELL RESPONSE TO ANTIGEN AND COMPARATIVE STUDY OF LYMPHOID CELLS EUR-2469.F N66-14089
- M**
- MAMMAL**
OXIDATION AND PHOSPHORYLATION CORRELATION IN BRAIN TISSUES DURING OVERCOOLING AND REWARMING IN EXPERIMENTAL ANIMALS. A66-80170
BODY TEMPERATURE AND CARDIOVASCULAR AND RESPIRATORY ACTIVITY OF MAN AND DOG UNDER HYPOXIA AND HOT AND COLD TEMPERATURE EXPOSURE A66-80188
THERMOREGULATORY METABOLIC RESPONSE OF COLD AND HEAT EXPOSED SQUIRREL MONKEYS /SAIMIRI SCIUREA/ AS COMPARED TO SIMILARLY TREATED RODENTS A66-80225
PHARMACOLOGICALLY ACTIVE AND LETHAL SUBSTANCES RELEASED FROM THERMALLY INJURED SKIN OF HUMAN AND ANIMAL SUBJECTS INCLUDING HISTAMINE, BRADYKININ, ADENYLIC COMPOUNDS, AND POSSIBLY SEROTONIN A66-80254
PATHOGENIC ROLE OF MICROCIRCULATORY IMPAIRMENT DURING COLD INJURY OF SKIN OF RABBIT AND MOUSE. A66-80256
- MAN**
CALCULATIONS ON GAS EXCHANGE VOLUMES IN MAN UNDER RAREFIED ATMOSPHERIC CONDITIONS JPRS-33057 N66-13423
- MAN-MACHINE SYSTEM**
MATHEMATICAL MODEL BASED ON CONTROL AND QUEUEING THEORY FOR HUMAN CONTROLLER FOR TURN-ROUND OPERATIONS ON AIRPORT APRON A66-12886
AUTOMATIC COMMAND CONTROL SYSTEM USING PHONETIC VOICE PATTERN RECOGNITION A66-13496
MAN-MACHINE RELATIONSHIP DURING SPACE FLIGHT A66-14085
USING COMPUTER ANALYZED SPEECH SIGNALS FACILITATING BETTER COMMUNICATION OF MAN WITH MACHINES A66-80334
- MANNED ORBITAL LABORATORY /MOL/**
NEUROPHYSIOLOGICAL ASPECTS OF MANNED EXTRATERRESTRIAL SPACE FLIGHTS SUCH AS MOTOR RESPONSES BY SENSORY INPUTS, CORTICAL RESPONSES, ETC A66-14065
- MANNED SPACE FLIGHT**
NAVIGATION AND CONTROL SIMULATION PORTION OF OVERALL MANNED SPACE CABIN TEST PROGRAM AIAA PAPER 65-277 A66-12776
CYBERNETICS ROLE IN SPACE FLIGHT INCLUDING CONTROL CIRCUITS FOR GUIDANCE AND ELECTRONIC EQUIPMENT AUTOMATION AND DEVELOPMENT A66-13495
BIOLOGICAL STRESSES OF MANNED SPACE FLIGHT IN LIMITING FLIGHT DURATION, NOTING ISOLATION EFFECT

- A66-13507
SPACE TRAVEL AND EXPLORATION COVERING BIOLOGICAL AND TECHNICAL DIFFICULTIES SUCH AS RADIATION, METEOR IMPACT, VEHICLE STERILIZATION, ETC
A66-13806
- INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE AT PARIS, FRANCE IN OCTOBER 1962
A66-14063
- MONITORING HUMAN PERFORMANCE DURING MANNED ORBITAL FLIGHT FOR ASSESSMENT OF CENTRAL NERVOUS SYSTEM FUNCTION, NOTING ANIMAL STUDIES DURING SIMULATED STRESSES OF SPACE FLIGHT
A66-14088
- MANNED SPACE FLIGHT PROGRAM WITH BIOMEDICAL DATA COLLECTION FOR INTEGRATION OF CREWMAN INTO SPACECRAFT OPERATION
A66-14090
- TECHNOLOGICAL AND BIOLOGICAL CONTRIBUTIONS OF SOVIET UNION TO SPACE EXPLORATION
A66-80155
- POSTURE, RESPIRATION, AND PULMONARY FUNCTION IN RELATION TO PROLONGED ACCELERATION EXPOSURE IN SPACE FLIGHT
A66-80159
- INVESTIGATIONS OF PHYSIOLOGICAL RESPONSES OF ANIMALS AND MAN TO STRESSES IN VOSTOK SPACECRAFT
A66-80160
- COMPUTER ANALYSIS OF ELECTROENCEPHALOGRAPHIC RECORDING DURING ENVIRONMENTAL STRESSES OF SPACE FLIGHT
A66-80165
- HISTORY OF ASTRONAUT SELECTION PROCEDURES AS RELATED TO SELECTION OF SCIENTISTS BECOMING MEMBERS OF SPACECREW
A66-80187
- SURVEY OF SOVIET USE OF ACTIVE CHEMICALS FOR SPACE CABIN AIR REVITALIZATION
A66-80202
- RADIATION HAZARDS, DETECTION DEVICES, AND MEDICINES TO PREVENT INJURY DURING FLIGHTS OF VOSTOK AND VOSKHOD SPACESHIPS
A66-80204
- SIMULATORS USED IN TRAINING ASTRONAUTS FOR SPACEFLIGHT
A66-80296
- PHYSIOLOGICAL RESPONSE OF MAN TO IMPACT DECELERATIONS ACTING IN VARIOUS DIRECTIONS DURING SPACECRAFT LANDING AS AFFECTED BY SAFETY BELTS, HARNESSSES, AND SHOCK ABSORBERS
A66-80301
- FEASIBILITY OF USING CHICKEN AND DUCK FOR ASTRONAUT FOOD IN CLOSED ECOLOGICAL SYSTEM
A66-80308
- SPACE RADIATION-RELATIVE BIOLOGICAL EFFECTIVENESS AND PROBLEMS OF SHIELDING DURING MOON MISSION
A66-80310
- SKIN FUNCTION AND PROCESSES IN VITAL ACTIVITY AS RELATED TO PERSONAL HYGIENE DURING EXPOSURE TO SPACE FLIGHT STRESSES
A66-80312
- STUDY OF COMFORTABLE CLOTHING FOR ASTRONAUTS DURING 30-DAY TESTS WITHOUT WASHING IN AIR CONDITIONED SPACE CABINS IN RELATION TO SKIN CONDITION
A66-80314
- IMMUNITY TO INDIGENOUS MICROORGANISM IN ASTRONAUTS DURING TRAINING AND BEFORE AND AFTER VOSTOK SERIES SPACE FLIGHT
A66-80374
- N ASA SPACE BIOLOGY PROGRAM - EXOBIOLOGY, ENVIRONMENTAL AND BEHAVIORAL BIOLOGY, MOLECULAR BIOLOGY AND INSTRUMENTATION, FLIGHT PROGRAMS, AND MANNED SPACE FLIGHT
NASA-TM-X-57051
N66-13899
- MANNED SPACECRAFT**
ARTIFICIAL ENVIRONMENT IN MANNED SPACECRAFT FOR PRESERVING HUMAN LIFE, COMPARING PHYSICAL, CHEMICAL AND BIOLOGICAL PROCESSES
A66-14079
- COMPARISON OF MANNED AND UNMANNED SPACECRAFT
- A66-14092
POTENTIAL APPLICATIONS OF RADIOISOTOPES TO OPERATION OF MANNED SPACECRAFT LIFE SUPPORT SYSTEMS
SAN-575-12
N66-12582
- MANUAL CONTROL**
MANUAL CONTROL OF PULSE FREQUENCY MODULATED REACTION CONTROL
AMRL-TR-65-145
N66-13596
- HUMAN PERFORMANCE CHARACTERISTICS IN MANUAL CONTROL TASKS, AND TECHNIQUES FOR DATA ANALYSIS AND SYSTEMS SIMULATION
NASA-CR-68981
N66-14290
- MARS ENVIRONMENT**
ENVIRONMENT OF MARTIAN CANALS AND EXTRATERRESTRIAL LIFE
A66-80176
- MASKING**
STUDY OF HUMAN VISUAL PERCEPTION REACTION TIME WITH MASKING
A66-80306
- MATHEMATICAL MODEL**
MATHEMATICAL MODEL OF HUMAN COMPENSATORY TRACKING BEHAVIOR
A66-80149
- MATHEMATICS /GEN/**
CONFERENCES ON AEROSPACE MEDICINE - ASTRONAUT PERFORMANCE, ELECTROPHYSIOLOGICAL STUDIES ON VOSKHOD MANNED SPACECRAFT, AND MATHEMATICAL METHODS
JPRS-32808
N66-12657
- SUMMARIES OF REPORTS GIVEN AT CONFERENCE ON APPLICATION OF MATHEMATICAL METHODS IN AEROSPACE MEDICINE
N66-12660
- MATRIX ANALYSIS**
THREE INDEPENDENT SYSTEMS OF MATRIX EQUATIONS FOR SOLVING TRANSFER FUNCTION OF MULTIPARAMETER LINEAR SYSTEM HANDLING BY HUMAN OPERATOR
A66-12699
- MEASURING APPARATUS**
MEASUREMENT OF REACTION IN MAN OF RESISTANCE AND CAPACITY VESSELS IN FOREARM AND HAND TO LEG EXERCISE
A66-80221
- DETERMINATION OF MALE AND FEMALE BODY VOLUME FROM HEIGHT AND WEIGHT USING GRAPHICAL METHOD
A66-80228
- KINETICS OF OXYGEN UPTAKE BY ERYTHROCYTES OF DIFFERENT AGES AS RELATED TO RESPIRATORY FUNCTION OF BLOOD
A66-80229
- DISTRIBUTION FUNCTION OF HELIUM CLEARANCE TIME CONSTANT IN HEALTHY AND DISEASED LUNGS OF HUMAN SUBJECTS
A66-80232
- MEASUREMENT OF FUNCTIONAL RESIDUAL CAPACITY OF RATS VARYING IN AGE AND WEIGHT
A66-80233
- RECORDING BAG IN A BOX SPIROMETER USABLE IN VENTILATORY FUNCTION STUDIES IN HEALTHY AND DISEASED SUBJECTS
A66-80241
- COMBINED RESPIROGRAPHIC TECHNIQUE AND ANALYTICAL METHOD INDICATING EFFECT OF CHANGES IN RAT OF SULFUR DIOXIDE CONCENTRATION AND DURATION OF EXPOSURE ON PULMONARY RETENTION, TIDAL VOLUME, AND RESPIRATORY RATE
A66-80264
- METHOD FOR REGISTERING POTENTIALS OF AUTONOMIC NERVES DURING CONTINUOUS EXPERIMENT IN DOGS
A66-80331
- SUITABILITY OF TEXTUROMETER FOR MEAT TEXTURE DESCRIPTION - HARDNESS, COHESIVENESS, ELASTICITY, CHEWINESS, AND WATER RELEASE OF FRESH AND FREEZE DEHYDRATED MEATS
FD-17
N66-14020
- MECHANICAL PROPERTY**
MECHANOElastic PROPERTIES OF CORNIFIED EPITHELIUM AS AFFECTED BY VARIOUS SOLVENT AND SOLUTION

- ENVIRONMENTAL CHANGES A66-80258
- MECHANISM**
 BIOLOGICAL MECHANISMS FOR MEMORY - NEURON
 EXCITATION, NUCLEIC ACID METABOLISM, AND PROTEIN
 SYNTHESIS MECHANISM - DEOXYRIBONUCLEIC ACID
 JPRS-32809 N66-12269
- ENZYME CATALYSIS MECHANISMS, RELATIONSHIP BETWEEN
 ENZYME MOLECULAR STRUCTURE AND CATALYTIC
 ACTIVITY, AND FORMATION OF ENZYME INTERMEDIATE
 PRODUCTS N66-12629
- MEDICAL ELECTRONICS**
 PRINCIPLES OF MATHEMATICAL LOGIC AND PROBABILITY
 THEORY IN COMPUTER DIAGNOSIS OF DISEASES
 JPRS-33161 N66-13032
- PHYSIOLOGICAL MEASUREMENTS DURING INTERPLANETARY
 FLIGHT FOR MEDICAL MONITORING, EXAMINATIONS AND
 DIAGNOSES, AND SCIENTIFIC RESEARCH - ANALYSIS OF
 VOSTOK SPACECRAFT BIOINSTRUMENTATION N66-13789
- MEDICINE /GEN/**
 CYBERNETIC DEVICES USED IN MEDICAL PRACTICE, AND
 CYBERNETIC SYSTEMS FOR NEUROLOGICAL STUDIES AND
 DIAGNOSTIC TECHNIQUES
 JPRS-32344 N66-12728
- MEDICAL AND LIFE SCIENCES, ELECTRIC POWER SYSTEMS,
 ENERGY CONVERSION, ELECTROMAGNETIC FIELDS,
 COMMUNICATION, NONLINEAR CIRCUITS, MATERIALS,
 AND CONTROL AND INFORMATION SYSTEMS
 AD-622202 N66-13758
- MEMORY**
 DISTINCTIVE FEATURES AND ERRORS IN SHORT TERM
 MEMORY FOR ENGLISH VOWELS A66-12816
- HUMAN USE OF SHORT-TERM MEMORY IN PROCESSING
 INFORMATION ON COMPUTER CONSOLE A66-80151
- SHORT TERM MEMORY AS FUNCTION OF NUMBER OF ITEMS
 SENT AND NUMBER OF CHANNELS IN MULTICHANNEL
 LISTENING EXPERIMENT A66-80153
- DELAYED AUDITORY FEEDBACK, EXPOSURE TIME AND
 RETENTION A66-80177
- SHORT-TERM MEMORY, CHOICE REACTION TIME, AND HAND
 STEADINESS OF EXERCISING AND RESTING SUBJECTS IN
 RESPONSE TO EPINEPHRINE OR INSULIN ADMINISTRATION
 A66-80201
- SIGNAL DETECTION THEORY AND SHORT TERM MEMORY
 A66-80265
- SHORT TERM RECOGNITION MEMORY FOR SINGLE DIGITS
 AND PAIRS OF DIGITS A66-80268
- EFFECT OF SIZE AND LOCATION OF INFORMATIONAL
 TRANSFORMS UPON SHORT-TERM RETENTION A66-80269
- BIOLOGICAL MECHANISMS FOR MEMORY - NEURON
 EXCITATION, NUCLEIC ACID METABOLISM, AND PROTEIN
 SYNTHESIS MECHANISM - DEOXYRIBONUCLEIC ACID
 JPRS-32809 N66-12269
- MENTAL PERFORMANCE**
 UPPER THERMAL TOLERANCE LIMITS FOR UNIMPAIRED
 MENTAL PERFORMANCE A66-12359
- HUMAN INTERAREA ELECTROENCEPHALOGRAPHIC PHASE
 RELATIONSHIPS FOLLOWING SENSORY AND IDEATIONAL
 STIMULI A66-80277
- MENTAL STRESS**
 DEGREE OF MENTAL STRESS CORRELATED WITH EXCRETION
 OF CATECHOLAMINE, FREE ADRENALINE AND
 NORADRENALINE IN URINE A66-14081
- THERMOREGULATION RESPONSES OF HUMAN MUSCULATURE
 TO SUDDEN COOLING AND TO EMOTIONAL STRESS
 A66-80344
- PHYSIOLOGICAL RESPONSES OF ENDOCRINE SYSTEM TO
 PHYSICAL AND MENTAL STRESS - URINARY EXCRETION
 OF ADRENALINE AND NORADRENALINE N66-13507
- METABOLISM**
 WATER CONSUMPTION BY MAN IN WARM ENVIRONMENT
 ANALYZED STATISTICALLY AND RELATED TO METABOLIC
 VARIABLES A66-80216
- SWEAT CHLORIDE CONCENTRATION AND RATE, METABOLIC
 RATE, SKIN AND BODY TEMPERATURES OF YOUNG AND OLD
 MALES WALKING IN DESERT ENVIRONMENT A66-80217
- THERMOREGULATORY METABOLIC RESPONSE OF COLD AND
 HEAT EXPOSED SQUIRREL MONKEYS /SAIMIRI SCIUREA/
 COMPARED TO SIMILARLY TREATED RODENTS A66-80225
- CHANGES IN SERUM PROTEIN-IODINE IN MEN EXPOSED TO
 POLAR CLIMATE A66-80293
- CARDIAC METABOLISM AT REST AND DURING HEART ARREST
 A66-80345
- BIOCHEMICAL RESEARCH IN CHINA AND DEVELOPMENT IN
 AREAS OF ENZYME SYSTEMS, METABOLISM, NUTRITION,
 CANCER, AND MEDICAL TECHNOLOGY - SYMPOSIUM
 N66-12627
- COMPARATIVE BIOCHEMICAL METHOD FOR STUDYING
 METABOLISM, NUTRITION, AND BODY FLUIDS AND
 TISSUES N66-12633
- METABOLISM AND CHEMICAL COMPOSITION OF CONNECTIVE
 TISSUE - FIBROUS AND NONFIBROUS PROTEINS
 N66-12635
- METABOLIC RESEARCH - ATOMIC ABSORPTION
 SPECTROMETRY USED FOR MEASURING NICKEL IN
 BIOLOGICAL MATERIALS, SERUM CA, MG, ACIDITY,
 AND CONDUCTIVITY - FREEZING POINT METHOD
 NYO-1397-1 N66-12898
- CALCIUM-45 AND STRONTIUM-85 METABOLISM IN HUMANS
 COO-587-2 N66-13061
- COMPUTER PROGRAMS FOR REDUCING METABOLIC DATA
 OBTAINED BY SCINTILLATION COUNTERS
 LA-3298 N66-13431
- METABOLISM AND ENERGY EXCHANGE BALANCE TESTS IN
 RESPIRATION CALORIMETER TO DETERMINE RELATION
 BETWEEN BODY TEMPERATURE AND FLUCTUATIONS OF
 OTHER BODY FUNCTIONS
 NASA-TT-F-9796 N66-13484
- METABOLIC STUDIES OF ENERGY DENSE COMPOUNDS FOR
 AEROSPACE NUTRITION
 AMRL-TR-64-121 N66-13594
- MICROBIOLOGY**
 MICROBIOCHEMICAL CONTRIBUTIONS TO BIOLOGY -
 BACTERIAL PHOTOSYNTHESIS, CATABOLISM, INDUCED
 ENZYMES N66-12632
- MICROORGANISM**
 CONTAMINATION OF CARBONACEOUS CHONDRITES BY
 ORDINARY VIABLE MICROORGANISMS, ISOLATING THREE
 TYPES OF BACTERIA ON VARIOUS METEORITES A66-13339
- SKIN DISORDERS DUE TO MICROBIAL INFECTIONS IN
 MILITARY PERSONNEL LIVING IN TROPICS A66-80262
- IMMUNITY TO INDOGENOUS MICROORGANISM IN ASTRONAUTS
 DURING TRAINING AND BEFORE AND AFTER VOSTOK SERIES
 SPACE FLIGHT A66-80374
- REDUCTION OF BACTERIAL DISSEMINATION FROM HUMANS
 AND SURFACE CONTAMINATION BY MICROORGANISMS
 NASA-CR-68090 N66-12250
- SURVIVAL OF MICROORGANISMS EXPOSED TO SHOCK WAVE
 AND CRYOGENIC TEMPERATURES DURING UPPER
 ATMOSPHERIC AIR SAMPLING
 NASA-CR-354 N66-12533

MICROWAVE FREQUENCY

SUBJECT INDEX

- SURVIVAL OF MICROORGANISMS EXPOSED TO SHOCK WAVE AND CRYOGENIC TEMPERATURE DURING WHOLE AIR SAMPLING OF UPPER ATMOSPHERE
NASA-CR-68421 N66-13095
- CLEAN ROOM BACTERIOLOGY - HEAT RESISTANCE OF SPORE FORMERS, MICROORGANISM IDENTIFICATIONS, HUMAN CONTACT CONTAMINATION
NASA-CR-68729 N66-13553
- MICROWAVE FREQUENCY**
PULSED MICROWAVE IRRADIATION OF DOGS NOTING BODY WEIGHT, RECTAL TEMPERATURE AND HEMATOLOGIC RESPONSE
A66-13351
- MICROWAVE RADIATION**
BEHAVIORAL EFFECTS IN RATS OF PROLONGED EXPOSURE TO ULTRA HIGH FREQUENCY RADIATION
A66-80273
- BIOLOGICAL EFFECTS OF MICROWAVE RADIATION
JPRS-33054 N66-12294
- MIDDLE EAR**
MEASUREMENT OF OTOLITH ACTIVITY AS INDICATED BY OCULAR COUNTERROLLING IN RESPONSE TO BODY TILT WITHIN FORCE FIELD OF ZERO G, ONE-HALF G, AND STANDARD G - EXTRALABYRINTHINE FACTORS
NASA-CR-68391 N66-13097
- MILITARY HELICOPTER**
RELATIONSHIP BETWEEN ANTISUBMARINE HELICOPTER TEAM PERFORMANCE AND COMMUNICATIONS FLOW WITHIN TEAM DURING SIMULATED ATTACK
NAVTRADEVGEN-1537-1 N66-13972
- MINERAL**
UTILIZATION OF MINERAL COMPONENTS IN THE MEDIUM OF CHLORELLA PYRENOIDOSA CULTURES
A66-80399
- MITOSIS**
COMBINED ACCELERATION, VIBRATION, AND RADIATION EFFECTS ON MITOTIC ACTIVITY OF BONE MARROW CELLS IN MICE
A66-80319
- REVERSIBLE PROCESS OF CHROMOSOME DAMAGE DURING MITOSIS BY IONIZING RADIATION IN YEAST
A66-80321
- MOLECULAR STRUCTURE**
MOLECULAR STRUCTURE OF PEPTIDE CHAINS OF PROTEINS TO FIND RULES GOVERNING AMINO ACIDS
N66-12628
- ENZYME CATALYST MECHANISMS, RELATIONSHIP BETWEEN ENZYME MOLECULAR STRUCTURE AND CATALYTIC ACTIVITY, AND FORMATION OF ENZYME INTERMEDIATE PRODUCTS
N66-12629
- MOLECULE**
SPACE RELATED MOLECULAR BIOLOGY AND MOLECULAR ORGANIZATION OF EXTRATERRESTRIAL MATTER - DESIGN AND CONSTRUCTION OF HIGH VACUUM CONTAINER FOR TRANSFER OF EXTRATERRESTRIAL COLLECTING SURFACES
NASA-CR-68844 N66-13830
- MONITOR**
POSSIBILITIES OF UTILIZATION OF ELECTRONIC LOGICAL SYSTEMS FOR AUTOMATIC MEDICAL CONTROL OF SPACECRAFT PERSONNEL
A66-80368
- RADIATION HAZARDS CONTROL - AIR MONITORS, FILM SENSITIVITY, STIMULATED EMISSION DOSIMETRY, GLASS CLEANING TECHNIQUES, HIGH DENSITY GRASS SAMPLES, AND FIRE HOSE FRICTION LOSSES
UCRL-14351 N66-12576
- MONKEY**
MOTOR RESTRAINT EFFECT ON BEHAVIOR RESPIRATION, HEART FUNCTION, AND BRAIN BIOELECTRIC ACTIVITY IN MONKEY
A66-80376
- HISTOLOGICAL CHANGES IN OVARIES AND RESISTANCE TO TRANSVERSE ACCELERATION REVEALED BY CARDIOVASCULAR AND RESPIRATORY ACTIVITY OF YOUNG FEMALE MONKEYS
A66-80378
- PROLONGED HOT OR COLD STIMULATION EFFECTS ON EYE
- MOVEMENTS, VESTIBULOSPINAL, AND SEGMENTAL SPINAL ACTIVITIES IN MONKEYS
NASA-CR-68266 N66-12177
- ENVIRONMENTAL TEMPERATURE EFFECTS ON EKG OF SQUIRREL MONKEY - ANIMAL STUDY OF HEART RATE AND T-WAVE AMPLITUDE
NASA-CR-68306 N66-12972
- MORPHINE**
EMETIC EFFECT OF APOMORPHINE AS RELATED TO DURATION OF ROTATION OR OSCILLATION EXPOSURE IN DOGS
A66-80326
- MORPHOLOGICAL INDEX**
MORPHOLOGY OF PERIPHERAL BLOOD IN MICE AS INDEX TO PHYSIOLOGICAL EFFECT OF EXPOSURE TO HIGH OXYGEN PARTIAL PRESSURE
A66-80386
- MOTION EQUATION**
EQUATIONS OF MOTION IN CIRCULAR MOTION TERMS FOR LIMACON CURVE - GEOMETRY - VESTIBULAR EFFECT ON HUMANS MOVING ALONG LIMACON
NADC-ML-6507 N66-14197
- MOTION PERCEPTION**
VISUAL PERCEPTION OF REAL AND APPARENT MOVEMENT, NOTING CUES AND THRESHOLD
A66-13797
- DETECTION OF COMPOUND MOTION IN TWO-TARGET COLLISION PREDICTION SITUATION
SP-1946/001/00 N66-14021
- MOTION SICKNESS**
MOTION SICKNESS HISTORY RELATION TO ATTRITION FROM FLIGHT TRAINING IN PENSACOLA MOTION SICKNESS QUESTIONNAIRE
A66-12364
- PHYSIOLOGICAL PROBLEMS OF WEIGHTLESSNESS DISCUSSING MOTION SICKNESS, FLUID VOLUME CONTROL AND CHRONIC EFFECTS ON CIRCULATORY SYSTEM
A66-14071
- AIRSICKNESS IN STUDENT AVIATORS DURING FLIGHT TRAINING AS RELATED TO VESTIBULAR AND VISUAL STIMULI AND ANXIETY
A66-80206
- AIR SICKNESS IN STUDENT AVIATORS ASSOCIATED WITH PEAKS OF PHYSIOLOGICAL AND PSYCHOLOGICAL STRESS DURING TRAINING
NSAM-939 N66-13700
- CONTROL OF VESTIBULAR APPARATUS BY CENTRAL NERVOUS SYSTEM - PREVENTION OF MOTION SICKNESS - AEROSPACE MEDICINE
AD-623676 N66-14320
- MOTION SICKNESS DRUG**
COMPARISON OF EFFECTIVENESS OF ANTIMOTION SICKNESS DRUGS TESTED IN HUMAN CENTRIFUGE
NASA-CR-68858 N66-13833
- MOTION STABILITY**
COMPARATIVE EFFECTS OF PROLONGED ROTATION AT 10 RPM ON POSTURAL EQUILIBRIUM IN VESTIBULAR NORMAL AND DEFECTIVE HUMAN SUBJECTS
A66-80198
- SHORT-TERM MEMORY, CHOICE REACTION TIME, AND HAND STEADINESS OF EXERCISING AND RESTING SUBJECTS IN RESPONSE TO EPINEPHRINE OR INSULIN ADMINISTRATION
A66-80201
- MOTOR SYSTEM**
ADAPTATION, SURVIVAL, RESPIRATORY RATE, AND MOTOR ACTIVITY OF MICE IN PROLONGED EXPOSURE TO HIGH CONCENTRATIONS OF CARBON DIOXIDE
A66-80320
- MOUSE**
ANIMAL TEMPERATURE SENSING FOR STUDYING EFFECT OF PROLONGED ORBITAL FLIGHT ON CIRCADIAN RHYTHMS OF POCKET MICE
A66-12767
- BIOCHEMICAL EVIDENCE OF SIMILARITY OF RADIATION PROTECTION MECHANISMS OF CYSTAMINE, CYSTEAMINE, SEROTININ, AND ANOXIA IN ALBINO MICE
A66-80169
- ULTRAVIOLET INJURY IN MOUSE AS AFFECTED BY HOT

- ENVIRONMENT A66-80255
- EFFECT OF NITROGEN BREATHING ON RADIATION DAMAGE IN ALBINO MICE A66-80295
- EMBRYONIC DEVELOPMENT OF CHICK AND FROG EGGS AND RESPIRATION OF CHICKEN AND MOUSE IN SIMULATED SPACE CABIN ATMOSPHERE CONSISTING OF HELIUM AND OXYGEN A66-80315
- COMBINED ACCELERATION, VIBRATION, AND RADIATION EFFECTS ON MITOTIC ACTIVITY OF BONE MARROW CELLS IN MICE A66-80319
- ADAPTATION, SURVIVAL, RESPIRATORY RATE, AND MOTOR ACTIVITY OF MICE IN PROLONGED EXPOSURE TO HIGH CONCENTRATIONS OF CARBON DIOXIDE A66-80320
- ACTIVE SELECTION OF AIR WITH VARIOUS OXYGEN CONTENT BY MICE PREVIOUSLY EXPOSED IN CHAMBER TO NORMAL CONDITIONS AND AIR WITH HIGH OXYGEN CONTENT A66-80325
- SENSITIVITY OF DIFFERENT ORGAN MOUSE TISSUE CELLS DURING IN SITU AND IN VITRO STUDIES IN RESPONSE TO VIBRATION A66-80380
- RADIOPROTECTIVE EFFECT OF VARIOUS DRUGS AGAINST X - RAYS AND GAMMA RAYS DURING PROTON IRRADIATION MICE A66-80381
- PROTON AND GAMMA IRRADIATION EFFECTS ON SPLEEN, THYMUS AND BONE MARROW IN MICE A66-80383
- MORPHOLOGY OF PERIPHERAL BLOOD IN MICE AS INDEX TO PHYSIOLOGICAL EFFECT OF EXPOSURE TO HIGH OXYGEN PARTIAL PRESSURE A66-80386
- EFFECT OF PROLONGED EXPOSURE TO HIGH CONCENTRATION OF OXYGEN ON LUNGS AND BLOOD IN MICE A66-80389
- AMMONIA EFFECTS ON PHYSIOLOGICAL FUNCTIONS OF MICE IN CLOSED ENVIRONMENT A66-80390
- TUMORS IN MICE AFTER THYMECTOMY AND X-RAY IRRADIATION, AND CHROMOSOME ANOMALIES FROM TRITIATED THYMIDINE - RADIOBIOLOGY EUR-2462.F N66-12431
- BIOLOGICAL EFFECT OF HIGH ENERGY PROTON IRRADIATION ON CORNEAL EPITHELIA OF MICE N66-12456
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTON IRRADIATION ON MICE HER/AP-2-65 N66-12462
- INHALATION STUDY OF NEODYMIUM OXIDE PATHOGENESIS IN MICE AND GUINEA PIGS - ANIMAL STUDY COO-1170-4 N66-12951
- EFFECT OF VIBRATION ON CELL DIVISION IN BONE MARROW OF MOUSE N66-13791
- CALORIMETRIC DETERMINATION OF ICE FORMED IN FEET OF MICE FROZEN AT VARIOUS TEMPERATURE AAL-TDR-63-29 N66-14037
- MUSCLE**
- METABOLISM OF CARNITINE IN MUSCLE OF COLD ACCLIMATED RAT A66-80152
- ELECTROENCEPHALOGRAPHIC RESPONSES AND CHANGES IN ELECTRIC POTENTIALS IN NECK MUSCLES OF RAT DURING SHORT PERIODS OF WEIGHTLESSNESS A66-80161
- MUSCULAR FATIGUE**
- RESISTANCE TO HYPOXIA AND FATIGUE OF RESPIRATORY MUSCLE DURING ASCENT TO HIGH ALTITUDE AS AFFECTED BY ACCLIMATIZATION A66-80305
- MUSCULAR FUNCTION**
- ELECTROMYOGRAPHIC STUDY OF ABDOMINAL MUSCLE INVOLVEMENT DURING PERFORMANCE OF VARIOUS FORMS OF SIT UP EXERCISE A66-80337
- MUSCULAR STRENGTH**
- PHYSICAL ATROPHY PREVENTION IN PROTRACTED WEIGHTLESSNESS, DISCUSSING PHYSICAL FITNESS MAINTENANCE DURING SPACE FLIGHT A66-14072
- MUSCULAR SYSTEM**
- METHODS FOR SOMATIC CLASSIFICATION OF PILOTS OF DIFFERENT AGES ACCORDING TO STATUS OF FUNCTIONAL MUSCULAR, CIRCULATORY, AND RESPIRATORY CAPACITIES AS RELATED TO TRAINING A66-80164
- MUSCLE TENSION CHANGES DURING RAPID EYE MOVEMENT STATE A66-80182
- VENTILATION OF DOGS IN RESPONSE TO PRESSURE AND ELECTRIC STIMULATION OF MUSCLE AFFERENTS A66-80234
- ELECTRIC METHOD FOR REGISTERING TONGUE MOTION DURING ARTICULATION OF CONSONANTS A66-80329
- THERMOREGULATION RESPONSES OF HUMAN MUSCULATURE TO SUDDEN COOLING AND TO EMOTIONAL STRESS A66-80344
- MUSCULAR TONUS**
- AVOIDING MUSCULAR ATROPHY AND HEMOGLOBIN LOSS IN PROTRACTED WEIGHTLESSNESS THROUGH PHYSICAL EXERCISE A66-80158
- MUTATION**
- AMINOTHIOLS AND PYRIMIDINE ANALOGS TESTED FOR PROTECTIVE EFFECTS AGAINST GENETIC MUTATIONS IN ESCHERICHIA COLI EXPOSED TO X-RAY IRRADIATION A66-80385
- RADIATION SENSITIVITY OF CHROMOSOME MUTATION IN WHITE BLOOD CELLS OF HUMANS, MONKEYS, AND RABBITS N66-12756
- N**
- NASA PROGRAM**
- NASA BIOSATELLITE PROGRAM - PURPOSES AND PROPOSED EXPERIMENTS A66-80364
- NEODYMIUM COMPOUND**
- INHALATION STUDY OF NEODYMIUM OXIDE PATHOGENESIS IN MICE AND GUINEA PIGS - ANIMAL STUDY COO-1170-4 N66-12951
- NERVOUS SYSTEM**
- MECHANISM, PREVENTION AND TREATMENT OF OXYGEN TOXICITY IN CENTRAL NERVOUS SYSTEM, NOTING ACETYLCHOLINESTERASE ACTIVITY A66-13346
- MONITORING HUMAN PERFORMANCE DURING MANNED ORBITAL FLIGHT FOR ASSESSMENT OF CENTRAL NERVOUS SYSTEM FUNCTION, NOTING ANIMAL STUDIES DURING SIMULATED STRESSES OF SPACE FLIGHT A66-14088
- VENTILATION OF DOGS IN RESPONSE TO PRESSURE AND ELECTRIC STIMULATION OF MUSCLE AFFERENTS A66-80234
- NEUROLOGY**
- CYBERNETIC DEVICES USED IN MEDICAL PRACTICE, AND CYBERNETIC SYSTEMS FOR NEUROLOGICAL STUDIES AND DIAGNOSTIC TECHNIQUES JPRS-32344 N66-12728
- NEURON TRANSMISSION**
- BIOLOGICAL MECHANISMS FOR MEMORY - NEURON EXCITATION, NUCLEIC ACID METABOLISM, AND PROTEIN SYNTHESIS MECHANISM - DEOXYRIBONUCLEIC ACID JPRS-32809 N66-12269
- NEUROPHYSIOLOGY**
- NEUROPHYSIOLOGICAL ASPECTS OF MANNED EXTRATERRESTRIAL SPACE FLIGHTS SUCH AS MOTOR RESPONSES BY SENSORY INPUTS, CORTICAL RESPONSES, ETC A66-14065
- NITROGEN**
- ALVEOLAR NITROGEN CONCENTRATION AND ENVIRONMENTAL PRESSURE INFLUENCE UPON RATE OF GAS ABSORPTION FROM NONVENTILATED LUNG IN DOG A66-12357

- APPLICATION OF DIGITAL COMPUTATION TECHNIQUES FOR ON LINE DISPLAY OF PULMONARY NITROGEN WASHOUT AND COMPARISON OF DATA WITH CONVENTIONAL TECHNIQUES
A66-80231
- EFFECT OF NITROGEN BREATHING ON RADIATION DAMAGE IN ALBINO MICE
A66-80295
- ACTIVE SELECTION OF AIR WITH VARIOUS OXYGEN CONTENT BY MICE PREVIOUSLY EXPOSED IN CHAMBER TO NORMAL CONDITIONS AND AIR WITH HIGH OXYGEN CONTENT
A66-80325
- HYPOXIA PRODUCED BY INHALATION OF PURE NITROGEN AND INTERMITTENT OXYGEN BREATHING IN CATS
A66-80388
- NOISE**
MEASUREMENTS OF HEARING SENSITIVITY OF MEN DURING PROLONGED ISOLATION IN SMALL CHAMBER UNDER CONDITIONS OF CONSTANT NOISE
A66-80307
- NOISE INJURY**
HIGH NOISE LEVELS EFFECT ON HEARING DAMAGE OF TECHNICAL PERSONNEL OF MILITARY AIRFIELD
A66-14386
- NOISE TOLERANCE**
TOLERANCE OF JET AND ROCKET ENGINE EXHAUST NOISE AND EAR PROTECTION DEVICES FOR PILOTS AND GROUND CREWS
NASA-TT-F-9799
N66-13297
- NOREPINEPHRINE**
DEGREE OF MENTAL STRESS CORRELATED WITH EXCRETION OF CATECHOLAMINE, FREE ADRENALINE AND NORADRENALINE IN URINE
A66-14081
- PHYSIOLOGICAL RESPONSES OF ENDOCRINE SYSTEM TO PHYSICAL AND MENTAL STRESS - URINARY EXCRETION OF ADRENALINE AND NORADRENALINE
N66-13507
- NUCLEAR RADIATION**
NUCLEAR RADIATION MEDICINE - METHODS OF RECORDING COUNTING RATE
ORNL-P-1383
N66-12899
- NUCLEIC ACID**
SYMPOSIUM ON BIOCHEMICAL RESEARCH IN MAINLAND CHINA
JPRS-33002
N66-12626
- NUTRITION**
NUTRITIONAL PROBLEMS OF SUGAR REGULATION IN AVIATION MEDICINE - HYPERGLYCEMIA IN RATS AND SURV OF NUTRITIONAL HABITS OF FLYING PERSONNEL
A66-80361
- BIOCHEMICAL RESEARCH IN CHINA AND DEVELOPMENT IN AREAS OF ENZYME SYSTEMS, METABOLISM, NUTRITION, CANCER, AND MEDICAL TECHNOLOGY - SYMPOSIUM
N66-12627
- COMPARATIVE BIOCHEMICAL METHOD FOR STUDYING METABOLISM, NUTRITION, AND BODY FLUIDS AND TISSUES
N66-12633
- BIOCHEMICAL PROBLEMS PERTINENT TO FOOD INDUSTRY AND NUTRITION
N66-12636
- METABOLIC STUDIES OF ENERGY DENSE COMPOUNDS FOR AEROSPACE NUTRITION
AMRL-TR-64-121
N66-13594
- NUTRITIONAL REQUIREMENT**
UTILIZATION OF MINERAL COMPONENTS IN THE MEDIUM OF CHLORELLA PYRENOIDOSA CULTURES
A66-80399
- NYSTAGMUS**
HYPOXIC HYPOXIA AND HYPERVENTILATION EFFECT ON NYSTAGMUS INDUCED BY ANGULAR ACCELERATION
A66-13356
- INTERACTION OF CENTRAL AND FLASH NYSTAGMUS IN RABBITS
A66-80339
- PROLONGED OPTOKINETIC STIMULATION EFFECT ON RABBIT
- OCULAR CIRCULATION**
RHEOGRAPHIC REGIONAL METHOD FOR EVALUATION OF CEREBRAL AND OCULAR CIRCULATION IN CARDIAC AND CEREBROVASCULAR DISEASE
A66-14002
- OCULAR CONVERGENCE**
MEASUREMENT OF OTOLITH ACTIVITY AS INDICATED BY OCULAR COUNTERROLLING IN RESPONSE TO BODY TILT WITHIN FORCE FIELD OF ZERO G, ONE-HALF G, AND STANDARD G - EXTRALABYRINTHINE FACTORS
NASA-CR-68391
N66-13097
- OCULOGRAVIC ILLUSION**
VALIDITY OF OCULOGRAVIC ILLUSION AS SPECIFIC INDICATOR OF OTOLITH FUNCTION
A66-80200
- OCULOGRAVIC ILLUSION - PERCEPTION OF VISUAL HORIZONTAL IN NORMAL AND INNER EAR DEFECTIVE SUBJECTS DURING PROLONGED ROTATION
NASA-CR-68659
N66-13560
- OPERATIONS RESEARCH**
RESEARCH AND DEVELOPMENT PROGRAM MANAGEMENT - PROBLEM SOLVING STRATEGIES IN PARALLEL PROJECTS
NASA-CR-68375
N66-12989
- OPERATOR PERFORMANCE**
OPTIMAL CONTROL DISPLAY RELATIONSHIPS IN GENERAL TRACKING INCLUDING PILOTING AND RADAR TRACKING OPERATION
A66-13349
- COMPARISON OF CROSS CORRELATION AND ORTHOGONALIZED EXPONENTIAL ANALYSES BY REGRESSION ANALYSIS FOR IDENTIFICATION OF HUMAN PILOT DYNAMIC RESPONSE CHARACTERISTICS
NASA-CR-68701
N66-13516
- OPTIMAL CONTROL**
OPTIMAL CONTROL DISPLAY RELATIONSHIPS IN GENERAL TRACKING INCLUDING PILOTING AND RADAR TRACKING OPERATION
A66-13349
- ORGAN**
ELECTRIC METHOD FOR REGISTERING TONGUE MOTION DURING ARTICULATION OF CONSONANTS
A66-80329
- SENSITIVITY OF DIFFERENT ORGAN MOUSE TISSUE CELLS DURING IN SITU AND IN VITRO STUDIES IN RESPONSE TO VIBRATION
A66-80380
- ORGANISM**
BIOENERGETIC STUDIES OF ENERGY TRANSFERS, THERMODYNAMICS, AND ENTROPY IN LIVING ORGANISMS
N66-12631
- ORTHOGONAL FUNCTION**
COMPARISON OF CROSS CORRELATION AND ORTHOGONALIZED EXPONENTIAL ANALYSES BY REGRESSION ANALYSIS FOR IDENTIFICATION OF HUMAN PILOT DYNAMIC RESPONSE CHARACTERISTICS
NASA-CR-68701
N66-13516
- ORTHOSTATIC TOLERANCE**
DEHYDRATION OF SUBJECTS DURING PROLONGED BED REST AS AFFECTED BY 9 ALPHAFLUOROHYDROCORTISONE
A66-80196
- OSCILLATION**
EMETIC EFFECT OF APOMORPHINE AS RELATED TO DURATION OF ROTATION OR OSCILLATION EXPOSURE IN DOGS
A66-80326
- OTOLITH**
VALIDITY OF OCULOGRAVIC ILLUSION AS SPECIFIC INDICATOR OF OTOLITH FUNCTION
A66-80200
- MEASUREMENT OF OTOLITH ACTIVITY AS INDICATED BY OCULAR COUNTERROLLING IN RESPONSE TO BODY TILT WITHIN FORCE FIELD OF ZERO G, ONE-HALF G, AND STANDARD G - EXTRALABYRINTHINE FACTORS
NASA-CR-68391
N66-13097
- OVARY**
HISTOLOGICAL CHANGES IN OVARIES AND RESISTANCE TO

- TRANSVERSE ACCELERATION REVEALED BY CARDIOVASCULAR AND RESPIRATORY ACTIVITY OF YOUNG FEMALE MONKEYS
A66-80378
- OXIDATION**
OXIDATION AND PHOSPHORYLATION CORRELATION IN BRAIN TISSUES DURING OVERCOOLING AND REWARMING IN EXPERIMENTAL ANIMALS.
A66-80170
- OXYGEN**
VERBAL COMMUNICATION INTELLIGIBILITY IN OXYGEN-HELIUM AND OTHER BREATHING MIXTURES IN LOW PRESSURE CHAMBER
A66-80199
- EMBRYONIC DEVELOPMENT OF CHICK AND FROG EGGS AND RESPIRATION OF CHICKEN AND MOUSE IN SIMULATED SPACE CABIN ATMOSPHERE CONSISTING OF HELIUM AND OXYGEN
A66-80315
- ACTIVE SELECTION OF AIR WITH VARIOUS OXYGEN CONTENT BY MICE PREVIOUSLY EXPOSED IN CHAMBER TO NORMAL CONDITIONS AND AIR WITH HIGH OXYGEN CONTENT
A66-80325
- CHLORELLA AS SOURCE OF OXYGEN AND FOOD IN SHINER, NOTROPIS
A66-80335
- PARTIAL PRESSURE OF OXYGEN AND CARBON DIOXIDE, HYDROGEN ION CONCENTRATION, HEMOGLOBIN SATURATION, AND TEMPERATURE OF DOG BLOOD ANALYZED USING DIGITAL COMPUTER
SAM-TR-65-39
N66-13209
- FEASIBILITY OF USING ENERGY IN BREATHING OXYGEN WHEN EXPANDED FROM STORAGE PRESSURE TO BREATHING PRESSURE TO POWER OXYGEN-CIRCULATING BLOWER AND WATER CIRCULATING PUMP
AMRL-TR-65-128
N66-13595
- OXYGEN BREATHING**
AEROSPACE BREATHING CHART USED IN ANALYTICAL EVALUATION OF BREATHABLE ATMOSPHERES AND EMERGENCY OXYGEN SYSTEMS
AIAA PAPER 65-723
A66-12544
- HYPOXIA PRODUCED BY INHALATION OF PURE NITROGEN AND INTERMITTENT OXYGEN BREATHING IN CATS
A66-80388
- EFFECT OF PROLONGED EXPOSURE TO HIGH CONCENTRATION OF OXYGEN ON LUNGS AND BLOOD IN MICE
A66-80389
- OXYGEN CONSUMPTION**
VENTILATION, HEART RATE, LACTATE FORMATION, AND OXYGEN CONSUMPTION DURING ARM AND LEG EXERCISE IN SUPINE AND SITTING POSITION
A66-80211
- KINETICS OF OXYGEN UPTAKE BY ERYTHROCYTES OF DIFFERENT AGES AS RELATED TO RESPIRATORY FUNCTION OF BLOOD
A66-80229
- CARDIAC METABOLISM AT REST AND DURING HEART ARREST
A66-80345
- OXYGEN SATURATION AND DESATURATION TIMES IN CARDIAC MUSCLE AND CORRESPONDING VALUES CALCULATED FROM KROGH SUPPLY MODEL
A66-80346
- OXYGEN CONSUMPTION RATE AND ELECTROENCEPHALOGRAPHIC STAGE OF SLEEP
A66-80353
- EFFECTS OF GRADUAL OR SUDDEN ONSET OF HYPOXIA ON OXYGEN DEMAND
A66-80387
- OXYGEN DEFICIENCY**
THERMAL HOMOIOSTASIS UNDER HYPOXIA IN MAN, DISCUSSING THERMAL STRESS ADAPTATION AND PHYSIOLOGICAL RESPONSES IN OXYGEN-DEFICIENT ENVIRONMENT
A66-14068
- OXYGEN METABOLISM**
CHANGES IN MYOCARDIAL OXYGEN PRESSURE OF DOGS DURING ASCENT AND ACCELERATION DETERMINED BY POLAROGRAPHIC ELECTRODES IMPLANTED IN HEART MUSCLES
JPRS-33066
N66-12271
- OXYGEN PRODUCTION**
STUDY OF MODE OF ACTION OF 3-74-CHLOROPHENYL/-1, 1-DIMETHYLUREA ON PHOTOSYNTHESIS AND OXYGEN PRODUCTION IN CHLORELLA PYRENOIDOSA AS FUNCTION OF LIGHT AND TEMPERATURE
A66-80290
- SIMPLE OSCILLATIONS IN PHOTOSYNTHETIC OXYGEN EVOLUTION IN CHLORELLA PYRENOIDOSA
A66-80291
- OPTIMAL SYSTEM OF CHLORELLA CULTURE FOR HUMAN OXYGEN REQUIREMENTS
A66-80336
- PHOTOSYNTHESIS INTENSITY IN CHLORELLA CULTURE AS DETERMINED BY SUSPENSION DENSITY, CARBON DIOXIDE CONCENTRATION, AND OTHER FACTORS
A66-80398
- OXYGEN TENSION**
OXYGEN DIFFUSION IN BRAIN TISSUE CALCULATED ON BASIS OF CONICAL SPATIAL MODEL
A66-80342
- OXYGEN DIFFUSION IN BRAIN IN VENOUS OR ARTERIAL HYPOXIA
A66-80343
- MORPHOLOGY OF PERIPHERAL BLOOD IN MICE AS INDEX TO PHYSIOLOGICAL EFFECT OF EXPOSURE TO HIGH OXYGEN PARTIAL PRESSURE
A66-80386
- OXYGEN TOXICITY**
MECHANISM, PREVENTION AND TREATMENT OF OXYGEN TOXICITY IN CENTRAL NERVOUS SYSTEM, NOTING ACETYLCHOLINESTERASE ACTIVITY
A66-13346
- P**
- PAIN**
GATE CONTROL SYSTEM ROLE IN PAIN MECHANISM, NOTING SPECIFICITY AND PATTERN THEORIES
A66-13337
- PARABOLIC FLIGHT**
EFFECT OF WEIGHTLESSNESS ON PHYSIOLOGICAL STATE OF HUMAN ORGANISM DURING PARABOLIC FLIGHTS.
A66-80172
- PARTIAL PRESSURE**
PARTIAL PRESSURE OF OXYGEN AND CARBON DIOXIDE, HYDROGEN ION CONCENTRATION, HEMOGLOBIN SATURATION, AND TEMPERATURE OF DOG BLOOD ANALYZED USING DIGITAL COMPUTER
SAM-TR-65-39
N66-13209
- PARTICLE**
WHOLE BODY DEPOSITION OF PARTICLES AS FUNCTION OF VARIOUS PHYSICAL AND CHEMICAL PARAMETERS
N66-12684
- PATHOLOGICAL EFFECT**
PATHOLOGICAL EFFECTS OF X-RAY IRRADIATION ON GASTROINTESTINAL SYSTEM IN DOGS - RADIATION SICKNESS
FTD-TT-64-910/1&2&3&4
N66-12607
- PATHOLOGY**
INHALATION STUDY OF NEODYMIUM OXIDE PATHOGENESIS IN MICE AND GUINEA PIGS - ANIMAL STUDY
COO-1170-4
N66-12951
- PATTERN RECOGNITION**
AUTOMATIC COMMAND CONTROL SYSTEM USING PHONETIC VOICE PATTERN RECOGNITION
A66-13496
- SIMPLE PATTERN RECOGNITION IN SMALL GROUP SITUATION
A66-80181
- PENETRATION**
EFFECTS OF WETTING ON CUTANEOUS VULNERABILITY
A66-80260
- PEPTIDE**
MOLECULAR STRUCTURE OF PEPTIDE CHAINS OF PROTEINS TO FIND RULES GOVERNING AMINO ACIDS
N66-12628
- PERCEPTION**
STABILIZED RETINAL IMAGES AND DISAPPEARANCE TIME AS RELATED TO STIMULUS SIZE
A66-80173

- SELECTED BIBLIOGRAPHY ON PERCEPTION A66-80183
- PERCEPTUAL SPEED**
PSYCHOLOGICAL STRESS SUSCEPTIBILITY OF NAVAL AND MARINE PILOT TRAINEES, EXAMINING ENVIRONMENTAL CUE MANIPULATION TO CONTROL PERCEPTIONS A66-12355
- PERFORMANCE CHARACTERISTICS**
COMPENSATORY TRACKING BEHAVIOR AS AFFECTED BY KNOWLEDGE OF PERFORMANCE LEVEL A66-80150
EVALUATION OF AIR VENTILATED CLOTHING SYSTEM REGULATING HEAT LOSS DURING EXTRAVEHICULAR ACTIVITY IN SPACE A66-80157
TELLING COMPUTER HOW TO EVALUATE MULTIDIMENSIONAL SITUATIONS AND TERMINOLOGY AND STATISTICS FOR DETERMINING PERFORMANCE OF DECISION MAKER A66-80184
PRINCIPLES FOR CREATING SYSTEMS CAPABLE OF MAINTAINING OPTIMUM CONDITIONS IN SPACE CAPSULE ENVIRONMENT A66-80190
- PERFORMANCE PREDICTION**
MEASUREMENT, STRUCTURE, AND PREDICTION OF JOB AND TRAINING PERFORMANCE OF AIR TRAFFIC CONTROL SPECIALISTS OF DIFFERENT AGES A66-80193
- PERSONALITY**
STATEMENT ATTRACTIVENESS INDICES OBTAINED UNDER PERSONAL OR SOCIAL ACCEPTABILITY - CORRELATION OF INDICES WITH EACH OTHER NASM-937 N66-12380
- PERSONNEL**
HUMAN FACTORS INFORMATION REQUIREMENTS FOR SPACE SYSTEM DEVELOPMENT NASA-CR-68230 N66-12959
- PERSONNEL SELECTION**
HISTORY OF ASTRONAUT SELECTION PROCEDURES AS RELATED TO SELECTION OF SCIENTISTS BECOMING MEMBERS OF SPACECREW A66-80187
MEASUREMENT, STRUCTURE, AND PREDICTION OF JOB AND TRAINING PERFORMANCE OF AIR TRAFFIC CONTROL SPECIALISTS OF DIFFERENT AGES A66-80193
- PETROLOGY**
BIOLOGIC-TYPE ALKANES OF INDIGENOUS ORIGIN MORE THAN 2.7 BILLION YEARS OLD PRESENT IN PRECAMBRIAN ROCKS OF SOUDAN FORMATION A66-12366
- PH**
PARTIAL PRESSURE OF OXYGEN AND CARBON DIOXIDE, HYDROGEN ION CONCENTRATION, HEMOGLOBIN SATURATION, AND TEMPERATURE OF DOG BLOOD ANALYZED USING DIGITAL COMPUTER SAM-TR-65-39 N66-13209
- PHARMACOLOGY**
PHARMACOLOGICALLY ACTIVE AND LETHAL SUBSTANCES RELEASED FROM THERMALLY INJURED SKIN OF HUMAN AND ANIMAL SUBJECTS INCLUDING HISTAMINE, BRADYKININ, ADENYLIC COMPOUNDS, AND POSSIBLY SEROTONIN A66-80254
PROPHYLAXIS AND THERAPY OF RADIATION INJURIES CAUSED BY HIGH ENERGY PROTON IRRADIATION N66-12461
- PHONEME**
DISTINCTIVE FEATURES AND ERRORS IN SHORT TERM MEMORY FOR ENGLISH VOWELS A66-12816
SPEECH STREAM SEGMENTATION INTO PHONEMES JPRS-32790 N66-12957
- PHOSPHORUS**
METABOLISM AND EXCRETION OF CESIUM, PHOSPHORUS, PLUTONIUM, TRITIUM AND RADIATION, STRONTIUM, SULFUR, TRITIUM AND URANIUM FROM HUMAN BODY N66-12686
- PHOSPHORUS METABOLISM**
EFFECT OF GLUCAGON ON BLOOD SUGAR AND INORGANIC PHOSPHORUS LEVELS IN NORMOTHERMIC AND HYPOTHERMIC RATS A66-80245
- PHOSPHORYLATION**
OXIDATION AND PHOSPHORYLATION CORRELATION IN BRAIN TISSUES DURING OVERCOOLING AND REWARMING IN EXPERIMENTAL ANIMALS. A66-80170
- PHOTIC STIMULATION**
LIGHT INDUCED CHANGES IN LIPIDS OF CHLORELLA VULGARIS A66-80246
INTERACTION OF CENTRAL AND FLASH NYSTAGMUS IN RABBITS A66-80339
- PHOTOCHEMISTRY**
PHOTOCHEMISTRY OF VISION INCLUDING SPECTROPHOTOMETRIC ANALYSIS OF RHODOPSIN OPTICAL DENSITY, ABSORBANCE AND QUANTUM EFFICIENCY A66-13789
- PHOTOSYNTHESIS**
LIGHT INDUCED ABSORPTION CHANGES AT 520 NM IN CHLORELLA PYRENOIDOSA AND THEIR RELATIONSHIP TO TWO PIGMENT SYSTEM OF PHOTOSYNTHESIS A66-80289
STUDY OF MODE OF ACTION OF 3-74-CHLOROPHENYL/-1, 1-DIMETHYLUREA ON PHOTOSYNTHESIS AND OXYGEN PRODUCTION IN CHLORELLA PYRENOIDOSA AS FUNCTION OF LIGHT AND TEMPERATURE A66-80290
SIMPLE OSCILLATIONS IN PHOTOSYNTHETIC OXYGEN EVOLUTION IN CHLORELLA PYRENOIDOSA A66-80291
PHOTOSYNTHESIS INTENSITY IN CHLORELLA CULTURE AS DETERMINED BY SUSPENSION DENSITY, CARBON DIOXIDE CONCENTRATION, AND OTHER FACTORS A66-80398
MICROBIOCHEMICAL CONTRIBUTIONS TO BIOLOGY - BACTERIAL PHOTOSYNTHESIS, CATABOLISM, INDUCED ENZYMES N66-12632
- PHYSICAL ENDURANCE**
PHYSICAL AND PHYSIOLOGICAL PARAMETERS EFFECTING RESPIRATORY TRACT DEPOSITION N66-12683
- PHYSICAL EXAMINATION**
ASTRONAUT SELECTION INCLUDING DYNAMIC TESTING, DISCUSSING EXAMINATION METHODS, BIOLOGICAL PARAMETERS, LABORATORY AND RADIOLOGICAL PROCEDURES, BLOOD CHEMISTRY TECHNIQUES, ETC A66-14064
HISTORY OF ASTRONAUT SELECTION PROCEDURES AS RELATED TO SELECTION OF SCIENTISTS BECOMING MEMBERS OF SPACECREW A66-80187
- PHYSICAL EXERCISE**
EXERCISE TOLERANCE, PLASMA VOLUME, RED CELL MASS, TOTAL BLOOD VOLUME AND ORTHOSTATIC TOLERANCE DURING FOUR WEEKS OF BED REST A66-13354
SYMPATHETIC NERVOUS STIMULATION OF HEART - BETA ADRENERGIC BLOCKING CARDIAC FUNCTION, CIRCULATORY RESPONSE AND PHYSICAL EXERCISE A66-80147
AVOIDING MUSCULAR ATROPHY AND HEMOGLOBIN LOSS IN PROTRACTED WEIGHTLESSNESS THROUGH PHYSICAL EXERCISE A66-80158
CENTRAL NERVOUS SYSTEM FUNCTION OF HUMAN SUBJECTS EXPOSED TO PHYSICAL EXERCISE, SLEEP DEPRIVATION, STARVATION, AND HYPOXIA A66-80191
COMPARATIVE EFFECTS OF PROLONGED ROTATION AT 10 RPM ON POSTURAL EQUILIBRIUM IN VESTIBULAR NORMAL AND DEFECTIVE HUMAN SUBJECTS A66-80198
SHORT-TERM MEMORY, CHOICE REACTION TIME, AND HAND STEADINESS OF EXERCISING AND RESTING SUBJECTS IN RESPONSE TO EPINEPHRINE OR INSULIN ADMINISTRATION A66-80201
PATELLAR REFLEX TIME OF OLD AND YOUNG MALE SUBJECTS AS AFFECTED BY EXERCISE A66-80207

SUBJECT INDEX

PHYSIOLOGICAL RESPONSE

- VENTILATION, HEART RATE, LACTATE FORMATION, AND OXYGEN CONSUMPTION DURING ARM AND LEG EXERCISE IN SUPINE AND SITTING POSITION A66-80211
- HEART RATE AND OUTPUT AND BODY TEMPERATURE OF ACCLIMATIZED MALE DURING EXERCISE IN HOT ENVIRONMENT A66-80219
- FOOD INTAKE, BODY WEIGHT, AND ACTIVITY OF RAT EXERCISING IN HOT ENVIRONMENT A66-80220
- MEASUREMENT OF REACTION IN MAN OF RESISTANCE AND CAPACITY VESSELS IN FOREARM AND HAND TO LEG EXERCISE A66-80221
- COMPARISON OF HUMAN RESPONSES TO PULSED AND UNPULSED ENVIRONMENTAL HEAT AND PHYSICAL EXERCISE A66-80222
- INFLUENCE OF PROPRIOCEPTOR IN VENTILATORY RESPONSE TO EXERCISE A66-80223
- PULMONARY DIFFUSING CAPACITY IN SUBJECTS AT REST AND DURING EXERCISE AS AFFECTED BY INCREASED ENVIRONMENTAL TEMPERATURE A66-80224
- ALVEOLAR CARBON DIOXIDE TENSION OF SUPINE SUBJECTS EXERCISING ON BICYCLE ERGOMETER AT INCREASED PRESSURE. A66-80226
- COMPARISON OF METHODS OF BLOOD PRESSURE MEASUREMENTS AND PRESSURE FLOW DYNAMICS DURING VARIOUS CONDITIONS OF PHYSICAL EXERCISE A66-80244
- MECHANISMS OF SWEATING IN WORK-SWEATING RESPONSES IN PHYSICAL EXERCISE RELATED TO CHANGES IN BODY TEMPERATURE A66-80252
- ELECTROMYOGRAPHIC STUDY OF ABDOMINAL MUSCLE INVOLVEMENT DURING PERFORMANCE OF VARIOUS FORMS OF SIT UP EXERCISE A66-80337
- INFLUENCE OF SEVERAL PHYSICAL ACTIVITIES ON BLOOD SERUM CHOLESTEROL CONCENTRATION IN YOUNG MEN A66-80356
- PHYSICAL FITNESS**
- COMPARATIVE PHYSICAL PERFORMANCES OF NAVAL AVIATOR TRAINEES FROM VARIOUS PROCUREMENT SOURCES AND UNDER TWO DIFFERENT SYLLABI A66-12354
- PHYSICAL ATROPHY PREVENTION IN PROTRACTED WEIGHTLESSNESS, DISCUSSING PHYSICAL FITNESS MAINTENANCE DURING SPACE FLIGHT A66-14072
- METHODS FOR SOMATIC CLASSIFICATION OF PILOTS OF DIFFERENT AGES ACCORDING TO STATUS OF FUNCTIONAL MUSCULAR, CIRCULATORY, AND RESPIRATORY CAPACITIES AS RELATED TO TRAINING A66-80164
- SOME ELECTROCARDIOGRAPHIC ABNORMALITIES AND PHYSICAL FITNESS OF FLYING PERSONNEL A66-80362
- PHYSICAL WORK**
- BLOOD SUPPLY OF EXTREMITY MUSCLES DURING INTENSE PHYSICAL WORK IN ALBINO RATS A66-80174
- PHYSICIAN**
- REVIEW OF PROBLEMS FOR PHYSICIAN IN AEROSPACE MEDICINE A66-80405
- PHYSIOLOGICAL INDEX**
- SWEDISH AIR FORCE PERSONNEL TESTING FOR SOMATIC CLASSIFICATION, APPRAISING BODY DIMENSIONS, MUSCULAR CAPACITY, ENDURANCE INDEX, ETC A66-14087
- ERYTHROPOIETIN, ACTIVITY, BLOOD, AND PHYSIOLOGICAL RESPONSES TO SEVERE HYPOXIA IN MAN A66-80214
- AUTONOMIC COMPONENTS OF HUMAN ORIENTING BEHAVIOR IN RESPONSE TO WHITE NOISE A66-80275
- EIGHT HOUR ISOLATION AND HYPOKINESIA EFFECT ON BIOCHEMICAL AND PHYSIOLOGICAL INDICES IN MAN
- PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS IN MAN OF LONG TERM STAY IN CABIN SIMULATING SPACEFLIGHT ENVIRONMENT A66-80300
- AUTOMATIC INDUCTION OF HYPOTHERMIA IN DOGS, ITS COURSE, REWARMING, AND AFTEREFFECTS A66-80333
- APPLICATION OF INFORMATION THEORY CONCEPTS TO ANALYSIS OF PHYSIOLOGICAL DATA DURING SPACE FLIGHTS A66-80367
- BIOELECTRIC RECORDINGS OF MALE SUBJECTS SUBJECTED TO WEIGHTLESSNESS - INDICES OF PHYSIOLOGICAL FUNCTIONS - ELECTROENCEPHALOGRAM / EEG/, AND VESTIBULAR COORDINATION REACTIONS JPRS-33115 N66-12273
- PHYSIOLOGICAL RESPONSE**
- DYNAMIC ENVIRONMENTAL INFLUENCES ON MAN DURING SPACE FLIGHT COVERING FORCE FIELDS, INERTIAL FORCES DUE TO ACCELERATION AND METHODS OF PROTECTION A66-14074
- SOVIET BIOLOGICAL AND PHYSIOLOGICAL INVESTIGATIONS IN ROCKETS AND SATELLITES, PARTICULARLY NONPATHOLOGICAL CHARACTER OF PHYSIOLOGICAL REACTIONS TO STRESS FACTORS A66-14076
- SPATIAL ORIENTATION DISTURBANCES AND VEGETATIVE DISORDERS OCCURRING IN COSMONAUTS DURING SPACE FLIGHT DUE TO DISTURBANCES IN PHYSIOLOGICAL INTERPLAY OF SENSING MECHANISMS GOVERNING SPACE PERCEPTION A66-14084
- ASTRONAUT PHYSIOLOGICAL RESPONSES TO SPACE FLIGHT CONDITIONS MEASURED FOR CLINICAL OR EXPERIMENTAL PURPOSES A66-14091
- INVESTIGATIONS OF PHYSIOLOGICAL RESPONSES OF ANIMALS AND MAN TO STRESSES IN VOSTOK SPACECRAFT A66-80160
- EFFECT OF WEIGHTLESSNESS ON PHYSIOLOGICAL STATE OF HUMAN ORGANISM DURING PARABOLIC FLIGHTS. A66-80172
- SKIN FUNCTION AND PROCESSES IN VITAL ACTIVITY AS RELATED TO PERSONAL HYGIENE DURING EXPOSURE TO SPACE FLIGHT STRESSES A66-80312
- PROLONGED HYPOKINESIA EFFECT ON ACCELERATION TOLERANCE OF HUMAN A66-80316
- CARDIOVASCULAR AND VESTIBULAR RESPONSE OF HUMAN BODY EXPOSED AT VARIOUS POSITIONS TO ROTATIONAL STRESS A66-80379
- MORPHOLOGY OF PERIPHERAL BLOOD IN MICE AS INDEX TO PHYSIOLOGICAL EFFECT OF EXPOSURE TO HIGH OXYGEN PARTIAL PRESSURE A66-80386
- SENSORS FOR PHYSIOLOGICAL INVESTIGATIONS UNDER SPACE FLIGHT CONDITIONS - BIOASTRONAUTICS N66-12221
- EFFECT OF REPLACING ATMOSPHERIC NITROGEN BY HELIUM ON DEVELOPMENT OF CHICK EMBRYOS JPRS-32905 N66-12299
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON DOGS AND WHITE RATS N66-12455
- MEASUREMENT OF OTOLITH ACTIVITY AS INDICATED BY OCULAR COUNTERROLLING IN RESPONSE TO BODY TILT WITHIN FORCE FIELD OF ZERO G, ONE-HALF G, AND STANDARD G - EXTRALABYRINTHINE FACTORS NASA-CR-68391 N66-13097
- PHYSIOLOGICAL RESPONSES OF ENDOCRINE SYSTEM TO PHYSICAL AND MENTAL STRESS - URINARY EXCRETION OF ADRENALINE AND NORADRENALINE N66-13507
- PHYSIOLOGICAL RESPONSES TO AND BIOLOGICAL EFFECTS OF SPACE FLIGHT STRESS - ASTRONAUT PERFORMANCE ANL-TRANS-209 N66-13520

- PHYSIOLOGICAL MEASUREMENTS DURING INTERPLANETARY FLIGHT FOR MEDICAL MONITORING, EXAMINATIONS AND DIAGNOSES, AND SCIENTIFIC RESEARCH - ANALYSIS OF VOSTOK SPACECRAFT BIOINSTRUMENTATION N66-13789
- ELECTRONYSTAGNUS MEASUREMENT OF VERTICAL EYEBALL DISPLACEMENT TO INVESTIGATE CHINCHILLA VESTIBULAR SYSTEM RESPONSE TO VERTICAL LINEAR ACCELERATION GE/EE/65-6 N66-13814
- PHYSIOLOGICAL TELEMETRY**
TELEMETERING INFORMATION FROM WITHIN BODY OF ANIMALS AND MAN, USING TINY TRANSMITTERS CALLED ENDORADIOSONDES A66-13370
- LONG-LIFE PHYSIOLOGICAL TELEMETRY APPARATUS FOR BODY TEMPERATURE MEASUREMENT IN SMALL ANIMALS A66-80242
- POSSIBILITIES OF UTILIZATION OF ELECTRONIC LOGICAL SYSTEMS FOR AUTOMATIC MEDICAL CONTROL OF SPACECRAFT PERSONNEL A66-80368
- SENSORS FOR AUTOMATIC CONTROL AND REGULATION OF PHYSIOLOGICAL PROCESSES OF PLANTS IN CLOSED SYSTEMS A66-80396
- PHYSIOLOGY**
SPACE EXPLORATION AND STUDY OF ROLE OF EARTH ENVIRONMENTAL CONDITIONS IN EVOLUTION, PHYSIOLOGY, AND BEHAVIOR OF TERRESTRIAL ORGANISMS A66-80156
- COMPILATION OF PAPERS PRESENTED AT PHYSIOLOGY CONFERENCE FTD-TT-65-47/162 N66-13224
- HAZARDS TO HUMAN EAR FROM SHOCK WAVES OF HIGH ENERGY ELECTRIC DISCHARGES AWRE-E-1/65 N66-13711
- ANNOTATED BIBLIOGRAPHY OF AEROSPACE MEDICINE AND BIOLOGY WITH SUBJECT, AUTHOR, AND CORPORATE SOURCE INDEXES - PHYSIOLOGICAL, PSYCHOLOGICAL, AND SPACE ENVIRONMENT EFFECTS ON MAN NASA-SP-7011/18/ N66-14160
- PIG**
WEIGHT GAIN AND FEED EFFICIENCY IN WEANLING, HEALTHY PIG AS AFFECTED BY EXPOSURE TO NEGATIVE AIR IONIZATION FOR DIFFERENT DURATIONS A66-80406
- PIGMENT**
PHOTOCHEMISTRY OF VISION INCLUDING SPECTROPHOTOMETRIC ANALYSIS OF RHODOPSIN OPTICAL DENSITY, ABSORBANCE AND QUANTUM EFFICIENCY A66-13789
- PILOT**
HIGH ALTITUDE FLYING IN MILITARY AIR TRANSPORT SERVICE AND PROTECTIVE MEASURES FOR PILOT A66-80338
- PILOT PERFORMANCE**
COMPARATIVE PHYSICAL PERFORMANCES OF NAVAL AVIATOR TRAINEES FROM VARIOUS PROCUREMENT SOURCES AND UNDER TWO DIFFERENT SYLLABI A66-12354
- VESTIBULO-OCULAR DISORGANIZATION IN AERODYNAMIC SPIN, NOTING ROLL PLANE OF SKULL A66-12363
- SWEDISH AIR FORCE PERSONNEL TESTING FOR SOMATIC CLASSIFICATION, APPRAISING BODY DIMENSIONS, MUSCULAR CAPACITY, ENDURANCE INDEX, ETC A66-14087
- PLANE CRASH AS RESULT OF PILOTS CORONARY DISEASE, DISCUSSING PREVENTION AND REHABILITATION A66-14387
- ERROR AND CONTROL EFFICIENCY ANALYSIS OF PILOTS EXPOSED TO SIMULATED PITCH, ROLL, YAW, AND ALTITUDE VARIATIONS NASA-CR-68219 N66-12195
- COMPARISON OF CROSS CORRELATION AND ORTHOGONALIZED EXPONENTIAL ANALYSES BY REGRESSION ANALYSIS FOR IDENTIFICATION OF HUMAN PILOT DYNAMIC RESPONSE CHARACTERISTICS NASA-CR-68701 N66-13516
- PILOT TRAINING**
COMPARATIVE PHYSICAL PERFORMANCES OF NAVAL AVIATOR TRAINEES FROM VARIOUS PROCUREMENT SOURCES AND UNDER TWO DIFFERENT SYLLABI A66-12354
- PSYCHOLOGICAL STRESS SUSCEPTIBILITY OF NAVAL AND MARINE PILOT TRAINEES, EXAMINING ENVIRONMENTAL CUE MANIPULATION TO CONTROL PERCEPTIONS A66-12355
- MOTION SICKNESS HISTORY RELATION TO ATTRITION FROM FLIGHT TRAINING IN PENSACOLA MOTION SICKNESS QUESTIONNAIRE A66-12364
- AIR SICKNESS IN STUDENT AVIATORS ASSOCIATED WITH PEAKS OF PHYSIOLOGICAL AND PSYCHOLOGICAL STRESS DURING TRAINING NSAM-939 N66-13700
- PLANETARY ENVIRONMENT**
SPACE TRAVEL AND EXPLORATION COVERING BIOLOGICAL AND TECHNICAL DIFFICULTIES SUCH AS RADIATION, METEOR IMPACT, VEHICLE STERILIZATION, ETC A66-13806
- PLANT /BIOL/**
SENSORS FOR AUTOMATIC CONTROL AND REGULATION OF PHYSIOLOGICAL PROCESSES OF PLANTS IN CLOSED SYSTEMS A66-80396
- HIGH RESOLUTION ELECTRON MICROSCOPY OF FRACTION I PROTEIN FROM PLANT LEAVES NASA-CR-68099 N66-12198
- EFFECT OF LIGHT ON LOWER PLANT REPRODUCTION NASA-TT-F-9742 N66-13481
- PLASTIC**
DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES USING SYNCHROCYCLOTRON - IRRADIATION OF ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION RESISTANCE OF PLASTICS N66-12453
- PLUTONIUM**
TWO TYPES OF PLUTONIUM EXPOSURE IN URINE, FECES, AND BLOOD OF HUMAN BODY, AND EFFECTIVENESS OF DIETHYLENETRIAMINEPENTAACETIC ACID TREATMENTS N66-12685
- METABOLISM AND EXCRETION OF CESIUM, PHOSPHORUS, PLUTONIUM, TRITIUM AND RADIATION, STRONTIUM, SULFUR, TRITIUM AND URANIUM FROM HUMAN BODY N66-12686
- COMPARISON OF MEASURED LUNG BURDEN IN ANIMAL SPECIES WITH AMOUNTS OF PLUTONIUM COLLECTED BY CASCADE IMPACTOR SAMPLERS AWRE-U-29/65 N66-14097
- PLUTONIUM OXIDE**
URINARY ELIMINATION FOLLOWING INHALATION OF INSOLUBLE PLUTONIUM OXIDE N66-12682
- POCKET MOUSE**
HISTOPATHOLOGY OF POCKET MOUSE INTESTINE MUCOUS AFTER IRRADIATION - GROWTH AND DEVELOPMENT DATA ON LABORATORY POCKET MOUSE NASA-CR-68217 N66-12200
- POISONING**
AMMONIA EFFECTS ON PHYSIOLOGICAL FUNCTIONS OF MICE IN CLOSED ENVIRONMENT A66-80390
- POLAR REGION**
CHANGES IN SERUM PROTEIN-IODINE IN MEN EXPOSED TO POLAR CLIMATE A66-80293
- POLONIUM**
METABOLISM AND EXCRETION OF CESIUM, PHOSPHORUS, PLUTONIUM, TRITIUM AND RADIATION, STRONTIUM, SULFUR, TRITIUM AND URANIUM FROM HUMAN BODY N66-12686

- POSTURE**
 POSTURE, RESPIRATION, AND PULMONARY FUNCTION IN RELATION TO PROLONGED ACCELERATION EXPOSURE IN SPACE FLIGHT A66-80159
 SPATIAL ORIENTATION AND PERCEPTION OF SUBJECTS ASSUMING VARIOUS HEAD AND BODY POSITIONS UNDER INCREASED ACCELERATION WITHOUT VISUAL REFERENCE FRAME A66-80163
 COMPARATIVE EFFECTS OF PROLONGED ROTATION AT 10 RPM ON POSTURAL EQUILIBRIUM IN VESTIBULAR NORMAL AND DEFECTIVE HUMAN SUBJECTS A66-80198
 VENTILATION, HEART RATE, LACTATE FORMATION, AND OXYGEN CONSUMPTION DURING ARM AND LEG EXERCISE IN SUPINE AND SITTING POSITION A66-80211
 RESPONSE OF CAPACITY VESSELS IN HUMAN LIMBS TO HEAD-UP TILT AND SUBATMOSPHERE PRESSURE ON LOWER BODY A66-80212
 INFLUENCE OF AGE ON CARDIOVASCULAR AND RENAL RESPONSES TO TILTING A66-80213
 ALVEOLAR CARBON DIOXIDE TENSION OF SUPINE SUBJECTS EXERCISING ON BICYCLE ERGOMETER AT INCREASED PRESSURE. A66-80226
 PRESSURE FLOW RELATIONSHIP OF AIRWAYS IN SITTING SUBJECT UNDER NORMAL CONDITIONS, IMMERSSED IN WATER TO NECK LEVEL, AND DURING NEGATIVE PRESSURE BREATHING SUFFICIENT TO REDUCE LUNG VOLUME AS DURING IMMERSION. A66-80236
 CARDIOVASCULAR AND VESTIBULAR RESPONSE OF HUMAN BODY EXPOSED AT VARIOUS POSITIONS TO ROTATIONAL STRESS A66-80379
 PRECEDING POSTURE AND AMBIENT TEMPERATURE EFFECTS ON HEART AND BLOOD CIRCULATION ACCELERATION AT INITIATION OF EXERCISE CRDLR-3268 N66-12827
- POTABLE WATER**
 METHOD FOR PROCESSING HUMAN WASTE TO RECLAIM WATER USING CHLORELLA - BACTERIA SYSTEM A66-80391
- PRESSURE**
 RESPONSE OF CAPACITY VESSELS IN HUMAN LIMBS TO HEAD-UP TILT AND SUBATMOSPHERE PRESSURE ON LOWER BODY A66-80212
 VENTILATION OF DOGS IN RESPONSE TO PRESSURE AND ELECTRIC STIMULATION OF MUSCLE AFFERENTS A66-80234
- PRESSURE BREATHING**
 BREATHING MECHANICS DURING TRANSVERSE ACCELERATION, DISCUSSING EXPERIMENTS AND MEASUREMENTS MADE ON MAN A66-14075
 ALVEOLAR CARBON DIOXIDE TENSION OF SUPINE SUBJECTS EXERCISING ON BICYCLE ERGOMETER AT INCREASED PRESSURE. A66-80226
 PRESSURE FLOW RELATIONSHIP OF AIRWAYS IN SITTING SUBJECT UNDER NORMAL CONDITIONS, IMMERSSED IN WATER TO NECK LEVEL, AND DURING NEGATIVE PRESSURE BREATHING SUFFICIENT TO REDUCE LUNG VOLUME AS DURING IMMERSION. A66-80236
- PRESSURE EFFECT**
 ALVEOLAR NITROGEN CONCENTRATION AND ENVIRONMENTAL PRESSURE INFLUENCE UPON RATE OF GAS ABSORPTION FROM NONVENTILATED LUNG IN DOG A66-12357
 HYDRATION DURING BED REST IN RESPONSE TO LOWER BODY NEGATIVE PRESSURE AS RELATED TO MANNED SPACE FLIGHT A66-80195
 EFFECT OF ELEVATED INTRAPULMONARY PRESSURE ON RESPIRATION AND CIRCULATION FTD-TT-65-154/1&2 N66-12387
- PRESSURE PULSE**
 GENERATION AND TRANSMISSION OF PRESSURE PULSES IN TUBULAR SYSTEM IMPACTED BY FALLING STEEL WEIGHT
- RELATED TO IMPACT INJURY** A66-80340
- PRESSURIZED SUIT**
 THREE AIR-COOLED AND ONE WATER-COOLED PRESSURE SUIT EVALUATED IN HOT ENVIRONMENTS A66-12360
 WATER IMMERSION TECHNIQUE FOR SIMULATING ZERO GRAVITY MOBILITY PERFORMANCE OF ASTRONAUT IN PRESSURIZED SPACESUIT NASA-TN-D-3054 N66-14151
- PROBABILITY THEORY**
 PRINCIPLES OF MATHEMATICAL LOGIC AND PROBABILITY THEORY IN COMPUTER DIAGNOSIS OF DISEASES JPRS-33161 N66-13032
- PROBLEM SOLVING**
 EXPERIMENTAL PSYCHOLOGICAL EXAMINATION OF COSMONAUTS A66-80298
 RESEARCH AND DEVELOPMENT PROGRAM MANAGEMENT - PROBLEM SOLVING STRATEGIES IN PARALLEL PROJECTS NASA-CR-68375 N66-12989
- PROGRAM MANAGEMENT**
 RESEARCH AND DEVELOPMENT PROGRAM MANAGEMENT - PROBLEM SOLVING STRATEGIES IN PARALLEL PROJECTS NASA-CR-68375 N66-12989
- PROPAGATION VELOCITY**
 DETERMINATION OF PROPAGATION VELOCITY OF PULSE WAVES FROM HUMAN ARTERIES BY CONVERTING MECHANICAL VIBRATIONS INTO ELECTRICAL OSCILLATIONS NASA-TT-F-407 N66-12346
- PROPRIOCEPTION**
 INFLUENCE OF PROPRIOCEPTOR IN VENTILATORY RESPONSE TO EXERCISE A66-80223
- PROTECTION**
 HIGH ALTITUDE FLYING IN MILITARY AIR TRANSPORT SERVICE AND PROTECTIVE MEASURES FOR PILOT A66-80338
 SUCCINATE-PROTECTIVE AGENT AGAINST HIGH PRESSURE OXYGEN TOXICITY IN RAT A66-80365
- PROTECTIVE CLOTHING**
 HANDBEAR INSULATION EFFECTIVENESS OF FREON 12, CARBON DIOXIDE, AND HELIUM A66-80227
 FRENCH DEVELOPED PROTECTIVE CLOTHING FOR FLYING PERSONNEL AGAINST HIGH ENVIRONMENTAL TEMPERATURES A66-80360
- PROTEIN**
 RELATION OF EARLIEST PROTEINS TO PROTOCELL, WITH TABULATED COMPARISON OF KEY PROPERTIES OF ACID PROTEINOIDS AND PROTEIN A66-13369
 BIOLOGICAL MECHANISMS FOR MEMORY - NEURON EXCITATION, NUCLEIC ACID METABOLISM, AND PROTEIN SYNTHESIS MECHANISM - DEOXYRIBONUCLEIC ACID JPRS-32809 N66-12269
 SYMPOSIUM ON BIOCHEMICAL RESEARCH IN MAINLAND CHINA JPRS-33002 N66-12626
 MOLECULAR STRUCTURE OF PEPTIDE CHAINS OF PROTEINS TO FIND RULES GOVERNING AMINO ACIDS N66-12628
 PROTEIN BIOSYNTHESIS BY INCORPORATION OF AMINO ACIDS AND ACTION OF SOLUBLE RIBONUCLEIC ACID N66-12630
 METABOLISM AND CHEMICAL COMPOSITION OF CONNECTIVE TISSUE - FIBROUS AND NONFIBROUS PROTEINS N66-12635
- PROTEIN METABOLISM**
 HIGH RESOLUTION ELECTRON MICROSCOPY OF FRACTION I PROTEIN FROM PLANT LEAVES NASA-CR-68099 N66-12198

PROTEINOID

FUTURE OF ENVIRONMENTAL BIOLOGY, DISCUSSING SPACE RESEARCH ON LIVING ORGANISMS IN EXTRATERRESTRIAL ENVIRONMENT A66-14069

PROTON BEAM

ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY PROTONS IN MULTIPLE IRRADIATION N66-12454

PROTON IRRADIATION

RADIATION PROTECTION OF ANIMALS BY VARIOUS DRUGS DURING EXPOSURE TO GAMMA, PROTON, AND X-RAY IRRADIATION AS RELATED TO RELATIVE BIOLOGICAL EFFECT A66-80311

RADIOPROTECTIVE EFFECT OF VARIOUS DRUGS AGAINST X - RAYS AND GAMMA RAYS DURING PROTON IRRADIATION MICE A66-80381

SURVIVAL DURING SCREENING OF VARIOUS AREAS OF RAT BODY TO GAMMA RAYS AND HIGH ENERGY PROTONS AS AFFECTED BY VIBRATION OR ACCELERATION STRESS A66-80382

PROTON AND GAMMA IRRADIATION EFFECTS ON SPLEEN, THYMUS AND BONE MARROW IN MICE A66-80383

RADIATION SAFETY IN SPACE FLIGHTS - BIOLOGICAL EFFECT OF HIGH ENERGY PROTON IRRADIATION ON ANIMALS AND RADIATION PROTECTION AND THERAPY NASA-TT-F-353 N66-12451

DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES USING SYNCHROCYCLOTRON - IRRADIATION OF ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION RESISTANCE OF PLASTICS N66-12453

ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY PROTONS IN MULTIPLE IRRADIATION N66-12454

BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON DOGS AND WHITE RATS N66-12455

BIOLOGICAL EFFECT OF HIGH ENERGY PROTON IRRADIATION ON CORNEAL EPITHELIA OF MICE N66-12456

BIOLOGICAL EFFECTS OF HIGH ENERGY PROTON AND X-RAY IRRADIATION ON HEREDITY STRUCTURES OF RATS N66-12457

RELATIVE BIOLOGICAL EFFECT OF PROTONS IN FRACTIONAL IRRADIATION COMPARED WITH MULTIPLE X-RAY IRRADIATION OF DOGS AND RATS N66-12459

COMPARISON OF BIOLOGICAL EFFECTS OF PROTON, X-RAY, AND GAMMA IRRADIATIONS ON DOGS AND WHITE RATS N66-12460

PROPHYLAXIS AND THERAPY OF RADIATION INJURIES CAUSED BY HIGH ENERGY PROTON IRRADIATION N66-12461

BIOLOGICAL EFFECTS OF HIGH ENERGY PROTON IRRADIATION ON MICE HER/AP-2-65 N66-12462

PSYCHOLOGICAL EFFECT

PSYCHOLOGICAL STRESS SUSCEPTIBILITY OF NAVAL AND MARINE PILOT TRAINEES, EXAMINING ENVIRONMENTAL CUE MANIPULATION TO CONTROL PERCEPTIONS A66-12355

SELF-REPORTED STRESS-RELATED SYMPTOMS AMONG AIR TRAFFIC CONTROL SPECIALISTS / ATCS/ AND NON- ATCS PERSONNEL A66-12358

ANNOTATED BIBLIOGRAPHY OF AEROSPACE MEDICINE AND BIOLOGY WITH SUBJECT, AUTHOR, AND CORPORATE SOURCE INDEXES - PHYSIOLOGICAL, PSYCHOLOGICAL, AND SPACE ENVIRONMENT EFFECTS ON MAN NASA-SP-7011/18/ N66-14160

PSYCHOLOGICAL FACTOR

HUMAN PERCEPTUAL MECHANISM DEFINED BY PSYCHOLOGICAL RESEARCH AND APPLIED TO AIRCRAFT

COCKPIT DISPLAY DESIGN A66-12883

MAN-MACHINE RELATIONSHIP DURING SPACE FLIGHT A66-14085

EFFECTS OF ORGANIZATIONAL AFFILIATION ON HIGH ENERGY PHYSICS RESEARCH GROUPS - PSYCHOLOGICAL FACTOR OF GROUP BEHAVIOR NASA-CR-68303 N66-12994

PSYCHOLOGICAL INDEX

STATEMENT ATTRACTIVENESS INDICES OBTAINED UNDER PERSONAL OR SOCIAL ACCEPTABILITY - CORRELATION OF INDICES WITH EACH OTHER NASM-937 N66-12380

PSYCHOLOGICAL SET

INTERACTION OF TIME UNCERTAINTY AND RELATIVE SIGNAL FREQUENCY IN DETERMINING CHOICE REACTION TIME A66-80266

PSYCHOLOGICAL TESTING

ORGANISMIC VARIABLES FROM PERSONALITY AND INTELLIGENCE TESTS AS PREDICTORS OF VIGILANCE BEHAVIOR A66-80178

HISTORY OF ASTRONAUT SELECTION PROCEDURES AS RELATED TO SELECTION OF SCIENTISTS BECOMING MEMBERS OF SPACECREW A66-80187

MEASUREMENT, STRUCTURE, AND PREDICTION OF JOB AND TRAINING PERFORMANCE OF AIR TRAFFIC CONTROL SPECIALISTS OF DIFFERENT AGES A66-80193

EXPERIMENTAL PSYCHOLOGICAL EXAMINATION OF COSMONAUTS A66-80298

LEARNING OF PAIRED-ASSOCIATE ITEMS RELATED TO DIFFERENT REPETITIVE REINFORCEMENT AND TESTING SEQUENCES TR-76 N66-13689

PSYCHOLOGY /GEN/

DETECTION OF VISUAL SIGNAL WITH LOW BACKGROUND NOISE A66-80267

PSYCHOMETRICS

STATEMENT ATTRACTIVENESS INDICES OBTAINED UNDER PERSONAL OR SOCIAL ACCEPTABILITY - CORRELATION OF INDICES WITH EACH OTHER NASM-937 N66-12380

PSYCHOMOTOR PERFORMANCE

TRANSFER OF TRAINING FUNCTION OF STIMULUS RESPONSE RELATIONSHIPS A66-80166

PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS IN MAN OF LONG TERM STAY IN CABIN SIMULATING SPACEFLIGHT ENVIRONMENT A66-80300

ELECTROMYOGRAPHIC GRADIENTS AS INDICANTS OF EFFICIENCY AND VELOCITY PRECISION IN MIRROR TRACING A66-80341

PSYCHOPHYSICS

JUDGMENTS OF SAMENESS OF TONES AND TONE DIFFERENCE - EXPERIMENTS ON DECISION TIME A66-80355

PSYCHOPHYSIOLOGY

ELECTROPHYSIOLOGY AND PSYCHOPHYSIOLOGY OF SLEEP JPRS-33033 N66-13176

DATA ACQUISITION, CONVERSION, HANDLING, ANALYSIS, AND RECORDING SYSTEM FOR PSYCHOPHYSIOLOGICAL STRESS AMRL-TDR-64-64 N66-14315

PULMONARY CIRCULATION

ALVEOLAR NITROGEN CONCENTRATION AND ENVIRONMENTAL PRESSURE INFLUENCE UPON RATE OF GAS ABSORPTION FROM NONVENTILATED LUNG IN DOG A66-12357

EFFECT OF ELEVATED INTRAPULMONARY PRESSURE ON RESPIRATION AND CIRCULATION FTD-TT-65-154/1&2 N66-12387

PULMONARY FUNCTION

POSTURE, RESPIRATION, AND PULMONARY FUNCTION IN

- RELATION TO PROLONGED ACCELERATION EXPOSURE IN SPACE FLIGHT A66-80159
- VENTILATION, HEART RATE, LACTATE FORMATION, AND OXYGEN CONSUMPTION DURING ARM AND LEG EXERCISE IN SUPINE AND SITTING POSITION A66-80211
- PULMONARY DIFFUSING CAPACITY IN SUBJECTS AT REST AND DURING EXERCISE AS AFFECTED BY INCREASED ENVIRONMENTAL TEMPERATURE A66-80224
- PULMONARY GAS EXCHANGE IN DOGS DURING LIQUID BREATHING UNDER HYPERBARIC OXYGENATION A66-80230
- APPLICATION OF DIGITAL COMPUTATION TECHNIQUES FOR ON LINE DISPLAY OF PULMONARY NITROGEN WASHOUT AND COMPARISON OF DATA WITH CONVENTIONAL TECHNIQUES A66-80231
- MEASUREMENT OF FUNCTIONAL RESIDUAL CAPACITY OF RATS VARYING IN AGE AND WEIGHT A66-80233
- NEW METHOD FOR ANALYSIS OF DISTRIBUTION OF MECHANICAL TIME CONSTANTS IN LUNG A66-80238
- RECORDING BAG IN A BOX SPIROMETER USABLE IN VENTILATORY FUNCTION STUDIES IN HEALTHY AND DISEASED SUBJECTS A66-80241
- COMBINED RESPIROGRAPHIC TECHNIQUE AND ANALYTICAL METHOD INDICATING EFFECT OF CHANGES IN RAT OF SULFUR DIOXIDE CONCENTRATION AND DURATION OF EXPOSURE ON PULMONARY RETENTION, TIDAL VOLUME, AND RESPIRATORY RATE A66-80264
- RESISTANCE TO HYPOXIA AND FATIGUE OF RESPIRATORY MUSCLE DURING ASCENT TO HIGH ALTITUDE AS AFFECTED BY ACCLIMATIZATION A66-80305
- PULSE FREQUENCY MODULATION /PFM/**
MANUAL CONTROL OF PULSE FREQUENCY MODULATED REACTION CONTROL
AMRL-TR-65-145 A66-13596
- PULSE RATE /BIOL/**
REACTION TO WEIGHTLESSNESS OF ASTRONAUTS PARTICIPATING IN VOSTOK FLIGHTS II TO VI INCLUSIVELY A66-80373
- DETERMINATION OF PROPAGATION VELOCITY OF PULSE WAVES FROM HUMAN ARTERIES BY CONVERTING MECHANICAL VIBRATIONS INTO ELECTRICAL OSCILLATIONS
NASA-TT-F-407 A66-12346
- PULSED RADIATION**
APPARENT MOVEMENT PHENOMENA ON CATHODE RAY TUBE DISPLAYS - THRESHOLD DETERMINATIONS OF APPARENT MOVEMENTS OF PULSED LIGHT SOURCES
NASA-CR-342 A66-12162
- PUPIL SIZE**
VISUAL ACUITY DEFINITION AND CLINICAL MEASUREMENT OF RELEVANT FACTORS A66-13793
- PURSUIT TRACKING**
VISUAL RESPONSE COMPONENT OF ROTARY PURSUIT TRACKING A66-80179
- ACQUISITION OF STEP FUNCTION TRACKING TASK AS FUNCTION OF ALTERNATIVES AND SEQUENCE LENGTH
A66-80180
- THEORY FOR DETERMINISTIC CHARACTERIZATION OF TIME VARYING DYNAMICS OF HUMAN OPERATOR PERFORMANCE TRACKING TASK. A66-80185
- EVALUATION OF SAMPLED DATA PURSUIT TRACKING MODEL. A66-80186
- PYRIMIDINE**
AMINOTHIOLS AND PYRIMIDINE ANALOGS TESTED FOR PROTECTIVE EFFECTS AGAINST GENETIC MUTATIONS IN ESCHERICHIA COLI EXPOSED TO X-RAY IRRADIATION A66-80385
- Q**
- QUANTITATIVE ANALYSIS**
QUANTITATIVE ANALYSIS OF LIPID CONSTITUENTS IN CHLORELLA CELLS A66-80171
- R**
- RABBIT**
ELECTROCARDIOGRAM AND BLOOD PRESSURE OF RABBIT DURING PROLONGED WEIGHTLESSNESS SIMULATED BY IMMERSION METHOD A66-80192
- CEREBRAL VENOUS FLOW IN RABBITS DURING ACCELERATION WITH EMPHASIS ON METHOD OF REGISTRATION A66-80332
- INTERACTION OF CENTRAL AND FLASH NYSTAGMUS IN RABBITS A66-80339
- PROLONGED OPTOKINETIC STIMULATION EFFECT ON RABBIT A66-80377
- RACE FACTOR**
ECCRINE SWEAT GLAND ACTIVITY AND RACIAL DIFFERENCES IN RESTING SKIN CONDUCTANCE A66-80276
- RADIATION CONTROL**
RADIATION HAZARDS CONTROL - AIR MONITORS, FILM SENSITIVITY, STIMULATED EMISSION DOSIMETRY, GLASS CLEANING TECHNIQUES, HIGH DENSITY GRASS SAMPLES, AND FIRE HOSE FRICTION LOSSES UCRL-14351 N66-12576
- RADIATION DETECTOR**
RADIATION HAZARDS, DETECTION DEVICES, AND MEDICINES TO PREVENT INJURY DURING FLIGHTS OF VOSTOK AND VOSKHOD SPACESHIPS A66-80204
- RADIATION DOSE**
RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS, DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION LEVEL DETERMINATION N66-12452
- RADIATION SENSITIVITY OF CHROMOSOME MUTATION IN WHITE BLOOD CELLS OF HUMANS, MONKEYS, AND RABBITS N66-12756
- SPACE RADIOBIOLOGY TRAINING AND OPERATIONS - RADIATION ZONES AND EXPOSURE, BIOLOGICAL EFFECTS RADIATION, DOSE RATES, AND RECOVERY AMD-TR-65-2 N66-13006
- RADIATION EFFECT**
BIOLOGICAL EFFECTS OF LASER RADIATION WITH REFERENCE TO INTACT ANIMALS, PRIMATE EYES AND SKIN AND MALIGNANT TUMORS OF ANIMAL AND HUMAN ORIGIN A66-12994
- BIOLOGICAL EFFECTS OF COSMIC RADIATION UNDER LABORATORY AND FLIGHT CONDITIONS ON VARIOUS CRAFT TO STUDY MEASURES FOR PHARMACOLOGICAL AND BIOLOGICAL PROTECTION A66-14077
- BIOLOGICAL HAZARDS OF RADIATION EXPOSURE OF MAN IN SPACE DISCUSSING RECOVERY, DELAYED EFFECT, INJURY TREATMENT AND DOSE A66-14078
- HISTOPATHOLOGY OF POCKET MOUSE INTESTINE MUCOUS AFTER IRRADIATION - GROWTH AND DEVELOPMENT DATA ON LABORATORY POCKET MOUSE
NASA-CR-68217 N66-12200
- RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS, DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION LEVEL DETERMINATION N66-12452
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON DOGS AND WHITE RATS N66-12455
- BIOLOGICAL EFFECT OF HIGH ENERGY PROTON IRRADIATION ON CORNEAL EPITHELIA OF MICE N66-12456
- RELATIVE BIOLOGICAL EFFECT OF PROTONS IN FRACTIONAL IRRADIATION COMPARED WITH MULTIPLE X-RAY IRRADIATION OF DOGS AND RATS

- N66-12459
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTON IRRADIATION ON MICE
HER/AP-2-65 N66-12462
- EFFECTS OF IONIZING X- AND GAMMA RADIATION ON DEOXYRIBONUCLEIC ACID
EUR-2471.F N66-14092
- RADIATION EMISSION**
BIOLOGICAL EFFECT IN MOUSE OF GAMMA IRRADIATION AS AFFECTED BY SOLAR FLARE, RADIOPROTECTIVE DRUGS, AND ACCELERATION STRESS DURING SIMULATION OF RADIATION CONDITIONS OF SPACEFLIGHT A66-80402
- RADIATION EXPOSURE**
PULSED MICROWAVE IRRADIATION OF DOGS NOTING BODY WEIGHT, RECTAL TEMPERATURE AND HEMATOLOGIC RESPONSE A66-13351
- SPACE RADIOBIOLOGY TRAINING AND OPERATIONS - RADIATION ZONES AND EXPOSURE, BIOLOGICAL EFFECTS RADIATION, DOSE RATES, AND RECOVERY
AMD-TR-65-2 N66-13006
- RADIATION HAZARD**
RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS, DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION LEVEL DETERMINATION N66-12452
- RADIATION HAZARDS CONTROL - AIR MONITORS, FILM SENSITIVITY, STIMULATED EMISSION DOSIMETRY, GLASS CLEANING TECHNIQUES, HIGH DENSITY GRASS SAMPLES, AND FIRE HOSE FRICTION LOSSES
UCRL-14351 N66-12576
- RADIATION MEDICINE**
NUCLEAR RADIATION MEDICINE - METHODS OF RECORDING COUNTING RATE
ORNL-P-1383 N66-12899
- RADIATION PROTECTION**
BIOCHEMICAL EVIDENCE OF SIMILARITY OF RADIATION PROTECTION MECHANISMS OF CYSTAMINE, CYSTEAMINE, SEROTININ, AND ANOXIA IN ALBINO MICE A66-80169
- EFFECT OF NITROGEN BREATHING ON RADIATION DAMAGE IN ALBINO MICE A66-80295
- POSSIBILITIES OF PHARMACEUTICAL AND CHEMICAL PROTECTION OF HUMAN SUBJECTS AGAINST RADIATION INJURIES DURING OUTER SPACE FLIGHTS A66-80309
- PROTECTION OF CORN, WHEAT, AND LUPINE SEEDS AGAINST BETA-RADIATION BY TREATMENT WITH SULFANILAMIDE AND NONANIC ACID DERIVATIVES A66-80323
- AMINOTHIOLS AND PYRIMIDINE ANALOGS TESTED FOR PROTECTIVE EFFECTS AGAINST GENETIC MUTATIONS IN ESCHERICHIA COLI EXPOSED TO X-RAY IRRADIATION A66-80385
- RADIATION SAFETY IN SPACE FLIGHTS - BIOLOGICAL EFFECT OF HIGH ENERGY PROTON IRRADIATION ON ANIMALS AND RADIATION PROTECTION AND THERAPY
NASA-TT-F-353 N66-12451
- PROPHYLAXIS AND THERAPY OF RADIATION INJURIES CAUSED BY HIGH ENERGY PROTON IRRADIATION N66-12461
- RADIATION RESISTANCE**
DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES USING SYNCHROCYCLOTRON - IRRADIATION OF ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION RESISTANCE OF PLASTICS N66-12453
- RADIATION SHIELDING**
DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES USING SYNCHROCYCLOTRON - IRRADIATION OF ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION RESISTANCE OF PLASTICS N66-12453
- RADIATION SICKNESS**
PARTIAL CANINE BODY EXPOSURE TO IONIZATION RADIATION NOTING ANOREXIA, WEIGHT LOSS, VOMITING AND HYPERSIALOSIS DUE TO 1000 KVP X-RAY EXPOSURE A66-13352
- TOLERANCE OF RAT TO HYPOXIA DURING RADIATION SICKNESS CAUSED BY X-RAY IRRADIATION A66-80384
- PATHOLOGICAL EFFECTS OF X-RAY IRRADIATION ON GASTROINTESTINAL SYSTEM IN DOGS - RADIATION SICKNESS
FTD-TT-64-910/1&2&3&4 N66-12607
- RADIATION SOURCE**
LABORATORY APPARATUS FOR BIOLOGICAL EXPERIMENT GAMMA RADIATION SOURCES
JPRS 32704 N66-13245
- RADIATION THERAPY**
RADIATION SAFETY IN SPACE FLIGHTS - BIOLOGICAL EFFECT OF HIGH ENERGY PROTON IRRADIATION ON ANIMALS AND RADIATION PROTECTION AND THERAPY
NASA-TT-F-353 N66-12451
- PROPHYLAXIS AND THERAPY OF RADIATION INJURIES CAUSED BY HIGH ENERGY PROTON IRRADIATION N66-12461
- RADIO**
POTENTIAL APPLICATIONS OF RADIOISOTOPES TO OPERATION OF MANNED SPACECRAFT LIFE SUPPORT SYSTEMS
SAN-575-12 N66-12582
- RADIOACTIVE DECAY**
ANALYTICAL DATA ON FISSION YIELD AND FISSION PRODUCT DECAY, AIR SAMPLING TECHNIQUES, RADIOCHEMICAL DETERMINATION OF RADIOISOTOPES IN WATER, FECES, AND URINE
NYO-4700, SUPPL. 2 N66-13854
- RADIOACTIVE ISOTOPE**
CLEARANCE RATE OF CALCIUM-45 IN DOGS AFTER INTRAVENOUS INJECTION AND BLOOD DISTRIBUTION BETWEEN MARROW AND BONE
TID-21339 N66-13051
- CALCIUM-45 AND STRONTIUM-85 METABOLISM IN HUMANS
COO-587-2 N66-13061
- ANALYTICAL DATA ON FISSION YIELD AND FISSION PRODUCT DECAY, AIR SAMPLING TECHNIQUES, RADIOCHEMICAL DETERMINATION OF RADIOISOTOPES IN WATER, FECES, AND URINE
NYO-4700, SUPPL. 2 N66-13854
- RADIOBIOLOGY**
TUMORS IN MICE AFTER THYMECTOMY AND X-RAY IRRADIATION, AND CHROMOSOME ANOMALIES FROM TRITIATED THYMIDINE - RADIOBIOLOGY
EUK-2462.F N66-12431
- SPACE RADIOBIOLOGY TRAINING AND OPERATIONS - RADIATION ZONES AND EXPOSURE, BIOLOGICAL EFFECTS RADIATION, DOSE RATES, AND RECOVERY
AMD-TR-65-2 N66-13006
- RADIOCHEMISTRY**
ANALYTICAL DATA ON FISSION YIELD AND FISSION PRODUCT DECAY, AIR SAMPLING TECHNIQUES, RADIOCHEMICAL DETERMINATION OF RADIOISOTOPES IN WATER, FECES, AND URINE
NYO-4700, SUPPL. 2 N66-13854
- RAREFIED GAS DYNAMICS**
CALCULATIONS ON GAS EXCHANGE VOLUMES IN MAN UNDER RAREFIED ATMOSPHERIC CONDITIONS
JPRS-33057 N66-13423
- RAT**
METABOLISM OF CARNITINE IN MUSCLE OF COLD ACCLIMATED RAT A66-80152
- ELECTROENCEPHALOGRAPHIC RESPONSES AND CHANGES IN ELECTRIC POTENTIALS IN NECK MUSCLES OF RAT DURING SHORT PERIODS OF WEIGHTLESSNESS A66-80161

SUBJECT INDEX

RESEARCH PROJECT

BLOOD SUPPLY OF EXTREMITY MUSCLES DURING INTENSE PHYSICAL WORK IN ALBINO RATS A66-80174

TOLERANCE RELATIONSHIP BETWEEN EFFECTS OF INTERNAL AND EXTERNAL COLD AND DIFFERENT FORMS OF ANOXIA IN RAT A66-80189

BEHAVIORAL THERMOREGULATION IN YOUNG AND OLD RATS IN COLD ENVIRONMENT A66-80208

FOOD INTAKE, BODY WEIGHT, AND ACTIVITY OF RAT EXERCISING IN HOT ENVIRONMENT A66-80220

MEASUREMENT OF FUNCTIONAL RESIDUAL CAPACITY OF RATS VARYING IN AGE AND WEIGHT A66-80233

MECHANICAL PROPERTIES OF LUNG IN PATHOGEN FREE AND NORMAL RATS A66-80237

EFFECT OF GLUCAGON ON BLOOD SUGAR AND INORGANIC PHOSPHORUS LEVELS IN NORMOTHERMIC AND HYPOTHERMIC RATS A66-80264

COMBINED RESPIROGRAPHIC TECHNIQUE AND ANALYTICAL METHOD INDICATING EFFECT OF CHANGES IN RAT OF SULFUR DIOXIDE CONCENTRATION AND DURATION OF EXPOSURE ON PULMONARY RETENTION, TIDAL VOLUME, AND RESPIRATORY RATE A66-80264

BEHAVIORAL EFFECTS IN RATS OF PROLONGED EXPOSURE TO ULTRA HIGH FREQUENCY RADIATION A66-80273

BEHAVIORAL EFFECTS OF IONIZED AIR ON RATS A66-80278

CARDIAC METABOLISM AT REST AND DURING HEART ARREST A66-80345

NUTRITIONAL PROBLEMS OF SUGAR REGULATION IN AVIATION MEDICINE - HYPERGLYCEMIA IN RATS AND SURV OF NUTRITIONAL HABITS OF FLYING PERSONNEL A66-80361

SUCCINATE-PROTECTIVE AGENT AGAINST HIGH PRESSURE OXYGEN TOXICITY IN RAT A66-80365

SURVIVAL DURING SCREENING OF VARIOUS AREAS OF RAT BODY TO GAMMA RAYS AND HIGH ENERGY PROTONS AS AFFECTED BY VIBRATION OR ACCELERATION STRESS A66-80382

TOLERANCE OF RAT TO HYPOXIA DURING RADIATION SICKNESS CAUSED BY X-RAY IRRADIATION A66-80384

EFFECTS OF GRADUAL OR SUDDEN ONSET OF HYPOXIA ON OXYGEN DEMAND A66-80387

ARTIFICIAL HYPOTHERMIA EFFECTS ON ARTERIAL BLOOD IN ALBINO RATS A66-80401

DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES USING SYNCHROCYCLOTRON - IRRADIATION OF ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION RESISTANCE OF PLASTICS N66-12453

BIOLOGICAL EFFECTS OF HIGH ENERGY PROTON AND X-RAY IRRADIATION ON HEREDITY STRUCTURES OF RATS N66-12457

REACTION CONTROL
 MANUAL CONTROL OF PULSE FREQUENCY MODULATED REACTION CONTROL
 AMRL-TR-65-145 N66-13596

REACTION TIME
 SHORT-TERM MEMORY, CHOICE REACTION TIME, AND HAND STEADINESS OF EXERCISING AND RESTING SUBJECTS IN RESPONSE TO EPINEPHRINE OR INSULIN ADMINISTRATION A66-80201

INTERACTION OF TIME UNCERTAINTY AND RELATIVE SIGNAL FREQUENCY IN DETERMINING CHOICE REACTION TIME A66-80266

REACTION TIME TO AUDITORY STIMULI OF DIFFERENT INTENSITIES AT DIFFERENT ADAPTATION LEVELS A66-80281

STUDY OF HUMAN VISUAL PERCEPTION REACTION TIME WITH MASKING A66-80306

HUMAN ELECTROENCEPHALOGRAPH, REACTION TIME, AND TOLERANCE DURING CORIOLIS ACCELERATION DIRECTED BACK TO CHEST A66-80318

READOUT
 DIAL READING ABILITY OF SPACECRAFT CREW DURING PROLONGED ACCELERATION AND VIBRATION
 AMRL-TR-65-110 N66-12376

RECORDING INSTRUMENT
 COMPUTER ANALYSIS OF ELECTROENCEPHALOGRAPHIC RECORDING DURING ENVIRONMENTAL STRESSES OF SPACE FLIGHT A66-80165

ELECTRIC METHOD FOR REGISTERING TONGUE MOTION DURING ARTICULATION OF CONSONANTS A66-80329

AUTOMATIC RECORDING AND PROCESSING OF DATA REGARDING ARTICULATION OF SPEECH A66-80392

NUCLEAR RADIATION MEDICINE - METHODS OF RECORDING COUNTING RATE
 ORNL-P-1383 N66-12899

RECOVERY
 IMPORTANCE OF RECONSTRUCTION OF CELLS DAMAGED BY IONIZING RADIATION ON TOTAL VIABILITY OF ORGANISM A66-80322

REFLEX
 PATELLAR REFLEX TIME OF OLD AND YOUNG MALE SUBJECTS AS AFFECTED BY EXERCISE A66-80207

REGRESSION ANALYSIS
 COMPARISON OF CROSS CORRELATION AND ORTHOGONALIZED EXPONENTIAL ANALYSES BY REGRESSION ANALYSIS FOR IDENTIFICATION OF HUMAN PILOT DYNAMIC RESPONSE CHARACTERISTICS
 NASA-CR-68701 N66-13516

REINFORCEMENT
 ACCELERATION EFFECT ON FOOD REINFORCED DRL AND FR SCHEDULES A66-13175

LEARNING OF PAIRED-ASSOCIATE ITEMS RELATED TO DIFFERENT REPETITIVE REINFORCEMENT AND TESTING SEQUENCES
 TR-76 N66-13689

RELATIVE BIOLOGICAL EFFECTIVENESS /RBE/
 SPACE RADIATION-RELATIVE BIOLOGICAL EFFECTIVENESS AND PROBLEMS OF SHIELDING DURING MOON MISSION A66-80310

RADIATION PROTECTION OF ANIMALS BY VARIOUS DRUGS DURING EXPOSURE TO GAMMA, PROTON, AND X-RAY IRRADIATION AS RELATED TO RELATIVE BIOLOGICAL EFFECT A66-80311

RENAL FUNCTION
 GRAVITY EFFECT ON HEMODYNAMIC FACTORS AND SODIUM AND WATER EXCRETION IN TWO DOGS SUBJECTED TO CHANGE FROM SUPINE TO ERECT POSITION AND WATER IMMERSION A66-12352

INFLUENCE OF AGE ON CARDIOVASCULAR AND RENAL RESPONSES TO TILTING A66-80213

REPRODUCTIVE SYSTEM
 EFFECT OF SPACE FLIGHT FACTORS ON REPRODUCTIVE SYSTEM OF DROSOPHILA AND GENETIC APPARATUS OF TRADESCANTIA A66-80371

EFFECT OF LIGHT ON LOWER PLANT REPRODUCTION
 NASA-TT-f-9742 N66-13481

RESEARCH PROJECT
 EFFECTS OF ORGANIZATIONAL AFFILIATION ON HIGH ENERGY PHYSICS RESEARCH GROUPS - PSYCHOLOGICAL FACTOR OF GROUP BEHAVIOR
 NASA-CR-68303 N66-12994

RESPIRATION

SUBJECT INDEX

RESPIRATION

POSTURE, RESPIRATION, AND PULMONARY FUNCTION IN RELATION TO PROLONGED ACCELERATION EXPOSURE IN SPACE FLIGHT A66-80159

VERBAL COMMUNICATION INTELLIGIBILITY IN OXYGEN-HELIUM AND OTHER BREATHING MIXTURES IN LOW PRESSURE CHAMBER A66-80199

INFLUENCE OF PROPRIOCEPTOR IN VENTILATORY RESPONSE TO EXERCISE A66-80223

ALVEOLAR CARBON DIOXIDE TENSION OF SUPINE SUBJECTS EXERCISING ON BICYCLE ERGOMETER AT INCREASED PRESSURE. A66-80226

KINETICS OF OXYGEN UPTAKE BY ERYTHROCYTES OF DIFFERENT AGES AS RELATED TO RESPIRATORY FUNCTION OF BLOOD A66-80229

VENTILATION OF DOGS IN RESPONSE TO PRESSURE AND ELECTRIC STIMULATION OF MUSCLE AFFERENTS A66-80234

PRESSURE FLOW RELATIONSHIP OF AIRWAYS IN SITTING SUBJECT UNDER NORMAL CONDITIONS, IMMERSSED IN WATER TO NECK LEVEL, AND DURING NEGATIVE PRESSURE BREATHING SUFFICIENT TO REDUCE LUNG VOLUME AS DURING IMMERSION. A66-80236

MECHANICAL PROPERTIES OF LUNG IN PATHOGEN FREE AND NORMAL RATS A66-80237

BREATH BY BREATH MEASUREMENT OF RESPIRATORY FUNCTIONS - INSTRUMENTATION AND APPLICATIONS A66-80240

RECORDING BAG IN A BOX SPIROMETER USABLE IN VENTILATORY FUNCTION STUDIES IN HEALTHY AND DISEASED SUBJECTS A66-80241

CHANGES IN PHYSIOLOGICAL AND BIOCHEMICAL STATE OF MAN AFTER EXPOSURE TO SMALL CONCENTRATIONS OF CARBON MONOXIDE - HEART FUNCTION, RESPIRATION AND CHOLINESTERASE BLOOD LEVEL A66-80304

EMBRYONIC DEVELOPMENT OF CHICK AND FROG EGGS AND RESPIRATION OF CHICKEN AND MOUSE IN SIMULATED SPACE CABIN ATMOSPHERE CONSISTING OF HELIUM AND OXYGEN A66-80315

EFFECT OF SPACE FLIGHT FACTORS ON HEART ACTIVITY, RESPIRATION AND ELECTROENCEPHALOGRAM OF ASTRONAUTS B. F. BYKOVSKII AND V. V. TERESHKOVA A66-80370

HYPOXIA PRODUCED BY INHALATION OF PURE NITROGEN AND INTERMITTENT OXYGEN BREATHING IN CATS A66-80388

EFFECT OF ELEVATED INTRAPULMONARY PRESSURE ON RESPIRATION AND CIRCULATION N66 12307

RESPIRATORY DISEASE

CLINICAL MANIFESTATIONS AND THERAPY OF RESPIRATORY ACIDOSIS A66-80347

CLINICAL MANIFESTATIONS OF RESPIRATORY ALKALOSIS A66-80348

RESPIRATORY IMPEDANCE

DYNAMIC BEHAVIOR OF AIRCREW BREATHING EQUIPMENT CONSIDERING CYCLIC FLOW RESPONSE TESTS, STABILITY PROBLEMS, MEASUREMENT TECHNIQUES AND HUMAN RESPIRATORY IMPEDANCE A66-13350

RESPIRATORY PHYSIOLOGY

AEROSPACE BREATHING CHART USED IN ANALYTICAL EVALUATION OF BREATHABLE ATMOSPHERES AND EMERGENCY OXYGEN SYSTEMS A66-12544

PHYSICAL AND PHYSIOLOGICAL PARAMETERS EFFECTING RESPIRATORY TRACT DEPOSITION N66-12683

RESPIRATORY RATE

COMBINED RESPIROGRAPHIC TECHNIQUE AND ANALYTICAL METHOD INDICATING EFFECT OF CHANGES IN RAT OF

SULFUR DIOXIDE CONCENTRATION AND DURATION OF EXPOSURE ON PULMONARY RETENTION, TIDAL VOLUME, AND RESPIRATORY RATE A66-80264

ARTERIAL PRESSURE, RESPIRATORY RATE, ELECTROCARDIOGRAM, AND ELECTROENCEPHALOGRAM OF YOUNG MEN DURING SHORT TERM ANGULAR ACCELERATIONS A66-80303

ADAPTATION, SURVIVAL, RESPIRATORY RATE, AND MOTOR ACTIVITY OF MICE IN PROLONGED EXPOSURE TO HIGH CONCENTRATIONS OF CARBON DIOXIDE A66-80320

REACTION TO WEIGHTLESSNESS OF ASTRONAUTS PARTICIPATING IN VOSTOK FLIGTS II TO VI INCLUSIVELY A66-80373

HISTOLOGICAL CHANGES IN OVARIES AND RESISTANCE TO TRANSVERSE ACCELERATION REVEALED BY CARDIOVASCULAR AND RESPIRATORY ACTIVITY OF YOUNG FEMALE MONKEYS A66-80378

RESPIRATORY SYSTEM

METHODS FOR SOMATIC CLASSIFICATION OF PILOTS OF DIFFERENT AGES ACCORDING TO STATUS OF FUNCTIONAL MUSCULAR, CIRCULATORY, AND RESPIRATORY CAPACITIES AS RELATED TO TRAINING A66-80164

BODY TEMPERATURE AND CARDIOVASCULAR AND RESPIRATORY ACTIVITY OF MAN AND DOG UNDER HYPOXIA AND HOT AND COLD TEMPERATURE EXPOSURE A66-80188

RESISTANCE TO HYPOXIA AND FATIGUE OF RESPIRATORY MUSCLE DURING ASCENT TO HIGH ALTITUDE AS AFFECTED BY ACCLIMATIZATION A66-80305

CARDIOVASCULAR AND RESPIRATORY DISEASE IN FORMER FLIGHT STUDENTS - AEROSPACE MEDICINE NASA-CR-68541 N66-13165

REST

EIGHT HOUR ISOLATION AND HYPOKINESIA EFFECT ON BIOCHEMICAL AND PHYSIOLOGICAL INDICES IN MAN A66-80299

PROLONGED HYPOKINESIA EFFECT ON ACCELERATION TOLERANCE OF HUMAN A66-80316

RESTRAINT

MOTOR RESTRAINT EFFECT ON BEHAVIOR RESPIRATION, HEART FUNCTION, AND BRAIN BIOELECTRIC ACTIVITY IN MONKEY A66-80376

RETINAL IMAGE

STABILIZED RETINAL IMAGES AND DISAPPEARANCE TIME AS RELATED TO STIMULUS SIZE A66-80173

RHEOELECTRICAL SIMULATION

RHEOGRAPHIC REGIONAL METHOD FOR EVALUATION OF CEREBRAL AND OCULAR CIRCULATION IN CARDIAC AND CEREBROVASCULAR DISEASE A66-14002

RIBONUCLEIC ACID

BIOLOGICAL MECHANISMS FOR MEMORY - NEURON EXCITATION, NUCLEIC ACID METABOLISM, AND PROTEIN SYNTHESIS MECHANISM - DEOXYRIBONUCLEIC ACID JPRS-32809 N66-12269

PROTEIN BIOSYNTHESIS BY INCORPORATION OF AMINO ACIDS AND ACTION OF SOLUBLE RIBONUCLEIC ACID N66-12630

ROCKET ENGINE NOISE

TOLERANCE OF JET AND ROCKET ENGINE EXHAUST NOISE AND EAR PROTECTION DEVICES FOR PILOTS AND GROUND CREWS NASA-TT-F-9799 N66-13297

ROCKET THRUST

AEROSPACE MEDICINE - COMPRESSION DEFORMITIES OF THORACIS VERTEBRAE IN HUMAN TOLERANCE TEST DURING EXPOSURE TO SIMULATED ESCAPE SYSTEM ROCKET THRUST VECTOR AMRL-TR-65-134 N66-12885

ROTATING ENVIRONMENT

COMPARATIVE EFFECTS OF PROLONGED ROTATION AT 10

SUBJECT INDEX

SIMULATION

RPM ON POSTURAL EQUILIBRIUM IN VESTIBULAR NORMAL AND DEFECTIVE HUMAN SUBJECTS A66-80198

RETENTION A66-80177

ROTATION
EMETIC EFFECT OF APOMORPHINE AS RELATED TO DURATION OF ROTATION OR OSCILLATION EXPOSURE IN DOGS A66-80326

SENSORY STIMULATION
SIGNAL DETECTION OF AUDITORY SENSORY RESPONSES TO STIMULI - AUDITORY INFORMATION PROCESSING NASA-CR-68881 N66-13990

OCULOGRAVIC ILLUSION - PERCEPTION OF VISUAL HORIZONTAL IN NORMAL AND INNER EAR DEFECTIVE SUBJECTS DURING PROLONGED ROTATION NASA-CR-68659 N66-13560

SEROTONIN
PHARMACOLOGICALLY ACTIVE AND LETHAL SUBSTANCES RELEASED FROM THERMALLY INJURED SKIN OF HUMAN AND ANIMAL SUBJECTS INCLUDING HISTAMINE, BRADYKININ, ADENYLIC COMPOUNDS, AND POSSIBLY SEROTONIN A66-80254

RUBY LASER
BIOLOGICAL EFFECTS OF LASER RADIATION WITH REFERENCE TO INTACT ANIMALS, PRIMATE EYES AND SKIN AND MALIGNANT TUMORS OF ANIMAL AND HUMAN ORIGIN A66-12994

SERUM
BEHAVIOR OF SERUM LACTIC DEHYDROGENASE IN MEN EXPOSED TO BRIEF, INTENSE THERMAL IMPULSES A66-80203

SAFETY DEVICE
PHYSIOLOGICAL RESPONSE OF MAN TO IMPACT DECELERATIONS ACTING IN VARIOUS DIRECTIONS DURING SPACECRAFT LANDING AS AFFECTED BY SAFETY BELTS, HARNESES, AND SHOCK ABSORBERS A66-80301

METABOLIC RESEARCH - ATOMIC ABSORPTION SPECTROMETRY USED FOR MEASURING NICKEL IN BIOLOGICAL MATERIALS, SERUM CA, MG, ACIDITY, AND CONDUCTIVITY - FREEZING POINT METHOD NYO-1397-1 N66-12898

SAMPLED DATA SYSTEM
EVALUATION OF SAMPLED DATA PURSUIT TRACKING MODEL. A66-80186

SEX FACTOR
SEX DIFFERENCES, INCIDENCE, REVERSAL, AND PREVENTION OF HIDROMEIOSIS-DECREMENT OF RATE OF THERMALLY INDUCED SWEATING A66-80251

SCIENTIST
HISTORY OF ASTRONAUT SELECTION PROCEDURES AS RELATED TO SELECTION OF SCIENTISTS BECOMING MEMBERS OF SPACECREW A66-80187

SEX DIFFERENCES IN ADAPTATION OF GALVANIC SKIN RESPONSE TO REPETITION OF VISUAL STIMULUS A66-80271

SCINTILLATION COUNTER
COMPUTER PROGRAMS FOR REDUCING METABOLIC DATA OBTAINED BY SCINTILLATION COUNTERS LA-3298 N66-13431

SHIELDING
SPACE RADIATION-RELATIVE BIOLOGICAL EFFECTIVENESS AND PROBLEMS OF SHIELDING DURING MOON MISSION A66-80310

SCREENING TECHNIQUE
SURVIVAL DURING SCREENING OF VARIOUS AREAS OF RAT BODY TO GAMMA RAYS AND HIGH ENERGY PROTONS AS AFFECTED BY VIBRATION OR ACCELERATION STRESS A66-80382

SHOCK WAVE
SURVIVAL OF MICROORGANISMS EXPOSED TO SHOCK WAVE AND CRYOGENIC TEMPERATURE DURING WHOLE AIR SAMPLING OF UPPER ATMOSPHERE AS NASA-CR-68421 N66-13095

SEAT
CRITERIA FOR BODY BLOCKS, ANTHROPOMORPHIC DUMMIES, AND INSTRUMENTATION FOR USE IN STATIC AND DYNAMIC TESTING OF CIVIL AIRCRAFT SEAT SYSTEMS FAA-ADS-20 N66-13926

HAZARDS TO HUMAN EAR FROM SHOCK WAVES OF HIGH ENERGY ELECTRIC DISCHARGES AWRE-E-1/65 N66-13711

SEMICIRCULAR CANAL
BIOLOGICAL EFFECT OF DIFFERENT DOSES OF IONIZING RADIATION ON VESTIBULAR APPARATUS N66-12458

SIGNAL DETECTION
SIGNAL DETECTION THEORY AND SHORT TERM MEMORY A66-80265

SENSITIVITY
SENSITIVITY OF DIFFERENT ORGAN MOUSE TISSUE CELLS DURING IN SITU AND IN VITRO STUDIES IN RESPONSE TO VIBRATION A66-80380

DETECTION OF VISUAL SIGNAL WITH LOW BACKGROUND NOISE A66-80267

RADIATION SENSITIVITY OF CHROMOSOME MUTATION IN WHITE BLOOD CELLS OF HUMANS, MONKEYS, AND RABBITS N66-12756

DETERIORATION OF SIGNAL DETECTABILITY DURING VIGILANCE TASK AS FUNCTION OF BACKGROUND EVENT RATE A66-80280

HYPOXIA EFFECTS ON SENSITIVITY TO EPILEPTOGENIC AGENTS AND ON FUNCTIONAL PROPERTIES OF MOTOR FORMATIONS OF BRAIN JPRS-33056 N66-12903

DETECTION THRESHOLDS AS FUNCTION OF INTERVAL SEPARATION BETWEEN TWO SUCCESSIVE TARGETS A66-80354

SENSOR
SENSORS FOR PHYSIOLOGICAL INVESTIGATIONS UNDER SPACE FLIGHT CONDITIONS - BIOASTRONAUTICS N66-12221

SIGNAL RECEPTION
AFFECTIVE COMMUNICATION IN SPEECH AND RELATED QUANTITATIVE PROBLEMS - HUMAN PERCEPTION AND RESPONSE TO VOICE COMMUNICATION /SPEECH SIGNAL/ ACOUSTICAL PROPERTIES AD-620333 N66-12783

DESIGN, CALIBRATION, AND SENSOR CONSTRUCTION OF AUTOMATIC EQUIPMENT FOR ANALYZING BALLISTOCARDIOGRAMS - BIOASTRONAUTICS N66-12222

SIMULATION
BASIC PRINCIPLES OF SPECIAL TRAINING OF ASTRONAUTS BY SIMULATION OF SPACE FLIGHT FACTORS A66-80297

SENSORY DEPRIVATION
EIGHT HOUR ISOLATION AND HYPOKENISIA EFFECT ON BIOCHEMICAL AND PHYSIOLOGICAL INDICES IN MAN A66-80299

EMBRYONIC DEVELOPMENT OF CHICK AND FROG EGGS AND RESPIRATION OF CHICKEN AND MOUSE IN SIMULATED SPACE CABIN ATMOSPHERE CONSISTING OF HELIUM AND OXYGEN A66-80315

RELATIONSHIP BETWEEN ANTISUBMARINE HELICOPTER TEAM PERFORMANCE AND COMMUNICATIONS FLOW WITHIN

SIMULATOR

SUBJECT INDEX

- TEAM DURING SIMULATED ATTACK
NAVTRADEVCEM-1537-1 N66-13972 A66-80167
- HUMAN PERFORMANCE CHARACTERISTICS IN MANUAL
CONTROL TASKS, AND TECHNIQUES FOR DATA ANALYSIS
AND SYSTEMS SIMULATION
NASA-CR-68981 N66-14290 A66-80182
- SIMULATOR**
SIMULATORS USED IN TRAINING ASTRONAUTS FOR
SPACEFLIGHT A66-80296 A66-80353
- SIZE PERCEPTION**
SPECIFICATION OF STIMULUS CONDITIONS FOR VISUAL
SPACE PERCEPTION IN TERMS OF MONOCULAR AND
BINOCULAR CUES A66-13795 A66-80395
- SKIN /BIOL/**
DERMATOLOGICAL CONDITIONS OF HUMAN SKIN AS RESULTS
OF HEAT AND HUMIDITY A66-80247 A66-80353
- SEX DIFFERENCES, INCIDENCE, REVERSAL, AND
PREVENTION OF HIDROMEIOSIS-DECREMENT OF RATE OF
THERMALLY INDUCED SWEATING A66-80251 A66-13176
- INCIDENCE, MORPHOLOGY, AND ETIOLOGY OF MILIARIA
OCCURRING DURING EXPOSURE TO HOT ENVIRONMENT
A66-80253 A66-13176
- PHARMACOLOGICALLY ACTIVE AND LETHAL SUBSTANCES
RELEASED FROM THERMALLY INJURED SKIN OF HUMAN AND
ANIMAL SUBJECTS INCLUDING HISTAMINE, BRADYKININ,
ADENYLIC COMPOUNDS, AND POSSIBLY SEROTONIN
A66-80254 A66-13176
- PATHOGENIC ROLE OF MICROCIRCULATORY IMPAIRMENT
DURING COLD INJURY OF SKIN OF RABBIT AND MOUSE.
A66-80256 A66-13176
- RESPONSE OF HUMAN EPIDERMIS TO GRADED THERMAL AND
COLD STRESS. A66-80257 A66-13176
- MECHANOELASTIC PROPERTIES OF CORNIFIED EPITHELIUM
AS AFFECTED BY VARIOUS SOLVENT AND SOLUTION
ENVIRONMENTAL CHANGES A66-80258 A66-13176
- PHOSPHOLIPOPROTEIN EXTRACTED FROM HUMAN EPIDERMAL
TISSUES EXHIBITING WATER VAPOR BARRIER PROPERTIES
COMPARABLE TO INTACT EPIDERMIS A66-80259 A66-13176
- EFFECTS OF WETTING ON CUTANEOUS VULNERABILITY
A66-80260 A66-13176
- ROLE OF STRATUM CORNEUM IN BODY DEFENSE AGAINST
VARIOUS TYPES OF INJURY AND INFECTION
A66-80261 A66-13176
- SKIN DISORDERS DUE TO MICROBIAL INFECTIONS IN
MILITARY PERSONNEL LIVING IN TROPICS
A66-80262 A66-13176
- TEMPERATURE AND HYDRATION FACTORS AFFECTING
CUTANEOUS BARRIERS TO PENETRATION
A66-80263 A66-13176
- LEVEL OF SKIN POTENTIAL IN HEALTHY MALES AND
EFFECT OF AGE A66-80284 A66-13176
- SKIN FUNCTION AND PROCESSES IN VITAL ACTIVITY AS
RELATED TO PERSONAL HYGIENE DURING EXPOSURE TO
SPACE FLIGHT STRESSES A66-80312 A66-13176
- STUDY OF COMFORTABLE CLOTHING FOR ASTRONAUTS
DURING 30-DAY TESTS WITHOUT WASHING IN AIR
CONDITIONED SPACE CABINS IN RELATION TO SKIN
CONDITION A66-80314 A66-13176
- SKIN TEMPERATURE /BIOL/**
SWEAT CHLORIDE CONCENTRATION AND RATE, METABOLIC
RATE, SKIN AND BODY TEMPERATURES OF YOUNG AND OLD
MALES WALKING IN DESERT ENVIRONMENT
A66-80217 A66-13176
- VASCULAR AND SWEATING RESPONSES OF MAN TO VARYING
TEMPERATURE EXPOSURES A66-80250 A66-13176
- SLEEP**
RAPID EYE MOVEMENT STATE /DREAMING/ DIFFERENTIATED
BIOLOGICALLY FROM SLEEP AND WAKEFULNESS A66-80167
- MUSCLE TENSION CHANGES DURING RAPID EYE MOVEMENT
STATE A66-80182
- OXYGEN CONSUMPTION RATE AND
ELECTROENCEPHALOGRAPHIC STAGE OF SLEEP
A66-80353
- FREQUENCY ANALYSIS OF DIURNAL PERIODICITY IN HUMAN
ELECTROENCEPHALOGRAM A66-80395
- ELECTROPHYSIOLOGY AND PSYCHOPHYSIOLOGY OF SLEEP
JPRS-33033 N66-13176
- SLEEP DEPRIVATION**
HUMAN STRESS REACTIONS TO THREE-DAY MARCH, SLEEP
DEPRIVATION, FOOD AND OXYGEN STARVATION, NOTING
CHANGES IN CENTRAL NERVOUS SYSTEM FUNCTIONS
A66-14080
- BIOLOGICAL ROLE OF RAPID EYE MOVEMENT STATE
A66-80168
- CENTRAL NERVOUS SYSTEM FUNCTION OF HUMAN SUBJECTS
EXPOSED TO PHYSICAL EXERCISE, SLEEP DEPRIVATION,
STARVATION, AND HYPOXIA A66-80191
- SOCIAL ISOLATION**
EIGHT HOUR ISOLATION AND HYPOKINESIA EFFECT ON
BIOCHEMICAL AND PHYSIOLOGICAL INDICES IN MAN
A66-80299
- PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS IN MAN OF
LONG TERM STAY IN CABIN SIMULATING SPACEFLIGHT
ENVIRONMENT A66-80300
- MEASUREMENTS OF HEARING SENSITIVITY OF MEN DURING
PROLONGED ISOLATION IN SMALL CHAMBER UNDER
CONDITIONS OF CONSTANT NOISE A66-80307
- SOLAR FLARE**
BIOLOGICAL EFFECT IN MOUSE OF GAMMA IRRADIATION
AS AFFECTED BY SOLAR FLARE, RADIOPROTECTIVE DRUGS,
AND ACCELERATION STRESS DURING SIMULATION OF
RADIATION CONDITIONS OF SPACEFLIGHT
A66-80402
- SOLVENT**
MECHANOELASTIC PROPERTIES OF CORNIFIED EPITHELIUM
AS AFFECTED BY VARIOUS SOLVENT AND SOLUTION
ENVIRONMENTAL CHANGES A66-80258
- SPACE CABIN ATMOSPHERE**
PRINCIPLES FOR CREATING SYSTEMS CAPABLE OF
MAINTAINING OPTIMUM CONDITIONS IN SPACE CAPSULE
ENVIRONMENT A66-80190
- SURVEY OF SOVIET USE OF ACTIVE CHEMICALS FOR SPACE
CABIN AIR REVITALIZATION A66-80202
- STUDY OF COMFORTABLE CLOTHING FOR ASTRONAUTS
DURING 30-DAY TESTS WITHOUT WASHING IN AIR
CONDITIONED SPACE CABINS IN RELATION TO SKIN
CONDITION A66-80314
- EMBRYONIC DEVELOPMENT OF CHICK AND FROG EGGS AND
RESPIRATION OF CHICKEN AND MOUSE IN SIMULATED
SPACE CABIN ATMOSPHERE CONSISTING OF HELIUM AND
OXYGEN A66-80315
- ELECTROCHEMICAL CARBON DIOXIDE CONCENTRATION
SYSTEM FOR PURIFYING SPACE CABIN ATMOSPHERE
NASA-CR-54849 N66-13114
- SPACE CABIN SIMULATION**
HUMAN FACTORS EVALUATION OF COMMUNICATIONS
EQUIPMENT SWITCH ACTUATORS UNDER SIMULATED SPACE
CRAFT AND ORDINARY CONDITIONS A66-80148
- PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS IN MAN OF
LONG TERM STAY IN CABIN SIMULATING SPACEFLIGHT
ENVIRONMENT A66-80300
- SPACE ENVIRONMENT**
BIOSATELLITE PROGRAM - EXPLOITATION OF SPACE
ENVIRONMENT FOR BIOLOGICAL RESEARCH
N66-12419

- METHODS USED AND PROBLEMS ENCOUNTERED IN EVALUATING PERFORMANCE OF ASTRONAUTS IN SPACE FLIGHT ENVIRONMENT N66-12658
- N ASA SPACE BIOLOGY PROGRAM - EXOBIOLOGY, ENVIRONMENTAL AND BEHAVIORAL BIOLOGY, MOLECULAR BIOLOGY AND INSTRUMENTATION, FLIGHT PROGRAMS, AND MANNED SPACE FLIGHT NASA-TM-X-57051 N66-13899
- ANNOTATED BIBLIOGRAPHY OF AEROSPACE MEDICINE AND BIOLOGY WITH SUBJECT, AUTHOR, AND CORPORATE SOURCE INDEXES - PHYSIOLOGICAL, PSYCHOLOGICAL, AND SPACE ENVIRONMENT EFFECTS ON MAN NASA-SP-7011/18/ N66-14160
- SPACE EXPLORATION**
SPACE TRAVEL AND EXPLORATION COVERING BIOLOGICAL AND TECHNICAL DIFFICULTIES SUCH AS RADIATION, METEOR IMPACT, VEHICLE STERILIZATION, ETC A66-13806
- INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL PROBLEMS OF MAN IN SPACE AT PARIS, FRANCE IN OCTOBER 1962 A66-14063
- ENERGY PATTERNS FROM SPACE ACCESSIBLE TO HUMAN SENSES THROUGH DATA SENSORS AND INFORMATION ACQUISITION A66-14093
- TECHNOLOGICAL AND BIOLOGICAL CONTRIBUTIONS OF SOVIET UNION TO SPACE EXPLORATION A66-80155
- SPACE EXPLORATION AND STUDY OF ROLE OF EARTH ENVIRONMENTAL CONDITIONS IN EVOLUTION, PHYSIOLOGY, AND BEHAVIOR OF TERRESTRIAL ORGANISMS A66-80156
- SPACE FLIGHT**
ASTRONAUT PHYSIOLOGICAL RESPONSES TO SPACE FLIGHT CONDITIONS MEASURED FOR CLINICAL OR EXPERIMENTAL PURPOSES A66-14091
- COMPARISON OF MANNED AND UNMANNED SPACECRAFT A66-14092
- EFFECT OF SPACE FLIGHT FACTORS ON REPRODUCTIVE SYSTEM OF DROSOPHILA AND GENETIC APPARATUS OF TRADESCANTIA A66-80371
- MOTOR RESTRAINT EFFECT ON BEHAVIOR RESPIRATION, HEART FUNCTION, AND BRAIN BIOELECTRIC ACTIVITY IN MONKEY A66-80376
- BIOLOGICAL EFFECT IN MOUSE OF GAMMA IRRADIATION AS AFFECTED BY SOLAR FLARE, RADIOPROTECTIVE DRUGS, AND ACCELERATION STRESS DURING SIMULATION OF RADIATION CONDITIONS OF SPACEFLIGHT A66-80402
- SENSORS FOR PHYSIOLOGICAL INVESTIGATIONS UNDER SPACE FLIGHT CONDITIONS - BIOASTRONAUTICS N66-12221
- RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS, DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION LEVEL DETERMINATION N66-12452
- DOMINANT LETHALS IN DROSOPHILA MALES EXPOSED TO VIBRATION, ACCELERATION, AND GAMMA IRRADIATION DURING SPACE FLIGHTS N66-13790
- SPACE FLIGHT FEEDING**
METABOLIC STUDIES OF ENERGY DENSE COMPOUNDS FOR AEROSPACE NUTRITION AMRL-TR-64-121 N66-13594
- SPACE FLIGHT STRESS**
BIOLOGICAL STRESSES OF MANNED SPACE FLIGHT IN LIMITING FLIGHT DURATION, NOTING ISOLATION EFFECT A66-13507
- DYNAMIC ENVIRONMENTAL INFLUENCES ON MAN DURING SPACE FLIGHT COVERING FORCE FIELDS, INERTIAL FORCES DUE TO ACCELERATION AND METHODS OF PROTECTION A66-14074
- SOVIET BIOLOGICAL AND PHYSIOLOGICAL INVESTIGATIONS IN ROCKETS AND SATELLITES, PARTICULARLY NONPATHOLOGICAL CHARACTER OF PHYSIOLOGICAL REACTIONS TO STRESS FACTORS A66-14076
- INVESTIGATIONS OF PHYSIOLOGICAL RESPONSES OF ANIMALS AND MAN TO STRESSES IN VOSTOK SPACECRAFT A66-80160
- COMPUTER ANALYSIS OF ELECTROENCEPHALOGRAPHIC RECORDING DURING ENVIRONMENTAL STRESSES OF SPACE FLIGHT A66-80165
- SKIN FUNCTION AND PROCESSES IN VITAL ACTIVITY AS RELATED TO PERSONAL HYGIENE DURING EXPOSURE TO SPACE FLIGHT STRESSES A66-80312
- HUMAN CELLS AND GENETIC CHANGES IN ESCHERICHIA DURING EXPOSURE STRESSES OF SPACE FLIGHT ON VOSTOK SPACECRAFT A66-80372
- PHYSIOLOGICAL RESPONSES TO AND BIOLOGICAL EFFECTS OF SPACE FLIGHT STRESS - ASTRONAUT PERFORMANCE ANL-TRANS-209 N66-13520
- SPACE FOOD**
FEASIBILITY OF USING CHICKEN AND DUCK FOR ASTRONAUT FOOD IN CLOSED ECOLOGICAL SYSTEM A66-80308
- REVIEW OF LIFE SUPPORT PROBLEMS IN SPACE - FOOD, WATER, OXYGEN, WEIGHTLESSNESS, AND ACCELERATION FTD-TT-65-601/164 N66-14028
- SPACE LABORATORY**
FUTURE OF ENVIRONMENTAL BIOLOGY, DISCUSSING SPACE RESEARCH ON LIVING ORGANISMS IN EXTRATERRESTRIAL ENVIRONMENT A66-14069
- SPACE MISSION**
SPACE RADIOBIOLOGY TRAINING AND OPERATIONS - RADIATION ZONES AND EXPOSURE, BIOLOGICAL EFFECTS RADIATION, DOSE RATES, AND RECOVERY AMD-TR-65-2 N66-13006
- SPACE NAVIGATION**
NAVIGATION AND CONTROL SIMULATION PORTION OF OVERALL MANNED SPACE CABIN TEST PROGRAM AIAA PAPER 65-277 A66-12776
- SPACE ORIENTATION**
SPATIAL ORIENTATION DISTURBANCES AND VEGETATIVE DISORDERS OCCURRING IN COSMONAUTS DURING SPACE FLIGHT DUE TO DISTURBANCES IN PHYSIOLOGICAL INTERPLAY OF SENSING MECHANISMS GOVERNING SPACE PERCEPTION A66-14084
- PERCEPTION OF APPARENT VERTICAL WITHOUT VISUAL CUES DEPENDING ON LONGITUDINAL AXES OF BODY AND HEAD TO DIRECTION OF RESULTANT ACCELERATION ABOVE 1 G A66-14086
- SPACE PROGRAM**
MANNED SPACE FLIGHT PROGRAM WITH BIOMEDICAL DATA COLLECTION FOR INTEGRATION OF CREWMAN INTO SPACECRAFT OPERATION A66-14090
- HUMAN FACTORS INFORMATION REQUIREMENTS FOR SPACE SYSTEM DEVELOPMENT NASA-CR-68230 N66-12959
- SPACE RADIATION**
SPACE RADIATION OF SOLAR AND COSMIC ORIGIN AND BIOLOGICAL EFFECTS, EXAMINING DNA STRUCTURE AND RADIATION INDUCED CHANGES A66-13897
- RADIATION HAZARDS, DETECTION DEVICES, AND MEDICINES TO PREVENT INJURY DURING FLIGHTS OF VOSTOK AND VOSKHOD SPACESHIPS A66-80204
- POSSIBILITIES OF PHARMACEUTICAL AND CHEMICAL PROTECTION OF HUMAN SUBJECTS AGAINST RADIATION INJURIES DURING OUTER SPACE FLIGHTS A66-80309
- SPACE RADIATION-RELATIVE BIOLOGICAL EFFECTIVENESS AND PROBLEMS OF SHIELDING DURING MOON MISSION A66-80310

- SPACE SUIT**
 APOLLO SPACE SUIT DESIGN DISCUSSING CONSTRUCTION,
 PURPOSE AND OPERATING CONDITIONS OF LIQUID-COOLED
 LIFE SUPPORT SYSTEM A66-12631
- HEAT LOSS IN SPACE, DISCUSSING TEMPERATURE
 REGULATION DURING SPACE WALK VIA HEAT EXCHANGERS
 IN AIR VENTILATED SPACE SUIT A66-14070
- EVALUATION OF AIR VENTILATED CLOTHING SYSTEM
 REGULATING HEAT LOSS DURING EXTRAVEHICULAR
 ACTIVITY IN SPACE A66-80157
- WATER IMMERSION TECHNIQUE FOR SIMULATING ZERO
 GRAVITY MOBILITY PERFORMANCE OF ASTRONAUT IN
 PRESSURIZED SPACESUIT
 NASA-TN-D-3054 N66-14151
- SPACE SYSTEMS ENGINEERING**
 HUMAN FACTORS INFORMATION REQUIREMENTS FOR SPACE
 SYSTEMS ENGINEERING - SURVEY AND BIBLIOGRAPHY
 NASA-CR-68616 N66-13331
- SPACECRAFT CONTROL**
 NAVIGATION AND CONTROL SIMULATION PORTION OF
 OVERALL MANNED SPACE CABIN TEST PROGRAM
 AIAA PAPER 65-277 A66-12776
- SPACECRAFT ELECTRONIC EQUIPMENT**
 CYBERNETICS ROLE IN SPACE FLIGHT INCLUDING CONTROL
 CIRCUITS FOR GUIDANCE AND ELECTRONIC EQUIPMENT
 AUTOMATION AND DEVELOPMENT A66-13495
- SPACECRAFT ENVIRONMENT**
 ASTRONAUT SELECTION INCLUDING DYNAMIC TESTING,
 DISCUSSING EXAMINATION METHODS, BIOLOGICAL
 PARAMETERS, LABORATORY AND RADIOLOGICAL
 PROCEDURES, BLOOD CHEMISTRY TECHNIQUES, ETC
 A66-14064
- ARTIFICIAL ENVIRONMENT IN MANNED SPACECRAFT FOR
 PRESERVING HUMAN LIFE, COMPARING PHYSICAL,
 CHEMICAL AND BIOLOGICAL PROCESSES A66-14079
- PROBLEMS OF SPACECRAFT PERSONNEL LIFE SUPPORT BY
 RECONVERSION OF WASTE PRODUCTS OF METABOLISM
 A66-80313
- SPACECRAFT LANDING**
 PHYSIOLOGICAL RESPONSE OF MAN TO IMPACT
 DECELERATIONS ACTING IN VARIOUS DIRECTIONS DURING
 SPACECRAFT LANDING AS AFFECTED BY SAFETY BELTS,
 HARNESSSES, AND SHOCK ABSORBERS A66-80301
- SPATIAL ORIENTATION**
 SPATIAL ORIENTATION AND PERCEPTION OF SUBJECTS
 ASSUMING VARIOUS HEAD AND BODY POSITIONS UNDER
 INCREASED ACCELERATION WITHOUT VISUAL REFERENCE
 FRAME A66-80163
- SPATIAL PERCEPTION**
 SPECIFICATION OF STIMULUS CONDITIONS FOR VISUAL
 SPACE PERCEPTION IN TERMS OF MONOCULAR AND
 BINOCULAR CUES A66-13795
- SPATIAL ORIENTATION AND PERCEPTION OF SUBJECTS
 ASSUMING VARIOUS HEAD AND BODY POSITIONS UNDER
 INCREASED ACCELERATION WITHOUT VISUAL REFERENCE
 FRAME A66-80163
- DETECTION OF COMPOUND MOTION IN TWO-TARGET
 COLLISION PREDICTION SITUATION
 SP-1946/001/00 N66-14021
- SPECTROMETRY**
 METABOLIC RESEARCH - ATOMIC ABSORPTION
 SPECTROMETRY USED FOR MEASURING NICKEL IN
 BIOLOGICAL MATERIALS, SERUM CA, MG, ACIDITY,
 AND CONDUCTIVITY - FREEZING POINT METHOD
 NYO-1397-1 N66-12898
- SPEECH**
 ELECTRIC METHOD FOR REGISTERING TONGUE MOTION
 DURING ARTICULATION OF CONSONANTS A66-80329
- USING COMPUTER ANALYZED SPEECH SIGNALS
 FACILITATING BETTER COMMUNICATION OF MAN WITH
- MACHINES** A66-80334
- AUTOMATIC RECORDING AND PROCESSING OF DATA
 REGARDING ARTICULATION OF SPEECH** A66-80392
- SPEECH STREAM SEGMENTATION INTO PHONEMES**
 JPRS-32790 N66-12957
- SPEECH DISCRIMINATION**
 DISTINCTIVE FEATURES AND ERRORS IN SHORT TERM
 MEMORY FOR ENGLISH VOWELS A66-12816
- VERBAL COMMUNICATION INTELLIGIBILITY IN OXYGEN-
 HELIUM AND OTHER BREATHING MIXTURES IN LOW
 PRESSURE CHAMBER A66-80199
- LIPREADING AS VISUAL METHOD OF SPEECH RECOGNITION
 AND COMMUNICATION A66-80393
- AFFECTIVE COMMUNICATION IN SPEECH AND RELATED
 QUANTITATIVE PROBLEMS - HUMAN PERCEPTION AND
 RESPONSE TO VOICE COMMUNICATION /SPEECH SIGNAL/
 ACOUSTICAL PROPERTIES AD-620333 N66-12783
- SPINAL CORD**
 PROLONGED HOT OR COLD STIMULATION EFFECTS ON EYE
 MOVEMENTS, VESTIBULOSPINAL, AND SEGMENTAL SPINAL
 ACTIVITIES IN MONKEYS
 NASA-CR-68266 N66-12177
- SPINE**
 CAUSES OF COMPRESSION FRACTURES OF SPINE DURING
 LARGE NUMBER OF USAF EJECTIONS A66-12361
- SPLEEN**
 PROTON AND GAMMA IRRADIATION EFFECTS ON SPLEEN,
 THYMUS AND BONE MARROW IN MICE A66-80383
- SPORE**
 CLEAN ROOM BACTERIOLOGY - HEAT RESISTANCE OF SPORE
 FORMERS, MICROORGANISM IDENTIFICATIONS, HUMAN
 CONTACT CONTAMINATION
 NASA-CR-68729 N66-13553
- STARVATION**
 CENTRAL NERVOUS SYSTEM FUNCTION OF HUMAN SUBJECTS
 EXPOSED TO PHYSICAL EXERCISE, SLEEP DEPRIVATION,
 STARVATION, AND HYPOXIA A66-80191
- ROLE OF ADIPOSE TISSUE OF WELL-FED AND STARVED
 GUINEA PIGS IN DECOMPRESSION SICKNESS A66-80294
- STATISTICAL ANALYSIS**
 GASTRODUODENAL ULCERS IN FRENCH AIR FORCE
 PERSONNEL - STATISTICAL ANALYSIS A66-80363
- ERROR AND CONTROL EFFICIENCY ANALYSIS OF PILOTS
 EXPOSED TO SIMULATED PITCH, ROLL, YAW, AND
 ALTITUDE VARIATIONS
 NASA-CR-68219 N66-12195
- STATISTICAL ANALYSIS OF HEAT SYNDROME CAUSES -
 ENVIRONMENTAL AND HUMAN FACTORS, AND PREVENTION
 AND ALLEVIATION IN CIVIL DEFENSE SHELTERS AND IN
 EMERGENCY SITUATIONS
 AD-623578 N66-13007
- STATISTICAL CORRELATION**
 STATEMENT ATTRACTIVENESS INDICES OBTAINED UNDER
 PERSONAL OR SOCIAL ACCEPTABILITY - CORRELATION
 OF INDICES WITH EACH OTHER
 NASM-937 N66-12380
- STEREOSCOPIC VISION**
 ROLE OF CONVERGENCE IN STEREOSCOPIC VISION
 A66-80288
- STIMULATED EMISSION**
 RADIATION HAZARDS CONTROL - AIR MONITORS, FILM
 SENSITIVITY, STIMULATED EMISSION DOSIMETRY,
 GLASS CLEANING TECHNIQUES, HIGH DENSITY GRASS
 SAMPLES, AND FIRE HOSE FRICTION LOSSES
 UCRL-14351 N66-12576

- STOMACH**
GASTRODUODENAL ULCERS IN FRENCH AIR FORCE
PERSONNEL - STATISTICAL ANALYSIS A66-80363
- STRESS /BIOL/**
PSYCHOLOGICAL STRESS SUSCEPTIBILITY OF NAVAL AND
MARINE PILOT TRAINEES, EXAMINING ENVIRONMENTAL CUE
MANIPULATION TO CONTROL PERCEPTIONS A66-12355
- SELF-REPORTED STRESS-RELATED SYMPTOMS AMONG AIR
TRAFFIC CONTROL SPECIALISTS / ATCS/ AND NON- ATCS
PERSONNEL A66-12358
- HUMAN STRESS REACTIONS TO THREE-DAY MARCH, SLEEP
DEPRIVATION, FOOD AND OXYGEN STARVATION, NOTING
CHANGES IN CENTRAL NERVOUS SYSTEM FUNCTIONS A66-14080
- DEGREE OF MENTAL STRESS CORRELATED WITH EXCRETION
OF CATECHOLAMINE, FREE ADRENALINE AND
NORADRENALINE IN URINE A66-14081
- BEHAVIORAL EFFECTS OF IONIZED AIR ON RATS A66-80278
- PHYSIOLOGICAL RESPONSES OF ENDOCRINE SYSTEM TO
PHYSICAL AND MENTAL STRESS - URINARY EXCRETION
OF ADRENALINE AND NORADRENALINE N66-13507
- AIR SICKNESS IN STUDENT AVIATORS ASSOCIATED WITH
PEAKS OF PHYSIOLOGICAL AND PSYCHOLOGICAL STRESS
DURING TRAINING NSAM-939 N66-13700
- FLIGHT FATIGUE AND STRESS OF PILOTS AM-65-13 N66-13897
- STRESS IMPOSED ON AIRCREW IN CIVIL JET AIRCRAFT
DURING LONG FLIGHT DLR-FB-65-44 N66-14261
- DATA ACQUISITION, CONVERSION, HANDLING, ANALYSIS,
AND RECORDING SYSTEM FOR PSYCHOPHYSIOLOGICAL
STRESS AMRL-TDR-64-64 N66-14315
- STRONTIUM**
CALCIUM-45 AND STRONTIUM-85 METABOLISM IN HUMANS
COD-587-2 N66-13061
- SULFANILAMIDE**
PROTECTION OF CORN, WHEAT, AND LUPINE SEEDS
AGAINST BETA-RADIATION BY TREATMENT WITH
SULFANILAMIDE AND NONANOIC ACID DERIVATIVES A66-80323
- SULFONE**
PROTECTION OF CORN, WHEAT, AND LUPINE SEEDS
AGAINST BETA-RADIATION BY TREATMENT WITH
SULFANILAMIDE AND NONANOIC ACID DERIVATIVES A66-80323
- SULFUR DIOXIDE**
COMBINED RESPIROGRAPHIC TECHNIQUE AND ANALYTICAL
METHOD INDICATING EFFECT OF CHANGES IN RAT OF
SULFUR DIOXIDE CONCENTRATION AND DURATION OF
EXPOSURE ON PULMONARY RETENTION, TIDAL VOLUME, AND
RESPIRATORY RATE A66-80264
- SUPERSONIC TRANSPORT**
HUMAN FACTORS IN CONCORDE SST PROGRAM A66-13357
- SURVIVAL**
USAF AIRCRAFT ACCIDENTS INVOLVING TEN OR MORE
FATALITIES FOR 1953 TO 1962 PERIOD IN RELATION TO
ACCIDENT PREVENTION PROGRAM A66-80197
- ADAPTATION, SURVIVAL, RESPIRATORY RATE, AND MOTOR
ACTIVITY OF MICE IN PROLONGED EXPOSURE TO HIGH
CONCENTRATIONS OF CARBON DIOXIDE A66-80320
- RADIOPROTECTIVE EFFECT OF VARIOUS DRUGS AGAINST
X - RAYS AND GAMMA RAYS DURING PROTON IRRADIATION
MICE A66-80381
- SURVIVAL DURING SCREENING OF VARIOUS AREAS OF RAI
BODY TO GAMMA RAYS AND HIGH ENERGY PROTONS AS
AFFECTED BY VIBRATION OR ACCELERATION STRESS A66-80382
- SURVIVAL OF MICROORGANISMS EXPOSED TO SHOCK WAVE
AND CRYOGENIC TEMPERATURES DURING UPPER
ATMOSPHERIC AIR SAMPLING NASA-CR-354 N66-12533
- FORTRAN COMPUTER PROGRAM FOR EVALUATION OF POST
IRRADIATION SURVIVAL TIMES - ANIMAL STUDY
UCLA-12-573 N66-12917
- SURVIVAL OF MICROORGANISMS EXPOSED TO SHOCK WAVE
AND CRYOGENIC TEMPERATURE DURING WHOLE AIR
SAMPLING OF UPPER ATMOSPHERE NASA-CR-68421 N66-13095
- SWEATING**
PHYSIOLOGICAL ROLE OF ADRENAL MEDULLA IN PALMAR
ANHIDROTIC RESPONSE TO STRESS A66-80215
- SWEAT CHLORIDE CONCENTRATION AND RATE, METABOLIC
RATE, SKIN AND BODY TEMPERATURES OF YOUNG AND OLD
MALES WALKING IN DESERT ENVIRONMENT A66-80217
- SWEAT GLAND FATIGUE AS REFLECTED BY SWEAT RATES
AND RECTAL TEMPERATURES DURING EXPOSURE TO HOT
ENVIRONMENT A66-80218
- ACCLIMATIZATION AND SWEATING-EFFECT OF DRUGS AND
THERMAL STRESS A66-80248
- MORPHOLOGICAL AND FUNCTIONAL ASPECTS OF
SWEATING-SODIUM SECRETION REABSORPTION AND
BIOLOGICAL MODEL OF SWEAT GLAND A66-80249
- VASCULAR AND SWEATING RESPONSES OF MAN TO VARYING
TEMPERATURE EXPOSURES A66-80250
- SEX DIFFERENCES, INCIDENCE, REVERSAL, AND
PREVENTION OF HIDROMEIOSIS-DECREMENT OF RATE OF
THERMALLY INDUCED SWEATING A66-80251
- MECHANISMS OF SWEATING IN WORK-SWEATING RESPONSES
IN PHYSICAL EXERCISE RELATED TO CHANGES IN BODY
TEMPERATURE A66-80252
- INCIDENCE, MORPHOLOGY, AND ETIOLOGY OF MILIARIA
OCCURRING DURING EXPOSURE TO HOT ENVIRONMENT A66-80253
- ECCRINE SWEAT GLAND ACTIVITY AND RACIAL
DIFFERENCES IN RESTING SKIN CONDUCTANCE A66-80276
- SWEDEN**
SWEDISH AIR FORCE PERSONNEL TESTING FOR SOMATIC
CLASSIFICATION, APPRAISING BODY DIMENSIONS,
MUSCULAR CAPACITY, ENDURANCE INDEX, ETC A66-14087
- SWITCH**
HUMAN FACTORS EVALUATION OF COMMUNICATIONS
EQUIPMENT SWITCH ACTUATORS UNDER SIMULATED SPACE
CRAFT AND ORDINARY CONDITIONS A66-80148
- SYMPATHETIC NERVOUS SYSTEM**
SYMPATHETIC NERVOUS STIMULATION OF HEART - BETA
ADRENERGIC BLOCKING CARDIAC FUNCTION, CIRCULATORY
RESPONSE AND PHYSICAL EXERCISE A66-80147
- SYNCHROCYCLOTRON**
DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES
USING SYNCHROCYCLOTRON - IRRADIATION OF
ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION
RESISTANCE OF PLASTICS N66-12453
- SYNTHESIS**
PROTEIN BIOSYNTHESIS BY INCORPORATION OF AMINO
ACIDS AND ACTION OF SOLUBLE RIBONUCLEIC ACID N66-12630

T

- TARGET RECOGNITION**
 AFTERIMAGES PRODUCED BY BLACK AND LIGHT TARGETS VIEWED PERIPHERALLY BY DARK ADAPTED SUBJECTS A66-80175
 SHORT TERM RECOGNITION MEMORY FOR SINGLE DIGITS AND PAIRS OF DIGITS A66-80268
 STUDY OF HUMAN VISUAL PERCEPTION REACTION TIME WITH MASKING A66-80306
 DETECTION OF COMPOUND MOTION IN TWO-TARGET COLLISION PREDICTION SITUATION SP-1946/001/00 N66-14021
- TEACHING MACHINE**
 TRAINING AND INSTRUCTION BY MEANS OF TEACHING MACHINES IN FIELD OF AVIATION A66-13508
- TEMPERATURE CONTROL**
 HEAT LOSS IN SPACE, DISCUSSING TEMPERATURE REGULATION DURING SPACE WALK VIA HEAT EXCHANGERS IN AIR VENTILATED SPACE SUIT A66-14070
 BEHAVIORAL THERMOREGULATION IN YOUNG AND OLD RATS IN COLD ENVIRONMENT A66-80208
 THERMOREGULATORY METABOLIC RESPONSE OF COLD AND HEAT EXPOSED SQUIRREL MONKEYS /SAIMIRI SCIUREA/ AS COMPARED TO SIMILARLY TREATED RODENTS A66-80225
- TEMPERATURE EFFECT**
 UPPER THERMAL TOLERANCE LIMITS FOR UNIMPAIRED MENTAL PERFORMANCE A66-12359
 ANIMAL TEMPERATURE SENSING FOR STUDYING EFFECT OF PROLONGED ORBITAL FLIGHT ON CIRCADIAN RHYTHMS OF POCKET MICE A66-12767
 ENVIRONMENTAL TEMPERATURE EFFECTS ON EKG OF SQUIRREL MONKEY - ANIMAL STUDY OF HEART RATE AND T-WAVE AMPLITUDE NASA-CR-68306 N66-12972
- TEST METHOD**
 APPLICATION OF DIGITAL COMPUTATION TECHNIQUES FOR ON LINE DISPLAY OF PULMONARY NITROGEN WASHOUT AND COMPARISON OF DATA WITH CONVENTIONAL TECHNIQUES A66-80231
 NEW METHOD FOR ANALYSIS OF DISTRIBUTION OF MECHANICAL TIME CONSTANTS IN LUNG A66-80238
 COMPARISON OF METHODS OF BLOOD PRESSURE MEASUREMENTS AND PRESSURE FLOW DYNAMICS DURING VARIOUS CONDITIONS OF PHYSICAL EXERCISE A66-80244
 NEW METHOD FOR BLOOD SERUM CALCIUM ESTIMATION IN PATIENTS A66-80292
- THERAPY**
 CLINICAL MANIFESTATIONS AND THERAPY OF RESPIRATORY ACIDOSIS A66-80347
- THERMAL AGITATION**
 PROLONGED HOT OR COLD STIMULATION EFFECTS ON EYE MOVEMENTS, VESTIBULOSPINAL, AND SEGMENTAL SPINAL ACTIVITIES IN MONKEYS NASA-CR-68266 N66-12177
- THERMAL INSULATION**
 HANDGEAR INSULATION EFFECTIVENESS OF FREON 12, CARBON DIOXIDE, AND HELIUM A66-80227
- THERMAL PROTECTION**
 EFFECTS OF COLD AND ABNORMAL ATMOSPHERE DISCUSSING TOLERANCE LIMITS TO HYPERCAPNIA, ANOXIA INDUCED HYPOTHERMIA AND HYPOXIA A66-14067
- THERMAL STRESS**
 HEAT STRESS AND MINIMAL DEHYDRATION EFFECT UPON HUMAN TOLERANCE TO POSITIVE ACCELERATION A66-12353
 BEHAVIOR OF SERUM LACTIC DEHYDROGENASE IN MEN EXPOSED TO BRIEF, INTENSE THERMAL IMPULSES A66-80203
- ACCLIMATIZATION AND SWEATING-EFFECT OF DRUGS AND THERMAL STRESS** A66-80248
- THERMOCONDUCTIVITY**
 THERMAL AND ELECTRIC CONDUCTIVITY OF BODY FLUIDS AND TISSUES GLR-37 N66-12592
- THERMODYNAMICS**
 BIOENERGETIC STUDIES OF ENERGY TRANSFERS, THERMODYNAMICS, AND ENTROPY IN LIVING ORGANISMS N66-12631
- THERMOREGULATION**
 THERMOREGULATION RESPONSES OF HUMAN MUSCULATURE TO SUDDEN COOLING AND TO EMOTIONAL STRESS A66-80344
 THERMOREGULATION - HEAT EXCHANGE IN FLYING PERSONNEL RELATED TO ALTITUDE AND AIRCRAFT VELOCITY A66-80359
- THERMOSTABILITY**
 THERMAL HOMOIOSTASIS UNDER HYPOXIA IN MAN, DISCUSSING THERMAL STRESS ADAPTATION AND PHYSIOLOGICAL RESPONSES IN OXYGEN-DEFICIENT ENVIRONMENT A66-14068
- THIOL**
 AMINOTHIOLS AND PYRIMIDINE ANALOGS TESTED FOR PROTECTIVE EFFECTS AGAINST GENETIC MUTATIONS IN ESCHERICHIA COLI EXPOSED TO X-RAY IRRADIATION A66-80385
- THORAX**
 AEROSPACE MEDICINE - COMPRESSION DEFORMITIES OF THORACIC VERTEBRAE IN HUMAN TOLERANCE TEST DURING EXPOSURE TO SIMULATED ESCAPE SYSTEM ROCKET THRUST VECTOR AMRL-TR-65-134 N66-12885
- THYMIDINE**
 TUMORS IN MICE AFTER THYMECTOMY AND X-RAY IRRADIATION, AND CHROMOSOME ANOMALIES FROM TRITIATED THYMIDINE - RADIOBIOLOGY EUR-2462.F N66-12431
- THYMUS**
 PROTON AND GAMMA IRRADIATION EFFECTS ON SPLEEN, THYMUS AND BONE MARROW IN MICE A66-80383
- THYROID**
 CHANGES IN SERUM PROTEIN-IODINE IN MEN EXPOSED TO POLAR CLIMATE A66-80293
- TIME DISCRIMINATION**
 HUMAN ESTIMATION OF TIME INTERVALS AND RELATION TO BIOLOGICAL RHYTHM A66-80286
- TIME FACTOR**
 STABILIZED RETINAL IMAGES AND DISAPPEARANCE TIME AS RELATED TO STIMULUS SIZE A66-80173
 THEORY FOR DETERMINISTIC CHARACTERIZATION OF TIME VARYING DYNAMICS OF HUMAN OPERATOR PERFORMANCE TRACKING TASK. A66-80185
 PATELLAR REFLEX TIME OF OLD AND YOUNG MALE SUBJECTS AS AFFECTED BY EXERCISE A66-80207
 CRITICAL FLICKER FUSION FREQUENCY AS FUNCTION OF EXPOSURE TIME IN TWO DIFFERENT AGE GROUPS A66-80285
 WEIGHT GAIN AND FEED EFFICIENCY IN WEANLING, HEALTHY PIG AS AFFECTED BY EXPOSURE TO NEGATIVE AIR IONIZATION FOR DIFFERENT DURATIONS A66-80406
- TISSUE**
 SENSITIVITY OF DIFFERENT ORGAN MOUSE TISSUE CELLS DURING IN SITU AND IN VITRO STUDIES IN RESPONSE TO VIBRATION A66-80380
 HISTOCHEMICAL USE OF FRESH CUT TISSUE SHEET - CUT SHEET ATTACHMENT IN LOW TEMPERATURE

- CRYOSTAT, AND FREEZING AND CUTTING TECHNIQUE
N66-12371
- THERMAL AND ELECTRIC CONDUCTIVITY OF BODY FLUIDS
AND TISSUES
GLR-37 N66-12592
- COMPARATIVE BIOCHEMICAL METHOD FOR STUDYING
METABOLISM, NUTRITION, AND BODY FLUIDS AND
TISSUES N66-12623
- TOLERANCE /BIOL/**
RESISTANCE TO HYPOXIA AND FATIGUE OF RESPIRATORY
MUSCLE DURING ASCENT TO HIGH ALTITUDE AS AFFECTED
BY ACCLIMATIZATION A66-80305
- TOLERANCE OF RAT TO HYPOXIA DURING RADIATION
SICKNESS CAUSED BY X-RAY IRRADIATION A66-80384
- TOXICITY**
COMBINED RESPIROGRAPHIC TECHNIQUE AND ANALYTICAL
METHOD INDICATING EFFECT OF CHANGES IN RAT OF
SULFUR DIOXIDE CONCENTRATION AND DURATION OF
EXPOSURE ON PULMONARY RETENTION, TIDAL VOLUME, AND
RESPIRATORY RATE A66-80264
- SUCCINATE-PROTECTIVE AGENT AGAINST HIGH PRESSURE
OXYGEN TOXICITY IN RAT A66-80365
- TRACKING SYSTEM**
OPTIMAL CONTROL DISPLAY RELATIONSHIPS IN GENERAL
TRACKING INCLUDING PILOTING AND RADAR TRACKING
OPERATION A66-13349
- TRADESCANTIA**
EFFECT OF SPACE FLIGHT FACTORS ON REPRODUCTIVE
SYSTEM OF DROSOPHILA AND GENETIC APPARATUS OF
TRADESCANTIA A66-80371
- TRANSFER FUNCTION**
THREE INDEPENDENT SYSTEMS OF MATRIX EQUATIONS FOR
SOLVING TRANSFER FUNCTION OF MULTIPARAMETER LINEAR
SYSTEM HANDLING BY HUMAN OPERATOR A66-12699
- TRANSFER OF TRAINING**
TRANSFER OF TRAINING FUNCTION OF STIMULUS RESPONSE
RELATIONSHIPS A66-80166
- TRANSPLANTATION**
RESTORATION OF CONTRACTILITY, RESUMPTION OF
HEMODYNAMICS, AND TRANSPLANTATION PROSPECTS IN
HUMAN AND ANIMAL HEARTS
NASA-TT-F-404 N66-12263
- TROPICS**
SKIN DISORDERS DUE TO MICROBIAL INFECTIONS IN
MILITARY PERSONNEL LIVING IN TROPICS A66-80262
- TUMOR**
TUMORS IN MICE AFTER THYMECTOMY AND X-RAY
IRRADIATION, AND CHROMOSOME ANOMALIES FROM
TRITIATED THYMIDINE - RADIOBIOLOGY
EUR-2462.F N66-12431
- U**
- U.S.S.R.**
HUMAN CELLS AND GENETIC CHANGES IN ESCHERICHIA
DURING EXPOSURE STRESSES OF SPACE FLIGHT ON VOSTOK
SPACECRAFT A66-80372
- U.S.S.R. SPACE PROGRAM**
SOVIET BIOLOGICAL AND PHYSIOLOGICAL INVESTIGATIONS
IN ROCKETS AND SATELLITES, PARTICULARLY
NONPATHOLOGICAL CHARACTER OF PHYSIOLOGICAL
REACTIONS TO STRESS FACTORS A66-14076
- SPACE BIOLOGY AND MEDICINE RESEARCH, STRESSING
FLIGHT EXPERIMENTS PERFORMED WITH RUSSIAN
SATELLITES AND SPACECRAFT A66-14089
- RADIATION HAZARDS, DETECTION DEVICES, AND
MEDICINES TO PREVENT INJURY DURING FLIGHTS OF
VOSTOK AND VOSKHOD SPACESHIPS A66-80204
- ULCER**
GASTRODUODENAL ULCERS IN FRENCH AIR FORCE
PERSONNEL - STATISTICAL ANALYSIS A66-80363
- ULTRAVIOLET RADIATION**
ULTRAVIOLET INJURY IN MOUSE AS AFFECTED BY HOT
ENVIRONMENT A66-80255
- ULTRAVIOLET RADIATION EFFECTS ON VARIOUS FLOWERING
PLANTS UNDER NEAR SPACE CONDITIONS SUCH AS ARCTIC
AND HIGH ALTITUDE A66-80324
- UNCERTAINTY**
DECISION MAKING EFFECTS OF TWO SOURCES OF
UNCERTAINTY DECISION A66-80274
- UNMANNED SPACECRAFT**
COMPARISON OF MANNED AND UNMANNED SPACECRAFT
A66-14092
- URANIUM**
METABOLISM AND EXCRETION OF CESIUM, PHOSPHORUS,
PLUTONIUM, TRITIUM AND RADIATION, STRONTIUM,
SULFUR, TRITIUM AND URANIUM FROM HUMAN BODY
N66-12686
- URANIUM CONTENT IN HUMAN DIET - BONE, TISSUE, AND
OTHER ORGANS OF BODY N66-12689
- UREA**
STUDY OF MODE OF ACTION OF 3-/4-CHLOROPHENYL/-1,
1-DIMETHYLUREA ON PHOTOSYNTHESIS AND OXYGEN
PRODUCTION IN CHLORELLA PYRENOIDOSA AS FUNCTION OF
LIGHT AND TEMPERATURE A66-80290
- URINATION**
URINARY ELIMINATION FOLLOWING INHALATION OF
INSOLUBLE PLUTONIUM OXIDE N66-12682
- PHYSIOLOGICAL RESPONSES OF ENDOCRINE SYSTEM TO
PHYSICAL AND MENTAL STRESS - URINARY EXCRETION
OF ADRENALINE AND NORADRENALINE N66-13507
- URINE**
TWO TYPES OF PLUTONIUM EXPOSURE IN URINE, FECES,
AND BLOOD OF HUMAN BODY, AND EFFECTIVENESS OF
DIETHYLENTRIAMINEPENTAACETIC ACID TREATMENTS
N66-12685
- V**
- VASCULAR SYSTEM**
RHEOGRAPHIC REGIONAL METHOD FOR EVALUATION OF
CEREBRAL AND OCULAR CIRCULATION IN CARDIAC AND
CEREBROVASCULAR DISEASE A66-14002
- RESPONSE OF CAPACITY VESSELS IN HUMAN LIMBS TO
HEAD-UP TILT AND SUBATMOSPHERE PRESSURE ON LOWER
BODY A66-80212
- MEASUREMENT OF REACTION IN MAN OF RESISTANCE AND
CAPACITY VESSELS IN FOREARM AND HAND TO LEG
EXERCISE A66-80221
- VASCULAR AND SWEATING RESPONSES OF MAN TO VARYING
TEMPERATURE EXPOSURES A66-80250
- VERTEBRAL COLUMN**
AEROSPACE MEDICINE - COMPRESSION DEFORMITIES
OF THORACIS VERTEBRAE IN HUMAN TOLERANCE TEST
DURING EXPOSURE TO SIMULATED ESCAPE SYSTEM
ROCKET THRUST VECTOR
AMRL-TR-65-134 N66-12885
- VERTICAL PERCEPTION**
PERCEPTION OF APPARENT VERTICAL WITHOUT VISUAL
CUES DEPENDING ON LONGITUDINAL AXES OF BODY AND
HEAD TO DIRECTION OF RESULTANT ACCELERATION ABOVE
1 G A66-14086
- VESTIBULAR APPARATUS**
COMPARATIVE EFFECTS OF PROLONGED ROTATION AT 10
RPM ON POSTURAL EQUILIBRIUM IN VESTIBULAR NORMAL
AND DEFECTIVE HUMAN SUBJECTS A66-80198
- AIRSICKNESS IN STUDENT AVIATORS DURING FLIGHT
TRAINING AS RELATED TO VESTIBULAR AND VISUAL

- STIMULI AND ANXIETY A66-80206
- CORIOLIS ACCELERATION EFFECT ON HUMAN HEART A66-80317
- MODEL OF VESTIBULAR APPARATUS DEMONSTRATING ITS FUNCTIONS UNDER CONDITIONS OF VARIABLE GRAVITATIONAL FIELD A66-80327
- PHYSIOLOGICAL DATA FOR EVALUATION OF HEALTH AND WORK CAPABILITY OF ASTRONAUT DURING ORBITAL FLIGHTS A66-80369
- PROLONGED OPTOKINETIC STIMULATION EFFECT ON RABBIT A66-80377
- CARDIOVASCULAR AND VESTIBULAR RESPONSE OF HUMAN BODY EXPOSED AT VARIOUS POSITIONS TO ROTATIONAL STRESS A66-80379
- BIOLOGICAL EFFECT OF DIFFERENT DOSES OF IONIZING RADIATION ON VESTIBULAR APPARATUS N66-12458
- MEASUREMENT OF OTOLITH ACTIVITY AS INDICATED BY OCULAR COUNTERROLLING IN RESPONSE TO BODY TILT WITHIN FORCE FIELD OF ZERO G, ONE-HALF G, AND STANDARD G - EXTRALABYRINTHINE FACTORS NASA-CR-68391 N66-13097
- CONTROL OF VESTIBULAR APPARATUS BY CENTRAL NERVOUS SYSTEM - PREVENTION OF MOTION SICKNESS - AEROSPACE MEDICINE AD-623676 N66-14320
- VESTIBULAR EFFECT**
- VESTIBULO-OCULAR DISORGANIZATION IN AERODYNAMIC SPIN, NOTING ROLL PLANE OF SKULL A66-12363
- HYPOXIC HYPOXIA AND HYPERVENTILATION EFFECT ON NYSTAGMUS INDUCED BY ANGULAR ACCELERATION A66-13356
- VESTIBULAR SICKNESS SUSCEPTIBILITY UNDER CONDITIONS OF WEIGHTLESSNESS A66-14082
- CHANGES IN FUNCTION AND RECIPROCAL ACTION OF VESTIBULAR APPARATUS COMPONENTS, OTOLITHS AND CUPULA, OF MAN DURING GRAVITATIONAL CHANGES INCLUDING WEIGHTLESSNESS A66-80302
- NEW THEORY OF FUNCTIONAL MECHANISM OF LABYRINTHINE EPITHELIUM A66-80403
- PROLONGED HOT OR COLD STIMULATION EFFECTS ON EYE MOVEMENTS, VESTIBULOSPINAL, AND SEGMENTAL SPINAL ACTIVITIES IN MONKEYS NASA-CR-68266 N66-12177
- BIOELECTRIC RECORDINGS OF MALE SUBJECTS SUBJECTED TO WEIGHTLESSNESS - INDICES OF PHYSIOLOGICAL FUNCTIONS - ELECTROENCEPHALOGRAPH / EEG/, AND VESTIBULAR COORDINATION REACTIONS JPRS 33115 N66-12273
- EFFECT OF VESTIBULAR IRRITATION ON ELECTRICAL ACTIVITY OF CORTEX AND BASAL AREAS OF BRAIN FTD-TT-65-410/162&4 N66-12762
- EQUATIONS OF MOTION IN CIRCULAR MOTION TERMS FOR LIMACON CURVE - GEOMETRY - VESTIBULAR EFFECT ON HUMANS MOVING ALONG LIMACON NADC-ML-6507 N66-14197
- VESTIBULAR TEST**
- ELECTRONYSTAGMUS MEASUREMENT OF VERTICAL EYEBALL DISPLACEMENT TO INVESTIGATE CHINCHILLA VESTIBULAR SYSTEM RESPONSE TO VERTICAL LINEAR ACCELERATION GE/EE/65-6 N66-13814
- VIBRATION**
- DOMINANT LETHALS IN DROSOPHILA MALES EXPOSED TO VIBRATION, ACCELERATION, AND GAMMA IRRADIATION DURING SPACE FLIGHTS N66-13790
- VIBRATION EFFECT**
- VIBRATION EXPOSURE WITH VARYING PEAK AND RMS
- ACCELERATION AND FREQUENCY IN LOW ALTITUDE HIGH-SPEED FLIGHT A66-13355
- DIAL READING ABILITY OF SPACECRAFT CREW DURING PROLONGED ACCELERATION AND VIBRATION AMRL-TR-65-110 N66-12376
- EFFECT OF VIBRATION ON CELL DIVISION IN BONE MARROW OF MOUSE N66-13791
- VIBRATIONAL STRESS**
- ENDOCRINE AND METABOLIC RESPONSE OF DOGS TO WHOLE BODY VIBRATION A66-80194
- COMBINED ACCELERATION, VIBRATION, AND RADIATION EFFECTS ON MITOTIC ACTIVITY OF BONE MARROW CELLS IN MICE A66-80319
- SENSITIVITY OF DIFFERENT ORGAN MOUSE TISSUE CELLS DURING IN SITU AND IN VITRO STUDIES IN RESPONSE TO VIBRATION A66-80380
- SURVIVAL DURING SCREENING OF VARIOUS AREAS OF RAT BODY TO GAMMA RAYS AND HIGH ENERGY PROTONS AS AFFECTED BY VIBRATION OR ACCELERATION STRESS A66-80382
- VIGILANCE**
- ORGANISMIC VARIABLES FROM PERSONALITY AND INTELLIGENCE TESTS AS PREDICTORS OF VIGILANCE BEHAVIOR A66-80178
- DETERIORATION OF SIGNAL DETECTABILITY DURING VIGILANCE TASK AS FUNCTION OF BACKGROUND EVENT RATE A66-80280
- VIRUS**
- CHEMOTHERAPY OF VIRUS INFECTIONS, BIOLOGICAL PEST CONTROL, VIRUS NUCLEIC ACIDS, AND VIRAL GROWTH N66-12634
- VISION**
- PHOTOCHEMISTRY OF VISION INCLUDING SPECTROPHOTOMETRIC ANALYSIS OF RHODOPSIN OPTICAL DENSITY, ABSORBANCE AND QUANTUM EFFICIENCY A66-13789
- VISUAL ACUITY**
- VISUAL ACUITY DEFINITION AND CLINICAL MEASUREMENT OF RELEVANT FACTORS A66-13793
- VISUAL DISPLAY**
- APPARENT MOVEMENT PHENOMENA ON CATHODE RAY TUBE DISPLAYS - THRESHOLD DETERMINATIONS OF APPARENT MOVEMENTS OF PULSED LIGHT SOURCES NASA-CR-342 N66-12162
- DETECTION OF COMPOUND MOTION IN TWO-TARGET COLLISION PREDICTION SITUATION SP-1946/001/00 N66-14021
- VISUAL FIELD**
- AFTERIMAGES PRODUCED BY BLACK AND LIGHT TARGETS VIEWED PERIPHERALLY BY DARK ADAPTED SUBJECTS A66-80175
- VISUAL PERCEPTION**
- MONOGRAPHS ON VISION AND VISUAL PERCEPTION A66-13787
- ELECTROPHYSIOLOGY OF VISION DESCRIBING NEURAL AND PHOTOCHEMICAL PROCESSES AND MOTOR RESPONSE A66-13788
- HUMAN EYE ADAPTATION TO DARK AND LIGHT, NOTING THRESHOLD DEPENDENCE ON PREVIOUS HISTORY OF ILLUMINATION A66-13790
- BRIGHTNESS DISCRIMINATION AND BRIGHTNESS CONTRAST OF HUMAN AND ANIMAL EYES IN SUPRATHRESHOLD LUMINANCE DIFFERENCE A66-13791
- CHARACTERISTICS OF AFTERIMAGES PRODUCED BY PERSISTING VISUAL EFFECT AFTER TERMINATION OF ILLUMINATION A66-13794
- SPECIFICATION OF STIMULUS CONDITIONS FOR VISUAL SPACE PERCEPTION IN TERMS OF MONOCULAR AND BINOCULAR CUES A66-13795

- VISUAL PERCEPTION OF FORMS AND RELEVANT FACTORS
A66-13796
- VISUAL PERCEPTION OF REAL AND APPARENT MOVEMENT,
NOTING CUES AND THRESHOLD A66-13797
- IDENTIFICATION OF SEQUENTIAL AUDITORY AND VISUAL
STIMULI A66-80279
- DETERIORATION OF SIGNAL DETECTABILITY DURING
VIGILANCE TASK AS FUNCTION OF BACKGROUND EVENT
RATE A66-80280
- DETECTION THRESHOLDS AS FUNCTION OF INTERVAL
SEPARATION BETWEEN TWO SUCCESSIVE TARGETS
A66-80354
- VISUAL PROBLEMS ASSOCIATED WITH LOW ALTITUDE
FLIGHT A66-80357
- OCULOGRAVIC ILLUSION - PERCEPTION OF VISUAL
HORIZONTAL IN NORMAL AND INNER EAR DEFECTIVE
SUBJECTS DURING PROLONGED ROTATION
NASA-CR-68659 N66-13560
- VISUAL STIMULUS
REVIEW OF DATA ON VISUAL FLICKER FUSION AND
INTERMITTENT STIMULATION A66-13792
- STABILIZED RETINAL IMAGES AND DISAPPEARANCE TIME
AS RELATED TO STIMULUS SIZE A66-80173
- VISUAL SYSTEM
AIRSICKNESS IN STUDENT AVIATORS DURING FLIGHT
TRAINING AS RELATED TO VESTIBULAR AND VISUAL
STIMULI AND ANXIETY A66-80206
- PROLONGED OPTOKINETIC STIMULATION EFFECT ON RABBIT
A66-80377
- VISUAL TASK
DETECTION OF VISUAL SIGNAL WITH LOW BACKGROUND
NOISE A66-80267
- EXPERIMENTAL STUDY OF ORGANIZATION OF INFORMATION
IN VISUAL TASK IN MAN A66-80394
- VISUAL TRACKING
VISUAL RESPONSE COMPONENT OF ROTARY PURSUIT
TRACKING A66-80179
- VOICE COMMUNICATION
AFFECTIVE COMMUNICATION IN SPEECH AND RELATED
QUANTITATIVE PROBLEMS - HUMAN PERCEPTION AND
RESPONSE TO VOICE COMMUNICATION /SPEECH SIGNAL/
ACOUSTICAL PROPERTIES
AD-620333 N66-12783
- VOICE DATA PROCESSING SYSTEM
AUTOMATIC COMMAND CONTROL SYSTEM USING PHONETIC
VOICE PATTERN RECOGNITION A66-13496
- VOLUNTARY APNEA
HEART RATE AND FOREARM BLOOD FLOW OF MAN WITH AND
WITHOUT BREATH HOLDING DURING FACE IMMERSION IN
WATER A66-80210
- VOSKHOD II SPACECRAFT
SOVIET PAPERS DEALING WITH BIOASTRONAUTICS, LIFE
SUPPORT SYSTEMS, AND VOSKHOD II FLIGHT
N66-12650
- VOSKHOD MANNED SPACECRAFT
RADIATION HAZARDS, DETECTION DEVICES, AND
MEDICINES TO PREVENT INJURY DURING FLIGHTS OF
VOSTOK AND VOSKHOD SPACESHIPS A66-80204
- CONFERENCES ON AEROSPACE MEDICINE - ASTRONAUT
PERFORMANCE, ELECTROPHYSIOLOGICAL STUDIES ON
VOSKHOD MANNED SPACECRAFT, AND MATHEMATICAL
METHODS
JPRS-32808 N66-12657
- ELECTROPHYSIOLOGICAL STUDIES ON VOSKHOD MANNED
SPACECRAFT N66-12659
- VOSTOK II SPACECRAFT
APPLICATION OF INFORMATION THEORY CONCEPTS TO
ANALYSIS OF PHYSIOLOGICAL DATA DURING SPACE
FLIGHTS A66-80361
- VOSTOK SPACECRAFT
INVESTIGATIONS OF PHYSIOLOGICAL RESPONSES OF
ANIMALS AND MAN TO STRESSES IN VOSTOK SPACECRAFT
A66-80160
- RADIATION HAZARDS, DETECTION DEVICES, AND
MEDICINES TO PREVENT INJURY DURING FLIGHTS OF
VOSTOK AND VOSKHOD SPACESHIPS A66-80204
- PHYSIOLOGICAL DATA FOR EVALUATION OF HEALTH AND
WORK CAPABILITY OF ASTRONAUT DURING ORBITAL
FLIGHTS A66-80369
- EFFECT OF SPACE FLIGHT FACTORS ON HEART ACTIVITY,
RESPIRATION AND ELECTROENCEPHALOGRAPH OF
ASTRONAUTS B. F. BYKOVSKII AND V. V. TERESHKOVA
A66-80370
- HUMAN CELLS AND GENETIC CHANGES IN ESCHERICHIA
DURING EXPOSURE STRESSES OF SPACE FLIGHT ON VOSTOK
SPACECRAFT A66-80372
- REACTION TO WEIGHTLESSNESS OF ASTRONAUTS
PARTICIPATING IN VOSTOK FLIGHTS II TO VI
INCLUSIVELY A66-80373
- IMMUNITY TO INDIGENOUS MICROORGANISM IN ASTRONAUTS
DURING TRAINING AND BEFORE AND AFTER VOSTOK SERIES
SPACE FLIGHT A66-80374
- PHYSIOLOGICAL MEASUREMENTS DURING INTERPLANETARY
FLIGHT FOR MEDICAL MONITORING, EXAMINATIONS AND
DIAGNOSES, AND SCIENTIFIC RESEARCH - ANALYSIS OF
VOSTOK SPACECRAFT BIOINSTRUMENTATION
N66-13789
- W**
- WAKEFULNESS
RAPID EYE MOVEMENT STATE /DREAMING/ DIFFERENTIATED
BIOLOGICALLY FROM SLEEP AND WAKEFULNESS
A66-80167
- FREQUENCY ANALYSIS OF DIURNAL PERIODICITY IN HUMAN
ELECTROENCEPHALOGRAPH A66-80395
- WASTE UTILIZATION
METHOD FOR PROCESSING HUMAN WASTE TO RECLAIM
WATER USING CHLORELLA - BACTERIA SYSTEM
A66-80391
- CHINESE CABBAGE SPROUTS GROWN AEROPONICALLY IN
CLOSED ECOLOGICAL SYSTEM AS AFFECTED BY
MINERALIZED PRODUCTS OF HUMAN WASTE
A66-80397
- WATER
ANALYTICAL DATA ON FISSION YIELD AND FISSION
PRODUCT DECAY, AIR SAMPLING TECHNIQUES,
RADIOCHEMICAL DETERMINATION OF RADIOISOTOPES IN
WATER, FECES, AND URINE
NYD-4700, SUPPL. 2 N66-13854
- WATER BALANCE
PHOSPHOLIPOPROTEIN EXTRACTED FROM HUMAN EPIDERMAL
TISSUES EXHIBITING WATER VAPOR BARRIER PROPERTIES
COMPARABLE TO INTACT EPIDERMIS A66-80259
- WATER INTAKE
WATER CONSUMPTION BY MAN IN WARM ENVIRONMENT
ANALYZED STATISTICALLY AND RELATED TO METABOLIC
VARIABLES A66-80216
- WATER LANDING
HUMAN TOLERANCE LIMITS IN WATER IMPACT,
IDENTIFYING ENVIRONMENTAL AND TRAUMA
CHARACTERISTICS A66-12356
- WATER RECOVERY
METHOD FOR PROCESSING HUMAN WASTE TO RECLAIM
WATER USING CHLORELLA - BACTERIA SYSTEM
A66-80391
- WAVE RECORDER
WAVEMETER AND INTEGRATOR FOR EVALUATION OF WAVE
PATTERNS AND AMPLITUDE OF BRAIN POTENTIALS -
ELECTROPHYSIOLOGY

JPRS-33055 N66-12444

WEIGHTLESSNESS
 NUCLEAR FAST RED TECHNIQUE OF CALCIUM IN SERUM,
 PAROTID FLUID AND URINE IN WEIGHTLESS STATE
 A66-13347

BIOLOGICAL CHARACTERISTICS AND PHYSICAL CONDITIONS
 OF SPACE FLIGHTS, SUCH AS LOW PRESSURE, IONIZING
 RADIATION, NOISE, ACCELERATION, WEIGHTLESSNESS,
 ARTIFICIAL ATMOSPHERE, FEEDING PROBLEMS, ETC
 A66-14066

PHYSIOLOGICAL PROBLEMS OF WEIGHTLESSNESS
 DISCUSSING MOTION SICKNESS, FLUID VOLUME CONTROL
 AND CHRONIC EFFECTS ON CIRCULATORY SYSTEM
 A66-14071

PHYSICAL ATROPHY PREVENTION IN PROTRACTED
 WEIGHTLESSNESS, DISCUSSING PHYSICAL FITNESS
 MAINTENANCE DURING SPACE FLIGHT
 A66-14072

VESTIBULAR SICKNESS SUSCEPTIBILITY UNDER
 CONDITIONS OF WEIGHTLESSNESS
 A66-14082

HEART AND BREATHING RATE AND ELECTROENCEPHALO-
 GRAPHIC RESPONSES OF RATS DURING
 WEIGHTLESSNESS
 A66-14083

AVOIDING MUSCULAR ATROPHY AND HEMOGLOBIN LOSS IN
 PROTRACTED WEIGHTLESSNESS THROUGH PHYSICAL
 EXERCISE
 A66-80158

EFFECT OF WEIGHTLESSNESS ON PHYSIOLOGICAL STATE OF
 HUMAN ORGANISM DURING PARABOLIC FLIGHTS.
 A66-80172

CHANGES IN FUNCTION AND RECIPROCAL ACTION OF
 VESTIBULAR APPARATUS COMPONENTS, OTOLITHS AND
 CUPULA, OF MAN DURING GRAVITATIONAL CHANGES
 INCLUDING WEIGHTLESSNESS
 A66-80302

REACTION TO WEIGHTLESSNESS OF ASTRONAUTS
 PARTICIPATING IN VOSTOK FLIGHTS II TO VI
 INCLUSIVELY
 A66-80373

BIOELECTRIC RECORDINGS OF MALE SUBJECTS SUBJECTED
 TO WEIGHTLESSNESS - INDICES OF PHYSIOLOGICAL
 FUNCTIONS - ELECTROENCEPHALOGRAPH / EEG/, AND
 VESTIBULAR COORDINATION REACTIONS
 JPRS-33115 N66-12273

SUMMARY OF PROGRAM FOR MONITORING BRAIN FUNCTION
 AND PERFORMANCE IN PRIMATE UNDER PROLONGED
 WEIGHTLESSNESS
 NASA-CR-68413 N66-13089

MEASUREMENT OF OTOLITH ACTIVITY AS INDICATED BY
 OCULAR COUNTERROLLING IN RESPONSE TO BODY
 TILT WITHIN FORCE FIELD OF ZERO G, ONE-HALF G,
 AND STANDARD G - EXTRALABYRINTHINE FACTORS
 NASA-CR-68391 N66-13097

DESIGN CRITERIA FOR CREW STATIONS AS RELATED TO
 CREW MEMBER EGRESS FROM SINGLE PLACE PILOT
 STATION IN WEIGHTLESS ENVIRONMENT - HUMAN
 ENGINEERING AND FLIGHT DYNAMICS
 AFFDL-TR-65-148 N66-13978

REVIEW OF LIFE SUPPORT PROBLEMS IN SPACE - FOOD,
 WATER, OXYGEN, WEIGHTLESSNESS, AND ACCELERATION
 FTD-TT-65-601/1&4 N66-14028

WATER IMMERSION TECHNIQUE FOR SIMULATING ZERO
 GRAVITY MOBILITY PERFORMANCE OF ASTRONAUT IN
 PRESSURIZED SPACESUIT
 NASA-TN-D-3054 N66-14151

WEIGHTLESSNESS SIMULATION
 OBSERVATIONS ON HEART RATES AND CARDIODYNAMICS
 DURING PROLONGED WEIGHTLESSNESS, DISCUSSING
 IMMERSION EXPERIMENT ON ANIMALS
 A66-14073

ELECTROCARDIOGRAM AND BLOOD PRESSURE OF RABBIT
 DURING PROLONGED WEIGHTLESSNESS SIMULATED BY
 IMMERSION METHOD
 A66-80192

WETTING
 EFFECTS OF WETTING ON CUTANEOUS VULNERABILITY
 A66-80260

X

X-RAY
 EFFECTS OF IONIZING X- AND GAMMA RADIATION ON
 DEOXYRIBONUCLEIC ACID
 EUR-2471.F N66-14092

X-RAY IRRADIATION
 PARTIAL CANINE BODY EXPOSURE TO IONIZATION
 RADIATION NOTING ANOREXIA, WEIGHT LOSS, VOMITING
 AND HYPERSIALOSIS DUE TO 1000 KVP X-RAY EXPOSURE
 A66-13352

RADIATION PROTECTION OF ANIMALS BY VARIOUS DRUGS
 DURING EXPOSURE TO GAMMA, PROTON, AND X-RAY
 IRRADIATION AS RELATED TO RELATIVE BIOLOGICAL
 EFFECT
 A66-80311

COMBINED ACCELERATION, VIBRATION, AND RADIATION
 EFFECTS ON MITOTIC ACTIVITY OF BONE MARROW CELLS
 IN MICE
 A66-80319

RADIOPROTECTIVE EFFECT OF VARIOUS DRUGS AGAINST
 X - RAYS AND GAMMA RAYS DURING PROTON IRRADIATION
 MICE
 A66-80381

TOLERANCE OF RAT TO HYPOXIA DURING RADIATION
 SICKNESS CAUSED BY X-RAY IRRADIATION
 A66-80384

AMINOTHIOLS AND PYRIMIDINE ANALOGS TESTED FOR
 PROTECTIVE EFFECTS AGAINST GENETIC MUTATIONS IN
 ESCHERICHIA COLI EXPOSED TO X-RAY IRRADIATION
 A66-80385

TUMORS IN MICE AFTER THYMECTOMY AND X-RAY
 IRRADIATION, AND CHROMOSOME ANOMALIES FROM
 TRITIATED THYMIDINE - RADIOBIOLOGY
 EUR-2462.F N66-12431

BIOLOGICAL EFFECTS OF HIGH ENERGY PROTON AND
 X-RAY IRRADIATION ON HEREDITY STRUCTURES OF
 RATS
 N66-12457

RELATIVE BIOLOGICAL EFFECT OF PROTONS IN
 FRACTIONAL IRRADIATION COMPARED WITH MULTIPLE
 X-RAY IRRADIATION OF DOGS AND RATS
 N66-12459

COMPARISON OF BIOLOGICAL EFFECTS OF PROTON,
 X-RAY, AND GAMMA IRRADIATIONS ON DOGS AND WHITE
 RATS
 N66-12460

PATHOLOGICAL EFFECTS OF X-RAY IRRADIATION ON
 GASTROINTESTINAL SYSTEM IN DOGS - RADIATION
 SICKNESS
 FTD-TT-64-910/1&2&3&4 N66-12607

Y

YEAST
 REVERSIBLE PROCESS OF CHROMOSOME DAMAGE DURING
 MITOSIS BY IONIZING RADIATION IN YEAST
 A66-80321

IMPORTANCE OF RECONSTRUCTION OF CELLS DAMAGED BY
 IONIZING RADIATION ON TOTAL VIABILITY OF ORGANISM
 A66-80322

Z

ZERO GRAVITY
 MEASUREMENT OF OTOLITH ACTIVITY AS INDICATED BY
 OCULAR COUNTERROLLING IN RESPONSE TO BODY
 TILT WITHIN FORCE FIELD OF ZERO G, ONE-HALF G,
 AND STANDARD G - EXTRALABYRINTHINE FACTORS
 NASA-CR-68391 N66-13097

RESEARCH TECHNIQUE USED IN MEASUREMENT OF HUMAN
 PERFORMANCE UNDER LOW OR ZERO GRAVITY CONDITIONS
 AD-620931 N66-14029

WATER IMMERSION TECHNIQUE FOR SIMULATING ZERO
 GRAVITY MOBILITY PERFORMANCE OF ASTRONAUT IN
 PRESSURIZED SPACESUIT

NASA-TN-D-3054

N66-14151

Corporate Source Index

AEROSPACE MEDICINE AND BIOLOGY / a continuing bibliography

MARCH 1966

Listing of Reports by Source

A Notation of Content, rather than the title of the document, appears under each corporate source. The accession number is located beneath and to the right of the Notation of Content, e.g., N66-12345. Under any one corporate source, the accession numbers are arranged in sequence.

A

- AEROSPACE MEDICAL DIV. AEROSPACE MEDICAL RESEARCH LABS. /6570TH/, WRIGHT-PATTERSON AFB, OHIO.**
- DIAL READING ABILITY OF SPACECRAFT CREW DURING PROLONGED ACCELERATION AND VIBRATION
AMRL-TR-65-110 N66-12376
- AEROSPACE MEDICINE - COMPRESSION DEFORMITIES OF THORACIC VERTEBRAE IN HUMAN TOLERANCE TEST DURING EXPOSURE TO SIMULATED ESCAPE SYSTEM ROCKET THRUST VECTOR
AMRL-TR-65-134 N66-12885
- MANUAL CONTROL OF PULSE FREQUENCY MODULATED REACTION CONTROL
AMRL-TR-65-145 N66-13596
- RESEARCH TECHNIQUE USED IN MEASUREMENT OF HUMAN PERFORMANCE UNDER LOW OR ZERO GRAVITY CONDITIONS
AD-620931 N66-14029
- AIR FORCE INST. OF TECH., WRIGHT-PATTERSON AFB, OHIO.**
- ELECTRONYSTAGMUS MEASUREMENT OF VERTICAL EYEBALL DISPLACEMENT TO INVESTIGATE CHINCHILLA VESTIBULAR SYSTEM RESPONSE TO VERTICAL LINEAR ACCELERATION
GE/EE/65-6 N66-13814
- AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AFB, OHIO.**
- EFFECT OF ELEVATED INTRAPULMONARY PRESSURE ON RESPIRATION AND CIRCULATION
FTD-TT-65-154/162 N66-12387
- PATHOLOGICAL EFFECTS OF X-RAY IRRADIATION ON GASTROINTESTINAL SYSTEM IN DOGS - RADIATION SICKNESS**
FTD-TT-64-910/162&3&4 N66-12607
- EFFECT OF VESTIBULAR IRRITATION ON ELECTRICAL ACTIVITY OF CORTEX AND BASAL AREAS OF BRAIN
FTD-TT-65-410/162&4 N66-12762
- COMPILATION OF PAPERS PRESENTED AT PHYSIOLOGY CONFERENCE
FTD-TT-65-47/162 N66-13224
- PHYSIOLOGICAL MEASUREMENTS DURING INTERPLANETARY FLIGHT FOR MEDICAL MONITORING, EXAMINATIONS AND DIAGNOSES, AND SCIENTIFIC RESEARCH - ANALYSIS OF**
- VOSTOK SPACECRAFT BIOINSTRUMENTATION N66-13789
- DOMINANT LETHALS IN DROSOPHILA MALES EXPOSED TO VIBRATION, ACCELERATION, AND GAMMA IRRADIATION DURING SPACE FLIGHTS** N66-13790
- EFFECT OF VIBRATION ON CELL DIVISION IN BONE MARROW OF MOUSE N66-13791
- DESIGN CRITERIA FOR CREW STATIONS AS RELATED TO CREW MEMBER EGRESS FROM SINGLE PLACE PILOT STATION IN WEIGHTLESS ENVIRONMENT - HUMAN ENGINEERING AND FLIGHT DYNAMICS
AFFDL-TR-65-148 N66-13978
- REVIEW OF LIFE SUPPORT PROBLEMS IN SPACE - FOOD, WATER, OXYGEN, WEIGHTLESSNESS, AND ACCELERATION
FTD-TT-65-601/1&4 N66-14028
- AIRESEARCH MFG. CO., LOS ANGELES, CALIF.**
- POTENTIAL APPLICATIONS OF RADIOISOTOPES TO OPERATION OF MANNED SPACECRAFT LIFE SUPPORT SYSTEMS
SAN-575-12 N66-12582
- AMERICAN FOUNDATION FOR BIOLOGICAL RESEARCH, MADISON, WIS.**
- CALORIMETRIC DETERMINATION OF ICE FORMED IN FEET OF MICE FROZEN AT VARIOUS TEMPERATURE
AAL-TDR-63-29 N66-14037
- AMERICAN INST. FOR RESEARCH, PITTSBURGH, PA.**
- HUMAN FACTORS INFORMATION REQUIREMENTS FOR SPACE SYSTEM DEVELOPMENT
NASA-CR-68230 N66-12959
- HUMAN FACTORS INFORMATION REQUIREMENTS FOR SPACE SYSTEMS ENGINEERING - SURVEY AND BIBLIOGRAPHY
NASA-CR-68616 N66-13331
- APPLIED PSYCHOLOGICAL SERVICES, WAYNE, PA.**
- RELATIONSHIP BETWEEN ANTISUBMARINE HELICOPTER TEAM PERFORMANCE AND COMMUNICATIONS FLOW WITHIN TEAM DURING SIMULATED ATTACK
NAVTRADEVGEN-1537-1 N66-13972
- ARGONNE NATIONAL LAB., ILL.**
- PHYSIOLOGICAL RESPONSES TO AND BIOLOGICAL EFFECTS OF SPACE FLIGHT STRESS - ASTRONAUT PERFORMANCE
ANL-TRANS-209 N66-13520
- ARMY CHEMICAL CENTER, EDGEWOOD, MD.**
- PRECEDING POSTURE AND AMBIENT TEMPERATURE EFFECTS ON HEART AND BLOOD CIRCULATION ACCELERATION AT INITIATION OF EXERCISE
CRDLR-3268 N66-12827
- ASSOCIATION CLAUDE BERNARD, PARIS /FRANCE/.**
- IMMUNOLOGICALLY COMPETENT CELL RESPONSE TO ANTIGEN AND COMPARATIVE STUDY OF LYMPHOID CELLS
EUR-2469.F N66-14089
- ATOMIC ENERGY COMMISSION, NEW YORK.**
- ANALYTICAL DATA ON FISSION YIELD AND FISSION PRODUCT DECAY, AIR SAMPLING TECHNIQUES, RADIOCHEMICAL DETERMINATION OF RADIOISOTOPES IN WATER, FECES, AND URINE
NYO-4700, SUPPL. 2 N66-13854
- ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.**
- URANIUM CONTENT IN HUMAN DIET - BONE, TISSUE, AND OTHER ORGANS OF BODY N66-12689

ATOMIC WEAPONS RESEARCH ESTABLISHMENT,
ALDERMASTON /ENGLAND/.
HAZARDS TO HUMAN EAR FROM SHOCK WAVES OF HIGH
ENERGY ELECTRIC DISCHARGES
AWRE-E-1/65 N66-13711

COMPARISON OF MEASURED LUNG BURDEN IN ANIMAL
SPECIES WITH AMOUNTS OF PLUTONIUM COLLECTED BY
CASCADE IMPACTOR SAMPLERS
AWRE-O-29/65 N66-14097

AVIATION SAFETY ENGINEERING AND RESEARCH,
PHOENIX, ARIZ.-
CRITERIA FOR BODY BLOCKS, ANTHROPOMORPHIC DUMMIES,
AND INSTRUMENTATION FOR USE IN STATIC AND
DYNAMIC TESTING OF CIVIL AIRCRAFT SEAT SYSTEMS
FAA-ADS-20 N66-13926

B

BATTELLE MEMORIAL INST., COLUMBUS, OHIO.
FLUORESCENT EMISSION FROM CAT CEREBRAL CORTEX
AMRL-TR-65-88 N66-12385

BELL HELICOPTER CO., FORT WORTH, TEX.
ERROR AND CONTROL EFFICIENCY ANALYSIS OF PILOTS
EXPOSED TO SIMULATED PITCH, ROLL, YAW, AND
ALTITUDE VARIATIONS
NASA-CR-68219 N66-12195

BOLT, BERANEK, AND NEWMAN, INC., CAMBRIDGE,
MASS.
COMPARISON OF CROSS CORRELATION AND
ORTHOGONALIZED EXPONENTIAL ANALYSES BY
REGRESSION ANALYSIS FOR IDENTIFICATION OF HUMAN
PILOT DYNAMIC RESPONSE CHARACTERISTICS
NASA-CR-68701 N66-13516

BRUSSELS UNIV. /BELGIUM/.
TUMORS IN MICE AFTER THYMECTOMY AND X-RAY
IRRADIATION, AND CHROMOSOME ANOMALIES FROM
TRITIATED THYMIDINE - RADIOBIOLOGY
EUR-2462.F N66-12431

C

CALIFORNIA UNIV., BERKELEY. LAWRENCE
RADIATION LAB.
INDUCED FREE RADICALS IN ENZYMES BY ELECTRONS AND
HEAVY IONS
UCRL-16358 N66-13907

CALIFORNIA UNIV., LIVERMORE. LAWRENCE
RADIATION LAB.
RADIATION HAZARDS CONTROL - AIR MONITORS, FILM
SENSITIVITY, STIMULATED EMISSION DOSIMETRY,
GLASS CLEANING TECHNIQUES, HIGH DENSITY GRASS
SAMPLES, AND FIRE HOSE FRICTION LOSSES
UCRL-14351 N66-12576

CALIFORNIA UNIV., LOS ANGELES.
FORTRAN COMPUTER PROGRAM FOR EVALUATION OF POST
IRRADIATION SURVIVAL TIMES - ANIMAL STUDY
UCLA 12-573 N66-12917

SUMMARY OF PROGRAM FOR MONITORING BRAIN FUNCTION
AND PERFORMANCE IN PRIMATE UNDER PROLONGED
WEIGHTLESSNESS
NASA-CR-68413 N66-13089

CHICAGO UNIV., ILL.
HIGH RESOLUTION ELECTRON MICROSCOPY OF FRACTION
I PROTEIN FROM PLANT LEAVES
NASA-CR-68099 N66-12198

SPACE RELATED MOLECULAR BIOLOGY AND MOLECULAR
ORGANIZATION OF EXTRATERRESTRIAL MATTER - DESIGN
AND CONSTRUCTION OF HIGH VACUUM CONTAINER FOR
TRANSFER OF EXTRATERRESTRIAL COLLECTING SURFACES
NASA-CR-68844 N66-13830

CREIGHTON UNIV., OMAHA, NEBR.
CALCIUM-45 AND STRONTIUM-85 METABOLISM IN HUMANS
COO-587-2 N66-13061

D

DARTMOUTH COLL., HANOVER, N. H.
AFFECTIVE COMMUNICATION IN SPEECH AND RELATED

QUANTITATIVE PROBLEMS - HUMAN PERCEPTION AND
RESPONSE TO VOICE COMMUNICATION /SPEECH SIGNAL/
ACOUSTICAL PROPERTIES
AD-620333 N66-12783

DEUTSCHE VERSUCHSANSTALT FUR LUFT- UND
RAUMFAHRT, BAD GOEDESBERG /WEST GERMANY/.
STRESS IMPOSED ON AIRCREW IN CIVIL JET AIRCRAFT
DURING LONG FLIGHT
DLR-FB-65-44 N66-14261

DOM CHEMICAL CO., DENVER, COLO.
TWO TYPES OF PLUTONIUM EXPOSURE IN URINE, FECES,
AND BLOOD OF HUMAN BODY, AND EFFECTIVENESS OF
DIETHYLENETRIAMINEPENTAACETIC ACID TREATMENTS
N66-12685

DUNLAP AND ASSOCIATES, INC., DARIEN, CONN.
APPARENT MOVEMENT PHENOMENA ON CATHODE RAY TUBE
DISPLAYS - THRESHOLD DETERMINATIONS OF APPARENT
MOVEMENTS OF PULSED LIGHT SOURCES
NASA-CR-342 N66-12162

F

FEDERAL AVIATION AGENCY, OKLAHOMA CITY, OKLA.
FLIGHT FATIGUE AND STRESS OF PILOTS
AM-65-13 N66-13897

G

GENERAL FOODS CORP., WHITE PLAINS, N. Y.
SUITABILITY OF TEXTUROMETER FOR MEAT TEXTURE
DESCRIPTION - HARDNESS, COHESIVENESS,
ELASTICITY, CHEWINESS, AND WATER RELEASE OF
FRESH AND FREEZE DEHYDRATED MEATS
FD-17 N66-14020

GEOSCIENCE, LTD., LA JOLLA, CALIF.
THERMAL AND ELECTRIC CONDUCTIVITY OF BODY FLUIDS
AND TISSUES
GLR-37 N66-12592

I

INSTITUT PASTEUR, PARIS /FRANCE/.
EFFECTS OF IONIZING X- AND GAMMA RADIATION ON
DEOXYRIBONUCLEIC ACID
EUR-2471.F N66-14092

IOWA STATE UNIV. OF SCIENCE AND TECHNOLOGY,
AMES.
INHALATION STUDY OF NEODYMIUM OXIDE PATHOGENESIS
IN MICE AND GUINEA PIGS - ANIMAL STUDY
COO-1170-4 N66-12951

J

JEFFERSON MEDICAL COLL., PHILADELPHIA, PA.
METABOLIC RESEARCH - ATOMIC ABSORPTION
SPECTROMETRY USED FOR MEASURING NICKEL IN
BIOLOGICAL MATERIALS, SERUM CA, MG, ACIDITY,
AND CONDUCTIVITY - FREEZING POINT METHOD
NYO-1397-1 N66-12898

JOINT PUBLICATIONS RESEARCH SERVICE,
WASHINGTON, D. C.
BIOLOGICAL MECHANISMS FOR MEMORY - NEURON
EXCITATION, NUCLEIC ACID METABOLISM, AND PROTEIN
SYNTHESIS MECHANISM - DEOXYRIBONUCLEIC ACID
JPRS-32809 N66-12269

CHANGES IN MYOCARDIAL OXYGEN PRESSURE OF DOGS
DURING ASCENT AND ACCELERATION DETERMINED BY
POLAROGRAPHIC ELECTRODES IMPLANTED IN HEART
MUSCLES
JPRS-33066 N66-12271

BIOELECTRIC RECORDINGS OF MALE SUBJECTS SUBJECTED
TO WEIGHTLESSNESS - INDICES OF PHYSIOLOGICAL
FUNCTIONS - ELECTROENCEPHALOGRAM / EEG/, AND
VESTIBULAR COORDINATION REACTIONS
JPRS-33115 N66-12273

BIOLOGICAL EFFECTS OF MICROWAVE RADIATION
JPRS-33054 N66-12294

EFFECT OF REPLACING ATMOSPHERIC NITROGEN BY
HELIUM ON DEVELOPMENT OF CHICK EMBRYOS

- JPRS-32905 N66-12299
HISTOCHEMICAL USE OF FRESH CUT TISSUE SHEET - CUT SHEET ATTACHMENT IN LOW TEMPERATURE CRYOSTAT, AND FREEZING AND CUTTING TECHNIQUE N66-12371
- WAVEMETER AND INTEGRATOR FOR EVALUATION OF WAVE PATTERNS AND AMPLITUDE OF BRAIN POTENTIALS - ELECTROPHYSIOLOGY JPRS-33055 N66-12444
- SYMPOSIUM ON BIOCHEMICAL RESEARCH IN MAINLAND CHINA JPRS-33002 N66-12626
- BIOCHEMICAL RESEARCH IN CHINA AND DEVELOPMENT IN AREAS OF ENZYME SYSTEMS, METABOLISM, NUTRITION, CANCER, AND MEDICAL TECHNOLOGY - SYMPOSIUM N66-12627
- MOLECULAR STRUCTURE OF PEPTIDE CHAINS OF PROTEINS TO FIND RULES GOVERNING AMINO ACIDS N66-12628
- ENZYME CATALYST MECHANISMS, RELATIONSHIP BETWEEN ENZYME MOLECULAR STRUCTURE AND CATALYTIC ACTIVITY, AND FORMATION OF ENZYME INTERMEDIATE PRODUCTS N66-12629
- PROTEIN BIOSYNTHESIS BY INCORPORATION OF AMINO ACIDS AND ACTION OF SOLUBLE RIBONUCLEIC ACID N66-12630
- BIOENERGETIC STUDIES OF ENERGY TRANSFERS, THERMODYNAMICS, AND ENTROPY IN LIVING ORGANISMS N66-12631
- MICROBIOCHEMICAL CONTRIBUTIONS TO BIOLOGY - BACTERIAL PHOTOSYNTHESIS, CATABOLISM, INDUCED ENZYMES N66-12632
- COMPARATIVE BIOCHEMICAL METHOD FOR STUDYING METABOLISM, NUTRITION, AND BODY FLUIDS AND TISSUES N66-12633
- CHEMOTHERAPY OF VIRUS INFECTIONS, BIOLOGICAL PEST CONTROL, VIRUS NUCLEIC ACIDS, AND VIRAL GROWTH N66-12634
- METABOLISM AND CHEMICAL COMPOSITION OF CONNECTIVE TISSUE - FIBROUS AND NONFIBROUS PROTEINS N66-12635
- BIOCHEMICAL PROBLEMS PERTINENT TO FOOD INDUSTRY AND NUTRITION N66-12636
- CONFERENCES ON AEROSPACE MEDICINE - ASTRONAUT PERFORMANCE, ELECTROPHYSIOLOGICAL STUDIES ON VOSKHO D MANNED SPACECRAFT, AND MATHEMATICAL METHODS JPRS-32808 N66-12657
- METHODS USED AND PROBLEMS ENCOUNTERED IN EVALUATING PERFORMANCE OF ASTRONAUTS IN SPACE FLIGHT ENVIRONMENT N66-12658
- ELECTROPHYSIOLOGICAL STUDIES ON VOSKHO D MANNED SPACECRAFT N66-12659
- SUMMARIES OF REPORTS GIVEN AT CONFERENCE ON APPLICATION OF MATHEMATICAL METHODS IN AEROSPACE MEDICINE N66-12660
- CYBERNETIC DEVICES USED IN MEDICAL PRACTICE, AND CYBERNETIC SYSTEMS FOR NEUROLOGICAL STUDIES AND DIAGNOSTIC TECHNIQUES JPRS-32344 N66-12728
- DEVELOPMENT OF CYBERNETICS AS SCIENCE TO PRODUCE PRACTICAL MACHINES AND TO BENEFIT SOCIETY - COMMUNIST CHINA N66-12752
- RADIATION SENSITIVITY OF CHROMOSOME MUTATION IN WHITE BLOOD CELLS OF HUMANS, MONKEYS, AND RABBITS N66-12756
- HYPOXIA EFFECTS ON SENSITIVITY TO EPILEPTOGENIC AGENTS AND ON FUNCTIONAL PROPERTIES OF MOTOR FORMATIONS OF BRAIN JPRS-33056 N66-12903
- SPEECH STREAM SEGMENTATION INTO PHONEMES JPRS-32790 N66-12957
- PRINCIPLES OF MATHEMATICAL LOGIC AND PROBABILITY THEORY IN COMPUTER DIAGNOSIS OF DISEASES JPRS-33161 N66-13032
- ELECTROPHYSIOLOGY AND PSYCHOPHYSIOLOGY OF SLEEP JPRS-33033 N66-13176
- LABORATORY APPARATUS FOR BIOLOGICAL EXPERIMENT GAMMA RADIATION SOURCES JPRS 32704 N66-13245
- CALCULATIONS ON GAS EXCHANGE VOLUMES IN MAN UNDER RAREFIED ATMOSPHERIC CONDITIONS JPRS-33057 N66-13423
- ### K
- KAROLINSKA INSTITUTET, STOCKHOLM /SWEDEN/. PHYSIOLOGICAL RESPONSES OF ENDOCRINE SYSTEM TO PHYSICAL AND MENTAL STRESS - URINARY EXCRETION OF ADRENALINE AND NORADRENALINE N66-13507
- ### L
- LIBRARY OF CONGRESS, WASHINGTON, D. C. SOVIET PAPERS DEALING WITH BIOASTRONAUTICS, LIFE SUPPORT SYSTEMS, AND VOSKHO D II FLIGHT N66-12650
- LOS ALAMOS SCIENTIFIC LAB., N. MEX. COMPUTER PROGRAMS FOR REDUCING METABOLIC DATA OBTAINED BY SCINTILLATION COUNTERS LA-3298 N66-13431
- LOVELACE FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH, ALBUQUERQUE, N. MEX. FISSION PRODUCT INHALATION PROGRAM - GAMMA RAY DETECTION SYSTEM FOR BIOLOGICAL SAMPLES LF-28 N66-12581
- PHYSICAL AND PHYSIOLOGICAL PARAMETERS EFFECTING RESPIRATORY TRACT DEPOSITION N66-12683
- WHOLE BODY DEPOSITION OF PARTICLES AS FUNCTION OF VARIOUS PHYSICAL AND CHEMICAL PARAMETERS N66-12684
- ### M
- MASSACHUSETTS INST. OF TECH., CAMBRIDGE. RESEARCH AND DEVELOPMENT PROGRAM MANAGEMENT - PROBLEM SOLVING STRATEGIES IN PARALLEL PROJECTS NASA-CR-68375 N66-12989
- EFFECTS OF ORGANIZATIONAL AFFILIATION ON HIGH ENERGY PHYSICS RESEARCH GROUPS - PSYCHOLOGICAL FACTOR OF GROUP BEHAVIOR NASA-CR-68303 N66-12994
- METABOLIC STUDIES OF ENERGY DENSE COMPOUNDS FOR AEROSPACE NUTRITION AMRL-TR-64-121 N66-13594
- MELPAR, INC., FALLS CHURCH, VA. SURVIVAL OF MICROORGANISMS EXPOSED TO SHOCK WAVE AND CRYOGENIC TEMPERATURES DURING UPPER ATMOSPHERIC AIR SAMPLING NASA-CR-354 N66-12533
- SURVIVAL OF MICROORGANISMS EXPOSED TO SHOCK WAVE AND CRYOGENIC TEMPERATURE DURING WHOLE AIR SAMPLING OF UPPER ATMOSPHERE NASA-CR-68421 N66-13095
- MICHIGAN UNIV., ANN ARBOR. HUMAN PERFORMANCE CHARACTERISTICS IN MANUAL CONTROL TASKS, AND TECHNIQUES FOR DATA ANALYSIS AND SYSTEMS SIMULATION NASA-CR-68981 N66-14290
- MILAN UNIV. /ITALY/. BIOLOGICAL EFFECTS OF HIGH ENERGY PROTON

- IRRADIATION ON MICE
HER/AP-2-65 N66-12462
- MINNESOTA UNIV., MINNEAPOLIS.
CLEAN ROOM BACTERIOLOGY - HEAT RESISTANCE OF SPORE
FORMERS, MICROORGANISM IDENTIFICATIONS, HUMAN
CONTACT CONTAMINATION NASA-CR-68729 N66-13553
- MOUND LAB., MIAMISBURG, OHIO.
URINARY ELIMINATION FOLLOWING INHALATION OF
INSOLUBLE PLUTONIUM OXIDE N66-12682
- N**
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION.
LANGLEY RESEARCH CENTER, LANGLEY STATION, VA.
WATER IMMERSION TECHNIQUE FOR SIMULATING ZERO
GRAVITY MOBILITY PERFORMANCE OF ASTRONAUT IN
PRESSURIZED SPACESUIT NASA-TN-D-3054 N66-14151
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION,
WASHINGTON, D. C.
HUMAN PERFORMANCE AND LIFE SUPPORT SYSTEMS IN
SPACE MONITORED BY DIGITAL COMPUTER WHICH CAN
SIMULATE CLINICAL LOGIC - BIOASTRONAUTICS N66-12219
- INVESTIGATIVE AND AUTOMATIC CONTROL DATA
PROCESSING APPLICATIONS IN BIOASTRONAUTICS N66-12220
- SENSORS FOR PHYSIOLOGICAL INVESTIGATIONS UNDER
SPACE FLIGHT CONDITIONS - BIOASTRONAUTICS N66-12221
- DESIGN, CALIBRATION, AND SENSOR CONSTRUCTION OF
AUTOMATIC EQUIPMENT FOR ANALYZING
BALLISTOCARDIOGRAMS - BIOASTRONAUTICS N66-12222
- RESTORATION OF CONTRACTILITY, RESUMPTION OF
HEMODYNAMICS, AND TRANSPLANTATION PROSPECTS IN
HUMAN AND ANIMAL HEARTS NASA-TT-F-404 N66-12263
- BIBLIOGRAPHY OF AEROSPACE MEDICINE AND BIOLOGY
NASA-SP-7011/17/ N66-12345
- DETERMINATION OF PROPAGATION VELOCITY OF PULSE
WAVES FROM HUMAN ARTERIES BY CONVERTING
MECHANICAL VIBRATIONS INTO ELECTRICAL
OSCILLATIONS NASA-TT-F-407 N66-12346
- RADIATION SAFETY IN SPACE FLIGHTS - BIOLOGICAL
EFFECT OF HIGH ENERGY PROTON IRRADIATION ON
ANIMALS AND RADIATION PROTECTION AND THERAPY
NASA-TT-F-353 N66-12451
- RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS,
DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION
LEVEL DETERMINATION N66-12452
- DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES
USING SYNCHROCYCLOTRON - IRRADIATION OF
ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION
RESISTANCE OF PLASTICS N66-12453
- ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY
PROTONS IN MULTIPLE IRRADIATION N66-12454
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON
DOGS AND WHITE RATS N66-12455
- BIOLOGICAL EFFECT OF HIGH ENERGY PROTON
IRRADIATION ON CORNEAL EPITHELIA OF MICE N66-12456
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTON AND
X-RAY IRRADIATION ON HEREDITY STRUCTURES OF
RATS N66-12457
- BIOLOGICAL EFFECT OF DIFFERENT DOSES OF IONIZING
RADIATION ON VESTIBULAR APPARATUS N66-12458
- RELATIVE BIOLOGICAL EFFECT OF PROTONS IN
FRACTIONAL IRRADIATION COMPARED WITH MULTIPLE
X-RAY IRRADIATION OF DOGS AND RATS N66-12459
- COMPARISON OF BIOLOGICAL EFFECTS OF PROTON,
X-RAY, AND GAMMA IRRADIATIONS ON DOGS AND WHITE
RATS N66-12460
- PROPHYLAXIS AND THERAPY OF RADIATION INJURIES
CAUSED BY HIGH ENERGY PROTON IRRADIATION N66-12461
- TOLERANCE OF JET AND ROCKET ENGINE EXHAUST NOISE
AND EAR PROTECTION DEVICES FOR PILOTS AND GROUND
CREWS NASA-TT-F-9799 N66-13297
- EFFECT OF LIGHT ON LOWER PLANT REPRODUCTION
NASA-TT-F-9742 N66-13481
- METABOLISM AND ENERGY EXCHANGE BALANCE TESTS IN
RESPIRATION CALORIMETER TO DETERMINE RELATION
BETWEEN BODY TEMPERATURE AND FLUCTUATIONS OF
OTHER BODY FUNCTIONS NASA-TT-F-9796 N66-13484
- NASA SPACE BIOLOGY PROGRAM - EXOBIOLGY,
ENVIRONMENTAL AND BEHAVIORAL BIOLOGY, MOLECULAR
BIOLOGY AND INSTRUMENTATION, FLIGHT PROGRAMS,
AND MANNED SPACE FLIGHT NASA-TM-X-57051 N66-13899
- ANNOTATED BIBLIOGRAPHY OF AEROSPACE MEDICINE AND
BIOLOGY WITH SUBJECT, AUTHOR, AND CORPORATE
SOURCE INDEXES - PHYSIOLOGICAL, PSYCHOLOGICAL,
AND SPACE ENVIRONMENT EFFECTS ON MAN NASA-SP-7011/18/ N66-14160
- NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA.
EQUATIONS OF MOTION IN CIRCULAR MOTION TERMS FOR
LIMACON CURVE - GEOMETRY - VESTIBULAR EFFECT ON
HUMANS MOVING ALONG LIMACON NADC-ML-6507 N66-14197
- NAVAL RADIOLOGICAL DEFENSE LAB.,
SAN FRANCISCO, CALIF.
ANTIBODY PLAQUE FORMING CELLS - KINETICS OF
PRIMARY AND SECONDARY IMMUNE HEMOLYSIS RESPONSE
USNRDL-897 N66-14207
- NAVAL SCHOOL OF AVIATION MEDICINE, PENSACOLA,
FLA.
PROLONGED HOT OR COLD STIMULATION EFFECTS ON EYE
MOVEMENTS, VESTIBULOSPINAL, AND SEGMENTAL SPINAL
ACTIVITIES IN MONKEYS NASA-CR-68266 N66-12177
- STATEMENT ATTRACTIVENESS INDICES OBTAINED UNDER
PERSONAL OR SOCIAL ACCEPTABILITY - CORRELATION
OF INDICES WITH EACH OTHER NASM-937 N66-12380
- ENVIRONMENTAL TEMPERATURE EFFECTS ON EKG OF
SQUIRREL MONKEY - ANIMAL STUDY OF HEART RATE AND
T-WAVE AMPLITUDE NASA-CR-68306 N66-12972
- MEASUREMENT OF OTOLITH ACTIVITY AS INDICATED BY
OCULAR COUNTERROLLING IN RESPONSE TO BODY
TILT WITHIN FORCE FIELD OF ZERO G, ONE-HALF G,
AND STANDARD G - EXTRALABYRINTHINE FACTORS
NASA-CR-68391 N66-13097
- OCULOGRAVIC ILLUSION - PERCEPTION OF VISUAL
HORIZONTAL IN NORMAL AND INNER EAR DEFECTIVE
SUBJECTS DURING PROLONGED ROTATION NASA-CR-68659 N66-13560
- AIR SICKNESS IN STUDENT AVIATORS ASSOCIATED WITH
PEAKS OF PHYSIOLOGICAL AND PSYCHOLOGICAL STRESS
DURING TRAINING NSAM-939 N66-13700
- COMPARISON OF EFFECTIVENESS OF ANTIMOTION SICKNESS
DRUGS TESTED IN HUMAN CENTRIFUGE NASA-CR-68858 N66-13833

- * NORTHROP SPACE LABS., HAWTHORNE, CALIF.**
HISTOPATHOLOGY OF POCKET MOUSE INTESTINE MUCOUS
AFTER IRRADIATION - GROWTH AND DEVELOPMENT DATA
ON LABORATORY POCKET MOUSE
NASA-CR-68217 N66-12200
- O**
- OAK RIDGE NATIONAL LAB., TENN.**
NUCLEAR RADIATION MEDICINE - METHODS OF RECORDING
COUNTING RATE
ORNL-P-1383 N66-12899
- P**
- PENNSYLVANIA UNIV., PHILADELPHIA.**
BIOSATELLITE PROGRAM - EXPLOITATION OF SPACE
ENVIRONMENT FOR BIOLOGICAL RESEARCH
N66-12419
- PRESBYTERIAN-ST. LUKES HOSPITAL, CHICAGO, ILL.**
CLEARANCE RATE OF CALCIUM-45 IN DOGS AFTER
INTRAVENOUS INJECTION AND BLOOD DISTRIBUTION
BETWEEN MARROW AND BONE
TID-21339 N66-13051
- PUBLIC HEALTH SERVICE, WASHINGTON, D. C.**
REDUCTION OF BACTERIAL DISSEMINATION FROM HUMANS
AND SURFACE CONTAMINATION BY MICROORGANISMS
NASA-CR-68090 N66-12250
- STATISTICAL ANALYSIS OF HEAT SYNDROME CAUSES -
ENVIRONMENTAL AND HUMAN FACTORS, AND PREVENTION
AND ALLEVIATION IN CIVIL DEFENSE SHELTERS AND IN
EMERGENCY SITUATIONS
AD-623578 N66-13007
- CARDIOVASCULAR AND RESPIRATORY DISEASE IN FORMER
FLIGHT STUDENTS - AEROSPACE MEDICINE
NASA-CR-68541 N66-13165
- PURDUE UNIV., LAFAYETTE, IND.**
MEDICAL AND LIFE SCIENCES, ELECTRIC POWER SYSTEMS,
ENERGY CONVERSION, ELECTROMAGNETIC FIELDS,
COMMUNICATION, NONLINEAR CIRCUITS, MATERIALS,
AND CONTROL AND INFORMATION SYSTEMS
AD-622202 N66-13758
- S**
- SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEX.**
SPACE RADIOBIOLOGY TRAINING AND OPERATIONS -
RADIATION ZONES AND EXPOSURE, BIOLOGICAL
EFFECTS RADIATION, DOSE RATES, AND RECOVERY
AMD-TR-65-2 N66-13006
- PARTIAL PRESSURE OF OXYGEN AND CARBON DIOXIDE,
HYDROGEN ION CONCENTRATION, HEMOGLOBIN
SATURATION, AND TEMPERATURE OF DOG BLOOD
ANALYZED USING DIGITAL COMPUTER
SAM-TR-65-39 N66-13209
- CONTROL OF VESTIBULAR APPARATUS BY CENTRAL NERVOUS
SYSTEM - PREVENTION OF MOTION SICKNESS -
AEROSPACE MEDICINE
AD-623676 N66-14320
- STANFORD UNIV., CALIF.**
LEARNING OF PAIRED-ASSOCIATE ITEMS RELATED TO
DIFFERENT REPETITIVE REINFORCEMENT AND TESTING
SEQUENCES
TR-76 N66-13689
- SYSTEM DEVELOPMENT CORP., SANTA MONICA, CALIF.**
DETECTION OF COMPOUND MOTION IN TWO-TARGET
COLLISION PREDICTION SITUATION
SP-1946/001/00 N66-14021
- SYSTEMS RESEARCH LABS., INC., DAYTON, OHIO.**
DATA ACQUISITION, CONVERSION, HANDLING, ANALYSIS,
AND RECORDING SYSTEM FOR PSYCHOPHYSIOLOGICAL
STRESS
AMRL-TDR-64-64 N66-14315
- T**
- TECH DEVELOPMENT, INC., DAYTON, OHIO.**
FEASIBILITY OF USING ENERGY IN BREATHING OXYGEN
WHEN EXPANDED FROM STORAGE PRESSURE TO BREATHING
PRESSURE TO POWER OXYGEN-CIRCULATING BLOWER AND
WATER CIRCULATING PUMP
AMRL-TR-65-128 N66-13595
- TELEDYNE SYSTEMS CORP., HAWTHORNE, CALIF.**
ADVANCED CONCEPTS IN BIOTECHNOLOGY, HUMAN ANALOGS,
AND BIONICS
NASA-CR-68777 N66-13831
- TEXAS UNIV., AUSTIN.**
SIGNAL DETECTION OF AUDITORY SENSORY RESPONSES TO
STIMULI - AUDITORY INFORMATION PROCESSING
NASA-CR-68881 N66-13990
- THOMPSON RAMO WOOLDRIDGE, INC., CLEVELAND,
OHIO.**
ELECTROCHEMICAL CARBON DIOXIDE CONCENTRATION
SYSTEM FOR PURIFYING SPACE CABIN ATMOSPHERE
NASA-CR-54849 N66-13114
- U**
- UNITED KINGDOM ATOMIC ENERGY AUTHORITY,
HARWELL /ENGLAND/.**
METABOLISM AND EXCRETION OF CESIUM, PHOSPHORUS,
PLUTONIUM, TRITIUM AND RADIATION, STRONTIUM,
SULFUR, TRITIUM AND URANIUM FROM HUMAN BODY
N66-12686

Personal Author Index

AFROSPACE MEDICINE AND BIOLOGY / a continuing bibliography

MARCH 1966

Listing of Personal Authors of Reports

A Notation of Content, rather than the title of the document, appears under each author's name. The accession number is located beneath and to the right of the Notation of Content. e.g., N66-12345. Under any one author's name, the accession numbers are arranged in sequence.

A

- ABAJIAN, J. C., JR.**
APPLICATION OF DIGITAL COMPUTATION TECHNIQUES FOR
ON LINE DISPLAY OF PULMONARY NITROGEN WASHOUT AND
COMPARISON OF DATA WITH CONVENTIONAL TECHNIQUES
A66-80231
- ABAKUMOVA, I. A.**
FEASIBILITY OF USING CHICKEN AND DUCK FOR
ASTRONAUT FOOD IN CLOSED ECOLOGICAL SYSTEM
A66-80308
- ABBOTT, B. A.**
ERROR AND CONTROL EFFICIENCY ANALYSIS OF PILOTS
EXPOSED TO SIMULATED PITCH, ROLL, YAW, AND
ALTITUDE VARIATIONS
NASA-CR-68219 N66-12195
- ABRAMOVA, V. M.**
CHINESE CABBAGE SPROUTS GROWN AEROPONICALLY IN
CLOSED ECOLOGICAL SYSTEM AS AFFECTED BY
MINERALIZED PRODUCTS OF HUMAN WASTE
A66-80397
- ADES, H. W.**
PROLONGED HOT OR COLD STIMULATION EFFECTS ON EYE
MOVEMENTS, VESTIBULOSPINAL, AND SEGMENTAL SPINAL
ACTIVITIES IN MONKEYS
NASA-CR-68266 N66-12177
- ADEY, W. R.**
MONITORING HUMAN PERFORMANCE DURING MANNED ORBITAL
FLIGHT FOR ASSESSMENT OF CENTRAL NERVOUS SYSTEM
FUNCTION, NOTING ANIMAL STUDIES DURING SIMULATED
STRESSES OF SPACE FLIGHT
A66-14088
- COMPUTER ANALYSIS OF ELECTROENCEPHALOGRAPHIC
RECORDING DURING ENVIRONMENTAL STRESSES OF SPACE
FLIGHT
A66-80165
- SUMMARY OF PROGRAM FOR MONITORING BRAIN FUNCTION
AND PERFORMANCE IN PRIMATE UNDER PROLONGED
WEIGHTLESSNESS
NASA-CR-68413 N66-13089
- AFANASYEV, V. P.**
DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES
USING SYNCHROCYCLOTRON - IRRADIATION OF
ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION
RESISTANCE OF PLASTICS
N66-12453
- AFFINITO, F. J.**
APPARENT MOVEMENT PHENOMENA ON CATHODE RAY TUBE
DISPLAYS - THRESHOLD DETERMINATIONS OF APPARENT
MOVEMENTS OF PULSED LIGHT SOURCES
NASA-CR-342 N66-12162
- AGADZHANYAN, N. A.**
PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS IN MAN OF
LONG TERM STAY IN CABIN SIMULATING SPACEFLIGHT
ENVIRONMENT
A66-80300
- CALCULATIONS ON GAS EXCHANGE VOLUMES IN MAN UNDER
RAREFIED ATMOSPHERIC CONDITIONS
JPRS-33057 N66-13423
- AGOSTONI, E.**
PRESSURE FLOW RELATIONSHIP OF AIRWAYS IN SITTING
SUBJECT UNDER NORMAL CONDITIONS, IMMERSED IN WATER
TO NECK LEVEL, AND DURING NEGATIVE PRESSURE
BREATHING SUFFICIENT TO REDUCE LUNG VOLUME AS
DURING IMMERSION.
A66-80236
- AICARDI, G.**
ELECTROMYOGRAPHIC GRADIENTS AS INDICANTS OF
EFFICIENCY AND VELOCITY PRECISION IN MIRROR
TRACING
A66-80341
- AHLEBININSKII, K. S.**
FEASIBILITY OF USING CHICKEN AND DUCK FOR
ASTRONAUT FOOD IN CLOSED ECOLOGICAL SYSTEM
A66-80308
- AKULINICHEV, I. T.**
MAN-MACHINE RELATIONSHIP DURING SPACE FLIGHT
A66-14085
- SPACE BIOLOGY AND MEDICINE RESEARCH, STRESSING
FLIGHT EXPERIMENTS PERFORMED WITH RUSSIAN
SATELLITES AND SPACECRAFT
A66-14089
- SENSORS FOR PHYSIOLOGICAL INVESTIGATIONS UNDER
SPACE FLIGHT CONDITIONS - BIOASTRONAUTICS
N66-12221
- ELECTROPHYSIOLOGICAL STUDIES ON VOSKHOD MANNED
SPACECRAFT
N66-12659
- ALEKSEEVA, A. G.**
IMMUNITY TO INDIGENOUS MICROORGANISM IN ASTRONAUTS
DURING TRAINING AND BEFORE AND AFTER VOSTOK SERIES
SPACE FLIGHT
A66-80374
- ALEXANDER, L. T.**
DETECTION OF COMPOUND MOTION IN TWO-TARGET
COLLISION PREDICTION SITUATION
SP-1946/001/00 N66-14021
- ALIAKRINSKII, V. V.**
LIPREADING AS VISUAL METHOD OF SPEECH RECOGNITION
AND COMMUNICATION
A66-80393
- ALIUKHIN, I. U. S.**
SEMICONDUCTOR DEVICE FOR SUBJECTING SMALL
EXPERIMENTAL ANIMALS TO HYPOTHERMIA
A66-80328
- ALLEN, G. R.**
DYNAMIC BEHAVIOR OF AIRCREW BREATHING EQUIPMENT
CONSIDERING CYCLIC FLOW RESPONSE TESTS, STABILITY
PROBLEMS, MEASUREMENT TECHNIQUES AND HUMAN
RESPIRATORY IMPEDANCE
A66-13350
- ALLEN, J. R.**
THERMOREGULATORY METABOLIC RESPONSE OF COLD AND
HEAT EXPOSED SQUIRREL MONKEYS /SAHIRI SCIUREA/ AS

- COMPARED TO SIMILARLY TREATED RODENTS
A66-80225 A66-80310
- ALLEN, T. J.**
RESEARCH AND DEVELOPMENT PROGRAM MANAGEMENT -
PROBLEM SOLVING STRATEGIES IN PARALLEL PROJECTS
NASA-CR-68375 N66-12989 A66-80371
- ALTMAN, J. W.**
HUMAN FACTORS INFORMATION REQUIREMENTS FOR SPACE
SYSTEM DEVELOPMENT
NASA-CR-68230 N66-12959 A66-80372
- HUMAN FACTORS INFORMATION REQUIREMENTS FOR SPACE
SYSTEMS ENGINEERING - SURVEY AND BIBLIOGRAPHY
NASA-CR-68616 N66-13331 A66-80382
- ALTSHULER, K. Z.**
OXYGEN CONSUMPTION RATE AND
ELECTROENCEPHALOGRAPHIC STAGE OF SLEEP
A66-80353 A66-80382
- AMIEL, J. L.**
IMMUNOLOGICALLY COMPETENT CELL RESPONSE TO ANTIGEN
AND COMPARATIVE STUDY OF LYMPHOID CELLS
EUR-2469.F N66-14089 A66-80385
- AMMONS, C. H.**
SELECTED BIBLIOGRAPHY ON PERCEPTION
A66-80183 A66-80402
- AMMONS, R. B.**
SELECTED BIBLIOGRAPHY ON PERCEPTION
A66-80183 A66-80402
- ANDERSON, M. M.**
ANIMAL TEMPERATURE SENSING FOR STUDYING EFFECT OF
PROLONGED ORBITAL FLIGHT ON CIRCADIAN RHYTHMS OF
POCKET MICE A66-12767 A66-80319
- ANDJUS, R. K.**
EFFECTS OF COLD AND ABNORMAL ATMOSPHERE DISCUSSING
TOLERANCE LIMITS TO HYPERCAPNIA, ANOXIA INDUCED
HYPOTHERMIA AND HYPOXIA A66-14067 A66-80378
- TOLERANCE RELATIONSHIP BETWEEN EFFECTS OF INTERNAL
AND EXTERNAL COLD AND DIFFERENT FORMS OF ANOXIA IN
RAT A66-80189 A66-80378
- ANDREYEV, S. V.**
RESTORATION OF CONTRACTILITY, RESUMPTION OF
HEMODYNAMICS, AND TRANSPLANTATION PROSPECTS IN
HUMAN AND ANIMAL HEARTS
NASA-TT-F-404 N66-12263 A66-80378
- ANGIBOUST, R.**
HEART AND BREATHING RATE AND ELECTROENCEPHALO-
GRAPHIC RESPONSES OF RATS DURING
WEIGHTLESSNESS A66-14083 A66-80216
- ELECTROENCEPHALOGRAPHIC RESPONSES AND CHANGES IN
ELECTRIC POTENTIALS IN NECK MUSCLES OF RAT DURING
SHORT PERIODS OF WEIGHTLESSNESS A66-80161 A66-80216
- ANISKIN, E. D.**
AMINOTHIOLS AND PYRIMIDINE ANALOGS TESTED FOR
PROTECTIVE EFFECTS AGAINST GENETIC MUTATIONS IN
ESCHERICHIA COLI EXPOSED TO X-RAY IRRADIATION
A66-80385 A66-80385
- ANOKHIN, M. I.**
PRINCIPLES OF MATHEMATICAL LOGIC AND PROBABILITY
THEORY IN COMPUTER DIAGNOSIS OF DISEASES
JPRS-33161 N66-13032 A66-80385
- ANTIPOV, V. V.**
BIOLOGICAL EFFECTS OF COSMIC RADIATION UNDER
LABORATORY AND FLIGHT CONDITIONS ON VARIOUS CRAFT
TO STUDY MEASURES FOR PHARMACOLOGICAL AND
BIOLOGICAL PROTECTION A66-14077 A66-80368
- POSSIBILITIES OF PHARMACEUTICAL AND CHEMICAL
PROTECTION OF HUMAN SUBJECTS AGAINST RADIATION
INJURIES DURING OUTER SPACE FLIGHTS A66-80309 A66-80368
- SPACE RADIATION-RELATIVE BIOLOGICAL EFFECTIVENESS
AND PROBLEMS OF SHIELDING DURING MOON MISSION A66-80309 A66-80368
- EFFECT OF SPACE FLIGHT FACTORS ON REPRODUCTIVE
SYSTEM OF DROSOPHILA AND GENETIC APPARATUS OF
TRADESCANTIA A66-80371 A66-80372
- HUMAN CELLS AND GENETIC CHANGES IN ESCHERICHIA
DURING EXPOSURE STRESSES OF SPACE FLIGHT ON VOSTOK
SPACECRAFT A66-80372 A66-80382
- SURVIVAL DURING SCREENING OF VARIOUS AREAS OF RAT
BODY TO GAMMA RAYS AND HIGH ENERGY PROTONS AS
AFFECTED BY VIBRATION OR ACCELERATION STRESS
A66-80382 A66-80382
- PROTON AND GAMMA IRRADIATION EFFECTS ON SPLEEN,
THYMUS AND BONE MARROW IN MICE A66-80383 A66-80385
- AMINOTHIOLS AND PYRIMIDINE ANALOGS TESTED FOR
PROTECTIVE EFFECTS AGAINST GENETIC MUTATIONS IN
ESCHERICHIA COLI EXPOSED TO X-RAY IRRADIATION
A66-80385 A66-80385
- BIOLOGICAL EFFECT IN MOUSE OF GAMMA IRRADIATION
AS AFFECTED BY SOLAR FLARE, RADIOPROTECTIVE DRUGS,
AND ACCELERATION STRESS DURING SIMULATION OF
RADIATION CONDITIONS OF SPACEFLIGHT A66-80402 A66-80402
- ANTSYSHKINA, L. M.**
CHLORELLA AS SOURCE OF OXYGEN AND FOOD IN SHINER,
NOTROPIS A66-80335 A66-80335
- ARSENEVA, M. A.**
COMBINED ACCELERATION, VIBRATION, AND RADIATION
EFFECTS ON MITOTIC ACTIVITY OF BONE MARROW CELLS
IN MICE A66-80319 A66-80319
- ARTEMEVA, N. S.**
HISTOLOGICAL CHANGES IN OVARIES AND RESISTANCE TO
TRANSVERSE ACCELERATION REVEALED BY CARDIOVASCULAR
AND RESPIRATORY ACTIVITY OF YOUNG FEMALE MONKEYS
A66-80378 A66-80378
- ASPE, J.**
EFFECT OF CAFFEINE ON BLOOD SERUM FREE FATTY ACIDS
IN NORMAL HUMAN SUBJECTS A66-80349 A66-80349
- ASTRATYAN, E. A.**
COMPILATION OF PAPERS PRESENTED AT PHYSIOLOGY
CONFERENCE
FTD-TT-65-47/162 N66-13224 A66-80349
- AVERKIN, E. G.**
WATER CONSUMPTION BY MAN IN WARM ENVIRONMENT
ANALYZED STATISTICALLY AND RELATED TO METABOLIC
VARIABLES A66-80216 A66-80216
- B**
- BABINSKY, A. D.**
ELECTROCHEMICAL CARBON DIOXIDE CONCENTRATION
SYSTEM FOR PURIFYING SPACE CABIN ATMOSPHERE
NASA-CR 54649 N66-13114 A66-80216
- BACHOFER, B. T.**
NAVIGATION AND CONTROL SIMULATION PORTION OF
OVERALL MANNED SPACE CABIN TEST PROGRAM
AIAA PAPER 65-277 A66-12776 A66-12776
- BAEVSKII, R. M.**
SPACE BIOLOGY AND MEDICINE RESEARCH, STRESSING
FLIGHT EXPERIMENTS PERFORMED WITH RUSSIAN
SATELLITES AND SPACECRAFT A66-14089 A66-14089
- POSSIBILITIES OF UTILIZATION OF ELECTRONIC LOGICAL
SYSTEMS FOR AUTOMATIC MEDICAL CONTROL OF
SPACECRAFT PERSONNEL A66-80368 A66-80368
- BAILEY, R. W.**
VISUAL PROBLEMS ASSOCIATED WITH LOW ALTITUDE
FLIGHT A66-80357 A66-80357
- BAIRD, R.**
URANIUM CONTENT IN HUMAN DIET - BONE, TISSUE, AND
OTHER ORGANS OF BODY N66-12689 A66-80357
- BALIKA, YU. D.**
PROPHYLAXIS AND THERAPY OF RADIATION INJURIES A66-80357 A66-80357

- CAUSED BY HIGH ENERGY PROTON IRRADIATION N66-12461
- BALKE, B.**
COMPARISON OF METHODS OF BLOOD PRESSURE MEASUREMENTS AND PRESSURE FLOW DYNAMICS DURING VARIOUS CONDITIONS OF PHYSICAL EXERCISE A66-80244
- BANNISTER, T. T.**
SIMPLE OSCILLATIONS IN PHOTOSYNTHETIC OXYGEN EVOLUTION IN CHLORELLA PYRENOIDOSA A66-80291
- BARER, A. S.**
HUMAN ELECTROENCEPHALOGRAPH, REACTION TIME, AND TOLERANCE DURING CORIOLIS ACCELERATION DIRECTED BACK TO CHEST A66-80318
- BARKHATOVA, I. M.**
METHOD FOR PROCESSING HUMAN WASTE TO RECLAIM WATER USING CHLORELLA - BACTERIA SYSTEM A66-80391
- BARNETT, T.**
SHORT TERM MEMORY AS FUNCTION OF NUMBER OF ITEMS SENT AND NUMBER OF CHANNELS IN MULTICHANNEL LISTENING EXPERIMENT A66-80153
- BARUKOV, V. S.**
REVERSIBLE PROCESS OF CHROMOSOME DAMAGE DURING MITOSIS BY IONIZING RADIATION IN YEAST A66-80321
- IMPORTANCE OF RECONSTRUCTION OF CELLS DAMAGED BY IONIZING RADIATION ON TOTAL VIABILITY OF ORGANISM A66-80322
- BARTLETT, N. R.**
HUMAN EYE ADAPTATION TO DARK AND LIGHT, NOTING THRESHOLD DEPENDENCE ON PREVIOUS HISTORY OF ILLUMINATION A66-13790
- BARZEELE, J.**
INTERACTION OF TIME UNCERTAINTY AND RELATIVE SIGNAL FREQUENCY IN DETERMINING CHOICE REACTION TIME A66-80266
- BATES, A.**
SHORT TERM MEMORY AS FUNCTION OF NUMBER OF ITEMS SENT AND NUMBER OF CHANNELS IN MULTICHANNEL LISTENING EXPERIMENT A66-80153
- BATOV, V. A.**
ILLUMINATION AND CELL DENSITY EFFECTS ON GROWTH RATE OF CHLORELLA VULGARIS CULTURE A66-80400
- BAYEVSKIY, R. H.**
HUMAN PERFORMANCE AND LIFE SUPPORT SYSTEMS IN SPACE MONITORED BY DIGITAL COMPUTER WHICH CAN SIMULATE CLINICAL LOGIC - BIOASTRONAUTICS N66-12219
- INVESTIGATIVE AND AUTOMATIC CONTROL DATA PROCESSING APPLICATIONS IN BIOASTRONAUTICS N66-12220
- SENSORS FOR PHYSIOLOGICAL INVESTIGATIONS UNDER SPACE FLIGHT CONDITIONS - BIOASTRONAUTICS N66-12221
- PHYSIOLOGICAL MEASUREMENTS DURING INTERPLANETARY FLIGHT FOR MEDICAL MONITORING, EXAMINATIONS AND DIAGNOSES, AND SCIENTIFIC RESEARCH - ANALYSIS OF VOSTOK SPACECRAFT BIOINSTRUMENTATION N66-13789
- BAZYKIN, V.**
RADIATION HAZARDS, DETECTION DEVICES, AND MEDICINES TO PREVENT INJURY DURING FLIGHTS OF VOSTOK AND VOSKHOD SPACESHIPS A66-80204
- BEARD, S. E.**
VERBAL COMMUNICATION INTELLIGIBILITY IN OXYGEN-HELIUM AND OTHER BREATHING MIXTURES IN LOW PRESSURE CHAMBER A66-80199
- BEASLEY, J. L.**
ACCELERATION EFFECT ON FOOD REINFORCED DRL AND FR SCHEDULES A66-13175
- BEATON, J. R.**
FOOD INTAKE, BODY WEIGHT, AND ACTIVITY OF RAT EXERCISING IN HOT ENVIRONMENT A66-80220
- BEHAN, R. A.**
LANDING TASK AND PILOT ACCEPTANCE OF DISPLAYS FOR LANDING IN REDUCED WEATHER MINIMUMS AIAA PAPER 65-722 A66-12579
- BEKEY, G. A.**
MATHEMATICAL MODEL OF HUMAN COMPENSATORY TRACKING BEHAVIOR A66-80149
- BELDING, H. S.**
HEART RATE AND OUTPUT AND BODY TEMPERATURE OF ACCLIMATIZED MALE DURING EXERCISE IN HOT ENVIRONMENT A66-80219
- COMPARISON OF HUMAN RESPONSES TO PULSED AND UNPULSED ENVIRONMENTAL HEAT AND PHYSICAL EXERCISE A66-80222
- BELIAEVA, L. A.**
COMBINED ACCELERATION, VIBRATION, AND RADIATION EFFECTS ON MITOTIC ACTIVITY OF BONE MARROW CELLS IN MICE A66-80319
- BELIANIN, V. N.**
ILLUMINATION AND CELL DENSITY EFFECTS ON GROWTH RATE OF CHLORELLA VULGARIS CULTURE A66-80400
- BELL, P. R.**
NUCLEAR RADIATION MEDICINE - METHODS OF RECORDING COUNTING RATE ORNL-P-1383 N66-12899
- BELLET, S.**
EFFECT OF CAFFEINE ON BLOOD SERUM FREE FATTY ACIDS IN NORMAL HUMAN SUBJECTS A66-80349
- BELYAYEVA, L. A.**
EFFECT OF VIBRATION ON CELL DIVISION IN BONE MARROW OF MOUSE N66-13791
- BENEDICT, F. G.**
METABOLISM AND ENERGY EXCHANGE BALANCE TESTS IN RESPIRATION CALORIMETER TO DETERMINE RELATION BETWEEN BODY TEMPERATURE AND FLUCTUATIONS OF OTHER BODY FUNCTIONS NASA-TT-F-9796 N66-13484
- BENNETT, G.**
HUMAN FACTORS IN CONCORDE SST PROGRAM A66-13357
- BERGMANN, F.**
INTERACTION OF CENTRAL AND FLASH NYSTAGMUS IN RABBITS A66-80339
- BERKSHIRE, J. R.**
COMPARATIVE PHYSICAL PERFORMANCES OF NAVAL AVIATOR TRAINEES FROM VARIOUS PROCUREMENT SOURCES AND UNDER TWO DIFFERENT SYLLABI A66-12354
- BERTELSON, P.**
INTERACTION OF TIME UNCERTAINTY AND RELATIVE SIGNAL FREQUENCY IN DETERMINING CHOICE REACTION TIME A66-80266
- BEVEGARD, B. S.**
VENTILATION, HEART RATE, LACTATE FORMATION, AND OXYGEN CONSUMPTION DURING ARM AND LEG EXERCISE IN SUPINE AND SITTING POSITION A66-80211
- MEASUREMENT OF REACTION IN MAN OF RESISTANCE AND CAPACITY VESSELS IN FOREARM AND HAND TO LEG EXERCISE A66-80221
- BIBERGAL, A. V.**
LABORATORY APPARATUS FOR BIOLOGICAL EXPERIMENT GAMMA RADIATION SOURCES JPRS 32704 N66-13245

- BIBIKOVA, A. F.**
ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY
PROTONS IN MULTIPLE IRRADIATION N66-12454
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON
DOGS AND WHITE RATS N66-12455
- PROPHYLAXIS AND THERAPY OF RADIATION INJURIES
CAUSED BY HIGH ENERGY PROTON IRRADIATION N66-12461
- BICKEL, D.**
OXYGEN SATURATION AND DESATURATION TIMES IN
CARDIAC MUSCLE AND CORRESPONDING VALUES CALCULATED
FROM KROGH SUPPLY MODEL A66-80346
- BINDRA, D.**
JUDGMENTS OF SAMENESS OF TONES AND TONE
DIFFERENCE - EXPERIMENTS ON DECISION TIME A66-80355
- BIZIN, IU. P.**
PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS IN MAN OF
LONG TERM STAY IN CABIN SIMULATING SPACEFLIGHT
ENVIRONMENT A66-80300
- BJURSTEDT, H.**
INTERNATIONAL SYMPOSIUM ON BASIC ENVIRONMENTAL
PROBLEMS OF MAN IN SPACE AT PARIS, FRANCE
IN OCTOBER 1962 A66-14063
- BLIVAISS, B. B.**
ENDOCRINE AND METABOLIC RESPONSE OF DOGS TO WHOLE
BODY VIBRATION A66-80194
- BLOCK, S.**
RADIATION HAZARDS CONTROL - AIR MONITORS, FILM
SENSITIVITY, STIMULATED EMISSION DOSIMETRY,
GLASS CLEANING TECHNIQUES, HIGH DENSITY GRASS
SAMPLES, AND FIRE HOSE FRICTION LOSSES
UCRL-14351 N66-12576
- BOGDANDV, V. V.**
HUMAN PERFORMANCE AND LIFE SUPPORT SYSTEMS IN
SPACE MONITORED BY DIGITAL COMPUTER WHICH CAN
SIMULATE CLINICAL LOGIC - BIOASTRONAUTICS N66-12219
- ELECTROPHYSIOLOGICAL STUDIES ON VOSKHOD MANNED
SPACECRAFT N66-12659
- BOGDONOFF, M. D.**
CHARACTERISTICS OF LIPID MOBILIZATION AND
PERIPHERAL DISPOSITION IN AGED INDIVIDUALS A66-80283
- BOGINA, I. D.**
MOTOR RESTRAINT EFFECT ON BEHAVIOR RESPIRATION,
HEART FUNCTION, AND BRAIN BIOELECTRIC ACTIVITY IN
MONKEY A66-80376
- BORISKIN, V. V.**
EFFECT OF REPLACING ATMOSPHERIC NITROGEN BY
HELIUM ON DEVELOPMENT OF CHICK EMBRYOS
JPRS-32905 N66-12299
- BORSHCHENKO, V. V.**
STUDY OF COMFORTABLE CLOTHING FOR ASTRONAUTS
DURING 30-DAY TESTS WITHOUT WASHING IN AIR
CONDITIONED SPACE CABINS IN RELATION TO SKIN
CONDITION A66-80314
- BORSHCHEVSKIY, I.**
TOLERANCE OF JET AND ROCKET ENGINE EXHAUST NOISE
AND EAR PROTECTION DEVICES FOR PILOTS AND GROUND
CREWS
NASA-TT-F-9799 N66-13297
- BOTVINNIKOV, B. A.**
EFFECT OF ELEVATED INTRAPULMONARY PRESSURE ON
RESPIRATION AND CIRCULATION
FTD-TT-65-154/162 N66-12387
- BOWEN, H. M.**
APPARENT MOVEMENT PHENOMENA ON CATHODE RAY TUBE
DISPLAYS - THRESHOLD DETERMINATIONS OF APPARENT
MOVEMENTS OF PULSED LIGHT SOURCES
NASA-CR-342 N66-12162
- BOX, B. M.**
FOOD INTAKE, BODY WEIGHT, AND ACTIVITY OF RAT
EXERCISING IN HOT ENVIRONMENT A66-80220
- BRAND, D. H.**
DATA ACQUISITION, CONVERSION, HANDLING, ANALYSIS,
AND RECORDING SYSTEM FOR PSYCHOPHYSIOLOGICAL
STRESS
AMRL-TDR-64-64 N66-14315
- BRAUNWALD, E.**
SYMPATHETIC NERVOUS STIMULATION OF HEART - BETA
ADRENERGIC BLOCKING CARDIAC FUNCTION, CIRCULATORY
RESPONSE AND PHYSICAL EXERCISE A66-80147
- BREBBIA, D. R.**
OXYGEN CONSUMPTION RATE AND
ELECTROENCEPHALOGRAPHIC STAGE OF SLEEP A66-80353
- BREDELL, G. A. G.**
SWEAT GLAND FATIGUE AS REFLECTED BY SWEAT RATES
AND RECTAL TEMPERATURES DURING EXPOSURE TO HOT
ENVIRONMENT A66-80218
- BRESLAV, I. S.**
ACTIVE SELECTION OF AIR WITH VARIOUS OXYGEN
CONTENT BY MICE PREVIOUSLY EXPOSED IN CHAMBER TO
NORMAL CONDITIONS AND AIR WITH HIGH OXYGEN CONTENT
A66-80325
- MORPHOLOGY OF PERIPHERAL BLOOD IN MICE AS INDEX TO
PHYSIOLOGICAL EFFECT OF EXPOSURE TO HIGH OXYGEN
PARTIAL PRESSURE A66-80386
- EFFECT OF PROLONGED EXPOSURE TO HIGH CONCENTRATION
OF OXYGEN ON LUNGS AND BLOOD IN MICE A66-80389
- BREWER, M.**
THERMOREGULATORY METABOLIC RESPONSE OF COLD AND
HEAT EXPOSED SQUIRREL MONKEYS /SAIMIRI SCIUREA/ AS
COMPARED TO SIMILARLY TREATED RODENTS A66-80225
- BREZIN, C.**
IMMUNOLOGICALLY COMPETENT CELL RESPONSE TO ANTIGEN
AND COMPARATIVE STUDY OF LYMPHOID CELLS
EUR-2469.F N66-14089
- BRICE, R.**
HEART AND BREATHING RATE AND ELECTROENCEPHALO-
GRAPHIC RESPONSES OF RATS DURING
WEIGHTLESSNESS A66-14083
- ELECTROENCEPHALOGRAPHIC RESPONSES AND CHANGES IN
ELECTRIC POTENTIALS IN NECK MUSCLES OF RAT DURING
SHORT PERIODS OF WEIGHTLESSNESS A66-80161
- BRICK, I.**
HEART RATE AND FOREARM BLOOD FLOW OF MAN WITH AND
WITHOUT BREATH HOLDING DURING FACE IMMERSION IN
WATER A66-80210
- BRINKLEY, J. W.**
VIBRATION EXPOSURE WITH VARYING PEAK AND RMS
ACCELERATION AND FREQUENCY IN LOW ALTITUDE HIGH-
SPEED FLIGHT A66-13355
- BROCKHOUSE, J. E.**
VASCULAR AND SWEATING RESPONSES OF MAN TO VARYING
TEMPERATURE EXPOSURES A66-80250
- BROWN, A. H.**
BIOSATELLITE PROGRAM - EXPLOITATION OF SPACE
ENVIRONMENT FOR BIOLOGICAL RESEARCH N66-12419
- BROWN, J. L.**
BRIGHTNESS DISCRIMINATION AND BRIGHTNESS CONTRAST
OF HUMAN AND ANIMAL EYES IN SUPRATHRESHOLD
LUMINANCE DIFFERENCE A66-13791
- REVIEW OF DATA ON VISUAL FLICKER FUSION AND
INTERMITTENT STIMULATION A66-13792
- CHARACTERISTICS OF AFTERIMAGES PRODUCED BY
PERSISTING VISUAL EFFECT AFTER TERMINATION OF

- ILLUMINATION A66-13794
- BROWN, R. H.
WEIGHT GAIN AND FEED EFFICIENCY IN WEANLING,
HEALTHY PIG AS AFFECTED BY EXPOSURE TO NEGATIVE
AIR IONIZATION FOR DIFFERENT DURATIONS A66-80406
- BROWN, W. K.
SEX DIFFERENCES, INCIDENCE, REVERSAL, AND
PREVENTION OF HIDROMEIOSIS-DECREMENT OF RATE OF
THERMALLY INDUCED SWEATING A66-80251
- BROWSE, N. L.
RESPONSE OF CAPACITY VESSELS IN HUMAN LIMBS TO
HEAD-UP TILT AND SUBATMOSPHERE PRESSURE ON LOWER
BODY A66-80212
- BRUNER, H.
STRESS IMPOSED ON AIRCREW IN CIVIL JET AIRCRAFT
DURING LONG FLIGHT DLR-FB-65-44 N66-14261
- BUDDECKE, C. L.
ENERGY PATTERNS FROM SPACE ACCESSIBLE TO HUMAN
SENSES THROUGH DATA SENSORS AND INFORMATION
ACQUISITION A66-14093
- BUEHLER, D. W.
ELECTRONYSTAGNUS MEASUREMENT OF VERTICAL EYEBALL
DISPLACEMENT TO INVESTIGATE CHINCHILLA
VESTIBULAR SYSTEM RESPONSE TO VERTICAL LINEAR
ACCELERATION GE/EE/65-6 N66-13814
- BUEHRING, W. B.
HANDGEAR INSULATION EFFECTIVENESS OF FREON 12,
CARBON DIOXIDE, AND HELIUM A66-80227
- BURNS, C. A.
DATA ACQUISITION, CONVERSION, HANDLING, ANALYSIS,
AND RECORDING SYSTEM FOR PSYCHOPHYSIOLOGICAL
STRESS AMRL-TDR-64-64 N66-14315
- BURYY, N. G.
DESIGN, CALIBRATION, AND SENSOR CONSTRUCTION OF
AUTOMATIC EQUIPMENT FOR ANALYZING
BALLISTOCARDIOGRAMS - BIASTRONAUTICS N66-12222
- BUTCHER, B. A.
NUCLEAR FAST RED TECHNIQUE OF CALCIUM IN SERUM,
PAROTID FLUID AND URINE IN WEIGHTLESS STATE A66-13347
- BUTEYKO, K. P.
DESIGN, CALIBRATION, AND SENSOR CONSTRUCTION OF
AUTOMATIC EQUIPMENT FOR ANALYZING
BALLISTOCARDIOGRAMS - BIASTRONAUTICS N66-12222
- BUTT, L. C.
ELECTRONYSTAGNUS MEASUREMENT OF VERTICAL EYEBALL
DISPLACEMENT TO INVESTIGATE CHINCHILLA
VESTIBULAR SYSTEM RESPONSE TO VERTICAL LINEAR
ACCELERATION GE/EE/65-6 N66-13814
- BYCHKOV, V. P.
FEASIBILITY OF USING CHICKEN AND DUCK FOR
ASTRONAUT FOOD IN CLOSED ECOLOGICAL SYSTEM A66-80308
- C**
- CAILLER, B.
HEART AND BREATHING RATE AND ELECTROENCEPHALO-
GRAPHIC RESPONSES OF RATS DURING
WEIGHTLESSNESS A66-14083
- ELECTROENCEPHALOGRAPHIC RESPONSES AND CHANGES IN
ELECTRIC POTENTIALS IN NECK MUSCLES OF RAT DURING
SHORT PERIODS OF WEIGHTLESSNESS A66-80161
- CAIN, S. M.
PARTIAL PRESSURE OF OXYGEN AND CARBON DIOXIDE,
HYDROGEN ION CONCENTRATION, HEMOGLOBIN
- SATURATION, AND TEMPERATURE OF DOG BLOOD
ANALYZED USING DIGITAL COMPUTER SAM-TR-65-39 N66-13209
- CALONJE, M. A.
STATISTICAL ANALYSIS OF HEAT SYNDROME CAUSES -
ENVIRONMENTAL AND HUMAN FACTORS, AND PREVENTION
AND ALLEVIATION IN CIVIL DEFENSE SHELTERS AND IN
EMERGENCY SITUATIONS AD-623578 N66-13007
- CAMPBELL, D. E.
INFLUENCE OF SEVERAL PHYSICAL ACTIVITIES ON
BLOOD SERUM CHOLESTEROL CONCENTRATION IN YOUNG MEN A66-80356
- CARROLL, D. F.
CRITERIA FOR BODY BLOCKS, ANTHROPOMORPHIC DUMMIES,
AND INSTRUMENTATION FOR USE IN STATIC AND
DYNAMIC TESTING OF CIVIL AIRCRAFT SEAT SYSTEMS
FAA-ADS-20 N66-13926
- CASKEY, W. E.
CONTINUITY EFFECT WITH ALTERNATELY SOUNDED NOISE
AND TONE SIGNALS AS FUNCTION OF MANNER OF
PRESENTATION A66-80154
- CAVAGNA, G. A.
MODALITIES OF ENERGY SHIFT FROM KINETIC TO
POTENTIAL, AND VICE VERSA, WHILE WALKING AND
RUNNING, AT DIFFERENT SPEEDS AGAINST GRAVITY A66-80239
- CHAFFEE, R. R. J.
THERMOREGULATORY METABOLIC RESPONSE OF COLD AND
HEAT EXPOSED SQUIRREL MONKEYS /SAIMIRI SCIUREA/ AS
COMPARED TO SIMILARLY TREATED RODENTS A66-80225
- CHAIMOVITZ, M.
INTERACTION OF CENTRAL AND FLASH NYSTAGMUS IN
RABBITS A66-80339
- CHANG, S.-H.
HISTOCHEMICAL USE OF FRESH CUT TISSUE SHEET -
CUT SHEET ATTACHMENT IN LOW TEMPERATURE
CRYOSTAT, AND FREEZING AND CUTTING TECHNIQUE N66-12371
- CHATELIER, G.
HEART AND BREATHING RATE AND ELECTROENCEPHALO-
GRAPHIC RESPONSES OF RATS DURING
WEIGHTLESSNESS A66-14083
- ELECTROENCEPHALOGRAPHIC RESPONSES AND CHANGES IN
ELECTRIC POTENTIALS IN NECK MUSCLES OF RAT DURING
SHORT PERIODS OF WEIGHTLESSNESS A66-80161
- CHEKHONADSKII, N. A.
MODEL OF VESTIBULAR APPARATUS DEMONSTRATING ITS
FUNCTIONS UNDER CONDITIONS OF VARIABLE
GRAVITATIONAL FIELD A66-80327
- USE OF ELECTRONIC COMPUTERS IN SPACE BIOLOGY A66-80366
- INVESTIGATIVE AND AUTOMATIC CONTROL DATA
PROCESSING APPLICATIONS IN BIASTRONAUTICS N66-12220
- CHEN, H.-M.
HISTOCHEMICAL USE OF FRESH CUT TISSUE SHEET -
CUT SHEET ATTACHMENT IN LOW TEMPERATURE
CRYOSTAT, AND FREEZING AND CUTTING TECHNIQUE N66-12371
- CHERNIAKOV
FREQUENCY ANALYSIS OF DIURNAL PERIODICITY IN HUMAN
ELECTROENCEPHALOGRAM A66-80395
- CHERNIGOVSKII, V. N.
SOVIET BIOLOGICAL AND PHYSIOLOGICAL INVESTIGATIONS
IN ROCKETS AND SATELLITES, PARTICULARLY
NONPATHOLOGICAL CHARACTER OF PHYSIOLOGICAL
REACTIONS TO STRESS FACTORS A66-14076
- INVESTIGATIONS OF PHYSIOLOGICAL RESPONSES OF
ANIMALS AND MAN TO STRESSES IN VOSTOK SPACECRAFT

- A66-80160
PHYSIOLOGICAL RESPONSES TO AND BIOLOGICAL EFFECTS OF SPACE FLIGHT STRESS - ASTRONAUT PERFORMANCE ANL-TRANS-209 N66-13520
- CHETVERIKOV, D. A.
TOLERANCE OF RAT TO HYPOXIA DURING RADIATION SICKNESS CAUSED BY X-RAY IRRADIATION A66-80384
- CHI, C.
COMPARATIVE BIOCHEMICAL METHOD FOR STUDYING METABOLISM, NUTRITION, AND BODY FLUIDS AND TISSUES N66-12633
- CHISTOVICH, L. A.
USING COMPUTER ANALYZED SPEECH SIGNALS FACILITATING BETTER COMMUNICATION OF MAN WITH MACHINES A66-80334
- CHOQUET, C.
IMMUNOLOGICALLY COMPETENT CELL RESPONSE TO ANTIGEN AND COMPARATIVE STUDY OF LYMPHOID CELLS EUR-2469.F N66-14089
- CHOU, H.-T.
RADIATION SENSITIVITY OF CHROMOSOME MUTATION IN WHITE BLOOD CELLS OF HUMANS, MONKEYS, AND RABBITS N66-12756
- CHU, J.-P.
PATHOLOGICAL EFFECTS OF X-RAY IRRADIATION ON GASTROINTESTINAL SYSTEM IN DOGS - RADIATION SICKNESS FTD-TT-64-910/1&2&3&4 N66-12607
- CHUBB, R. M.
CAUSES OF COMPRESSION FRACTURES OF SPINE DURING LARGE NUMBER OF USAF EJECTIONS A66-12361
- CHUCHKIN, V. G.
SENSORS FOR AUTOMATIC CONTROL AND REGULATION OF PHYSIOLOGICAL PROCESSES OF PLANTS IN CLOSED SYSTEMS A66-80396
- CLARE, R.
HAZARDS TO HUMAN EAR FROM SHOCK WAVES OF HIGH ENERGY ELECTRIC DISCHARGES AWRE-E-1/65 N66-13711
- CLARK, B.
VALIDITY OF OCULOGRAVIC ILLUSION AS SPECIFIC INDICATOR OF OTOLITH FUNCTION A66-80200
OCULOGRAVIC ILLUSION - PERCEPTION OF VISUAL HORIZONTAL IN NORMAL AND INNER EAR DEFECTIVE SUBJECTS DURING PROLONGED ROTATION NASA-CR-68659 N66-13560
- CLARK, D. A.
NUCLEAR FAST REP TECHNIQUE OF CALCIUM IN SERUM, PAROTID FLUID AND URINE IN WEIGHTLESS STATE A66-13347
- CLARKE, N. P.
VIBRATION EXPOSURE WITH VARYING PEAK AND RMS ACCELERATION AND FREQUENCY IN LOW ALTITUDE HIGH-SPEED FLIGHT A66-13355
DIAL READING ABILITY OF SPACECRAFT CREW DURING PROLONGED ACCELERATION AND VIBRATION AMRL-TR-65-110 N66-12376
AEROSPACE MEDICINE - COMPRESSION DEFORMITIES OF THORACIS VERTEBRAE IN HUMAN TOLERANCE TEST DURING EXPOSURE TO SIMULATED ESCAPE SYSTEM ROCKET THRUST VECTOR AMRL-TR-65-134 N66-12885
- CLEVELAND, A. S.
ERYTHROPOIETIN, ACTIVITY, BLOOD, AND PHYSIOLOGICAL RESPONSES TO SEVERE HYPOXIA IN MAN A66-80214
- COBB, B. B.
MEASUREMENT, STRUCTURE, AND PREDICTION OF JOB AND TRAINING PERFORMANCE OF AIR TRAFFIC CONTROL
- SPECIALISTS OF DIFFERENT AGES A66-80193
- COLE, L. J.
ANTIBODY PLAQUE FORMING CELLS - KINETICS OF PRIMARY AND SECONDARY IMMUNE HEMOLYSIN RESPONSE USNRDL-897 N66-14207
- COLER, C. R.
SHORT-TERM MEMORY, CHOICE REACTION TIME, AND HAND STEADINESS OF EXERCISING AND RESTING SUBJECTS IN RESPONSE TO EPINEPHRINE OR INSULIN ADMINISTRATION A66-80201
- COLLIN, J.
FRENCH DEVELOPED PROTECTIVE CLOTHING FOR FLYING PERSONNEL AGAINST HIGH ENVIRONMENTAL TEMPERATURES A66-80360
- COLLINS, K. J.
ACCLIMATIZATION AND SWEATING-EFFECT OF DRUGS AND THERMAL STRESS A66-80248
- COLLISON, H. A.
DETERMINATION OF MALE AND FEMALE BODY VOLUME FROM HEIGHT AND WEIGHT USING GRAPHICAL METHOD A66-80228
- COOKE, J. P.
VERBAL COMMUNICATION INTELLIGIBILITY IN OXYGEN-HELIUM AND OTHER BREATHING MIXTURES IN LOW PRESSURE CHAMBER A66-80199
- COOPERBAND, A. S.
DETECTION OF COMPOUND MOTION IN TWO-TARGET COLLISION PREDICTION SITUATION SP-1946/001/00 N66-14021
- CORKINDALE, K. G.
HUMAN PERCEPTUAL MECHANISM DEFINED BY PSYCHOLOGICAL RESEARCH AND APPLIED TO AIRCRAFT COCKPIT DISPLAY DESIGN A66-12883
- COSTIN, A.
INTERACTION OF CENTRAL AND FLASH NYSTAGMUS IN RABBITS A66-80339
- CRAIG, F. N.
PRECEDING POSTURE AND AMBIENT TEMPERATURE EFFECTS ON HEART AND BLOOD CIRCULATION ACCELERATION AT INITIATION OF EXERCISE CRDLR-3268 N66-12827
- CRAWFORD, A. L.
EFFECT OF GLUCAGON ON BLOOD SUGAR AND INORGANIC PHOSPHORUS LEVELS IN NORMOTHERMIC AND HYPOTHERMIC RATS A66-80245
- CROCKFORD, G. W.
ACCLIMATIZATION AND SWEATING-EFFECT OF DRUGS AND THERMAL STRESS A66-80248
- CROUNSE, R. G.
PSYSPHOLIPOPROTEIN EXTRACTED FROM HUMAN EPIDERMAL TISSUES EXHIBITING WATER VAPOR BARRIER PROPERTIES COMPARABLE TO INTACT EPIDERMIS A66-80259
- CUMMING, G.
RECORDING BAG IN A BOX SPIROMETER USABLE IN VENTILATORY FUNCTION STUDIES IN HEALTHY AND DISEASED SUBJECTS A66-80241
- CURRAN, P. M.
PSYCHOLOGICAL STRESS SUSCEPTIBILITY OF NAVAL AND MARINE PILOT TRAINEES, EXAMINING ENVIRONMENTAL CUE MANIPULATION TO CONTROL PERCEPTIONS A66-12355

D

- DALHAMER, W. A.
OPTIMAL CONTROL DISPLAY RELATIONSHIPS IN GENERAL TRACKING INCLUDING PILOTING AND RADAR TRACKING OPERATION A66-13349
- DALLOW, T. P.
NASA BIOSATELLITE PROGRAM - PURPOSES AND PROPOSED EXPERIMENTS A66-80364

- DARENKAYA, N. G.
ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY
PROTONS IN MULTIPLE IRRADIATION
N66-12454
A66-80308
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON
DOGS AND WHITE RATS
N66-12455
A66-14085
- RELATIVE BIOLOGICAL EFFECT OF PROTONS IN
FRACTIONAL IRRADIATION COMPARED WITH MULTIPLE
X-RAY IRRADIATION OF DOGS AND RATS
N66-12459
A66-80296
- COMPARISON OF BIOLOGICAL EFFECTS OF PROTON,
X-RAY, AND GAMMA IRRADIATIONS ON DOGS AND WHITE
RATS
N66-12460
A66-12455
- DARROW, C. W.
HUMAN INTERAREA ELECTROENCEPHALOGRAPHIC PHASE
RELATIONSHIPS FOLLOWING SENSORY AND IDEATIONAL
STIMULI
A66-80277
A66-13114
- DAVIS, G. D.
POTENTIAL APPLICATIONS OF RADIOISOTOPES TO
OPERATION OF MANNED SPACECRAFT LIFE SUPPORT
SYSTEMS
SAN-575-12
N66-12582
A66-12361
- DAVISON, F. C.
INHALATION STUDY OF NEODYMIUM OXIDE PATHOGENESIS
IN MICE AND GUINEA PIGS - ANIMAL STUDY
COO-1170-4
N66-12951
A66-12361
- DAVYDOV, B. I.
POSSIBILITIES OF PHARMACEUTICAL AND CHEMICAL
PROTECTION OF HUMAN SUBJECTS AGAINST RADIATION
INJURIES DURING OUTER SPACE FLIGHTS
A66-80309
A66-12361
- BIOLOGICAL EFFECT IN MOUSE OF GAMMA IRRADIATION
AS AFFECTED BY SOLAR FLARE, RADIOPROTECTIVE DRUGS,
AND ACCELERATION STRESS DURING SIMULATION OF
RADIATION CONDITIONS OF SPACEFLIGHT
A66-80402
A66-80402
- DE BUONO, G. J.
ANIMAL TEMPERATURE SENSING FOR STUDYING EFFECT OF
PROLONGED ORBITAL FLIGHT ON CIRCADIAN RHYTHMS OF
POCKET MICE
A66-12767
A66-12767
- DE FELICE, D.
SUITABILITY OF TEXTUROMETER FOR MEAT TEXTURE
DESCRIPTION - HARDNESS, COHESIVENESS,
ELASTICITY, CHEWINESS, AND WATER RELEASE OF
FRESH AND FREEZE DEHYDRATED MEATS
FD-17
N66-14020
A66-14077
- DE RESPIRIS, D. L.
ELECTROCHEMICAL CARBON DIOXIDE CONCENTRATION
SYSTEM FOR PURIFYING SPACE CABIN ATMOSPHERE
NASA-CR-54849
N66-13114
A66-80372
- DEAN, P. N.
COMPUTER PROGRAMS FOR REDUCING METABOLIC DATA
OBTAINED BY SCINTILLATION COUNTERS
LA-3298
N66-13431
A66-80382
- DEBOO, G. J.
LONG-LIFE PHYSIOLOGICAL TELEMETRY APPARATUS FOR
BODY TEMPERATURE MEASUREMENT IN SMALL ANIMALS
A66-80242
A66-80385
- DEGEEST, H.
REFLEX EFFECTS OF CEPHALIC HYPOXIA, HYPERCAPNIA,
AND ISCHEMIA UPON VENTRICULAR CONTRACTILITY IN
DOGS.
A66-80350
A66-80402
- DELONE, N. L.
EFFECT OF SPACE FLIGHT FACTORS ON REPRODUCTIVE
SYSTEM OF DROSOPHILA AND GENETIC APPARATUS OF
TRADESCANTIA
A66-80371
A66-80249
- DEMENT, W. C.
BIOLOGICAL ROLE OF RAPID EYE MOVEMENT STATE
A66-80168
A66-80253
- DEMOCHKINA, N. G.
FEASIBILITY OF USING CHICKEN AND DUCK FOR
ASTRONAUT FOOD IN CLOSED ECOLOGICAL SYSTEM
A66-80253
- DENISOV, V. G.
MAN-MACHINE RELATIONSHIP DURING SPACE FLIGHT
A66-14085
A66-80296
- SIMULATORS USED IN TRAINING ASTRONAUTS FOR
SPACEFLIGHT
A66-80296
- DERBENEVA, N. A.
BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON
DOGS AND WHITE RATS
N66-12455
A66-13114
- DEREZINSKI, S. J.
ELECTROCHEMICAL CARBON DIOXIDE CONCENTRATION
SYSTEM FOR PURIFYING SPACE CABIN ATMOSPHERE
NASA-CR-54849
N66-13114
A66-12361
- DETRICK, W. R.
CAUSES OF COMPRESSION FRACTURES OF SPINE DURING
LARGE NUMBER OF USAF EJECTIONS
A66-12361
A66-12453
- DEYEV, YU. S.
DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES
USING SYNCHROCYCLOTRON - IRRADIATION OF
ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION
RESISTANCE OF PLASTICS
N66-12453
A66-80342
- DIEMER, K.
OXYGEN DIFFUSION IN BRAIN TISSUE CALCULATED ON
BASIS OF CONICAL SPATIAL MODEL
A66-80342
A66-80343
- OXYGEN DIFFUSION IN BRAIN IN VENOUS OR ARTERIAL
HYPOXIA
A66-80343
A66-80217
- DILL, D. B.
SWEAT CHLORIDE CONCENTRATION AND RATE, METABOLIC
RATE, SKIN AND BODY TEMPERATURES OF YOUNG AND OLD
MALES WALKING IN DESERT ENVIRONMENT
A66-80217
A66-12358
- DILLE, J. R.
SELF-REPORTED STRESS-RELATED SYMPTOMS AMONG AIR
TRAFFIC CONTROL SPECIALISTS / ATCS/ AND NON- ATCS
PERSONNEL
A66-12358
A66-14077
- DOBROV, N. N.
BIOLOGICAL EFFECTS OF COSMIC RADIATION UNDER
LABORATORY AND FLIGHT CONDITIONS ON VARIOUS CRAFT
TO STUDY MEASURES FOR PHARMACOLOGICAL AND
BIOLOGICAL PROTECTION
A66-14077
A66-80309
- POSSIBILITIES OF PHARMACEUTICAL AND CHEMICAL
PROTECTION OF HUMAN SUBJECTS AGAINST RADIATION
INJURIES DURING OUTER SPACE FLIGHTS
A66-80309
A66-80372
- HUMAN CELLS AND GENETIC CHANGES IN ESCHERICHIA
DURING EXPOSURE STRESSES OF SPACE FLIGHT ON VOSTOK
SPACECRAFT
A66-80372
A66-80382
- SURVIVAL DURING SCREENING OF VARIOUS AREAS OF RAT
BODY TO GAMMA RAYS AND HIGH ENERGY PROTONS AS
AFFECTED BY VIBRATION OR ACCELERATION STRESS
A66-80382
A66-80385
- AMINOTHIOLS AND PYRIMIDINE ANALOGS TESTED FOR
PROTECTIVE EFFECTS AGAINST GENETIC MUTATIONS IN
ESCHERICHIA COLI EXPOSED TO X-RAY IRRADIATION
A66-80385
A66-80402
- BIOLOGICAL EFFECT IN MOUSE OF GAMMA IRRADIATION
AS AFFECTED BY SOLAR FLARE, RADIOPROTECTIVE DRUGS,
AND ACCELERATION STRESS DURING SIMULATION OF
RADIATION CONDITIONS OF SPACEFLIGHT
A66-80402
A66-80249
- DOBSON, R. L.
MORPHOLOGICAL AND FUNCTIONAL ASPECTS OF
SWEATING-SODIUM SECRETION REABSORPTION AND
BIOLOGICAL MODEL OF SWEAT GLAND
A66-80249
A66-80253
- INCIDENCE, MORPHOLOGY, AND ETIOLOGY OF MILIARIA
OCCURRING DURING EXPOSURE TO HOT ENVIRONMENT
A66-80253

- DOLINA, S. A. A66-13347
 HYPOXIA EFFECTS ON SENSITIVITY TO EPILEPTOGENIC AGENTS AND ON FUNCTIONAL PROPERTIES OF MOTOR FORMATIONS OF BRAIN
 JPRS-33056 N66-12903
- DOLPHIN, G. W.
 METABOLISM AND EXCRETION OF CESIUM, PHOSPHORUS, PLUTONIUM, TRITIUM AND RADIATION, STRONTIUM, SULFUR, TRITIUM AND URANIUM FROM HUMAN BODY
 N66-12686
- DOMSHLAK, M. P.
 ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY PROTONS IN MULTIPLE IRRADIATION
 N66-12454
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON DOGS AND WHITE RATS
 N66-12455
- RELATIVE BIOLOGICAL EFFECT OF PROTONS IN FRACTIONAL IRRADIATION COMPARED WITH MULTIPLE X-RAY IRRADIATION OF DOGS AND RATS
 N66-12459
- COMPARISON OF BIOLOGICAL EFFECTS OF PROTON, X-RAY, AND GAMMA IRRADIATIONS ON DOGS AND WHITE RATS
 N66-12460
- DORONIN, G. P.
 PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS IN MAN OF LONG TERM STAY IN CABIN SIMULATING SPACEFLIGHT ENVIRONMENT
 A66-80300
- DOUGHERTY, J. D.
 SELF-REPORTED STRESS-RELATED SYMPTOMS AMONG AIR TRAFFIC CONTROL SPECIALISTS / ATCS/ AND NON- ATCS PERSONNEL
 A66-12358
- DOWN, S.
 EFFECT OF AGE ON PART AND WHOLE LEARNING IN MAIL SORTERS
 A66-80282
- DRISCOLL, J. M.
 DECISION MAKING EFFECTS OF TWO SOURCES OF UNCERTAINTY DECISION
 A66-80274
- DUDKIN, V. YE.
 RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS, DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION LEVEL DETERMINATION
 N66-12452
- DUDZIAK, R.
 CARDIAC METABOLISM AT REST AND DURING HEART ARREST
 A66-80345
- DUFFEE, D. A.
 BEHAVIORAL EFFECTS OF IONIZED AIR ON RATS
 A66-80278
- DUFFY, E. J.
 MECHANISM, PREVENTION AND TREATMENT OF OXYGEN TOXICITY IN CENTRAL NERVOUS SYSTEM, NOTING ACETYLCHOLINESTERASE ACTIVITY
 A66-13346
- DUKELSKIY, N. I.
 SPEECH STREAM SEGMENTATION INTO PHONEMES
 JPRS-32790 N66-12957
- DYER, D. L.
 PREDICTING PRODUCTION IN LIGHT LIMITED CONTINUOUS CULTURES OF ALGAE, CHLORELLA PYRENOIDOSA AND DUNALIELLA TERTIOLECTA
 A66-80351
- DYMSZA, H. A.
 METABOLIC STUDIES OF ENERGY DENSE COMPOUNDS FOR AEROSPACE NUTRITION
 AMRL-TR-64-121 N66-13594
- E**
- EAKIN, S. K.
 BEHAVIORAL EFFECTS IN RATS OF PROLONGED EXPOSURE TO ULTRA HIGH FREQUENCY RADIATION
 A66-80273
- EASTIS, J. F.
 NUCLEAR FAST RED TECHNIQUE OF CALCIUM IN SERUM, PAROTID FLUID AND URINE IN WEIGHTLESS STATE
- EDWARDS, M. J. A66-80229
 KINETICS OF OXYGEN UPTAKE BY ERYTHROCYTES OF DIFFERENT AGES AS RELATED TO RESPIRATORY FUNCTION OF BLOOD
- EGOROV, A. D. A66-80367
 APPLICATION OF INFORMATION THEORY CONCEPTS TO ANALYSIS OF PHYSIOLOGICAL DATA DURING SPACE FLIGHTS
- EGOROV, B. B. A66-80327
 MODEL OF VESTIBULAR APPARATUS DEMONSTRATING ITS FUNCTIONS UNDER CONDITIONS OF VARIABLE GRAVITATIONAL FIELD
- EICHENHOLZ, A. A66-80348
 CLINICAL MANIFESTATIONS OF RESPIRATORY ALKALOSIS
- EISDORFER, C. A66-80283
 CHARACTERISTICS OF LIPID MOBILIZATION AND PERIPHERAL DISPOSITION IN AGED INDIVIDUALS
- ELAM, C. B. N66-12195
 ERROR AND CONTROL EFFICIENCY ANALYSIS OF PILOTS EXPOSED TO SIMULATED PITCH, ROLL, YAW, AND ALTITUDE VARIATIONS
 NASA-CR-68219
- ELFNER, L. A66-80154
 CONTINUITY EFFECT WITH ALTERNATELY SOUNDED NOISE AND TONE SIGNALS AS FUNCTION OF MANNER OF PRESENTATION
- ELKIND, J. I. N66-13516
 COMPARISON OF CROSS CORRELATION AND ORTHOGONALIZED EXPONENTIAL ANALYSES BY REGRESSION ANALYSIS FOR IDENTIFICATION OF HUMAN PILOT DYNAMIC RESPONSE CHARACTERISTICS
 NASA-CR-68701
- ELLO, E. A66-80404
 RENAL CIRCULATION OF DOG AS AFFECTED BY ANGIOTENSIN
- EMDE, G. A66-13508
 TRAINING AND INSTRUCTION BY MEANS OF TEACHING MACHINES IN FIELD OF AVIATION
- EMELIANOV, M. D. A66-80297
 SPATIAL ORIENTATION DISTURBANCES AND VEGETATIVE DISORDERS OCCURRING IN COSMONAUTS DURING SPACE FLIGHT DUE TO DISTURBANCES IN PHYSIOLOGICAL INTERPLAY OF SENSING MECHANISMS GOVERNING SPACE PERCEPTION
- BASIC PRINCIPLES OF SPECIAL TRAINING OF ASTRONAUTS BY SIMULATION OF SPACE FLIGHT FACTORS
- EFFECT OF SPACE FLIGHT FACTORS ON HEART ACTIVITY, RESPIRATION AND ELECTROENCEPHALOGRAM OF ASTRONAUTS B. F. BYKOVSKII AND V. V. TERESHKOVA
 A66-80370
- EPPLEY, R. W. A66-80351
 PREDICTING PRODUCTION IN LIGHT LIMITED CONTINUOUS CULTURES OF ALGAE, CHLORELLA PYRENOIDOSA AND DUNALIELLA TERTIOLECTA
- EPSTEIN, S. E. A66-80147
 SYMPATHETIC NERVOUS STIMULATION OF HEART - BETA ADRENERGIC BLOCKING CARDIAC FUNCTION, CIRCULATORY RESPONSE AND PHYSICAL EXERCISE
- EREMENKO, I. V. A66-80330
 AUTOMATIC DEVICE FOR PRODUCING CONTROLLED HYPOTHERMIA IN ANIMALS AND HUMANS
- ERNSTING, J. A66-12357
 ALVEOLAR NITROGEN CONCENTRATION AND ENVIRONMENTAL PRESSURE INFLUENCE UPON RATE OF GAS ABSORPTION FROM NONVENTILATED LUNG IN DOG

- EROSHIN, I. S.
ILLUMINATION AND CELL DENSITY EFFECTS ON GROWTH
RATE OF CHLORELLA VULGARIS CULTURE
A66-80400
- ESKIN, A.
ENVIRONMENTAL TEMPERATURE EFFECTS ON EKG OF
SQUIRREL MONKEY - ANIMAL STUDY OF HEART RATE AND
T-WAVE AMPLITUDE
NASA-CR-68306
N66-12972
- ESTES, W. K.
LEARNING OF PAIRED-ASSOCIATE ITEMS RELATED TO
DIFFERENT REPETITIVE REINFORCEMENT AND TESTING
SEQUENCES
TR-76
N66-13689
- EULER, U. S. V.
DEGREE OF MENTAL STRESS CORRELATED WITH EXCRETION
OF CATECHOLAMINE, FREE ADRENALINE AND
NORADRENALINE IN URINE
A66-14081
- EYRING, H. B.
EFFECTS OF ORGANIZATIONAL AFFILIATION ON HIGH
ENERGY PHYSICS RESEARCH GROUPS - PSYCHOLOGICAL
FACTOR OF GROUP BEHAVIOR
NASA-CR-68303
N66-12994
- EZEPCHUK, N. I.
PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS IN MAN OF
LONG TERM STAY IN CABIN SIMULATING SPACEFLIGHT
ENVIRONMENT
A66-80300
- F**
- FABRE, J.
NUTRITIONAL PROBLEMS OF SUGAR REGULATION IN
AVIATION MEDICINE - HYPERGLYCEMIA IN RATS AND SURV
OF NUTRITIONAL HABITS OF FLYING PERSONNEL
A66-80361
- FARKAS, E.
SUITABILITY OF TEXTUROMETER FOR MEAT TEXTURE
DESCRIPTION - HARDNESS, COHESIVENESS,
ELASTICITY, CHEWINESS, AND WATER RELEASE OF
FRESH AND FREEZE DEHYDRATED MEATS
FD-17
N66-14020
- FEDERMAN, P.
RELATIONSHIP BETWEEN ANTISUBMARINE HELICOPTER
TEAM PERFORMANCE AND COMMUNICATIONS FLOW WITHIN
TEAM DURING SIMULATED ATTACK
NAVTRADEVCEM-1537-1
N66-13972
- FEDOROVA, L. D.
EFFECT OF PROLONGED EXPOSURE TO HIGH CONCENTRATION
OF OXYGEN ON LUNGS AND BLOOD IN MICE
A66-80389
- FELEKI, V.
FOOD INTAKE, BODY WEIGHT, AND ACTIVITY OF RAT
EXERCISING IN HOT ENVIRONMENT
A66-80220
- FERNANDEZ-MORAN, H.
HIGH RESOLUTION ELECTRON MICROSCOPY OF FRACTION
I PROTEIN FROM PLANT LEAVES
NASA-CR-68099
N66-12198
- SPACE RELATED MOLECULAR BIOLOGY AND MOLECULAR
ORGANIZATION OF EXTRATERRESTRIAL MATTER - DESIGN
AND CONSTRUCTION OF HIGH VACUUM CONTAINER FOR
TRANSFER OF EXTRATERRESTRIAL COLLECTING SURFACES
NASA-CR-68844
N66-13830
- FINLAY, J. R.
DIAGNOSIS CRITERIA FOR GLAUCOMA IN PILOTS AND
FLIGHT FITNESS.
A66-80205
- FLATT, J.
FEASIBILITY OF USING ENERGY IN BREATHING OXYGEN
WHEN EXPANDED FROM STORAGE PRESSURE TO BREATHING
PRESSURE TO POWER OXYGEN-CIRCULATING BLOWER AND
WATER CIRCULATING PUMP
AMRL-TR-65-128
N66-13595
- FLICKINGER, D. D.
MONITORING HUMAN PERFORMANCE DURING MANNED ORBITAL
FLIGHT FOR ASSESSMENT OF CENTRAL NERVOUS SYSTEM
FUNCTION, NOTING ANIMAL STUDIES DURING SIMULATED
STRESSES OF SPACE FLIGHT
A66-14088
- COMPUTER ANALYSIS OF ELECTROENCEPHALOGRAPHIC
RECORDING DURING ENVIRONMENTAL STRESSES OF SPACE
FLIGHT
A66-80165
- FLINT, M. M.
ELECTROMYOGRAPHIC STUDY OF ABDOMINAL MUSCLE
INVOLVEMENT DURING PERFORMANCE OF VARIOUS FORMS OF
SIT UP EXERCISE
A66-80337
- FOA, P. P.
ENDOCRINE AND METABOLIC RESPONSE OF DOGS TO WHOLE
BODY VIBRATION
A66-80194
- FOX, S.
CARDIOVASCULAR AND RESPIRATORY DISEASE IN FORMER
FLIGHT STUDENTS - AEROSPACE MEDICINE
NASA-CR-68541
N66-13165
- FOX, S. W.
RELATION OF EARLIEST PROTEINS TO PROTOCELL, WITH
TABULATED COMPARISON OF KEY PROPERTIES OF ACID
PROTEINOIDS AND PROTEIN
A66-13369
- FRANK, G. M.
BIOLOGICAL EFFECTS OF COSMIC RADIATION UNDER
LABORATORY AND FLIGHT CONDITIONS ON VARIOUS CRAFT
TO STUDY MEASURES FOR PHARMACOLOGICAL AND
BIOLOGICAL PROTECTION
A66-14077
- FRAYSER, R.
PULMONARY DIFFUSING CAPACITY IN SUBJECTS AT REST
AND DURING EXERCISE AS AFFECTED BY INCREASED
ENVIRONMENTAL TEMPERATURE
A66-80224
- FREEMAN, R. G.
ULTRAVIOLET INJURY IN MOUSE AS AFFECTED BY HOT
ENVIRONMENT
A66-80255
- FREGLY, A. R.
COMPARATIVE EFFECTS OF PROLONGED ROTATION AT 10
RPM ON POSTURAL EQUILIBRIUM IN VESTIBULAR NORMAL
AND DEFECTIVE HUMAN SUBJECTS
A66-80198
- FRENCH, J. D.
SUMMARY OF PROGRAM FOR MONITORING BRAIN FUNCTION
AND PERFORMANCE IN PRIMATE UNDER PROLONGED
WEIGHTLESSNESS
NASA-CR-68413
N66-13089
- FREYSCHUSS, U.
VENTILATION, HEART RATE, LACTATE FORMATION, AND
OXYGEN CONSUMPTION DURING ARM AND LEG EXERCISE IN
SUPINE AND SITTING POSITION
A66-80211
- FRYER, T. B.
LONG-LIFE PHYSIOLOGICAL TELEMETRY APPARATUS FOR
BODY TEMPERATURE MEASUREMENT IN SMALL ANIMALS
A66-80242
- G**
- GAIDAMAKIN, N. A.
PROTON AND GAMMA IRRADIATION EFFECTS ON SPLEEN,
THYMUS AND BONE MARROW IN MICE
A66-80383
- GALANSINO, G.
ENDOCRINE AND METABOLIC RESPONSE OF DOGS TO WHOLE
BODY VIBRATION
A66-80194
- GALBAN, P.
GASTRODUODENAL ULCERS IN FRENCH AIR FORCE
PERSONNEL - STATISTICAL ANALYSIS
A66-80363
- GAMBINO, J. J.
HISTOPATHOLOGY OF POCKET MOUSE INTESTINE MUCOUS
AFTER IRRADIATION - GROWTH AND DEVELOPMENT DATA
ON LABORATORY POCKET MOUSE
NASA-CR-68217
N66-12200
- GANSHINA, A. N.
ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY
PROTONS IN MULTIPLE IRRADIATION
N66-12454
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON
DOGS AND WHITE RATS
N66-12455

- GARDNER, D.
SUITABILITY OF TEXTUROMETER FOR MEAT TEXTURE
DESCRIPTION - HARDNESS, COHESIVENESS,
ELASTICITY, CHEWINESS, AND WATER RELEASE OF
FRESH AND FREEZE DEHYDRATED MEATS
FD-17 N66-14020
- GASTEVA, S. V.
TOLERANCE OF RAT TO HYPOXIA DURING RADIATION
SICKNESS CAUSED BY X-RAY IRRADIATION A66-80384
- GAUER, D. H.
PHYSIOLOGICAL PROBLEMS OF WEIGHTLESSNESS
DISCUSSING MOTION SICKNESS, FLUID VOLUME CONTROL
AND CHRONIC EFFECTS ON CIRCULATORY SYSTEM A66-14071
- GAZENKO, D. G.
SOVIET BIOLOGICAL AND PHYSIOLOGICAL INVESTIGATIONS
IN ROCKETS AND SATELLITES, PARTICULARLY
NONPATHOLOGICAL CHARACTER OF PHYSIOLOGICAL
REACTIONS TO STRESS FACTORS A66-14076
- ARTIFICIAL ENVIRONMENT IN MANNED SPACECRAFT FOR
PRESERVING HUMAN LIFE, COMPARING PHYSICAL,
CHEMICAL AND BIOLOGICAL PROCESSES A66-14079
- SPACE BIOLOGY AND MEDICINE RESEARCH, STRESSING
FLIGHT EXPERIMENTS PERFORMED WITH RUSSIAN
SATELLITES AND SPACECRAFT A66-14089
- INVESTIGATIONS OF PHYSIOLOGICAL RESPONSES OF
ANIMALS AND MAN TO STRESSES IN VOSTOK SPACECRAFT A66-80160
- PRINCIPLES FOR CREATING SYSTEMS CAPABLE OF
MAINTAINING OPTIMUM CONDITIONS IN SPACE CAPSULE
ENVIRONMENT A66-80190
- MODEL OF VESTIBULAR APPARATUS DEMONSTRATING ITS
FUNCTIONS UNDER CONDITIONS OF VARIABLE
GRAVITATIONAL FIELD A66-80327
- PHYSIOLOGICAL DATA FOR EVALUATION OF HEALTH AND
WORK CAPABILITY OF ASTRONAUT DURING ORBITAL
FLIGHTS A66-80369
- INVESTIGATIVE AND AUTOMATIC CONTROL DATA
PROCESSING APPLICATIONS IN BIOASTRONAUTICS N66-12220
- SENSORS FOR PHYSIOLOGICAL INVESTIGATIONS UNDER
SPACE FLIGHT CONDITIONS - BIOASTRONAUTICS N66-12221
- PHYSIOLOGICAL RESPONSES TO AND BIOLOGICAL EFFECTS
OF SPACE FLIGHT STRESS - ASTRONAUT PERFORMANCE
ANL-TRANS-209 N66-13520
- GEDEON, J.
THREE INDEPENDENT SYSTEMS OF MATRIX EQUATIONS FOR
SOLVING TRANSFER FUNCTION OF MULTIPARAMETER LINEAR
SYSTEM HANDLING BY HUMAN OPERATOR A66-12699
- GELFAND, R.
BREATH BY BREATH MEASUREMENT OF RESPIRATORY
FUNCTIONS - INSTRUMENTATION AND APPLICATIONS A66-80240
- GENIN, A. M.
ARTIFICIAL ENVIRONMENT IN MANNED SPACECRAFT FOR
PRESERVING HUMAN LIFE, COMPARING PHYSICAL,
CHEMICAL AND BIOLOGICAL PROCESSES A66-14079
- PRINCIPLES FOR CREATING SYSTEMS CAPABLE OF
MAINTAINING OPTIMUM CONDITIONS IN SPACE CAPSULE
ENVIRONMENT A66-80190
- GEORGE, H. C.
HIGH ALTITUDE FLYING IN MILITARY AIR TRANSPORT
SERVICE AND PROTECTIVE MEASURES FOR PILOT A66-80338
- GEORGIEVSKII, V. S.
EIGHT HOUR ISOLATION AND HYPOKINESIA EFFECT ON
BIOCHEMICAL AND PHYSIOLOGICAL INDICES IN MAN A66-80299
- CHANGES IN PHYSIOLOGICAL AND BIOCHEMICAL STATE OF
MAN AFTER EXPOSURE TO SMALL CONCENTRATIONS OF
CARBON MONOXIDE - HEART FUNCTION, RESPIRATION AND
CHOLINESTERASE BLOOD LEVEL A66-80304
- GERASIMOVA, G. K.
ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY
PROTONS IN MULTIPLE IRRADIATION N66-12454
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON
DOGS AND WHITE RATS N66-12455
- GERNANDT, B. E.
PROLONGED HOT OR COLD STIMULATION EFFECTS ON EYE
MOVEMENTS, VESTIBULOSPINAL, AND SEGMENTAL SPINAL
ACTIVITIES IN MONKEYS NASA-CR-68266 N66-12177
- GERSHENOVICH, Z. S.
OXIDATION AND PHOSPHORYLATION CORRELATION IN BRAIN
TISSUES DURING OVERCOOLING AND REWARMING IN
EXPERIMENTAL ANIMALS. A66-80170
- GILBERT, R.
INFLUENCE OF PROPRIOCEPTOR IN VENTILATORY RESPONSE
TO EXERCISE A66-80223
- GILLINGHAM, K. K.
CONTROL OF VESTIBULAR APPARATUS BY CENTRAL NERVOUS
SYSTEM - PREVENTION OF MOTION SICKNESS -
AEROSPACE MEDICINE AD-623676 N66-14320
- GINGRAS, G.
STUDY OF MODE OF ACTION OF 3-/4-CHLOROPHENYL-/1,
1-DIMETHYLUREA ON PHOTOSYNTHESIS AND OXYGEN
PRODUCTION IN CHLORELLA PYRENOIDOSA AS FUNCTION OF
LIGHT AND TEMPERATURE A66-80290
- GINZBURG, I. SH.
EFFECT OF ELEVATED INTRAPULMONARY PRESSURE ON
RESPIRATION AND CIRCULATION FTD-TT-65-154/162 N66-12387
- GITELZON, I. I.
ILLUMINATION AND CELL DENSITY EFFECTS ON GROWTH
RATE OF CHLORELLA VULGARIS CULTURE A66-80400
- GIURDZHIAN, A. A.
SPATIAL ORIENTATION DISTURBANCES AND VEGETATIVE
DISORDERS OCCURRING IN COSMONAUTS DURING SPACE
FLIGHT DUE TO DISTURBANCES IN PHYSIOLOGICAL
INTERPLAY OF SENSING MECHANISMS GOVERNING SPACE
PERCEPTION A66-14084
- GODBEY, A. L.
AIRSICKNESS IN STUDENT AVIATORS DURING FLIGHT
TRAINING AS RELATED TO VESTIBULAR AND VISUAL
STIMULI AND ANXIETY A66-80206
- AIR SICKNESS IN STUDENT AVIATORS ASSOCIATED WITH
PEAKS OF PHYSIOLOGICAL AND PSYCHOLOGICAL STRESS
DURING TRAINING NSAM-939 N66-13700
- GOLDBLITH, S. A.
METABOLIC STUDIES OF ENERGY DENSE COMPOUNDS FOR
AEROSPACE NUTRITION AMRL-TR-64-121 N66-13594
- GOLDEN, P. M.
HAZARDS TO HUMAN EAR FROM SHOCK WAVES OF HIGH
ENERGY ELECTRIC DISCHARGES AWRE-E-1/65 N66-13711
- GOLENHOFEN, K.
THERMOREGULATION RESPONSES OF HUMAN MUSCULATURE
TO SUDDEN COOLING AND TO EMOTIONAL STRESS A66-80344
- GOLOVKINA, A. V.
COMBINED ACCELERATION, VIBRATION, AND RADIATION
EFFECTS ON MITOTIC ACTIVITY OF BONE MARROW CELLS
IN MICE A66-80319

- EFFECT OF VIBRATION ON CELL DIVISION IN BONE MARROW OF MOUSE N66-13791
- GOLUBKOVA, B. M.
ULTRAVIOLET RADIATION EFFECTS ON VARIOUS FLOWERING PLANTS UNDER NEAR SPACE CONDITIONS SUCH AS ARCTIC AND HIGH ALTITUDE A66-80324
- GORBOV, F. D.
EXPERIMENTAL PSYCHOLOGICAL EXAMINATION OF COSMONAUTS A66-80298
- GOURVES, P.
HYPOGLYCEMIA IN FLYING PERSONNEL - CASE HISTORIES A66-80358
- GRACHEV, V. I.
RELATIVE BIOLOGICAL EFFECT OF PROTONS IN FRACTIONAL IRRADIATION COMPARED WITH MULTIPLE X-RAY IRRADIATION OF DOGS AND RATS N66-12459
- GRAEVSKII, E. IA.
BIOCHEMICAL EVIDENCE OF SIMILARITY OF RADIATION PROTECTION MECHANISMS OF CYSTAMINE, CYSTEAMINE, SEROTININ, AND ANOXIA IN ALBINO MICE A66-80169
- GRAHAM, C. H.
SPECIFICATION OF STIMULUS CONDITIONS FOR VISUAL SPACE PERCEPTION IN TERMS OF MONOCULAR AND BINOCULAR CUES A66-13795
VISUAL PERCEPTION OF FORMS AND RELEVANT FACTORS A66-13796
VISUAL PERCEPTION OF REAL AND APPARENT MOVEMENT, NOTING CUES AND THRESHOLD A66-13797
- GRANDPIERRE, R.
HEART AND BREATHING RATE AND ELECTROENCEPHALOGRAPHIC RESPONSES OF RATS DURING WEIGHTLESSNESS A66-14083
ELECTROENCEPHALOGRAPHIC RESPONSES AND CHANGES IN ELECTRIC POTENTIALS IN NECK MUSCLES OF RAT DURING SHORT PERIODS OF WEIGHTLESSNESS A66-80161
- GRAUL, E. H.
BIOLOGICAL STRESSES OF MANNED SPACE FLIGHT IN LIMITING FLIGHT DURATION, NOTING ISOLATION EFFECT A66-13507
- GRAYBIEL, A.
VESTIBULAR SICKNESS SUSCEPTIBILITY UNDER CONDITIONS OF WEIGHTLESSNESS A66-14082
VALIDITY OF OCULOGRAVIC ILLUSION AS SPECIFIC INDICATOR OF OTOLITH FUNCTION A66-80200
MEASUREMENT OF OTOLITH ACTIVITY AS INDICATED BY OCULAR COUNTERROLLING IN RESPONSE TO BODY TILT WITHIN FORCE FIELD OF ZERO G, ONE-HALF G, AND STANDARD G - EXTRALABYRINTHINE FACTORS NASA-CR-68391 N66-13097
OCULOGRAVIC ILLUSION - PERCEPTION OF VISUAL HORIZONTAL IN NORMAL AND INNER EAR DEFECTIVE SUBJECTS DURING PROLONGED ROTATION NASA-CR-68659 N66-13560
COMPARISON OF EFFECTIVENESS OF ANTIMOTION SICKNESS DRUGS TESTED IN HUMAN CENTRIFUGE NASA-CR-68858 N66-13833
- GREENE, N. D.
THERMAL AND ELECTRIC CONDUCTIVITY OF BODY FLUIDS AND TISSUES GLR-37 N66-12592
- GREENLEAF, J. E.
WATER CONSUMPTION BY MAN IN WARM ENVIRONMENT ANALYZED STATISTICALLY AND RELATED TO METABOLIC VARIABLES A66-80216
- GRIGORYEV, YU. G.
RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS, DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION
- LEVEL DETERMINATION N66-12452
- BIOLOGICAL EFFECT OF DIFFERENT DOSES OF IONIZING RADIATION ON VESTIBULAR APPARATUS N66-12458
- COMPARISON OF BIOLOGICAL EFFECTS OF PROTON, X-RAY, AND GAMMA IRRADIATIONS ON DOGS AND WHITE RATS N66-12460
- GRINGS, W. W.
AUTONOMIC COMPONENTS OF HUMAN ORIENTING BEHAVIOR IN RESPONSE TO WHITE NOISE A66-80275
- GRISHINA, I. S.
PROLONGED HYPOKINESIA EFFECT ON ACCELERATION TOLERANCE OF HUMAN A66-80316
- GUDA, V. A.
SPACE RADIATION-RELATIVE BIOLOGICAL EFFECTIVENESS AND PROBLEMS OF SHIELDING DURING MOON MISSION A66-80310
- GUDZ, P. Z.
BLOOD SUPPLY OF EXTREMITY MUSCLES DURING INTENSE PHYSICAL WORK IN ALBINO RATS A66-80174
- GULTYAYAV, P. A.
EFFECT OF REPLACING ATMOSPHERIC NITROGEN BY HELIUM ON DEVELOPMENT OF CHICK EMBRYOS JPRS-32905 N66-12299
- GUROVSKII, N. N.
SIMULATORS USED IN TRAINING ASTRONAUTS FOR SPACEFLIGHT A66-80296
BASIC PRINCIPLES OF SPECIAL TRAINING OF ASTRONAUTS BY SIMULATION OF SPACE FLIGHT FACTORS A66-80297
- GURTNER, G.
PRESSURE FLOW RELATIONSHIP OF AIRWAYS IN SITTING SUBJECT UNDER NORMAL CONDITIONS, IMMERSED IN WATER TO NECK LEVEL, AND DURING NEGATIVE PRESSURE BREATHING SUFFICIENT TO REDUCE LUNG VOLUME AS DURING IMMERSION. A66-80236
- GURVICH, A. M.
HETEROGENOUS CHARACTER OF SLOW WAVES OF DELTA RHYTHM OCCURRING DURING ANOXIC CLINICAL DEATH AND REANIMATION IN DOGS A66-80352
- H
- HAGEN, N. S.
FORTRAN COMPUTER PROGRAM FOR EVALUATION OF POST IRRADIATION SURVIVAL TIMES - ANIMAL STUDY UCLA-12-573 N66-12917
- HAIST, R. E.
EFFECT OF GLUCAGON ON BLOOD SUGAR AND INORGANIC PHOSPHORUS LEVELS IN NORMOTHERMIC AND HYPOTHERMIC RATS A66-80245
- HALCOMB, C. G.
ORGANISMIC VARIABLES FROM PERSONALITY AND INTELLIGENCE TESTS AS PREDICTORS OF VIGILANCE BEHAVIOR A66-80178
- HALL, F. G.
SWEAT CHLORIDE CONCENTRATION AND RATE, METABOLIC RATE, SKIN AND BODY TEMPERATURES OF YOUNG AND OLD MALES WALKING IN DESERT ENVIRONMENT A66-80217
- HALL, I. H.
SUCCINATE-PROTECTIVE AGENT AGAINST HIGH PRESSURE OXYGEN TOXICITY IN RAT A66-80365
- HALL, J. F.
HANDGEAR INSULATION EFFECTIVENESS OF FREON 12, CARBON DIOXIDE, AND HELIUM A66-80227
- HAMMOND, S. E.
TWO TYPES OF PLUTONIUM EXPOSURE IN URINE, FECES, AND BLOOD OF HUMAN BODY, AND EFFECTIVENESS OF DIETHYLENTRIAMINEPENTAACETIC ACID TREATMENTS N66-12685

- HAND, D. J.
AIRSICKNESS IN STUDENT AVIATORS DURING FLIGHT TRAINING AS RELATED TO VESTIBULAR AND VISUAL STIMULI AND ANXIETY A66-80206
- AIR SICKNESS IN STUDENT AVIATORS ASSOCIATED WITH PEAKS OF PHYSIOLOGICAL AND PSYCHOLOGICAL STRESS DURING TRAINING NSAM-939 N66-13700
- HANSON, J. S.
APPLICATION OF DIGITAL COMPUTATION TECHNIQUES FOR ON LINE DISPLAY OF PULMONARY NITROGEN WASHOUT AND COMPARISON OF DATA WITH CONVENTIONAL TECHNIQUES A66-80231
- HARRIS, C. C.
NUCLEAR RADIATION MEDICINE - METHODS OF RECORDING COUNTING RATE ORNL-P-1383 N66-12899
- HARRISON, J.
PHYSIOLOGICAL ROLE OF ADRENAL MEDULLA IN PALMAR ANHDROTIC RESPONSE TO STRESS A66-80215
- HASELKORN, R.
HIGH RESOLUTION ELECTRON MICROSCOPY OF FRACTION I PROTEIN FROM PLANT LEAVES NASA-CR-68099 N66-12198
- HAWKINS, R. D.
EFFECT OF GLUCAGON ON BLOOD SUGAR AND INORGANIC PHOSPHORUS LEVELS IN NORMOTHERMIC AND HYPOTHERMIC RATS A66-80245
- HEGE, J. S.
ANTIBODY PLAQUE FORMING CELLS - KINETICS OF PRIMARY AND SECONDARY IMMUNE HEMOLYSIN RESPONSE USNRDL-897 N66-14207
- HELLSTROM, G.
GENERATION AND TRANSMISSION OF PRESSURE PULSES IN TUBULAR SYSTEM IMPACTED BY FALLING STEEL WEIGHT RELATED TO IMPACT INJURY A66-80340
- HENDERSON, M. J.
EFFECT OF GLUCAGON ON BLOOD SUGAR AND INORGANIC PHOSPHORUS LEVELS IN NORMOTHERMIC AND HYPOTHERMIC RATS A66-80245
- HENNEBERGER, H. G. C.
CRITERIA FOR BODY BLOCKS, ANTHROPOMORPHIC DUMMIES, AND INSTRUMENTATION FOR USE IN STATIC AND DYNAMIC TESTING OF CIVIL AIRCRAFT SEAT SYSTEMS FAA-ADS-20 N66-13926
- HENRIKSEN, T.
INDUCED FREE RADICALS IN ENZYMES BY ELECTRONS AND HEAVY IONS UCRL-16358 N66-13907
- HENZEL, J. H.
VIBRATION EXPOSURE WITH VARYING PEAK AND RMS ACCELERATION AND FREQUENCY IN LOW ALTITUDE HIGH-SPEED FLIGHT A66-13355
- AEROSPACE MEDICINE - COMPRESSION DEFORMITIES OF THORACIS VERTEBRAE IN HUMAN TOLERANCE TEST DURING EXPOSURE TO SIMULATED ESCAPE SYSTEM ROCKET THRUST VECTOR AMRL-TR-65-134 N66-12885
- HERTIG, B. A.
HEART RATE AND OUTPUT AND BODY TEMPERATURE OF ACCLIMATIZED MALE DURING EXERCISE IN HOT ENVIRONMENT A66-80219
- COMPARISON OF HUMAN RESPONSES TO PULSED AND UNPULSED ENVIRONMENTAL HEAT AND PHYSICAL EXERCISE A66-80222
- HIATT, E. P.
DYNAMIC ENVIRONMENTAL INFLUENCES ON MAN DURING SPACE FLIGHT COVERING FORCE FIELDS, INERTIAL FORCES DUE TO ACCELERATION AND METHODS OF PROTECTION A66-14074
- POSTURE, RESPIRATION, AND PULMONARY FUNCTION IN RELATION TO PROLONGED ACCELERATION EXPOSURE IN SPACE FLIGHT A66-80159
- HICKS, R. G.
HUMAN INTERAREA ELECTROENCEPHALOGRAPHIC PHASE RELATIONSHIPS FOLLOWING SENSORY AND IDEATIONAL STIMULI A66-80277
- HIGUCHI, T.
MECHANDELASTIC PROPERTIES OF CORNIFIED EPITHELIUM AS AFFECTED BY VARIOUS SOLVENT AND SOLUTION ENVIRONMENTAL CHANGES A66-80258
- HOHLE, R. H.
DETECTION OF VISUAL SIGNAL WITH LOW BACKGROUND NOISE A66-80267
- HORNSETH, J. P.
MANUAL CONTROL OF PULSE FREQUENCY MODULATED REACTION CONTROL AMRL-TR-65-145 N66-13596
- HORTON, B. D.
MECHANISM, PREVENTION AND TREATMENT OF OXYGEN TOXICITY IN CENTRAL NERVOUS SYSTEM, NOTING ACETYLCHOLINESTERASE ACTIVITY A66-13346
- MECHANISM OF IN VIVO RBC DAMAGE BY OXYGEN, NOTING EFFECT ON CANINE ERYTHROCYTES A66-13348
- HORVATH, S. M.
THERMOREGULATORY METABOLIC RESPONSE OF COLD AND HEAT EXPOSED SQUIRREL MONKEYS /SAIMIRI SCIUREA/ AS COMPARED TO SIMILARLY TREATED RODENTS A66-80225
- HOUDAS, Y.
FRENCH DEVELOPED PROTECTIVE CLOTHING FOR FLYING PERSONNEL AGAINST HIGH ENVIRONMENTAL TEMPERATURES A66-80360
- HOWARD, P.
ASTRONAUT PHYSIOLOGICAL RESPONSES TO SPACE FLIGHT CONDITIONS MEASURED FOR CLINICAL OR EXPERIMENTAL PURPOSES A66-14091
- HOWE, R. M.
HUMAN PERFORMANCE CHARACTERISTICS IN MANUAL CONTROL TASKS, AND TECHNIQUES FOR DATA ANALYSIS AND SYSTEMS SIMULATION NASA-CR-68981 N66-14290
- HOWLAND, J. W.
PULSED MICROWAVE IRRADIATION OF DOGS NOTING BODY WEIGHT, RECTAL TEMPERATURE AND HEMATOLOGIC RESPONSE A66-13351
- HSIA, Y.
PHOTOCHEMISTRY OF VISION INCLUDING SPECTROPHOTOMETRIC ANALYSIS OF RHODOPSIN OPTICAL DENSITY, ABSORBANCE AND QUANTUM EFFICIENCY A66-13789
- HSU, C.-H.
BIOENERGETIC STUDIES OF ENERGY TRANSFERS, THERMODYNAMICS, AND ENTROPY IN LIVING ORGANISMS N66-12631
- HU, S.-H.
DEVELOPMENT OF CYBERNETICS AS SCIENCE TO PRODUCE PRACTICAL MACHINES AND TO BENEFIT SOCIETY - COMMUNIST CHINA N66-12752
- HULSE, E. V.
BIOLOGICAL HAZARDS OF RADIATION EXPOSURE OF MAN IN SPACE DISCUSSING RECOVERY, DELAYED EFFECT, INJURY TREATMENT AND DOSE A66-14078
- HUNTINGTON, J. M.
CRITICAL FLICKER FUSION FREQUENCY AS FUNCTION OF EXPOSURE TIME IN TWO DIFFERENT AGE GROUPS A66-80285
- HUTCHINS, C. W., JR.
MOTION SICKNESS HISTORY RELATION TO ATTRITION FROM FLIGHT TRAINING IN PENSACOLA MOTION SICKNESS QUESTIONNAIRE A66-12364

- 1
- IARMONENKO, S. P.
RADIATION PROTECTION OF ANIMALS BY VARIOUS DRUGS
DURING EXPOSURE TO GAMMA, PROTON, AND X-RAY
IRRADIATION AS RELATED TO RELATIVE BIOLOGICAL
EFFECT A66-80311
- IAZDOVSKII, V. I.
SOVIET BIOLOGICAL AND PHYSIOLOGICAL INVESTIGATIONS
IN ROCKETS AND SATELLITES, PARTICULARLY
NONPATHOLOGICAL CHARACTER OF PHYSIOLOGICAL
REACTIONS TO STRESS FACTORS A66-14076
- INVESTIGATIONS OF PHYSIOLOGICAL RESPONSES OF
ANIMALS AND MAN TO STRESSES IN VOSTOK SPACECRAFT
A66-80160
- PHYSIOLOGICAL DATA FOR EVALUATION OF HEALTH AND
WORK CAPABILITY OF ASTRONAUT DURING ORBITAL
FLIGHTS A66-80369
- EFFECT OF SPACE FLIGHT FACTORS ON HEART ACTIVITY,
RESPIRATION AND ELECTROENCEPHALOGRAPH OF
ASTRONAUTS B. F. BYKOVSKII AND V. V. TERESHKOVA
A66-80370
- REACTION TO WEIGHTLESSNESS OF ASTRONAUTS
PARTICIPATING IN VOSTOK FLIGHTS II TO VI
INCLUSIVELY A66-80373
- IBRAHIM, M. M.
ROLE OF CONVERGENCE IN STEREOSCOPIC VISION
A66-80288
- IGARASHI, M.
PROLONGED HOT OR COLD STIMULATION EFFECTS ON EYE
MOVEMENTS, VESTIBULOSPINAL, AND SEGMENTAL SPINAL
ACTIVITIES IN MONKEYS
NASA-CR-68266 N66-12177
- ILIN, E. A.
PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS IN MAN OF
LONG TERM STAY IN CABIN SIMULATING SPACEFLIGHT
ENVIRONMENT A66-80300
- ILIUTKIN, G. N.
AUTOMATIC DEVICE FOR PRODUCING CONTROLLED
HYPOTHERMIA IN ANIMALS AND HUMANS
A66-80330
- AUTOMATIC INDUCTION OF HYPOTHERMIA IN DOGS, ITS
COURSE, REWARMING, AND AFTEREFFECTS
A66-80333
- IOSELEVICH, F. M.
EFFECT OF VESTIBULAR IRRITATION ON ELECTRICAL
ACTIVITY OF CORTEX AND BASAL AREAS OF BRAIN
FTD-TT-65-410/1&2&4 N66-12762
- ISAKOV, F. Y.
METHODS USED AND PROBLEMS ENCOUNTERED IN
EVALUATING PERFORMANCE OF ASTRONAUTS IN SPACE
FLIGHT ENVIRONMENT N66-12658
- ISHAK, I. G. H.
ROLE OF CONVERGENCE IN STEREOSCOPIC VISION
A66-80288
- ISHIHARA, M.
EFFECTS OF WETTING ON CUTANEOUS VULNERABILITY
A66-80260
- IUGANOV, E. M.
SPATIAL ORIENTATION DISTURBANCES AND VEGETATIVE
DISORDERS OCCURRING IN COSMONAUTS DURING SPACE
FLIGHT DUE TO DISTURBANCES IN PHYSIOLOGICAL
INTERPLAY OF SENSING MECHANISMS GOVERNING SPACE
PERCEPTION A66-14084
- CHANGES IN FUNCTION AND RECIPROCAL ACTION OF
VESTIBULAR APPARATUS COMPONENTS, OTOLITHS AND
CUPULA, OF MAN DURING GRAVITATIONAL CHANGES
INCLUDING WEIGHTLESSNESS A66-80302
- IUROV, B. N.
EFFECT OF WEIGHTLESSNESS ON PHYSIOLOGICAL STATE OF
HUMAN ORGANISM DURING PARABOLIC FLIGHTS.
- IVANENKO, G. T.
BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON
DOGS AND WHITE RATS N66-12455
- IVANOV, D. I.
FREQUENCY ANALYSIS OF DIURNAL PERIODICITY IN HUMAN
ELECTROENCEPHALOGRAPH A66-80395
- IVANOV, E. A.
OPTIMAL SYSTEM OF CLORELLA CULTURE FOR HUMAN
OXYGEN REQUIREMENTS A66-80336
- IVANOV, K. P.
TOLERANCE OF RAT TO HYPOXIA DURING RADIATION
SICKNESS CAUSED BY X-RAY IRRADIATION
A66-80384
- IZAWA, C.
LEARNING OF PAIRED-ASSOCIATE ITEMS RELATED TO
DIFFERENT REPETITIVE REINFORCEMENT AND TESTING
SEQUENCES
TR-76 N66-13689
- IZOSIMOV, G. V.
PHYSIOLOGICAL DATA FOR EVALUATION OF HEALTH AND
WORK CAPABILITY OF ASTRONAUT DURING ORBITAL
FLIGHTS A66-80369
- J
- JACKSON, S.
METABOLISM AND EXCRETION OF CESIUM, PHOSPHORUS,
PLUTONIUM, TRITIUM AND RADIATION, STRONTIUM,
SULFUR, TRITIUM AND URANIUM FROM HUMAN BODY
N66-12686
- JACQUEMIN, CH.
BREATHING MECHANICS DURING TRANSVERSE
ACCELERATION, DISCUSSING EXPERIMENTS AND
MEASUREMENTS MADE ON MAN A66-14075
- JAKUBCZAK, L. F.
BEHAVIORAL THERMOREGULATION IN YOUNG AND OLD RATS
IN COLD ENVIRONMENT A66-80208
- JAMISON, D.
ENVIRONMENT OF MARTIAN CANALS AND EXTRATERRESTRIAL
LIFE A66-80176
- JARRETT, A. S.
ALVEOLAR CARBON DIOXIDE TENSION OF SUPINE SUBJECTS
EXERCISING ON BICYCLE ERGOMETER AT INCREASED
PRESSURE. A66-80226
- JEFFRESS, L. A.
SIGNAL DETECTION OF AUDITORY SENSORY RESPONSES TO
STIMULI - AUDITORY INFORMATION PROCESSING
NASA-CR-68881 N66-13990
- JENKINS, D. W.
NASA BIOSATELLITE PROGRAM - PURPOSES AND PROPOSED
EXPERIMENTS A66-80364
- JOHNSON, L. C.
ECCRINE SWEAT GLAND ACTIVITY AND RACIAL
DIFFERENCES IN RESTING SKIN CONDUCTANCE
A66-80276
- JOHNSON, R. L.
EXERCISE TOLERANCE, PLASMA VOLUME, RED CELL MASS,
TOTAL BLOOD VOLUME AND ORTHOSTATIC TOLERANCE
DURING FOUR WEEKS OF BED REST A66-13354
- JOHNSON, W. H.
HYPOXIC HYPOXIA AND HYPERVENTILATION EFFECT ON
NYSTAGMUS INDUCED BY ANGULAR ACCELERATION
A66-13356
- JONES, G. M.
VESTIBULO-OCULAR DISORGANIZATION IN AERODYNAMIC
SPIN, NOTING ROLL PLANE OF SKULL
A66-12363
- JONSSON, A.
GENERATION AND TRANSMISSION OF PRESSURE PULSES IN
TUBULAR SYSTEM IMPACTED BY FALLING STEEL WEIGHT
RELATED TO IMPACT INJURY A66-80340

K

- KAHLER, R. L.**
SYMPATHETIC NERVOUS STIMULATION OF HEART - BETA
ADRENERGIC BLOCKING CARDIAC FUNCTION, CIRCULATORY
RESPONSE AND PHYSICAL EXERCISE A66-80147
- KARURIN, L. I.**
EIGHT HOUR ISOLATION AND HYPOKENISIA EFFECT ON
BIOCHEMICAL AND PHYSIOLOGICAL INDICES IN MAN
A66-80299
- PROLONGED HYPOKINESIA EFFECT ON ACCELERATION
TOLERANCE OF HUMAN A66-80316
- KALETA, Z.**
OBSERVATIONS ON HEART RATES AND CARDIODYNAMICS
DURING PROLONGED WEIGHTLESSNESS, DISCUSSING
IMMERSION EXPERIMENT ON ANIMALS A66-14073
- ELECTROCARDIOGRAM AND BLOOD PRESSURE OF RABBIT
DURING PROLONGED WEIGHTLESSNESS SIMULATED BY
IMMERSION METHOD A66-80192
- KALINICHENKO, I. R.**
CALCULATIONS ON GAS EXCHANGE VOLUMES IN MAN UNDER
RARIFIED ATMOSPHERIC CONDITIONS
JPRS-33057 N66-13423
- KALININA, A. N.**
EIGHT HOUR ISOLATION AND HYPOKENISIA EFFECT ON
BIOCHEMICAL AND PHYSIOLOGICAL INDICES IN MAN
A66-80299
- CHANGES IN PHYSIOLOGICAL AND BIOCHEMICAL STATE OF
MAN AFTER EXPOSURE TO SMALL CONCENTRATIONS OF
CARBON MONOXIDE - HEART FUNCTION, RESPIRATION AND
CHOLINESTERASE BLOOD LEVEL A66-80304
- KALINOVSKII, A. P.**
POSSIBILITIES OF UTILIZATION OF ELECTRONIC LOGICAL
SYSTEMS FOR AUTOMATIC MEDICAL CONTROL OF
SPACECRAFT PERSONNEL A66-80368
- KAMLET, A. S.**
IDENTIFICATION OF SEQUENTIAL AUDITORY AND VISUAL
STIMULI A66-80279
- KAO, S.-Y.**
CHEMOTHERAPY OF VIRUS INFECTIONS, BIOLOGICAL PEST
CONTROL, VIRUS NUCLEIC ACIDS, AND VIRAL GROWTH
N66-12634
- KAPLAN, N. O.**
COMPARISON METHODS FOR RELATIONSHIP AMONG
ENZYMES THAT ARE SAME BUT BELONG TO DIFFERENT
ORGANISMS A66-13367
- KARPOV, E. A.**
BASIC PRINCIPLES OF SPECIAL TRAINING OF ASTRONAUTS
BY SIMULATION OF SPACE FLIGHT FACTORS A66-80297
- KARPOVICH, P. V.**
PATELLAR REFLEX TIME OF OLD AND YOUNG MALE
SUBJECTS AS AFFECTED BY EXERCISE A66-80207
- KASIAN, I. I.**
EFFECT OF WEIGHTLESSNESS ON PHYSIOLOGICAL STATE OF
HUMAN ORGANISM DURING PARABOLIC FLIGHTS. A66-80172
- REACTION TO WEIGHTLESSNESS OF ASTRONAUTS
PARTICIPATING IN VOSTOK FLIGHTS II TO VI
INCLUSIVELY A66-80373
- BIOELECTRIC RECORDINGS OF MALE SUBJECTS SUBJECTED
TO WEIGHTLESSNESS - INDICES OF PHYSIOLOGICAL
FUNCTIONS - ELECTROENCEPHALOGRAM / EEG/, AND
VESTIBULAR COORDINATION REACTIONS
JPRS-33115 N66-12273
- KASTEN, D. F.**
RESEARCH TECHNIQUE USED IN MEASUREMENT OF HUMAN
PERFORMANCE UNDER LOW OR ZERO GRAVITY CONDITIONS
AD-620931 N66-14029
- KATKOVSKII, B. S.**
EIGHT HOUR ISOLATION AND HYPOKENISIA EFFECT ON
BIOCHEMICAL AND PHYSIOLOGICAL INDICES IN MAN
A66-80299
- CHANGES IN PHYSIOLOGICAL AND BIOCHEMICAL STATE OF
MAN AFTER EXPOSURE TO SMALL CONCENTRATIONS OF
CARBON MONOXIDE - HEART FUNCTION, RESPIRATION AND
CHOLINESTERASE BLOOD LEVEL A66-80304
- KAZARYAN, L. A.**
HUMAN PERFORMANCE AND LIFE SUPPORT SYSTEMS IN
SPACE MONITORED BY DIGITAL COMPUTER WHICH CAN
SIMULATE CLINICAL LOGIC - BIOASTRONAUTICS
N66-12219
- KEIRIMMARKUS, I. B.**
DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES
USING SYNCHROCYCLOTRON - IRRADIATION OF
ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION
RESISTANCE OF PLASTICS N66-12453
- KELLOGG, R. S.**
MEASUREMENT OF DTOLITH ACTIVITY AS INDICATED BY
OCULAR COUNTERROLLING IN RESPONSE TO BODY
TILT WITHIN FORCE FIELD OF ZERO G, ONE-HALF G,
AND STANDARD G - EXTRALABYRINTHINE FACTORS
NASA-CR-68391 N66-13097
- KENNEDY, R. S.**
MOTION SICKNESS HISTORY RELATION TO ATTRITION FROM
FLIGHT TRAINING IN PENSACOLA MOTION SICKNESS
QUESTIONNAIRE A66-12364
- COMPARATIVE EFFECTS OF PROLONGED ROTATION AT 10
RPM ON POSTURAL EQUILIBRIUM IN VESTIBULAR NORMAL
AND DEFECTIVE HUMAN SUBJECTS A66-80198
- COMPARISON OF EFFECTIVENESS OF ANTIMOTION SICKNESS
DRUGS TESTED IN HUMAN CENTRIFUGE
NASA-CR-68858 N66-13833
- KERSHBAUM, A.**
EFFECT OF CAFFEINE ON BLOOD SERUM FREE FATTY ACIDS
IN NORMAL HUMAN SUBJECTS A66-80349
- KERSLAKE, D. M.**
HEAT LOSS IN SPACE, DISCUSSING TEMPERATURE
REGULATION DURING SPACE WALK VIA HEAT EXCHANGERS
IN AIR VENTILATED SPACE SUIT A66-14070
- EVALUATION OF AIR VENTILATED CLOTHING SYSTEM
REGULATING HEAT LOSS DURING EXTRAVEHICULAR
ACTIVITY IN SPACE A66-80157
- KHACHATURYANTS, L. S.**
METHODS USED AND PROBLEMS ENCOUNTERED IN
EVALUATING PERFORMANCE OF ASTRONAUTS IN SPACE
FLIGHT ENVIRONMENT N66-12658
- KICRAS, F. J.**
HIGH RESOLUTION ELECTRON MICROSCOPY OF FRACTION
I PROTEIN FROM PLANT LEAVES
NASA-CR-68099 N66-12198
- KIMMEL, E.**
SEX DIFFERENCES IN ADAPTATION OF GALVANIC SKIN
RESPONSE TO REPETITION OF VISUAL STIMULUS
A66-80271
- KIMMEL, H. D.**
SEX DIFFERENCES IN ADAPTATION OF GALVANIC SKIN
RESPONSE TO REPETITION OF VISUAL STIMULUS
A66-80271
- KINCAIDE, W. C.**
APOLLO SPACE SUIT DESIGN DISCUSSING CONSTRUCTION,
PURPOSE AND OPERATING CONDITIONS OF LIQUID-COOLED
LIFE SUPPORT SYSTEM A66-12631
- KING, D. J.**
DELAYED AUDITORY FEEDBACK, EXPOSURE TIME AND
RETENTION A66-80177
- KING, T. K. C.**
MEASUREMENT OF FUNCTIONAL RESIDUAL CAPACITY OF
RATS VARYING IN AGE AND WEIGHT A66-80233

- MECHANICAL PROPERTIES OF LUNG IN PATHOGEN FREE AND NORMAL RATS A66-80237
- KIRCHHOFF, H. W.
PLANE CRASH AS RESULT OF PILOTS CORONARY DISEASE, DISCUSSING PREVENTION AND REHABILITATION A66-14387
- KIRILENKO, N. S.
CHLORELLA AS SOURCE OF OXYGEN AND FOOD IN SHINER, NOTROPIS A66-80335
- KIRK, R. E.
ORGANISMIC VARIABLES FROM PERSONALITY AND INTELLIGENCE TESTS AS PREDICTORS OF VIGILANCE BEHAVIOR A66-80178
- KLEBS, G.
EFFECT OF LIGHT ON LOWER PLANT REPRODUCTION NASA-TT-F-9742 N66-13481
- KLEIN, K. E.
STRESS IMPOSED ON AIRCREW IN CIVIL JET AIRCRAFT DURING LONG FLIGHT DLR-FB-65-44 N66-14261
- KLEM, L.
TELLING COMPUTER HOW TO EVALUATE MULTIDIMENSIONAL SITUATIONS AND TERMINOLOGY AND STATISTICS FOR DETERMINING PERFORMANCE OF DECISION MAKER A66-80184
- KLIACHKO-GURVICH, G. L.
QUANTITATIVE ANALYSIS OF LIPID CONSTITUENTS IN CHLORELLA CELLS A66-80171
- KLIMOVITSKII, V. IA.
CEREBRAL VENOUS FLOW IN RABBITS DURING ACCELERATION WITH EMPHASIS ON METHOD OF REGISTRATION A66-80332
- KNOX, J. M.
ULTRAVIOLET INJURY IN MOUSE AS AFFECTED BY HOT ENVIRONMENT A66-80255
- KOHFELD, D. L.
REACTION TIME TO AUDITORY STIMULI OF DIFFERENT INTENSITIES AT DIFFERENT ADAPTATION LEVELS A66-80281
- KOLDER, H.
PERCEPTION OF APPARENT VERTICAL WITHOUT VISUAL CUES DEPENDING ON LONGITUDINAL AXES OF BODY AND HEAD TO DIRECTION OF RESULTANT ACCELERATION ABOVE 1 G A66-14086
SPATIAL ORIENTATION AND PERCEPTION OF SUBJECTS ASSUMING VARIOUS HEAD AND BODY POSITIONS UNDER INCREASED ACCELERATION WITHOUT VISUAL REFERENCE FRAME A66-80163
- KOLOSOV, I. A.
EFFECT OF WEIGHTLESSNESS ON PHYSIOLOGICAL STATE OF HUMAN ORGANISM DURING PARABOLIC FLIGHTS. A66-80172
BIOELECTRIC RECORDINGS OF MALE SUBJECTS SUBJECTED TO WEIGHTLESSNESS - INDICES OF PHYSIOLOGICAL FUNCTIONS - ELECTROENCEPHALOGRAM / EEG/, AND VESTIBULAR COORDINATION REACTIONS JPRS-33115 N66-12273
- KONDRATEV, IU. I.
FEASIBILITY OF USING CHICKEN AND DUCK FOR ASTRONAUT FOOD IN CLOSED ECOLOGICAL SYSTEM A66-80308
- KONNOVA, N. I.
PROLONGED HYPOKINESIA EFFECT ON ACCELERATION TOLERANCE OF HUMAN A66-80316
SURVIVAL DURING SCREENING OF VARIOUS AREAS OF RAT BODY TO GAMMA RAYS AND HIGH ENERGY PROTONS AS AFFECTED BY VIBRATION OR ACCELERATION STRESS A66-80382
- KONOPLIANNIKOV, A. G.
RADIATION PROTECTION OF ANIMALS BY VARIOUS DRUGS DURING EXPOSURE TO GAMMA, PROTON, AND X-RAY
- IRRADIATION AS RELATED TO RELATIVE BIOLOGICAL EFFECT A66-80311
- KONSTANTINOV, V. A.
AUTOMATIC DEVICE FOR PRODUCING CONTROLLED HYPOTHERMIA IN ANIMALS AND HUMANS A66-80330
AMINOTHIOLS AND PYRIMIDINE ANALOGS TESTED FOR PROTECTIVE EFFECTS AGAINST GENETIC MUTATIONS IN ESCHERICHIA COLI EXPOSED TO X-RAY IRRADIATION A66-80385
EFFECTS OF GRADUAL OR SUDDEN ONSET OF HYPOXIA ON OXYGEN DEMAND A66-80387
HYPOXIA PRODUCED BY INHALATION OF PURE NITROGEN AND INTERMITTENT OXYGEN BREATHING IN CATS A66-80388
- KONSTANTINOVA, M. M.
BIOCHEMICAL EVIDENCE OF SIMILARITY OF RADIATION PROTECTION MECHANISMS OF CYSTAMINE, CYSTEAMINE, SEROTININ, AND ANOXIA IN ALBINO MICE A66-80169
- KONTOS, H. A.
ROLE OF HYPOCAPNIA IN CARDIAC OUTPUT, HEART RATE AND BLOOD PRESSURE RESPONSES TO ACUTE HYPOXIA IN MAN A66-80209
- KONZA, E. A.
EFFECT OF PROLONGED EXPOSURE TO HIGH CONCENTRATION OF OXYGEN ON LUNGS AND BLOOD IN MICE A66-80389
- KOONTZ, R. H.
BEHAVIORAL EFFECTS OF IONIZED AIR ON RATS A66-80278
- KOPANEV, V. I.
PHYSIOLOGICAL DATA FOR EVALUATION OF HEALTH AND WORK CAPABILITY OF ASTRONAUT DURING ORBITAL FLIGHTS A66-80369
EFFECT OF SPACE FLIGHT FACTORS ON HEART ACTIVITY, RESPIRATION AND ELECTROENCEPHALOGRAM OF ASTRONAUTS B. F. BYKOVSKII AND V. V. TERESHKOVA A66-80370
REACTION TO WEIGHTLESSNESS OF ASTRONAUTS PARTICIPATING IN VOSTOK FLIGHTS II TO VI INCLUSIVELY A66-80373
- KORESHKIN, A. I.
ADAPTATION, SURVIVAL, RESPIRATORY RATE, AND MOTOR ACTIVITY OF MICE IN PROLONGED EXPOSURE TO HIGH CONCENTRATIONS OF CARBON DIOXIDE A66-80320
- KOROLKOV, V. I.
CHANGES IN MYOCARDIAL OXYGEN PRESSURE OF DOGS DURING ASCENT AND ACCELERATION DETERMINED BY POLAROGRAPHIC ELECTRODES IMPLANTED IN HEART MUSCLES JPRS-33066 N66-12271
- KOSTIKOVA, V. IA.
POSSIBILITIES OF UTILIZATION OF ELECTRONIC LOGICAL SYSTEMS FOR AUTOMATIC MEDICAL CONTROL OF SPACECRAFT PERSONNEL A66-80368
- KOTOVSKAIA, A. R.
PROLONGED HYPOKINESIA EFFECT ON ACCELERATION TOLERANCE OF HUMAN A66-80316
HISTOLOGICAL CHANGES IN OVARIES AND RESISTANCE TO TRANSVERSE ACCELERATION REVEALED BY CARDIOVASCULAR AND RESPIRATORY ACTIVITY OF YOUNG FEMALE MONKEYS A66-80378
- KOVALENKO, YE. A.
CHANGES IN MYOCARDIAL OXYGEN PRESSURE OF DOGS DURING ASCENT AND ACCELERATION DETERMINED BY POLAROGRAPHIC ELECTRODES IMPLANTED IN HEART MUSCLES JPRS-33066 N66-12271

- KOVALEV, YE. YE.**
RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS,
DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION
LEVEL DETERMINATION N66-12452
- DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES
USING SYNCHROCYCLOTRON - IRRADIATION OF
ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION
RESISTANCE OF PLASTICS N66-12453
- KOVER, G.**
RENAL CIRCULATION OF DOG AS AFFECTED BY
ANGIOTENSIN A66-80404
- KOVROV, B. G.**
ILLUMINATION AND CELL DENSITY EFFECTS ON GROWTH
RATE OF CHLORELLA VULGARIS CULTURE A66-80400
- KOZHEVNIKOV, V. A.**
USING COMPUTER ANALYZED SPEECH SIGNALS
FACILITATING BETTER COMMUNICATION OF MAN WITH
MACHINES A66-80334
- KOZLOV, V. A.**
POSSIBILITIES OF PHARMACEUTICAL AND CHEMICAL
PROTECTION OF HUMAN SUBJECTS AGAINST RADIATION
INJURIES DURING OUTER SPACE FLIGHTS A66-80309
- HUMAN CELLS AND GENETIC CHANGES IN ESCHERICHIA
DURING EXPOSURE STRESSES OF SPACE FLIGHT ON VOSTOK
SPACECRAFT A66-80372
- AMINOTHIOLS AND PYRIMIDINE ANALOGS TESTED FOR
PROTECTIVE EFFECTS AGAINST GENETIC MUTATIONS IN
ESCHERICHIA COLI EXPOSED TO X-RAY IRRADIATION A66-80385
- KRANING, K. K., II**
HEART RATE AND OUTPUT AND BODY TEMPERATURE OF
ACCLIMATIZED MALE DURING EXERCISE IN HOT
ENVIRONMENT A66-80219
- COMPARISON OF HUMAN RESPONSES TO PULSED AND
UNPULSED ENVIRONMENTAL HEAT AND PHYSICAL EXERCISE A66-80222
- KRASILNIKOV, S. A.**
AUTOMATIC DEVICE FOR PRODUCING CONTROLLED
HYPOTHERMIA IN ANIMALS AND HUMANS A66-80330
- KRASOTCHENKO, L. M.**
PHOTOSYNTHESIS INTENSITY IN CHLORELLA CULTURE AS
DETERMINED BY SUSPENSION DENSITY, CARBON DIOXIDE
CONCENTRATION, AND OTHER FACTORS A66-80398
- KRASOVSKII, A. S.**
EFFECT OF WEIGHTLESSNESS ON PHYSIOLOGICAL STATE OF
HUMAN ORGANISM DURING PARABOLIC FLIGHTS. A66-80172
- BIOELECTRIC RECORDINGS OF MALE SUBJECTS SUBJECTED
TO WEIGHTLESSNESS - INDICES OF PHYSIOLOGICAL
FUNCTIONS - ELECTROENCEPHALOGRAM / EEG/, AND
VESTIBULAR COORDINATION REACTIONS
JPRS-33115 N66-12273
- KREIFELDT, J. G.**
EVALUATION OF SAMPLED DATA PURSUIT TRACKING MODEL. A66-80186
- KRICHAGIN, V. I.**
STUDY OF COMFORTABLE CLOTHING FOR ASTRONAUTS
DURING 30-DAY TESTS WITHOUT WASHING IN AIR
CONDITIONED SPACE CABINS IN RELATION TO SKIN
CONDITION A66-80314
- KROENER, C.**
CALORIMETRIC DETERMINATION OF ICE FORMED IN FEET
OF MICE FROZEN AT VARIOUS TEMPERATURE
AAL-TDR-63-29 N66-14037
- KRYLOV, IU. V.**
MEASUREMENTS OF HEARING SENSITIVITY OF MEN DURING
PROLONGED ISOLATION IN SMALL CHAMBER UNDER
CONDITIONS OF CONSTANT NOISE A66-80307
- KULKA, J. P.**
PATHOGENIC ROLE OF MICROCIRCULATORY IMPAIRMENT
DURING COLD INJURY OF SKIN OF RABBIT AND MOUSE. A66-80256
- KUSTOV, V. V.**
EIGHT HOUR ISOLATION AND HYPOKENISIA EFFECT ON
BIOCHEMICAL AND PHYSIOLOGICAL INDICES IN MAN A66-80299
- CHANGES IN PHYSIOLOGICAL AND BIOCHEMICAL STATE OF
MAN AFTER EXPOSURE TO SMALL CONCENTRATIONS OF
CARBON MONOXIDE - HEART FUNCTION, RESPIRATION AND
CHOLINESTERASE BLOOD LEVEL A66-80304
- KUZMIN, IU. I.**
ELECTRIC METHOD FOR REGISTERING TONGUE MOTION
DURING ARTICULATION OF CONSONANTS A66-80329
- METHOD FOR PROCESSING HUMAN WASTE TO RECLAIM
WATER USING CHLORELLA - BACTERIA SYSTEM A66-80391
- KUZMINOV, A. P.**
SIMULATORS USED IN TRAINING ASTRONAUTS FOR
SPACEFLIGHT A66-80296
- KUZNETSOV, A. G.**
SPATIAL ORIENTATION DISTURBANCES AND VEGETATIVE
DISORDERS OCCURRING IN COSMONAUTS DURING SPACE
FLIGHT DUE TO DISTURBANCES IN PHYSIOLOGICAL
INTERPLAY OF SENSING MECHANISMS GOVERNING SPACE
PERCEPTION A66-14084
- PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS IN MAN OF
LONG TERM STAY IN CABIN SIMULATING SPACEFLIGHT
ENVIRONMENT A66-80300
- KUZNETSOVA, S. S.**
DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES
USING SYNCHROCYCLOTRON - IRRADIATION OF
ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION
RESISTANCE OF PLASTICS N66-12453
- KYLSTRA, J. A.**
PULMONARG GAS EXCHANGE IN DOGS DURING LIQUID
BREATHING UNDER HYPERBARIC OXYGENATION A66-80230
- L**
- LAGERQUIST, C. R.**
TWO TYPES OF PLUTONIUM EXPOSURE IN URINE, FECES,
AND BLOOD OF HUMAN BODY, AND EFFECTIVENESS OF
DIETHYLENTRIAMINEPENTAACETIC ACID TREATMENTS N66-12685
- LACNEAU, L. E.**
TUMORS IN MICE AFTER THYMECTOMY AND X-RAY
IRRADIATION, AND CHROMOSOME ANOMALIES FROM
TRITIATED THYMIDINE - RADIOBIOLOGY
EUR-2462-F N66-12431
- LAMB, L. E.**
EXERCISE TOLERANCE, PLASMA VOLUME, RED CELL MASS,
TOTAL BLOOD VOLUME AND ORTHOSTATIC TOLERANCE
DURING FOUR WEEKS OF BED REST A66-13354
- HYDRATION DURING BED REST IN RESPONSE TO LOWER
BODY NEGATIVE PRESSURE AS RELATED TO MANNED
SPACE FLIGHT A66-80195
- LAMBERTSEN, C. J.**
BREATH BY BREATH MEASUREMENT OF RESPIRATORY
FUNCTIONS - INSTRUMENTATION AND APPLICATIONS A66-80240
- LONDON, M. M.**
ECCRINE SWEAT GLAND ACTIVITY AND RACIAL
DIFFERENCES IN RESTING SKIN CONDUCTANCE A66-80276
- LANPHIER, E. H.**
PULMONARG GAS EXCHANGE IN DOGS DURING LIQUID

- BREATHING UNDER HYPERBARIC OXYGENATION
A66-80230
- LANZETTA, J. T.
DECISION MAKING EFFECTS OF TWO SOURCES OF
UNCERTAINTY DECISION A66-80274
- LAPAYEV, E.
TOLERANCE OF JET AND ROCKET ENGINE EXHAUST NOISE
AND EAR PROTECTION DEVICES FOR PILOTS AND GROUND
CREWS
NASA-TT-F-9799 N66-13297
- LAPIN, B. A.
HISTOLOGICAL CHANGES IN OVARIES AND RESISTANCE TO
TRANSVERSE ACCELERATION REVEALED BY CARDIOVASCULAR
AND RESPIRATORY ACTIVITY OF YOUNG FEMALE MONKEYS
A66-80378
- LASSEUR, PH.
NUTRITIONAL PROBLEMS OF SUGAR REGULATION IN
AVIATION MEDICINE - HYPERGLYCEMIA IN RATS AND SURV
OF NUTRITIONAL HABITS OF FLYING PERSONNEL
A66-80361
- LATARJET, R.
EFFECTS OF IONIZING X- AND GAMMA RADIATION ON
DEOXYRIBONUCLEIC ACID
EUR-2471.F N66-14092
- LEBEDEV, V. I.
EFFECT OF WEIGHTLESSNESS ON PHYSIOLOGICAL STATE OF
HUMAN ORGANISM DURING PARABOLIC FLIGHTS.
A66-80172
- BIOELECTRIC RECORDINGS OF MALE SUBJECTS SUBJECTED
TO WEIGHTLESSNESS - INDICES OF PHYSIOLOGICAL
FUNCTIONS - ELECTROENCEPHALOGRAM / EEG/, AND
VESTIBULAR COORDINATION REACTIONS
JPRS-33115 N66-12273
- ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY
PROTONS IN MULTIPLE IRRADIATION
N66-12454
- PROPHYLAXIS AND THERAPY OF RADIATION INJURIES
CAUSED BY HIGH ENERGY PROTON IRRADIATION
N66-12461
- LEBEDEVA, E. K.
UTILIZATION OF MINERAL COMPONENTS IN THE MEDIUM
OF CHLORELLA PYRENOIDOSA CULTURES
A66-80399
- LEBEDINSKIY, A. V.
RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS,
DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION
LEVEL DETERMINATION N66-12452
- LEE, T. D., JR.
INFLUENCE OF AGE ON CARDIOVASCULAR AND RENAL
RESPONSES TO TILTING A66-80213
- LEITCH, J. L.
FORTRAN COMPUTER PROGRAM FOR EVALUATION OF POST
IRRADIATION SURVIVAL TIMES - ANIMAL STUDY
UCLA-12-573 N66-12917
- LEMAIRE, R.
THERMOREGULATION - HEAT EXCHANGE IN FLYING PERSONNEL
RELATED TO ALTITUDE AND AIRCRAFT VELOCITY
A66-80359
- LEMASSEN, C.
STUDY OF MODE OF ACTION OF 3-/4-CHLOROPHENYL/-1,
1-DIMETHYLUREA ON PHOTOSYNTHESIS AND OXYGEN
PRODUCTION IN CHLORELLA PYRENOIDOSA AS FUNCTION OF
LIGHT AND TEMPERATURE A66-80290
- LEONG, K. J.
COMBINED RESPIROGRAPHIC TECHNIQUE AND ANALYTICAL
METHOD INDICATING EFFECT OF CHANGES IN RAT OF
SULFUR DIOXIDE CONCENTRATION AND DURATION OF
EXPOSURE ON PULMONARY RETENTION, TIDAL VOLUME, AND
RESPIRATORY RATE A66-80264
- LEVASHOV, V. V.
SKIN FUNCTION AND PROCESSES IN VITAL ACTIVITY AS
RELATED TO PERSONAL HYGIENE DURING EXPOSURE TO
SPACE FLIGHT STRESSES A66-80312
- LEVI, L.
PHYSIOLOGICAL RESPONSES OF ENDOCRINE SYSTEM TO
PHYSICAL AND MENTAL STRESS - URINARY EXCRETION
OF ADRENALINE AND NORADRENALINE
N66-13507
- LEVIN, H. S.
PULMONARY DIFFUSING CAPACITY IN SUBJECTS AT REST
AND DURING EXERCISE AS AFFECTED BY INCREASED
ENVIRONMENTAL TEMPERATURE A66-80224
- LEVINSKIY, S. V.
RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS,
DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION
LEVEL DETERMINATION N66-12452
- LEVY, M. N.
REFLEX EFFECTS OF CEPHALIC HYPOXIA, HYPERCAPNIA,
AND ISCHEMIA UPON VENTRICULAR CONTRACTILITY IN
DOGS. A66-80350
- LIE, R.
WHOLE BODY DEPOSITION OF PARTICLES AS FUNCTION OF
VARIOUS PHYSICAL AND CHEMICAL PARAMETERS
N66-12684
- LIM, T. P. K.
THERMAL HOMOIOSTASIS UNDER HYPOXIA IN MAN,
DISCUSSING THERMAL STRESS ADAPTATION AND
PHYSIOLOGICAL RESPONSES IN OXYGEN-DEFICIENT
ENVIRONMENT A66-14068
- BODY TEMPERATURE AND CARDIOVASCULAR AND
RESPIRATORY ACTIVITY OF MAN AND DOG UNDER HYPOXIA
AND HOT AND COLD TEMPERATURE EXPOSURE
A66-80188
- LINDBERG, R. G.
ANIMAL TEMPERATURE SENSING FOR STUDYING EFFECT OF
PROLONGED ORBITAL FLIGHT ON CIRCADIAN RHYTHMS OF
POCKET MICE A66-12767
- HISTOPATHOLOGY OF POCKET MOUSE INTESTINE MUCOUS
AFTER IRRADIATION - GROWTH AND DEVELOPMENT DATA
ON LABORATORY POCKET MOUSE
NASA-CR-68217 N66-12200
- LINDEMAN, R. D.
INFLUENCE OF AGE ON CARDIOVASCULAR AND RENAL
RESPONSES TO TILTING A66-80213
- LINHART, R. M.
DATA ACQUISITION, CONVERSION, HANDLING, ANALYSIS,
AND RECORDING SYSTEM FOR PSYCHOPHYSIOLOGICAL
STRESS
AMRL-TDR-64-64 N66-14315
- LITTA-MODIGNANI, R.
ENDOCRINE AND METABOLIC RESPONSE OF DOGS TO WHOLE
BODY VIBRATION A66-80194
- LITVINOVA, E. G.
DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES
USING SYNCHROCYCLOTRON - IRRADIATION OF
ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION
RESISTANCE OF PLASTICS N66-12453
- LOATS, H. L., JR.
WATER IMMERSION TECHNIQUE FOR SIMULATING ZERO
GRAVITY MOBILITY PERFORMANCE OF ASTRONAUT IN
PRESSURIZED SPACESUIT
NASA-TN-D-3054 N66-14151
- LOBITZ, W. C., JR.
INCIDENCE, MORPHOLOGY, AND ETIOLOGY OF MILIARIA
OCCURRING DURING EXPOSURE TO HOT ENVIRONMENT
A66-80253
- LOCHNER, W.
CARDIAC METABOLISM AT REST AND DURING HEART ARREST
A66-80345
- LOGUNOV, IU. N.
SEMICONDUCTOR DEVICE FOR SUBJECTING SMALL
EXPERIMENTAL ANIMALS TO HYPOTHERMIA
A66-80328

- LOMOVA, M. A.**
EFFECT OF WEIGHTLESSNESS ON PHYSIOLOGICAL STATE OF HUMAN ORGANISM DURING PARABOLIC FLIGHTS. A66-80172
- BIOELECTRIC RECORDINGS OF MALE SUBJECTS SUBJECTED TO WEIGHTLESSNESS - INDICES OF PHYSIOLOGICAL FUNCTIONS - ELECTROENCEPHALOGRAM / EEG/, AND VESTIBULAR COORDINATION REACTIONS JPRS-33115 N66-12273
- LONGTON, P. A.**
MATHEMATICAL MODEL BASED ON CONTROL AND QUEUEING THEORY FOR HUMAN CONTROLLER FOR TURN-ROUND OPERATIONS ON AIRPORT APRON A66-12886
- LOVELACE, W. R., II**
ASTRONAUT SELECTION INCLUDING DYNAMIC TESTING, DISCUSSING EXAMINATION METHODS, BIOLOGICAL PARAMETERS, LABORATORY AND RADIOLOGICAL PROCEDURES, BLOOD CHEMISTRY TECHNIQUES, ETC A66-14064
- HISTORY OF ASTRONAUT SELECTION PROCEDURES AS RELATED TO SELECTION OF SCIENTISTS BECOMING MEMBERS OF SPACECREW A66-80187
- LOW, L.**
SIMPLE PATTERN RECOGNITION IN SMALL GROUP SITUATION A66-80181
- LUFT, U. C.**
ASTRONAUT SELECTION INCLUDING DYNAMIC TESTING, DISCUSSING EXAMINATION METHODS, BIOLOGICAL PARAMETERS, LABORATORY AND RADIOLOGICAL PROCEDURES, BLOOD CHEMISTRY TECHNIQUES, ETC A66-14064
- THERMAL HOMEOSTASIS UNDER HYPOXIA IN MAN, DISCUSSING THERMAL STRESS ADAPTATION AND PHYSIOLOGICAL RESPONSES IN OXYGEN-DEFICIENT ENVIRONMENT A66-14068
- HISTORY OF ASTRONAUT SELECTION PROCEDURES AS RELATED TO SELECTION OF SCIENTISTS BECOMING MEMBERS OF SPACECREW A66-80187
- BODY TEMPERATURE AND CARDIOVASCULAR AND RESPIRATORY ACTIVITY OF MAN AND DOG UNDER HYPOXIA AND HOT AND COLD TEMPERATURE EXPOSURE A66-80188
- LUYET, B. J.**
CALORIMETRIC DETERMINATION OF ICE FORMED IN FEET OF MICE FROZEN AT VARIOUS TEMPERATURE AAL-TDR-63-29 N66-14037
- LVITSINA, G. M.**
BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON DOGS AND WHITE RATS N66-12455
- LYOVA, T. S.**
SURVIVAL DURING SCREENING OF VARIOUS AREAS OF RAT BODY TO GAMMA RAYS AND HIGH ENERGY PROTONS AS AFFECTED BY VIBRATION OR ACCELERATION STRESS A66-80382
- LYNCH, T. N.**
DEHYDRATION OF SUBJECTS DURING PROLONGED BED REST AS AFFECTED BY 9 ALPHAFLUOROHYDROCORTISONE A66-80196
- LYSENKO, O. IU.**
AUTOMATIC DEVICE FOR PRODUCING CONTROLLED HYPOTHERMIA IN ANIMALS AND HUMANS A66-80330
- M**
- MAC FARLAND, N.**
COMBINED RESPIROGRAPHIC TECHNIQUE AND ANALYTICAL METHOD INDICATING EFFECT OF CHANGES IN RAT OF SULFUR DIOXIDE CONCENTRATION AND DURATION OF EXPOSURE ON PULMONARY RETENTION, TIDAL VOLUME, AND RESPIRATORY RATE A66-80264
- MACDONALD, F. M.**
CLINICAL MANIFESTATIONS AND THERAPY OF RESPIRATORY ACIDOSIS A66-80347
- MACKAY, R. S.**
TELEMETERING INFORMATION FROM WITHIN BODY OF ANIMALS AND MAN, USING TINY TRANSMITTERS CALLED ENDORADIOSONDES A66-13370
- MACKINNON, P. C. B.**
PHYSIOLOGICAL ROLE OF ADRENAL MEDULLA IN PALMAR ANHIDROTIC RESPONSE TO STRESS A66-80215
- MACKNORTH, J. F.**
DETERIORATION OF SIGNAL DETECTABILITY DURING VIGILANCE TASK AS FUNCTION OF BACKGROUND EVENT RATE A66-80280
- MADDOCK, R. W.**
AEROSPACE BREATHING CHART USED IN ANALYTICAL EVALUATION OF BREATHABLE ATMOSPHERES AND EMERGENCY OXYGEN SYSTEMS AIAA PAPER 65-723 A66-12544
- MAISTRACH, E. V.**
AUTOMATIC DEVICE FOR PRODUCING CONTROLLED HYPOTHERMIA IN ANIMALS AND HUMANS A66-80330
- MAKSIMOV, D. G.**
PHYSIOLOGICAL DATA FOR EVALUATION OF HEALTH AND WORK CAPABILITY OF ASTRONAUT DURING ORBITAL FLIGHTS A66-80369
- ELECTROPHYSIOLOGICAL STUDIES ON VOSKHOD MANNED SPACECRAFT N66-12659
- MALINOVSKII, O. V.**
REVERSIBLE PROCESS OF CHROMOSOME DAMAGE DURING MITOSIS BY IONIZING RADIATION IN YEAST A66-80321
- IMPORTANCE OF RECONSTRUCTION OF CELLS DAMAGED BY IONIZING RADIATION ON TOTAL VIABILITY OF ORGANISM A66-80322
- MALKIN, V. B.**
FREQUENCY ANALYSIS OF DIURNAL PERIODICITY IN HUMAN ELECTROENCEPHALOGRAM A66-80395
- MALKINSON, F. D.**
ROLE OF STRATUM CORNEUM IN BODY DEFENSE AGAINST VARIOUS TYPES OF INJURY AND INFECTION A66-80261
- MALYUSZ, M.**
RENAL CIRCULATION OF DOG AS AFFECTED BY ANGIOTENSIN A66-80404
- MAMONTOV, V. IA.**
CHLORELLA AS SOURCE OF OXYGEN AND FOOD IN SHINER, NOTROPIS A66-80335
- MANDROVSKY, B. N.**
SOVIET PAPERS DEALING WITH BIOASTRONAUTICS, LIFE SUPPORT SYSTEMS, AND VOSKHOD II FLIGHT N66-12650
- MANSUROV, A. R.**
CARDIOVASCULAR AND VESTIBULAR RESPONSE OF HUMAN BODY EXPOSED AT VARIOUS POSITIONS TO ROTATIONAL STRESS A66-80379
- MARGARIA, R.**
MODALITIES OF ENERGY SHIFT FROM KINETIC TO POTENTIAL, AND VICE VERSA, WHILE WALKING AND RUNNING, AT DIFFERENT SPEEDS AGAINST GRAVITY A66-80239
- MARKARIAN, S. S.**
CARDIOVASCULAR AND VESTIBULAR RESPONSE OF HUMAN BODY EXPOSED AT VARIOUS POSITIONS TO ROTATIONAL STRESS A66-80379
- MARRIOTT, F. H. C.**
AFTERIMAGES PRODUCED BY BLACK AND LIGHT TARGETS VIEWED PERIPHERALLY BY DARK ADAPTED SUBJECTS A66-80175
- MASLEN, K. R.**
DYNAMIC BEHAVIOR OF AIRCREW BREATHING EQUIPMENT CONSIDERING CYCLIC FLOW RESPONSE TESTS, STABILITY PROBLEMS, MEASUREMENT TECHNIQUES AND HUMAN

- RESPIRATORY IMPEDANCE A66-13350
- MASON, C.
THERMOREGULATORY METABOLIC RESPONSE OF COLD AND
HEAT EXPOSED SQUIRREL MONKEYS /SAIMIRI SCIUREA/ AS
COMPARED TO SIMILARLY TREATED RODENTS A66-80225
- MASSEY, H.
SPACE TRAVEL AND EXPLORATION COVERING BIOLOGICAL
AND TECHNICAL DIFFICULTIES SUCH AS RADIATION,
METEOR IMPACT, VEHICLE STERILIZATION, ETC A66-13806
- MASTER, R. C.
NEW METHOD FOR BLOOD SERUM CALCIUM ESTIMATION IN
PATIENTS A66-80292
- MASTRYUKOVA, V. M.
BIOLOGICAL EFFECT OF HIGH ENERGY PROTON
IRRADIATION ON CORNEAL EPITHELIA OF MICE N66-12456
- MATHE, G.
IMMUNOLOGICALLY COMPETENT CELL RESPONSE TO ANTIGEN
AND COMPARATIVE STUDY OF LYMPHOID CELLS
EUR-2469.F N66-14089
- MATSATSA, V. F.
AUTOMATIC DEVICE FOR PRODUCING CONTROLLED
HYPOTHERMIA IN ANIMALS AND HUMANS A66-80330
- MATTINGLY, G. S.
WATER IMMERSION TECHNIQUE FOR SIMULATING ZERO
GRAVITY MOBILITY PERFORMANCE OF ASTRONAUT IN
PRESSURIZED SPACESUIT NASA-TN-D-3054 N66-14151
- MAYO, A. M.
ENERGY PATTERNS FROM SPACE ACCESSIBLE TO HUMAN
SENSES THROUGH DATA SENSORS AND INFORMATION
ACQUISITION A66-14093
- MC COOK, R. D.
VASCULAR AND SWEATING RESPONSES OF MAN TO VARYING
TEMPERATURE EXPOSURES A66-80250
- MC GEE, V. E.
AFFECTIVE COMMUNICATION IN SPEECH AND RELATED
QUANTITATIVE PROBLEMS - HUMAN PERCEPTION AND
RESPONSE TO VOICE COMMUNICATION /SPEECH SIGNAL/
ACOUSTICAL PROPERTIES AD-620333 N66-12783
- MC LAURIN, W. A.
SHORT-TERM MEMORY, CHOICE REACTION TIME, AND HAND
STEADINESS OF EXERCISING AND RESTING SUBJECTS IN
RESPONSE TO EPINEPHRINE OR INSULIN ADMINISTRATION A66-80201
- MC TEE, A. C.
OPTIMAL CONTROL DISPLAY RELATIONSHIPS IN GENERAL
TRACKING INCLUDING PILOTING AND RADAR TRACKING
OPERATION A66-13349
- TRANSFER OF TRAINING FUNCTION OF STIMULUS RESPONSE
RELATIONSHIPS A66-80166
- MC VEAN, D. E.
BEHAVIOR OF SERUM LACTIC DEHYDROGENASE IN MEN
EXPOSED TO BRIEF, INTENSE THERMAL IMPULSES A66-80203
- MCCARTNEY, A. J.
BIOLOGICAL EFFECTS OF LASER RADIATION WITH
REFERENCE TO INTACT ANIMALS, PRIMATE EYES AND SKIN
AND MALIGNANT TUMORS OF ANIMAL AND HUMAN ORIGIN A66-12994
- MEDVEDEV, V. P.
DETERMINATION OF PROPAGATION VELOCITY OF PULSE
WAVES FROM HUMAN ARTERIES BY CONVERTING
MECHANICAL VIBRATIONS INTO ELECTRICAL
OSCILLATIONS NASA-TT-F-407 N66-12346
- MEHLMAN, M. A.
METABOLISM OF CARNITINE IN MUSCLE OF COLD
ACCLIMATED RAT A66-80152
- MEINSCHEN, W. G.
BIOLOGIC-TYPE ALKANES OF INDIGENOUS ORIGIN MORE
THAN 2.7 BILLION YEARS OLD PRESENT IN PRECAMBRIAN
ROCKS OF SOUDAN FORMATION A66-12366
- MEISSINGER, H. F.
MATHEMATICAL MODEL OF HUMAN COMPENSATORY TRACKING
BEHAVIOR A66-80149
- MELESHKO, G. I.
PHOTOSYNTHESIS INTENSITY IN CHLORELLA CULTURE AS
DETERMINED BY SUSPENSION DENSITY, CARBON DIOXIDE
CONCENTRATION, AND OTHER FACTORS A66-80398
- UTILIZATION OF MINERAL COMPONENTS IN THE MEDIUM
OF CHLORELLA PYRENOIDOSA CULTURES A66-80399
- MELNIKOV, G. B.
CHLORELLA AS SOURCE OF OXYGEN AND FOOD IN SHINER,
NOTROPIS A66-80335
- MELZACK, R.
GATE CONTROL SYSTEM ROLE IN PAIN MECHANISM, NOTING
SPECIFICITY AND PATTERN THEORIES A66-13337
- MENG, W.-L.
PROTEIN BIOSYNTHESIS BY INCORPORATION OF AMINO
ACIDS AND ACTION OF SOLUBLE RIBONUCLEIC ACID N66-12630
- MENGEL, C. E.
MECHANISM, PREVENTION AND TREATMENT OF OXYGEN
TOXICITY IN CENTRAL NERVOUS SYSTEM, NOTING
ACETYLCHOLINESTERASE ACTIVITY A66-13346
- MECHANISM OF IN VIVO RBC DAMAGE BY OXYGEN, NOTING
EFFECT ON CANINE ERYTHROCYTES A66-13348
- MENNINGER, R. P.
ANATOMICAL STUDIES IN DOG ANESTHETIZED WITH
PENTOBARBITAL AND CHLORPROMAZINE AND SUBJECTED TO
REPEATED PROLONGED POSITIVE G A66-12362
- MESSER, J. V.
PULMONARY DIFFUSING CAPACITY IN SUBJECTS AT REST
AND DURING EXERCISE AS AFFECTED BY INCREASED
ENVIRONMENTAL TEMPERATURE A66-80224
- MEWISSEN, D. J.
TUMORS IN MICE AFTER THYMECTOMY AND X-RAY
IRRADIATION, AND CHROMOSOME ANOMALIES FROM
TRITIATED THYMIDINE - RADIOBIOLOGY EUR-2462.F N66-12431
- MEYERS, J.
STATISTICAL ANALYSIS OF HEAT SYNDROME CAUSES -
ENVIRONMENTAL AND HUMAN FACTORS, AND PREVENTION
AND ALLEVIATION IN CIVIL DEFENSE SHELTERS AND IN
EMERGENCY SITUATIONS AD-623578 N66-13007
- MICHAELSEN, G. S.
CLEAN ROOM BACTERIOLOGY - HEAT RESISTANCE OF SPORE
FORMERS, MICROORGANISM IDENTIFICATIONS, HUMAN
CONTACT CONTAMINATION NASA-CR-68729 N66-13553
- MICHAELSON, S. M.
PULSED MICROWAVE IRRADIATION OF DOGS NOTING BODY
WEIGHT, RECTAL TEMPERATURE AND HEMATOLOGIC
RESPONSE A66-13351
- PARTIAL CANINE BODY EXPOSURE TO IONIZATION
RADIATION NOTING ANOREXIA, WEIGHT LOSS, VOMITING
AND HYPERSIALOSIS DUE TO 1000 KVP X-RAY EXPOSURE A66-13352
- MIKHAILOV, V. I.
EIGHT HOUR ISOLATION AND HYPOKENISIA EFFECT ON
BIOCHEMICAL AND PHYSIOLOGICAL INDICES IN MAN A66-80299

- CHANGES IN PHYSIOLOGICAL AND BIOCHEMICAL STATE OF MAN AFTER EXPOSURE TO SMALL CONCENTRATIONS OF CARBON MONOXIDE - HEART FUNCTION, RESPIRATION AND CHOLINESTERASE BLOOD LEVEL A66-80304
- AMMONIA EFFECTS ON PHYSIOLOGICAL FUNCTIONS OF MICE IN CLOSED ENVIRONMENT A66-80390
- MILLER, D. C.
COMPENSATORY TRACKING BEHAVIOR AS AFFECTED BY KNOWLEDGE OF PERFORMANCE LEVEL A66-80150
- MILLER, E. F., II
MEASUREMENT OF OTOLITH ACTIVITY AS INDICATED BY OCULAR COUNTERROLLING IN RESPONSE TO BODY TILT WITHIN FORCE FIELD OF ZERO G, ONE-HALF G, AND STANDARD G - EXTRALABYRINTHINE FACTORS NASA-CR-68391 N66-13097
- MILLER, M. C.
MEASUREMENT, STRUCTURE, AND PREDICTION OF JOB AND TRAINING PERFORMANCE OF AIR TRAFFIC CONTROL SPECIALISTS OF DIFFERENT AGES A66-80193
- MILLER, P. B.
EXERCISE TOLERANCE, PLASMA VOLUME, RED CELL MASS, TOTAL BLOOD VOLUME AND ORTHOSTATIC TOLERANCE DURING FOUR WEEKS OF BED REST A66-13354
- MILLER, S. A.
METABOLIC STUDIES OF ENERGY DENSE COMPOUNDS FOR AEROSPACE NUTRITION AMRL-TR-64-121 N66-13594
- MILLODDT, M.
STABILIZED RETINAL IMAGES AND DISAPPEARANCE TIME AS RELATED TO STIMULUS SIZE A66-80173
- MIROLIUBOV, G. P.
PHYSIOLOGICAL RESPONSE OF MAN TO IMPACT DECELERATIONS ACTING IN VARIOUS DIRECTIONS DURING SPACECRAFT LANDING AS AFFECTED BY SAFETY BELTS, HARNESSSES, AND SHOCK ABSORBERS A66-80301
- MITIUSHOVA, H. M.
REVERSIBLE PROCESS OF CHROMOSOME DAMAGE DURING MITOSIS BY IONIZING RADIATION IN YEAST A66-80321
- MITSKIS, A. M.
WAVEMETER AND INTEGRATOR FOR EVALUATION OF WAVE PATTERNS AND AMPLITUDE OF BRAIN POTENTIALS - ELECTROPHYSIOLOGY JPRS-33055 N66-12444
- MOHLER, S. R.
FLIGHT FATIGUE AND STRESS OF PILOTS AM-65-13 N66-13897
- MOHR, G. C.
VIBRATION EXPOSURE WITH VARYING PEAK AND RMS ACCELERATION AND FREQUENCY IN LOW ALTITUDE HIGH-SPEED FLIGHT A66-13355
- AEROSPACE MEDICINE - COMPRESSION DEFORMITIES OF THORACIS VERTEBRAE IN HUMAN TOLERANCE TEST DURING EXPOSURE TO SIMULATED ESCAPE SYSTEM ROCKET THRUST VECTOR AMRL-TR-65-134 N66-12885
- MOLL, I. M.
SPACE RADIATION OF SOLAR AND COSMIC ORIGIN AND BIOLOGICAL EFFECTS, EXAMINING DNA STRUCTURE AND RADIATION INDUCED CHANGES A66-13897
- MONASTYRSHINA, E. I.
SENSITIVITY OF DIFFERENT ORGAN MOUSE TISSUE CELLS DURING IN SITU AND IN VITRO STUDIES IN RESPONSE TO VIBRATION A66-80380
- MOORE, J. W.
ACHIEVEMENT IN PROGRAMMED MATHEMATICS AS FUNCTION OF DIFFERENTIAL KNOWLEDGE OF RESULTS A66-80272
- MORAVEK, M.
HUMAN STRESS REACTIONS TO THREE-DAY MARCH, SLEEP DEPRIVATION, FOOD AND OXYGEN STARVATION, NOTING CHANGES IN CENTRAL NERVOUS SYSTEM FUNCTIONS A66-14080
- CENTRAL NERVOUS SYSTEM FUNCTION OF HUMAN SUBJECTS EXPOSED TO PHYSICAL EXERCISE, SLEEP DEPRIVATION, STARVATION, AND HYPOXIA A66-80191
- MORAY, N.
SHORT TERM MEMORY AS FUNCTION OF NUMBER OF ITEMS SENT AND NUMBER OF CHANNELS IN MULTICHANNEL LISTENING EXPERIMENT A66-80153
- MOREHOUSE, P. M.
THERMAL AND ELECTRIC CONDUCTIVITY OF BODY FLUIDS AND TISSUES GLR-37 N66-12592
- MOROZOV, V. S.
POSSIBILITIES OF PHARMACEUTICAL AND CHEMICAL PROTECTION OF HUMAN SUBJECTS AGAINST RADIATION INJURIES DURING OUTER SPACE FLIGHTS A66-80309
- RADIOPROTECTIVE EFFECT OF VARIOUS DRUGS AGAINST X - RAYS AND GAMMA RAYS DURING PROTON IRRADIATION MICE A66-80381
- SURVIVAL DURING SCREENING OF VARIOUS AREAS OF RAT BODY TO GAMMA RAYS AND HIGH ENERGY PROTONS AS AFFECTED BY VIBRATION OR ACCELERATION STRESS A66-80382
- BIOLOGICAL EFFECT IN MOUSE OF GAMMA IRRADIATION AS AFFECTED BY SOLAR FLARE, RADIOPROTECTIVE DRUGS, AND ACCELERATION STRESS DURING SIMULATION OF RADIATION CONDITIONS OF SPACEFLIGHT A66-80402
- MORRISON, J. F.
SWEAT GLAND FATIGUE AS REFLECTED BY SWEAT RATES AND RECTAL TEMPERATURES DURING EXPOSURE TO HOT ENVIRONMENT A66-80218
- MOSKALEV, YU. I.
BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON DOGS AND WHITE RATS N66-12455
- MUELLER, C. G.
BRIGHTNESS DISCRIMINATION AND BRIGHTNESS CONTRAST OF HUMAN AND ANIMAL EYES IN SUPRATHRESHOLD LUMINANCE DIFFERENCE A66-13791
- MUELLER, E. A.
PHYSICAL ATROPHY PREVENTION IN PROTRACTED WEIGHTLESSNESS, DISCUSSING PHYSICAL FITNESS MAINTENANCE DURING SPACE FLIGHT A66-14072
- AVOIDING MUSCULAR ATROPHY AND HEMOGLOBIN LOSS IN PROTRACTED WEIGHTLESSNESS THROUGH PHYSICAL EXERCISE A66-80158
- MURDOCK, B. B., JR.
SIGNAL DETECTION THEORY AND SHORT TERM MEMORY A66-80265
- MURRAY, H. G.
REACTION TIME TO AUDITORY STIMULI OF DIFFERENT INTENSITIES AT DIFFERENT ADAPTATION LEVELS A66-80281
- MURRAY, R. H.
ANATOMICAL STUDIES IN DOG ANESTHETIZED WITH PENTOBARBITAL AND CHLORPROMAZINE AND SUBJECTED TO REPEATED PROLONGED POSITIVE G A66-12362
- MYGIND, S. H.
NEW THEORY OF FUNCTIONAL MECHANISM OF LABYRINTHINE EPITHELIUM A66-80403

N

- NAGLE, F. J.
COMPARISON OF METHODS OF BLOOD PRESSURE MEASUREMENTS AND PRESSURE FLOW DYNAMICS DURING VARIOUS CONDITIONS OF PHYSICAL EXERCISE A66-80244

- NAISH, J. M.
HEAD-UP DISPLAY / HUD/ DEVELOPED FOR AUTOMATIC
LANDING IN CIVIL AIRCRAFT A66-12884
- NAKAMURA, T.
DISTRIBUTION FUNCTION OF HELIUM CLEARANCE TIME
CONSTANT IN HEALTHY AND DISEASED LUNGS OF HUMAN
SUBJECTS A66-80232
- NEW METHOD FOR ANALYSIS OF DISTRIBUTION OF
MECHANICAL TIME CONSTANTS IN LUNG A66-80238
- NAUGHTON, J.
COMPARISON OF METHODS OF BLOOD PRESSURE
MEASUREMENTS AND PRESSURE FLOW DYNAMICS DURING
VARIOUS CONDITIONS OF PHYSICAL EXERCISE A66-80244
- NEARY, G. J.
BIOLOGICAL HAZARDS OF RADIATION EXPOSURE OF MAN IN
SPACE DISCUSSING RECOVERY, DELAYED EFFECT, INJURY
TREATMENT AND DOSE A66-14078
- NEFEDOV, YU. G.
RADIATION SAFETY IN SPACE FLIGHTS - BIOLOGICAL
EFFECT OF HIGH ENERGY PROTON IRRADIATION ON
ANIMALS AND RADIATION PROTECTION AND THERAPY
NASA-TT-F-353 N66-12451
- RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS,
DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION
LEVEL DETERMINATION N66-12452
- ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY
PROTONS IN MULTIPLE IRRADIATION N66-12454
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON
DOGS AND WHITE RATS N66-12455
- COMPARISON OF BIOLOGICAL EFFECTS OF PROTON,
X-RAY, AND GAMMA IRRADIATIONS ON DOGS AND WHITE
RATS N66-12460
- NEVEROV, V. P.
PROLONGED OPTOKINETIC STIMULATION EFFECT ON RABBIT
A66-80377
- NEVISON, T. O.
ASTRONAUT SELECTION INCLUDING DYNAMIC TESTING,
DISCUSSING EXAMINATION METHODS, BIOLOGICAL
PARAMETERS, LABORATORY AND RADIOLOGICAL
PROCEDURES, BLOOD CHEMISTRY TECHNIQUES, ETC
A66-14064
- HISTORY OF ASTRONAUT SELECTION PROCEDURES AS
RELATED TO SELECTION OF SCIENTISTS BECOMING
MEMBERS OF SPACECREW A66-80187
- NEVSKAIA, A. A.
STUDY OF HUMAN VISUAL PERCEPTION REACTION TIME
WITH MASKING A66-80306
- NEWBERRY, P. D.
HYPOXIC HYPOXIA AND HYPERVENTILATION EFFECT ON
NYSTAGMUS INDUCED BY ANGULAR ACCELERATION
A66-13356
- NICHOLS, B. W.
LIGHT INDUCED CHANGES IN LIPIDS OF CHLORELLA
VULGARIS A66-80246
- NIESEL, W.
OXYGEN SATURATION AND DESATURATION TIMES IN
CARDIAC MUSCLE AND CORRESPONDING VALUES CALCULATED
FROM KROGH SUPPLY MODEL A66-80346
- NIKITIN, M. D.
POSSIBILITIES OF PHARMACEUTICAL AND CHEMICAL
PROTECTION OF HUMAN SUBJECTS AGAINST RADIATION
INJURIES DURING OUTER SPACE FLIGHTS
A66-80309
- SPACE RADIATION-RELATIVE BIOLOGICAL EFFECTIVENESS
AND PROBLEMS OF SHIELDING DURING MOON MISSION
A66-80310
- NIKOLAEV, V. F.
CEREBRAL VENOUS FLOW IN RABBITS DURING
ACCELERATION WITH EMPHASIS ON METHOD OF
REGISTRATION A66-80332
- NIKOLAYEV, A.
REVIEW OF LIFE SUPPORT PROBLEMS IN SPACE - FOOD,
WATER, OXYGEN, WEIGHTLESSNESS, AND ACCELERATION
FTD-TT-65-601/184 N66-14028
- NOBLE, M.
ACQUISITION OF STEP FUNCTION TRACKING TASK AS
FUNCTION OF ALTERNATIVES AND SEQUENCE LENGTH
A66-80180
- NORMAN, D. A.
SHORT TERM RECOGNITION MEMORY FOR SINGLE DIGITS
AND PAIRS OF DIGITS A66-80268
- NOVIKOV, M. A.
EXPERIMENTAL PSYCHOLOGICAL EXAMINATION OF
COSMONAUTS A66-80298
- NOZDRACHEV, A. D.
METHOD FOR REGISTERING POTENTIALS OF AUTONOMIC
NERVES DURING CONTINUOUS EXPERIMENT IN DOGS
A66-80331
- EFFECT OF PROLONGED EXPOSURE TO HIGH CONCENTRATION
OF OXYGEN ON LUNGS AND BLOOD IN MICE A66-80389
- O
- ODLAND, L. T.
PARTIAL CANINE BODY EXPOSURE TO IONIZATION
RADIATION NOTING ANOREXIA, WEIGHT LOSS, VOMITING
AND HYPERSIALOSIS DUE TO 1000 KVP X-RAY EXPOSURE
A66-13352
- OKUBO, T.
DISTRIBUTION FUNCTION OF HELIUM CLEARANCE TIME
CONSTANT IN HEALTHY AND DISEASED LUNGS OF HUMAN
SUBJECTS A66-80232
- NEW METHOD FOR ANALYSIS OF DISTRIBUTION OF
MECHANICAL TIME CONSTANTS IN LUNG A66-80238
- OMALLEY, B. W.
MECHANISM OF IN VIVO RBC DAMAGE BY OXYGEN, NOTING
EFFECT ON CANINE ERYTHROCYTES A66-13348
- ORBACH, J.
DETECTION THRESHOLDS AS FUNCTION OF INTERVAL
SEPARATION BETWEEN TWO SUCCESSIVE TARGETS
A66-80354
- ORLOV, S. F.
ARTERIAL PRESSURE, RESPIRATORY RATE,
ELECTROCARDIOGRAM, AND ELECTROENCEPHALOGRAM OF
YOUNG MEN DURING SHORT TERM ANGULAR ACCELERATIONS
A66-80303
- ORMONROYD, F.
COCKPIT DISPLAY CORRECTION METHODS USED IN DESIGN
OF TRIDENT AIRCRAFT A66-12882
- ORO, J.
CONTAMINATION OF CARBONACEOUS CHONDRITES BY
ORDINARY VIABLE MICROORGANISMS, ISOLATING THREE
TYPES OF BACTERIA ON VARIOUS METEORITES
A66-13339
- P
- PAGANELLI, C. V.
PULMONARY GAS EXCHANGE IN DOGS DURING LIQUID
BREATHING UNDER HYPERBARIC OXYGENATION
A66-80230
- PANNIER, R.
HYPOGLYCEMIA IN FLYING PERSONNEL - CASE HISTORIES
A66-80358
- SOME ELECTROCARDIOGRAPHIC ABNORMALITIES AND
PHYSICAL FITNESS OF FLYING PERSONNEL
A66-80362

- PAO, I.-YU.**
HISTOCHEMICAL USE OF FRESH CUT TISSUE SHEET -
CUT SHEET ATTACHMENT IN LOW TEMPERATURE
CRYOSTAT, AND FREEZING AND CUTTING TECHNIQUE
N66-12371
- PAPPER, E. M.**
ADJUSTMENT IN NORMAL SUBJECTS OF ARTERIAL CARBON
DIOXIDE TENSION FOLLOWING HYPERVENTILATION.
A66-80235
- PARFENOV, G. P.**
EFFECT OF SPACE FLIGHT FACTORS ON REPRODUCTIVE
SYSTEM OF DROSOPHILA AND GENETIC APPARATUS OF
TRADESCANTIA A66-80371
- HUMAN CELLS AND GENETIC CHANGES IN ESCHERICHIA
DURING EXPOSURE STRESSES OF SPACE FLIGHT ON VOSTOK
SPACECRAFT A66-80372
- DOMINANT LETHALS IN DROSOPHILA MALES EXPOSED TO
VIBRATION, ACCELERATION, AND GAMMA IRRADIATION
DURING SPACE FLIGHTS N66-13790
- PARIN, V. V.**
PHYSIOLOGICAL RESPONSES TO AND BIOLOGICAL EFFECTS
OF SPACE FLIGHT STRESS - ASTRONAUT PERFORMANCE
ANL-TRANS-209 N66-13520
- PARKER, H. G.**
ERYTHROPOIETIN, ACTIVITY, BLOOD, AND PHYSIOLOGICAL
RESPONSES TO SEVERE HYPOXIA IN MAN A66-80214
- PARRINO, P. S.**
STATISTICAL ANALYSIS OF HEAT SYNDROME CAUSES -
ENVIRONMENTAL AND HUMAN FACTORS, AND PREVENTION
AND ALLEVIATION IN CIVIL DEFENSE SHELTERS AND IN
EMERGENCY SITUATIONS AD-623578 N66-13007
- PARSHIN, V. S.**
POSSIBILITIES OF PHARMACEUTICAL AND CHEMICAL
PROTECTION OF HUMAN SUBJECTS AGAINST RADIATION
INJURIES DURING OUTER SPACE FLIGHTS A66-80309
- PASINETTI, A.**
BIOLOGICAL EFFECTS OF HIGH ENERGY PROTON
IRRADIATION ON MICE HER/AP-2-65 N66-12462
- PATTERSON, J. L., JR.**
ROLE OF HYPOCAPNIA IN CARDIAC OUTPUT, HEART RATE
AND BLOOD PRESSURE RESPONSES TO ACUTE HYPOXIA IN
MAN A66-80209
- PATTERSON, R. W.**
ADJUSTMENT IN NORMAL SUBJECTS OF ARTERIAL CARBON
DIOXIDE TENSION FOLLOWING HYPERVENTILATION.
A66-80235
- PEARSON, R. W.**
RESPONSE OF HUMAN EPIDERMIS TO GRADED THERMAL AND
COLD STRESS. A66-80257
- PESTOV, I. D.**
EMETIC EFFECT OF APOMORPHINE AS RELATED TO
DURATION OF ROTATION OR OSCILLATION EXPOSURE IN
DOGS A66-80326
- PETER, J.**
SWEAT GLAND FATIGUE AS REFLECTED BY SWEAT RATES
AND RECTAL TEMPERATURES DURING EXPOSURE TO HOT
ENVIRONMENT A66-80218
- PETERS, A. C.**
FLUORESCENT EMISSION FROM CAT CEREBRAL CORTEX
AMRL-TR-65-88 N66-12385
- PETROCELLI, A. W.**
SURVEY OF SOVIET USE OF ACTIVE CHEMICALS FOR SPACE
CABIN AIR REVITALIZATION A66-80202
- PETROVICH, I. K.**
BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON
DOGS AND WHITE RATS N66-12455
- PETRUKHIN, V. G.**
PROTON AND GAMMA IRRADIATION EFFECTS ON SPLEEN,
THYMUS AND BONE MARROW IN MICE A66-80383
- PEW, R. W.**
HUMAN PERFORMANCE CHARACTERISTICS IN MANUAL
CONTROL TASKS, AND TECHNIQUES FOR DATA ANALYSIS
AND SYSTEMS SIMULATION NASA-CR-68981 N66-14290
- PICKERING, J. E.**
SPACE RADIOBIOLOGY TRAINING AND OPERATIONS -
RADIATION ZONES AND EXPOSURE, BIOLOGICAL
EFFECTS RADIATION, DOSE RATES, AND RECOVERY
AMD-TR-65-2 N66-13006
- PILIPIUK, Z. I.**
EIGHT HOUR ISOLATION AND HYPOKENSIA EFFECT ON
BIOCHEMICAL AND PHYSIOLOGICAL INDICES IN MAN
A66-80299
- CHANGES IN PHYSIOLOGICAL AND BIOCHEMICAL STATE OF
MAN AFTER EXPOSURE TO SMALL CONCENTRATIONS OF
CARBON MONOXIDE - HEART FUNCTION, RESPIRATION AND
CHOLINESTERASE BLOOD LEVEL A66-80304
- PILTINGSRUD, C. W.**
TWO TYPES OF PLUTONIUM EXPOSURE IN URINE, FECES,
AND BLOOD OF HUMAN BODY, AND EFFECTIVENESS OF
DIETHYLENTRIAMINEPENTAACETIC ACID TREATMENTS
N66-12685
- PINES, J.**
PULMONARY DIFFUSING CAPACITY IN SUBJECTS AT REST
AND DURING EXERCISE AS AFFECTED BY INCREASED
ENVIRONMENTAL TEMPERATURE A66-80224
- PINGANNAUD, P. M.**
NUTRITIONAL PROBLEMS OF SUGAR REGULATION IN
AVIATION MEDICINE - HYPERGLYCEMIA IN RATS AND SURV
OF NUTRITIONAL HABITS OF FLYING PERSONNEL
A66-80361
- PLOTNIKOVA, YE. D.**
BIOLOGICAL EFFECTS OF HIGH ENERGY PROTON AND
X-RAY IRRADIATION ON HEREDITY STRUCTURES OF
RATS N66-12457
- PODOPLELOV, I. I.**
HUMAN CELLS AND GENETIC CHANGES IN ESCHERICHIA
DURING EXPOSURE STRESSES OF SPACE FLIGHT ON VOSTOK
SPACECRAFT A66-80372
- POGOVENKO, E. S.**
MOTOR RESTRAINT EFFECT ON BEHAVIOR RESPIRATION,
HEART FUNCTION, AND BRAIN BIOELECTRIC ACTIVITY IN
MONKEY A66-80376
- POGROMSKIY, I. I.**
CYBERNETIC DEVICES USED IN MEDICAL PRACTICE, AND
CYBERNETIC SYSTEMS FOR NEUROLOGICAL STUDIES AND
DIAGNOSTIC TECHNIQUES JPRS-32344 N66-12728
- POKOTOVA, N. A.**
MOTOR RESTRAINT EFFECT ON BEHAVIOR RESPIRATION,
HEART FUNCTION, AND BRAIN BIOELECTRIC ACTIVITY IN
MONKEY A66-80376
- EXPERIMENTAL STUDY OF ORGANIZATION OF INFORMATION
IN VISUAL TASK IN MAN A66-80394
- POKROVSKAYA, G. L.**
EFFECT OF VIBRATION ON CELL DIVISION IN BONE
MARROW OF MOUSE N66-13791
- POLLYCOVE, M.**
ERYTHROPOIETIN, ACTIVITY, BLOOD, AND PHYSIOLOGICAL
RESPONSES TO SEVERE HYPOXIA IN MAN A66-80214
- POPKOV, V. L.**
FREQUENCY ANALYSIS OF DIURNAL PERIODICITY IN HUMAN
ELECTROENCEPHALOGRAM A66-80395
- POPOV, I. G.**
STUDY OF COMFORTABLE CLOTHING FOR ASTRONAUTS
DURING 30-DAY TESTS WITHOUT WASHING IN AIR
CONDITIONED SPACE CABINS IN RELATION TO SKIN

- CONDITION A66-80314
- POPOV, I. I.
ELECTROPHYSIOLOGICAL STUDIES ON VOSKHOD MANNED SPACECRAFT N66-12659
- POPOV, V. A.
METHODS USED AND PROBLEMS ENCOUNTERED IN EVALUATING PERFORMANCE OF ASTRONAUTS IN SPACE FLIGHT ENVIRONMENT N66-12658
- POPOVA, E. O.
FREQUENCY ANALYSIS OF DIURNAL PERIODICITY IN HUMAN ELECTROENCEPHALOGRAM A66-80395
- POPPODIEK, H. F.
THERMAL AND ELECTRIC CONDUCTIVITY OF BODY FLUIDS AND TISSUES GLR-37 N66-12592
- POSNER, M. I.
EFFECT OF SIZE AND LOCATION OF INFORMATIONAL TRANSFORMS UPON SHORT-TERM RETENTION A66-80269
- POUJOL, CL.
SOME ELECTROCARDIOGRAPHIC ABNORMALITIES AND PHYSICAL FITNESS OF FLYING PERSONNEL A66-80362
- POWELL, A. H., JR.
CHARACTERISTICS OF LIPID MOBILIZATION AND PERIPHERAL DISPOSITION IN AGED INDIVIDUALS A66-80283
- POZDNYAKOV, A. L.
BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON DOGS AND WHITE RATS N66-12455
- PRESMAN, A. S.
BIOLOGICAL EFFECTS OF MICROWAVE RADIATION JPRS-33054 N66-12294
- PRINE, J.
ANATOMICAL STUDIES IN DOG ANESTHETIZED WITH PENTOBARBITAL AND CHLORPROMAZINE AND SUBJECTED TO REPEATED PROLONGED POSITIVE G A66-12362
- PRIVEZENTSEV, V. I.
AUTOMATIC DEVICE FOR PRODUCING CONTROLLED HYPOTHERMIA IN ANIMALS AND HUMANS A66-80330
- PROPER, R.
ASTRONAUT SELECTION INCLUDING DYNAMIC TESTING, DISCUSSING EXAMINATION METHODS, BIOLOGICAL PARAMETERS, LABORATORY AND RADIOLOGICAL PROCEDURES, BLOOD CHEMISTRY TECHNIQUES, ETC A66-14064
- HISTORY OF ASTRONAUT SELECTION PROCEDURES AS RELATED TO SELECTION OF SCIENTISTS BECOMING MEMBERS OF SPACECREW A66-80187
- PUTZIER, E. A.
TWO TYPES OF PLUTONIUM EXPOSURE IN URINE, FECES, AND BLOOD OF HUMAN BODY, AND EFFECTIVENESS OF DIETHYLENEDIAMINEPENTAACETIC ACID TREATMENTS N66-12685
- R**
- RADWAN, M. H. S.
ROLE OF CONVERGENCE IN STEREOSCOPIC VISION A66-80288
- RAHN, H.
PRESSURE FLOW RELATIONSHIP OF AIRWAYS IN SITTING SUBJECT UNDER NORMAL CONDITIONS, IMMERSSED IN WATER TO NECK LEVEL, AND DURING NEGATIVE PRESSURE BREATHING SUFFICIENT TO REDUCE LUNG VOLUME AS DURING IMMERSION. A66-80236
- RAMSEY, F. K.
INHALATION STUDY OF NEODYMIUM OXIDE PATHOGENESIS IN MICE AND GUINEA PIGS - ANIMAL STUDY CDO-1170-4 N66-12951
- RANDALL, R.
THERMAL AND ELECTRIC CONDUCTIVITY OF BODY FLUIDS AND TISSUES GLR-37 N66-12592
- RANDALL, W. C.
VASCULAR AND SWEATING RESPONSES OF MAN TO VARYING TEMPERATURE EXPOSURES A66-80250
- RAZGOVOROV, B. L.
POSSIBILITIES OF PHARMACEUTICAL AND CHEMICAL PROTECTION OF HUMAN SUBJECTS AGAINST RADIATION INJURIES DURING OUTER SPACE FLIGHTS A66-80309
- SURVIVAL DURING SCREENING OF VARIOUS AREAS OF RAT BODY TO GAMMA RAYS AND HIGH ENERGY PROTONS AS AFFECTED BY VIBRATION OR ACCELERATION STRESS A66-80382
- RAZORENOVA, V. A.
COMPARISON OF BIOLOGICAL EFFECTS OF PROTON, X-RAY, AND GAMMA IRRADIATIONS ON DOGS AND WHITE RATS N66-12460
- RAZUMEEV, A. N.
MODEL OF VESTIBULAR APPARATUS DEMONSTRATING ITS FUNCTIONS UNDER CONDITIONS OF VARIABLE GRAVITATIONAL FIELD A66-80327
- REBELL, G.
SKIN DISORDERS DUE TO MICROBIAL INFECTIONS IN MILITARY PERSONNEL LIVING IN TROPICS A66-80262
- REINHARDT, R. F.
AIRSICKNESS IN STUDENT AVIATORS DURING FLIGHT TRAINING AS RELATED TO VESTIBULAR AND VISUAL STIMULI AND ANXIETY A66-80206
- AIR SICKNESS IN STUDENT AVIATORS ASSOCIATED WITH PEAKS OF PHYSIOLOGICAL AND PSYCHOLOGICAL STRESS DURING TRAINING NSAM-939 N66-13700
- RENDON, L.
BEHAVIOR OF SERUM LACTIC DEHYDROGENASE IN MEN EXPOSED TO BRIEF, INTENSE THERMAL IMPULSES A66-80203
- REBERG, M. S.
METHOD FOR PROCESSING HUMAN WASTE TO RECLAIM WATER USING CHLORELLA - BACTERIA SYSTEM A66-80391
- REYNOLDS, O. E.
FUTURE OF ENVIRONMENTAL BIOLOGY, DISCUSSING SPACE RESEARCH ON LIVING ORGANISMS IN EXTRATERRESTRIAL ENVIRONMENT A66-14069
- SPACE EXPLORATION AND STUDY OF ROLE OF EARTH ENVIRONMENTAL CONDITIONS IN EVOLUTION, PHYSIOLOGY, AND BEHAVIOR OF TERRESTRIAL ORGANISMS A66-80156
- RIABOV, F. P.
CHLORELLA AS SOURCE OF OXYGEN AND FOOD IN SHINER, NOTROPIS A66-80335
- RICCIO, D. C.
ENVIRONMENTAL TEMPERATURE EFFECTS ON EKG OF SQUIRREL MONKEY - ANIMAL STUDY OF HEART RATE AND T-WAVE AMPLITUDE NASA-CR-68306 N66-12972
- RICHARDSON, D. W.
ROLE OF HYPOCAPNIA IN CARDIAC OUTPUT, HEART RATE AND BLOOD PRESSURE RESPONSES TO ACUTE HYPOXIA IN MAN A66-80209
- RIGGS, L. A.
ELECTROPHYSIOLOGY OF VISION DESCRIBING NEURAL AND PHOTOCHEMICAL PROCESSES AND MOTOR RESPONSE A66-13788
- VISUAL ACUITY DEFINITION AND CLINICAL MEASUREMENT OF RELEVANT FACTORS A66-13793

- ROBERTS, E. O.
DESIGN CRITERIA FOR CREW STATIONS AS RELATED TO
CREW MEMBER EGRESS FROM SINGLE PLACE PILOT
STATION IN WEIGHTLESS ENVIRONMENT - HUMAN
ENGINEERING AND FLIGHT DYNAMICS
AFFDL-TR-65-148 N66-13978
- ROBINSON, B. F.
SYMPATHETIC NERVOUS STIMULATION OF HEART - BETA
ADRENERGIC BLOCKING CARDIAC FUNCTION, CIRCULATORY
RESPONSE AND PHYSICAL EXERCISE A66-80147
- ROBINSON, S.
MECHANISMS OF SWEATING IN WORK-SWEATING RESPONSES
IN PHYSICAL EXERCISE RELATED TO CHANGES IN BODY
TEMPERATURE A66-80252
- ROBY, T. B.
SIMPLE PATTERN RECOGNITION IN SMALL GROUP
SITUATION A66-80181
- ROGOZKIN, V. D.
PROPHYLAXIS AND THERAPY OF RADIATION INJURIES
CAUSED BY HIGH ENERGY PROTON IRRADIATION N66-12461
- ROLNIK, V. V.
EFFECT OF REPLACING ATMOSPHERIC NITROGEN BY
HELIUM ON DEVELOPMENT OF CHICK EMBRYOS
JPRS-32905 N66-12299
- ROMANOV, A. K.
DESIGN, CALIBRATION, AND SENSOR CONSTRUCTION OF
AUTOMATIC EQUIPMENT FOR ANALYZING
BALLISTOCARDIOGRAMS - BIODASTRONAUTICS N66-12222
- ROMANOV, S. N.
SENSITIVITY OF DIFFERENT ORGAN MOUSE TISSUE CELLS
DURING IN SITU AND IN VITRO STUDIES IN RESPONSE TO
VIBRATION A66-80380
- ROMANOVA, R. A.
SENSITIVITY OF DIFFERENT ORGAN MOUSE TISSUE CELLS
DURING IN SITU AND IN VITRO STUDIES IN RESPONSE TO
VIBRATION A66-80380
- ROPPEL, R. M.
FLUORESCENT EMISSION FROM CAT CEREBRAL CORTEX
AMRL-TR-65-88 N66-12385
- ROSE, R. E.
MATHEMATICAL MODEL OF HUMAN COMPENSATORY TRACKING
BEHAVIOR A66-80149
- ROSENQUIST, H. S.
VISUAL RESPONSE COMPONENT OF ROTARY PURSUIT
TRACKING A66-80179
- ROSENSTOCK, E. H.
ACHIEVEMENT IN PROGRAMMED MATHEMATICS AS FUNCTION
OF DIFFERENTIAL KNOWLEDGE OF RESULTS A66-80272
- ROSENTHAL, S. R.
PHARMACOLOGICALLY ACTIVE AND LETHAL SUBSTANCES
RELEASED FROM THERMALLY INJURED SKIN OF HUMAN AND
ANIMAL SUBJECTS INCLUDING HISTAMINE, BRADYKININ,
ADENYLIC COMPOUNDS, AND POSSIBLY SEROTONIN A66-80254
- ROSS, D. A.
NUCLEAR RADIATION MEDICINE - METHODS OF RECORDING
COUNTING RATE
ORNL-P-1383 N66-12899
- ROSS, J. C.
PULMONARY DIFFUSING CAPACITY IN SUBJECTS AT REST
AND DURING EXERCISE AS AFFECTED BY INCREASED
ENVIRONMENTAL TEMPERATURE A66-80224
- ROSSING, R. G.
PARTIAL PRESSURE OF OXYGEN AND CARBON DIOXIDE,
HYDROGEN ION CONCENTRATION, HEMOGLOBIN
SATURATION, AND TEMPERATURE OF DOG BLOOD
ANALYZED USING DIGITAL COMPUTER
SAM-TR-65-39 N66-13209
- ROSSMAN, E.
EFFECT OF SIZE AND LOCATION OF INFORMATIONAL
TRANSFORMS UPON SHORT-TERM RETENTION A66-80269
- ROTH, E. M.
ASTRONAUT SELECTION INCLUDING DYNAMIC TESTING,
DISCUSSING EXAMINATION METHODS, BIOLOGICAL
PARAMETERS, LABORATORY AND RADIOLOGICAL
PROCEDURES, BLOOD CHEMISTRY TECHNIQUES, ETC
A66-14064
- HISTORY OF ASTRONAUT SELECTION PROCEDURES AS
RELATED TO SELECTION OF SCIENTISTS BECOMING
MEMBERS OF SPACECREW A66-80187
- ROWLANDS, G. F.
DYNAMIC BEHAVIOR OF AIRCREW BREATHING EQUIPMENT
CONSIDERING CYCLIC FLOW RESPONSE TESTS, STABILITY
PROBLEMS, MEASUREMENT TECHNIQUES AND HUMAN
RESPIRATORY IMPEDANCE A66-13350
- ROZHDESTVENSKII, V. I.
SENSORS FOR AUTOMATIC CONTROL AND REGULATION OF
PHYSIOLOGICAL PROCESSES OF PLANTS IN CLOSED
SYSTEMS A66-80396
- ROZIER, J.
HEART AND BREATHING RATE AND ELECTROENCEPHALO-
GRAPHIC RESPONSES OF RATS DURING
WEIGHTLESSNESS A66-14083
- ELECTROENCEPHALOGRAPHIC RESPONSES AND CHANGES IN
ELECTRIC POTENTIALS IN NECK MUSCLES OF RAT DURING
SHORT PERIODS OF WEIGHTLESSNESS A66-80161
- RUBINSTEIN, D.
LIGHT INDUCED ABSORPTION CHANGES AT 520 NM IN
CHLORELLA PYRENOIDOSA AND THEIR RELATIONSHIP TO
TWO PIGMENT SYSTEM OF PHOTOSYNTHESIS A66-80289
- RUFF, G. E.
REVIEW OF PROBLEMS FOR PHYSICIAN IN AEROSPACE
MEDICINE A66-80405
- RUFF, S.
STRESS IMPOSED ON AIRCREW IN CIVIL JET AIRCRAFT
DURING LONG FLIGHT
DLR-FB-65-44 N66-14261
- RYBAKOV, N. I.
HUMAN CELLS AND GENETIC CHANGES IN ESCHERICHIA
DURING EXPOSURE STRESSES OF SPACE FLIGHT ON VOSTOK
SPACECRAFT A66-80372
- AMINOTHIOLS AND PYRIMIDINE ANALOGS TESTED FOR
PROTECTIVE EFFECTS AGAINST GENETIC MUTATIONS IN
ESCHERICHIA COLI EXPOSED TO X-RAY IRRADIATION A66-80205
- RYZHKOVA, V. L.
BIOLOGICAL MECHANISMS FOR MEMORY - NEURON
EXCITATION, NUCLEIC ACID METABOLISM, AND PROTEIN
SYNTHESIS MECHANISM - DEOXYRIBONUCLEIC ACID
JPRS-32809 N66-12269
- RYZHOV, N. I.
RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS,
DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION
LEVEL DETERMINATION N66-12452
- ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY
PROTONS IN MULTIPLE IRRADIATION N66-12454
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON
DOGS AND WHITE RATS N66-12455
- RELATIVE BIOLOGICAL EFFECT OF PROTONS IN
FRACTIONAL IRRADIATION COMPARED WITH MULTIPLE
X-RAY IRRADIATION OF DOGS AND RATS N66-12459
- COMPARISON OF BIOLOGICAL EFFECTS OF PROTON,
X-RAY, AND GAMMA IRRADIATIONS ON DOGS AND WHITE
RATS N66-12460

S

- SABIN, B. M.**
EMBRYONIC DEVELOPMENT OF CHICK AND FROG EGGS AND RESPIRATION OF CHICKEN AND MOUSE IN SIMULATED SPACE CABIN ATMOSPHERE CONSISTING OF HELIUM AND OXYGEN A66-80315
- SABINICH, F. K.**
STUDY OF COMFORTABLE CLOTHING FOR ASTRONAUTS DURING 30-DAY TESTS WITHOUT WASHING IN AIR CONDITIONED SPACE CABINS IN RELATION TO SKIN CONDITION A66-80314
- SAGI, Y.**
NEW METHOD FOR ANALYSIS OF DISTRIBUTION OF MECHANICAL TIME CONSTANTS IN LUNG A66-80238
- SAIS, J.**
GASTRODUODENAL ULCERS IN FRENCH AIR FORCE PERSONNEL - STATISTICAL ANALYSIS A66-80363
- SAKOVICH, V. A.**
DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES USING SYNCHROCYCLOTRON - IRRADIATION OF ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION RESISTANCE OF PLASTICS N66-12453
- SAKSONOV, P. P.**
BIOLOGICAL CHARACTERISTICS AND PHYSICAL CONDITIONS OF SPACE FLIGHTS, SUCH AS LOW PRESSURE, IONIZING RADIATION, NOISE, ACCELERATION, WEIGHTLESSNESS, ARTIFICIAL ATMOSPHERE, FEEDING PROBLEMS, ETC A66-14066
- BIOLOGICAL EFFECTS OF COSMIC RADIATION UNDER LABORATORY AND FLIGHT CONDITIONS ON VARIOUS CRAFT TO STUDY MEASURES FOR PHARMACOLOGICAL AND BIOLOGICAL PROTECTION A66-14077
- POSSIBILITIES OF PHARMACEUTICAL AND CHEMICAL PROTECTION OF HUMAN SUBJECTS AGAINST RADIATION INJURIES DURING OUTER SPACE FLIGHTS A66-80309
- SPACE RADIATION-RELATIVE BIOLOGICAL EFFECTIVENESS AND PROBLEMS OF SHIELDING DURING MOON MISSION A66-80310
- HUMAN CELLS AND GENETIC CHANGES IN ESCHERICHIA DURING EXPOSURE STRESSES OF SPACE FLIGHT ON VOSTOK SPACECRAFT A66-80372
- SURVIVAL DURING SCREENING OF VARIOUS AREAS OF RAT BODY TO GAMMA RAYS AND HIGH ENERGY PROTONS AS AFFECTED BY VIBRATION OR ACCELERATION STRESS A66-80382
- PROTON AND GAMMA IRRADIATION EFFECTS ON SPLEEN, THYMUS AND BONE MARROW IN MICE A66-80383
- AMINOTHIOLS AND PYRIMIDINE ANALOGS TESTED FOR PROTECTIVE EFFECTS AGAINST GENETIC MUTATIONS IN ESCHERICHIA COLI EXPOSED TO X-RAY IRRADIATION A66-80385
- BIOLOGICAL EFFECT IN MOUSE OF GAMMA IRRADIATION AS AFFECTED BY SOLAR FLARE, RADIOPROTECTIVE DRUGS, AND ACCELERATION STRESS DURING SIMULATION OF RADIATION CONDITIONS OF SPACEFLIGHT A66-80402
- SALATSINSKAIA, E. N.**
RESISTANCE TO HYPOXIA AND FATIGUE OF RESPIRATORY MUSCLE DURING ASCENT TO HIGH ALTITUDE AS AFFECTED BY ACCLIMATIZATION A66-80305
- EFFECT OF PROLONGED EXPOSURE TO HIGH CONCENTRATION OF OXYGEN ON LUNGS AND BLOOD IN MICE A66-80389
- SAMUELOFF, S. L.**
RESPONSE OF CAPACITY VESSELS IN HUMAN LIMBS TO HEAD-UP TILT AND SUBATMOSPHERE PRESSURE ON LOWER BODY A66-80212
- SANDERS, A. P.**
SUCCINATE-PROTECTIVE AGENT AGAINST HIGH PRESSURE OXYGEN TOXICITY IN RAT A66-80365
- SARGENT, F., II**
WATER CONSUMPTION BY MAN IN WARM ENVIRONMENT ANALYZED STATISTICALLY AND RELATED TO METABOLIC VARIABLES A66-80216
- SEX DIFFERENCES, INCIDENCE, REVERSAL, AND PREVENTION OF HIDROMEIOSIS-DECREMENT OF RATE OF THERMALLY INDUCED SWEATING A66-80251
- SASAKI, T.**
DISTRIBUTION FUNCTION OF HELIUM CLEARANCE TIME CONSTANT IN HEALTHY AND DISEASED LUNGS OF HUMAN SUBJECTS A66-80232
- NEW METHOD FOR ANALYSIS OF DISTRIBUTION OF MECHANICAL TIME CONSTANTS IN LUNG A66-80238
- SATTERFIELD, M. M.**
NUCLEAR RADIATION MEDICINE - METHODS OF RECORDING COUNTING RATE GRNL-P-1383 N66-12899
- SAUNDERS, J. F.**
NASA BIOSATELLITE PROGRAM - PURPOSES AND PROPOSED EXPERIMENTS A66-80364
- SAVIN, V. M.**
EFFECT OF REPLACING ATMOSPHERIC NITROGEN BY HELIUM ON DEVELOPMENT OF CHICK EMBRYOS JPRS-32905 N66-12299
- SCHERER, H. F.**
DIAL READING ABILITY OF SPACECRAFT CREW DURING PROLONGED ACCELERATION AND VIBRATION AMRL-TR-65-110 N66-12376
- SCHIECHEL, F. A.**
HIGH NOISE LEVELS EFFECT ON HEARING DAMAGE OF TECHNICAL PERSONNEL OF MILITARY AIRFIELD A66-14386
- SCHMIDT, K.**
OXYGEN SATURATION AND DESATURATION TIMES IN CARDIAC MUSCLE AND CORRESPONDING VALUES CALCULATED FROM KROGH SUPPLY MODEL A66-80346
- SCHUBERT, G.**
SPATIAL ORIENTATION AND PERCEPTION OF SUBJECTS ASSUMING VARIOUS HEAD AND BODY POSITIONS UNDER INCREASED ACCELERATION WITHOUT VISUAL REFERENCE FRAME A66-80163
- SCHUCKMAN, H.**
DETECTION THRESHOLDS AS FUNCTION OF INTERVAL SEPARATION BETWEEN TWO SUCCESSIVE TARGETS A66-80354
- SCHUMSKY, D. A.**
USE OF NEGATIVE SLOPE TRANSFORMATIONS OF KNOWLEDGE OF RESULTS ON SIMPLE MOTOR RESPONSE A66-80270
- SCHUSTER, D. H.**
HUMAN FACTORS EVALUATION OF COMMUNICATIONS EQUIPMENT SWITCH ACTUATORS UNDER SIMULATED SPACE CRAFT AND ORDINARY CONDITIONS A66-80148
- SCHWICHTENBERG, A. H.**
ASTRONAUT SELECTION INCLUDING DYNAMIC TESTING, DISCUSSING EXAMINATION METHODS, BIOLOGICAL PARAMETERS, LABORATORY AND RADIOLOGICAL PROCEDURES, BLOOD CHEMISTRY TECHNIQUES, ETC A66-14064
- HISTORY OF ASTRONAUT SELECTION PROCEDURES AS RELATED TO SELECTION OF SCIENTISTS BECOMING MEMBERS OF SPACECREW A66-80187
- SELDEEN, B. L.**
ACCELERATION EFFECT ON FOOD REINFORCED DRL AND FR SCHEDULES A66-13175
- SENAPATI, J. M.**
VENTILATION OF DOGS IN RESPONSE TO PRESSURE AND

- ELECTRIC STIMULATION OF MUSCLE AFFERENTS
A66-80234
- SENDROY, J., JR.
DETERMINATION OF MALE AND FEMALE BODY VOLUME FROM
HEIGHT AND WEIGHT USING GRAPHICAL METHOD
A66-80228
- SERGEEV, N. P.
ARTIFICIAL ENVIRONMENT IN MANNED SPACECRAFT FOR
PRESERVING HUMAN LIFE, COMPARING PHYSICAL,
CHEMICAL AND BIOLOGICAL PROCESSES
A66-14079
- PRINCIPLES FOR CREATING SYSTEMS CAPABLE OF
MAINTAINING OPTIMUM CONDITIONS IN SPACE CAPSULE
ENVIRONMENT
A66-80190
- SEVANKAYEV, A. V.
BIOLOGICAL EFFECT OF DIFFERENT DOSES OF IONIZING
RADIATION ON VESTIBULAR APPARATUS
N66-12458
- SHADRINTSEV, I. S.
SENSORS FOR PHYSIOLOGICAL INVESTIGATIONS UNDER
SPACE FLIGHT CONDITIONS - BIOASTRONAUTICS
N66-12221
- SHAH, R. C.
NEW METHOD FOR BLOOD SERUM CALCIUM ESTIMATION IN
PATIENTS
A66-80292
- SHAH, S. R.
NEW METHOD FOR BLOOD SERUM CALCIUM ESTIMATION IN
PATIENTS
A66-80292
- SHADAROV, IU. I.
PROTECTION OF CORN, WHEAT, AND LUPINE SEEDS
AGAINST BETA-RADIATION BY TREATMENT WITH
SULFANILAMIDE AND NONANOIC ACID DERIVATIVES
A66-80323
- CHINESE CABBAGE SPROUTS GROWN AEROPONICALLY IN
CLOSED ECOLOGICAL SYSTEM AS AFFECTED BY
MINERALIZED PRODUCTS OF HUMAN WASTE
A66-80397
- SHADUROV, V. S.
ULTRAVIOLET RADIATION EFFECTS ON VARIOUS FLOWERING
PLANTS UNDER NEAR SPACE CONDITIONS SUCH AS ARCTIC
AND HIGH ALTITUDE
A66-80324
- SHAKHLAMOV, V. A.
HISTOLOGICAL CHANGES IN OVARIES AND RESISTANCE TO
TRANSVERSE ACCELERATION REVEALED BY CARDIOVASCULAR
AND RESPIRATORY ACTIVITY OF YOUNG FEMALE MONKEYS
A66-80378
- SHAKHOV, A. A.
ULTRAVIOLET RADIATION EFFECTS ON VARIOUS FLOWERING
PLANTS UNDER NEAR SPACE CONDITIONS SUCH AS ARCTIC
AND HIGH ALTITUDE
A66-80324
- SHAKHOVA, A. N.
UTILIZATION OF MINERAL COMPONENTS IN THE MEDIUM
OF CHLORELLA PYRENOIDOSA CULTURES
A66-80399
- SHANNON, R. H.
CAUSES OF COMPRESSION FRACTURES OF SPINE DURING
LARGE NUMBER OF USAF EJECTIONS
A66-12361
- SHAPIO, W.
ROLE OF HYPOCAPNIA IN CARDIAC OUTPUT, HEART RATE
AND BLOOD PRESSURE RESPONSES TO ACUTE HYPOXIA IN
MAN
A66-80209
- SHASHKOV, V. S.
POSSIBILITIES OF PHARMACEUTICAL AND CHEMICAL
PROTECTION OF HUMAN SUBJECTS AGAINST RADIATION
INJURIES DURING OUTER SPACE FLIGHTS
A66-80309
- RADIOPROTECTIVE EFFECT OF VARIOUS DRUGS AGAINST
X - RAYS AND GAMMA RAYS DURING PROTON IRRADIATION
MICE
A66-80381
- SURVIVAL DURING SCREENING OF VARIOUS AREAS OF RAT
BODY TO GAMMA RAYS AND HIGH ENERGY PROTONS AS
AFFECTED BY VIBRATION OR ACCELERATION STRESS
A66-80382
- PROTON AND GAMMA IRRADIATION EFFECTS ON SPLEEN,
THYMUS AND BONE MARROW IN MICE
A66-80383
- BIOLOGICAL EFFECT IN MOUSE OF GAMMA IRRADIATION
AS AFFECTED BY SOLAR FLARE, RADIOPROTECTIVE DRUGS,
AND ACCELERATION STRESS DURING SIMULATION OF
RADIATION CONDITIONS OF SPACEFLIGHT
A66-80402
- SHEEHAN, W. E.
URINARY ELIMINATION FOLLOWING INHALATION OF
INSOLUBLE PLUTONIUM OXIDE
N66-12682
- SHEIKIN, R. L.
MOTOR RESTRAINT EFFECT ON BEHAVIOR RESPIRATION,
HEART FUNCTION, AND BRAIN BIOELECTRIC ACTIVITY IN
MONKEY
A66-80376
- SHEN, S.-C.
MICROBIOCHEMICAL CONTRIBUTIONS TO BIOLOGY -
BACTERIAL PHOTOSYNTHESIS, CATABOLISM, INDUCED
ENZYMES
N66-12632
- SHEPELEV, E. IA.
PROBLEMS OF SPACECRAFT PERSONNEL LIFE SUPPORT BY
RECONVERSION OF WASTE PRODUCTS OF METABOLISM
A66-80313
- SHEPHERD, J. T.
RESPONSE OF CAPACITY VESSELS IN HUMAN LIMBS TO
HEAD-UP TILT AND SUBATMOSPHERE PRESSURE ON LOWER
BODY
A66-80212
- MEASUREMENT OF REACTION IN MAN OF RESISTANCE AND
CAPACITY VESSELS IN FOREARM AND HAND TO LEG
EXERCISE
A66-80221
- SHEPOVALNIKOV, A.
ELECTROPHYSIOLOGY AND PSYCHOPHYSIOLOGY OF SLEEP
JPRS-33033
N66-13176
- SHERIDAN, T. B.
HUMAN USE OF SHORT-TERM MEMORY IN PROCESSING
INFORMATION ON COMPUTER CONSOLE
A66-80151
- SHEWELL, J.
EFFECT OF NITROGEN BREATHING ON RADIATION DAMAGE
IN ALBINO MICE
A66-80295
- SHIH, S.-C.
PATHOLOGICAL EFFECTS OF X-RAY IRRADIATION ON
GASTROINTESTINAL SYSTEM IN DOGS - RADIATION
SICKNESS
FTD-TT-64-910/1&2&3&4
N66-12607
- SHIKHODYROV, V. V.
BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON
DOGS AND WHITE RATS
N66-12455
- SHINOZAKI, T.
APPLICATION OF DIGITAL COMPUTATION TECHNIQUES FOR
ON LINE DISPLAY OF PULMONARY NITROGEN WASHOUT AND
COMPARISON OF DATA WITH CONVENTIONAL TECHNIQUES
A66-80231
- SHMELEVA, A. M.
MORPHOLOGY OF PERIPHERAL BLOOD IN MICE AS INDEX TO
PHYSIOLOGICAL EFFECT OF EXPOSURE TO HIGH OXYGEN
PARTIAL PRESSURE
A66-80386
- EFFECT OF PROLONGED EXPOSURE TO HIGH CONCENTRATION
OF OXYGEN ON LUNGS AND BLOOD IN MICE
A66-80389
- SHOCK, N. W.
INFLUENCE OF AGE ON CARDIOVASCULAR AND RENAL
RESPONSES TO TILTING
A66-80213
- SHUPLIAKOV, V. S.
AUTOMATIC RECORDING AND PROCESSING OF DATA
REGARDING ARTICULATION OF SPEECH
A66-80392

- SICILIANI, F. A.**
LANDING TASK AND PILOT ACCEPTANCE OF DISPLAYS FOR
LANDING IN REDUCED WEATHER MINIMUMS
AIAA PAPER 65-722 A66-12579
- SIDKO, F. IA.**
ILLUMINATION AND CELL DENSITY EFFECTS ON GROWTH
RATE OF CHLORELLA VULGARIS CULTURE A66-80400
- SIEGEL, A. I.**
RELATIONSHIP BETWEEN ANTISUBMARINE HELICOPTER
TEAM PERFORMANCE AND COMMUNICATIONS FLOW WITHIN
TEAM DURING SIMULATED ATTACK
NAVTRADVCEN-1537-1 N66-13972
- SILVERMAN, G.**
CHARACTERISTICS OF LIPID MOBILIZATION AND
PERIPHERAL DISPOSITION IN AGED INDIVIDUALS A66-80283
- SILVESTROV, M. M.**
SIMULATORS USED IN TRAINING ASTRONAUTS FOR
SPACEFLIGHT A66-80296
- SIMONSON, E.**
CRITICAL FLICKER FUSION FREQUENCY AS FUNCTION OF
EXPOSURE TIME IN TWO DIFFERENT AGE GROUPS A66-80285
- SIMPURA, S. F.**
PROLONGED HYPOKINESIA EFFECT ON ACCELERATION
TOLERANCE OF HUMAN A66-80316
- HISTOLOGICAL CHANGES IN OVARIES AND RESISTANCE TO
TRANSVERSE ACCELERATION REVEALED BY CARDIOVASCULAR
AND RESPIRATORY ACTIVITY OF YOUNG FEMALE MONKEYS
A66-80378
- SIPPLE, J. H.**
INFLUENCE OF PROPRIOCEPTOR IN VENTILATORY RESPONSE
TO EXERCISE A66-80223
- SIRI, W. E.**
ERYTHROPOIETIN, ACTIVITY, BLOOD, AND PHYSIOLOGICAL
RESPONSES TO SEVERE HYPOXIA IN MAN A66-80214
- SISAKIAN, N. M.**
TECHNOLOGICAL AND BIOLOGICAL CONTRIBUTIONS OF
SOVIET UNION TO SPACE EXPLORATION A66-80155
- SISHCHENKO, S. V.**
ULTRAVIOLET RADIATION EFFECTS ON VARIOUS FLOWERING
PLANTS UNDER NEAR SPACE CONDITIONS SUCH AS ARCTIC
AND HIGH ALTITUDE A66-80324
- SLOMAN, K.**
SUITABILITY OF TEXTUROMETER FOR MEAT TEXTURE
DESCRIPTION - HARDNESS, COHESIVENESS,
ELASTICITY, CHEWINESS, AND WATER RELEASE OF
FRESH AND FREEZE DEHYDRATED MEATS
FD-17 N66-14020
- SMILEY, J. R.**
HYPOXIC HYPOXIA AND HYPERVENTILATION EFFECT ON
NYSTAGMUS INDUCED BY ANGULAR ACCELERATION A66-13356
- SMIRENNYY, L. N.**
RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS,
DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION
LEVEL DETERMINATION N66-12452
- DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES
USING SYNCHROCYCLOTRON - IRRADIATION OF
ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION
RESISTANCE OF PLASTICS N66-12453
- SMIRNOVA, I. I.**
DESIGN, CALIBRATION, AND SENSOR CONSTRUCTION OF
AUTOMATIC EQUIPMENT FOR ANALYZING
BALLISTOCARDIOGRAMS - BIOASTRONAUTICS N66-12222
- SMITH, R. E.**
THERMOREGULATORY METABOLIC RESPONSE OF COLD AND
HEAT EXPOSED SQUIRREL MONKEYS /SAIMIRI SCIUREA/ AS
COMPARED TO SIMILARLY TREATED RODENTS A66-80225
- SMITH, W. I.**
ACHIEVEMENT IN PROGRAMMED MATHEMATICS AS FUNCTION
OF DIFFERENTIAL KNOWLEDGE OF RESULTS A66-80272
- SMELL, J. F.**
METABOLISM AND ENERGY EXCHANGE BALANCE TESTS IN
RESPIRATION CALORIMETER TO DETERMINE RELATION
BETWEEN BODY TEMPERATURE AND FLUCTUATIONS OF
OTHER BODY FUNCTIONS
NASA-TT-F-9796 N66-13484
- SNYDER, F.**
RAPID EYE MOVEMENT STATE /DREAMING/ DIFFERENTIATED
BIOLOGICALLY FROM SLEEP AND WAKEFULNESS A66-80167
- SNYDER, M. W.**
STATISTICAL ANALYSIS OF HEAT SYNDROME CAUSES -
ENVIRONMENTAL AND HUMAN FACTORS, AND PREVENTION
AND ALLEVIATION IN CIVIL DEFENSE SHELTERS AND IN
EMERGENCY SITUATIONS
AD-623578 N66-13007
- SNYDER, R. G.**
HUMAN TOLERANCE LIMITS IN WATER IMPACT,
IDENTIFYING ENVIRONMENTAL AND TRAUMA
CHARACTERISTICS A66-12356
- SOKOLOVA, I. K.**
DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES
USING SYNCHROCYCLOTRON - IRRADIATION OF
ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION
RESISTANCE OF PLASTICS N66-12453
- SOKOLOVA, D. M.**
BIOCHEMICAL EVIDENCE OF SIMILARITY OF RADIATION
PROTECTION MECHANISMS OF CYSTAMINE, CYSTEAMINE,
SEROTININ, AND ANOXIA IN ALBINO MICE A66-80169
- SOSHIN, B. A.**
POSSIBILITIES OF UTILIZATION OF ELECTRONIC LOGICAL
SYSTEMS FOR AUTOMATIC MEDICAL CONTROL OF
SPACECRAFT PERSONNEL A66-80368
- STAHL, W. M.**
GRAVITY EFFECT ON HEMODYNAMIC FACTORS AND SODIUM
AND WATER EXCRETION IN TWO DOGS SUBJECTED TO
CHANGE FROM SUPINE TO ERECT POSITION AND WATER
IMMERSION A66-12352
- STANKO, S. A.**
ULTRAVIOLET RADIATION EFFECTS ON VARIOUS FLOWERING
PLANTS UNDER NEAR SPACE CONDITIONS SUCH AS ARCTIC
AND HIGH ALTITUDE A66-80324
- STAQUET, M.**
CHANGES IN SERUM PROTEIN-IODINE IN MEN EXPOSED TO
POLAR CLIMATE A66-80293
- STAUB, N. C.**
KINETICS OF OXYGEN UPTAKE BY ERYTHROCYTES OF
DIFFERENT AGES AS RELATED TO RESPIRATORY FUNCTION
OF BLOOD A66-80229
- STEINBUCH, K.**
CYBERNETICS ROLE IN SPACE FLIGHT INCLUDING CONTROL
CIRCUITS FOR GUIDANCE AND ELECTRONIC EQUIPMENT
AUTOMATION AND DEVELOPMENT A66-13495
- COMPARISON OF MANNED AND UNMANNED SPACECRAFT
A66-14092
- STEVENS, P. M.**
HYDRATION DURING BED REST IN RESPONSE TO LOWER
BODY NEGATIVE PRESSURE AS RELATED TO MANNED
SPACE FLIGHT A66-80195
- DEHYDRATION OF SUBJECTS DURING PROLONGED BED REST
AS AFFECTED BY 9 ALPHAFLUOROHYDROCORTISONE
A66-80196
- STEVENSON, J. A. F.**
FOOD INTAKE, BODY WEIGHT, AND ACTIVITY OF RAT
EXERCISING IN HOT ENVIRONMENT A66-80220

- STEWART, K.
COMPARISON OF MEASURED LUNG BURDEN IN ANIMAL SPECIES WITH AMOUNTS OF PLUTONIUM COLLECTED BY CASCADE IMPACTOR SAMPLERS
AWRE-D-29/65 N66-14097
- STEWART, W. K.
NEUROPHYSIOLOGICAL ASPECTS OF MANNED EXTRATERRESTRIAL SPACE FLIGHTS SUCH AS MOTOR RESPONSES BY SENSORY INPUTS, CORTICAL RESPONSES, ETC
A66-14065
- STONE, B. J.
WEIGHT GAIN AND FEED EFFICIENCY IN WEANLING, HEALTHY PIG AS AFFECTED BY EXPOSURE TO NEGATIVE AIR IONIZATION FOR DIFFERENT DURATIONS
A66-80406
- STOUGHTON, R. B.
TEMPERATURE AND HYDRATION FACTORS AFFECTING CUTANEOUS BARRIERS TO PENETRATION
A66-80263
- STRANDELL, T.
VENTILATION, HEART RATE, LACTATE FORMATION, AND OXYGEN CONSUMPTION DURING ARM AND LEG EXERCISE IN SUPINE AND SITTING POSITION
A66-80211
- STRASHNENKO, S. I.
BIOLOGICAL EFFECTS OF HIGH ENERGY PROTON AND X-RAY IRRADIATION ON HEREDITY STRUCTURES OF RATS
N66-12457
- STROBL, W. W.
HANDGEAR INSULATION EFFECTIVENESS OF FREON 12, CARBON DIOXIDE, AND HELIUM
A66-80227
- STROEM, G.
SWEDISH AIR FORCE PERSONNEL TESTING FOR SOMATIC CLASSIFICATION, APPRAISING BODY DIMENSIONS, MUSCULAR CAPACITY, ENDURANCE INDEX, ETC
A66-14087
- STROM, G.
METHODS FOR SOMATIC CLASSIFICATION OF PILOTS OF DIFFERENT AGES ACCORDING TO STATUS OF FUNCTIONAL MUSCULAR, CIRCULATORY, AND RESPIRATORY CAPACITIES AS RELATED TO TRAINING
A66-80164
- STRYDOM, N. B.
SWEAT GLAND FATIGUE AS REFLECTED BY SWEAT RATES AND RECTAL TEMPERATURES DURING EXPOSURE TO HOT ENVIRONMENT
A66-80218
- STRZHIZHOVSKIY, A. D.
BIOLOGICAL EFFECT OF HIGH ENERGY PROTON IRRADIATION ON CORNEAL EPITHELIA OF MICE
N66-12456
- SULLIVAN, S. F.
ADJUSTMENT IN NORMAL SUBJECTS OF ARTERIAL CARBON DIOXIDE TENSION FOLLOWING HYPERVENTILATION.
A66-80235
- SULZBERGER, M. B.
DERMATOLOGICAL CONDITIONS OF HUMAN SKIN AS RESULTS OF HEAT AND HUMIDITY
A66-80247
- SUNDERMAN, F. W.
METABOLIC RESEARCH - ATOMIC ABSORPTION SPECTROMETRY USED FOR MEASURING NICKEL IN BIOLOGICAL MATERIALS, SERUM CA, MG, ACIDITY, AND CONDUCTIVITY - FREEZING POINT METHOD
NYO-1397-1 N66-12898
- SURMILLO, W. W.
LEVEL OF SKIN POTENTIAL IN HEALTHY MALES AND EFFECT OF AGE
A66-80284
- SUSKIND, R. R.
EFFECTS OF WETTING ON CUTANEOUS VULNERABILITY
A66-80260
- SVESHNIKOV, A. A.
BIOLOGICAL EFFECT OF DIFFERENT DOSES OF IONIZING RADIATION ON VESTIBULAR APPARATUS
N66-12458
- SWARTZ, W. F.
OPTIMAL CONTROL DISPLAY RELATIONSHIPS IN GENERAL TRACKING INCLUDING PILOTING AND RADAR TRACKING OPERATION
A66-13349
- SWEENEY, B. M.
BIOLOGICAL CLOCKS AND ENVIRONMENTAL INFLUENCES
A66-80287
- SYCHKOV, M. A.
RADIATION EFFECTS UNDER SPACE FLIGHT CONDITIONS, DOSIMETRIC CONTROL, AND ADMISSABLE RADIATION LEVEL DETERMINATION
N66-12452
- DOSIMETRIC INVESTIGATIONS AND SHIELDING STUDIES USING SYNCHROCYCLOTRON - IRRADIATION OF ANIMALS BY HIGH ENERGY PROTONS, AND RADIATION RESISTANCE OF PLASTICS
N66-12453
- SZCZESNIAK, A.
SUITABILITY OF TEXTUROMETER FOR MEAT TEXTURE DESCRIPTION - HARDNESS, COHESIVENESS, ELASTICITY, CHEWINESS, AND WATER RELEASE OF FRESH AND FREEZE DEHYDRATED MEATS
FD-17 N66-14020
- SZOCS, E.
RENAL CIRCULATION OF DOG AS AFFECTED BY ANGIOTENSIN
A66-80404
- T
- TABAKIN, B. S.
APPLICATION OF DIGITAL COMPUTATION TECHNIQUES FOR ON LINE DISPLAY OF PULMONARY NITROGEN WASHOUT AND COMPARISON OF DATA WITH CONVENTIONAL TECHNIQUES
A66-80231
- TABUSSE, L.
HYPOGLYCEMIA IN FLYING PERSONNEL - CASE HISTORIES
A66-80358
- SOME ELECTROCARDIOGRAPHIC ABNORMALITIES AND PHYSICAL FITNESS OF FLYING PERSONNEL
A66-80362
- TAKAHASHI, H.
DISTRIBUTION FUNCTION OF HELIUM CLEARANCE TIME CONSTANT IN HEALTHY AND DISEASED LUNGS OF HUMAN SUBJECTS
A66-80232
- TAKISHIMA, T.
DISTRIBUTION FUNCTION OF HELIUM CLEARANCE TIME CONSTANT IN HEALTHY AND DISEASED LUNGS OF HUMAN SUBJECTS
A66-80232
- NEW METHOD FOR ANALYSIS OF DISTRIBUTION OF MECHANICAL TIME CONSTANTS IN LUNG
A66-80238
- TALIAFERRO, E. H.
HEAT STRESS AND MINIMAL DEHYDRATION EFFECT UPON HUMAN TOLERANCE TO POSITIVE ACCELERATION
A66-12353
- TANNENBAUM, S. R.
METABOLIC STUDIES OF ENERGY DENSE COMPOUNDS FOR AEROSPACE NUTRITION
AMRL-TR-64-121 N66-13594
- TAPLIN, D.
SKIN DISORDERS DUE TO MICROBIAL INFECTIONS IN MILITARY PERSONNEL LIVING IN TROPICS
A66-80262
- TARASENKO, A. G.
BIOCHEMICAL EVIDENCE OF SIMILARITY OF RADIATION PROTECTION MECHANISMS OF CYSTAMINE, CYSTEAMINE, SEROTININ, AND ANOXIA IN ALBINO MICE
A66-80169
- TARDOV, V. M.
ARTERIAL PRESSURE, RESPIRATORY RATE, ELECTROCARDIOGRAM, AND ELECTROENCEPHALOGRAM OF YOUNG MEN DURING SHORT TERM ANGULAR ACCELERATIONS
A66-80303
- TAUB, H.
DIAL READING ABILITY OF SPACECRAFT CREW DURING

- PROLONGED ACCELERATION AND VIBRATION
AMRL-TR-65-110 N66-12376
- TEMPLE, W. E.
DIAL READING ABILITY OF SPACECRAFT CREW DURING
PROLONGED ACCELERATION AND VIBRATION
AMRL-TR-65-110 N66-12376
- TENERY, G. R.
ENERGY PATTERNS FROM SPACE ACCESSIBLE TO HUMAN
SENSES THROUGH DATA SENSORS AND INFORMATION
ACQUISITION A66-14093
- TERRY, J. L.
COMPARISON OF MEASURED LUNG BURDEN IN ANIMAL
SPECIES WITH AMOUNTS OF PLUTONIUM COLLECTED BY
CASCADE IMPACTOR SAMPLERS
AWRE-D-29/65 N66-14097
- TERSKOV, I. A.
ILLUMINATION AND CELL DENSITY EFFECTS ON GROWTH
RATE OF CHLORELLA VULGARIS CULTURE A66-80400
- TERRIAULT, D. G.
METABOLISM OF CARNITINE IN MUSCLE OF COLD
ACCLIMATED RAT A66-80152
- THOMAS, D. M. C.
COMPARISON OF MEASURED LUNG BURDEN IN ANIMAL
SPECIES WITH AMOUNTS OF PLUTONIUM COLLECTED BY
CASCADE IMPACTOR SAMPLERS
AWRE-D-29/65 N66-14097
- THOMAS, R. G.
FISSION PRODUCT INHALATION PROGRAM - GAMMA RAY
DETECTION SYSTEM FOR BIOLOGICAL SAMPLES
LF-28 N66-12581
- PHYSICAL AND PHYSIOLOGICAL PARAMETERS EFFECTING
RESPIRATORY TRACT DEPOSITION N66-12683
- THOMPSON, W. D.
BEHAVIORAL EFFECTS IN RATS OF PROLONGED EXPOSURE
TO ULTRA HIGH FREQUENCY RADIATION A66-80273
- THOMSON, R. A. E.
PULSED MICROWAVE IRRADIATION OF DOGS NOTING BODY
WEIGHT, RECTAL TEMPERATURE AND HEMATOLOGIC
RESPONSE A66-13351
- TILLMAN, W. J.
MECHANOELASTIC PROPERTIES OF CORNIFIED EPITHELIUM
AS AFFECTED BY VARIOUS SOLVENT AND SOLUTION
ENVIRONMENTAL CHANGES A66-80258
- TIPTON, C. M.
PATELLAR REFLEX TIME OF OLD AND YOUNG MALE
SUBJECTS AS AFFECTED BY EXERCISE A66-80207
- TOKAREV, I. N.
EIGHT HOUR ISOLATION AND HYPOKINESIA EFFECT ON
BIOCHEMICAL AND PHYSIOLOGICAL INDICES IN MAN
A66-80299
- CHANGES IN PHYSIOLOGICAL AND BIOCHEMICAL STATE OF
MAN AFTER EXPOSURE TO SMALL CONCENTRATIONS OF
CARBON MONOXIDE - HEART FUNCTION, RESPIRATION AND
CHOLINESTERASE BLOOD LEVEL A66-80304
- TORNABENE, T.
CONTAMINATION OF CARBONACEOUS CHONDRITES BY
ORDINARY VIABLE MICROORGANISMS, ISOLATING THREE
TYPES OF BACTERIA ON VARIOUS METEORITES
A66-13339
- TORRI, G.
PRESSURE FLOW RELATIONSHIP OF AIRWAYS IN SITTING
SUBJECT UNDER NORMAL CONDITIONS, IMMERSED IN WATER
TO NECK LEVEL, AND DURING NEGATIVE PRESSURE
BREATHING SUFFICIENT TO REDUCE LUNG VOLUME AS
DURING IMMERSION. A66-80236
- TREISMAN, M.
HUMAN ESTIMATION OF TIME INTERVALS AND RELATION TO
BIOLOGICAL RHYTHM A66-80286
- TRITES, D. K.
SELF-REPORTED STRESS-RELATED SYMPTOMS AMONG AIR
TRAFFIC CONTROL SPECIALISTS / ATCS/ AND NON- ATCS
PERSONNEL A66-12358
- MEASUREMENT, STRUCTURE, AND PREDICTION OF JOB AND
TRAINING PERFORMANCE OF AIR TRAFFIC CONTROL
SPECIALISTS OF DIFFERENT AGES A66-80193
- TROSHIKHIN, G. V.
EFFECT OF PROLONGED EXPOSURE TO HIGH CONCENTRATION
OF OXYGEN ON LUNGS AND BLOOD IN MICE A66-80389
- TROUT, O. F., JR.
WATER IMMERSION TECHNIQUE FOR SIMULATING ZERO
GRAVITY MOBILITY PERFORMANCE OF ASTRONAUT IN
PRESSURIZED SPACESUIT
NASA-TN-D-3054 N66-14151
- TRUMBO, D.
ACQUISITION OF STEP FUNCTION TRACKING TASK AS
FUNCTION OF ALTERNATIVES AND SEQUENCE LENGTH
A66-80180
- TSAO, T.-C.
MOLECULAR STRUCTURE OF PEPTIDE CHAINS OF PROTEINS
TO FIND RULES GOVERNING AMINO ACIDS N66-12628
- TSOU, C.-L.
ENZYME CATALYST MECHANISMS, RELATIONSHIP BETWEEN
ENZYME MOLECULAR STRUCTURE AND CATALYTIC
ACTIVITY, AND FORMATION OF ENZYME INTERMEDIATE
PRODUCTS N66-12629
- TSVETKOVA, I. V.
CHINESE CABBAGE SPROUTS GROWN AEROPONICALLY IN
CLOSED ECOLOGICAL SYSTEM AS AFFECTED BY
MINERALIZED PRODUCTS OF HUMAN WASTE A66-80397
- TUCKER, G. J.
AIRSICKNESS IN STUDENT AVIATORS DURING FLIGHT
TRAINING AS RELATED TO VESTIBULAR AND VISUAL
STIMULI AND ANXIETY A66-80206
- AIR SICKNESS IN STUDENT AVIATORS ASSOCIATED WITH
PEAKS OF PHYSIOLOGICAL AND PSYCHOLOGICAL STRESS
DURING TRAINING
NSAM-939 N66-13700
- TUTOCHKINA, L. T.
ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY
PROTONS IN MULTIPLE IRRADIATION N66-12454
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON
DOGS AND WHITE RATS N66-12455
- U
- ULRICH, L.
ACQUISITION OF STEP FUNCTION TRACKING TASK AS
FUNCTION OF ALTERNATIVES AND SEQUENCE LENGTH
A66-80180
- UNO, T.
AUTONOMIC COMPONENTS OF HUMAN ORIENTING BEHAVIOR
IN RESPONSE TO WHITE NOISE A66-80275
- USHAKOV, A. S.
FEASIBILITY OF USING CHICKEN AND DUCK FOR
ASTRONAUT FOOD IN CLOSED ECOLOGICAL SYSTEM
A66-80308
- USPENSKAYA, M. S.
ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY
PROTONS IN MULTIPLE IRRADIATION N66-12454
- BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON
DOGS AND WHITE RATS N66-12455
- USTIUSHIN, B. V.
ARTERIAL PRESSURE, RESPIRATORY RATE,
ELECTROCARDIOGRAM, AND ELECTROENCEPHALOGRAM OF
YOUNG MEN DURING SHORT TERM ANGULAR ACCELERATIONS
A66-80303

V

- VALLERIE, L. L.
APPARENT MOVEMENT PHENOMENA ON CATHODE RAY TUBE
DISPLAYS - THRESHOLD DETERMINATIONS OF APPARENT
MOVEMENTS OF PULSED LIGHT SOURCES
NASA-CR-342 N66-12162
- VAN BEAUMONT, W.
SWEAT CHLORIDE CONCENTRATION AND RATE, METABOLIC
RATE, SKIN AND BODY TEMPERATURES OF YOUNG AND OLD
MALES WALKING IN DESERT ENVIRONMENT A66-80217
- VAN BRUGGEN, E. F. J.
HIGH RESOLUTION ELECTRON MICROSCOPY OF FRACTION
I PROTEIN FROM PLANT LEAVES
NASA-CR-68099 N66-12198
- VAN DYKE, D. C.
ERYTHROPOIETIN, ACTIVITY, BLOOD, AND PHYSIOLOGICAL
RESPONSES TO SEVERE HYPOXIA IN MAN A66-80214
- VARENE, P.
BREATHING MECHANICS DURING TRANSVERSE
ACCELERATION, DISCUSSING EXPERIMENTS AND
MEASUREMENTS MADE ON MAN A66-14075
- VARTBARONOV, R. A.
CORIOLIS ACCELERATION EFFECT ON HUMAN HEART
A66-80317
- VASILEV, P. V.
EFFECT OF SPACE FLIGHT FACTORS ON HEART ACTIVITY,
RESPIRATION AND ELECTROENCEPHALOGRAM OF
ASTRONAUTS B. F. BYKOVSKII AND V. V. TERESHKOVA
A66-80370
- HISTOLOGICAL CHANGES IN OVARIES AND RESISTANCE TO
TRANSVERSE ACCELERATION REVEALED BY CARDIOVASCULAR
AND RESPIRATORY ACTIVITY OF YOUNG FEMALE MONKEYS
A66-80378
- VASKOVA, N. V.
DESIGN, CALIBRATION, AND SENSOR CONSTRUCTION OF
AUTOMATIC EQUIPMENT FOR ANALYZING
BALLISTOCARDIOGRAMS - BIOASTRONAUTICS
N66-12222
- VEGHE, J. H.
THREE AIR-COOLED AND ONE WATER-COOLED PRESSURE
SUIT EVALUATED IN HOT ENVIRONMENTS A66-12360
- VEKSLER, IA. I.
OXIDATION AND PHOSPHORYLATION CORRELATION IN BRAIN
TISSUES DURING OVERCOOLING AND REWARMING IN
EXPERIMENTAL ANIMALS. A66-80170
- VERESHCHAGIN, A. G.
QUANTITATIVE ANALYSIS OF LIPID CONSTITUENTS IN
CHLORELLA CELLS A66-80171
- VIOTTI, G.
ROLE OF ADIPOSE TISSUE OF WELL-FED AND STARVED
GUINEA PIGS IN DECOMPRESSION SICKNESS A66-80294
- VOLKOV, M. N.
AMINOTHIOLS AND PYRIMIDINE ANALOGS TESTED FOR
PROTECTIVE EFFECTS AGAINST GENETIC MUTATIONS IN
ESCHERICHIA COLI EXPOSED TO X-RAY IRRADIATION
A66-80385
- VOLYNKIN, IU. M.
BIOLOGICAL CHARACTERISTICS AND PHYSICAL CONDITIONS
OF SPACE FLIGHTS, SUCH AS LOW PRESSURE, IONIZING
RADIATION, NOISE, ACCELERATION, WEIGHTLESSNESS,
ARTIFICIAL ATMOSPHERE, FEEDING PROBLEMS, ETC
A66-14066
- SPACE RADIATION-RELATIVE BIOLOGICAL EFFECTIVENESS
AND PROBLEMS OF SHIELDING DURING MOON MISSION.
A66-80310
- VON DIRINGSHOFFEN, H.
BIOLOGICAL STRESSES OF MANNED SPACE FLIGHT IN
LIMITING FLIGHT DURATION, NOTING ISOLATION EFFECT
A66-13507
- VON EULER, U. S.
EVALUATION OF STRESS BY QUANTITATIVE CATECHOLAMINE
A66-80162
- VON GIERKE, H. E.
VIBRATION EXPOSURE WITH VARYING PEAK AND RMS
ACCELERATION AND FREQUENCY IN LOW ALTITUDE HIGH-
SPEED FLIGHT A66-13355
- VOROBEVA, T. I.
METHOD FOR PROCESSING HUMAN WASTE TO RECLAIM
WATER USING CHLORELLA - BACTERIA SYSTEM A66-80391
- VOSKRESENSKII, A. D.
PHYSIOLOGICAL DATA FOR EVALUATION OF HEALTH AND
WORK CAPABILITY OF ASTRONAUT DURING ORBITAL
FLIGHTS A66-80369
- INVESTIGATIVE AND AUTOMATIC CONTROL DATA
PROCESSING APPLICATIONS IN BIOASTRONAUTICS
N66-12220
- VYKUKAL, H. E.
DIAL READING ABILITY OF SPACECRAFT CREW DURING
PROLONGED ACCELERATION AND VIBRATION
AMRL-TR-65-110 N66-12376
- VYSOTSKII, V. G.
EFFECT OF SPACE FLIGHT FACTORS ON REPRODUCTIVE
SYSTEM OF DROSOPHILA AND GENETIC APPARATUS OF
TRADESCANTIA A66-80371

W

- WALAWSKI, J.
OBSERVATIONS ON HEART RATES AND CARDIODYNAMICS
DURING PROLONGED WEIGHTLESSNESS, DISCUSSING
IMMERSION EXPERIMENT ON ANIMALS A66-14073
- ELECTROCARDIOGRAM AND BLOOD PRESSURE OF RABBIT
DURING PROLONGED WEIGHTLESSNESS SIMULATED BY
IMMERSION METHOD A66-80192
- WALDER, D. N.
ROLE OF ADIPOSE TISSUE OF WELL-FED AND STARVED
GUINEA PIGS IN DECOMPRESSION SICKNESS A66-80294
- MALL, P. D.
GATE CONTROL SYSTEM ROLE IN PAIN MECHANISM, NOTING
SPECIFICITY AND PATTERN THEORIES A66-13337
- WANG, S.-L.
METABOLISM AND CHEMICAL COMPOSITION OF CONNECTIVE
TISSUE - FIBROUS AND NONFIBROUS PROTEINS
N66-12635
- WANG, T.-P.
PROTEIN BIOSYNTHESIS BY INCORPORATION OF AMINO
ACIDS AND ACTION OF SOLUBLE RIBONUCLEIC ACID
N66-12630
- WANG, Y.-L.
BIOCHEMICAL RESEARCH IN CHINA AND DEVELOPMENT IN
AREAS OF ENZYME SYSTEMS, METABOLISM, NUTRITION,
CANCER, AND MEDICAL TECHNOLOGY - SYMPOSIUM
N66-12627
- WATERS, L. K.
STATEMENT ATTRACTIVENESS INDICES OBTAINED UNDER
PERSONAL OR SOCIAL ACCEPTABILITY - CORRELATION
OF INDICES WITH EACH OTHER
NASM-937 N66-12380
- WEAVER, J. A.
EQUATIONS OF MOTION IN CIRCULAR MOTION TERMS FOR

- LIMACON CURVE - GEOMETRY - VESTIBULAR EFFECT ON HUMANS MOVING ALONG LIMACON
NADC-ML-6507 N66-14197 A66-80242
- WEINER, J. S.
ACCLIMATIZATION AND SWEATING-EFFECT OF DRUGS AND THERMAL STRESS A66-80248
- WEIS, E. B., JR.
AEROSPACE MEDICINE - COMPRESSION DEFORMITIES OF THORACIS VERTEBRAE IN HUMAN TOLERANCE TEST DURING EXPOSURE TO SIMULATED ESCAPE SYSTEM ROCKET THRUST VECTOR
AMRL-TR-65-134 N66-12885
- WELFORD, G. A.
URANIUM CONTENT IN HUMAN DIET - BONE, TISSUE, AND OTHER ORGANS OF BODY N66-12689
- WEMPEN, R. R.
HEAT STRESS AND MINIMAL DEHYDRATION EFFECT UPON HUMAN TOLERANCE TO POSITIVE ACCELERATION A66-12353
- WHERRY, R. J., JR.
PSYCHOLOGICAL STRESS SUSCEPTIBILITY OF NAVAL AND MARINE PILOT TRAINEES, EXAMINING ENVIRONMENTAL CUE MANIPULATION TO CONTROL PERCEPTIONS A66-12355
- WHITE, S. C.
MANNED SPACE FLIGHT PROGRAM WITH BIOMEDICAL DATA COLLECTION FOR INTEGRATION OF CREWMAN INTO SPACECRAFT OPERATION A66-14090
- WHITE, W. J.
HEAT STRESS AND MINIMAL DEHYDRATION EFFECT UPON HUMAN TOLERANCE TO POSITIVE ACCELERATION A66-12353
- WICKELGREN, W. A.
DISTINCTIVE FEATURES AND ERRORS IN SHORT TERM MEMORY FOR ENGLISH VOWELS A66-12816
SHORT TERM RECOGNITION MEMORY FOR SINGLE DIGITS AND PAIRS OF DIGITS A66-80268
- WIERWILLE, W. W.
THEORY FOR DETERMINISTIC CHARACTERIZATION OF TIME VARYING DYNAMICS OF HUMAN OPERATOR PERFORMANCE TRACKING TASK. A66-80185
- WILLIAMS, C. G.
SWEAT GLAND FATIGUE AS REFLECTED BY SWEAT RATES AND RECTAL TEMPERATURES DURING EXPOSURE TO HOT ENVIRONMENT A66-80218
- WILLIAMS, J. A.
JUDGMENTS OF SAMENESS OF TONES AND TONE DIFFERENCE - EXPERIMENTS ON DECISION TIME A66-80355
- WILLIAMS, R.
CALORIMETRIC DETERMINATION OF ICE FORMED IN FEET OF MICE FROZEN AT VARIOUS TEMPERATURE
AAL-TDR-63-29 N66-14037
- WILSON, R. H.
COMPARISON OF MEASURED LUNG BURDEN IN ANIMAL SPECIES WITH AMOUNTS OF PLUTONIUM COLLECTED BY CASCADE IMPACTOR SAMPLERS
AWRE-O-29/65 N66-14097
- WINCHELL, H. S.
ERYTHROPOIETIN, ACTIVITY, BLOOD, AND PHYSIOLOGICAL RESPONSES TO SEVERE HYPOXIA IN MAN A66-80214
- WINCKEL, F.
AUTOMATIC COMMAND CONTROL SYSTEM USING PHONETIC VOICE PATTERN RECOGNITION A66-13496
- WING, J. F.
UPPER THERMAL TOLERANCE LIMITS FOR UNIMPAIRED MENTAL PERFORMANCE A66-12359
- WINGET, C. M.
LONG-LIFE PHYSIOLOGICAL TELEMETRY APPARATUS FOR BODY TEMPERATURE MEASUREMENT IN SMALL ANIMALS
- WISE, J. S.
JUDGMENTS OF SAMENESS OF TONES AND TONE DIFFERENCE - EXPERIMENTS ON DECISION TIME A66-80355
- WOHL, J. G.
APPARENT MOVEMENT PHENOMENA ON CATHODE RAY TUBE DISPLAYS - THRESHOLD DETERMINATIONS OF APPARENT MOVEMENTS OF PULSED LIGHT SOURCES
NASA-CR-342 N66-12162
- WOOD, C. D.
COMPARISON OF EFFECTIVENESS OF ANTIMOTION SICKNESS DRUGS TESTED IN HUMAN CENTRIFUGE
NASA-CR-68858 N66-13833
- WOODHALL, B.
SUCCINATE-PROTECTIVE AGENT AGAINST HIGH PRESSURE OXYGEN TOXICITY IN RAT A66-80365
- WOODSON, G. S.
ASTRONAUT SELECTION INCLUDING DYNAMIC TESTING, DISCUSSING EXAMINATION METHODS, BIOLOGICAL PARAMETERS, LABORATORY AND RADIOLOGICAL PROCEDURES, BLOOD CHEMISTRY TECHNIQUES, ETC
A66-14064
HISTORY OF ASTRONAUT SELECTION PROCEDURES AS RELATED TO SELECTION OF SCIENTISTS BECOMING MEMBERS OF SPACECREW A66-80187
- WORTZ, E. C.
OPTIMAL CONTROL DISPLAY RELATIONSHIPS IN GENERAL TRACKING INCLUDING PILOTING AND RADAR TRACKING OPERATION A66-13349
TRANSFER OF TRAINING FUNCTION OF STIMULUS RESPONSE RELATIONSHIPS A66-80166
- WRIGHT, E. A.
EFFECT OF NITROGEN BREATHING ON RADIATION DAMAGE IN ALBINO MICE A66-80295
- WURSTER, R. D.
VASCULAR AND SWEATING RESPONSES OF MAN TO VARYING TEMPERATURE EXPOSURES A66-80250
- WYNDHAM, C. H.
SWEAT GLAND FATIGUE AS REFLECTED BY SWEAT RATES AND RECTAL TEMPERATURES DURING EXPOSURE TO HOT ENVIRONMENT A66-80218
- Y
- YAKOVLEV, V. V.
ANIMAL STUDY - BIOLOGICAL EFFECT OF HIGH ENERGY PROTONS IN MULTIPLE IRRADIATION N66-12454
BIOLOGICAL EFFECTS OF HIGH ENERGY PROTONS ON DOGS AND WHITE RATS N66-12455
- YAZDOVSKII, V. I.
HUMAN PERFORMANCE AND LIFE SUPPORT SYSTEMS IN SPACE MONITORED BY DIGITAL COMPUTER WHICH CAN SIMULATE CLINICAL LOGIC - BIOASTRONAUTICS N66-12219
PHYSIOLOGICAL RESPONSES TO AND BIOLOGICAL EFFECTS OF SPACE FLIGHT STRESS - ASTRONAUT PERFORMANCE
ANL-TRANS-209 N66-13520
- YEGOROV, A. D.
INVESTIGATIVE AND AUTOMATIC CONTROL DATA PROCESSING APPLICATIONS IN BIOASTRONAUTICS N66-12220
- YENSEN, R.
MUSCLE TENSION CHANGES DURING RAPID EYE MOVEMENT STATE A66-80182
- YIENGST, M. J.
INFLUENCE OF AGE ON CARDIOVASCULAR AND RENAL RESPONSES TO TILTING A66-80213
- YNTEMA, D. B.
TELLING COMPUTER HOW TO EVALUATE MULTIDIMENSIONAL

SITUATIONS AND TERMINOLOGY AND STATISTICS FOR
DETERMINING PERFORMANCE OF DECISION MAKER

A66-80184

BACK TO CHEST

A66-80318

YOUNG, C. R.

HIGH ALTITUDE FLYING IN MILITARY AIR TRANSPORT
SERVICE AND PROTECTIVE MEASURES FOR PILOT

A66-80338

ZUCCHI, M.

ELECTROMYOGRAPHIC GRADIENTS AS INDICANTS OF
EFFICIENCY AND VELOCITY PRECISION IN MIRROR
TRACING

A66-80341

YOUNG, D. R.

SHORT-TERM MEMORY, CHOICE REACTION TIME, AND HAND
STEADINESS OF EXERCISING AND RESTING SUBJECTS IN
RESPONSE TO EPINEPHRINE OR INSULIN ADMINISTRATION

A66-80201

Z

ZAIAS, N.

SKIN DISORDERS DUE TO MICROBIAL INFECTIONS IN
MILITARY PERSONNEL LIVING IN TROPICS

A66-80262

ZAZYKIN, K. P.

SENSORS FOR PHYSIOLOGICAL INVESTIGATIONS UNDER
SPACE FLIGHT CONDITIONS - BIOASTRONAUTICS

N66-12221

ZEIGLER, B. P.

HUMAN USE OF SHORT-TERM MEMORY IN PROCESSING
INFORMATION ON COMPUTER CONSOLE

A66-80151

ZELLER, A. F.

USAF AIRCRAFT ACCIDENTS INVOLVING TEN OR MORE
FATALITIES FOR 1953 TO 1962 PERIOD IN RELATION TO
ACCIDENT PREVENTION PROGRAM

A66-80197

ZHDANOV, A. M.

HUMAN PERFORMANCE AND LIFE SUPPORT SYSTEMS IN
SPACE MONITORED BY DIGITAL COMPUTER WHICH CAN
SIMULATE CLINICAL LOGIC - BIOASTRONAUTICS

N66-12219

ZHIRMUNSKAYA, YE. A.

EFFECT OF VESTIBULAR IRRITATION ON ELECTRICAL
ACTIVITY OF CORTEX AND BASAL AREAS OF BRAIN
FTD-TT-65-410/1&2&4

N66-12762

ZHIRONKIN, A. G.

EFFECT OF PROLONGED EXPOSURE TO HIGH CONCENTRATION
OF OXYGEN ON LUNGS AND BLOOD IN MICE

A66-80389

ZHUKOV-VEREZHNIKOV, N. N.

HUMAN CELLS AND GENETIC CHANGES IN ESCHERICHIA
DURING EXPOSURE STRESSES OF SPACE FLIGHT ON VOSTOK
SPACECRAFT

A66-80372

AMINOTHIOLS AND PYRIMIDINE ANALOGS TESTED FOR
PROTECTIVE EFFECTS AGAINST GENETIC MUTATIONS IN
ESCHERICHIA COLI EXPOSED TO X-RAY IRRADIATION

A66-80385

ZIMMUNICZ-RADVAN, S. A.

RHEOGRAPHIC REGIONAL METHOD FOR EVALUATION OF
CEREBRAL AND OCULAR CIRCULATION IN CARDIAC AND
CEREBROVASCULAR DISEASE

A66-14002

ZIESKE, H.

REFLEX EFFECTS OF CEPHALIC HYPOXIA, HYPERCAPNIA,
AND ISCHEMIA UPON VENTRICULAR CONTRACTILITY IN
DOGS.

A66-80350

ZIRKLE, L. G., JR.

MECHANISM, PREVENTION AND TREATMENT OF OXYGEN
TOXICITY IN CENTRAL NERVOUS SYSTEM, NOTING
ACETYLCHOLINESTERASE ACTIVITY

A66-13346

MECHANISM OF IN VIVO RBC DAMAGE BY OXYGEN, NOTING
EFFECT ON CANINE ERYTHROCYTES

A66-13348

ZNAMENSKAYA, K. M.

PROPHYLAXIS AND THERAPY OF RADIATION INJURIES
CAUSED BY HIGH ENERGY PROTON IRRADIATION

N66-12461

ZUBAVIN, V. B.

HUMAN ELECTROENCEPHALOGRAPH, REACTION TIME, AND
TOLERANCE DURING CORIOLIS ACCELERATION DIRECTED

Collections of NASA Documents

NASA is depositing its technical documents and bibliographic tools in eleven Federal Regional Technical Report Centers. Each Center, located in the organizations listed below, is prepared to furnish the general public such services as personal reference, inter-library loans, photocopy service, and assistance in obtaining retention copies of NASA documents.

California: University of California, Berkeley

Colorado: University of Colorado Libraries,
Boulder

District of Columbia: Library of Congress

Georgia: Georgia Institute of Technology,
Atlanta

Illinois: The John Crerar Library, Chicago

Massachusetts: MIT, Cambridge

Missouri: Linda Hall Library, Kansas City

New York: Columbia University, New York

Pennsylvania: Carnegie Library of Pittsburgh

Texas: Southern Methodist University, Dallas

Washington: University of Washington Library,
Seattle

In addition, NASA publications are currently being forwarded to the public libraries in the cities listed below:

Alabama: Birmingham

Alaska: Anchorage

Arizona: Phoenix

Arkansas: Little Rock

California: Los Angeles, Oakland, San Diego,
San Francisco

Colorado: Denver

Connecticut: Hartford, Bridgeport

Delaware: Wilmington

Florida: Miami

Louisiana: New Orleans

Maryland: Enoch Pratt Free Library,
Baltimore

Massachusetts: Boston

Michigan: Detroit

Minnesota: St. Paul

Missouri: Kansas City, St. Louis

New Jersey: Trenton

New York: New York State Library, Brooklyn,
Buffalo, Rochester

North Carolina: Charlotte

Ohio: Cleveland, Cincinnati, Dayton, Toledo

Oklahoma: Oklahoma City

Pennsylvania: Pittsburgh

Tennessee: Memphis

Texas: Fort Worth, San Antonio

Washington: Seattle

Wisconsin: Milwaukee

An extensive collection of NASA and NASA-sponsored scientific and technical publications available to the public for reference purposes is maintained at the Technical Information Service, American Institute of Aeronautics and Astronautics, 750 Third Avenue, New York, New York, 10017.

"The aeronautical and space activities of the United States shall be conducted so as to contribute . . . to the expansion of human knowledge of phenomena in the atmosphere and space. The Administration shall provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof."

—NATIONAL AERONAUTICS AND SPACE ACT OF 1958

NASA SCIENTIFIC AND TECHNICAL PUBLICATIONS

TECHNICAL REPORTS: Scientific and technical information considered important, complete, and a lasting contribution to existing knowledge.

TECHNICAL NOTES: Information less broad in scope but nevertheless of importance as a contribution to existing knowledge.

TECHNICAL MEMORANDUMS: Information receiving limited distribution because of preliminary data, security classification, or other reasons.

CONTRACTOR REPORTS: Technical information generated in connection with a NASA contract or grant and released under NASA auspices.

TECHNICAL TRANSLATIONS: Information published in a foreign language considered to merit NASA distribution in English.

SPECIAL PUBLICATIONS: Information derived from or of value to NASA activities. Publications include conference proceedings, monographs, data compilations, handbooks, sourcebooks, and special bibliographies.

TECHNOLOGY UTILIZATION PUBLICATIONS: Information on technology used by NASA that may be of particular interest in commercial and other nonaerospace applications. Publications include Tech Briefs; Technology Utilization Reports and Notes; and Technology Surveys.

Details on the availability of these publications may be obtained from:

SCIENTIFIC AND TECHNICAL INFORMATION DIVISION
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D.C. 20546