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AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES

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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 American Institute of Aeronautics and Astronautics (AIAA) and NASA Scientific and Technical Information Facility. 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.

Each entry consists of a standard citation accompanied by its abstract in the following order:

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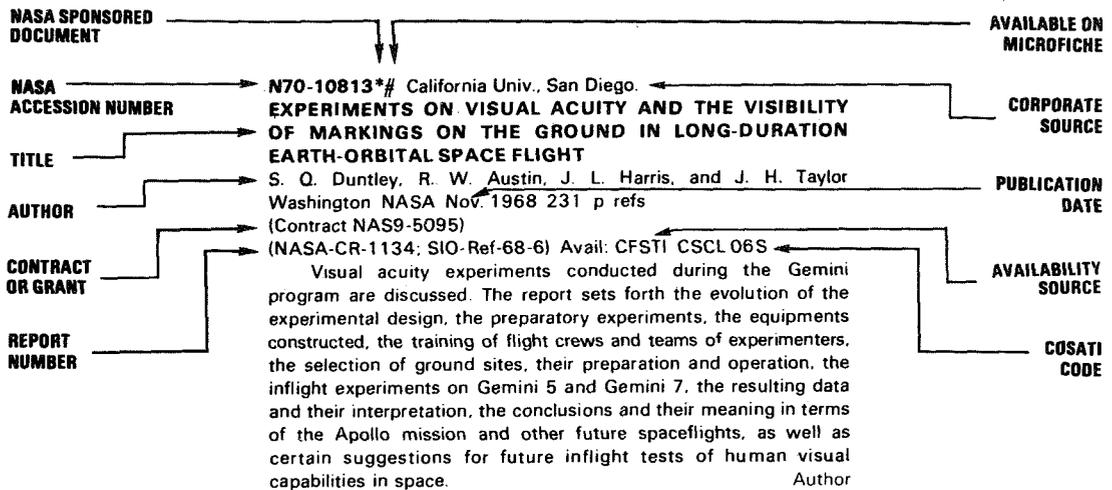
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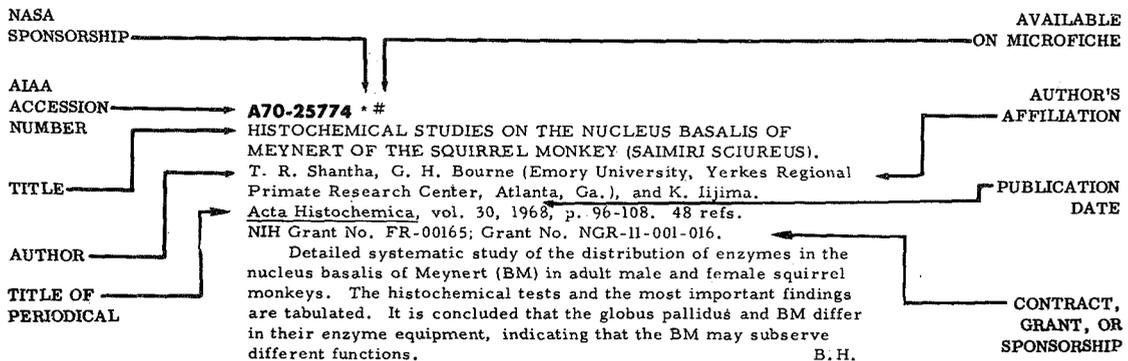
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TYPICAL CITATION AND ABSTRACT FROM IAA





AEROSPACE MEDICINE AND BIOLOGY

a continuing bibliography

MAY 1970

STAR ENTRIES

N70-18310*# McDonnell-Douglas Astronautics Co., Santa Monica, Calif.

EMERGENCY EVAPORATIVE COOLANT GARMENT SYSTEM/LIQUID-COOLED GARMENT (EECGS/LCG), PHASE 2 Final Report

J. G. Bitterly Dec. 1969 136 p refs
(Contract NAS9-7207)

(NASA-CR-102153; MDC-G1220) Avail: CFSTI CSCL 06K

A new concept high-performance Evaporative Cooling Garment System (EECGS) is developed. An investigation of the potential of the ECGS concept was applied to an emergency cooling system to supplement the current Liquid-Cooled Garment (LCG). The requirements further stipulated that the presence of the Emergency Evaporative Cooling Garment System (EECGS) should not affect the normal operation and/or effectiveness of the LCG. The only exposed areas of the body not covered by the LCG were the collar, head, hands, and feet. Since the LCG was not to be compromised in any way, the only possible way to obtain maximum cooling potential was to cool through the LCG along with cooling the unused body surface areas. The EECGS, therefore, had to be integrated with the LCG forming an EECGS/LCG. The target performance was to provide cooling for 30 minutes at 3,000-Btu/hr metabolic rate, all on ECGS self-contained internally stored expendables (water); and to operate with the LCG at zero cooling rate.

Author

N70-18311*# AiResearch Mfg. Co., Los Angeles, Calif. Dept. of Life Sciences.

EVALUATION OF THE METABOLIC COST OF LOCOMOTION IN AN APOLLO SPACE SUIT

W. G. Robertson and E. C. Wortz Jan. 1970 48 p refs
(Contract NAS9-9459)

(NASA-CR-102154; Rept-69-5909) Avail: CFSTI CSCL 06K

In a series of tests conducted with the A7L space suit, six subjects performed locomotion exercises under conditions that simulated lunar gravity. Independent variables were treadmill velocity, walking surface, and lunar gravity simulation technique. The primary dependent variable was the level of energy expenditure of the subjects. In this report, conclusions are drawn about the average metabolic rates for each task, the effects of surface conditions, the effects of simulation technique employed, and the differences between different types of space suits.

Author

N70-18342# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

THE CONSTRUCTION OF A RECTIFYING SPACE FOR PATTERN RECOGNITION

V. I. Belyakov-Bodin 12 Mar. 1969 18 p refs Transl. into ENGLISH from Vychislitel'nyy Tsentr. Akad. Nauk SSSR (Moscow), 1967 p 13-23

(AD-696499; FTD-HT-23-1094-68) Avail: CFSTI CSCL 6/4

Automata termed artrons (artificial neurons, i.e. neuron models or mathematical models of threshold elements), which have n binary inputs, a binary output and are capable of learning how to separate input situations into two classes, have recently begun to be often employed for pattern recognition. Two possible cases are considered. Either the reception field can be compared with coordinate unit vectors in Euclidean n -variate space X , such that the various input situations forming the set of nodes of the n -variate cube will be separated by a hyperplane in X (case 1), or the classes in X are not separated by a hyperplane and then transition from the X -space to the so-called rectifying Z -space, in which separation of these classes by a hyperplane is feasible, is needed (case 2). The article examines certain aspects of the construction of the Z -space. The n -th degree polynomial is proposed as the logic separating function.

TAB

N70-18354*# Hawaii Univ., Honolulu. Dept. of Botany.

ROLE OF GRAVITATIONAL STRESS IN LAND PLANT EVOLUTION: THE GRAVITATIONAL FACTOR IN LIGNIFICATION Semiannual Report

S. M. Siegel Dec. 1969 28 p *Its Hawaii Botan. Sci. Paper* No. 16

(Grant NGR-12-001-053)

(NASA-CR-107949) Avail: CFSTI CSCL 06C

The lignification in plants under hypogravity and hypergravity conditions was studied in herbaceous seedlings. An uncoupling of lignin from growth, and lignin increase with g were shown by the simulated gravity conditions. The relationship of lignin content to plant size is discussed.

F.O.S.

N70-18435*# George Washington Univ., Washington, D.C. Medical Center.

BIOMEDICAL APPLICATION OF AEROSPACE TECHNOLOGY FOR NASA Quarterly Report, 1 Jun. - 31 Aug. 1969

31 Aug. 1969 108 p

(Contract NSR-09-010-057)

(NASA-CR-107797) Avail: CFSTI CSCL 06E

The involvement of the BATEam (Biomedical Applications Teams) program, its methodology and objectives, and the management of activities of different elements participating in the program are described. Significant points resulting from a review and analysis of BATEam data and information as well as from the Biological Sciences Communication Project (BSCP) efforts are summarized. Conclusions deduced by BSCP from BATEam reports and BSCP activities are cited with recommendations designed to optimize the advantageous developments and to correct negative trends. In addition, the teams are analyzed and the data submitted by them are related to the program objectives and team tasks.

Author

N70-18452# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

MONOGRAPHS ON THE PHYSIOLOGY AND PATHOLOGY OF MAN AND ANIMALS UNDER HIGH-MOUNTAIN CONDITIONS

M. A. Aliev et al 9 Dec. 1968 174 p refs Transl. into ENGLISH from Ocherki po Fiziol. i Zhivotn. Usloviyakh Vysokogorya, (Leningrad), 1967 p 1-158

(AD-696169; FTD-MT-24-262-68) Avail: CFSTI CSCL 6/19

The monograph treats problems of acclimatization and adaptation to alpine environments, experimental considerations of such problems and illnesses encountered under such conditions, and pharmacological approaches to alpine acclimatization.

Author (TAB)

N70-18495# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

SPACE INVESTIGATIONS AND BIOLOGICAL SCIENCES

O. G. Gazenko 15 May 1969 21 p refs Transl. into ENGLISH from Konf. Organ. Obedinennykh Natsii Po Issledovaniyu i Ispolz. Kosmich. Prostranstva v Mirnykh Tsel'yakh (Vienna), 1968 p 1-10

(AD-696487; FTD-MT-24-98-69) Avail: CFSTI CSCL 6/3

A very general introductory account is given of the importance of space biology and its relationship to present day needs on earth.

Author (TAB)

N70-18498*# State Univ. of New York at Buffalo. Center for Theoretical Biology.

SUMMER COLLOQUIUM IN THEORETICAL BIOLOGY

J. F. Danielli 16 Dec. 1969 62 p refs Conf. Presented at Ft. Collins, Colo., 1969

(NASA-CR-107865) Avail: CFSTI CSCL 06C

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1. ORGANIZATION OF THE COLLOQUIUM p 1-3
2. WORKING PARTIES: SUBJECT, FACULTY, PARTICIPANTS, REPORTS p 4-8
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N70-18499*# State Univ. of New York at Buffalo. Center for Theoretical Biology.

TIME DEPENDENT VARIATION IN CELLS

B. Goodwin (Sussex Univ., England) *In its* Summer Colloq. in Theoret. Biol. 16 Dec. 1969 p 9-13 refs (See N70-18498 07-04)

Avail: CFSTI CSCL 06C

Dynamic characterization and stability of self-reproductive systems are reviewed. Metabolic networks simulated by switching automata nearly always showed cyclic behavior in their steady states; this analysis was extended to show that metabolic networks

with macromolecular control elements have low connectivity and will show limit cycle behavior in the steady state. Dynamical consequences of certain efficiency criteria applied to chemical networks were studied, producing evidence that optimal behavior of the network and product yield occur when the variables oscillate. A mathematical model of oscillating biochemical networks with stable temporal organization was also investigated, along with a problem in developmental pattern formation. J.A.M.

N70-18500*# State Univ. of New York at Buffalo. Center for Theoretical Biology.

INTRACELLULAR RELATIONSHIPS AND CELL THEORY

J. F. Danielli, E. A. Pollard (Pa. State Univ.), and Paul Scheie (Pa. State Univ.) *In its* Summer Colloq. in Theoret. Biol. 16 Dec. 1969 p 14-20 (See N70-18498 07-04)

Avail: CFSTI CSCL 06C

Procedural methods of intracellular investigations are proposed. Existence limits of terrestrial cells and cells from Mars and Venus are discussed. Isoprene biochemistry related to hydrocarbon phase cells was considered, as well as the possibility of constructing macromolecules and membranes from complex polyisoprenes. Genetic systems of *E. coli* were briefly cited. Alternative approach to cell synthesis, control of cell function by steroids, *E. coli* inadequacy as model for understanding steroid response in mammalian systems, estrogen action, and minimal cell membranes are also mentioned. A temperature limit study of DNA genetic systems is recommended. J.A.M.

N70-18501*# State Univ. of New York at Buffalo. Center for Theoretical Biology.

PATTERN GENERATION AND MORPHOGENESIS

R. Rosen and M. Ycas (Upstate Med. Center, Syracuse, N.Y.) *In its* Summer Colloq. in Theoret. Biol. 16 Dec. 1969 p 21-31 refs (See N70-18498 07-04)

Avail: CFSTI CSCL 06C

Work on protein tertiary structure, virus assembly, and cell sorting is proposed. A hypothesis stating that motility and differential adhesion are sufficient to account for cell sorting is examined, along with its implications for morphogenesis of real biological patterns. The system is modeled on a two-dimensional grid, and neighboring configurations are introduced. J.A.M.

N70-18502*# State Univ. of New York at Buffalo. Center for Theoretical Biology.

SELF-REPRODUCING AUTOMATA, RELATIONAL SYSTEMS AND CELL 1 THEORY

H. Pattee (Stanford Univ., Calif.), L. Bianchi, and J. Hamann *In its* Summer Colloq. in Theoret. Biol. 16 Dec. 1969 p 32-34 (See N70-18498 07-04)

Avail: CFSTI CSCL 06C

Logical and physical bases for the origin and propagation of hierarchical systems are summarized. A general definition of hierarchy was developed, along with specific concepts of hierarchical control and control continuity. A preliminary model for the autonomous emergence of life was derived. Discussions on probabilistic extremization method, stochastic vs. deterministic descriptions, biological information, chemical reaction stability, macromolecule properties, and computer simulated eco-systems are included. J.A.M.

N70-18503*# State Univ. of New York at Buffalo. Center for Theoretical Biology.

INFORMATION PROCESSING BY CELL ASSEMBLIES

K. N. Leibovic *In its* Summer Colloq. in Theoret. Biol. 16 Dec. 1969 p 35-39 (See N70-18498 07-04)

Avail: CFSTI CSCL 06C

Problems in visual adaption and binocular space perception are

presented. In visual adaption, the relationships of psychophysical data to the responses of single cells and cell assemblies, primarily in the retina, are considered including a neural model, a quantitative comparison of stimulus parameters and corresponding responses, and empirical curve fitting. In the binocular space perception, relationships in psychophysics, eye geometry, and data processing are given containing a model relating behavioral data to neural hypothesis, preliminary calculations indicating different predictions of the model from Luneberg theory, and modification of Luneberg theory. J.A.M.

N70-18528*# Oakland Univ., Rochester, Mich. School of Engineering.

BIOSYSTEMS ENGINEERING RESEARCH Quarterly Progress Report

J. E. Gibson, J. C. Hill, R. E. Haskell, and R. H. Edgerton 30 Oct. 1969 161 p refs

(Grant NGR-23-054-003)

(NASA-CR-107927; QPR-2) Avail: CFSTI CSCL 06B

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2. NASA BIOSYSTEMS: BIO-OPTICS R. H. Edgerton p 45-60 refs (See N70-18530 07-04)

3. PATTERN RECOGNITION OF RANDOM SPATIAL SIGNALS USING COHERENT OPTICAL TECHNIQUES R. E. Haskell p 61-81 refs (See N70-18531 07-05)

4. MANUAL CONTROL SYSTEMS RESEARCH G. A. Jackson p 82-96 refs (See N70-18532 07-05)

5. A MODEL OF THE HUMAN POSTURAL CONTROL SYSTEM J. C. Hill 12 p refs (See N70-18533 07-04)

6. FORMAC SOURCE PROGRAM GENERATING THE EQUATIONS OF MOTION OF THE SEVEN ELEMENT STICK MAN J. C. Hill 9 p refs (See N70-18534 07-08)

7. CALCULATION OF THE DIELECTRIC CONSTANT OF A SUSPENSION OF SYMMETRIC ELLIPSOIDS IN A SIMPLE SHEAR FLOW R. H. Edgerton 12 p refs (See N70-18535 07-12)

8. DETERMINATION OF THE ERROR COST FUNCTIONAL USED BY HUMAN OPERATORS WHILE CONTROLLING CERTAIN COMPENSATORY SYSTEMS G. A. Jackson 30 p refs (See N70-18536 07-05)

N70-18529*# Oakland Univ., Rochester, Mich. School of Engineering.

MUSCULAR COORDINATION AND MULTI-DEGREE OF FREEDOM CONTROL SYSTEMS

J. C. Hill *In its* Biosystems Eng. Res. 30 Oct. 1969 p 4-44 refs (See N70-18528 07-05)

Avail: CFSTI CSCL 06P

Work on a physiological computer model for the stick man concentrated on digital simulation of expressions for muscular kinetic and potential energies and the differentiation operations required to obtain the pertinent equations of motion. Preliminary results reported cover: (1) the derivation of full nonlinear equations of motion for a seven-element stick man with the use of a digital symbolic processing language; (2) the small angle approximations that lead to a linearized model suitable for small deviations from equilibrium; (3) the digital simulation of above small angle model; and (4) the experimentation with an idealized form of control law, with each joint torqued proportional to the joint angular deflection and proportional to the joint angular rate. G.G.

N70-18530*# Oakland Univ., Rochester, Mich. School of Engineering.

NASA BIOSYSTEMS: BIO-OPTICS

R. H. Edgerton *In its* Biosystems Eng. Res. 30 Oct. 1969

p 45-60 (See N70-18528 07-05)

Avail: CFSTI CSCL 06P

Considered is the application of liquid crystals to control problems in bio-optical dynamic tracking problems where the human physiological eye focus control is not adequate and augmentation of visual accommodation is required. The technique of altering the index of refraction is used to evaluate rapid response possibilities of liquid shear type crystals. Theoretical results are obtained for a crystal control problem that uses ellipsoidal particles representing long molecules in a simple shear field. The dielectric constant of a suspension in which the ellipsoids are in motion is obtained as a function of axle ratio. Physiological experiments to determine the transparency of excised rabbit corneas show that the ratio of the intensity transmitted to scattered light is approximately 10 to 1. G.G.

N70-18531*# Oakland Univ., Rochester, Mich. School of Engineering.

PATTERN RECOGNITION OF RANDOM SPATIAL SIGNALS USING COHERENT OPTICAL TECHNIQUES

R. E. Haskell *In its* Biosystems Eng. Res. 30 Oct. 1969 p 61-81 refs (See N70-18528 07-05)

Avail: CFSTI CSCL 06P

Described is an optical processing system for power spectrum and autocorrelation measurements that uses one lens for both, transforming and imaging the input signal so that the incident wave need not be a plane wave. The single lens can be replaced by a spherical mirror. Also developed is a general computer technique for generating random spatial patterns with known statistical characteristics that use an appropriate random function generator on a digital computer to locate a random point as a spot on an oscilloscope face. A large number of random points can then be plotted rapidly and photographed for optical identification. G.G.

N70-18532*# Oakland Univ., Rochester, Mich. School of Engineering.

MANUAL CONTROL SYSTEMS RESEARCH

G. A. Jackson *In its* Biosystems Eng. Res. 30 Oct. 1969 p 82-96 refs (See N70-18528 07-05)

Avail: CFSTI CSCL 05H

Briefly outlined are individual studies on optimal properties of the human operator and the design of an arm movement control stick. Manual control research activities deal with fast parameter identification methods and human operator adaptation in changing control systems. Considered is a hybrid modification of the continuous parameter tracking method that centers on on-line identification of the crossover model parameters, as well as a continuous parameter tracking method with simultaneous real-time sampling of the compensatory system and fast-time iterations into the continuous parameter tracking model. Also described is a hybrid identification technique utilizing estimates by stochastic approximation. G.G.

N70-18533*# Oakland Univ., Rochester, Mich. School of Engineering.

A MODEL OF THE HUMAN POSTURAL CONTROL SYSTEM

J. C. Hill *In its* Biosystems Eng. Res. 30 Oct. 1969 12 p refs Presented at the IEEE Systems and Cybernetics Conf., Philadelphia, 22-24 Oct. 1969 (See N70-18528 07-05)

Avail: CFSTI CSCL 06P

A nine degree of freedom pitch axis model of the human postural control system is proposed. Expressions for the kinetic and potential energies of the system are derived. The trunk, thigh, shank, foot, upper arm, forearm, and head are each modeled by a lumped mass at the element center of mass and an associated rotational inertia. Author

N70-18536*# Oakland Univ., Rochester, Mich. School of Engineering.

DETERMINATION OF THE ERROR COST FUNCTIONAL USED BY HUMAN OPERATORS WHILE CONTROLLING CERTAIN COMPENSATORY SYSTEMS

Glenn A. Jackson *In its* Biosystems Eng. Res. 30 Oct. 1969 30 p refs Sponsored in part by NSF (See N70-18528 07-05) (Grant NSF GK-3490)

Avail: CFSTI CSCL 05H

The purpose of this research was to determine the error cost functional used by human operators while controlling low order compensatory control systems. The systems investigated were limited to those cases where the model of the forward loop of the control system—including human operator and controlled element—was satisfactorily represented by a crossover model. This forward loop model consists entirely of a gain, a time-delay, and a single integration. This simple model is applicable for a fairly wide range of low order controlled elements. Author

N70-18558# School of Aerospace Medicine, Brooks AFB, Tex. **DISCOVERY OF HEARING LOSS IN A CEBUS CAPUCINUS MONKEY BY A SHOCK-AVOIDANCE TECHNIQUE** Final Report, Jun. 1968-Feb. 1969

Daniel E. Dreher and Vernon C. Bragg Oct. 1969 12 p refs (AD-697384; SAM-TR-69-57) Avail: CFSTI CSCL 6/5

A hearing loss brought about by infection after middle ear surgery in a Cebus capucinus monkey was detected on an audiogram elicited by a shock-avoidance technique. Stable prepathology thresholds to five pure-tone frequencies had been established previously, and the course of infection and recovery after treatment was clearly demonstrated. This threshold measurement technique proved valuable in detecting the results of middle ear surgery and in describing changes in hearing during ear pathology. Author (TAB)

N70-18592*# California Univ., Los Angeles. Brain Research Inst. **EYE MOVEMENT DURING SLEEP AND WAKING IN INFANT MONKEYS (MACACA MULATTA) DEPRIVED OF PATTERNED VISION**

Ralph J. Berger and Gilbert W. Meier [1970] 30 p refs (Grant NsG-502; Contract AF 49(638)-1387; Grants NIH NB-02501; NIH FR-3)

(NASA-CR-108091) Avail: CFSTI CSCL 06C

Five newborn rhesus monkeys deprived of patterned vision and 4 normal sighted controls were reared until 18 months of age. There was a significant decrease in frequency of rapid eye movement (REM) with age in both groups. Frequency of REM tended to be lower in experimental monkeys than in controls. Asymmetries in velocity of waking horizontal eye movement were evident in experimental monkeys, and the velocity of REMs was less in pattern deprived monkeys than in controls. Nonsequential interval histograms between REMs at 18 months of age differed significantly from a random exponential distribution in both groups. Pattern deprived monkeys had significantly fewer short intervals between REMs than controls. Author

N70-18642# Army Medical Research Lab., Fort Knox, Ky. **PRACTICE EFFECTS AND SIGNAL DETECTION INDICES IN AN AUDITORY VIGILANCE TASK** Progress Report

Jimmy L. Hatfield and David R. Soderquist 30 Jun. 1969 15 p refs

(AD-696418; USAMRL-827) Avail: CFSTI CSCL 5/10

Performance of subjects was investigated in 90-minute vigilance sessions. Trends in performance over and within sessions were examined in terms of three dependent measures: (a) correct detections, (b) errors of commission, and (c) theory of signal detectability (TSD). Author (TAB)

N70-18657*# Bolt, Beranek, and Newman, Inc., Cambridge, Mass.

ON CRITICAL PILOT TASKS

D. C. Miller and J. Markowitz 22 Dec. 1969 23 p

(Contract NAS2-5108)

(NASA-CR-73408; Rept-1924) Avail: CFSTI CSCL 05J

The possibility of formally defining and classifying critical pilot tasks is considered. To include both the elements of danger and complexity a critical pilot task is defined as one that affords a low probability of recovery from an incorrect pilot decision or control action. Three basic reasons for a task being critical are given: the task may have to be performed in a very narrow time window, it may involve an operation near some limit of aircraft performance, and it may involve an operation near some limit of pilot capability. Emphasis is placed on the pilot's decision-making capabilities. Author

N70-18660# Ballistic Research Labs., Aberdeen Proving Ground, Md.

PROBABILITY ANALYSIS OF OCULAR DAMAGE DUE TO LASER RADIATION THROUGH THE ATMOSPHERE

Paul H. Deitz Sep. 1969 40 p refs

(AD-697151; BRL-MR-2012) Avail: CFSTI CSCL 6/5

A mathematical model is developed which predicts the probability of ocular damage occurring to personnel illuminated by a pulsed laser beam as a function of the appropriate optical and atmospheric parameters. The evaluation includes terms for the laser output energy and divergence, and atmospheric parameters of attenuation and scintillation. Sample computations are shown, and a safety nomograph is developed to facilitate the eye hazard analysis. Author (TAB)

N70-18661# School of Aerospace Medicine, Brooks AFB, Tex. **A SHOCK-AVOIDANCE TECHNIQUE FOR DETERMINING AUDIOLOGIC THRESHOLDS IN THE CEBUS MONKEY** Final Report, Nov. 1967-Dec. 1968

Vernon C. Bragg and Daniel D. Dreher Oct. 1969 16 p refs

(AD-697385; SAM-TR-69-58) Avail: CFSTI CSCL 6/16

Audiologic thresholds were determined in fourteen white-throated Cebus capucinus monkeys using a shock-avoidance method. Results indicated that this is an effective technique for use with this species of monkey. Stable and consistent thresholds within subjects were found, but a wide range existed between animals. Author (TAB)

N70-18671# School of Aerospace Medicine, Brooks AFB, Tex. **NOMOGRAMS CORRELATING DOSE OF MMH WITH BLOOD LEVELS** Final Report, May-Nov. 1967

Edwin B. Smith and Dale A. Clark Sep. 1969 16 p refs

(AD-697374; SAM-TR-69-12) Avail: CFSTI CSCL 6/20

Nomograms were developed to show the interrelationship of time and dose to methemoglobinemia or plasma monomethyl hydrazine (MMH) concentration as observed during the first 2 hours after application of MMH to the chest of anesthetized male dogs. Limitations of the nomograms are discussed in respect to range and accuracy. It is emphasized that the nomograms were compiled from responses of anesthetized dogs. These nomograms could be used to estimate the severity of human exposure only in conjunction with other known MMH intoxication symptoms. In the absence of dose-response data from humans, however, the nomograms are considered the best available data by which to evaluate accidental exposure by skin contact with MMH. Author (TAB)

N70-18673# School of Aerospace Medicine, Brooks AFB, Tex. **FABRICATION OF LITHIUM CHLORIDE-BALSA WOOD ELECTRODES FOR ELECTROCARDIOGRAPHIC MONITORING** Final Report, Jan. 1957-Oct. 1968

Makley G. Salter Aug. 1969 12 p refs
(AD-697380; SAM-TR-69-51) Avail: CFSTI CSCL 6/12

An ECG electrode belt of balsa wood impregnated with lithium chloride was developed for possible use in long-term space missions. The method used to impregnate the electrodes is described, and a step-by-step procedure is given for the assemblage of the belt. The equipment can be adapted for use in emergency medical monitoring and in intensive care units. Author (TAB)

N70-18678# Johns Hopkins Univ., Baltimore, Md. School of Medicine.

RESEARCH AND DEVELOPMENT OF FUNDAMENTAL PERFORMANCE INFORMATION RELEVANT TO THE BEHAVIORAL EFFECTS OF LOW LEVEL MICROWAVE EXPOSURE Annual Summary Report, 31 Oct. 1968-31 Oct. 1969

Joseph F. Dardano Oct. 1969 18 p refs
(Contract DADA17-69-C-9076)

(AD-697161; Rept-4) Avail: CFSTI CSCL 6/18

The report covers the first year of a research program designed to provide information on the behavioral effects of low-level microwave radiation. A laboratory facility was established for an experimental analysis of the performance of primates exposed to a specified microwave field and experimental methods have been developed which will permit the assessment of changes in complex behavior resulting from acute and chronic exposure to a low-level microwave field of defined frequencies. In addition, methods are being developed for assessing biochemical effects of microwave exposure under conditions related to such performance changes.

Author (TAB)

N70-18684*# Michigan Univ., Ann Arbor. Dept. of Psychology.

A RESPONSE BIAS EXPLANATION OF CONSERVATIVE HUMAN INFERENCE

Wesley Michael DuCharme Dec. 1969 58 p refs
(Grant NGR-23-005-171)

(NASA-CR-108084; Rept-08901-1-T; TR-19) Avail: CFSTI CSCL 05J

Conservative human inference was attributed to misperception or misaggregation of data. Subjects revised odds estimates with two normal distribution data generators being sampled. An analysis of special sequences and a plot of revised odds against theoretical odds showed a bias in subjects' response functions. With different levels of prior odds, subjects shifted their response functions, so that, the optimal range centered around the set prior odds. The biased functions remained invariate over changes in data generator familiarity and diagnosticity. Subjects were biased over either cumulative evidence impact or the number system, but within their optimal range they neither misaggregated nor misperceived data.

Author

N70-18699# School of Aerospace Medicine, Brooks AFB, Tex.
MICROBIOLOGIC EVALUATION OF FROZEN FOIL PACK MEAL COMPONENTS Final Report, Aug. 1967-Jan. 1968

Raymond A. Madson, Joseph T. Cordaro, Charles Eller, and Dennis T. Nelson Aug. 1969 18 p refs

(AD-697378; SAM-TR-69-47) Avail: CFSTI CSCL 6/8

Microbiologic analyses were performed on foil pack meal components which had been precooked and frozen. Food lots were compared on the basis of conformance and nonconformance of total bacterial plate counts and of total coliform counts to the current Military Specifications (MS). The proportion of meat lots rejected at Francis E. Warren AFB was higher than at the School of Aerospace Medicine ($P < .05$). At the .05 level, no difference was detected in the proportion of vegetable lots rejected by both laboratories. Most of the total plate counts and total coliform counts were much lower than the maximum allowed by the MS. Consequently, the recommendation will be made to change the bacterial requirements: to total plate count not greater than 30,000

per gram, instead of 100,000 per gram; and to total coliform count of 10 per gram, instead of 100 per gram. Various microbiologic methods recommended by other food technology groups were performed for the recovery of Salmonellae and coagulase-positive staphylococci.

Author (TAB)

N70-18716# Tufts Univ., Boston, Mass. Dept. of Medicine.

STUDIES WITH ION-EXCHANGE CALCIUM ELECTRODES IN BIOLOGICAL FLUIDS: SOME APPLICATIONS IN BIOMEDICAL RESEARCH AND CLINICAL MEDICINE

Edward W. Moore *In* NBS Ion-Selective Electrodes Nov. 1969 p 215 - 285 refs (See N70-18709 07-06)

(Grants PHS-AM-07417; PHS-AM-10307; PHS-AM-13357; PHS-AM-05424)

Avail: SOD \$3.50

Studies with ion-exchange calcium electrodes are summarized and an attempt is made to develop a reasonably coherent thesis concerning some of the complex physicochemical factors governing serum calcium in man. From data obtained in various aqueous salt solutions, in sera, and in ultrafiltrates, models were developed for the state of serum calcium in normals, in patients with cirrhosis, and in the hypercalcemia of malignancy. The binding of calcium to the serum proteins was found to obey the mass-law equation and a dissection of the relative contributions in albumin and globulin was achieved by a simple regression analysis. Author

N70-18717# American Univ., Beirut (Lebanon). Dept. of Physiology.

ION-SELECTIVE ELECTRODES IN BIOMEDICAL RESEARCH

Raja N. Khuri *In* NBS Ion-Selective Electrodes Nov. 1969 p 287 - 312 refs (See N70-18709 07-06)

Avail: SOD \$3.50

Potentiometric measurements and electrodes for biological applications are discussed. Measurements of ion activities in biologic media both in vitro and in vivo are described, the latter including both extracellular and intracellular analyses. The design and characteristics are given for three glass electrodes for work with hydrogen (pH), sodium, and potassium ions, respectively. Metallic electrodes, the quinhydrone electrode involving reversible oxidation-reduction, and the new class of ion-exchange membrane electrodes with solid state or liquid-liquid membranes are also considered.

N.E.N.

N70-18767*# Mississippi State Univ., State College. Microbiology Dept.

CHARACTERIZATION STUDIES ON AN EXTRACELLULAR HETEROPOLYSACCHARIDE PRODUCED BY ANABAENA FLOS-AQUAE A-37

Edith Boyanton Davis (Ph.D. Thesis) Jan. 1970 112 p refs
(Grant NGR-25-001-004)

(NASA-CR-107839) Avail: CFSTI CSCL 06M

The extracellular polysaccharide produced by the blue-green alga *Anabaena flos-aqua* A-37 was analyzed by various methods to determine the nature of the polymer. Chromatographic methods identified the components of the polysaccharide as uronic acid, glucose, galactose, mannose, arabinose, xylose, fucose, ribose, and rhamnose; it was not possible to demonstrate the presence of neutral polysaccharides. G.G.

N70-18772# School of Aerospace Medicine, Brooks AFB, Tex.

AN IMPROVED HISTOLOGIC TECHNIQUE FOR STUDYING PRIMATE RETINA Final Report, Jun. 1968-May 1969

Philip S. Coogan and Fred Morris Sep. 1969 19 p

(AD-697381; SAM-TR-69-53) Avail: CFSTI CSCL 6/3

The histologic technique for preparing primate retina described in this report includes intravascular perfusion with a glutaraldehyde-paraformaldehyde mixture followed by osmium postfixation and Epon embedding. The technique routinely yields

N70-18795

histologic preparations of good quality which are suitable for both light and electron microscopy. The Paragon stain used for light microscopy gave excellent differentiation of receptor cell parts and made it easy to distinguish normal from degenerating receptor cells. The intravascular perfusion of fixative prevented artifactual retinal detachment, thus making this technique useful in studying retinal photic injury. Author (TAB)

N70-18795# Army Engineer Reactors Group, Ft. Belvoir, Va. Engineering Div.

ERGDOSSE: A UNIVAC 1108 COMPUTER CODE TO CALCULATE PREDICTED DOSES FROM THE DESIGN BASIS ACCIDENT Final Report

Lester K. Aldrich, II, Charles E. Meyer, and Charles A. Myers 15 May 1969 41 p refs
(AD-697140; ED-6913) Avail: CFSTI CSCL 6/18

A major concern in the siting of a nuclear power plant is the effect of released radioactivity in the case of a design accident. Such a situation implies release of all fission products from the fuel matrix, and further leakage of those highly radioactive products from the vapor container along with the associated high-pressure steam. Once in the atmosphere, the fission products can be spread by the prevailing wind, and in this way, are likely to be inhaled by nearby inhabitants. Of the many products of nuclear fission, iodine, because of its concentration by the thyroid after ingestion into the body, represents the greatest biological hazard. A computer code, ERGDOSSE (Engineer Reactors Group DOSE Calculation) was written specifically to calculate the resultant ingested dose due to five isotopes of iodine at any time after the initiation of a design basis accident, and at any distance from the site of that accident. Author (TAB)

N70-18840 Wisconsin Univ., Madison.

QUANTITATIVE MODELS FOR HUMAN MOTIONS

Appu Palpu Kattan (Ph.D. Thesis) 1968 421 p
Avail: Univ. Microfilms: HC \$19.15/Microfilm \$5.40 Order No. 69-939

A unified approach to modelling human motion was developed. Identification of the response and independent variables was accomplished by means of an interdisciplinary survey. It resulted in the identification of 47 broad classes of independent variables and 11 broad classes of response variables and possible relations among them. The survey also led to the following conclusions: there is no unified approach to the study of human motion; the interactions among the independent variables are neglected in most studies; theoretical findings are not satisfactorily incorporated into practice; theoretical research lags experimental research; task variables among independent variables and temporal variables among response variables are studied most. Four response variables, reaction time, movement time, manipulation time, and motion path length, and 3 independent variables, stimulus information, movement information, and manipulation information are considered. Dissert. Abstr.

N70-18885 Catholic Univ. of America, Washington, D.C.

A STUDY OF STATISTICAL TECHNIQUES IN THE RECOGNITION OF HAND-PRINTED CHARACTERS

Michael Emory Wilmer (Ph.D. Thesis) 1968 58 p
Avail: Univ. Microfilms: HC \$3.00/Microfilm \$3.00 Order No. 69-9121

The design of a machine capable of automatically recognizing hand-printer alphanumeric characters was approached as a representative pattern recognition problem. The machine was separated into three parts; namely, the scanner, the measurement device, and the decision device. The primary goal was the evolution of a systematic design approach for the measurement device. In order to obtain reasonable estimates for the required scanner resolution and the required machine complexity, the two dimensional information content of a sample of hand-printed

characters was estimated using thirty-five alphabets. The effect of scanner resolution on information content was investigated by the simulation of lower resolution scanners. A model for the information content was generated to account for the presence of noise in the scanned characters. This model was employed to justify the use of a 12 by 12 binary matrix for character representation. Dissert. Abstr.

N70-18899# Texas Univ., Galveston. Medical Branch.

ELECTRON MICROSCOPIC STUDIES ON ANIMALS EXPOSED TO DIFFERENTIAL POTENTIAL SPACECRAFT ENVIRONMENTS Final Report, Jun. 1966-Sep. 1968

Richard B. Marshall, Daniel K. Roberts, Robert A. Turner, and Donald L. Gordon Aug. 1969 43 p refs
(Contract AF 41(609)-3150)

(AD-697375; SAM-TR-69-34) Avail: CFSTI CSCL 6/19

Groups of male rats were exposed to 100% oxygen at 380 mm. Hg pressure and to normal atmosphere at ground level. They were sacrificed at 2-week intervals throughout the exposure period. Biochemical studies showed a pituitary adrenal response after 1 week of exposure to 100% oxygen at 380 mm. Hg pressure, returning toward control level after 3 weeks. Noise stress experienced by some of the animals after 7 weeks of exposure to 100% oxygen resulted in a marked rise in plasma corticoids. In animals exposed for 1 week, no alteration of ultrastructure was seen in the pituitary and only minimal alteration was seen in the adrenals. Pituitaries of the experimental rats exposed for 5 weeks showed no ultrastructural evidence of change. Adrenal cortical cells from these animals showed an increase in dense lipid and mitochondrial change at 1, 3, and 5 weeks of exposure. Pituitaries of rats stressed after 7 weeks of exposure showed ultrastructural evidence of secretory release from increased number of adrenal corticotrophic cells with a cytologic change in the fasciculata cells of the adrenal glands. Author (TAB)

N70-18912*# California Univ., Los Angeles. Brain Research Inst.
UCLA 1969 SUMMER INSTITUTE IN SPACE BIOLOGY Final Report

Jan. 1970 210 p refs Presented at Los Angeles, 28 Jul. - 29 Aug. 1969

(Contract NSR-05-007-089)

(NASA-CR-108120) Avail: CFSTI CSCL 06C

The program offered during the summer institute centered on the following three projects: (1) to design a biological experiment for a moon laboratory that includes engineering and electronic aspects; (2) to formulate desirable crew characteristics, including personality ones, and to devise tests to evaluate these characteristics; and (3) to search for intelligent life in the Universe, and to devise a transmission method for a possible communicative message. Emphasis was placed on basic biological systems in regard to problems of acquisition of biological signals from difficult environments and their analysis by modern digital computing techniques. G.G.

N70-18933 Wisconsin Univ., Madison.

REAL-TIME HYBRID-COMPUTER FEEDBACK ANALYSIS OF ACOUSTIC IMPEDANCE AND HEARING

Rolf Gunther Schuenzel (Ph.D. Thesis) 1968 210 p
Avail: Univ. Microfilms: HC \$9.45/Microfilm \$3.00 Order No. 69-993

The research encompassed three preliminary exploratory studies dealing with middle ear impedance variation due to facial muscle contractions, taste bud stimulation, and metabolic oxygen and carbon dioxide imbalance, and research on closed loop control and automation of impedance measurement. The major research involved (1) the development of a hybrid computer system for the automated measurement and control of middle ear impedance and (2) application of this system to studies of dynamic response of the intra-aural reflex by means of feedback experimentation. It is

concluded that the methods developed may in time be adapted as a new method of diagnosis of certain middle ear pathologies. Overall, the main conclusion is that the ear operates as a dynamic feedback system in controlling every aspect of sensory input by dynamic response of the middle ear. Dissert. Abstr.

N70-18944 California Univ., Berkeley.

KINETICS OF A DENSE CULTURE FERMENTATION

Lyman Dale Sortland (Ph.D. Thesis) 1968 171 p
 Avail: Univ. Microfilms: HC \$8.00/Microfilm \$3.00 Order No. 69-10387

A fermentation system was designed and constructed to study the growth characteristics of micro-organisms at low and high cell concentrations. The technique used to develop high cell densities utilized a rotating micro-filtration unit to permit the removal of cell-free product from the fermenter. The fermenter volume and the filter were contained in a single unit composed of a series of concentric cylinders. The annuli served as the fermenter volume while the second outermost cylinder supported a micro-filtration membrane. Feed to the system was pumped at constant rates and the internal pressure built up to a value which would effect the required filtration rate. The system was operated batchwise and continuously with and without filtration. The anaerobic growth characteristics of *Streptococcus faecalis* were determined at 37°C and pH 7.0 for batch, continuous and continuous with filtration modes of operation. Cell concentrations 45 times more concentrated than could be produced in batch culture were obtained using the filtration technique. Dissert. Abstr.

N70-18952*# Department of Health, Education, and Welfare, Phoenix, Ariz. Applied Microbiology and Planetary Quarantine Section.

SERVICES PROVIDED IN SUPPORT OF THE PLANETARY QUARANTINE REQUIREMENTS OCTOBER - DECEMBER 1969

1968 18 p
 (NASA Order R-137)

(NASA-CR-108101; Rept-28) Avail: CFSTI CSCL 06M

The research and developments in the planetary quarantine program are reported for this period. Among the projects discussed are: (1) Spore isolates from *Mariner Mars 69* were identified to species in order to determine any possible correlation between spore types and dry heat resistance. (2) Dust samples were collected at Cape Kennedy from various assembly, manufacturing, and testing areas for evaluation of subcultural spores having heat resistance. (3) A commercially available, vertical laminar flow biological safety cabinet was evaluated for efficiency in providing product protection and containment. It was found that contamination generated inside the cabinet tended to spread to other points in the work area before being exhausted from the cabinet. (4) Microbial contamination of electronic components was studied. (5) Microbial studies were performed on the *Apollo 12* spacecraft. F.O.S.

N70-19004# Aeronautical Research Labs., Melbourne (Australia).
SIMULATED HEAD IMPACT ON A FIBREGLASS SEAT BACK

S. R. Sarrailhe and B. M. Hearn Jun. 1969 14 p refs
 (ARL/SM-342) Avail: CFSTI

An airline seat back was impacted with a dummy head at velocities of 30 to 37 f.p.s. to determine head deceleration that could occur in an aircraft crash. The seat back had a fibreglass shell and rigid foam plastic core. Head decelerations were generally less severe than those developed in similar tests on a tubular steel seat back. The fibreglass construction improves passenger safety, but the best way to protect the head is to prevent impact by providing upper torso restraint. Author

N70-19091*# Food and Drug Administration, Cincinnati, Ohio. Div. of Microbiology.

ECOLOGY AND THERMAL INACTIVATION OF MICROBES IN AND ON INTERPLANETARY SPACE VEHICLE COMPONENTS Quarterly Progress Report, 1 Jul.-30 Sep. 1969

R. B. Read, Jr. Nov. 1969 18 p
 (NASA Order R-36-015-001)

(NASA-CR-107933; QPR-18) Avail: CFSTI CSCL 06M

Processes involved with thermal inactivation determinations were examined. Emphasis was placed on: (1) heat penetration studies of the heat exposure system and modification to accommodate stainless steel cups in lieu of tubes used in previous studies, (2) comparison of D values as obtained from plate-count and most-probable-number data, and (3) studies on the rate of cross contamination between cups in the test system. Cultures from *Apollo 11* were examined for growth characteristics, colony appearance, and pigment production. Tables of various culture properties data are included. D.L.G.

N70-19125*# Aztec School of Languages, Inc., Maynard, Mass. Research Translation Div.

DETECTION OF FETAL LIFE AND MEASUREMENT OF THE INFANT SKULL USING THE TWO-DIMENSIONAL ULTRASONIC ECHO METHOD [UBER DEN NACHWEIS FETALLEN LEBENS UND DIE MESSUNG DES KINDLICHEN SCHAEDELS MITTELS DES ZWEIDIMENSIONALEN ULTRASCHALLECHO-VERFAHRENS]

D. Hofmann et al Washington NASA Feb. 1970 3 p refs
 Transl. into ENGLISH from *Gynaecologia* (Karger), v. 165, 1968 p 60-61

(Contract NASw-1692)

(NASA-TT-F-12852) Avail: CFSTI CSCL 06E

An accuracy of 100% in detection of fetal life during the 12th to 42nd weeks of pregnancy is claimed, using the B-image method of ultrasonic examination. The advantages of the latter over the A-image method and fetal electrocardiography are stressed. It is apparent that the B-image method can be used for fetal skull measurement by the end of the 4th month of pregnancy at the very latest. Author

N70-19199*# Agence Tunisienne de Public-Relations, Tunis (Tunisia).

ABOUT THE INFLUENCE OF GRAVITY ON THE SLEEP MOVEMENTS ON LEAVES, PART 3 [UEBER DEN EINFLUSS DER SCHWERKRAFT AUF DIE SCHLAFBEWEGUNGEN DER BLATTER, 3]

Alfred Fischer Washington NASA Feb. 1970 17 p refs
 Transl. into ENGLISH from *Botan. Zeitung* (German), v. 48, no. 44, 31 Oct. 1890, Columns 705-718 Sponsored by NSA and NSF
 (NASA-TT-F-12619; TT-70-58009) Avail: CFSTI CSCL 06B

Clinostatic experiments with plants having their leaves in sleep position showed that their nyctitropical sensibility weakened and finally was almost destroyed by elimination of the unilateral gravitational effect. Complete suspension of leaf sleep movements was reached after gradual suppression at about the fourth or sixth day. Bending resistance in the joints of rotated beans remained approximately the same during both the day and the night after sleep movements had ceased. Strong heliotropical movements produced by bean leaves on an axis vertical to the window showed that only the nyctitropical but not the heliotropical movement sensibility was reduced by elimination of the unilateral gravitational effect. G.G.

N70-19211# School of Aerospace Medicine, Brooks AFB, Tex. Sealed Environment Branch.

AN AUTOMATED METHOD FOR QUANTIFYING URINARY PEPTIDES AND FREE AMINO ACIDS Final Report.

1965-1967

James P. Ellis, Jr., J. M. Prescott, and B. E. Welch Sep. 1969
35 p refs Submitted for publication
(AD-697382; SAM-TR-69-55) Avail: CFSTI CSCL 6/1

An automated method is described for the simultaneous quantitative analysis of urinary peptides and free amino acids. A novel ninhydrin reagent rendered the method particularly sensitive for the analysis of peptides containing amino acid residues. The method utilizes the hydrolysis and analytic components of a commercial peptide analyzer and the chromatographic and colorimetric recording components of a commercial amino acid analyzer. The method readily facilitates the analysis of one urine sample per day. A brief account is given of the developmental phase of this methodology. Applicability of the method is demonstrated by duplicate analyses of three samples collected from one subject and single analyses of two samples collected from each of three subjects. These data suggest the method yields reasonably reproducible results and that the quantitative excretion patterns of some peptides and amino acids may differ between subjects but are relatively the same for a given subject. Author (TAB)

N70-19218# Missouri Univ., Columbia.

THYROID SECRETION RATE AND LACTATION

Ralph R. Anderson [1969] 16 p refs Presented at the 5th Midwest Conf. on the Thyroid, Columbia, Mo. Sponsored by AEC (COO-1758-10; Conf-690215-1) Avail: CFSTI

In rats and cattle, the thyroid hormone secretion rate was determined with the substitution method using subcutaneous injections of I-131 and thyroxine. An increase in TSR of 100% was observed in lactating rats. However, the low correlation coefficient of 0.2 between TSR and milk production served to indicate that the other six hormones known to influence milk synthesis or removal must also play a significant role in controlling the level of milk production. The correlation coefficient of 0.29 between TSR and milk production obtained from 32 observations in cows confirmed this concept. NSA

N70-19266*# Wisconsin Univ., Madison. Dept. of Bacteriology.
STABILITY OF VIRUSES IN FOODS FOR SPACE FLIGHTS
Technical Report, 1 Dec. 1968 - 30 Nov. 1969

Dean O. Cliver Nov. 1969 28 p
(Grant NGR-50-002-086)
(NASA-CR-107947) Avail: CFSTI CSCL 06M

Final results are presented for a study to determine the extent to which various viruses in space flight foods remain stable during storage. Earlier tasks established that although viruses sometimes contaminate food, they apparently cannot multiply in it. The present work involved testing a broader range of viruses, including influenza, polio, and enteric intestinal types, and investigating temperature effects on their activation. Particular emphasis was placed on analyzing differences in polio virus stability among various food components under varying thermal conditions. The contributions of moisture levels in food containing this infective were also evaluated. One experiment was conducted to determine the effectiveness of freeze drying on virus stability in cream style corn, in which polio virus was inactivated 0.01. The remaining virus was very stable during storage of the product at 5 degrees centigrade. A.C.R.

N70-19267*# Agence Tunisienne de Public-Relations, Tunis (Tunisia).

CONCERNING THE INFLUENCE OF GRAVITY ON THE SLEEP MOVEMENTS OF LEAVES [UEBER DEN EINFLUSS DER SCHWERKRAFT AUF DIE SCHLAFBEWEGUNGEN DER BLATTER]

Alfred Fischer Washington NASA Feb. 1970 12 p refs Transl. into ENGLISH from Botan. Zeitung (German), v. 48, no. 42, 17 Oct. 1890 Columns 673-683 Sponsored by NASA and NSF (NASA-TT-F-12614; TT-70-58008) Avail: CFSTI CSCL 06C

The effects of gravity on the movements necessary for attaining the fixed light position of leaves were studied in an attempt to gain further knowledge of the secondary factors, other than primary light conditions, that cause this phenomenon. Present work involved inversion experiments with leaves in an overturned position to investigate the viewpoint that sleep movements of plants can be changed by various external conditions. Data obtained from samples of *Phaseolus vulgaris* rotated around a horizontal axis are tabulated and compared with the positions of an upright plant at various points in time. Results indicate that sleep movements are quickly suspended upon elimination of gravitational forces, and that they return as soon as the gravity reassumes its unilateral effect. A.C.R.

N70-19288*# Aztec School of Languages, Inc., Maynard, Mass. Research Translation Div.

AIR REGENERATION IN SEALED ENVIRONMENTS: A LITERATURE SURVEY [LUCHZUIVERING IN GESLOTEN RUIMTEN: EEN LITERATUURVERZICHT]

J. P. Sluimer Washington NASA Feb. 1970 28 p refs Transl. into ENGLISH from Chem. Lab., RVO-TNO Rept., 1968 40 p (Contract NASw-1692)

(NASA-TT-F-12841) Avail: CFSTI CSCL 13A

A literature survey is given for systems for air regeneration. Attention was paid mainly to pure chemical systems. Electrochemical and biochemical systems are dealt with only briefly. Special attention was given to combined sources of oxygen evolution and carbon dioxide absorption. A comparison of several systems concerning weight, volume, and heat evolution was made. Author

N70-19309*# Honeywell, Inc., Lexington, Mass. Radiation Center.

DESIGN OF A BREADBOARD REMOTE OCULOMETER

Kenneth A. Mason and John Merchant Washington NASA Feb. 1970 43 p
(Contract NAS12-531)

(NASA-CR-1459) Avail: CFSTI CSCL 06B

In order to prove the feasibility of the remote Oculometer concept, a breadboard of the device was designed and fabricated. This involved (1) a new optomechanical unit appropriate to the remote Oculometer, (2) a two axis moving mirror assembly, and (3) an additional electronics unit with which to control the moving mirror rotation angles. When these items were completed they were integrated with the electronics unit originally built for the laboratory Oculometer. Testing of the assembled remote Oculometer indicated that the expected performance was achieved. Photographs of the breadboard device (exclusive of the laboratory Oculometer electronics) are given. This document describes the design of the optics and the moving mirror subsystem that were required for the breadboard remote Oculometer. Author

N70-19329 Oregon State Univ., Corvallis.

AN INTERACTIVE MAN-HYBRID COMPUTER PARAMETER SEARCH ALGORITHM

Max Joseph Morgan (Ph.D. Thesis) 1969 135 p
Avail: Univ. Microfilms: HC \$6.40/Microfilm \$3.00 Order No. 69-8062

An interactive man-hybrid computer algorithm is presented for searching a set of dynamic system parameters which effect a compromise between performance characteristics and give satisfactory system sensitivity without any analytical calculations or a priori indices of performance. The parameter search is conducted in a real time design situation in which the computer algorithm provides interfacing functions between the man and the hybrid computer. The interfacing functions include the interpretation and translation of preferential cues into appropriate parameter changes, visual presentation of time response information, operational messages alerting the man of system events, and data outputs. The preferential cues are given by the man in response to his critical examination and judgment of the visual time response information.

Experimental results for both linear and nonlinear systems are given along with a discussion of experimental findings on the judgments a man can make with consistency about time response characteristics. Dissert. Abstr.

N70-19355*# Techtran Corp., Glen Burnie, Md.
NEW RESPIRATORY DEVICES FOR RESCUE OPERATIONS RECENTLY PLACED IN SERVICE IN THE MINES OF AUSTRIA AND HUNGARY [LES NOUVEAUX APPAREILS RESPIRATOIRES DE SECOURS RECENTMENT MIS EN USAGE DANS LES MINES DE L'AUTRICHE-HONGRIE]

H. Schmerber Washington NASA Feb. 1970 13 p Transl. into ENGLISH from Genie Civil (Paris), v. 32, 1897-1898 p 359-361 (Contract NASw-1695)

(NASA-TT-F-12838) Avail: CFSTI CSCL 06G

Respiratory devices for use in mine rescue operations are discussed. A portable device providing for the absorption of carbon monoxide and supply of fresh oxygen to the operator, is described. Its principal defect is that the user must maintain a tube in his mouth at all times. Modifications to this device are discussed along with descriptions of various other devices under consideration.

Author

N70-19362# School of Aerospace Medicine, Brooks AFB, Tex.
ISOLATION PROCEDURE, STRUCTURAL CHANGES, AND ENZYMIC ACTIVITY OF PARTICULATE SUBCELLULAR FRACTIONS OF RAT KIDNEY HOMOGENATES Interim Report, Jan.-Aug. 1966

James W. Frazier and Charles L. Martin Sep. 1969 16 p refs Submitted for publication

(AD-697383; SAM-TR-69-56) Avail: CFSTI CSCL 6/1

Previous data suggested that reversible structural changes occur in mammalian kidneys exposed to hypoxia. Since one of the concomitants of tissue hypoxia is swelling, with an uptake of external sodium ion, the formed elements of kidney homogenates were isolated in media containing 0.15 M NaCl, 0.15 M KCl, or 0.3 M sucrose in order to mimic ionic conditions surrounding these structures in normoxic and hypoxic conditions and to compare these with usual nonionic isolation procedures capable of producing relatively intact structures. NADH oxidase, ATPase, and light-scattering changes on acidification were measured. It was found that both cations had deleterious effects on NADH oxidase and light-scattering changes of mitochondrial and microsomal fractions. The 0.15 M KCl acted as a stimulator of microsomal ATPases and supported mitochondrial ATPases. The 0.15 M NaCl caused a dramatic inhibition of mitochondrial ATPases, but produced nearly the same microsomal ATPase activity as microsomes isolated in sucrose. These results indicate rather dramatic regulatory effects of monovalent cations on energy-utilizing (ATPases) and energy-producing (NADH oxidases) cellular reactions, together with striking effects on sensitivity of structural elements to changes in hydrogen ion content, as shown by light-scattering measurements.

Author (TAB)

N70-19374*# Agence Tunisienne de Public-Relations, Tunis (Tunisia).

ON THE IMPORTANCE OF THE FORCE OF GRAVITY FOR THE DEVELOPMENT OF THE ANIMAL EMBRYO [ZUR FRAGE VON DER BEDEUTUNG DER SCHWERKRAFT FUER DIE ENTWICKLUNG DES TIERISCHEN EMBRYO]

Oskar Schultze Washington NASA Feb. 1970 31 p refs Transl. into ENGLISH from Arch. Mikroskop. Anat. (German), v. 56, 1900 p 309-334 Sponsored by NASA and NSF

(NASA-TT-F-12584; TT-70-58001) Avail: CFSTI CSCL 06C

Gravitational effects on the development of fertilized frog eggs were studied experimentally. It was shown that the force of gravity must strike the egg axis at an angle of zero degree because under all other angular positions between zero and 180 degree, malformations proportional to the size of the angle arise or death occurs. G.G.

N70-19375*# Agence Tunisienne de Public-Relations, Tunis (Tunisia).

ON THE INFLUENCE OF GRAVITY IN ORGANIC FORMATION AND THE POSSIBLE ARTIFICIAL INDUCTION OF DIMORPHISM BY THE USE OF GRAVITY [UEBER DIE BEDEUTUNG DER SCHWERKRAFT FUER DIE ORGANISCHE GESTALTUNG, UBER DIE MIT HULFE DER SCHWERKRAFT MOGLICHE KUNSTLICHE ERZEUGUNG VON DOPPELBILDUNGEN]

O. Schultze Washington NASA Feb. 1970 25 p refs Transl. into ENGLISH from Sitzungsber. Physik. - Med. Ges. Wurzburg (German) New Ser. 28, no. 2, 1894 p 1-22 Sponsored by NASA and NSF

(NASA-TT-F-12577; TT-70-58005) Avail: CFSTI CSCL 06C

It is demonstrated that for the normal development of a fertilized frog egg the right gravitational effect is necessary, i.e. the conditions where the egg axis takes the vertical direction and where the light pole is at the top. Absence of these conditions leads to constantly arising modifications in the normal formation process and the ultimate death of the egg. Author

N70-19376*# Pennsylvania State Univ., University Park. Dept. of Biophysics.

PHYSICS OF CELLULAR SYNTHESIS, GROWTH AND DIVISION Status Report, 1 Jul. - 31 Dec. 1969

E. C. Pollard Jan. 1970 14 p refs

(Grant NGR-39-009-008)

(NASA-CR-108172) Avail: CFSTI CSCL 06C

Work in theoretical biology indicates that the mammalian cell adaptation mechanism to ionizing radiation, which achieves the complete destruction of the damaged nucleic acid resulting from high energy release of ionization, has a strong relationship to a membrane bound enzyme pool. A three dimensional analysis, consisting of electron microscopy, optical diffraction, and mathematical reconstruction, is advocated for evaluating spatial structures of ribosomal crystals. Investigations into the involvement of biogenic amines in long term memory establish the participation of norepinephrine in long term memory processes. DNA homology studies in mice indicate differences between male and female animals and also between mouse-rat and mouse-opossum relationships; mice and rats have 45 percent of their DNA in common whereas mice and opossums have only 29 percent of their DNA in common. Amber suppressors in a bacterium or bacteriophage messenger DNA which cause the effective translation of only the amber codon produce altered transfer RNAs which cause the insertion of serine, glutamine, and tyrosine, respectively, at the side of the amber codon. Evidence is presented that ochre suppressors are derived from each of the three amber suppressors by means of a specific mutagen decay. G.G.

N70-19461# Brookhaven National Lab., Upton, N.Y.

SERVO-TELEMANIPULATORS AND THEIR PRESENT AND FUTURE APPLICATIONS

Carl R. Flatau [1969] 27 p Presented at Colloq. on Current and Future Develop. in Teleoperator Techn. and Appl., Denver, 26-27 Feb. 1969 Sponsored by AEC

(BNL-13867; Conf-690213-1) Avail: CFSTI

A manipulator is described which was designed for use at high-energy accelerators, and specifically at Brookhaven. The communication link between the master and slave is described. Applications of servo-manipulators may be included in space exploration. Telemanipulating systems might be applied to coal mining and avoid hazardous disasters to humanity by loss of lives or health. However, to do this, the major problems to be hurdled are social and economic, not technical. NSA

N70-19481# Atomic Energy Establishment, Winfrith (England).
PROPORTIONAL COUNTERS FOR MEASURING Pu-239 IN VIVO: THE CHOICE OF COUNTING GAS AND THE USE OF PULSE SHAPE DISCRIMINATION TECHNIQUES

R. A. Pike and D. Ramsden Aug. 1969 15 p refs

N70-19507

(AEEW-M-912) Avail: CFSTI

The system for determining insoluble plutonium in vivo, now in routine use at A.E.E. Winfrith, has a limit of detection of the order of 4 nCi plutonium-239. The method of reducing background by using pulse shape discrimination techniques while retaining a high detection efficiency is described. The choice of a counting gas mixture to obtain optimum performance is discussed as are the techniques of gas handling. Author (NSA)

N70-19507*# Agence Tunisienne de Public-Relations, Tunis (Tunisia).

REMARKS ABOUT O. SCHULTZE'S WORK ON THE NECESSITY OF FREE DEVELOPMENT OF THE EMBRYO AND THE NORMAL EFFECT OF GRAVITATION ON DEVELOPMENT [BEMERKUNGEN ZU O. SCHULTZE'S ARBEIT UBER DIE NOTHWENDIGKEIT DER FREIEN ENTWICKELUNG DES EMBRYO SOWIE DER NORMALEN GRAVITATIONSWIRKUNG ZUR ENTWICKELUNG]

W. Roux Washington NASA Feb. 1970 22 p refs Transl. into ENGLISH from Arch. Entwicklungsmech. Organ. (Berlin), v. 9, 1900 p 479-493 Sponsored by NASA and NSF (NASA-TT-F-12549; TT-70-58000) Avail: CFSTI CSCL 06C

In opposition to a report that proclaims the necessity of free development for the embryo and the normal effect of gravitation on this development, the following conclusions are reached: (1) the normal gravitational effect is not necessary for the development of eggs and embryos; (2) by abnormal re-arrangement of the ingredients of the egg differing in specific gravity, the abnormal effects of the force of gravity become harmful and fatal; (3) the normal mobility of the egg and embryo in egg membranes is, in itself, not necessary for development yet its restriction can under certain circumstances cause abnormal effects of gravity and thus be harmful; and (4) the arrangements which make the movement of eggs and embryos in their membranes possible are there because the abnormal effects of the ever present and acting force of gravity are obviated. G.G.

N70-19508*# Agence Tunisienne de Public-Relations, Tunis (Tunisia).

CORRECTION OF O. SCHULTZE'S LATEST ARTICLE ON IMPORTANCE OF THE FORCE OF GRAVITY FOR THE DEVELOPMENT OF THE ANIMAL EMBRYO AND OTHER [BERICHTIGUNGEN ZU O. SCHULTZE'S JUNGSTEM AUFSATZ UBER DIE BEDEUTUNG DER SCHWERKRAFT FUER DIE ENTWICKELUNG DES TIERISCHEN EMBRYO UND ANDERES]

W. Roux Washington NASA Feb. 1970 19 p refs Transl. into ENGLISH from Arch. Entwicklungsmech. Organ. (Berlin), v. 10, 1900 p 244-255 Sponsored by NASA and NSF (NASA-TT-F-12587; TT-70-58003) Avail: CFSTI CSCL 06C

The author proved in earlier rotation experiments that the normal directing effect of the force of gravity is not necessary for the development of frog eggs. This observation is used to refute a study showing that eggs set up in a normal position and kept in an induced state by appropriate dryness remained stationary in the gastrula stage by lack of the normal effects of the force of gravity; rather, it is felt that these phenomena are attributable to a lack of air and too hard pressing caused by the excessive dryness. The circumstance that, after adding water, the eggs continue to develop is rather attributed to the elimination of these harmful effects than to the fact that the eggs now rotate a bit and can adjust themselves exactly to the direction of the earth's axis. G.G.

N70-19509*# Agence Tunisienne de Public-Relations, Tunis (Tunisia).

CONCERNING THE NECESSITY OF THE FREE DEVELOPMENT OF THE EMBRYO [UEBER DIE

NOTWENDIGKEIT DER FREIEN ENTWICKELUNG DES EMBRYO]

Oskar Schultze Washington NASA Feb. 1970 37 p refs Transl. into ENGLISH from Arch. Mikroskop. Anat. (German), v. 55, 1899 p 202-230 Sponsored by NASA and NSF (NASA-TT-F-12585; TT-70-58002) Avail: CFSTI CSCL 06C

It is shown experimentally that frog eggs with a controlled degree of membrane swelling, which suspends their capability to re-orient their inner substance by rotations, do not develop further. Not only is division inhibited at the lower egg pole containing less protoplasm, but cell division already accomplished is rapidly destroyed. Eggs in a highly induced state and with the light pole turned down can reach the end of gastrulation but never develop medullary bulges under above described circumstances. G.G.

N70-19514# Indiana Univ., Bloomington. **EFFECT OF IONIZING RADIATION ON RECURRENT INHIBITION OF THE SPINAL CORD**

Charles D. Barnes [1969] 18 p refs (Contract AT(11-1)-1475) (COO-1475-5) Avail: CFSTI

Cats were decerebrated and dorsal and ventral roots of lumbar nerves were exposed. Radiation doses of 200 to 5,000 rads were administered to the brain stem and spinal cord, and results were recorded in the form of a histogram. Early radiation changes were detected with the lowest doses. Figures are presented to show effects of acute radiation on the brainstem conditioned lumbar spinal cord extensor and flexor monosynaptic reflexes from the gastrocnemius and common peroneal muscles. It was found that increased doses led to inhibition of the unconditioned monosynaptic even if the early effect of radiation was facilitation. The effect of the removal of the cerebellum on the histogram patterns of the animal prior to radiation showed a lack of the long latency facilitation or inhibition that was seen in noncerebellectomized animals. Effects of radiation on short and long latency responses are discussed. It is thought that much of the effect of radiation on the brainstem-cord interactions is a result of the effect on the cerebellar Purkinje cells. It is suggested that if the radiosensitivity is further verified it will provide a useful tool for studying cerebellar-brainstem-cord interactions. NSA

N70-19619# Stanford Linear Accelerator Center, Calif. **UNDESIRABLE SECONDARY RADIATION IN THE IRRADIATION SPACE OF A SIEMENS 42-MeV BETATRON**

J. Rassow, H.-D. Strueter, and E. Lacin 1968 26 p refs Transl. into ENGLISH from Strahlentherapie, (Munich), v. 136, 1968 p 183-195

(SLAC-Trans-100) Avail: CFSTI

The radiation transmitted by the casing as affected by the construction at all exterior surfaces adjoining the instrument head was measured on the 42 MeV Siemens betatron. The highest dose rate for all irradiation parameters was only 5% of the beam, and 0.4% at the level of the patient. The total secondary radiation from the phantom is an order of magnitude higher than the transmitted radiation at a distance of 50 cm from the irradiated field. The part of the hard component (HVL about 17 mm Pb) amounts to 15 to 60% of the secondary radiation at distances of 25, 50, and 100 cm from the central axis, but 100% of the transmitted radiation. The ambient doses in the treatment room were studied (for vertical and horizontal beams) with and without a phantom. All measurements were made with electrons and photons of 43 MeV peak energy. To allow calculations of the protective walls, the dose rates at a distance of 50 cm inside the walls are given for the largest field as a function of the thickness of the phantom and for the different beam compensators. Author (NSA)

N70-19627# Oak Ridge National Lab., Tenn. **ENERGY AND ANGULAR DISTRIBUTION OF NEUTRONS AND GAMMA RAYS: OPERATION HENRE**

J. H. Thorngate, D. R. Johnson, and P. T. Perdue Aug. 1969
75 p refs
(CEX-65.11) Avail: CFSTI

The HENRE experiment, conducted at the Nevada Test Site in the winter and summer of 1967, was an extension of the experimental programs related to the Ichiban program to determine the doses received by the survivors at Hiroshima and Nagasaki. The data obtained on the neutron and gamma-ray dose as a function of polar angle, the fast neutron spectrum as a function of distance, and the high energy gamma-ray spectrum as a function of polar angle are presented. It was found that the neutron spectrum did not reach equilibrium within the distances at which measurements were made. This has an effect on the dose as a function of polar angle measured with different air densities. In addition, the measurements show the gamma-ray dose received from angles below the air-ground interface is affected by the diffuse source of gamma rays. Where possible, these data have been compared with data from previous field experiments. In every case, they were compared with calculations which approximated the experiment. Agreement in both cases is generally good, and this strengthens confidence in calculated results. Author (NSA)

N70-19643# Rochester Univ., N.Y. Dept. of Radiation Biology and Biophysics.

STUDIES WITH RADIOTHORIUM TH-228 ENRICHED THORIUM DIOXIDE AND ITS RADIOACTIVE PROGENY

John Edgerton Ballou (Ph.D. Thesis) 1969 154 p refs Sponsored by AEC

(UR-49-1153) Avail: CFSTI

The Ra-224 and Pb-212 daughters in ThO₂ were preferentially solubilized and translocated from deposits of the oxide in muscle, in the major reticuloendothelial organs and from the lung air space and vascular system. The extent of the washout varied with the primary site of ThO₂ deposition, but as a rule the lead isotope was depleted to a twofold greater extent than its radium precursor. A major portion of the Pb-212 deficit could be attributed to loss of the immediate parent of Pb-212, thoron in the expired air. The balance of the translocated Pb-212 accumulated in red blood cells and liver in the ratio of 5:1, respectively. The concentration of Pb-212 in blood appeared to reflect the amount of ThO₂ in the dog, regardless of deposition site. Author (NSA)

N70-19655# Scottish Research Reactor Centre, East Kilbride.

COMPARISON OF METHODS TO ASSESS GEOMETRICAL VARIATIONS OF THE COUNTING-RATE IN WHOLE-BODY MONITORS

Keith Boddy, Barbara M. Holmes, Priscilla C. King and Donald M. Dunn Dec. 1968 27 p refs
(SRRC-31/69) Avail: CFSTI

The variation in the counting-rate of a whole-body monitor, due to redistribution of an administered isotope in the body, has been investigated by three methods. Point sources in simple water phantoms including a life-like phantom containing simulated organs and human subjects were studied. The results from all methods were in reasonable agreement. The point source study showed that changes in the depth of the isotope in the body caused greater variation of the counting-rate than changes in longitudinal or lateral position, and realistic quantitative estimates of the variation were obtained. It is suggested that this simple method might be a suitable basis for inter-laboratory comparisons. Confirmatory data on human subjects are supplied by the routine use of the whole-body monitor. It was found that the use of an elaborate phantom, which may be expensive to purchase, is comparatively time-consuming and is probably unnecessary. Author (NSA)

N70-19685# Atomics International, Canoga Park, Calif.

RADIATION CHEMISTRY OF CHROMOSOMES, DECEMBER 1966-30 JUNE 1969

R. A. Holroyd and M. D. Sevilla 27 Jun. 1969 451 p refs
(Contract AT(04-3)-701)

(AI-AEC-Memo-12861) Avail: CFSTI

Chromosomes and chromosome constituents were exposed to electrons and hydrogen atoms, which are intermediates expected to be produced by ionizing radiation. The reactions of hydrogen atoms with purines and pyrimidines were studied and characteristic ESR spectra were obtained for each base. It was then possible to study the reactions of hydrogen atoms with DNA. It was found that hydrogen atoms react non-specifically by addition to the bases in DNA. The presence of histones was found to inhibit hydrogen atom attack on the DNA and result in preferential formation of radicals in the histone component. A tritium labeling technique was used to identify the radical sites on various amino acids of the histone samples. A high degree of specificity was found in that 67% of the radicals formed were on lysine residues. It was found that electrons reacted readily with adenine, cytosine, thymine, and uracil to form anions; but only the thymine anion reacted further by protonation. Interpretation of the ESR spectrum showed that protonation occurs at the 6-position of thymine. Author (NSA)

N70-19731*# California Univ., Los Angeles. Space Biology Lab.
EFFECT OF LOW-LEVEL, LOW-FREQUENCY ELECTRIC FIELDS ON EEG AND BEHAVIOR IN MACACA NEMESTRINA
R. J. Gavalas, D. O. Walter, J. Hamer, and W. Ross Adey [1969]
23 p refs

(Grant NGR-05-007-195; Contract DADA-17-67-C-7124; Grant NIH FR-3)

(NASA-CR-108247; M-2096) Avail: CFSTI CSCL 06C

A series of experiments has been done to assess the effects of low-level, low-frequency electronic fields on the behavior and EEG of monkeys. Three monkeys were implanted with subcortical and cortical EEG electrodes and trained to press a panel on a fixed interval-limited hold schedule. The monkeys were rewarded for pressing the panel once every five seconds within a 2.5-second enable period. After the animals were performing well, they were tested under low-level electric fields (2.8 volts p-p). Fields frequency was set at 7 or 10 Hz, within the range of typical EEG recording (0-33 Hz). Four-hour daily tests of field on were randomly interspersed with four-hour runs with fields-off. Under the 7-Hz fields, the monkeys showed a significantly faster interresponse time in 5 of 6 experiments. Analysis of the EEG data showed a relative peak in power at the frequency of the fields (10 Hz and 7 Hz) for the hippocampus in all three monkeys. Similar peaks were seen less consistently in the amygdala and the centre median. Author

N70-19772*# National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.

APOLLO 7 TO 11: MEDICAL CONCERNS AND RESULTS

Charles A. Berry Nov. 1969 64 p refs Presented at the 18th Intern. Congr. of Aerospace Med., Amsterdam, 18 Sep. 1969
(NASA-TM-X-58034) Avail: CFSTI CSCL 06E

The medical task required confirmation of the Gemini findings and definition and solution of any problems encountered in the four Apollo flights prior to the Apollo 11 lunar landing. The medical concerns included the following: (1) The effect of decreased red blood cell mass and decreased exercise capacity and of cardiovascular deconditioning on the ability of the crew to do lunar-surface activity; (2) the capability to work effectively in one-sixth g and the energy cost of such work; (3) the ability to get adequate rest and sleep in flight and on the lunar surface; (4) the prevention of preflight, inflight, and postflight illness by proper preventive medicine; (5) the possible development of motion sickness of vestibular origin; and (6) the conduct of a postflight quarantine of crew and lunar samples. Author

N70-19774*# Louisiana State Univ., Baton Rouge. Div. of Engineering Research.

THE EFFECT OF SONIC BOOM EXPOSURE TO THE GUINEA PIG COCHLEA

N70-19779

Deborah A. Majeau-Chargois 29 Oct. 1969 17 p refs
(Grant NGL-19-001-068)
(NASA-CR-102461) Avail: CFSTI CSCLO6S

Thirty guinea pigs with normal hearing were used. Six were controls and eight each were exposed to 1000 sonic booms at approximately 130 dB of 2, 4.76, and 125 msec N-wave pulse duration, respectively. The cochleae were dissected, stained with osmium tetroxide, and the organ of Corti removed for histological examination. It was observed that hair cell damage occurred in the apical turn of the cochleae of the exposed guinea pigs while the other turns were unaffected. Damage occurred in the same place with all pulse signatures tested. Author

N70-19779# Advisory Group for Aerospace Research and Development, Paris (France).

MEASUREMENT OF AIRCREW PERFORMANCE: THE FLIGHT DECK WORKLOAD AND ITS RELATION TO PILOT PERFORMANCE

Dec. 1969 106 p refs Presented at Symp. held by Aerospace Med. Panel of AGARD at Brooks AFB, Tex., 14-15 May 1969 (AGARD-CP-156) Avail: CFSTI

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7. FLIGHT DECK WORK LOAD AND NIGHT VISUAL APPROACH PERFORMANCE C. L. Kraft and C. L. Elworth (Boeing Co., Seattle, Wash.) 15 p refs (See N70-19786 08-05)

8. EXPLORATORY STUDY OF PILOT PERFORMANCE DURING HIGH AMBIENT TEMPERATURES/HUMIDITY S. Moreland and J. A. Barnes (Aberdeen Proving Ground) 26 p refs (See N70-19787 08-04)

N70-19780# Board of Trade, London (England). Civil Aviation Dept.

FLIGHT-DECK WORKLOAD STUDIES IN CIVIL TRANSPORT AIRCRAFT

J. S. Howitt *In* AGARD Meas. of Aircrew Performance Dec. 1969 (See N70-19779 08-04) 9 p
Avail: CFSTI

The term "Work Load Study" can be interpreted in many ways depending on one's particular interest and point of view. During the past four years a small team has been conducting field studies in civil airlines during both long-haul and short-haul operations. The team have found such studies can be conveniently divided into three main areas: (1) that associated with short term, or instantaneous work load; (2) that associated with accumulated effects of work loads over a particular period; and (3) that associated with the total working environment. Some of the methods used and the indications for further areas of research are discussed. Author

N70-19781# Army Aeromedical Research Unit, Fort Rucker, Ala. **ENERGY COST OF PILOTING FIXED AND ROTARY WING ARMY AIRCRAFT**

Delvin E. Littell *In* AGARD Meas. of Aircrew Performance Dec. 1969 6 p (See N70-19779 08-04)
Avail: CFSTI

The energy cost of piloting three Army helicopters (light, utility and medium) and one utility fixed wing aircraft was investigated. Energy expenditure was calculated from expired minute volume and expired air oxygen content measured during the basal state and in normal flight conditions. Data were collected on a total of sixteen pilots, five of whom flew all three helicopters. All of the helicopter pilots were experienced test pilots. The data indicate that, for these pilots, and flying conditions studied, the energy cost must be classed as very light work, averaging 1.79 kcal/minute. The energy cost of flying the fixed wing aircraft by less experienced pilots was similar to previously reported energy expenditures for such aircraft. The data were segregated to separate measurements made at altitude from those made during flight in close proximity to the ground. In three of the four aircraft, the pilot's energy expenditure was greater when ground contact was possible. Author

N70-19782# Aberdeen Proving Ground, Md. Systems Research Lab.

PSYCHOMOTOR PERFORMANCE UNDER THERMAL STRESS: A CRITICAL APPRAISAL

R. Douglas Jones *In* AGARD Meas. of Aircrew Performance Dec. 1969 16 p refs (See N70-19779 08-04)
Avail: CFSTI

The increasing demand for design standards applicable to crew station thermal environments would seem to necessitate some modification of approach in future thermal stress research. In general, changes in the basic research strategy should include: (1) adoption of a standardized index representing all relevant environmental parameters acting to produce what is now loosely termed "heat;" (2) investigation of those thermal conditions expected to obtain in the predicted operational environment for a given man-machine system; (3) greater emphasis on psychological variables such as learning, motivation and personality as they interact with both environmental and task variables; (4) a new definition of "stress" in terms of changes in a subject's ability to perform a given task rather than his physiological adaptation; and (5) increased attention to the kinds of increasingly complex performance demanded of the human operator in modern man-machine systems. Author

N70-19783 Dunlap and Associates, Inc., Darien, Conn.

OPERATIONAL MEASURES OF PILOT PERFORMANCE DURING FINAL APPROACH TO CARRIER LANDING

Clyde A. Britson *In* AGARD Meas. of Aircrew Performance Dec. 1969 13 p refs Submitted for publication (See N70-19779 08-04)

(Contract Nonr-4984(00))

Avail: CFSTI

Measures of pilot performance during night carrier landings were found to differ statistically and practically from daytime performance in terms of altitude control. Night approaches were characterized by more altitude variability, a larger percentage of approaches below glide slope and higher bolter rates compared with day approaches flown by the same pilots. Practical application of the performance data is discussed in terms of pilot and LSO training, visual landing aids and aviation safety. Empirical landing performance criteria are developed from the data and used to predict the probability of landing success as a function of deviations in final approach performance. Author

N70-19784# Boeing Co., Seattle, Wash. Military Airplane Systems Div.

AIRCREW TASK LOADING IN THE BOEING MULTIMISSION SIMULATOR

L. P. Zaitzeff *In* AGARD Meas. of Aircrew Performance Dec. 1969 5 p (See N70-19779 08-04)
Avail: CFSTI

The new multimission simulator, combining a 160 deg "real-world" visual display in high-resolution color, together with a completely functional and correlated cockpit, is described. The simulator permits aircrews to train in proposed aircraft and avionics systems and fly real-time missions over specially designated areas. The simulator was designed to evaluate aircrew performance using state-of-the-art concepts, controls, and displays incorporated in the cockpit of an advanced fighter/attack aircraft. Visual target acquisition performance was used as a measure of task loading in tests of one- and two-man crews flying both realistically task-loaded missions and sequences requiring visual target acquisition only. Visual target acquisition performance of two-man crews was significantly better than that of one-man crews in both types of flights. Author

N70-19785# Royal Aircraft Establishment, Farnborough (England).
PHYSIOLOGICAL ASSESSMENT OF PILOT STRESS DURING LANDING

K. G. Corkindale and F. G. Cumming, and A. M. Hammerton-Fraser (RAF Inst. of Aviation Med., Farnborough, England) *In* AGARD Meas. of Aircrew Performance Dec. 1969 5 p refs (See N70-19779 08-04)
Avail: CFSTI

A physiological recording system was developed for installation in a fairly large aircraft. Basically, the system reduced a set of physiological measurements into cumulative digital form which were photographically recorded at ten second intervals. The measurements taken were: (1) integrated arm muscle activity; (2) integrated leg muscle activity; (3) skin resistance activity; (4) respiratory rate; (5) respiratory flow; (6) end tidal carbon dioxide; and (7) heart rate. After testing in laboratory conditions the system was transferred to a rack in the forward passenger cabin of a Comet jet transport aircraft for the program being undertaken by the Blind Landing Experimental Unit at that time involved landing with or without Autoland facilities either completely blind or in various degrees of fog conditions. Author

N70-19786# Boeing Co., Seattle, Wash. Military Airplane Systems Div.

FLIGHT DECK WORK LOAD AND NIGHT VISUAL APPROACH PERFORMANCE

Conrad L. Kraft and Charles L. Elworth *In* AGARD Meas. of Aircrew Performance Dec. 1969 15 p refs (See N70-19779 08-04)
Avail: CFSTI

Research with a night visual approach simulator has provided data supporting a logical explanation for about 16 percent of air transport accidents. The explanation is in the form of a two-part hypothesis: a descent path that nulls out some visual information and a delay in relative motion supplement of the same information. The missing topographic information allows incorrect interpretation of altitude and distance. Most operational examples of this class of accidents include information about crew distractions, critical intrusions and work loads. In recent investigations, the flight deck work loads were altered by varying the frequency of appearance of other traffic which the pilot was instructed to detect and report to ground control. Analysis of the effect of work load on performance revealed this to be a significant factor only as it interacted with terrain slope and pilot differences, but not otherwise. Author

N70-19787# Aberdeen Proving Ground, Md. Systems Research Lab.

EXPLORATORY STUDY OF PILOT PERFORMANCE DURING HIGH AMBIENT TEMPERATURES/HUMIDITY

Stephen Moreland and John A. Barnes *In* AGARD Meas. of Aircrew Performance Dec. 1969 26 p refs (See N70-19799 08-04)
Avail: CFSTI

Stepwise multiple-regression program, Pearson correlation, analysis of variance and t tests of significance were employed on data to describe the relationships of temperature changes with pilot performance factors. The following statements generally summarize the results of the study: (1) pilot performance decreased and performance variability increased above a wet bulb globe temperature index of 85 F; (2) the predictor performance equations determined by the multiple-regression program indicated that skin and rectal temperatures were highly related to pilot performance; (3) pilot's reaction times increased as either ambient temperatures or rectal temperatures increased; (4) pilots performed better when they encountered light to moderate aircraft turbulence than they did on non-turbulent flights; (5) pilot subjective judgments of cabin heat were highly inconsistent with environmental measurements; (6) weight loss from perspiration appeared to have a positive correlation with performance; (7) the clothing and equipment configurations worn by the pilots had no significant effect on their performance; (8) the cabin heat did not significantly affect the pilots' ability to observe ground targets; (9) large differences in performance variability among pilots were due to basic pilot techniques; and (10) no constant relationship could be determined between ground and airborne measures of wet bulb globe temperature. Author

N70-19831*# John B. Pierce Foundation of Connecticut, New Haven.

EXPANSION OF A MATHEMATICAL MODEL OF THERMOREGULATION TO INCLUDE HIGH METABOLIC RATES Final Report, 19 Jun. 1968 - 18 Jun. 1969

J. A. J. Stolwijk 18 Jun. 1969 120 p refs

(Contract NAS9-7140)

(NASA-CR-102192; FR-B) Avail: CFSTI CSCL 06P

Working muscle temperature during work at various levels and different ambient temperatures was obtained. An experimental study of on and off transients of exercise at levels of 25, 50, and 75 percent aerobic capacity and at ambient temperatures of 10, 20, and 30 deg C is discussed, along with a theoretical study with the mathematical model of thermoregulation, involving the structure and coefficients of the regulatory portion of the model. J.A.M.

N70-19834*# American Inst. for Research, Palo Alto, Calif. Social and Educational Research Program.

A STUDY IN IMPROVING PERFORMANCE OF COMPLEX TASKS Final Report

Lloyd O. Brooks Jan. 1970 58 p refs

(Contract NAS2-3916)

(NASA-CR-73418; AIR-649-1/70-FR) Avail: CFSTI CSCL 05J

Laboratory experiments were conducted, with college students as subjects, in which contingencies of reinforcement were the experimental treatments. Speed and correctness of responses to instructional items were the dependent variables. Subjects participated individually, completed the first 142 items of a psychology program under a baseline condition, the next 489 items under one of the experimental treatments, and then responded to a posttest. A goal of the experiments was to identify procedures for improving performance of complex tasks. Subgoals were the development of techniques for accurately predicting later performance impairment from an early, pretreatment, sample of response times and the development of procedures for increasing performance speed without reducing correctness. In achieving the first subgoal, later impairment was defined in terms of the number of posttest errors on the posttest which followed the experimental treatment. Statistically significant predictions (multiple R's in excess of 0.5, cross validated with two samples of 35 subjects) were obtained on the basis of response times from three instructional items (selected from among the first four dozen at the beginning

N70-19858

of baseline). That is, subjects who responded quickly to these instructional items made fewer posttest errors. Those who responded slowly made more. Author

N70-19858*# Pennsylvania State Univ., University Park. King of Prussia Graduate Center.

DESIGN AND TESTING OF A HEAT TRANSFER SYSTEM IN THE CONSTANT NUSSELT NUMBER RANGE

Walter Kugler (M.S. Thesis) Mar. 1970 85 p

(Contract NAS2-1900)

(NASA-CR-73379) Avail: CFSTI CSCL 06S

This paper presents the thermal control subsystem design for the primate mission of the biosatellite program. A subsystem is described that provides temperature control for the fuel cell power source, cryogenic gases, miscellaneous liquids and the gas management assembly. The latter provides control of the gaseous environment in the primate compartment. The trade-offs to determine the subsystem and component requirements are presented as are component, subsystem breadboard and system thermal vacuum test results. The component test program verified that all components met their requirements with the exception of one heat exchanger. Fortunately, the system requirements could be and were relaxed. The subsequent breadboard and system thermal vacuum tests verified that the thermal control subsystem met all of the system requirements. Author

N70-19897# California Univ., San Francisco. School of Medicine. **ANALYSIS OF VOCAL BEHAVIOR Final Report, 1 May 1965 -30 Jun. 1969**

John A. Starkweather Jul. 1969 81 p refs

(Contract Nonr-3656(28))

(AD-698142) Avail: CFSTI CSCL 17/2

The research had as its objectives: (1) To develop acoustic measures of the voice to provide a useful monitor of the behavioral and emotional state of a speaker who is using a voice communication channel, (2) To explore and develop computer programs for pattern recognition of complex acoustic data to enable rapid processing, feedback of results, and adjustment of parameters for further work, and (3) To investigate the feasibility of equipment for the assessment of the behavioral state of personnel located at remote locations. A spectrum analyzer was developed appropriate to obtain time-averaged acoustic spectra of continuous speech which is converted into digital form for data reduction and analysis by off-line computer. The report describes the instrumentation developed for acoustic analysis and its connection to a computer providing graphic display and digital magnetic tape, the use of this tape on a larger computer for statistical analysis and an investigation of similarity of results with previous work. Author (TAB)

N70-19926*# Colorado State Univ., Fort Collins. **STIMULATION OF CARDIOVASCULAR ADAPTABILITY DURING PROLONGED SPACE EXPOSURE**

Harry A. Gorman *In its Biol. and Eng. of Space and Planetary Life Systems* Sep. 1969 8 p (See N70-19925 08-34)

Avail: CFSTI CSCL 06S

Cardiac output during intermittent venous pooling of blood by a sequential ripple sleeve system was studied on primates. The tranquilized animals were fitted with arm and leg sleeves and subjected to lower extremity venous pooling. Electronic monitoring of the physiological parameters of their cardiovascular systems showed that activation of the ripple sleeves, from the extremities toward the heart, accelerated venous blood return to the central circulation and decreased blood volume in the extremities. G.G.

N70-19969# Radio Corp. of America, Moorestown, N.J. Defense Electronic Products.

TECHNOLOGY FOR THE TACTICAL ENVIRONMENT

David Shore *In AGARD Tech. for Data Handling in Tactical Systems* Dec. 1969 p 1-6 (See N70-19969 08-07)

Avail: CFSTI

Developed is the operational environment and a systems concept for the construction of a new mobile tactical air command and control model. The system encompasses a command center and a series of decentralized control centers of high mobility that are connected by automatic data processing and may even incorporate airborne technologies. A secure, automatically switched, trunk communications system will interconnect all elements. G.G.

N70-19968# Informatics, Inc., Bethesda, Md. **SIMULATING A TACTICAL IMAGE INTERPRETATION FACILITY IN THE LABORATORY**

John J. Evans *In AGARD Tech. for Data Handling in Tactical Systems* Dec. 1969 p 267-290 (See N70-19968 08-07)

Avail: CFSTI

Factors which most influence the photo-interpreter's behavior and performance are studied with a laboratory simulation of an advanced tactical image interpretation system. This computerized system was designed to provide: (1) rapid retrieval of needed references; (2) specifications for optimal team communications and operating methods; and (3) procedures for controlling system operations and interpreter decision processes. This paper briefly describes pertinent operational imagery interpretation processes and problems. Major milestones in the design, development and implementation of a system simulation are then summarized. Particular attention is given to the balanced sharing of systems work between the man and the machine such that he is assisted and he is guided, but he is not driven by the automated subsystem in performing his work. Finally, important compromises in the design and test experiences are discussed. Author

N70-19969# Litton Systems, Inc., Van Nuys, Calif. Data Systems Div.

ADVANCED SYSTEM EFFECTIVENESS TECHNIQUES

Robert M. Stuckelman *In AGARD Tech. for Data Handling in Tactical Systems* Dec. 1969 p 291-298 refs (See N70-19968 08-07)

Avail: CFSTI

This paper describes advanced techniques for defining and evaluating the effectiveness of command and control systems. The techniques to be described are applicable to most command/control/information processing systems. The system effectiveness technique described herein is such an approach. Using it, a system is modeled with flow charts and performance is evaluated (via computer) based upon thousands of design parameters included in the model, using multiple input messages and various combinations of mission loading. Hardware, computer programs, communications, reliability, maintainability, personnel and logistic support factors are all taken into account in composite in predicting the system's performance in terms of reaction time for the various missions. Design decision impacts are evaluated by ascertaining the effects of differing parameters on the overall composite measure of performance. Confidence levels in composite system performance improve as the design progresses and as more test data becomes available to validate analytically determined parameters. Author

N70-20011# North American Rockwell Corp., Columbus, Ohio. **SYMPOSIUM ON APPLIED MODELS OF MAN-MACHINE SYSTEMS PERFORMANCE, COLUMBUS, OHIO, 12-14 NOVEMBER 1968 Final Report**

Girard W. Levy 3 Nov. 1969 356 p refs

(Contract N00014-68-C-0418)

(AD-697939; NR69H-591) Avail: CFSTI CSCL 5/8

Contents: The role of applied man-machine models; The development of sophisticated models of man-machine system performance; Criteria for selection and application of models; A visual target acquisition model; Unfinished business in the utility of visual detection models; Modeling the sonar operators detection process--a progress report; Field evaluation of a visual detection

model; Human operator models for manual control; Exposition of a human control model and its application; Computer simulation--savior, sanctuary, or silliness; Assumptions underlying the human reliability model; Application of a multiple task interactive model--simulation of human performance in sonar maintenance.

TAB

N70-20040# North American Rockwell Corp., Downey, Calif. Space Div.

A STUDY OF WORK-PRODUCING CHARACTERISTICS OF UNDERWATER OPERATIONS AS A FUNCTION OF DEPTH Final Report, May-Nov. 1969

I. Streimer 29 Nov. 1969 48 p refs

(Contract N00014-67-C-0363)

(AD-697937; SD-69-712) Avail: CFSTI CSCL 6/19

The effects of alterations in working depth upon the work-producing characteristics of human performing specific underwater manual tasks were examined. The tasks were: (1) A simple, repetitive rotary task requiring continuous torque production against a fixed resistance in a self-paced manner; and (2) A simple, repetitive, discontinuous flexion/extension task requiring the exertion of linear forces against a fixed resistance in a self-paced manner. The work was performed at two depths, 33 and 66 feet in the open ocean. During work sessions, heart rate and three skin temperatures were recorded. Similarly, techniques were employed which allows measurement of mean respiratory flow volumes and oxygen uptake level. The results obtained were examined as functions of task and depth. Statistically significant performance differences were found and related to previous study results.

Author (TAB)

N70-20058 Kent State Univ., Ohio.

ROLE OF SIGNAL ONSET IN SOUND LOCALIZATION

David Russell Perrott (Ph.D. Thesis) 1968 85 p

Avail: Univ. Microfilms: HC \$4.40/Microfilm \$3.00 Order No. 69-9568

A sound field analysis was performed to determine the transient interaural time and intensity differences in the sound wave patterns arriving at the ears of a human listener. The results of this analysis indicated that transient audio-signal states cannot be adequately defined on the basis of the speed of sound and the interaural distance difference alone. Transient differences were calculated on the basis of signal onset rate and headshadow effects. These correction factors appear necessary in a description of signal arrival to a biological system having an absolute threshold for audio-signals. Tests of localization precision were made on four human listeners as a function of signal frequency and signal onset duration. Localization precision was determined with a minimum audible angle procedure (MAA). MAA was defined as the minimum angular separation of two sound sources which could be detected 75 percent of the time. The Method of Constant Stimuli was used in a two alternative forced choice task. MAA was observed to be largest for the 2000 Hz signal, smaller for the 5000 Hz signal, and smallest for the 500 Hz signal. Onset duration was an effective variable only for the 2000 Hz signal. For this signal, changes in MAA were directly related to onset duration. These changes were in turn related to the changes in the transient interaural intensity differences.

Dissert. Abstr.

N70-20070*# National Aeronautics and Space Administration, Washington, D.C.

BIOLOGY

In its Rept. to COSPAR, French Space Program Feb. 1970 p 89-86 refs (See N70-20064 08-30)

Avail: CFSTI

Several important aspects of space biology are discussed, and include the following: experiments with black animals, quantitative studies of the biological effects of heavy cosmic radiation ions, pulmonary circulation and cutaneous circulation, continuous determination of the pulmonary artery flow and the carotid flow,

continuous measurement of partial oxygen pressure in the arteries and veins, acceleration tolerance experiments with an animal carrying cardiovascular indicators, implantation of bipolar electrodes in the bulbar protuberance region, miniaturization of a gamma detector, and achievement of isotopic radiocardiographs. Author

N70-20098 Case Western Reserve Univ., Cleveland, Ohio.

THE EFFECTS OF PHYSIOLOGICAL NOISE ON THE AUDITORY THRESHOLD

Linda Kathrine Moulin (Ph.D. Thesis) 1968 99 p

Avail: Univ. Microfilms: HC \$5.00/Microfilm \$3.00 Order No. 69-9363

The present study investigated the effects of physiological noise on two aspects of auditory threshold responses: the slope of the psychometric function and the occurrence of false positive responses. In addition, information concerning the origin of physiological noise and the frequency characteristics of the noise was obtained. An internal noise model of auditory functioning was proposed. Psychometric function slopes and false positive rates were obtained from three groups of subjects: those with normal hearing, those with blockage of the external auditory canal, and a group exhibiting otosclerotic hearing losses. The two criterion measures were determined for each of three frequencies: 80, 125, and 1000 Hz in unmasked and masked (50 dB SL white noise) conditions.

Dissert. Abstr.

N70-20178 Syracuse Univ., N.Y.

DIELECTRIC AND PARAMAGNETIC RESONANCE PROPERTIES OF BONE

Andrew Anthony Marino (Ph.D. Thesis) 1968 120 p

Avail: Univ. Microfilms: HC \$5.80/Microfilm \$3.00 Order No. 69-7760

The dielectric constant of human cortical bone having water contents from 0 to 72 mg H₂O/g-bone has been measured. From an analysis of the variation of the dielectric constant with water content a determination was made of the amount of water associated with bone that exists in the primary bound state. A difference in dielectric behavior is seen between normal and pathological bone. The Electron Paramagnetic Resonance (EPR) spectrum of bone at room temperature is found. From an analysis of the EPR spectrum of the cupric ion adsorbed on collagen and bone mineral from solution it is concluded that there are sites of essentially identical crystalline field symmetry located on each of the two materials. The possible importance of this in bone formation is discussed.

Dissert. Abstr.

N70-20222# Clemson Coll., S.C. Dept. of Electrical Engineering.
CONCEPT FORMULATION AS A BASIS FOR PATTERN RECOGNITION

Robert W. Snelsire 1969 15 p refs

(Contract N00014-69-C-0232)

(AD-697973) Avail: CFSTI CSCL 6/4

The problem of designing computer programs which will approach human capabilities in pattern recognition is discussed. The fact that human beings are very good at recognizing patterns which are highly structured and very bad at recognizing patterns which are not is contrasted with the fact that the performance of computer systems is almost independent of the amount of structure in the patterns. It is then suggested that those visual concepts are developed by human beings which are useful for solving the structured pattern recognition problem. To gain insight into the way these visual concepts may be programmed, a simple game playing environment is proposed in which the winning patterns may be changed. A program will then be written which will perform as nearly as possible the way humans do -- well for structured patterns and badly for unstructured ones. A computer program to implement this game has been written and is briefly discussed, but the main purpose of this paper is to point out directions for research which may prove fruitful in solving some of the many difficult problems in pattern recognition.

Author (TAB)

N70-20284# Bern Univ. (Switzerland). Toxic Hazards Div.
ELECTRON MICROSCOPIC AND MORPHOMETRIC STUDY OF MONKEY AND DOG LUNGS EXPOSED TO BERYLLIUM-CONTAINING DUST Final Report, Nov. 1967-Dec. 1968

Carmen R. Conradi, Yusuf Kapanci, Ewald R. Weibel, and Roger L. Sopher (Aerospace Med. Res. Lab.) Aug. 1969 21 p refs (Contract AF 61(052)-68-C-0030)

(AD-695486; AMRL-TR-69-45) Avail: CFSTI CSCL 6/5

Five monkeys and six dogs were exposed three times for 30 minutes each at monthly intervals to an atmosphere contaminated by a beryllium compound whose chief component was beryllium oxide. Two years after the exposure, the lungs of both test groups, as well as those of two control monkeys and two control dogs, were fixed and prepared for electron microscopic and morphometric analysis. Histologic examination revealed no fibrotic changes of pulmonary parenchyma in the exposed animals. The ultrastructure of lung tissue of exposed animals was identical to that of control animals in every respect. Neither the arithmetic nor the harmonic mean thickness of the air-blood-barrier were changed in the test animals; in particular it was not possible to demonstrate edematous or proliferative changes. It is concluded from the electron microscopic and morphometric examination of these lungs, that the beryllium compound investigated, essentially beryllium oxide, has not caused any pathological alterations in lung tissue two years after exposure. Author (TAB)

N70-20342 Yale Univ., New Haven, Conn.
BODY CUES IN ADAPTATION TO TILTED VISION

Donald Michael Quinlan (Ph.D. Thesis) 1968 73 p
 Avail: Univ. Microfilms: HC \$4.00/Microfilm \$3.00 Order No. 69-8411

Recent studies on adaptation to spatially transformed vision raised questions about the effect of viewing the body during exposure to the altered vision. Sixty male undergraduates were exposed to a 15 deg optical rotation (tilt) of the visual field for twenty minutes. Six treatment conditions were formed, composed of two levels of activity and three levels of viewing of the body. Active subjects walked during the exposure period; passive subjects were moved on a dolly. Both active walking movement and viewing of all or part of the body resulted in greater amounts of adaptation to visual tilt. Apparent vertical and body axis differed slightly but showed the same direction of effects for activity and body-viewing. The tactual-kinaesthetic measure revealed no adaptation. All subjects, regardless of treatment condition, tended to show that external visual cues such as the luminous frame had more influence on the judgment of vertical. Dissert. Abstr.

N70-20352# Randomline Inc., Willow Grove, Pa.
EFFECTS OF MICROWAVES AND RADIO FREQUENCY ENERGY ON THE CENTRAL NERVOUS SYSTEM

Allan H. Frey 17 Sep. 1969 12 p Presented at the Symp. on the Biol. Effects and Health Implications of Microwave Radiation, Richmond, 17-19 Sep. 1969

(Contract N00014-69-C-0181)

(AD-698195) Avail: CFSTI CSCL 6/16

The history of research in this area is briefly sketched, sources of misunderstanding and confusion are identified, the writers own experimentation is briefly outlined, and critical matters that an experimenter must recognize are defined. Author (TAB)

N70-20354# Naval Submarine Medical Center, Groton, Conn. Medical Research Lab.

A DETERMINATION FOR THE NAVY OF ZERO HEARING LEVEL FOR SPEECH

James F. Willott 25 Jul. 1969 10 p refs
 (AD-697932; SMRL-MR-69-7) Avail: CFSTI CSCL 6/16

Twenty-three normal-hearing candidates for the Submarine Force were examined for Speech Reception Threshold (SRT) by speech audiometry using phonetically-balanced (PB) lists of monosyllables instead of the usual spondee words. Such PB words

are felt to be considerably better in assessing the important frequency regions for daily speech communication, namely, 500-2000 cycles per second. The Navy threshold for SRT(PB) is 25 db sound pressure level re 0.0002 dyne/sq cm, or 6 db higher than the standard SRT(Spondees). A standard speech audiometer, now calibrated for spondees according to USA Standards Institute specifications, can then be used with the PB lists by subtracting 6 db from the Hearing Level dial reading to arrive at the particular subjects SRT(PB). Author (TAB)

N70-20368*# TRW, Inc., Cleveland, Ohio. Mechanical Products Div.

AIRCREW OXYGEN SYSTEM DEVELOPMENT Flight Test Report

R. J. Kiraly and A. D. Babinsky Dec. 1969 53 p
 (Contract NAS2-4444)

(NASA-CR-73392; TRW-ER-7256-15) Avail: CFSTI CSCL 06K

Flight testing of the breadboard version of an aircrew oxygen system was conducted along with a breathing simulator to produce respiration flow rates and oxygen consumption and carbon dioxide removal addition at metabolic rates, a resources adapter to provide coolant and compressed air services, an instrumentation package to provide visual readouts of the system and component operating parameters, and a tape recorder which provided important data. Each test phase included four types of system operation: baseline performance, variation of breathing volumes, variation of breathing rates, and off design operation. Results indicate no significant change in the performance of the system. Author

N70-20382# Argonne National Lab., Ill.
BIOLOGICAL AND MEDICAL RESEARCH DIVISION Annual Report, 1968

Dec. 1968 338 p refs
 (Contract W-31-109-eng-38)

(ANL-7535) Avail: CFSTI

Papers are included on microbial genetics, developmental biology, mechanisms of carcinogenesis, radiation protection, cellular and somatic effects, theoretical biology, characterization of the Argonne National Laboratory beagle, laboratory animal medicine, biophysics, cellular biochemistry, enzymology, isotope studies, cellular fine structure, plant radiobiology, and growth and development of plants in compensated gravitational, magnetic, and electrical fields. A list of staff publications and an author index is included. NSA

N70-20389# Ohio State Univ., Columbus. Dept. of Speech.
RELATIVE PERCEPTUAL SIMILARITY OF SIXTY INITIAL CONSONANTS

John W. Black Nov. 1969 33 p refs
 (Contract N00014-67-A-0232-0003)
 (AD-698205; TN-1) Avail: CFSTI CSCL 17/2

The study reported treated the relationship among 59 consonants and consonantal clusters plus the instance of the absence of an initial consonant; a total of 60 manners of commencing one-syllable words. The 60 ways of beginning one-syllable words were nearly exhaustive except that initial vowel sounds were not compared. The results of the study confirm the earlier approach (direct magnitude estimation) as one that can be used in assigning degrees of similarity-dissimilarity to initial consonants and clusters. Values obtained in this manner can be subjected satisfactorily to factor analysis. The outcome suggests that place of articulation, stop-continuant features, degrees of friction, and glide-like aspects of consonants contribute importantly to grouping the consonants on the basis of similarity. A number of applications of the results seem possible and are in prospect. The grading of aural material to facilitate speech perception has many ramifications; for example, in code-words and auditory training. Author (TAB)

N70-20428*# Space Sciences, Inc., Waltham, Mass.
NON-INVASIVE, MULTICHROMATIC EYE OXIMETER Final Report

Ronald A. Laing, Lee A. Danisch, and Laurence R. Young Oct. 1969 80 p refs

(Contract NAS12-2018)

(NASA-CR-86328) Avail: CFSTI CSCL 06B

The Eye Oximeter as an electro-optical instrument that noninvasively measures the oxygen saturation of choroidal blood in the back of the eye is described. The spectrophotometric method used by the Eye Oximeter is similar to that used in standard cuvette reflection oximeters such as the American Optical. The instrument consists of two basic systems: the Optical System and the Electronic System. The Optical System produces a suitable multi-chromatic beam of light, reflects this beam from the fundus of the subject's eye, and onto a low-noise photodetector. The Electronic System amplifies the weak composite signal from the photodetector, separates the two spectral components, computes the average oxygen saturation from the area of the fundus that was sampled, and displays the value of the computed oxygen saturation on a panel meter. The instrument is used with an external chart recorder to continuously record kinetic changes of either the oxygen saturation or the fundus reflectivity at each of the two measuring wavelengths. Since choroidal blood is characteristic of blood which is supplied to the brain, the Eye Oximeter is essentially using the eye as a window to look into the brain. The instrument can be used to monitor the amount of oxygen which is supplied to the brain under varying external conditions. Author

N70-20433*# Stanford Univ., Calif. Dept. of Applied Mechanics.
ALTERATION OF THE STATE OF MOTION OF A HUMAN BEING IN FREE FALL

M. P. Scher and T. R. Kane Jul. 1969 199 p refs

(Grant NGR-05-020-209)

(NASA-CR-108938; SU-TR-198) Avail: CFSTI CSCL 06B

A weightless astronaut can employ certain movements of his limbs to alter either the orientation or the attitude motion of his body. To study such limb maneuvers, principles of rigid body dynamics are applied to models of the human body. Maneuvers producing pitch, yaw, and roll reorientations are described, and their effectiveness in changing the orientation of a man initially at rest as regards rotational motion is explored. The results of these analyses justify considerable optimism regarding the use of limb movements as a self-rotation technique. When the human possesses initial rotational motion, it is theoretically possible to perform maneuvers which convert the motion to a more desirable form. The underlying rationale involves relationships between kinetic energy and the nature of the motion. Analysis shows that the maneuvers in question must be performed with such precision that it is exceedingly difficult to control tumbling motions by means of limb movements. However, the methods developed can be applied successfully to control motions of certain artificial satellites. Author

N70-20434*# Stanford Univ., Calif. Dept. of Applied Mechanics.
PLANAR MOTION OF A HUMAN BEING UNDER THE ACTION OF A BODY-FIXED THRUST

J. D. Yatteau and T. R. Kane Sep. 1969 43 p refs

(Grant NGR-05-020-209)

(NASA-CR-108941; SU-TR-199) Avail: CFSTI CSCL 06B

Equations of motion are derived for a system comprised of two rigid bodies subjected to the action of a force of constant magnitude, the force being applied to one of the bodies along a line fixed in the body. Analytical and numerical solutions of these equations are then used to study effects of certain relative motions of the two parts of the system on the translation of the mass center and on the rotations of the bodies. The purpose is to assess the feasibility of providing a weightless astronaut with an extremely simple maneuvering device, namely, a single thruster, rigidly attached to one part of the astronaut's body, directional and attitude control to be achieved by means of limb movements. The results obtained are encouraging: Rectilinear motions of the mass center, accompanied by negligible rotational motions of the parts of the system, turn out to be possible if the subject is capable of

performing in accordance with a simple linear feed-back law. Furthermore, it is found that substantial benefits can be derived even from open loop performance of certain maneuvers. Author

N70-20454# Army Foreign Science and Technology Center, Washington, D.C.

CYBERNETICS IN THE SERVICE OF COMMUNISM [KIBERNETIKU NA SLUZHBU KOMMUNIZMU SBORNIK STATEI]

A. I. Berg ed. 17 Sep. 1969 497 p refs Transl. into ENGLISH from *Energiya* (Moscow), v. 5, 1967 p 1-420

(AD-695085; FSTC-HT-23-145-69) Avail: CFSTI CSCL 6/4

The most important theoretical directions of cybernetics include: mathematical problems of cybernetics, including the branches of mathematics used in scientific research in the various trends of cybernetics; information theory; technical cybernetics, which studies control processes in technical systems; theory of reliability of control systems and their elements, which studies methods of analyzing reliability and ways of increasing it. In the applied directions, the most serious research is presently being carried out in the following areas: economics; chemistry; power engineering; transport; nature; psychology; and law. Author (TAB)

N70-20504# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

AVIATION AND SPACE MEDICINE: SELECTED ARTICLES [AVIATSIONNAYA I KOSMICHESKAYA MEDITSINA]

P. V. Buyanov et al 1 May 1969 7 p Transl. into ENGLISH from *Aviats. i Kosmich. Med.* (Russian), 1967 5 p

(AD-695909; FTD-MT-24-134-69) Avail: CFSTI CSCL 6/9

Results are summarized from two investigations on changes of cardiac electropotentials for flight personnel following flights which caused profound nervous-emotional tensions and on methods for the early exposure of pathology of the cardiovascular system. Results of hemodynamic studies are presented for the latter case. Conclusions are: (1) Psycho-emotional tension, connected with flight activity, causes a specific change in the functional condition of the cardiac muscle; (2) Recording of the EKG along with other methods, can be a test which helps the flight surgeon to correctly appraise psycho-emotional tension in connection with flight activity. Author (TAB)

N70-20509*# Texas Christian Univ., Fort Worth.

MAGNITUDE ESTIMATION: THE EXPONENT AND RANGE OF RESPONSE

Robert P. Markley Nov. 1969 9 p refs

(Grant NGR-44-009-018)

(NASA-CR-108925) Avail: CFSTI CSCL 05J

Twenty-four subjects made magnitude estimation judgments of the apparent distance of a space vehicle in a reduced cue setting. The effects of stimulus range on response range and the exponent of a Stevens type power function were investigated. Limitations upon the generality of previous findings about the effects of this variable were discussed. Author

N70-20527*# National Aeronautics and Space Administration, Washington, D.C.

THE INTERACTION OF LIVING SYSTEMS WITH THE SPACE ENVIRONMENT

Joseph F. Sanders *In its* Space Process. and Manufacturing 5 Feb. 1970 p 195-215 (See N70-20517 08-30)

Avail: CFSTI

It was found that weightlessness altered the orientation as well as the growth of plants. Bacteria, insects and plants exposed to gamma radiation while weightless confirmed that neutralization of gravity does change the effects of radiation on the cellular elements that control heredity. The effects were significantly selective. Greater damage occurred to unpaired chromosomes such as the "X" or male chromosome. The primate showed physiologic

deterioration attributed, mainly, to 8-1/2 days of weightlessness. Changes occurred in central nervous system function, cardiovascular performance, fluid and electrolyte metabolism and circadian rhythms.

Author

N70-20529# Martin Marietta Corp., Denver, Colo.
INDUSTRIAL MICROBIOLOGICAL APPLICATIONS IN ZERO GRAVITY: A VACCINE SATELLITE PROGRAM (VACSAT)

Russell T. Jordan /n NASA. Marshall Space Flight Center Space Process. and Manufacturing 5 Feb. 1970 p 238-251 refs (See N70-20517 08-30)

Avail: CFSTI

The data from biosatellite experiments clearly show that bacterial cultures grown in a liquid medium produce significantly larger populations and have higher growth rates, as a result of space flight, than do identical control cultures on Earth. This paper will discuss some potential applications for manufacturing pharmaceuticals in an "Orbital Work Shop" and present a preliminary design for a "Zero G Fermenter" with a proposed method for the unprecedented utilization of weightlessness in industrial fermentation.

Author

N70-20576*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

PROBABILITY LEARNING: FIRST-ORDER MARKOV STRUCTURES OF QUARTERLY EVENTS

Edward M. Huff Washington Feb. 1970 14 p refs (NASA-TN-D-5684) Avail: CFSTI CSCL 05J

Fifteen groups of subjects were exposed to different sequentially dependent stimulus sequences in a four-alternative probability learning paradigm. Groups were found to differ in both learning rate and terminal response levels as a joint function of the stochastic structure and the degree of dependence in the stimulus sequence. Events with common structural properties in different sequences were learned in a similar fashion. The manner in which subjects learn to predict four-alternative event sequences generated by first-order Markov processes is reported.

Author

N70-20578*# Battelle Memorial Inst., Columbus, Ohio.

STUDY OF A WATER-VAPOR ELECTROLYSIS UNIT

J. E. Clifford, B. C. Kim, and E. S. Kolic Washington NASA Mar. 1970 63 p refs

(Contract NAS2-2156)

(NASA-CR-1531) Avail: CFSTI CSCL 06K

Continuing development of the acid-type water-vapor electrolysis concept for oxygen generation was directed toward interface factors for subsystem integration in advanced life support systems. The experimental program involved detailed analysis of product gas purity. The sulfuric acid type water-vapor electrolysis module had already completed 100 days of satisfactory operation at design conditions. During an additional 45 days of evaluation on this program, it was established that the small generation rate of ozone and acid spray could be controlled to well below the acceptable limits for continuous exposure by use of the usual charcoal and particulate filters used for trace-contaminant control. No other trace contaminants of concern were found in the oxygen (air) or hydrogen at a level of detection of 0.01 ppm. There was preliminary evidence that airborne bacteria were rapidly destroyed. Supplemental data on current/voltage relationships for individual cells of the module was obtained.

Author

N70-20602# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

MOSCOW PHYSIOLOGICAL SOCIETY. AVIATION AND SPACE MEDICINE SECTION. TRANSACTIONS (SELECTED ARTICLES)

9 Jul. 1969 13 p Transl. into ENGLISH from Moskov. Fiziol.

Obshchestvo Sektsiya Aviats. i Kosmich. Med., (USSR), no. 1, 1967 p 128-133, 152-156

(AD-695942; FTD-MT-24-138-69) Avail: CFSTI CSCL 6/19

Contents: The problem of diurnal rhythm of physiological functions in man under conditions of insulation; Investigation of motor activity in man under conditions of hypodynamia and increased content of CO₂.

TAB

N70-20635# Kansas State Univ., Manhattan. Inst. for Environmental Research.

PROCEEDINGS OF THE SYMPOSIUM ON INDIVIDUAL COOLING

Ralph G. Nevins Jul. 1969 355 p refs Symp. held 17-18 Mar. 1969

(Contract F44620-68-C-0020)

(AD-694130; AFOSR-69-2397TR) Avail: CFSTI CSCL 6/17

The report contains twelve papers presented at a symposium on individual cooling.

Author (TAB)

N70-20656*# Honeywell, Inc., Lexington, Mass. Radiation Center.

THE OCULOMETER Summary Report

John Merchant Oct. 1969 41 p refs

(Contract NAS12-531)

(NASA-CR-86331) Avail: CFSTI CSCL 06B

A description of an electro-optic system that tracks eye detail and computes eye direction several feet from the subject is summarized. The construction of a breadboard configuration of the oculometer for aircraft use is described.

J.M.C.

N70-20663# Columbia Univ., New York. Radiological Research Lab.

RESEARCH PROJECT Annual Report, 1 Jan. 1969

1 Jan. 1969 379 p refs

(Contract AT(30-1)-2740)

(NYO-2740-6) Avail: CFSTI

The reports are divided into sections including: dosimetry, measurements of microscopic distribution of radiation energy, radiation protection, ancillary problems, biophysics, and radiobiology. A bibliography is included.

NSA

N70-20683*# AiResearch Mfg. Co., Los Angeles, Calif.

THE INTRAVEHICULAR ACTIVITY SPACE SUIT Final Report, 5 Aug. 1968 - 1 Feb. 1970

D. Friedman 13 Feb. 1970 51 p refs

(Contract NAS9-7555)

(NASA-CR-108278; Rept-70-6053) Avail: CFSTI CSCL 06K

The pertinent results of testing performed on prototype suits are presented, in addition to: (1) a description of the design of the IVA suit assembly; (2) fabrication techniques and problems encountered, and (3) recommendations for future development of the IVA suit concept. A summary presents highlights and the important aspects of the program.

Author

N70-20685*# National Aeronautics and Space Administration, Washington, D.C.

AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY WITH INDEXES

Jan. 1970 203 p

(NASA-SP-7011(71)) Avail: CFSTI CSCL 06C

Subject coverage 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. Each entry consists of a standard citation accompanied by its abstract.

Author

N70-20696*# California Univ., Davis, Bioastronautics Lab.
ORBITAL FLIGHT EFFECTS ON CALCIUM KINETICS AND FRACTURE HEALING Final Report

John R. Beljan, Richard L. Bell, Russell R. Burton, Marvin Goldman, Frank H. Kratzer et al 15 Feb. 1970 162 p refs
 (Contract NAS2-5245)
 (NASA-CR-73423) Avail: CFSTI CSCL 06S

Any determination of the effects of an environmental or nutritional perturbation on normal calcium homeostasis requires a basic understanding of some of the mineral kinetics of the system under study. In the avian model used, in studying the effects of weightlessness on skeletal quality, repair of calibrated osteotomies in weightlessness as well as at 1-'G' will include a quantitative evaluation of the dynamics and source of mineral utilized in bone repair. It should be emphasized that this experiment was to characterize the calcium dynamics of the avian model in our standard laboratory environment, at normal gravity, on a normal diet and in an unstressed condition. The object of this study was to determine the rate and degree of blood calcium exchange, using simple isotope dilution techniques, and to obtain a preliminary estimate of the fractorial skeletal uptake of a labeled pulse of blood calcium.

Author

N70-20717*# National Aeronautics and Space Administration, Flight Research Center, Edwards, Calif.

SYSTEM FOR COMMUNICATING BIOMEDICAL INFORMATION BY MEANS OF UNMODIFIED CONVENTIONAL VOICE COMMUNICATION SYSTEMS Patent Application

Charles E. Lewis, Jr., Lewis R. Carpenter, and Robert T. McDonald, inventors (to NASA) Filed 30 Jun. 1969 31 p
 (Contract NAS4-1133)
 (NASA-Case-FRC-10031; US-Patent-Appl-SN-856511) Avail: CFSTI CSCL 09F

A communication system for transmitting biomedical information obtained from a patient in a moving ambulance to a hospital for diagnosis. In the ambulance the information is converted into a frequency modulated (FM) audible signal which is then air coupled to the microphone of the two-way radio communication system in the ambulance, producing an FM/FM VHF signal. This signal is received at the ambulance's dispatch center where the first demodulation is accomplished removing the VHF carrier. Thereafter, the demodulated signal in the form of a frequency modulated audible signal is air coupled to the microphone of a telephone for transmitting these signals via a telephone link to the hospital. At the hospital the audible signal is again demodulated to extract the biomedical information which it contains. NASA

N70-20736*# National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville, Ala.

METABOLISM MONITOR FOR SPACE ACTIVITY Patent Application

John R. Rasquin, inventor (to NASA) Filed 4 Nov. 1969 16 p
 (NASA-Case-MFS-20092; US-Patent-Appl-SN-873792) Avail: CFSTI CSCL 06B

A system for monitoring the metabolic rate of an astronaut having a CO₂ analyzer used in conjunction with a spacesuit and life support system that provides an oxygen atmosphere to the interior of the spacesuit. The analyzer includes a sampling chamber through which the exhaust from the spacesuit is passed, a source of infrared radiation, a filter that passes only IR radiation having a wavelength of about 4.4 microns, an IR detector, and a signal processing apparatus for amplifying and reading out the signal from the IR detector. A wavelength of 4.4 microns is necessary because at this wavelength IR passed through the sampling chamber will be absorbed by CO₂, but not by water vapor in the spacesuit exhaust.

NASA

N70-20785*# National Aeronautics and Space Administration, Ames Research Center, Moffett Field, Calif.

ANTIOXIDANT REQUIREMENTS OF RATS EXPOSED TO 100% OXYGEN. PART 2: EFFECTS OF DIETARY ASCORBIC ACID

Anne M. Shaw, Daniel B. Menzel, and Gerald A. Brooksby [1969] 24 p refs Prepared in part by California Univ., Berkeley
 (Grant NGR-05-003-090)
 (NASA-TM-X-62817) Avail: CFSTI CSCL 06C

Young male Sprague-Dawley rats fed diets containing various combinations of vitamins E and C were continuously exposed to oxygen at 600 mm Hg for 4 weeks. Gain and food efficiency ratios of exposed rats fed diets lacking either vitamin E or C were significantly lower than those of their pair-fed controls. The addition of 750 mg ascorbate/kg to the diet containing vitamin E tended to improve gain and FER of exposed rats, while 1500 mg/kg appeared detrimental. The addition of 750 or 1500 mg ascorbic acid/kg of diet increased the blood ascorbic acid in both exposed and control rats, and decreased the difference between the oxygen-exposed rats and their pair-fed controls. Liver vitamin A was not affected by oxygen exposure in any of the diet groups, but in one of the experiments plasma vitamin A was depressed in exposed rats fed diets containing ascorbic acid compared to their pair-fed air controls. No consistent difference in liver catalase activity was observed in exposed rats and pair-fed controls, suggesting that other means of H₂O₂ removal may be more important for the oxygen-exposed animal.

Author

N70-20813# RAND Corp., Santa Monica, Calif.

SOVIET CYBERNETICS REVIEW

Wade B. Holland Jul. 1969 123 p refs /Its Ser. Vol. 3, No. 7
 (Contract F44620-67-C-0045)

(AD-694051; RM-6000/7-PR) Avail: CFSTI CSCL 9/2

The special issue is devoted to programming and programming languages. A revolution comparable to the FORTRAN II era in U. S. computing has been taking place in Soviet software, particularly in the development of algorithmic languages and translators. While ALGOL remains the basis of Soviet programming languages, interest is growing in FORTRAN, COBOL, and SIMSCRIPT, and local languages have been developed. New directions in Soviet computing are evidenced by trends toward large machines and third-generation (ASVT) computers that are compatible with the IBM Series/360; integration of hardware and system design; and new concern with man-machine interaction. Manifesting this heightened interest, the First All-Union Conference on Programming was held in November 1968. The issue contains abstracts of the papers presented and a full translation of a report on the use of automata theory in resolving problems in the man-machine interface. Author (TAB)

N70-20841*# California Univ., Berkeley.

INVESTIGATION OF THE ROLE OF SELENIUM IN THE NUTRITION AND PHYSIOLOGY OF NEURAL TISSUES OF CHICKENS AND TURKEYS

C. M. Johnson, W. O. Wilson, and L. Z. McFarland Jan. 1970 17 p refs
 (Contract NAS2-4915)

(NASA-CR-73422) Avail: CFSTI CSCL 06C

Endogenous selenium concentrations in selected tissues of chicken, turkey and coturnix are presented. The selenium concentration for laying chicken organs and tissues were variable and in decreasing order as follows: pineal, pituitary, kidney, spleen, egg yolk, liver, pancreas, magnum, cerebrum, diencephalon, cerebellum, blood, ovary and pectoral muscle. The order for turkey organs was similar except that for pineal which was much lower and similar in concentration to the ovary. In coturnix the order was

N70-20855

similar except the pineal had a very low concentration of selenium similar to the cerebellum and the pancreas had a high concentration exceeding that of the pituitary. Author

N70-20855*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

MOTIVATION: A SELECTED BIBLIOGRAPHY

20 Feb. 1970 62 p refs

(NASA-TM-X-64072; GP-816) Avail: CFSTI CSCL 05J

A bibliography of publications on motivation is presented. Books on the subject are listed regardless of publication date, but only articles published after 1960 are included. The bibliography is arranged by title, with subject-author index. Author

N70-20886# California Univ., San Diego. La Jolla Dept. of the Aerospace and Mechanical Engineering.

OPTIMIZATION OF A STANDARD LINEAR VISCOELASTIC MATERIAL FOR USE IN A SEAT BELT Technical Report

W. Nachbar and J. B. Schipmolder Nov. 1969 19 p refs

(Contract N00014-69-A-0200-6007)

(AD-697677; TR-1)

It is shown that a properly designed viscoelastic seat-belt material could have a low stiffness at low strain rates while still affording considerable improvement in the maximum safe cruising speed in comparison with a linear elastic belt. Author (TAB)

N70-20914# Tokyo Univ. (Japan). Inst. for Nuclear Study.

ON THE LOGICAL AND CONCEPTUAL FOUNDATIONS OF RADIATION DOSIMETRY

Kazuaki Kato Jun. 1969 16 p refs

(SJC-A-69-2) Avail: CFSTI

The currently used system of radiation dosimetry that is based on the recommendations made by ICRU and ICRP are criticized from the view point of logical consistency. Proposals are made to construct a better system. Author (NSA)

N70-20929# Army Medical Research and Nutrition Lab., Denver, Colo.

CARDIAC SIZE AND PULMONARY HYPERTENSION IN DOGS EXPOSED TO HIGH ALTITUDE

J. A. Vogel, R. L. Genovese, T. L. Powell, G. W. Bishop, T. J. Bucci et al Oct. 1969 28 p refs

(AD-697714; USAMRNL-322) Avail: CFSTI CSCL 6/19

Studies were conducted to determine whether the canine heart develops typical hypertrophy when subjected to high altitude exposure. Groups of six or eight purebred adult beagles were examined at sea level, after 16 weeks at 5,380 ft and after 6 and 16 weeks at 14,110 ft. Weight of ventricles and septum, expressed as absolute weight or as a ratio to body weight, was unchanged after 16 weeks at 5,380 ft. In those dogs held for 16 weeks at 14,110 ft the septal weights were less than those of the sea level controls. Ventricular weight and ratios of weights of the left and right ventricular components to the total ventricular weight were unaltered. Lack of any hypertrophy was further confirmed by ECG and angiography. Despite doubling of mean pulmonary artery pressure from sea level to 14,110 ft, pulmonary arterioles did not show medial hypertrophy. It is concluded that the dog does not develop cardiac hypertrophy under these conditions of altitude exposure. Dogs were found to have a proportionately larger right ventricle than do most mammalian species. Author (TAB)

N70-20949# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

PHOTOSYNTHESIZING SYSTEMS OF HIGH PRODUCTIVITY (COLLECTION OF ARTICLES)

A. I. Budagovskiy et al Mar. 1968 330 p refs Transl. into ENGLISH of the book "Fotosinteziruyushchie Sistemy Vysokoi Produktivnoisti" Moscow, Nauka, 1966 p 1-244

(AD-675382; FTD-MT-24-181-67) Avail: CFSTI CSCL 6/3

Contents: Problems of works on the study of photosynthetic activity of plants as a factor of productivity; the bases of the quantitative theory of the photosynthetic activity of snowings; the role of solar radiation in the photosynthetic activity of crops; photosynthetically active radiation on the territory of the USSR; biometric characteristics and dynamics of the development of a crop of corn; vertical distribution of biomass in sowings; spatial orientation of leaves in sowings and methods of its determination; an approximation method of determining the weakening and reflection of par and near infrared radiation in a sowing of corn by *measurements of the integral radiation; light curves of photosynthesis in a sowing of corn; the determination of the vertical carbon dioxide profile in sowings; the use of the products of photosynthesis in the growth processes; concerning the increase of the coefficient of economic productivity of photosynthesis.* TAB

N70-21005# Army Foreign Science and Technology Center, Washington, D.C.

MICROORGANISMS IN ROCK WEATHERING

A. N. Ilyaletdinov 5 Nov. 1969 19 p refs Transl. into ENGLISH from Izv. Akad. Nauk SSSR, Ser. Biol. (Moscow), v. 34, no. 3, 1969 p 420-427

(AD-697528; FSTC-HT-23-075-70) Avail: CFSTI CSCL 8/7

The paper reviews literary materials on the participation of microorganism in the destruction of rocks and minerals. A study of rocks involves heterotrophic microflora feeding at the expense of organic matter contained in algae and lichens. Organic acids formed as a result of oxidation of organic compounds by microorganisms are noted. Author (TAB)

N70-21018# Oak Ridge Associated Universities, Tenn. Medical Div.

[BIOLOGY AND MEDICINE] Research Report, Period Ending 31 Dec. 1968

1968 327 p refs

(ORAU-107) Avail: CFSTI

Research in cytogenetics, experimental radiotherapy, hematology, immunology, pathology, and ultrastructural anatomy during 1968 concerning the elucidation of mechanisms of radiation injury and its treatment is described. Author (NSA)

N70-21047# Akademiya Nauk URSR, Kiev.

THE SELECTION OF PROSPECTIVE CARRIERS OF BIOMETEOROLOGICAL INFORMATION

K. S. Voychishin, V. N. Mikhaylovskiy, Yu. Yu. Sikachevskiy, and V. N. Zhegar *In its* The Selection and Transmission of Inform., no. 17 1968 p 175-183 refs In RUSSIAN (See N70-21030 08-09)

Avail: CFSTI

Methods and some results of experimental verification are presented for a hypothesis on the correlation between the variations in magnetic field intensity and selected indices of bioactivity and meteorological processes. It is shown that variations in the vertical component of magnetic field intensity in the 2 to 32 hertz range do not correlate to a change in weather conditions or to the motor activity of certain living organisms. Author (H.W.)

N70-21083 National Lending Library for Science and Technology, Boston Spa (England).

CONTROLLING LIGHT CONDITIONS BY MEANS OF POLYMER FILMS WITH SPECIFIC OPTICAL PROPERTIES [REGULIROVANIE SVETOVYKH USLOVII PRI POMOSHCHI POLIMERNYKH PLENOK S ZADANNYMI OPTICHESKIMI SVOISTVAMI]

G. I. Kosobokov, E. A. Chernetsova, T. I. Vyatleva, and S. A. Stanko [1963] 9 p refs Transl. into ENGLISH from Vestn. Sel'skokhoz. Nauki, (Moscow), v. 7, 1968 p 11 - 15

(NLL-RTS-5440) Avail: Natl. Lending Library, Boston Spa, Engl.:
.2 NLL photocopy coupons

Polymer films with different melt indices were tested for application in controlling solar radiation and heat energy effects on agricultural crops. Plants grown under polyethylene films show greater yields than those grown under polyamide films. R.B.

N70-21088 National Lending Library for Science and Technology, Boston Spa (England).

EFFECT OF ATMOSPHERIC HUMIDITY AND DURATION OF FERMENTATION ON THE COURSE OF OXIDATIVE PROCESSES [VLIYANIE VLAZHNOSTI VOZDUKHA I PRODOLZHITELNOSTI FERMENTATSII NA KHOD OKISLITEL'NYKH PROTSESSOV]

N. D. Tedeshvili Nov. 1969 8 p refs Transl. into ENGLISH from Biokhim. Chain. Proizv. Akad. Nauk SSSR, Inst. Biokhim. Sb. (Moscow), no. 8, 1960 p 103 - 106

(NLL-RTS-5471) Avail: Natl. Lending Library, Boston Spa, Engl.:
10s or 1 NLL photocopy coupon

The influence of atmospheric humidity on the enzymic oxidation of the withered tea leaf was investigated. Tea tips, withered at room temperature for 18 hours, were thoroughly ground in a mortar. The resulting mass was investigated gasometrically in a Warburg apparatus. The absorption of oxygen and excretion of CO₂ were determined in parallel samples in the presence and absence of water at different atmospheric humidities: in one case the air was saturated with water vapour and the relative humidity of the air was 100%, while in the other case the relative humidity of the air was that normal for the room. It was concluded from an examination of the curves that atmospheric humidity has no significant effect on the absorption of oxygen by pulverized withered leaf, for the character of the oxygen absorption curves is the same for different relative humidities of the air. Author

N70-21090 National Lending Library for Science and Technology, Boston Spa (England).

THE ROLE OF PINOCYTOSIS IN THE TRANSPORT PROCESS OF AMNIOTIC FLUID [ROL PINOTSITOZA IV PROTSESSE TRANSPORTA OKOLOPLODNYKH VOD]

E. K. Bakhtin Nov. 1969 8 p refs Transl. into ENGLISH from Izv. Sibirsk. Otd. Akad. Nauk SSSR. Biol.-Med. Nauk (Novosibirsk), v. 1, no. 5, 1967 p 61 - 65

(NLL-RTS-5461) Avail: Natl. Lending Library, Boston Spa, Engl.:
10s or 1 NLL photocopy coupon

To elucidate the individual stages of formation of pinocytosis invaginations as well as the nature of the forming vacuoles, an investigation of ultrastructural organization of the epithelium of the amniotic membrane was conducted. Both normal conditions and conditions following the administration into the amniotic space of ferritin whose structure and density make it detectable in the cell and on its surface were studied. The amnion of a white rat on the 16th to the 20th day of pregnancy was used as a model. The process of pinocytosis in epithelial cells of the amniotic membrane of the white rat serves not only for transferring substances into a cell but also for a systematic removal of functionally nonactive regions of plasma membrane from the cell surface. Perhaps this feature is typical not only for epithelial cells of the amniotic membrane but may be widespread among other pinocytotic cells. Author

IAA ENTRIES

A70-18655 #

INVESTIGATIONS ON THE INTERRELATIONS BETWEEN CHLORELLA AND YEAST UNDER CONDITIONS OF JOINT CULTIVATION.

K. Popov, Z. Angelova, and N. Ousheva (B'lgarska Akademiia na Naukite, Institut po Fiziologiya na Rasteniata, Sofia, Bulgaria).

Bolgarskaia Akademiia Nauk, Doklady, vol. 22, no. 9, 1969, p. 1067-1070. 10 refs.

Demonstration that it is possible to cultivate jointly the two microorganisms, Chlorella (autotrophic) and Torulopsis (heterotrophic). They are favorably affected in the process of their joint cultivation because of the mutual utilization of a number of important metabolites and, in all probability, of certain growth substances as well. Joint cultivation leads to more intense growth and to the accumulation of a greater amount of biomass compared with individual cultivation, the nutrients being more effectively used in this manner. The favorable interrelations established between the two microorganisms under the conditions of their joint growth have a positive effect on the synthesis of pigments in the Chlorella as well.

F.R.L.

A70-18657 #

BIOLOGICAL FLUORESCENT SUBSTANCES—INDICATORS OF BLOOD SUPPLY OF CELLS.

K. Ichev.

Bolgarskaia Akademiia Nauk, Doklady, vol. 22, no. 10, 1969, p. 1197-1199. 5 refs.

Investigation of the passage of a fluorescent substance (4-methyl-7-diethylaminocoumarin) in the central nervous system (cerebrum and spinal cord) of 15 rabbits. Results show that the fluorescent substance passes from the blood into the protoplasm of the neural cells without getting fixed there, after which it penetrates the blood. Consequently, it marks the passage of substances soluble in water in the blood and in the neural cell.

F.R.L.

A70-18694 #

OLD AND NEW PROBLEMS OF INTERRELATIONS BETWEEN THE CORTEX AND SUBCORTICAL FORMATIONS (STARYE I NOVYE PROBLEMY VZAIMOOTNOSHENII KORY I PODKORKOVYKH OBRAZOVANII).

N. Iu. Belenkov (Gor'kovskii Meditsinskii Institut, Gorki, USSR).

Zhurnal Vysshei Nervnoi Deiatel'nosti, vol. 19, Sept.-Oct. 1969, p. 752-767. 44 refs. In Russian.

Critical appraisal of the basic concepts of the Pavlovian theory of conditioned reflexes in the light of subsequent studies. The value of this theory is seen in that it is a productive stimulus for further physiological studies rather than being an ultimate undisputable dogma. A scheme of multichannel circuits proposed by the author for conditioned reflexes (1965) and recent Soviet and foreign studies proving the presence of both a direct coupling and a feedback between the cortex and subcortical formations are mentioned as outgrowths of the Pavlovian theory.

V.Z.

A70-18695 #

RESPONSES OF CORTICAL NEURONES OF THE RABBIT AT AN EARLY STAGE OF DEFENSIVE CONDITIONING TO RHYTHMIC LIGHT (REAKTSII NEIRONOV KORY GOLOVNOGO MOZGA KROLIKA NA RANNEI STADII VYRABOTKI OBORONITEL'NOGO USLOVNOGO REFLEKSA NA RITMICHE-SKII SVET).

G. I. Shul'gina (Akademiia Nauk SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neurofiziologii, Moscow, USSR).

Zhurnal Vysshei Nervnoi Deiatel'nosti, vol. 19, Sept.-Oct. 1969, p. 778-787. 26 refs. In Russian.

Responses of 27 units of the sensorimotor and visual cortical areas were recorded in alert nonimmobilized rabbits at an early stage of defensive conditioning to rhythmic light. Relative intensity of activation and inhibition phases in the responses to nonreinforced flashes was dissimilar in different units of the visual area and may change in individual cells as the flashes are repeated in series. This apparently expressed the dynamics of interaction between the excitatory and inhibitory processes in the neuronal system responding to the rhythmic light. Addition of electrical stimulation of the extremity to the flash either did not change the reaction to light in most of the units of the visual and sensorimotor areas or produced a weakening of its inhibitory and enhancement of its excitatory components. Reactions of individual units of the sensorimotor and visual cortical areas to rhythmic light upon its pairing with electrical stimulation of the skin changed toward increased similarity in responses to paired stimuli.

(Author)

A70-18696 #

INFLUENCE OF HYPOTHERMIA OF DIFFERENT DEGREES AND DURATIONS ON THE HIGHER NERVOUS ACTIVITY AND VEGETATIVE FUNCTIONS OF RATS (VLIANIE OKHLAZHDE-NIIA RAZLICHNOI STEPENI I DLITEL'NOSTI NA VYSSHUIU NERVNUIU DEIATEL'NOST' I VEGETATIVNYE FUNKTSII KRYSA).

G. V. Altukhov, L. N. Khruleva, R. I. Gritsiuk, and P. A. Tkachenko (Institut Mediko-Biologicheskikh Problem, Moscow, USSR).

Zhurnal Vysshei Nervnoi Deiatel'nosti, vol. 19, Sept.-Oct. 1969, p. 788-793. 10 refs. In Russian.

Study of the effect of hypothermia in rats at body temperatures down to 30 C for periods up to 24 hr. It is found that such hypothermia produced a depression of food motor conditioned reflexes and of the general state, and reduced pulse and respiratory rates. On the following days, a stimulating effect of hypothermia on the conditioned activity of the animals was observed in 50% of the cases, manifested in shorter latency of conditioned reactions. Restoration of higher nervous activity started from the second or third day and was achieved in five to six days. Hypothermia down to a body temperature of 26 C, and especially to 21 C, produced more drastic changes in the higher nervous activity, the general condition, the pulse, and respiration. A stimulating effect on conditional activity was recorded only in isolated cases, and was not observed at all after maximum hypothermia. Death of the animals occurred in isolated cases only with hypothermia down to 21 C and a duration of 24 hr.

(Author)

A70-18697 #

GENERALISED RESPONSES OF THE HIGHER PARTS OF THE BRAIN DURING ELABORATION OF A SYSTEM OF SUCCESSIVE MOTOR REACTIONS IN MAN (GENERALIZOVANNYE REAKTSII VYSSHIIKH OTDELOV MOZGA CHELOVEKA PRI VYRABOTKE SISTEMY POSLEDOVATEL'NYKH DVGATEL'NYKH REAKTSII).

M. A. Alekseev and I. S. Dobronravova (Akademiia Nauk SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neurofiziologii, Moscow, USSR).

Zhurnal Vysshei Nervnoi Deiatel'nosti, vol. 19, Sept.-Oct. 1969, p. 816-827. 17 refs. In Russian.

Investigation into a rhythmic system of simple human motor reactions has shown that extinction of the generalized reaction—skin-galvanic reflex (SGR) is mainly related to the formation of stable systems of successive conditioned connections. Its appearance, on the contrary, is due to some disturbance of the system. SGR mainly reflects the changes in the dominating conditioned connection in the system. When the connection of the motor reaction with the external stimulus predominates, SGR emerges as a response to the stimulus. If

the systemic process prevails, SGR accompanies the process of correction and restoration of the disturbed system. Correction of insignificant disturbances is not necessarily accompanied by SRG.

(Author)

A70-18698 #
INVESTIGATION OF THE FREQUENCY SPECTRA OF ELECTROCORTECOGRAMS OBTAINED BY LAYER-BY-LAYER RECORDING OF RESPONSES OF THE VISUAL CORTEX OF RABBITS TO RHYTHMIC LIGHT STIMULI (ISSLEDOVANIE CHASTOTNYKH SPEKTROV ELEKTROKORTIKOGRAMM PRI POSLOINOM OTVEDENII OT ZRITEL'NOI KORY KROLIKA V OTVET NA DEISTVIE RITMICHESKOGO SVETOVOGO RAZDRAZHITELIA).

T. M. Efremova and V. D. Trush (Akademiia Nauk SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neurofiziologii, Moscow, USSR).

Zhurnal Vysshei Nervnoi Deiatel'nosti, vol. 19, Sept.-Oct. 1969, p. 839-845. 28 refs. In Russian.

Discussion of the frequency spectra of electrocorticograms taken from different layers of the visual cortex of a group of 7 waking loosely fixed rabbits exposed to sequences of rhythmic light pulses in a muffled dark chamber. Similar narrow-band responses remaining maximum during the first 10 sec following a signal are established in the exterior and interior layers of the visual cortex.

V.Z.

A70-18699 #
MECHANISMS OF FUNCTIONAL REARRANGEMENT IN DIFFERENT SECTIONS OF THE VISUAL ANALYSOR UNDER CONDITIONS OF PROLONGED LIGHT STIMULATION (K VOPROSU O MEKHAZIMAKH FUNKTSIONAL'NOI PERESTROIKI V RAZNYKH ZVEN'IAKH ZRITEL'NOGO ANALIZATORA V USLOVIAKH DLITEL'NOI SVETOVOI STIMULIATSII).

V. B. Val'tsev and A. A. Lalaian (Akademiia Nauk SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neurofiziologii, Moscow, USSR).

Zhurnal Vysshei Nervnoi Deiatel'nosti, vol. 19, Sept.-Oct. 1969, p. 853-861. 31 refs. In Russian.

Study of the time and amplitude characteristics of responses of the optic tract, corpus geniculatum laterale and visual cortex of a group of 14 anesthetized cats to 50-500 μ sec pulses of 0.5 to 100 lux. A linear dependence of the evoked potential on the logarithm of pulse intensity is established in all sections of the visual analyzor when the length of pulses is 0.5 μ sec or below. This dependence remains linear in the optic tract and becomes nonlinear in the corpus geniculatum and the visual cortex when the pulses are longer.

V.Z.

A70-18708 #
BLOOD VOLUME AND CIRCULATION RATE DURING A TRAUMATIC SHOCK AND ACUTE HEMORRHAGE UNDER HIGH-MOUNTAIN CONDITIONS (OB'EM TSIRKULIRUISHCHEI KROVI, SKOROST' KROVOTOKA PRI TRAVMATICHESKOM SHOKE I OSTROI KROVOPOTERE V USLOVIAKH VYSOKOGOR'IA).

K. T. Tadzhiiev and S. I. Rakhimov (Tadzhikskii Meditsinskii Institut, Dyushambe, Tadzhik SSR).

Akademiia Nauk Tadzhikskoi SSR, Doklady, vol. 12, no. 9, 1969, p. 63-66. 9 refs. In Russian.

Study of the blood volume and blood circulation rates in a group of dogs subjected to traumatic shock and hemorrhage at an altitude of 3600 m above sea level. 1 kg weights were suspended for 10 to 15 m to exposed mesenteries of the dogs and 40 ml/kg wt of blood was taken from their femoral arteries. A sharp drop in the blood volume and circulation rates is observed in the experimental dogs during a 58 day period of adaptation to high altitude conditions.

V.Z.

A70-18714 #
FORECASTING THE OUTCOME OF IRRADIATION OF MAMMALS (O PROGNOZIROVANII ISKHODA LUCHEVOGO VOZDEISTVIA U MLEKOPITAUSHCHIKH).

B. M. Graevskaia, I. A. Nechaev, and N. N. Zolotareva (Akademiia Nauk SSSR, Institut Biologicheskoi Fiziki, Pushchino-na-Oke, USSR).

Akademiia Nauk SSSR, Doklady, vol. 189, Nov. 21, 1969, p. 655-658. 9 refs. In Russian.

Investigation of the relation between the radiation sensitivity of mice and certain metabolism indices. In analyzing individual differences in the sensitivity of mice, an attempt is made to estimate the state of carbohydrate metabolism from the sugar level in the peripheral blood and from the reaction of this index to the introduction of adrenalin. Also an attempt is made to determine the rates of proteolytic processes occurring in the whole blood. It is shown that from these indices the reaction of an animal to irradiation can be determined, thus making it possible to compare the radiation sensitivity of the animal with the degree to which it manifests the investigated biochemical indices. The number of leucocytes in the peripheral blood of the animal is also studied as an additional indicator of sensitivity.

A.B.K.

A70-18715 #
EFFECT OF CHANGES IN OXYGEN TENSION ON THE ELECTRICAL AND CONTRACTILE PROPERTIES OF SMOOTH VASCULAR MUSCLES (VLIANIE IZMENENII NAPRIAZHENIIA KISLORODA NA ELEKTRICHESKIE I SOKRATITEL'NYE SVOISTVA GLADKIKH MYSHTS SOSUDOV).

S. A. Bershtein (Akademiia Nauk Ukrainskoi SSR, Institut Fiziologii, Kiev, Ukrainian SSR).

Akademiia Nauk SSSR, Doklady, vol. 189, Nov. 21, 1969, p. 670-673. 17 refs. In Russian.

Study of the changes in the relations between electrical and contractile activity occurring in smooth-muscle fibers of the portal vein of rats during changes in the oxygen tension of the solutions in which they are bathed. It is shown that a decrease in oxygen tension leads to changes in the electrical and contractile activity of smooth-muscle cells of spontaneously active blood vessels and is the cause of a decrease in the contractibility of smooth muscles of vessels not characterized by spontaneous manifestations of activity.

A.B.K.

A70-18716 #
VARIATIONS OF EVOKED POTENTIAL IN VARIOUS MOTIVATION REACTIONS IN RABBITS (IZMENENIIA VYZVANNOGO POTENTSIALA PRI RAZLICHNYKH MOTIVATSIONNYKH REAKTSIIAKH U KROLIKOV).

L. V. Kaliuzhnyi.

Akademiia Nauk SSSR, Doklady, vol. 189, Nov. 21, 1969, p. 674-677. 17 refs. In Russian.

Study of changes in the evoked potential of the visual cortex of rabbits in response to a light flash during a tentative reaction of the animal, during extinction of the reaction, and during a conditioned reflex in response to combinations of light with the reactions of self-stimulation, avoidance, and 'neutral' electrical stimulation. It is found that variation in the evoked potential in response to one and the same conditioned signal in one and the same animal in the presence of biologically different qualities of reinforcement leads to the appearance of a specific evoked potential configuration which depends on the biological sign of the signal.

A.B.K.

A70-18717 #
EFFECT OF AMYSYL ON THE DEVELOPMENT AND REINFORCEMENT OF CONDITIONED PASSIVE AVOIDANCE REFLEXES (VLIANIE AMIZILA NA VYRABOTKU I ZAKREPLENIE USLOVNYKH REFLEKSOV PASSIVNOGO IZBEGANIIA).

R. I. Kruglikov (Akademiia Nauk SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neurofiziologii, Moscow, USSR).

Akademiia Nauk SSSR, Doklady, vol. 189, Nov. 21, 1969, p. 682-684. 12 refs. In Russian.

Study of the effect of a tranquilizer (amysyl) on the development and reinforcement of conditioned passive avoidance reflexes in white mice subjected to electric shocks. A comparison is made of the effect of amysyl on the development, reinforcement, and repro-

duction of a conditioned passive avoidance reflex by injecting amysyl before and after development of the reflex, and before verifying the retention of the reflex. It is found that the injection of amysyl immediately after development of the reflex or immediately before checking the retention of the reflex has no effect on the reinforcement and reproduction of the reflex, whereas injection of the same dose of amysyl before the development of the reflex for all practical purposes precludes reinforcement and subsequent reproduction of the reflex.

A.B.K.

A70-18721 #
EFFECT OF ACUTE HYPOXIA ON THE CONTENT AND METABOLISM OF MONO-, DI- AND TRIPHOSPHOINOSITIDES IN THE CEREBRUM OF RATS (VLIHANIE OSTROGO KISLORODNOGO GOLODANIIA NA SODERZHANIE I INTENSIVNOST' OBMENA MONO-, DI- I TRIFOSFOINOZITIDOV V GOLOVNOM MOZGE KRYSA).

V. Ia. Dvorkin, G. V. Kiselev, and D. A. Chetverikov (Akademiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR).

Akademiia Nauk SSSR, Doklady, vol. 188, Oct. 1, 1969, p. 926-929. 18 refs. In Russian.

Chromatographic determination of mono-, di- and triphosphoinositides in the cerebral tissues of white rats subjected to pressures down to 140 mm Hg for 2 hr in a pressure chamber. Phosphate tracer injections were given to the rats before hypoxia and the distribution of radioactivity in their cerebral tissues was also determined. The cerebrum content of di- and triphosphoinositides was higher in experimental rats than in control rats.

V.Z.

A70-18722 #
INTERACTION BETWEEN CERTAIN TYPES OF EVOKED POTENTIALS IN THE SOMATOSENSORY PROJECTION ZONES OF THE FELINE CORTEX (VZAIMODEISTVIE NEKOTORYKH VIDOV VYZVANNYKH POTENCIALOV V SOMATOSENSORNYKH PROEKTSIONNYKH ZONAKH KORY GOLOVNOGO MOZGA KOSHEK).

A. A. Bashkurov (Universitet Druzhy Narodov, Moscow, USSR).

Akademiia Nauk SSSR, Doklady, vol. 188, Oct. 1, 1969, p. 946-949. 12 refs. In Russian.

Investigation of bioelectrical reactions in the 1C and 2C cortical zones of anesthetized cats in response to stimulation of their contralateral sciatic nerve. Special attention is given to the interaction between these reactions and the responses of certain points of the cortex to single and rhythmic stimuli. The biopotentials obtained are shown in diagrams.

V.Z.

A70-18723 #
PARTICIPATION OF THE THALAMIC N.VPL IN THE DISTRIBUTION OF THE AFFERENT FLUX TO THE CORTICAL PROJECTION FIELDS OF CATS (OB UCHASTI N.VPL TALAMUSA V RASPREDELENIИ AFFERENTNOGO POTOKA K PROEKTSIONNYM POLIAM KORY MOZGA KOSHKI).

G. F. Kalistratov (Universitet Druzhy Narodov, Moscow, USSR).

Akademiia Nauk SSSR, Doklady, vol. 188, Oct. 1, 1969, p. 950-953. 16 refs. In Russian.

Investigation of the role of the N.VPL in the distribution of an afferent flux produced in the cortex of a group of 27 anesthetized cats by stimulation of the contralateral sciatic nerve. It is concluded that the N.VPL of the thalamus is active primarily in producing afferent fluxes toward those portions of the Sml, SmlI and Msl which represent the responses of the contralateral hind extremity.

V.Z.

A70-18727 #
EFFECT OF AN ANTICEREBRAL CYTOTOXIC SERUM ON THE CONDITIONED-REFLEX ACTIVITY OF ANIMALS IN RELATION TO THE TYPOLOGICAL CHARACTERISTICS OF THEIR HIGHER NERVOUS ACTIVITY (VPLIV PROTIMOZKOVOI TSITOTOKSICHNOI SIROVATKI NA UMOVNOREFLEKTORNU DIIAL'NIST' TVARIN U ZV'IAZKU Z TIPOLOGICHNIMI

OSOBLIVOSTIAM I KH VISHCHOI NERVOVOI DIIAL'NOSTI).
 S. I. Vovk (Akademiia Nauk Ukrain's'koi RSR, Institut Fiziologii, Kiev, Ukrainian SSR).

Fiziologichnii Zhurnal, vol. 15, Nov.-Dec. 1969, p. 737-744. 25 refs. In Ukrainian.

Investigation of conditioned reflexes in groups of a total of 73 white rats after the administration of various doses of an anticerebral cytotoxic serum obtained from antigen-immunized rabbits. The suppression of various conditioned and unconditioned reflexes, notably motor and alimentary reflexes, in experimental rats is noted. Higher nervous activity tests showed no distinct relation between changes in the reflexes and the characteristics of typological groups of these rats.

V.Z.

A70-18728 #
CEREBRAL BIOPOTENTIALS OF RABBITS DURING THE ACTION OF A LOW ELECTROMAGNETIC FIELD OF RADIO-FREQUENCY WAVES (BIOPOTENCIALI KORI GOLOVNOGO MOZKU KROLIKIV PRI DII MALOINTENSIVNOGO ELEKTROMAGNITNOGO POLIA RADIOCHASTOTNIKH KHVIL').

L. K. Ershova and Iu. D. Dumanskii (Kiivs'kii Institut Zagal'noi ta Komunal'noi Higieni, Kiev, Ukrainian SSR).

Fiziologichnii Zhurnal, vol. 15, Nov.-Dec. 1969, p. 777-780. 10 refs. In Ukrainian.

Measurement of the biopotentials of the cerebrum in a group of 12 adult rabbits under prolonged exposures to a weak electromagnetic field in the radio frequency range. The prevalence of slow irregular biocurrents shown by the EEG's after exposures of 2 months is believed to indicate the progressive buildup of an inhibitive condition in the cortex.

V.Z.

A70-18729 #
EFFECT OF X-RAYS ON THE ACTIVITY OF SYMMETRICAL SECTIONS OF THE CORTEX OF DOGS (VPLIV RENTGENIVS'KOGO OPROMINENNIA NA DIIAL'NIST' SIMETRICHNIKH DILIANOK KORI GOLOVNOGO MOZKU SOBAK).

I. A. Medianik (Voronezh'kii Derzhavnii Universitet, Voronezh, USSR).

Fiziologichnii Zhurnal, vol. 15, Nov.-Dec. 1969, p. 781-788. 17 refs. In Ukrainian.

Study of the conditioned-reflex activity of a group of 9 dogs after bilateral exposures of their heads to an X-ray dose of 400 r administered in a single or 4 and 16 sessions. A brief initial depression of conditioned reflexes followed in succession by periods of enhancement, extended depression and recovery are observed in the dogs after exposures. The time of recovery varies depending on the type of exposure.

V.Z.

A70-18730 #
HEMOPOIETIC CONDITION DUE TO THE ACTION OF RADIO WAVES (STAN GEMOPOEZU PID VPLIVOM ELEKTROMAGNITNIKH RADIOKHVIL').

S. F. Gorodets'ka, G. G. Lisina, and M. B. Rapoport (Akademiia Nauk Ukrain's'koi RSR, Institut Fiziologii; Kiivs'kii Institut Higieni Pratsi i Profzakhvoriuvan', Kiev, Ukrainian SSR).

Fiziologichnii Zhurnal, vol. 15, Nov.-Dec. 1969, p. 805-811. 7 refs. In Ukrainian.

Study of the morphological composition of the peripheral blood and the structural changes in the hemopoietic organs of groups of 10 rabbits and 50 white mice after single and multiple exposures to microwave radiation of 100, 400 and 700 mwt/sq cm. An increase in the erythrocyte population and hemoglobin content and a decrease in the leucocyte population are observed in the test animals on the first day of exposures, followed by anemia which set in on the tenth day of repeated exposures.

V.Z.

A70-18731 #
TRANSISTORIZED DEVICE FOR PROGRAMMED AUTOMATIC CONTROL OF STUDIES OF THE TRANSIENT STATES OF

A70-18781

PUPILLARY REACTIONS, AND SOME EXPERIMENTAL RESULTS (TRANZISTORNII PRILAD DLIA AVTOMATICHNOGO PROGRAMNOGO KERUVANNIA DOSLIDZHENNIAMI PEREKHDNIKH STANIV ZINICHNOI REAKTSII I DEIAKI REZUL'TATI DOSLIDIV).

A. I. Shevko (Akademiia Nauk Ukrains'koi RSR, Institut Fiziologii, Kiev, Ukrainian SSR).
Fiziologichnii Zhurnal, vol. 15, Nov.-Dec. 1969, p. 849-854. 7 refs. In Ukrainian.

Description of the design and operation of a transistorized circuit for automatic control of photographic studies of the transient states of pupillary reactions in laboratory animals. A block diagram of the circuit is given and several representative curves characterizing the progress of pupillary reactions in rabbits are plotted. The dependence of a pupillary reaction on the duration of the light stimulus is discussed. The duration of miosis in rabbits is found to be 3 to 4 times that of mydriasis. V.Z.

A70-18781 # RADIOBIOLOGICAL AND RADIOECOLOGICAL ASPECTS OF RADIOACTIVE POLLUTION OF THE EARTH'S ATMOSPHERE (RADIOBIOLOGICZNE I RADIOEKOLOGICZNE ASPEKTY SKAZEN PROMIENIOTWÓRCZYCH ZIEMSKIEJ ATMOSFERY).

Jan Dobrowolski.
Polskie Towarzystwo Astronautyczne, Symposium Sztucznego Oddziaływania na Atmosferę i Przestrzeń Okołoziemską, Kraków, Poland, Nov. 8, 9, 1968.
Postępy Astronautyki, vol. 3, no. 3, 1969, p. 133-157. 31 refs. In Polish.

Description of the current global state of radioactive pollution of the atmosphere, and delineation of necessary additional studies and preventive measures. The need for intensified radiobiological and radioecological studies is stressed particularly for early stages of organic development and for marine ecological systems. International cooperation in the development of preventive measures is considered to be the only way of preventing future genetic effects associated with excessive radiation levels. T.M.

A70-18782 # APPLICATION OF THE METHOD BASED ON MEASUREMENTS OF ANIMAL MOVEMENT ACTIVITY TO STUDY THE INFLUENCE OF EXTERNAL FACTORS ON LIVING ORGANISMS (ZASTOSOWANIE METODY POMIARÓW AKTYWNOŚCI RUCHOWEJ ZWIERZĄT DO BADANIA WPŁYWU CZYNNIKÓW ZEWNĘTRZNYCH NA ORGANIZMY ŻYWE).

Stanisław Manikowski (Kraków, Uniwersytet, Kraków, Poland).
Polskie Towarzystwo Astronautyczne, Symposium Sztucznego Oddziaływania na Atmosferę i Przestrzeń Okołoziemską, Kraków, Poland, Nov. 8, 9, 1968.

Postępy Astronautyki, vol. 3, no. 3, 1969, p. 159-167. 28 refs. In Polish.

Survey of published results of experimental studies concerned with causal relationships between changes in the environment and animal reactions on molecular, physiological, and behavioral levels. The results examined seem to indicate that certain living organisms can perceive environmental changes which do not affect sensory organs. Measurement of the movement activity and of cyclic changes in the organism may prove to be a useful method of determining the degree of sensitivity to such environmental changes. T.M.

A70-18784 POLISH ASTRONAUTICAL SOCIETY AND POLISH PHYSIOLOGICAL SOCIETY, SYMPOSIUM DEDICATED TO PROBLEMS OF THE INFLUENCE OF GRAVITATIONAL CHANGES ON THE ORGANISM, WARSAW, POLAND, MARCH 1, 1969, REPORTS (POLSKIE TOWARZYSTWO ASTRONAUTYCZNE AND POLSKIE TOWARZYSTWO FIZJOLOGICZNE, SYMPOZJUM POŚWIĘCONE ZAGADNIENIOM WPŁYWU ZMIAN GRAWITACJI NA USTROJ, WARSAW, POLAND, MARCH 1, 1969, REFERATY).

Postępy Astronautyki, vol. 3, no. 4, 1969. 133 p. In Polish.

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SYMPOSIUM DEDICATED TO PROBLEMS OF THE INFLUENCE OF GRAVITATIONAL CHANGES ON THE ORGANISM (SYMPOZJUM POŚWIĘCONE ZAGADNIENIOM WPŁYWU ZMIAN GRAWITACJI NA USTRÓJ). S. Barański, p. 5, 6.

INFLUENCE OF ACCELERATIONS ON THE ORGANISM (WPŁYW PRZYSPIESZEŃ NA USTRÓJ). Z. Jethon (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland), p. 7-22. 66 refs. (See A70-18785 07-04)

PATHOPHYSIOLOGICAL REACTIONS OF THE ORGANISM IN WEIGHTLESSNESS (PATOFIZJOLOGICZNE REAKCJE USTROJU W NIEWAŻKOŚCI). J. Walawski, p. 23, 24.

PHYSIOLOGICAL EFFECTS OF HYPOKINESIA (FIZJOLOGICZNE SKUTKI HIPOKINEZJI). S. Kozłowski (Akademia Medyczna, Warsaw, Poland), p. 25-47. 46 refs. (See A70-18786 07-04)

ESTIMATE OF THE CORRELATION AMONG TOLERANCE TO POSITIVE ACCELERATIONS IN THE Z AXIS, RESULTS OF FUNCTIONAL TESTS, AND THE DEVELOPMENT OF SOME MOTORIC QUALITIES (OCENA WSPÓLZALEŻNOŚCI MIĘDZY ZNOSZENIEM PRZYSPIESZEŃ W OSI +Gz, WYNIKAMI PRÓB CZYNNOŚCIOWYCH A ROZWOJEM WYBRANYCH CECH MOTORYCZNYCH). Z. Dziuk, H. Sulajnis, and M. Wojtkowiak, p. 49-56. (See A70-18787 07-04)

RELATIONSHIP BETWEEN THE FUNDAMENTAL MOTORIC QUALITIES AND THE RESISTANCE OF THE ORGANISM TO THE ACTION OF POSITIVE ACCELERATION IN THE Z AXIS (ZWIĄZEK PODSTAWOWYCH CECH MOTORYCZNYCH Z ODPORNOŚCIĄ USTROJU NA DZIAŁANIE PRZYSPIESZENIA +Gz). P. Stechni (Wyższa Oficerska Szkoła Lotnicza, Dęblin, Poland), p. 57-61. (See A70-18788 07-04)

EVALUATION OF THE EFFICIENCY OF THE CIRCULATORY SYSTEM IN THE LIGHT OF CERTAIN FUNCTIONAL TESTS AND COMPARISON WITH THE RESULTS OBTAINED ON A CENTRIFUGE (OCENA WYDOLNOŚCI UKŁADU KRĄŻENIA W ŚWIETLE NIEKTORYCH PRÓB CZYNNOŚCIOWYCH I PORÓWNANIE ICH Z WYNIKAMI OSIĄGNIĘTYMI NA WIRÓWCE). J. Kikowicz (Wyższa Oficerska Szkoła Lotnicza, Dęblin, Poland), p. 63-67. (See A70-18789 07-04)

ANALYSIS OF THE CORRELATION OF DIFFERENT ESTIMATES OF TOLERANCE TO POSITIVE ACCELERATIONS IN THE Z AXIS (ANALIZA WSPÓLZALEŻNOŚCI RÓŻNYCH OCEN TOLERANCJI NA DZIAŁANIE PRZYSPIESZEŃ W OSI +Gz). Z. Jethon and H. Zaremba (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland), p. 69-76. (See A70-18790 07-04)

RADIOLOGICAL INVESTIGATIONS OF THE CHEST DURING THE ACTION OF ACCELERATIONS (BADANIA RADIOLOGICZNE KLATKI PIERSIOWEJ W CZASIE DZIAŁANIA PRZYSPIESZEŃ). B. Bembnowski (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland), p. 77-79. (See A70-18791 07-04)

SELECTION AND PHYSICAL TRAINING OF ASTRONAUTS (SELEKCJA I TRENING FIZYCZNY KOSMONAUTÓW). H. Sulajnis (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland), p. 81-89. (See A70-18792 07-05)

TOLERANCE TO ACCELERATIONS AND EMOTIONAL STABILITY (TOLERANCJA NA DZIAŁANIE PRZYSPIESZEŃ A STAŁOŚĆ EMOCJONALNA). K. Galubińska (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland), p. 91-95. (See A70-18793 07-04)

ADAPTATION OF THE RESPIRATORY AND CIRCULATORY SYSTEM'S FUNCTIONS TO CHANGES IN THE BODY POSITION (ADAPTACJA CZYNNOŚCI UKŁADU ODDYCHANIA I KRĄŻENIA DO ZMIAN POZYCJI CIAŁA). M. Golema and E. Zibro (Akademia Medyczna; Wyższa Szkoła Wychowania Fizycznego, Wrocław, Poland), p. 97-104. (See A70-18794 07-04)

SENSITIVITY OF THE VESTIBULAR APPARATUS TO ANGULAR ACCELERATIONS (CZUŁOŚĆ NARZĄDU PRZEDSIŁONKOWEGO NA PRZYSPIESZENIA KĄTOWE). L. Zaleski (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland), p. 105-112. (See A70-18795 07-04)

DISTRIBUTION OF BODY FLUIDS IN RATS SUBJECTED TO THE ACTION OF POSITIVE CENTRIPETAL ACCELERATIONS IN THE Z AXIS (ROZMIESZCZENIE PŁYNÓW USTROJOWYCH U SZCZURÓW PODDANYCH DZIAŁANIU PRZYSPIESZEŃ DOŚRODKOWYCH W OSI +Gz). P. Czernski and M. Wojtkowiak (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland), p. 113-120. (See A70-18796 07-04)

INFLUENCE OF ACCELERATIONS AND WEIGHTLESSNESS ON THE MUSCULAR SYSTEM (WPŁYW PRZYSPIESZEŃ I NIEMOŻNOŚCI NA UKŁAD MIĘŚNIOWY). W. Z. Kruk, p. 121-130. (See A70-18797 07-04)

COMBINED EFFECT OF ACCELERATIONS AND ELEVATED TEMPERATURE ON THE CARBOHYDRATE METABOLISM IN THE GUINEA PIG (SKOJARZONE DZIAŁANIE PRZYSPIESZEŃ I PODWYŻSZONEJ TEMPERATURY NA PRZEMIANĘ WĘGLOWODANOWĄ U ŚWINKI MORSKIEJ). M. Jendyk and M. Wojtkowiak (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland), p. 131-137. (See A70-18798 07-04)

A70-18785

INFLUENCE OF ACCELERATIONS ON THE ORGANISM (WPŁYW PRZYSPIESZEŃ NA USTRÓJ).

Zbigniew Jethon (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland).

(*Polskie Towarzystwo Astronautyczne and Polskie Towarzystwo Fizjologiczne, Symposium Poświęcone Zagadnieniom Wplywu Zmian Grawitacji na Ustrój, Warsaw, Poland, Mar. 1, 1969.*)

Postępy Astronautyki, vol. 3, no. 4, 1969, p. 7-22. 66 refs. In Polish.

Review of the physiological reactions of a living organism to accelerations encountered during aircraft and spacecraft flights. Types of accelerations are classified in terms of physiological reactions in humans, and physical parameters affecting the course of reaction are described. Methods of studying the influence of accelerations are examined, along with estimates of tolerance to acceleration. The causes of acceleration-induced disturbances are analyzed, with emphasis on the nature of respiratory and circulatory effects. Possibilities of increasing the tolerance level by physical, pharmacological, and training-associated methods are evaluated. T.M.

A70-18786

PHYSIOLOGICAL EFFECTS OF HYPOKINESIA (FIZJOLOGICZNE SKUTKI HIPOKINEZJI).

Stanisław Kozłowski (Akademia Medyczna, Warsaw, Poland).

(*Polskie Towarzystwo Astronautyczne and Polskie Towarzystwo Fizjologiczne, Symposium Poświęcone Zagadnieniom Wplywu Zmian Grawitacji na Ustrój, Warsaw, Poland, Mar. 1, 1969.*)

Postępy Astronautyki, vol. 3, no. 4, 1969, p. 25-47. 46 refs. In Polish.

Survey of original and published data concerning the physiological influence of a prolonged restriction of human motor activity (hypokinesia). The hypokinesia-associated changes which take place in the oxygen transport system are described, and their relationship with the work capacity is examined. Mechanisms responsible for decreased aerobic work capacity are analyzed, with emphasis on changes in the volume and distribution of body fluids. Changes in the metabolism and the endocrine function are taken into consideration.

T.M.

A70-18787

ESTIMATE OF THE CORRELATION AMONG TOLERANCE TO POSITIVE ACCELERATIONS IN THE Z AXIS, RESULTS OF FUNCTIONAL TESTS, AND THE DEVELOPMENT OF SOME MOTORIC QUALITIES (OCENA WSPÓLZALEŻNOŚCI MIĘDZY ZNOSZENIEM PRZYSPIESZEŃ W OSI +Gz, WYNIKAMI PRÓB CZYNNOSCIOWYCH A ROZWOJEM WYBRANYCH CECH MOTORICZNYCH).

Zbigniew Dziuk, Henryk Sulajnis, and Mieczysław Wojtkowiak.

(*Polskie Towarzystwo Astronautyczne and Polskie Towarzystwo Fizjologiczne, Symposium Poświęcone Zagadnieniom Wplywu Zmian Grawitacji na Ustrój, Warsaw, Poland, Mar. 1, 1969.*)

Postępy Astronautyki, vol. 3, no. 4, 1969, p. 49-56. In Polish.

Correlation of the tolerance level for centripetal accelerations with the results of functional tests of the circulatory system and with data obtained from physical exercises conducted to determine motoric features of the organism. The highest correlation with acceleration tolerance is exhibited by such motoric qualities as strength, speed endurance, and speed. It is suggested that these qualities be developed by physical training in pilots and astronauts.

T.M.

A70-18788

RELATIONSHIP BETWEEN THE FUNDAMENTAL MOTORIC QUALITIES AND THE RESISTANCE OF THE ORGANISM TO THE ACTION OF POSITIVE ACCELERATION IN THE Z AXIS (ZWIĄZEK PODSTAWOWYCH CECH MOTORICZNYCH Z ODPORNOŚCIĄ USTROJU NA DZIAŁANIE PRZYSPIESZENIA +Gz).

Piotr Stechni (Wyższa Oficerska Szkoła Lotnicza, Dęblin, Poland).

(*Polskie Towarzystwo Astronautyczne and Polskie Towarzystwo Fizjologiczne, Symposium Poświęcone Zagadnieniom Wplywu Zmian Grawitacji na Ustrój, Warsaw, Poland, Mar. 1, 1969.*)

Postępy Astronautyki, vol. 3, no. 4, 1969, p. 57-61. In Polish.

Results of experimental studies showing that the highest correlation with the action of maximum acceleration (5 g positive acceleration in the z axis until blackout) is exhibited by physical endurance and speed-endurance tests. Surface and underwater swimming tests show a significant statistical correlation to the effects of linear accelerations. It is argued that each type of acceleration requires specific physical training.

T.M.

A70-18789

EVALUATION OF THE EFFICIENCY OF THE CIRCULATORY SYSTEM IN THE LIGHT OF CERTAIN FUNCTIONAL TESTS AND COMPARISON WITH THE RESULTS OBTAINED ON A CENTRIFUGE (OCENA WYDOLNOŚCI UKŁADU KRĄŻENIA W ŚWIELE NIEKTÓRYCH PRÓB CZYNNOSCIOWYCH I PORÓWNANIE ICH Z WYNIKAMI OSIĄGNIĘTYMI NA WIRÓWCE).

Jan Kikowicz (Wyższa Oficerska Szkoła Lotnicza, Dęblin, Poland).

(*Polskie Towarzystwo Astronautyczne and Polskie Towarzystwo Fizjologiczne, Symposium Poświęcone Zagadnieniom Wplywu Zmian Grawitacji na Ustrój, Warsaw, Poland, Mar. 1, 1969.*)

Postępy Astronautyki, vol. 3, no. 4, 1969, p. 63-67. In Polish.

Comparison of the results of Flack and Crampton tests of the circulatory system with the data obtained during linear, intermittent, and continuous accelerations on a centrifuge. A lack of statistical correlation between the results of centrifuge tests and the results of functional tests indicates that the functional tests cannot be used to evaluate the tolerance of the organism to accelerations.

T.M.

A70-18790

ANALYSIS OF THE CORRELATION OF DIFFERENT ESTIMATES OF TOLERANCE TO POSITIVE ACCELERATIONS IN THE Z AXIS (ANALIZA WSPÓLZALEŻNOŚCI RÓŻNYCH OCEN TOLERANCJI NA DZIAŁANIE PRZYSPIESZEŃ W OSI +Gz).

Zbigniew Jethon and Henryk Zaremba (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland).

(*Polskie Towarzystwo Astronautyczne and Polskie Towarzystwo Fizjologiczne, Symposium Poświęcone Zagadnieniom Wplywu Zmian Grawitacji na Ustrój, Warsaw, Poland, Mar. 1, 1969.*)

Postępy Astronautyki, vol. 3, no. 4, 1969, p. 69-76. In Polish.

Study of the relative significance of tolerance levels to positive accelerations in the z axis as determined by different centrifuge techniques. The highest correlation is established between tests with constantly increasing acceleration and tests using the duration of acceleration in the estimate. Tests based on intermittent stepwise increasing accelerations cannot be replaced by other tests.

T.M.

A70-18791

RADIOLOGICAL INVESTIGATIONS OF THE CHEST DURING THE ACTION OF ACCELERATIONS (BADANIA RADIO-

LOGICZNE KLATKI PIERSIOWEJ W CZASIE DZIAŁANIA PRZYSPIESZEŃ).

Bolesław Bembnowski (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland).

(*Polskie Towarzystwo Astronautyczne and Polskie Towarzystwo Fizjologiczne, Sympozjum Poświęcone Zagadnieniom Wplywu Zmian Grawitacji na Ustrój, Warsaw, Poland, Mar. 1, 1969.*)

Postępy Astronautyki, vol. 3, no. 4, 1969, p. 77-79. In Polish.

X-ray study of the influence of 4 and 5 g positive accelerations in the z axis on the chest organs in 50 male subjects from 20 to 35 years of age. Results show significant changes in the shape and dimensions of the heart and major vessels, in the blood flow through pulmonary areas, and in the position of the diaphragm. Individuals with strongly affected blood vessels exhibited an earlier onset of blackout.

T.M.

A70-18792 #**SELECTION AND PHYSICAL TRAINING OF ASTRONAUTS (SELEKCJA I TRENING FIZYCZNY KOSMONAUTÓW).**

Henryk Sulajnis (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland).

(*Polskie Towarzystwo Astronautyczne and Polskie Towarzystwo Fizjologiczne, Sympozjum Poświęcone Zagadnieniom Wplywu Zmian Grawitacji na Ustrój, Warsaw, Poland, Mar. 1, 1969.*)

Postępy Astronautyki, vol. 3, no. 4, 1969, p. 81-89. In Polish.

Survey of available data concerning the selection of candidates for space flight and the physical training of astronauts. Physical and psychological examinations administered to potential candidates are described, and American and Soviet training programs are compared in terms of efficiency and physical requirements. Specific activities required of some Soviet astronauts are tabulated.

T.M.

A70-18793 #**TOLERANCE TO ACCELERATIONS AND EMOTIONAL STABILITY (TOLERANCJA NA DZIAŁANIE PRZYSPIESZEŃ A STAŁOŚĆ EMOCJONALNA).**

Krystyna Galubińska (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland).

(*Polskie Towarzystwo Astronautyczne and Polskie Towarzystwo Fizjologiczne, Sympozjum Poświęcone Zagadnieniom Wplywu Zmian Grawitacji na Ustrój, Warsaw, Poland, Mar. 1, 1969.*)

Postępy Astronautyki, vol. 3, no. 4, 1969, p. 91-95. In Polish.

Investigation of possible relationships between poor emotional stability and a low level of tolerance to accelerations in pilots from 20 to 30 years of age. Tests were performed on a centrifuge, and each subject's attitude to the experimental situation was analyzed. Results confirm a proposed hypothesis that individuals exhibiting emotional instability have poor resistance to acceleration as a stress situation. Emotional attitudes can reduce the acceleration tolerance level.

T.M.

A70-18794 #**ADAPTATION OF THE RESPIRATORY AND CIRCULATORY SYSTEM'S FUNCTIONS TO CHANGES IN THE BODY POSITION (ADAPTACJA CZYNNOSCI UKŁADU ODDYCHANIA I KRĄŻENIA DO ZMIAN POZYCJI CIAŁA).**

Marian Golema and Edward Ziobro (Akademia Medyczna; Wyższa Szkoła Wychowania Fizycznego, Wrocław, Poland).

(*Polskie Towarzystwo Astronautyczne and Polskie Towarzystwo Fizjologiczne, Sympozjum Poświęcone Zagadnieniom Wplywu Zmian Grawitacji na Ustrój, Warsaw, Poland, Mar. 1, 1969.*)

Postępy Astronautyki, vol. 3, no. 4, 1969, p. 97-104. In Polish.

Measurements of the ventilation function (using the Godard pulmonary test), pulse rate, and blood pressure in 30 male and female subjects from 15 to 20 years of age in vertical upright and head-down positions. It is shown that the degree of adaptation to changes in the body position can be accurately estimated on the basis of changes in (1) the Herbst oxygen consumption coefficient, (2) minute volume, (3) pulse rate, and (4) diastolic pressure, as measured in vertical upright and head-down positions.

T.M.

A70-18795 #**SENSITIVITY OF THE VESTIBULAR APPARATUS TO ANGULAR ACCELERATIONS (CZUŁOŚĆ NARZĄDU PRZEDSIÓNKOWEGO NA PRZYSPIESZENIA KĄTOWE).**

Leszek Zaleski (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland).

(*Polskie Towarzystwo Astronautyczne and Polskie Towarzystwo Fizjologiczne, Sympozjum Poświęcone Zagadnieniom Wplywu Zmian Grawitacji na Ustrój, Warsaw, Poland, Mar. 1, 1969.*)

Postępy Astronautyki, vol. 3, no. 4, 1969, p. 105-112. In Polish.

Results of electronystagmographic studies conducted to determine the excitation threshold of the vestibular semicircular canals in experienced pilots and in candidate pilots. The imposed angular accelerations were 0.3, 0.6, and 1.0 deg per sec per sec, resulting in final constant angular velocities of 30, 60, and 90 deg per sec, respectively. The pilots were decelerated at 6 deg per sec per sec, while the candidates were 'braked to stop' from the speed of 90 deg per sec. The results obtained show no relationship between the excitation threshold of the cupulo-endo-lymphatic system and the tendency to sensory illusions causing a loss of spatial orientation during flight.

T.M.

A70-18796 #**DISTRIBUTION OF BODY FLUIDS IN RATS SUBJECTED TO THE ACTION OF POSITIVE CENTRIPETAL ACCELERATIONS IN THE Z AXIS (ROZMIESZCZENIE PLYNÓW USTROJOWYCH U SZCZURÓW PODDANYCH DZIAŁANIU PRZYSPIESZEŃ DOSRODKOWYCH W OSI +Gz).**

Przemysław Czerski and Mieczysław Wojtkowiak (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland).

(*Polskie Towarzystwo Astronautyczne and Polskie Towarzystwo Fizjologiczne, Sympozjum Poświęcone Zagadnieniom Wplywu Zmian Grawitacji na Ustrój, Warsaw, Poland, Mar. 1, 1969.*)

Postępy Astronautyki, vol. 3, no. 4, 1969, p. 113-120. In Polish.

Experimental study of the displacement of body fluids in rats subjected to positive accelerations, using radioisotope tracer compounds. The animals were frozen by liquid nitrogen in the final stage of acceleration in order to fix the hemodynamic changes which have taken place. Results show displacements of body fluids in various organs coinciding with the direction of applied acceleration. Possible loss of protein from the vessels is indicated.

T.M.

A70-18797 #**INFLUENCE OF ACCELERATIONS AND WEIGHTLESSNESS ON THE MUSCULAR SYSTEM (WPŁYW PRZYSPIESZEŃ I NIĘWAŻKOŚCI NA UKŁAD MIĘŚNIOWY).**

Wiesław Zbigniew Kruk.

(*Polskie Towarzystwo Astronautyczne and Polskie Towarzystwo Fizjologiczne, Sympozjum Poświęcone Zagadnieniom Wplywu Zmian Grawitacji na Ustrój, Warsaw, Poland, Mar. 1, 1969.*)

Postępy Astronautyki, vol. 3, no. 4, 1969, p. 121-130. In Polish.

Survey of available knowledge concerning the effects of accelerations and weightlessness on the efficiency, reliability, and capacity of the muscular system in pilots and astronauts. Numerous investigations performed in this area are described, and their results are used to illustrate some of the theoretical problems which must be solved in the near future.

T.M.

A70-18798 #**COMBINED EFFECT OF ACCELERATIONS AND ELEVATED TEMPERATURE ON THE CARBOHYDRATE METABOLISM IN THE GUINEA PIG (SKOJARZONE DZIAŁANIE PRZYSPIESZEŃ I PODWYŻSZONEJ TEMPERATURY NA PRZEMIANĘ WĘGLOWODANOWĄ U ŚWINKI MORSKIEJ).**

Michał Jendyk and Mieczysław Wojtkowiak (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland).

(*Polskie Towarzystwo Astronautyczne and Polskie Towarzystwo Fizjologiczne, Sympozjum Poświęcone Zagadnieniom Wplywu Zmian Grawitacji na Ustrój, Warsaw, Poland, Mar. 1, 1969.*)

Postępy Astronautyki, vol. 3, no. 4, 1969, p. 131-137. In Polish.

Investigation of the effects of elevated temperature (plus 40 deg C), 4-g accelerations in the z axis, and a combination of both on the behavior of the carbohydrate metabolism in guinea pigs. Acceleration alone caused a slight rise of the glucose level in the blood, while both temperature and a combination of temperature and acceleration produced a drop of glucose in the blood and reduced the glycogen in muscle tissue. All three stress situations increased the lactic and pyruvic acid contents both in the blood and in muscle tissue.

T.M.

A70-18858**A MINIMUM VARIANCE, TIME OPTIMAL, CONTROL SYSTEM MODEL OF HUMAN LENS ACCOMMODATION.**

William D. O'Neill, C. K. Sanathanan (Presbyterian-St. Luke's Hospital; Illinois, University, Chicago, Ill.), and Jerald S. Brodkey (Case-Western-Reserve University, Cleveland, Ohio).

IEEE Transactions on Systems Science and Cybernetics, vol. SSC-5, Oct. 1969, p. 290-299, 23 refs.

Army-supported research.

Experimental data relating ciliary nerve stimulation and lens motion are used to identify the open-loop plant dynamics of the lens accommodation system via a parameter identification variation of the Kalman filter equations. Using the resultant minimum variance plant model, experimental closed-loop responses of the human accommodative system are predicted by synthesizing the system closed-loop controller. The resultant control signals are shown to minimize the time required to change the refractive state of the eye. The plant dynamic model and the closed-loop model are further verified by comparing their frequency responses to experimental data. The optimal performance of the lens system is compared to analogous performance of another ocular control system, and a possible general theory of optimal control is discussed. (Author)

A70-18859 ***THE INFORMATION TRANSFER REQUIRED IN REGULATORY PROCESSES.**

Roger C. Conant (Illinois, University, Chicago, Ill.).

IEEE Transactions on Systems Science and Cybernetics, vol. SSC-5, Oct. 1969, p. 334-338.

NASA-supported research; Grant No. AF AFOSR 7-67; Contract No. AF 33(615)-3890.

Several fundamental relations between regulation and informational quantities are given. These show that regulation is a phenomenon closely tied to the transinformation between the regulator and the system which might be called its opponent. Two basic types of regulators are distinguished. The first, error-controlled regulators, are shown to be essentially coding devices which operate by taking advantage of constraints in the input sequence. The second, cause-controlled regulators, are shown to be free of some limitations inherent in error-controlled regulators. The importance of the regulator's channel capacity in cause-controlled regulation is established. (Author)

A70-18860 ***DECISION PROCESSES IN THE ADAPTIVE BEHAVIOR OF HUMAN CONTROLLERS.**

Anil V. Phatak and George A. Bekey (Southern California, University, Los Angeles, Calif.).

IEEE Transactions on Systems Science and Cybernetics, vol. SSC-5, Oct. 1969, p. 339-351, 17 refs.

Grant No. NGR-05-018-022.

Development of a decision algorithm which simulates the rapid adaptive behavior of human controllers following sudden changes in plant dynamics. The control of a VTOL aircraft in hover following failure of the stability augmentation system is used as a specific example. The decision algorithm is based on the assumption that the human controller recognizes certain pattern features in the error/error-rate phase plane. Experimental data, obtained from pilots facing four possible alternatives following the time of failure, are presented.

G.R.

A70-18864**ERYTHROPOIETIC AND SOMATIC DEVELOPMENT IN CHICK EMBRYOS AT HIGH ALTITUDE (3,800 M).**

Robert W. Atherton and Paola S. Timiras (California, University, Berkeley, Calif.).

American Journal of Physiology, vol. 218, Jan. 1970, p. 75-79, 24 refs.

PHS Grants No. HD-101; No. GM-09267.

Erythropoetic and somatic development were compared between chick embryos at sea level and those acutely and chronically exposed to natural high altitude (3800 m; 12,500 ft). Somatic development was markedly impaired in high-altitude embryos and more so among those acutely exposed to the hypoxic environment. Measurement of cell populations at critical developmental stages indicated significant differences between high-altitude embryos and sea-level controls, the most marked effects appearing in the acutely exposed group. Acute exposure stimulated proliferation of erythroblasts more than chronic exposure, whereas both chronic and acute exposure slightly depressed the number of primitive polychromatic erythrocytes. Definitive polychromatic erythrocytes were very retarded among embryos acutely exposed to high altitude. Embryonic hemoglobin persisted 24 hr longer in high altitude embryos than in sea-level controls. The findings indicate that the delay in the switch from embryonic to adult hemoglobin characteristic of high-altitude embryos may be the result of altered erythrocyte kinetics and that optimal physiological adaptation to high altitude occurs with prolonged exposure. (Author)

A70-18865**EFFECT OF PERFUSION PRESSURE ON CORONARY FLOW AND OXYGEN USAGE OF NONWORKING HEART.**

Myron L. Weisfeldt and N. W. Shock (National Institute of Child Health and Human Development, Baltimore, Md.).

American Journal of Physiology, vol. 218, Jan. 1970, p. 95-101, 27 refs.

Use of a stable nonworking Langendorff perfused rat heart preparation to study the effect of changes in coronary perfusion pressure on myocardial oxygen consumption and coronary flow. Heart rate was maintained constant. Significant autoregulation of coronary flow was noted between 50 and 90 mm Hg perfusion pressure. Autoregulation was greater in hearts begun at 50 mm Hg than those begun at 90 mm Hg and was inhibited by lowering the arterial oxygen partial pressure from 650 to 150 mm Hg. A correlation was demonstrated between the change in coronary flow and the change in myocardial oxygen consumption between perfusion pressures of 50 and 90 mm Hg. Increases in coronary flow with adenosine infusion at constant perfusion pressure had no significant effect on myocardial oxygen consumption. Small increases in myocardial oxygen consumption were noted in experiments in which perfusion pressure changes were not accompanied by changes in coronary flow. These data demonstrate that coronary autoregulation is associated with a decrease in the response of myocardial oxygen consumption to changes in coronary perfusion pressure. They suggest that the effect of perfusion pressure on myocardial oxygen consumption is a result of factors relating both to the change in pressure per se and the accompanying change in coronary flow. (Author)

A70-18866**HYPOTHALAMIC CONTROL OF BARORECEPTOR REFLEXES.**

Gerard L. Gebber and David W. Snyder (Michigan State University, East Lansing, Mich.).

American Journal of Physiology, vol. 218, Jan. 1970, p. 124-131, 18 refs.

Research supported by the American Medical Association; NIH Grant No. FR-0562301.

The effect of hypothalamic stimulation was studied on the cardiac and vascular efferent components of the baroreceptor reflexes. Bradycardia evoked by carotid sinus nerve stimulation or norepinephrine was blocked by hypothalamic stimulation in spinal

A70-18870

cats. These data demonstrate the existence of a suprabulbar system which functions to inhibit vagal bradycardia induced by baroreceptor activation. In contrast, baroreceptor modulation of central sympathetic outflow was functionally important during hypothalamic stimulation. The depressor response produced by carotid sinus stretch was not reduced by hypothalamic stimulation in vagotomized cats. The pressor response evoked by hypothalamic stimulation was markedly enhanced during carotid occlusion or following section of the carotid sinus nerves. Also, peripheral sympathetic nerve discharges elicited by hypothalamic stimulation were reduced when arterial pressure was raised. It is concluded that tachycardia associated with the pressor response evoked by hypothalamic stimulation was the result not only of increased cardiac sympathetic nerve activity, but also of inhibition of baroreceptor-induced vagal activation. (Author)

A70-18870

THE MODULATION TRANSFER FUNCTION (MTF) OF THE EYE.

M. A. Ostrovskaia.

(*Optiko-Mekhanicheskaja Promyshlennost'*, vol. 36, Jan.-Feb. 1969.)
Soviet Journal of Optical Technology, vol. 36, Jan.-Feb. 1969, p. 132-142. 15 refs. Translation.

Review of the studies published in several countries since 1954 on the modulation transfer function of the eye and of the visual system. The visual system, in analogy to optical systems, is considered to be a spatial frequency filter consisting of two components: (1) optical, transmitting low frequencies; and (2) nerve, chemical, etc., transmitting high frequencies. The low-frequency transmitting component interacts with the optics of the eye. The high-frequency transmitting component is responsible for the Mach effect and other phenomena. It is closely related to inhibition processes in the brain and consists of a complex interaction of nerve, chemical, electrical, and other mechanisms. M.V.E.

A70-18895 *

PURIFICATION AND PROPERTIES OF RAT PROLACTIN.

S. Ellis, R. E. Grindelnd, J. M. Nuenke, and P. X. Callahan (NASA, Ames Research Center, Environmental Biology Div., Moffett Field, Calif.).

Endocrinology, vol. 85, Nov. 1969, p. 886-894. 33 refs.

Description of the procedures used and results obtained in the extraction, analysis and properties assessment of rat prolactin. This hormone was isolated from fresh, whole rat pituitary glands. The yield was about 1 mg/g of glands at a potency of 28 IU/mg by the local crop assay and 11 IU by the systemic assay. Analysis by sedimentation gave a mol wt of 21,600. Best-fit analysis of the amino acid composition gave a mol wt of 22,500; only two residues of methionine were present. Leucine constituted the amino terminus. Immunodiffusion showed that antiserum to rat prolactin cross-reacted strongly with hamster and weakly with mouse pituitary extracts, but not with extracts from pigeon, pig, or guinea pig. Complement fixation was absent when antiserum to rat prolactin was tested against bovine, ovine, and rabbit prolactin, as well as human and rat growth hormone. M.V.E.

A70-18902 *

EFFECT OF GLUTETHIMIDE AND AMINOGLUTETHIMIDE ON THE PITUITARY-ADRENAL SYSTEM.

Suzanne Schofield, Lynne Olds, Anne Daniels, Anne Goodwin, Patricia Muller, and Joan Vernikos-Danellis (Santa Clara, University, Sabta Clara; NASA, Ames Research Center, Environmental Biology Div., Moffett Field, Calif.).

Western Pharmacology Society, Proceedings, vol. 12, 1969, p. 109-111. 6 refs.

Investigation of the time pattern of adrenal suppression in the rat, following a single dose of aminoglutethimide, to determine the ability of the adrenal to respond to stress stimuli under these conditions, and to assess pituitary ACTH secretion before and after stress by measuring peripheral levels of ACTH. The experimental

results indicate that reversible inhibition of adrenal steroidogenesis of short duration can be effected by a single dose of aminoglutethimide. Furthermore, this compound can effectively inhibit adrenal cortical secretion in response to stress. M.M.

A70-18942

RETENTION OF VISUAL AND NAME CODES OF SINGLE LETTERS.

Michael I. Posner, Stephen J. Boies, William H. Eichelman, and Richard L. Taylor (Oregon, University, Eugene, Ore.).

Journal of Experimental Psychology (Monograph), vol. 79, Jan. 1969. 16 p. 14 refs.

NSF Grant No. GB-5960; Contract No. AF 44(620)-67-C-0099.

Investigation of the role of interpolated activity in the efficiency of two types of match: matching by physical identity and matching by name sameness. If a stored letter can be matched more rapidly with a physically identical letter (e.g., AA) than it can with a letter having only the same name (e.g., Aa), then the stored representation must preserve something of the visual aspect of the letter. Immediately after the presentation of a letter, a physical match is about 90 msec faster than a name match and this difference is lost after 2 sec. An interpolated information processing task abolished the difference between physical and name match reaction times, but visual noise alone does not affect this difference. When the visual aspect of the letter is made a completely reliable cue, the efficiency of a physical match is maintained more adequately. If only the name of the first letter is presented, subjects show the ability to recode the information into a form which is as efficient as a physical match and more efficient than a name match. Consideration is given to the relevance of these findings to the general questions of decay, rehearsal, and generation of visual codes. M.V.E.

A70-18943

RATE OF INFORMATION PROCESSING IN VISUAL PERCEPTION—SOME RESULTS AND METHODOLOGICAL CONSIDERATIONS.

Charles W. Eriksen and Terry Spencer (Illinois, University, Urbana, Ill.).

Journal of Experimental Psychology (Monograph), vol. 79, Feb. 1969. 16 p. 43 refs.

PHS Grant No. MH-1206.

Discussion of the inadequacies involved in the methodologies for studying rate of information processing in visual perception and introduction of different methodology. The latter was based on a 10-channel tachistoscope which permitted the presentation of letter stimuli at varying rates. The task was visual search, the subject having been required to detect whether an A (target) had occurred in a sequence of letters presented on a trial. Each letter was presented for approximately 2 msec with the rate between letters varying from 5 msec to approximately 3 sec. In addition to rate, the number of letters presented in a trial (sequence length) and the location of the target in the sequence were studied. The only significant effect was the number of letters in a sequence. Detection sensitivity decreased with increasing sequence length. Control experiments indicated that this change in sensitivity was not attributable to an overloading of the encoding mechanism but rather to a change in the judgmental task. An increase in the number of noise letters disproportionately increased the number of false alarms relative to hits. A simple probability model was able to describe the obtained results with fair accuracy. Failure to find a rate effect was interpreted in terms of filtering processes that operate in visual perception prior to the encoding process. M.V.E.

A70-18948 *

FLAVOR PREFERENCES FOR FORMULA DIETS.

Sally Hansen Cohenour and Doris Howes Calloway (California, University, Berkeley, Calif.).

American Dietetic Association, Journal, vol. 55, Nov. 1969, p. 476-479.

Grant No. NGR-05-003-089.

Investigation of the choice and frequency of flavors selected by men fed test diets of widely varying composition. It is found that more sweetening is preferred under a high protein diet than under one equally high in fats. It is also shown that people appear to experiment more widely with formulas they like than with those they do not. M.V.E.

A70-18949 ***THE COST OF RESEARCH DIETS.**

Janet C. King and Doris Howes Calloway (California, University, Berkeley, Calif.).

American Dietetic Association, Journal, vol. 55, Oct. 1969, p. 361-365. 8 refs.

Grant No. NGR-05-003-089.

Investigation of diets of varying degrees of specialization to determine the factors influencing the cost of research diets. A cost comparison of 2800-calorie and low-calorie research diets is tabulated. It was found that the cost of research diets can be reduced by using formulas composed of purified or synthetic food constituents, such as egg albumen, casein, various carbohydrates, and vegetable oils. A metabolic study requiring very highly purified synthetic food sources, such as amino acids, will incur significantly greater dietary costs. M.M.

A70-18951**HAEMATOCRIT VARIATIONS AND ELECTROMAGNETIC FLOWMETER SENSITIVITY.**

V. C. Roberts (King's College Hospital Medical School, London, England).

Bio-Medical Engineering, vol. 4, Sept. 1969, p. 408-412. 23 refs.

Discussion of the effect of haematocrit variations on the sensitivity of electromagnetic blood flowmeters and of the theory underlying this sensitivity variation. Particular attention is given to changes in the specific impedance of blood produced by changes in haematocrit. Cannulated and cuff type flow probes are compared theoretically in an attempt to clarify the present confusion on this topic, and a recommendation is made for the reduction of errors produced by haematocrit variations. G.R.

A70-18952**THE MBI ELECTROMAGNETIC BLOOD FLOWMETER.**

P. Wotton (Medical and Biological Instrumentation, Ltd., Ashford, England).

Bio-Medical Engineering, vol. 4, Sept. 1969, p. 413, 414, 422.

Discussion of the electromagnetic induction blood flowmeter which comprises a magnet assembly and pick-up electrodes mounted in a rigid probe, at right angles to each other and to the probe lumen. In such an arrangement, the voltage in the pick-up electrodes strictly is a measure of the blood velocity. However, since the cross-sectional area of the blood column is precisely defined, the device can be calibrated in terms of volumetric flow. G.R.

A70-18956**THE EVALUATION OF AN ULTRASONIC FLOW DETECTOR FOR THE ASSESSMENT OF PERIPHERAL VASCULAR DISEASE.**

J. S. Allan and H. J. Terry (St. Bartholomew's Hospital, London, England).

Cardiovascular Research, vol. 3, Oct. 1969, p. 503-509.

The circulation in the lower limbs of 50 patients with vascular disease was assessed transcutaneously with a commercially available ultrasonic flow detector. In 66 limbs, the results were compared with arteriograms. The findings were entirely correct in 57 limbs, and in every limb a reliable indication of the adequacy of the blood supply was obtained. (Author)

A70-18962**INVESTIGATIONS OF THE EFFECT OF VACUUM AND RADIATION ON ESCHERICHIA COLI (UNTERSUCHUNGEN ÜBER DIE WIRKUNG VON VAKUUM UND STRAHLUNG AUF ESCHERICHIA COLI).**

H. Bückner and G. Horneck (Frankfurt, Universität, Frankfurt am

Main, West Germany).

Biophysik, vol. 6, 1969, p. 69-75. 15 refs. In German.

Research supported by the Bundesministerium für Wissenschaftliche Forschung.

Cells of *E. coli* B/r were exposed to vacuum up to 1 microtorr. From these investigations it is assumed, that the damaging effect of vacuum mainly depends on the water desorption of the cells. All effects under consideration (i.e., inactivation, delay of the first cell division, and increase of radiation sensitivity) were obtained already in the range of about 1 torr. They were scarcely increased by further decompression. Cells which were protected by other bacteria, nutrient media, or crystals were less damaged by vacuum. The radiation sensitivity during vacuum exposure was higher than under control conditions. In vacuum the dose resulting in the same survival fraction was reduced to 1/4 for X-rays and to 1/6 for UV respectively. (Author)

A70-18964 ***VALUE OF INFORMATION FOR DECISIONS.**

Dirk Wendt (Hamburg, Universität, Hamburg, West Germany).

Journal of Mathematical Psychology, vol. 6, Oct. 1969, p. 430-443. 18 refs.

Grant No. NGR-23-005-171.

Description of two experiments intended to measure the estimates by 15 undergraduate participants of the value of risk-reducing information for their decision task. The measurements were performed by means of the Marschak bidding procedure where subjects bid against a uniformly distributed random list. The results indicate that subjects were sensitive enough to all three types of independent variables involved, i.e., diagnosticity, prior odds, and payoff. Yet, except for a few of them, the participants did not match the actual (theoretical) value of the information. In a discussion of the procedure it was shown that it did not pay very much to be accurate. M.V.E.

A70-18999**THE RELATION BETWEEN ERYTHROCYTE DEFORMABILITY, CELL SHAPE, AND MEMBRANE SURFACE TENSION.**

D. Braasch (Marburg, Universität, Marburg an der Lahn, West Germany).

Pflügers Archiv, vol. 313, no. 4, 1969, p. 316-320. 9 refs.

Discussion of the reasons for the increased flow resistance of blood in a glass capillary which occurs if the erythrocyte is transformed into a smooth sphere by the action of bile or free fatty acids. It is shown that this increase in flow resistance is caused by a shrinking of the red-cell membrane due to an alteration of the plasma surface tension. The degree of membrane stretching is maximal in the normal red cell and lowered in the sphered erythrocyte. G.R.

A70-19003**SURVIVAL AND FLIGHT EQUIPMENT ASSOCIATION, NATIONAL FLIGHT SAFETY, SURVIVAL AND PERSONAL EQUIPMENT SYMPOSIUM, 7TH, LAS VEGAS, NEV., OCTOBER 27-30, 1969, PROCEEDINGS, VOLUME 2.**

Van Nuys, Calif., Survival and Flight Equipment Association, 1969. 341 p.

→\$10.00.

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PILOT AIRBORNE RECOVERY DEVICE (PARD). R. Steere (USAF, Life Support System Program Office, Wright-Patterson AFB, Ohio), F. R. Nebiker, and D. E. Williams (Goodyear Aerospace Corp., Akron, Ohio), p. 477-511. 6 refs. (See A70-19019 07-02)

FLYING EJECTION SEAT. R. A. Roberts (Fairchild Hiller Corp., Manhattan Beach, Calif.), p. 512-528. (See A70-19020 07-02)

MEDICAL CHESTS AND SAFETY. J. R. Voskamp (U.S. Veterans Administration Hospital, Van Nuys; California, University, Los Angeles, Calif.), p. 529-533. (See A70-19021 07-05)

THE HUMAN AND EPIDEMIOLOGIC ASPECTS OF USAF MID-AIR COLLISIONS, 1 JAN 1959 TO 31 DEC 1968. V. J. Ferrari, Jr. (USAF, Directorate of Aerospace Safety, Norton AFB, Calif.), p. 534-545. (See A70-19022 07-02)

AN ANALYSIS OF INJURIES INCURRED DURING EMERGENCY EJECTION/EXTRACTION, COMBAT AND NON-COMBAT. R. H. Shannon (USAF, Directorate of Aerospace Safety, Norton AFB, Calif.), p. 546-558. 12 refs. (See A70-19023 07-02)

FINITE LOCATION OF DOWNED AIRCREWMEN. W. J. McClelland (USAF, Life Support Systems Program Office, Wright-Patterson AFB, Ohio), p. 559-566.

NAVY COMBAT SEARCH AND RESCUE DEVELOPMENT. F. T. Thomasson (U.S. Navy, Crew Systems Div., Washington, D.C.), p. 567-584. (See A70-19024 07-02)

SAVER—AN AERCAB CONCEPT. J. J. Barzda (Kaman Aerospace Corp., Bloomfield, Conn.), p. 585, 586.

ASTRONAUT RESTRAINTS FOR THE AQUANAUT. G. W. O'Neil, Jr. (McDonnell Douglas Astronautics Co., Huntington Beach,

Calif.), p. 587.

FLAMMIBILITY IN COCKPIT/CABIN ENVIRONMENTS. J. P. Meade (USAF, Directorate of Aerospace Safety, Norton AFB, Calif.), p. 588.

EMERGENCY GROUND EGRESS FROM USAF PASSENGER CARRYING AIRCRAFT. C. L. Brown (USAF, Directorate of Aerospace Safety, Norton AFB, Calif.), p. 589.

DESIGN AND DEVELOPMENT OF A HAZARDOUS ENVIRONMENT PROTECTIVE SUIT SYSTEM. V. D. Iacono, Jr. and E. Dogliotti (U.S. Army, Natick Laboratories, Natick, Mass.), p. 590.

CONDITIONED AIRCREWMEN CLOTHING SYSTEMS FOR MILITARY FLIGHT CREWS. L. A. Spano (U.S. Army, Natick Laboratories, Natick, Mass.), p. 591.

USAF WATER SURVIVAL EXPERIENCE FOLLOWING EJECTION. A. N. Till, Jr. (USAF, Directorate of Aerospace Safety, Norton AFB, Calif.), p. 592.

A NEW APPROACH TO COMMERCIAL ARRESTING GEAR. A. Condodina (E. W. Bliss Co., Canton, Ohio), p. 593, 594.

KYNOL. L. C. Wohrer, J. Economy, and F. J. Frechette (Carborundum Co., Niagara Falls, N.Y.), p. 595.

A70-19004

USE OF FLotation DUMMIES IN THE EVALUATION OF LIFE PRESERVER DESIGN.

Ernest B. McFadden and Hiley F. Harrison (FAA, Civil Aeromedical Institute, Oklahoma City, Okla.).

IN: SURVIVAL AND FLIGHT EQUIPMENT ASSOCIATION, NATIONAL FLIGHT SAFETY, SURVIVAL AND PERSONAL EQUIPMENT SYMPOSIUM, 7TH, LAS VEGAS, NEV., OCTOBER 27-30, 1969, PROCEEDINGS. VOLUME 2. (A70-19003 07-05)

Van Nuys, Calif., Survival and Flight Equipment Association, 1969, p. 282-292.

Description of the use of flotation dummies for experimental evaluation of various flotation device designs and the various parameters which influence their operational performance. A flotation dummy designed to simulate the characteristics of an unconscious survivor is described. The relationship of this simulator to human subjects in which unconsciousness was induced by a volatile anesthetic is compared. A telemetry system incorporated into the dummy to provide basic data is also described.

G.R.

A70-19007

ORGANIZED TRAINING AS A TOOL FOR SAFETY PROMOTION.

Nancy A. Morrison (Alhambra High School, Alhambra, Calif.).

IN: SURVIVAL AND FLIGHT EQUIPMENT ASSOCIATION, NATIONAL FLIGHT SAFETY, SURVIVAL AND PERSONAL EQUIPMENT SYMPOSIUM, 7TH, LAS VEGAS, NEV., OCTOBER 27-30, 1969, PROCEEDINGS. VOLUME 2. (A70-19003 07-05)

Van Nuys, Calif., Survival and Flight Equipment Association, 1969, p. 310-321. 5 refs.

Discussion of the importance of an organized training for survival in an emergency and of the aspects of such a training. Some examples are given in which the lack of survival training resulted in needless loss of lives. Psychological factors involved in a crisis, aspects of communication, living off the land and shelter are discussed.

G.R.

A70-19009

WATER SURVIVAL—PHYSIOLOGICAL EFFECTS.

R. J. Camenzend.

IN: SURVIVAL AND FLIGHT EQUIPMENT ASSOCIATION, NATIONAL FLIGHT SAFETY, SURVIVAL AND PERSONAL EQUIPMENT SYMPOSIUM, 7TH, LAS VEGAS, NEV., OCTOBER 27-30, 1969, PROCEEDINGS. VOLUME 2. (A70-19003 07-05)

Van Nuys, Calif., Survival and Flight Equipment Association, 1969, p. 349-351. 5 refs.

Evaluation of a survival test in which twenty persons have to spend 24 to 36 hr at sea in a twenty-man raft. Negative factors discovered during the test are discussed and suggestions are made for improving conditions. It is pointed out that physical discomfort and miseries contribute largely to the psychological deterioration of the prospective survivor.

G.R.

A70-19010**SPACE RESCUE CONCEPTS.**

Gloria W. Heath (SAR-Assist, Inc., Greenwich, Conn.).

IN: SURVIVAL AND FLIGHT EQUIPMENT ASSOCIATION, NATIONAL FLIGHT SAFETY, SURVIVAL AND PERSONAL EQUIPMENT SYMPOSIUM, 7TH, LAS VEGAS, NEV., OCTOBER 27-30, 1969, PROCEEDINGS. VOLUME 2. (A70-19003 07-05)

Van Nuys, Calif., Survival and Flight Equipment Association, 1969, p. 352-362.

Discussion of safety systems which appear feasible of incorporation into spacecraft systems with advances in the technology. Conceptual approaches are considered. The design of a nonseparable crew escape compartment and of a separable escape capsule are discussed. The design of a standby rescue system, which may be manned or unmanned, to wait in orbit or to be prepositioned at a lunar site for use on demand is examined. Another system considered is an earth-launched, manned or unmanned, rescue system for use on demand.

G.R.

A70-19012**FEDERAL AVIATION ADMINISTRATION'S PHYSIOLOGICAL TRAINING PROGRAM.**

William A. Staub (FAA, Civil Aeromedical Institute, Washington, D.C.).

IN: SURVIVAL AND FLIGHT EQUIPMENT ASSOCIATION, NATIONAL FLIGHT SAFETY, SURVIVAL AND PERSONAL EQUIPMENT SYMPOSIUM, 7TH, LAS VEGAS, NEV., OCTOBER 27-30, 1969, PROCEEDINGS. VOLUME 2. (A70-19003 07-05)

Van Nuys, Calif., Survival and Flight Equipment Association, 1969, p. 369-375.

Discussion of the physiological training program of the Federal Aviation Administration which was originated by Dr. Spealman, Bureau of Aviation Medicine, in 1959. Some slides on the Aero-nautical Center, its organizational setup, and the Civil Aeromedical Institute and its functional mission are discussed. The eligibility for the physiological training program is considered and its objectives are examined.

G.R.

A70-19013**REPORT OF SUCCESSFUL USE OF INHERENT FIRE-RESISTANT FLIGHT CLOTHING BY NAVAL AIRCREWMEN.**

Lionel I. Weinstock (U.S. Navy, Crew Systems Div., Washington, D.C.).

IN: SURVIVAL AND FLIGHT EQUIPMENT ASSOCIATION, NATIONAL FLIGHT SAFETY, SURVIVAL AND PERSONAL EQUIPMENT SYMPOSIUM, 7TH, LAS VEGAS, NEV., OCTOBER 27-30, 1969, PROCEEDINGS. VOLUME 2. (A70-19003 07-05)

Van Nuys, Calif., Survival and Flight Equipment Association, 1969, p. 376-385. 5 refs.

Discussion of the Navy's present and future fire-resistant protective flight clothing program. The background of the program is considered and the advantages of new inherently fire-resistant materials are examined. Some actual Navy accident case histories where Nomex flight clothing prevented serious burns are presented.

G.R.

A70-19015**FOAM IN PLACE, FORM FITTING PILOT'S HELMET LINER.**

Albert Olevitch (USAF, Materials Laboratory, Wright-Patterson AFB, Ohio) and David E. Sommers (USAF, Liaison Office, Wright-Patterson AFB, Ohio).

IN: SURVIVAL AND FLIGHT EQUIPMENT ASSOCIATION, NATIONAL FLIGHT SAFETY, SURVIVAL AND PERSONAL EQUIPMENT SYMPOSIUM, 7TH, LAS VEGAS, NEV., OCTOBER 27-30, 1969, PROCEEDINGS. VOLUME 2. (A70-19003 07-05)

Van Nuys, Calif., Survival and Flight Equipment Association, 1969, p. 392-402.

Description of a method of providing a perfect helmet liner for by means of fabricating the shock-absorbing liner right on the head. Foamed-in-place polyurethane in a specially designed mold is used. The technique has been applied to a number of USAF pilots without any difficulty. An interesting application for this foam system is as a

replacement for plaster of paris for setting broken bones or making temporary splints.

F.R.L.

A70-19017**FLAMEPROOF FABRIC FOR PERSONNEL AND EQUIPMENT PROTECTION.**

J. B. Ballentine (Chemstrand Research Center, Inc., Durham, N.C.).

IN: SURVIVAL AND FLIGHT EQUIPMENT ASSOCIATION, NATIONAL FLIGHT SAFETY, SURVIVAL AND PERSONAL EQUIPMENT SYMPOSIUM, 7TH, LAS VEGAS, NEV., OCTOBER 27-30, 1969, PROCEEDINGS. VOLUME 2. (A70-19003 07-05)

Van Nuys, Calif., Survival and Flight Equipment Association, 1969, p. 445-453.

Evaluation of two distinct fireproof fabrics (Durette) being reviewed in cooperative programs with DOD, NASA, aerospace and aircraft manufacturers, and their suppliers to determine their flame retarding and protection capability. Neither of the two (Durette gold or black) is appreciably affected by two minutes of direct flame impingement in 660 deg C burner flame tests. Applications of the fabrics are for aircraft interiors, escape parachutes, and flight coveralls and protective clothing.

F.R.L.

A70-19018**DON'T JUST SIT THERE.....A LOOK AT THE PSYCHOLOGY OF SURVIVAL FOR CIVIL AVIATION.**

Robert R. Brazell (General Dynamics Corp., San Diego, Calif.).

IN: SURVIVAL AND FLIGHT EQUIPMENT ASSOCIATION, NATIONAL FLIGHT SAFETY, SURVIVAL AND PERSONAL EQUIPMENT SYMPOSIUM, 7TH, LAS VEGAS, NEV., OCTOBER 27-30, 1969, PROCEEDINGS. VOLUME 2. (A70-19003 07-05)

Van Nuys, Calif., Survival and Flight Equipment Association, 1969, p. 466-470.

Discussion of two cases of irrational behavior after forced landings which are considered to represent what appears to be the two basic reasons for psychological suicide. The first case involved a man freezing to death, with adequate survival equipment and close to a frequently travelled road; the second involved death from exposure and thirst near a populated area. The two reasons are considered to be total exhaustion of mental resources, and activity inappropriate to the situation. It is suggested that indoctrination in basic survival techniques and equipment at all levels is needed.

F.R.L.

A70-19021**MEDICAL CHESTS AND SAFETY.**

Jack R. Voskamp (U.S. Veterans Administration Hospital, Van Nuys; California, University, Los Angeles, Calif.).

IN: SURVIVAL AND FLIGHT EQUIPMENT ASSOCIATION, NATIONAL FLIGHT SAFETY, SURVIVAL AND PERSONAL EQUIPMENT SYMPOSIUM, 7TH, LAS VEGAS, NEV., OCTOBER 27-30, 1969, PROCEEDINGS. VOLUME 2. (A70-19003 07-05)

Van Nuys, Calif., Survival and Flight Equipment Association, 1969, p. 529-533.

Discussion of what can be done for an injured or ill person when professional treatment is hours or days away. The advantages of a medical kit, containing basic medications for the treatment of minor ailments such as colds, sore throats, scrapes, cuts, and bruises are considered.

F.R.L.

A70-19050**PHYSICAL FACTORS AFFECTING VISUAL PERFORMANCE. I.**

Ian Lewin (Holophane Co., Inc., New York, N.Y.).

Optical Spectra, vol. 3, Nov.-Dec. 1969, p. 55-58. 12 refs.

Discussion of the effects of object size and of exposure time of the object on visual performance. The increase in visual acuity, as the surround luminance increases, is shown for a black object on a white background. The effect of illumination upon performance for varying object size is considered. It is pointed out that the time of exposure affects the visual performance level if the object is exposed to the eyes for an interval of less than one second.

G.R.

A70-19138 #
CHANGES IN THE INDUCED POTENTIALS OF THE RETICULAR FORMATION UNDER THE ACTION OF ISOLATED STIMULI OF THE HYPOTHALAMUS (IZMENENIIA VYZVANYKH POTENTIALOV RETIKULIARNOI FORMATSII POD VLIANIEM ODINOCHEK RAZDRAZHENII GIPOVLAMUSA).

D. G. Shevchenko (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR).

Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Nov. 1969, p. 3-6. 17 refs. In Russian.

Investigation of the recovery cycles of the mesencephalic reticular formation responses to stimulation of the sciatic nerve of anesthetized rabbits. The multifactorial influence of the hypothalamus on the mesencephalic reticular formation observed under the test conditions is examined. V.P.

A70-19139 #
MECHANISM OF VASODILATATION IN EXTREMITIES DURING THE POSTHYPOXIC PERIOD (O MEKHAZIMZE RASSHIRENIIA SOSUDOV KONECHNOSTI V POSTGIPOKSICHESKOM PERIODE).

N. K. Savel'ev and Iu. M. Smirnov (Orenburgskii Meditsinskii Institut, Orenburg, USSR).

Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Nov. 1969, p. 6-9. 12 refs. In Russian.

Discussion of experiments performed with dogs subjected to nembutal anesthesia, showing that posthypoxic vasodilatation in the extremities is preserved after exclusion of the carotid and aortic reflexogenic zones. Chronical tests with intra-arterial administration of atropine showed that posthypoxic vasodilation in the extremities is not associated with the activation of cholinergic vasodilators. V.P.

A70-19140 #
CHANGES IN THE PHASE STRUCTURE OF THE CARDIAC THRUST DURING HYPOTHERMIA (IZMENENIIA FAZOVOI STRUKTURY SERDECHNOGO TOLCHKA PRI GIPOTERMII).

I. I. Golitsyna (Vladimirskii Pedagogicheskii Institut, Vladimir, USSR).

Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Nov. 1969, p. 18-20. 5 refs. In Russian.

Discussion of experiments performed with dogs, showing that craniocerebral hypothermia tends to increase the duration of the rise and drop phase of the apical cardiac thrust and the phase of the thrust itself, but has no effect on the phase of the duration of the phase of the precardiac thrust. The maximum changes in the duration of the phases were observed at rectum temperatures between 36 and 31 deg C (brain temperatures between 35.1 and 27.1 deg C). V.P.

A70-19141 #
MORPHOLOGICAL CHARACTERISTICS OF THE DISTAL SEGMENTS OF THE MEDULLARY SUBSTANCE OF THE KIDNEYS OF RODENTS LIVING UNDER HIGH AMBIENT TEMPERATURE CONDITIONS (MORFOLOGICHESKIE OSOBENOSTI DISTAL'NYKH OTDEL'OV MOZGOVOGO SLOIA POCHEK GRYZUNOV, ZHIVUSHCHIKH V USLOVIYAKH VYSOKOI VNESHNEI TEMPERATURY).

T. L. Dubynin (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR) and I. I. Todris (Akademiia Nauk Turkmenkoi SSR, Institut Kraevoi Meditsiny, Ashkhabad, Turkmen SSR).

Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Nov. 1969, p. 105-107. 9 refs. In Russian.

Experimental investigation showing that, unlike rodents having free access to water, desert rodents almost lack acid mucopolysaccharides in the papillae of the medullary substance of the kidneys. The morphological picture of this kidney segment of desert rodents is stable and independent of their period of active life. V.P.

A70-19142 #
APPLICATION OF RADIORHEOPNEUMOGRAPHY TO A STUDY OF EXTERNAL RESPIRATION DURING PROFESSIONAL WORK (PRIMENENIE RADIOPNEUMOGRAFII PRI ISSLEDOVANII

VNESHNEGO DYKHANIYA V PROTSESE PROFESSIONAL'NOI RABOTY).

L. I. Popov and Z. M. Kuznetsova (Sverdlovskii Nauchno-Issledovatel'skii Institut Gigieny Truda i Profzabolevaniy, Sverdlovsk, USSR).

Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Nov. 1969, p. 116, 117. 9 refs. In Russian.

Investigation showing that radiorheopneumography is well suited for studying the respiratory rate of office workers during their professional work and when performing certain physical activities. The system employed in the investigations consisted of two radio transmitters, a rheopneumographic converter, two radio receivers, and a two-channel electrocardiograph. V.P.

A70-19202 * #
PEPTIDE FORMATION MEDIATED BY HYDROGEN CYANIDE TETRAMER—A POSSIBLE PREBIOTIC PROCESS.

Sherwood Chang, Jose Flores, and Cyril Ponnampuruma (NASA, Ames Research Center, Exobiology Div., Moffett Field, Calif.).

National Academy of Sciences, Proceedings, vol. 64, Nov. 1969, p. 1011-1015. 29 refs.

Study of chemical evolution on the primitive earth, assuming that such evolution must have involved condensation of alpha-amino acids to peptides. Under aqueous conditions consistent with current conceptions of primordial waters, heating glycerine with the hydrogen cyanide tetramer, diaminomaleonitrile, yields dipeptide. It is concluded that if nitrogen were cycled through primordial waters as cyanide, peptide synthesis by stepwise tetramer-mediated condensation of alpha-amino acids would have been a plausible process.

(Author)

A70-19223 #
THE INHALATION TOXICITY OF PYROLYSIS PRODUCTS OF BROMOCHLOROMETHANE (CH₂BrCl) AND BROMOTRIFLUOROMETHANE (CF₃Br).

C. C. Haun, E. H. Vernet, D. L. Geiger, and J. M. McNerney (SysteMed Corp., Dayton, Ohio).

American Industrial Hygiene Association Journal, vol. 30, Nov.-Dec. 1969, p. 551-558. 13 refs.

Contract No. AF 33(657)-11305.

Determination of the inhalation toxicities of the pyrolysis products of two fire extinguisher compounds, bromochloromethane and bromotrifluoromethane, for albino rats. Both compounds, currently used by the USAF for aircraft fires, were pyrolyzed at 800 deg C in a hydrogen-oxygen flame. The principal constituents of the pyrolysis products were identified. The pyrolysis products generated from a concentration of 465 ppm of bromochloromethane killed 50 per cent of rats exposed for 15 min. G.R.

A70-19224
EVALUATION OF LASER HAZARDS TO THE EYE AND THE SKIN.

W. D. Burnett (Sandia Laboratories, Albuquerque, N. Mex.).
(American Industrial Hygiene Association, Spring Meeting, St. Louis, Mo., May 13-17, 1968.)

American Industrial Hygiene Association Journal, vol. 30, Nov.-Dec. 1969, p. 582-587.

AEC-supported research.

Laser eye and skin hazards are evaluated by comparing direct-exposure intensity levels on the surface of the eye or skin to exposure guidelines equal to (a) threshold effect levels where the skin or cornea is affected and (b) conservatively safe levels based on worst case assumptions where the retina is affected. Equations are presented for calculating the exposure intensity when the laser beam parameters and the range are known. Intensity amplification factors of the eye are indicated for the three cases encountered in practice: (a) where simple geometric optics apply, (b) where the laser beam divergence angle is limiting, and (c) where Fraunhofer diffraction effects are limiting. Diffraction effects predict the maximum eye intensity amplification and hence define the worst case for retinal exposure. The resultant exposure guidelines are summarized, and estimates are made of the associated safety factors. These exposure guidelines quickly identify problem areas that may require more

complicated exposure equations and a careful consideration of the actual geometries and safety factors involved. (Author)

A70-19242**OVERSTRETCHING OF AND CIRCUMSCRIBED PATHOLOGICAL TENSION IN THE SPINAL CORD—A BASIC CAUSE OF SYMPTOMS IN CORD DISORDERS.**

A. Breig.

Journal of Biomechanics, vol. 3, Jan. 1970, p. 7-9.

The mechanism of pathological tension in the spinal cord is discussed according to the observations of the author based upon histological and radiological findings. The implications of the work in terms of the clinical treatment of spinal cord disorders are discussed and recommendations made regarding the proper treatment of the pathological conditions arising from this tension. (Author)

A70-19243**AXISYMMETRIC RESPONSE OF A FLUID-FILLED SPHERICAL SHELL IN FREE VIBRATIONS.**

A. E. Engin and Y. King Liu (Michigan, University, Ann Arbor, Mich.).

Journal of Biomechanics, vol. 3, Jan. 1970, p. 11-22. 25 refs.

Research supported by the National Center for Urban and Industrial Health and NIH.

This paper is concerned with a theoretical model of the head. Neuroanatomical and analytical considerations lead to a fluid-filled spherical shell as a first-generation model. The shell is considered thin, elastic, homogeneous, and isotropic. The shell equations include both membrane and bending effects in axisymmetric torsionless motion. The motion of the fluid is governed by the wave equation. A free vibration analysis of the fluid-shell system is obtained in the form of a frequency equation. Compared with a fluid-filled rigid shell and an elastic shell in vacuo, the frequency spectrum of the fluid-shell system is almost a 'superposition' of the spectra of the two special cases. The exceptions appear as slight distortions in the neighborhood of the 'curve' intersections. (Author)

A70-19244**ENTRY FLOW INTO BLOOD VESSELS AT ARBITRARY REYNOLDS NUMBER.**

H. S. Lew and Y. C. Fung (California, University, La Jolla, Calif.).

Journal of Biomechanics, vol. 3, Jan. 1970, p. 23-38. 31 refs.

NSF Grant No. GK-1415; Grant No. AF AFOSR 1186-67.

The steady axisymmetric flow in the inlet region of a circular cylindrical tube is studied. Emphasis is laid on the entry flow at lower (but finite) Reynolds numbers, and on flow in which arbitrary axial and radial velocity distributions are prescribed at the entry section. The boundary layer approximation is not used. A solution is presented in the form of a series of two sets of properly chosen eigenfunctions. Numerical results are presented for the case of uniform entry in the Reynolds number range 0-100. The application of the results to the blood flow problem is discussed. (Author)

A70-19245 ***HUMAN SELF-ROTATION BY MEANS OF LIMB MOVEMENTS.**

T. R. Kane and M. P. Scher (Stanford University, Stanford, Calif.).

Journal of Biomechanics, vol. 3, Jan. 1970, p. 39-49.

Grant No. NGR-05-020-209.

Analytical demonstration of the feasibility of employing two particular limb maneuvers, one producing pitch motion, and the other yaw, to move the body orientation of a weightless astronaut. Numerical results obtained from analyses show that significant pitch and yaw rotations can be obtained by means of limb movements. By using his arms, the average man can produce about 30 deg of either pitch or yaw per cycle of such a maneuver. The legs can be used effectively in yaw, producing reorientations of about 70 deg per cycle; and hand-held weights may, but do not always, significantly enhance the effectiveness of a maneuver. M.M.

A70-19246**THE MECHANICS OF THE KNEE JOINT IN RELATION TO****NORMAL WALKING.**

J. B. Morrison (MIT, Cambridge, Mass.).

Journal of Biomechanics, vol. 3, Jan. 1970, p. 51-61. 23 refs.

Research supported by the Medical Research Council.

Experimental measurements of normal walking were taken using male and female subjects. The mechanics of the knee joint were simplified and defined in mathematical terms. By considering the normal knee joint to function according to the mechanical principals thus defined, the forces transmitted by the joint were calculated from the experimental data. The general mechanical concepts of knee action are outlined and the assumptions made in defining the joint 'model' described. The results obtained are presented and discussed in relation to the assumptions made. (Author)

A70-19247 ***A LONG WAVE APPROXIMATION TO PERISTALTIC MOTION.**

T.-F. Zien and S. Ostrach (Case-Western-Reserve University, Cleveland, Ohio).

Journal of Biomechanics, vol. 3, Jan. 1970, p. 63-75. 8 refs.

Grant No. NGR-36-003-088.

Analytical study of the problem of motion of a viscous incompressible fluid induced by traveling-wave motions of the confining walls for the two-dimensional geometry. The analysis is aimed at the possible application to urine flow in human ureters. The wavelength, λ , of the peristaltic waves is assumed to be large compared to the half channel width, d , whereas the amplitude of the wave, a , need not be small compared to d . A systematic approach based on an asymptotic expansion of the solution in terms of the small parameter d/λ has been used. The limiting solution has been studied including the effects of externally applied pressure gradients, and the criteria for backward flow have been established and discussed in detail. Higher-order solutions which include the effects of nonlinear inertial terms of the Navier-Stokes equations, have been studied for the case of zero mean volume flow. Comparisons with some earlier results have been made, and certain agreements are brought out. (Author)

A70-19248**SHEAR STRESS ANALYSIS OF BLOOD-ENDOTHELIAL SURFACE IN INLET SECTION OF ARTERY WITH PLUGGING.**

G. Ray and N. Davids (Pennsylvania State University, University Park, Pa.).

Journal of Biomechanics, vol. 3, Jan. 1970, p. 99-110. 11 refs.

PHS Grant No. IR-01-HE-11289-01.

A 'Finite Element' method has been developed for carrying out the direct numerical analysis of viscous hemodynamic flow in a long tube, under arbitrarily time-varying end pressures. The method yields directly the velocity and shearing stress profiles at the vessel walls. This is here used to study the laminar flow condition for an incompressible fluid, for the inlet section of a straight cylindrical tube as well as a channel for both steady and pulsating flow. The special effect of plugging in such inlet sections for the development of shearing stress and the changes in velocity profile that it produces are studied. Our analysis, originally for radially symmetric plugging is now extended to asymmetric plugging also. The profiles obtained show a high shearing stress at the leading edge of the plug and a rapidly-fluctuating shear stress downstream of the trailing edge. (Author)

A70-19249**FLUID MECHANICS OF MODEL NORMAL AND STENOSED AORTIC VALVES.**

Brian Bellhouse and Francis Bellhouse (Oxford University, Oxford, England).

Circulation Research, vol. 25, Dec. 1969, p. 693-704. 10 refs.

A theory proposed for aortic valve closure is supported by measurements in a model valve in a pulsatile water tunnel. In this model strong vortices form in the aortic sinuses, and the ridge at the distal end of the sinuses is maintained at free-stream stagnation pressure during systole. At peak systole, the cusps project slightly into the sinuses and are held in a stable position by the trapped vortices. After peak systole, axial deceleration in the aorta causes a pressure imbalance across the cusps, which move toward the closed

A70-19276

position, and the valve is three-quarters closed by the end of systole. A stenosis prevents vortex formation and induces a low pressure region outside the turbulent jet emerging from the opening formed by the cusp free margins. Pressure differences between the coronary ostia and the ventricle are calculated for man, both resting and exercising, and with a normal or a stenosed valve. A fluid mechanic explanation of angina pectoris associated with effort, when the aortic valve is stenosed, is proposed. Flow studies of ball and elastic-recoil tricuspid prosthetic aortic valves show that they generate considerable turbulence. (Author)

A70-19276

STEREOSCOPIC VISION IN MACAQUE MONKEY. I—CELLS SENSITIVE TO BINOCULAR DEPTH IN AREA 18 OF THE MACAQUE MONKEY CORTEX.

D. H. Hubel and T. N. Wiesel (Harvard University, Boston, Mass.).

Nature, vol. 225, Jan. 3, 1970, p. 41, 42. 6 refs.

Research supported by the Bell Telephone Research Laboratories and NIH.

Discussion of behavioral evidence of stereoscopic vision in macaque monkeys obtained by means of random-dot stereoscopic patterns. Cells sensitive to binocular depth have been found in area 18 of the macaque monkey cortex. M.M.

A70-19277

STEREOSCOPIC VISION IN THE MACAQUE MONKEY—A BEHAVIOURAL DEMONSTRATION.

Edward W. Bough (Harvard University, Boston, Mass.).

Nature, vol. 225, Jan. 3, 1970, p. 42-44. 15 refs.

PHS-supported research.

Experimental investigation of stereoscopic vision in macaque monkeys, combining random-dot patterns with standard operant conditioning procedures. It was found that the ability of the tested animals to distinguish objects at different apparent distances in the absence of monocular cues is very strong evidence that monkeys have stereoscopic vision. M.M.

A70-19283

ELEVATION OF VISUAL THRESHOLD BY DISPLACEMENT OF RETINAL IMAGE.

D. M. MacKay (Keele, University, Keele, Staffs., England).

Nature, vol. 225, Jan. 3, 1970, p. 90-92. 10 refs.

Research supported by the Medical Research Council and the Science Research Council.

Experimental demonstration that elevation of the visual threshold for perception of a test flash is found when the eye is held stationary and the visual field is displaced in saccadic fashion. The time course of the elevation closely parallels that found with active saccades. It seems clear from the experimental results obtained that the displacement of the retinal image during a saccade can in some cases produce suppressive effects without any assistance by postulated corollaries of the activation of eye muscles or mechanical shearing of the retina. M.M.

A70-19284

ELECTROPHYSIOLOGICAL CORRELATE OF BINOCULAR DEPTH PERCEPTION IN MAN.

D. Regan (Keele, University, Keele, Staffs., England) and H. Spekrijse (Amsterdam, University, Amsterdam, Netherlands).

Nature, vol. 225, Jan. 3, 1970, p. 92-94. 14 refs.

Research supported by the Medical Research Council.

Description of the finding of an evoked potential (EP) correlate of binocular depth perception in man. Experimental results showed that the difference between the responses to horizontal and vertical changes in retinal disparity in conditions of fused binocular viewing is a correlate of stereoscopic depth perception and is not the result of displacements of the retinal image. This stereoscopic correlate presumably reflects neural events which are determined at a late stage in the processing of visual information, and so might be more closely related to psychophysical quantities than previously measured features of EPs. M.M.

A70-19285

BLUR ZONE.

T. C. D. Whiteside (RAF, Institute of Aviation Medicine, Farnborough, Hants., England) and G. D. Samuel (Army Personnel Research Establishment, Farnborough, Hants., England).

Nature, vol. 225, Jan. 3, 1970, p. 94, 95.

Description of findings of an investigation of the fact that when an aircraft flies at low altitude and at high speed, the terrain goes past so quickly that the pilot may be unable to see ground features clearly, particularly when he looks to either side of his aircraft. It was found, by geometric construction, that when an observer travels at a steady linear velocity relative to the ground, and at a theoretical zero feet altitude, the locus of all points on the ground having a common angular velocity can be described by the circumference of circles tangential to the observer's path and at the level of his eye. The diameter of the circle is directly proportional to the linear relative velocity, and inversely proportional to the angular velocity at its circumference. An observer's ability to see a moving object therefore depends on his threshold of dynamic visual acuity for the visibility of that particular object. Furthermore, if the blur zones are being calculated for an object of finite size, allowance should be made for the fact that when the object is nearer, its angular size increases, as a result of which it can be seen at higher angular velocity than when it is distant and small. These corrections would alter the shape of the blur circle, making it pear-shaped. M.M.

A70-19289

METABOLIC PROFILE OF SIALIC ACIDS IN THE TISSUES OF AN IRRADIATED ORGANISM (METABOLICHESKI) PROFIL' SIALOVYKH KISLOT V TKANIAXH OBLUCHENNOGO ORGANIZMA).

E. V. Malashevich and K. V. Fomichenko (Akademiia Nauk Belorusskoi SSR, Institut Fiziologii, Minsk, Belorussian SSR).

Akademiia Nauk BSSR, Doklady, vol. 13, Nov. 1969, p. 1039, 1040. 5 refs. In Russian.

Investigation of the metabolic behavior of sialic acids in the cerebrum, liver, myocardium and blood plasma of a group of rats after administration of X-ray doses of 40 r. The content of sialic acids in the samples is determined by ion-exchange chromatography with a cationate, an ion-exchange resin and an acetate buffer over a period of up to 30 days following the irradiation. The changes observed in sialic acid contents during this period are discussed. V.Z.

A70-19293

INCREASED OXYGEN UPTAKE WITH PASSIVE HYPERVENTILATION OF DOGS.

Stephen M. Cain (USAF, School of Aerospace Medicine, Brooks AFB, Tex.).

Journal of Applied Physiology, vol. 28, Jan. 1970, p. 4-7. 10 refs.

Experimental investigation of phenomena involved in the increase in oxygen uptake in passively hyperventilated dogs. The experimental results showed that the hyperventilation of anesthetized and paralyzed dogs with a respiratory pump increased oxygen uptake consistently and reproducibly. There was no active contraction of respiratory musculature nor was there any alkalotic tetany to explain the increase in oxygen uptake. It was not a result of an unsteady state in oxygen stores and it persisted as long as hydrogen ion concentration was lowered, at least for the 90-min period of hyperventilation used. M.M.

A70-19294

EFFECT OF CARBON DIOXIDE ON OXYGEN UPTAKE DURING HYPERVENTILATION IN NORMAL MAN.

Monroe S. Karetzky and Stephen M. Cain (USAF, School of Aerospace Medicine, Brooks AFB, Tex.).

Journal of Applied Physiology, vol. 28, Jan. 1970, p. 8-12. 38 refs.

The oxygen uptake was measured in four normal subjects at two levels of hyperventilation, breathing four different carbon dioxide mixtures at each level. The carbon dioxide mixtures were breathed for 16- or 20-min periods and the expired gas was collected continuously and measured at either 4- or 5-min intervals. The end-tidal carbon dioxide pressure was measured during the last

minute of each interval. Each level of ventilation was attained by two combinations of tidal volume and respiratory frequency. A linear relationship was found between the oxygen uptake and end-tidal carbon dioxide pressure during voluntary hyperventilation at combinations of frequency and tidal volume studied. We concluded that the excess oxygen uptake did not necessarily represent increased metabolism of the respiratory musculature alone but, rather, resulted from a complex interaction of the increased work of breathing and the stimulation of total body oxygen uptake by the fall in the positive hydrogen ion concentration. (Author)

A70-19295
PRESSURE DYNAMICS IN THORACIC AORTA DURING LINEAR DECELERATION.

Peter G. Hanson (USAF, Aeromedical Research Laboratory, Holloman AFB, N. Mex.).

Journal of Applied Physiology, vol. 28, Jan. 1970, p. 23-27. 12 refs.

Abrupt deceleration in the long axis of the body may produce traumatic rupture of the aortic arch and descending thoracic aorta. In this study, the relationship between thoracic aorta transmural pressure and rupture of the thoracic arterial vasculature was examined during a series of controlled decelerations. Anesthetized beagle dogs were restrained in form-fitted couches and exposed to head first impact over a range of 5-60 g. Thoracic aorta and intrapleural pressures were measured by chronically implanted strain-gauge pressure transducers. At impact, there was a prominent, short-duration pressure spike in the aortic pressure wave. The magnitude of the pressure peak increased as a linear function of peak g force. Intrapleural pressure also increased as a function of g force. The resulting transmural pressure exhibited an oscillatory fluctuation over the period of impact such that an initial rise in transmural pressure was immediately followed by a rapid diminution. These data suggest that the transient increase in aortic pressure is compensated by a subsequent rise in intrapleural pressure. Vascular ruptures which occurred in these studies were probably due to violent inertial displacement of the cardiac mass and thoracic viscera. (Author)

A70-19296
THORAX RESISTIVITY AT SEA LEVEL AND AT HIGH ALTITUDE.

Raúl Gamboa, Marco A. Romero, and Jose Fajri (Universidad Nacional Mayor de San Marcos, Lima, Peru).

Journal of Applied Physiology, vol. 28, Jan. 1970, p. 75-78. 12 refs.

Measurements of thorax resistivity were made in children and adults at sea level and at high altitude. Alternating currents of 300 cycles/sec and 2 ma were passed through the subject from the shoulders and neck to the legs, and from the left midaxillary line to the right midaxillary line. Equipotential lines were determined on the chest as well as cross-sectional areas. From the potential difference between isopotential lines, their average separation, and cross-sectional areas, it was possible to calculate mean vertical and mean transverse torso resistivities. A significant relationship was found in children between torso resistivity and age, both at sea level and at high altitude. On the other hand, no significant relationship was found in the adult groups. Significant differences were found between the mean torso resistivities of adults and children, and between adults from sea level and high altitude. The transverse torso resistivity was higher than the vertical resistivity at sea level and at high altitude. At high altitude the transverse/vertical resistivity ratio was higher than at sea level. These data suggest that the electrocardiographic differences between adults from sea level and adults from high altitude may be explained in part by the differences in torso resistivities. (Author)

A70-19297
MINIATURE PRESSURE TRANSDUCERS FOR PHYSIOLOGICAL MEASUREMENTS.

A. Kirkebo, H. Hognestad, and F. Serck-Hanssen (Bergen, University, Bergen, Norway; Norges Teknisk Naturvitenskapelige Forskningsråd, Sentralinstitutt for Industriell Forskning, Oslo, Norway).

Journal of Applied Physiology, vol. 28, Jan. 1970, p. 98, 99.

Navy-supported research.

Miniature piezoresistive pressure transducers are described. The transducers are made for implantation in small animals. High natural frequencies are obtained for both the catheter connection type and the types for external application on blood vessels. The catheter connection type can be calibrated through a second tubing emerging on the back of the animal. (Author)

A70-19364 #
PROGRESS IN THE RECORDING OF HUMAN RETINAL AND OCCIPITAL POTENTIALS.

Lorin A. Riggs (Brown University, Providence, R.I.).

(*Optical Society of America, Meeting, San Diego, Calif., Mar. 14, 1969.*)

Optical Society of America, Journal, vol. 59, Dec. 1969, p. 1558-1566. 64 refs.

Navy-supported research; PHS Grant No. NB-01453.

Review of the technical progress that in the recording of responses to stimulation of the human visual system. It is concluded that electrical methods of recording can profitably be used to study activity at various stages in the human visual system from receptor to striate cortex. An understanding of the special characteristics and limitations of recording from each level is being gained through comparing the results with those obtained with microelectrode studies on experimental animals and with psychophysical and perceptual observations by human subjects. Z.W.

A70-19468 #
CONNECTION OF THE RUBROSPINAL TRACT WITH VARIOUS GROUPS OF NEURONS OF THE LUMBAR SECTION OF THE SPINAL CORD (SVIAZ' RUBRO-SPINAL'NOGO TRAKTA S RAZLICHNYMI GRUPPAMI NEIRONOV POIASNICHNOGO OTDELA SPINNOGO MOZGA).

A. I. Piliavskii and G. G. Skibo (Akademiia Nauk Ukrainskoi SSR, Institut Fiziologii, Kiev, Ukrainian SSR).

Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Sept. 1969, p. 3-7. 12 refs. In Russian.

Study of the character of the connection of the fibers of the rubrospinal tract with various neuron groups of the spinal cord on the basis of electrophysiological and morphological investigations. It is shown that most of the ends of rubrospinal fibers are localized in the lateral part of the seventh layer while some fiber ends are located in the sixth layer. G.R.

A70-19469 #
INCREASE OF THE RESISTANCE OF ANIMALS TO DECOMPRESSION SICKNESS THROUGH THEIR ADAPTATION TO HYPOXIA AT NORMAL BAROMETRIC PRESSURE (POVYSHENIE USTOICHIVOSTI ZHIVOTNYKH K DEKOMPRESSIONNOI BOLEZNI PUTEM ADAPTATSII IKH K GIPOKSII PRI NORMAL'NOM BAROMETRICHESKOM DAVLENII).

I. P. Iunkin (Voenno-Meditsinskaia Akademiia, Leningrad, USSR).

Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Sept. 1969, p. 26-29. 12 refs. In Russian.

Discussion of experiments with mice which show that a preliminary 12-day adaptation to an atmosphere containing from 15 to 16 per cent or from 10 to 11 per cent oxygen increases the latent period of decompression sickness and facilitates its course. Other effects are an increase in the life span of the animals and a decrease in the mortality rate. The best result was obtained with a mixture containing from 10 to 11 per cent of oxygen. G.R.

A70-19470 #
EFFECT OF LOW-FREQUENCY ULTRASOUND ON ELECTROPHORETIC PROPERTIES AND THERMOSENSITIVITY OF HUMAN SERUM PROTEINS (VLIANIE NIZKOCHESTOTNOGO UL'TRAZVUKA NA ELEKTROFORETICHESKIE SVOISTVA I TERMOCHUVSTVITEL'NOST' SYVOROTOCHNYKH BELKOV CHELOVEKA).

S. Kh. Nikolov (Kubanskii Meditsinskii Institut, Krasnodar, Ukrainian SSR).

A70-19471

Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Sept. 1969, p. 58-60. 12 refs. In Russian.

Discussion of tests in which blood serum was subjected to a low-frequency ultrasound of 23.5 kc per sec. It was found that ultrasound vibrations of the type investigated do not produce irreversible denaturation of serum proteins, but are capable of modifying their electrophoretic properties, increasing the number of protein particles with average electrophoretic mobility. G.R.

A70-19471

CAPABILITY OF MAN TO MAINTAIN A STEADY RESPIRATION PATTERN DURING INHALATION OF VARIOUS GAS MIXTURES (O SPOSOBNOSTI CHELOVEKA PODDERZHIVAT' POSTOIANNYI REZHIM DYKHANIIA PRI INGALIATSII RAZLICHNYKH GAZOVYKH SMESEI).

I. S. Breslav (Akademiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR).

Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Oct. 1969, p. 8-13. 8 refs. In Russian.

Study of the respiration behavior in groups of healthy young men and women who were given normal air and hypoxic or hypercapnic air mixtures for breathing in alternation for 5, 10 and 15 min. The subjects breathed through masks connected to a spirometer continuously recording the respiration parameters and the oxygen content in the arterial blood. The respiration rhythm and depth were not controlled in one series of experiments and were assigned and controlled in another series. Spontaneous changes in breathing rates were observed when the oxygen concentration in the inhaled air was below 7 per cent or the carbon dioxide content was above 7 per cent. V.Z.

A70-19472

EFFECT OF THE HEAT PRODUCTION LEVEL OF THE HUMAN ORGANISM ON THE FUNCTIONAL STATE OF CUTANEOUS THERMORECEPTORS' (VLIANIE UROVNIA TEPLOPRODUKTSII ORGANIZMA NA FUNKTSIONAL'NOE SOSTOIANIE TERMORETSEPTOROV KOZHI CHELOVEKA).

Z. P. Belikova (Moskovskii Meditsinskii Stomatologicheskii Institut, Moscow, USSR).

Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Oct. 1969, p. 13, 14. 8 refs. In Russian.

Ethesiometric study of the reaction of cutaneous thermoreceptors of a group of subjects to variations in the heat production rates of their organisms. It is found that the number of cutaneous thermoreceptors becomes maximum 1.5 hr after taking food and that the reaction subsides to its original level by the end of the second hour. V.Z.

A70-19473

HYPEREMIA OF THE CEREBRUM DURING CRANIOCEREBRAL HYPOTHERMIA (KROVENAPOLNENIE GOLOVNOGO MOZGA PRI KRANIOTSEREBRAL'NOI GIPOTERMII).

V. P. Vindiuk and G. G. Shchegol'kova (Vladimirskii Gosudarstvennyi Pedagogicheskii Institut, Vladimir, USSR).

Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Oct. 1969, p. 33-35. 5 refs. In Russian.

Rheographic study of hyperemia in a group of 14 anesthetized dogs subjected to craniocerebral hypothermia at a rectum temperature down to 27 deg C and a cerebrum temperature down to 20.9 deg C. Occipitofrontal needle electrodes were used for recording the rheoencephalograms. The levels of hyperemia in experimental animals were 65-70 per cent lower under deep hyperthermic conditions than under normal temperature conditions. V.Z.

A70-19474

MECHANISM OF CHANGES IN THE ADHESIVENESS AND AGGREGATION OF BLOOD PLATELETS DURING ACUTE RADIATION SICKNESS (K MEKHANIZMU IZMENENIIA ADGEZIVNOSTI I AGREGATSII KROVIANYKH PLASTINOK PRI OSTROI LUCHEVOI BOLEZNI).

V. P. Baluda, G. N. Sushkevich, N. A. Zhukova, S. S. Khnychev, and

V. V. Shiriaev (Akademiia Meditsinskikh Nauk, Obninsk, USSR).

Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Oct. 1969, p. 35-39. 16 refs. In Russian.

Study of the properties of the blood platelets of a large number of rats exposed to 600 r doses of beta radiation at a rate of 77 r/sec. The number, morphology, adhesion and aggregation of blood platelets, the bleeding time and the lost blood volume are determined in experimental rats, showing symptoms of acute radiation disease of medium severity. The depression of the adhesive and aggregative properties of blood platelets established after irradiation is linked to the decreased activity of serum factor XII. V.Z.

A70-19475

ACTIVITY OF SUCCINIC DEHYDROGENASE IN THE CEREBRUM AND LIVER OF RATS UNDER HYPOTHERMIA AND AFTER WARMING (AKTIVNOST' SUKTSINATDEHIDROGENAZY MOZGA I PECHENI KRYS PRI GIPOTERMII I POSLE SOGREVANIIA).

V. A. Eliseev (Kalininskii Meditsinskii Institut, Kalinin, USSR).

Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Oct. 1969, p. 43, 44. In Russian.

Investigation of the activity of succinic dehydrogenase in the cerebrum and liver of groups of 180 white rats—intact, anesthetized, cooled to a rectal temperature of 20 deg C, and warmed to a rectal temperature of 37 deg C after cooling. The activity of the enzyme in experimental rats was lower during hypothermia and higher after warming. V.Z.

A70-19476

CENTRIFUGAL AND CENTRIPETAL FIBERS IN THE STRUCTURE OF OPTIC NERVES (TSENTRIFUGAL'NYE I TSENTRIPETAL'NYE VOLOKNA V SOSTAVE ZRITEL'NYKH NERVOV).

N. G. Gorikov (Stavropol'skii Meditsinskii Institut, Stavropol, USSR).

(*Stavropol'skii Meditsinskii Institut, Itogovaia Nauchnaia Konferentsiia za 1965-1966 gg., Stavropol, USSR, Apr. 18, 1967.*)

Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Oct. 1969, p. 101-105. 25 refs. In Russian.

Discussion of experiments in which unilateral and bilateral enucleation was performed on a group of 18 dogs and cats in an attempt to determine whether their optic nerves contain efferent and afferent fibers. The presence of thin pulpy fibers in the chiasm, above it and in the optic nerves after enucleation and the formation of bulbs by these fibers are established. These observations are believed to suggest the presence of efferent fibers in the optic nerves of these animals. It is theorized that the thin nerve fibers connect the tunica interna oculi with the occipital portion of the cortex. V.Z.

A70-19495

BIOMECHANICS OF MAN IN AN UNSUPPORTED POSITION (WEIGHTLESSNESS) (O BIOMEKHANIKE CHELOVEKA V BEZOPORNOM POLOZHENII /NEVESOMOSTI/).

V. I. Stepantsov and A. V. Eremin.

Kosmicheskie Issledovaniia, vol. 7, Nov.-Dec. 1969, p. 925-930. In Russian.

Determination of the average moments of inertia of a body and individual parts of it relative to various axes for a man with a height of 168 to 170 cm and a weight of 70 to 75 kg. The values of these moments of inertia are used to calculate the ratios between the moments of inertia of individual parts of the body relative to various axes, thus making it possible to estimate, choose, recommend, and justify the most favorable and most easily coordinated methods of turning (orienting) a man in an unsupported position relative to the longitudinal (course), transverse (pitch), and front-to-rear (roll) axes of the body exclusively by his own muscular forces, without resorting to technical means. A.B.K.

A70-19496

PATHOMORPHOLOGICAL AND HISTOCHEMICAL CHANGES IN THE ORGANS OF TORTOISES ON BOARD THE ZOND 5 AUTOMATIC STATION (PATOMORFOLOGICHESKIE I GISTO-

KHIMICHESKIE IZMENENIIA V ORGANAKH CHEREPAKH, NAKHODIVSHIKHSIA NA BORTU AVTOMATICHESKOI STANTSII 'ZOND-5'.

N. A. Gaidamakin, G. P. Parfenov, V. G. Petrukhin, V. V. Antipov, P. P. Saksonov, and A. V. Smirnova.

Kosmicheskije Issledovaniia, vol. 7, Nov.-Dec. 1969, p. 931-939. 6 refs. In Russian.

Study of the pathomorphological changes occurring in tortoises during a trip around the moon and back while deprived of food. A number of changes of atrophic nature were noted in the subjects—namely, a decrease in the thickness of the intestinal walls, in the diameter of the seminal ducts, and in the volume of liver and kidney cells. The number of cells in the embryonic epithelium of the testes decreased, the mitotic activity of the epithelium of the intestinal mucosa and of the hemopoietic tissue of the spleen was suppressed, and lipofuscin accumulated in the organs. The enzyme activity of the tissue cells was modified. A comparison of the changes occurring in these animals with those occurring in control animals showed that the main structural alterations in the tortoises were caused by hunger and only to a lesser extent by space flight factors. A.B.K.

A70-19502 #

PHYSIOLOGICAL AND HYGIENIC JUSTIFICATION OF A RATIONAL GASEOUS MEDIUM IN SPACE VEHICLE CABINS (K VOPROSU O FIZIOLOGO-GIGIENICHESKOM OBOSNOVANII RATSIONAL'NOI GAZOVOI SREDY V KABINAKH KOSMICHESKIKH KORABLEI).

N. A. Agadzhanian.

Kosmicheskaja Biologija i Meditsina, vol. 3, Sept.-Oct. 1969, p. 3-13. 17 refs. In Russian.

Summary of physiologically substantiated data on the total and partial pressure of oxygen in the atmosphere of space cabins used in short- and long-duration missions. On the basis of animal studies, a relationship between the atmospheric environment and tolerance to hypoxia is noted. The advisability of using various gaseous media in manned space cabins, depending on the conditions and duration of flight, and also on the assignments and work program of the crew, is stressed. A.B.K.

A70-19503 #

MORPHOLOGICAL CHANGES OF PARENCHYMATOUS ORGANS IN HYPERBARIC OXYGEN ATMOSPHERES (MORFOLOGICHESKIE IZMENENIIA V PARENKHIMATOZNYKH ORGANAKH PRI VOZDEISTVII VYSOKIKH DAVLENII KISLORODA).

S. N. Efuni, Iu. E. Mikhailov, T. S. Fokina, and L. L. Shimkevich.

Kosmicheskaja Biologija i Meditsina, vol. 3, Sept.-Oct. 1969, p. 14-18. 10 refs. In Russian.

Parenchymatous organs (lungs, liver, heart, kidney) of white rats exposed to a pure oxygen atmosphere at 5 excess atm were studied morphologically. The rats were kept in the environment until they displayed toxic convulsions. Many of the disorders observed were similar for all the organs: vascular disturbances (hyperemia of stasis, diapedetic hemorrhages) and dystrophic processes (fatty infiltration, nuclear chromatolysis, focal necrosis). Pronouncedly expressed tissue eosinophilia accompanied by eosinopenia was found in the peripheral blood. It is suggested that increased tissue eosinophilia represents a manifestation of cellular and tissue adaptation to oxygen toxicity. On the basis of their own findings and literature data, the authors conclude that animal susceptibility to hyperbaric oxygen varies significantly in various individuals. (Author)

A70-19504 #

TOLERANCE OF RATS TO RAPIDLY INCREASING HYPOXIA IN A HELIUM-OXYGEN ATMOSPHERE (USTOICHIVOST' K RYSK OSTRO NARASTAIUSHCHEI GIPOKSII V GELIO-KISLORODNOI ATMOSFERE).

L. A. Briantseva, A. G. Dianov, and R. M. Ivanova.

Kosmicheskaja Biologija i Meditsina, vol. 3, Sept.-Oct. 1969, p. 18-21. 6 refs. In Russian.

Animal tolerance to a rapidly increasing hypoxia in helium-

oxygen and argon-oxygen environments was studied. An attempt was made to elucidate the mechanism underlying changes in altitude tolerance of animals. Experiments were carried out on 143 albino rats in a heat-pressure chamber. Animal tolerance to a rapidly increasing hypoxia elevated in a helium-oxygen atmosphere at 21 deg C. This is associated with an increased cooling effect of a helium-oxygen mixture due to the higher thermal conductivity of helium as compared to nitrogen. In an argon-oxygen environment the animal tolerance to a rapidly increasing hypoxia remained unaffected in comparison to that in a sea-level atmosphere. (Author)

A70-19505 #

MODELING OF CHANGES OF OXYGEN TENSION IN BRAIN TISSUES OF ANIMALS DURING HYPOXIC HYPOXIA (MODELIROVANIE IZMENENIIA NAPRIAZHENIIA KISLORODA V TKANIAXH MOZGA ZHIVOTNYKH PRI GIPOKSICHESKOI GIPOKSII).

V. Sh. Berikashvili, E. A. Kovalenko, and A. B. Savvin.

Kosmicheskaja Biologija i Meditsina, vol. 3, Sept.-Oct. 1969, p. 22-27. 7 refs. In Russian.

Brief description of experiments involving a smooth ascent of dogs to an altitude of 12,000 m followed by a rapid rise to an altitude of 15,000 m in a decompression chamber. A mathematical model adequately reproducing changes of oxygen tension in the brain tissues of the animals in response to variations of the oxygen content in the atmosphere was evolved. The linear portion of the model is a third-order differential equation. The nonlinear portion takes account of a sharp change of the oxygen partial pressure in brain tissues during an ascent of animals to altitudes of over 8,000 m. The model was used to study the oxygen partial pressure variations during a rapid rise of animals to simulated altitudes of 2000, 4000, 6000, 8000, 10,000, 12,000, 14,000, and 16,000 m. The degree of correlation between components of the mathematical model and certain physiological structures of the animal body is discussed. (Author)

A70-19506 #

CHANGES OF THE MOTIVATION BEHAVIOR OF RABBITS EXPOSED TO INCREASING HYPOXIA (IZMENENIIA 'MOTIVATSIONNOGO POVEDENIIA' KROLIKOV PRI DEISTVII NARASTAIUSHCHEI GIPOKSII).

G. P. Goroian and L. V. Kaliuzhnyi.

Kosmicheskaja Biologija i Meditsina, vol. 3, Sept.-Oct. 1969, p. 28-33. 15 refs. In Russian.

Rabbits were exposed to different altitudes in a pressure chamber, the ascent rate being 25 m/sec. The animals displayed a slight decrease of the reaction of self-irritation at about 2,000 m followed by an increase at 3,000-4,000 m and a drastic decrease at 5,000-6,000 m. The pattern of variations in the reaction remained unaltered when the animals were given aminasine (chlorpromazine) though it developed at a lower level. Administration of scopolamine strongly inhibited the reaction beginning with altitudes of 3,000-4,000 m. Throughout the exposure to hypoxia up to an altitude of 6,000 m the avoidance reaction was alleviated and arrested at an altitude of 7,000 m. Injection of scopolamine alleviated the reaction to a greater extent while aminasine injection slightly reduced it, especially at altitudes of over 6,000 m. (Author)

A70-19507 #

EFFECT OF ALPHA-IRRADIATION ON CHLORELLA SURVIVAL AND MUTATION (VLIANIE ALPHA-CHASTITS IZOTOPNOGO ISTOCHNIKA NA VYZHIVAEMOST' I MUTATSIONNYI PROTSESS KHLORELLY).

L. K. Vekshina, I. G. Kogan, E. I. Kudriashov, D. R. Piatyshev, I. S. Sakovich, and V. A. Shevchenko.

Kosmicheskaja Biologija i Meditsina, vol. 3, Sept.-Oct. 1969, p. 34-38. 9 refs. In Russian.

Due to the small size of its cells, Chlorella is a suitable model for studying the effect of dense ionizing radiation in the living organism. The experiments revealed an exponential relationship between Chlorella survival and dosage of alpha-irradiation, a stimulatory effect of low doses of irradiation upon cellular division, and changes in Chlorella mutability depending on irradiation doses. (Author)

A70-19508 #
CHARACTERISTICS OF THE EFFECT OF HIGH-ENERGY PROTONS ON BIOLOGICAL OBJECTS (K KHARAKTERISTIKE DEISTVIA PROTONOV VYSOKIKH ENERGII NA BIOLOGICHESKIE OB'EKTY).

Iu. G. Grigor'ev, N. I. Ryzhov, N. N. Derbeneva, V. I. Popov, and M. A. Sychkov.

Kosmicheskaiia Biologiia i Meditsina, vol. 3, Sept.-Oct. 1969, p. 38-43. 13 refs. In Russian.

Review of the results of radiobiological studies performed with protons in the energy range from 660 to 10 MeV. It is found that exposure of animal organisms and microorganisms to high-energy protons does not result in the development of fundamentally new qualitative radiobiological effects typical only of proton radiations. On the other hand, reactions were recorded in which known symptoms of radiation disease developed in different quantitative proportions and which can be interpreted as manifestations of qualitative variations. A study of the quantitative characteristics of the proton effect on biological objects indicates that coefficients of the relative biological effectiveness of protons differ insignificantly as their energy changes by more than one order of magnitude (from 660 to 50 MeV), amounting to 1 within this energy range. The RBE coefficients increase slightly if the proton energy falls below 50 MeV.

A.B.K.

A70-19509 #
EFFECT OF HYPOKINESIA ON CELLULAR AND HUMORAL INDICES OF ANTIBODY FORMATION IN RATS (VLIIANIE GIPOKINEZII NA KLETOCHNYE I GUMORAL'NYE POKAZATELI ANTITELOGENEZA U KRYS).

V. G. Galaktionov and A. S. Ushakov.

Kosmicheskaiia Biologiia i Meditsina, vol. 3, Sept.-Oct. 1969, p. 43-47. 11 refs. In Russian.

Assessment of experimental findings showing changes in the cellular and humoral indices of antibody formation in rats exposed for various periods of time to hypokinesia-producing conditions. The number of antibody-producing cells in the spleen and hemolysin titers of test animals is found to depend on the exposure time. Thus two- and nine-day exposures of rats prior to immunization resulted in an inhibition of antibody formation—i.e., a decrease in the cellular and humoral indices of antibody formation. A 45-day exposure enhanced the antibody-producing function. A longer exposure (90 days) caused another inhibition of antibody production.

A.B.K.

A70-19510 #
STUDY OF THE POSSIBILITY OF CHEMICAL MODIFICATION OF RADIATION DAMAGE OF PLANTS DURING EXPOSURE TO FAST NEUTRONS (IZUCHENIE VOZMOZHNOI KHIMICHESKOI MODIFIKATSII LUCHEVOGO PORAZHENIIA U RASTENII PRI DEISTVII BYSTRYKH NEITRONOV).

D. M. Grodzinskii and A. A. Petrov.

Kosmicheskaiia Biologiia i Meditsina, vol. 3, Sept.-Oct. 1969, p. 48-55. 12 refs. In Russian.

Demonstration that with the aid of chemical substances it is possible to modify radiation damage in peas during irradiation of seeds with fast neutrons. Catalase, DNA hydrolyzate, cystein, and kinetin, in combination with heteroauxin and hydroxylamine, were used as the chemical substances. The protective effect of chemical substances was assayed by means of a new formula which made it possible to correct the degree of restoration produced by the radioprotectors, taking into account their effect on an unirradiated organism.

(Author)

A70-19511 #
FORMATION OF GAS BUBBLES IN SUPERSATURATED SOLUTIONS AND IN A LIVING ORGANISM DURING DECOMPRESSION (OBRAZOVANIE GAZOVYKH PUZYR'KOV V PERESYSHCHENNYKH RASTVORAKH I V ZHIVOM ORGANIZME PRI DEKOMPRESSII).

V. P. Nikolaev.

Kosmicheskaiia Biologiia i Meditsina, vol. 3, Sept.-Oct. 1969, p. 55-62. 20 refs. In Russian.

Basic characteristics of gas solutions within liquids are considered, and mechanisms of bubble formation in supersaturated solutions and in body fluids during decompression are described. The new data obtained with respect to the structure of liquids suggest a hypothesis covering the origin and nature of gas nuclei in the liquid. Mechanisms of bubble nucleation in a living organism are discussed from the theoretical point of view.

(Author)

A70-19512 #
ON THE DEVELOPMENT OF AUTOMATIC SYSTEMS OF CONTINUOUS MEDICAL MONITORING IN MANNED SPACE FLIGHTS (K PROBLEME SOZDANIIA AVTOMATICHESKIKH SISTEM NEPRERYVNOGO MEDITSINSKOGO KONTROLIA DLIA KOSMICHESKIKH POLETOV).

L. M. Komarova and I. S. Shadrintsev.

Kosmicheskaiia Biologiia i Meditsina, vol. 3, Sept.-Oct. 1969, p. 62-66. 35 refs. In Russian.

It is shown that automatic systems of continuous medical control are to be placed onboard spacecrafts, and tasks to be solved by means of the systems are indicated. Problems of selection of the parameters to be controlled, logics of diagnosing dangerous states, noise-resistance and reliability of the systems are discussed. As an illustration, a system of continuous medical control developed for long-duration simulation experiments is described.

(Author)

A70-19513 #
ON THE PATTERN OF CHANGES OF ELECTROCARDIOGRAMS AND CARDIAC CONTRACTION PHASES DURING ORTHOSTATIC TESTS AFTER PROLONGED HYPOKINESIA (O KHARAKTERE IZMENENII EKG I FAZ SERDECHNOGO SOKRASHCHENIIA PRI ORTOSTATICHESKIKH PROBAKH POSLE DLITEL'NOI GIPOKINEZII).

B. A. Korolev.

Kosmicheskaiia Biologiia i Meditsina, vol. 3, Sept.-Oct. 1969, p. 67-71. 8 refs. In Russian.

Results of a 70-day bed rest experiment was carried out on 16 test subjects between the ages of 20 and 25 years. At different time intervals the subjects underwent a 15-min orthostatic test at 75 deg tilt. Their electrocardiograms were recorded, phases of the systole of the left ventricle were determined, and vector analysis of the ECG in the frontal plane was performed. The prolonged bed rest led to orthostatic intolerance of the test subjects, involving intolerance in the erect position, tachycardia, symptoms of ischemia in the subendo- and subepicardial layers of the myocardium, and decrease of the contractile ability of the myocardium. Vector analysis of the ECG demonstrated that ECG changes occurred due to a reduction of the blood supply to the myocardium which, when aggravated by altered coronary vessels, may bring about organic disturbances of the myocardium.

(Author)

A70-19514 #
STUDY OF CONTAMINANTS IN THE AIR EXHALED BY MAN (ISSLEDOVANIE MIKROPRIMESEI V VYDYKHAEMOM CHELOVEKOM VOZDUKHE).

Iu. G. Nefedov, V. P. Savina, N. L. Sokolov, and V. E. Ryzhkova.

Kosmicheskaiia Biologiia i Meditsina, vol. 3, Sept.-Oct. 1969, p. 71-77. 8 refs. In Russian.

The air exhaled by healthy people at the age of 25 to 35 was analyzed for contaminants. The analysis was performed using gas-liquid chromatography, paper chromatography, colorimetry and nephelometry. The following compounds were found: ammonia, aldehydes (formaldehyde and acetaldehyde), ketones (acetone and methyl ethyl ketone), alcohols (methanol and ethanol), fatty (acetic and formic) acids, carbon oxide, methane, ethane, propane, pentane and hexane. Most of the compounds detected were quantitated. Analysis of the air exhaled by man may be of significance for the diagnostics of various diseases, study of metabolic processes as well as for investigation of atmospheric changes in space cabins during longterm manned flights.

(Author)

A70-19515

ON THE SELECTION OF CRITERIA FOR EVALUATING ILLUMINATION CONDITIONS IN SPACE CABINS (K VOPROSU O VYBORE KRITERIIA OTSENKI SVETOVOGO REZHIMA V KABINE PILOTIRUEMOGO KOSMICHESKOGO KORABLIA).

E. S. Kotova, S. M. Zalkind, and V. A. Pestova.

Kosmicheskaiia Biologiia i Meditsina, vol. 3, Sept.-Oct. 1969, p. 77-81. 7 refs. In Russian.

The paper gives information pertinent to the selection of illumination conditions in space cabins. It is recommended to use indices of visibility of objects as a criterion indicating quantitatively the level of optic perception in given illumination conditions. Experimental findings on limits of the visibility of luminous objects are given in relation to different levels of the luminance distribution within the field of vision of cosmonauts. The threshold level of visibility of objects has been found to be $V = 0.25$ lg (r.u.). This is the level at which inevitable errors in reading the information appear.

(Author)

A70-19516

A METHOD OF EVACUATING A GAS-AIR MIXTURE FROM AIRTIGHT CAVITIES WHEN CARRYING OUT MEDICO-CHEMICAL STUDIES OF SYNTHETIC MATERIALS (SPOSOB EVAKUATSII GAZO-VOZDUSHNOI SMESI IZ GERMETICH-NYKH EMKOSTEI PRI PROVEDENII SANITARNOKHIMICHESKIKH ISSLEDOVANII SINTECHESKIKH MATERIALOV).

V. D. Bartenev and V. V. Naletov.

Kosmicheskaiia Biologiia i Meditsina, vol. 3, Sept.-Oct. 1969, p. 82-85. In Russian.

Outline of a new method of removing air samples from hermetically sealed cavities during studies of toxic gas emanations from polymeric materials. According to the proposed method, the evacuation of the air from the cavity is achieved by displacing it with the aid of an elastic piston placed in the hermetically sealed cavity. The proposed method is recommended for use in medicochemical studies of synthetic materials under laboratory conditions involving the removal of air samples from hermetically sealed cavities of relatively small volume.

A.B.K.

A70-19517

RELATION BETWEEN OXYGEN CONSUMPTION AND PULMONARY VENTILATION IN ORTHOSTATIC TESTS (ZAVISIMOST' MEZHDU POTREBLENIIEM KISLORODA I LEGOCHNOI VENTILIATSIEI PRI ORTOSTATICHESKIKH PROBAKH).

A. D. Voskresenskii and V. I. Sokolov.

Kosmicheskaiia Biologiia i Meditsina, vol. 3, Sept.-Oct. 1969, p. 86-88. 10 refs. In Russian.

Statistical analysis of the pulmonary ventilation and gas exchange indices during orthostatic tests of 16 young men before and after 18 hours of immersion in water at a temperature of 34.5 C. The tests were made using a special table which rotated through an angle of 90 deg. The subjects were divided into a group which withstood the tests well and a group in which symptoms of orthostatic collapse were noted. As an indicator of the effectiveness of pulmonary ventilation, the oxygen use coefficient (the ratio of the oxygen consumption to the minute ventilation volume) was determined for each group before and after immersion. A regression analysis was performed to estimate the relation between the minute ventilation volume and the gas exchange indices.

A.B.K.

A70-19518

ROLE OF PROTEIN AND NUCLEIC ACID SYNTHESIS IN THE ADAPTATION OF THE ORGANISM TO HIGH-ALTITUDE HYPOXIA (O ROLI SINTEZA NUKLEINOVYKH KISLOT I BELKOV V ADAPTATSII ORGANIZMA K VYSOTNOI GIPOKSII).

F. Z. Meerson, M. Ia. Maizelis, and V. B. Malkin (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR).

Akademiia Nauk SSSR, Izvestiia, Seriiia Biologicheskaiia, Nov.-Dec. 1969, p. 819-831. 53 refs. In Russian.

Experimental study of the dynamics of the synthesis of nucleic acids and proteins in the heart and brain of rats during adaptation to high-altitude hypoxia. The rats were daily subjected to hypoxia for a period of six hours. It is shown that adaptation to hypoxia activates the synthesis of nucleic acids and proteins in the myocardium of the ventricles of the heart which in turn results in ventricular hypertrophy and in such changes of the myocardial metabolism that the heart becomes more resistant to significant stress. Protein synthesis is also activated in the brain, and RNA concentration increases in the cerebral cortex and, to a lesser extent, in the medulla oblongata and in the hypothalamus. Protein synthesis is mainly activated during the intervals between exposures to hypoxia and is accompanied by improved conservation of the conditional reflexes.

T.M.

A70-19519

KINETICS OF THE INTRODUCTION AND ELIMINATION OF 2,6-DI-TERNARY BUTYL-4-METHYLPHENOL IN MAN (KINETIKA POSTUPLENIIA I VYVEDENIIA 2,6-DI-TRET.-BUTIL-4-METILFENOLA U CHELOVEKA).

V. A. Gor'kov, S. A. Matveeva, Iu. D. Norikov, and L. S. Evseenko (Akademiia Nauk SSSR, Institut Khimicheskoi Fiziki, Moscow, USSR).

Akademiia Nauk SSSR, Izvestiia, Seriiia Biologicheskaiia, Nov.-Dec. 1969, p. 843-851. 16 refs. In Russian.

Application of liquid-gas chromatography to study variations of the concentration of 2,6-di-ternary butyl-4-methylphenol (ionol) in the blood of oncological patients and to determine its removal by urine and feces. The level of ionol in the blood did not exceed 1 mg/liter for different massive single and repeated doses in various medicinal forms. Insignificant amounts were removed with the urine, while the feces contained not less than 77% of a single 3-g dose within two days of its administration. Artificial saturation of preserved blood resulted in ionol levels from 100 to 150 mg/liter. A kinetic model is proposed for the variation in ionol levels after single and repeated administration.

T.M.

A70-19520

PROBLEM OF THE RELATIONSHIP BETWEEN THE INTRACEREBRAL AND PERIPHERAL BLOOD CIRCULATIONS DURING TRANSVERSE ACCELERATIONS (K VOPROSU O SOOTNO-SHENII VNUTRIMOZGOVOGO I PERIFERICHESKOGO KROVO-OBRASHCHENIIA PRI DEISTVII POPERECHNYKH PEREGRUZOK).

R. A. Vartbaronov, Iu. E. Moskalenko, and G. B. Vainshtein (Akademiia Nauk SSSR, Institut Evoliutsionnoi Fiziologii i Biokhimii, Leningrad, USSR).

Akademiia Nauk SSSR, Izvestiia, Seriiia Biologicheskaiia, Nov.-Dec. 1969, p. 863-868. 25 refs. In Russian.

Comparison of measured parameters of intracerebral, peripheral, and central blood circulation in humans subjected to transverse back-chest (positive x axis) accelerations. It is shown that the I and II type waves on the peripheral and intracerebral pulse curves coincide under different experimental conditions. A relationship is established between the frequency of cardiac contractions and the rate of reduction in the blood content of cerebral vessels.

T.M.

A70-19521

DISSOCIATION OF SOMATO-VEGETATIVE MANIFESTATIONS IN EMOTIONAL BEHAVIOR UNDER THE ACTION OF AMINAZINE (DISSOTSIATSIIA SOMATO-VEGETATIVNYKH PROIAV-LENII EMOTSIONAL'NOGO POVEDENIIA POD VLIANIEM AMINAZINA).

A. V. Val'dman and M. M. Kozlovskaiia (Meditsinskii Institut, Leningrad, USSR).

Fiziologicheskii Zhurnal SSSR, vol. 55, Oct. 1969, p. 1185-1195. 31 refs. In Russian.

Study of the somato-vegetative and behavioral reactions of rabbits to local electric stimulation of the hypothalamus after injections of various doses of aminazine. It is found that aminazine causes the dissociation of the motor, vegetative and emotional components of the aggressive-defensive reactions of rabbits to

A70-19522

localized stimulation of various sections of the hypothalamus. The degree of dissociation varies depending on the particular section of the hypothalamus which is stimulated. V.Z.

A70-19522

CHANGES IN THE INVOLVEMENT REACTION IN DYING AND REANIMATED ANIMALS (IZMENENIIA REAKTSII VOVLECHENIIA PRI UMIRANII I REANIMATSII ZHIVOTNOGO).

I. N. Ianvareva and T. R. Kuz'mina (Leningradskii Gosudarstvennyi Universitet, Leningrad, USSR).

Fiziologicheskii Zhurnal SSSR, vol. 55, Oct. 1969, p. 1203-1209. 34 refs. In Russian.

Study of the involvement reaction in a group of 33 anesthetized adult cats whose nucleus reticular hypothalamicus was stimulated by 0.2 μ sec rectangular pulses delivered 8-9 times in a second. Moribund conditions with a 5 min clinical death were created in the cats by acute bloodletting from the femoral artery; the cats were reanimated by a method developed by Negovskii (1954). It is found that in the process of dying the involvement reaction persists longer than the spontaneous activity of the cortex and that during reanimation the flash-evoked potentials are recovered first, followed by a much later recovery of the involvement reaction. V.Z.

A70-19523

METHODS OF THE AUTOMATIC CONTROL THEORY FOR ESTIMATING THE SATURATION OF ARTERIAL BLOOD WITH OXYGEN (METODY TEORII AVTOREGULIROVANIYA V OTSENKE NASYSHCHENIYA ARTERIAL'NOI KROVI KISLORODOM).

M. V. Barkan, Iu. I. Musiichuk, and A. I. Ravkin (I Meditsinskii Institut; Tsentralnyi Nauchno-Issledovatel'skii Institut Elektropriborov, Leningrad, USSR).

Fiziologicheskii Zhurnal SSSR, vol. 55, Oct. 1969, p. 1249-1256. 21 refs. In Russian.

Application of an automatic control technique in processing the oxyhemograms of a group of 13 healthy individuals and a group of 10 bronchial asthma patients subjected to ascent to an altitude of 4000 m in a pressure chamber. It is concluded that automatic control techniques can be effectively used in studying the saturation of arterial blood with oxygen. It is also found that a factor other than the oxygen partial pressure is primarily responsible for oxygen saturation control in the blood. V.Z.

A70-19524

MECHANICAL PROPERTIES OF THE LUNGS IN RELATION TO SEX AND AGE (MEKHANICHESKIE SVOISTVA LEGKIKH I ZAVISIMOSTI OT POLA I VOZRASTA).

M. V. Bobrova (Meditsinskii Institut, Aktiubinsk, USSR).

Fiziologicheskii Zhurnal SSSR, vol. 55, Oct. 1969, p. 1257-1260. 11 refs. In Russian.

Study of the static tensibility and vital capacity of the lungs in a group of 235 male and 289 female subjects, 18 to 27 years old, by a manometric technique and with the aid of tables compiled by Zatiushkov (1965). Statistical analysis of the results shows that at the age of 22-23 the tensibility of the lungs is maximum in males and is minimum in females, while decreasing in older and younger males and increasing in older and younger females. It is also found that smoking and pneumonia affect the elastic properties of the lungs. V.Z.

A70-19525

TWIN VELOERGOMETRIC ASSEMBLY FOR COMPETITIVE ACTIVITY SIMULATION (PARNAIA VELOERGOMETRICHESKAIA USTANOVKA DLIA MODELIROVANIYA SOREVENOVATEL'NOI DEIATEL'NOSTI).

S. A. Razumov and A. Ia. Menialin (Institut Fizicheskoi Kul'tury, Leningrad, USSR).

Fiziologicheskii Zhurnal SSSR, vol. 55, Oct. 1969, p. 1293-1296. 8 refs. In Russian.

Discussion of the design and operation of a veloergometric assembly using two bicycles for simultaneously measuring the motor activity of two persons performing in view of each other. The assembly differs from other veloergometric devices in that subjects can compare their performance when the test is performed on it. V.Z.

A70-19556

STABLE PERIODIC COMPONENTS OF THE RHYTHM OF HUMAN CARDIAC ACTIVITY (USTOICHIVYE PERIODICHESKIE SOSTAVLIAUSHCHIE RITMA SERDECHNOI DEIATEL'NOSTI CHELOVEKA).

A. D. Voskresenskii and M. D. Venttsel'.

Akademiia Nauk SSSR, Doklady, vol. 189, Nov. 11, 1969, p. 437-439. 5 refs. In Russian.

Study of the patterns of distribution of periodic components of human cardiac activity with respect to length of period and frequency of presence in the cardiac rhythm. In a study of a number of series of 150 to 300 R-R intervals of EKGs, performed by the digital filter method, it is found that two types of slow waves, with periods lying in clearly delineated ranges, are regularly present in the cardiac rhythm of a healthy human. A.B.K.

A70-19558

MATHEMATICAL FORMALIZATION OF INTUITIVE ESTIMATES OF THE COAGULATION CAPACITY OF THE BLOOD USING BIOCHEMICAL AND TROMBOELASTOGRAPHIC INDICES AND APPLYING AN ANALYSIS OF MAIN COMPONENTS (MATEMATICHESKAIA FORMALIZATSIIA INTUITIVNYKH OTSENOK KOAGULIRUIUSHCHEI SPOSOBNOSTI KROVI PO BIOKHEMICHESKIM I TROMBOELASTOGRAFICHESKIM POKAZATELIAM S PRIMENENIEM ANALIZA PO GLAVNYM KOMPONENTAM).

D. M. Zaferman and B. G. Kaplan (Azerbaidzhanskii Gosudarstvennyi Meditsinskii Institut, Baku, Azerbaidzhan SSR).

Akademiia Nauk Azerbaidzhanskoi SSR, Doklady, vol. 25, no. 7, 1969, p. 68-71. 6 refs. In Russian.

Derivation of empirical formulas for estimating the coagulability of the blood in individual patients in order to facilitate the prescription of correct dosages of the required medication. The study is based on the assumption that most of the intuitive estimates made by competent physicians (on the basis of different objective indices) are close to reality and that the errors are normally distributed. Initial data were supplied by a group of physicians, and the results obtained were used to derive the formulas proposed. T.M.

A70-19573

ULTRASONIC DETERMINATION OF LEFT VENTRICULAR WALL MOTION IN NORMAL MAN—STUDIES AT REST AND AFTER EXERCISE.

J. Ward Kennedy (U.S. Veterans Administration Hospital, Seattle, Wash.) and Robert F. Kraunz.

American Heart Journal, vol. 79, Jan. 1970, p. 36-43. 15 refs.

Measurement of the parameters of left ventricular wall motion in 25 normal males at rest and in 20 individuals after moderate exercise, using the analog presentation of the echocardiogram. The characteristic tracings of posterior wall motion, recorded by this technique, are discussed with relation to ventricular pressure and geometric events during the cardiac cycle. Following exercise, significant increases in posterior wall excursion and velocity were evident with only a fair correlation between increments in maximal wall velocity and heart rate. It is suggested that measurements of posterior wall motion with reflected ultrasound may provide an innocuous means of assessing changes in ventricular contractility. M.M.

A70-19588

PRESSURE-FLOW STUDIES IN MAN DURING PULSUS ALTERNANS.

Robert J. Bache (Duke University; U.S. Veterans Administration Hospital, Durham, N.C.; U.S. Public Health Service, Washington, D.C.), Jerome Ruskin, Alexander Harley (Duke University; U.S. Veterans Administration Hospital, Durham, N.C.), and Joseph C. Greenfield, Jr.

Cardiovascular Research, vol. 3, July 1969, p. 277-283. 20 refs. NIH Grant No. HE-09711.

Phasic aortic blood flow and left ventricular pressure were measured at constant heart rates during pulsus alternans in four patients. Duration of ejection and peak flow rate varied directly with stroke volume, while the pre-ejection period varied inversely. A higher left ventricular end-diastolic pressure preceded large beats in two patients, suggesting alternations of left ventricular filling contributed to pulsus alternans, but was not seen in two others.

(Author)

A70-19589

A LINEAR REFLECTION DENSITOMETER FOR INDOCYANINE GREEN.

F. Ten Hoor and G. A. Mook (Groningen, University, Groningen, Netherlands).

Cardiovascular Research, vol. 3, July 1969, p. 373-380. 10 refs.

Description of a reflection densitometer which responds linearly to changes in indocyanine green dye concentration using simple analog computation. The reciprocal of the light reflection of blood changes linearly with dye concentration. The photocell output of the densitometer, containing two endoscope bulbs, a Baird Atomic interference filter, 2 silicon barrier layer photocells, and a Pyrex glass cuvette, is amplified and fed into the denominator input of a Philbrick SPM1A divider, of which the numerator voltage is kept constant. The photocurrent due to nonblood reflection is compensated for. The densitometer has proved to be linear to a dye concentration of at least 40 mg/l. The calibration is independent of oxygen saturation. The dynamic response of the instrument has proved to be sufficiently fast. The densitometer is easy to operate and very stable.

M.M.

A70-19590

SCREEN FILTRATION PRESSURE OF BLOOD—AN EVALUATION.

D. P. Dhall, J. Engeset, F. N. McKenzie, and N. A. Matheson (Aberdeen, University, Aberdeen, Scotland).

Cardiovascular Research, vol. 3, Apr. 1969, p. 147-154. 16 refs.

Research supported by Pharmacia AB.

Examination of the relative importance of some factors in the determination of screen filtration pressure (SFP) of human blood. The physical determinants of SFP are defined, and the effects of time, anticoagulant, red cells, platelets, and leucocytes are established. Changes in SFP correspond closely to the size of platelet aggregates once a size of approximately 50 microns is exceeded.

(Author)

A70-19591

PLATELET AGGREGATE FILTRATION PRESSURE—A METHOD OF MEASURING PLATELET AGGREGATION IN WHOLE BLOOD.

D. P. Dhall and N. A. Matheson (Aberdeen, University, Aberdeen, Scotland).

Cardiovascular Research, vol. 3, Apr. 1969, p. 155-160. 11 refs.

A method of measuring platelet aggregation in whole blood is described. This method depends upon the filtration characteristics of whole blood after platelet aggregation has been induced in it in a standard fashion. The relationship of the filtration pressure to the final concentration of added ADP, the nature and final concentration of the anticoagulant, amount of agitation, time elapsed after venepuncture, time elapsed after the addition of ADP, platelet count and haematocrit are defined. The advantages of the method are discussed.

(Author)

A70-19592

A GEOMETRICAL MODEL OF SUCCESSIVE STAGES IN EXCITATION OF THE HUMAN HEART; ITS VALUE AS A LINK BETWEEN EXCITATION AND CLINICAL VECTOR-CARDIOGRAPHY.

A. C. Arntzenius (University Hospital, Leiden, Netherlands).

Cardiovascular Research, vol. 3, Apr. 1969, p. 198-208. 19 refs.

A geometrical model of successive stages of cardiac excitation in man, based on the anatomy of a normal heart and on certain simplifying assumptions, was devised. Its value for a better understanding of the spread of excitation and the relation of the latter to the shape of the QRS loop in the vectorcardiogram is discussed.

(Author)

A70-19593

PROBABILISTIC CHARACTERIZATION OF R-R INTERVALS.

M. Ten Hoopen (National Health Research Council, Institute of Medical Physics, Utrecht, Netherlands) and J. P. M. Bongaarts (Eindhoven, Technische Hogeschool, Eindhoven, Netherlands).

Cardiovascular Research, vol. 3, Apr. 1969, p. 218-226. 16 refs.

Statistical methods are applied in order to characterize R-R interval sequences of the ECG. By way of example, the interval distribution and the joint probability density function of pairs of adjacent intervals are treated in detail for data on one normal testee and three patients. The results are compared with the properties of the respective cardiogram. These methods of display, if used with discretion, provide a compact overall view of the degree of irregularity of intervals, and of the form of interdependency between the durations of successive intervals.

(Author)

A70-19594

THE FRAME OF REFERENCE OF THREE-DIMENSIONAL VECTORCARDIOGRAMS DRAWN BY A COMPUTER-DRIVEN CATHODE RAY TUBE.

Louis Brinberg (Mount Sinai School of Medicine, New York, N.Y.).

Cardiovascular Research, vol. 3, Apr. 1969, p. 227-234. 7 refs.

NIH Grant No. 5 R01 HE-09987-03 CVB.

Description of further variations and, in particular, additions to the frame of reference of a vectorcardiogram composed of solid figures which has been drawn to perspective by a computer-driven cathode ray tube. The frame of reference is a sphere. To identify its aspects, the sphere is placed upon a table, is divided by planes, or is centered within a cube. Variations are described.

M.M.

A70-19595

PULMONARY INTRA- AND EXTRAVASCULAR FLUID VOLUME CHANGES WITH EXERCISE.

M. Korsgren, R. Luepker, B. Linder, and E. Varnauskas (Sahlgren's Hospital, Göteborg, Sweden).

Cardiovascular Research, vol. 3, Jan. 1969, p. 1-6. 15 refs.

Measurements of pulmonary extravascular (PEV) and intravascular (PBV) volumes of fluid. These measurements were made in five patients both at rest and exercise. Mean PEV increase from rest to exercise was 88 per cent. No relationship between PEV and PBV could be demonstrated.

M.V.E.

A70-19596

A REDUCTION IN SOME VASODILATOR RESPONSES IN FREE-STANDING MAN.

J. G. Mosley (Belfast, Queen's University, Belfast, Northern Ireland).

Cardiovascular Research, vol. 3, Jan. 1969, p. 14-21. 14 refs.

Research supported by the Medical Research Council.

Experiments were carried out to study the effect of a change in posture on some vasodilator responses. Reactive hyperaemia, post-exercise hyperaemia, and local heat hyperaemia in the forearm were investigated with the subject lying and standing. In each case the hyperaemia was reduced on standing, though this reduction could be abolished by the intra-arterial infusion of a sympathetic adrenergic antagonist.

(Author)

A70-19604

A70-19604

ARRHYTHMIA MONITOR.

T. Horth (Hewlett-Packard Co., Waltham, Mass.).

Bio-Medical Engineering, vol. 4, July 1969, p. 308-312.

Description of an arrhythmia monitor which it is felt will make a contribution to the prediction of cardiac distress. The instrument, which is essentially a small hybrid computer, looks for changes to abnormal rhythm and automatically compares the width of each ECG complex with a stored normal in order to detect arrhythmias. Depending on the rest of the system used, arrhythmias can be permanently recorded or used to operate alarms. A trend recorder is available for use with the monitor. F.R.L.

A70-19615

EXPERIMENTAL MYOCARDIAL INFARCTION. II—ACUTE DEPRESSION AND SUBSEQUENT RECOVERY OF LEFT VENTRICULAR FUNCTION: SERIAL MEASUREMENTS IN INTACT CONSCIOUS DOGS.

Raj Kumar, William B. Hood, Jr., Julio Joison, John C. Norman, and Walter H. Abelmann (Harvard University; Boston City Hospital, Boston, Mass.).

Journal of Clinical Investigation, vol. 49, Jan. 1970, p. 55-62. 37 refs.

Research supported by the Massachusetts Heart Association; NIH Grants No. PH-43-68-684; No. HE-10539; No. HE-5244; No. AM-10517.

Experimental investigation of the capacity of the left ventricle of 8 intact conscious dogs to recover from the depression of ventricular function caused by acute myocardial infarction. Acute myocardial infarction caused a marked depression of left ventricular function measured 1 hr after onset of infarction, but 1 week later all 8 animals showed improvement with return of function toward the control levels. Hemodynamic data revealed evidence of left ventricular failure in all animals, but variability in individual hemodynamic parameters was noted. The data indicate that the marked depression of left ventricular function observed immediately after experimental acute myocardial infarction undergoes considerable resolution within 1 week, but that functional recovery remains incomplete. M.M.

A70-19689

PHYSICAL ACTIVITY AND AGING.

Edited by D. Brunner and E. Jokl.

Basel, Switzerland, S. Karger AG (Medicine and Sport. Volume 4), 1970. 326 p. \$21.

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PHYSICAL ACTIVITY AND THE EPIDEMIOLOGY OF CORONARY HEART DISEASE. A. Keys (Minnesota, University, Minneapolis, Minn.), p. 250-266. 21 refs. (See A70-19694 07-04)

LONG-TERM EPIDEMIOLOGIC STUDIES ON THE POSSIBLE

ROLE OF PHYSICAL ACTIVITY AND PHYSICAL FITNESS IN THE PREVENTION OF PREMATURE CLINICAL CORONARY HEART DISEASE. J. Stamler, D. M. Berkson, H. A. Lindberg, I. T. Whipple, W. Miller, L. Mojonier, Y. F. Hall, R. Soyugenc, and M. J. Levinson (Chicago Health Research Foundation, Chicago, Ill.), p. 274-300. 18 refs. (See A70-19695 07-04)

A70-19690

EXERCISE TESTS.

H. Blackburn, G. Winckler, J. Vilandr , J. Hodgson, and H. L. Taylor (Minnesota, University, Minneapolis, Minn.).

IN: PHYSICAL ACTIVITY AND AGING. (A70-19689 07-04)

Edited by D. Brunner and E. Jokl.

Basel, Switzerland, S. Karger AG (Medicine and Sport. Volume 4), 1970, p. 28-36. 11 refs.

Research supported by the American Heart Association; PHS Grants No. 5-R-01-CD-00118; No. HE-06314.

Comparison of the energy cost and heart rate responses to three-minute single-stage, nonsteady-state, submaximal exercise procedures commonly used in diagnostic and functional testing. Statistically significant differences are found in all possible paired comparisons, either for the energy cost of performing the task or in heart rate response. The systematic differences found are statistically and physiologically significant. The highest work load of the 5 tests compared is imposed by the graded double Master's, the lowest by the 3 mph, 5% grade, treadmill walk. The heart rate for the bicycle test is disproportionately high, in the group tested, in relation to oxygen consumption. Inter-individual variability in oxygen consumption and heart rate is also highest for the graded double Master two-step. The least variability in weight-adjusted oxygen consumption is in treadmill walking, and in any case variability is less for standard, constant rate procedures than for those graded according to body weight. Variability of heart rate response is generally similar between the tests compared. M.M.

A70-19691

THE CARDIOVASCULAR SYSTEM WITH AGING AND EXERCISE.

J. S. Skinner (Pennsylvania State University, University Park, Pa.).

IN: PHYSICAL ACTIVITY AND AGING. (A70-19689 07-04)

Edited by D. Brunner and E. Jokl.

Basel, Switzerland, S. Karger AG (Medicine and Sport. Volume 4), 1970, p. 100-108. 53 refs.

Brief review of the effects of physical training on selected factors in the cardiovascular system which are known to change with age. It is pointed out that it is not possible to state whether physical training will counteract, offset, or even delay the effect of aging on the cardiovascular system. The studies performed indicate that some of the changes of the circulatory system that do occur with training tend to be in the opposite direction of those usually seen with aging. There is little evidence, however, that the rate of aging is altered in physically active persons compared with the general population. Nor is it possible to state that physically more active persons will have a reduced morbidity or mortality from cardiovascular disease. It does appear, however, that endurance training favorably alters certain factors which are associated with a higher risk of developing cardiovascular disease. The clinical consequences of these changes, however, are unclear. M.M.

A70-19692

EXERCISE HABITS AND EMOTIONAL PATTERNS IN MYOCARDIAL PATHOPHYSIOLOGY.

W. Raab (Vermont, University, Burlington, Vt.).

IN: PHYSICAL ACTIVITY AND AGING. (A70-19689 07-04)

Edited by D. Brunner and E. Jokl.

Basel, Switzerland, S. Karger AG (Medicine and Sport. Volume 4), 1970, p. 132-135. 7 refs.

Discussion of our present-day state of knowledge regarding the

role of exercise habits and environmental-emotional stresses in the origin and prevention of degeneration heart disease. It is pointed out that there exists little if any evidence in favor of a significant influence of exercise habits upon coronary atherogenesis. Apart from an improvement of collateral formation in hypoxic areas of the myocardium, the most profound effects of exercise or its lack, respectively, concern the oxydative metabolism and electrolyte balance of the heart muscle itself. As a feature of the part played by oxygen in myocardial function and structure, it appears that its role consists largely in maintaining the electrolyte balance, especially concerning presentation of the intracellular potassium stores. This function of oxygen can be temporarily replaced to some extent by the administration of readily absorbable extra potassium. It is noted that environmental sensory and emotional stresses of various kinds, especially noise, anxiety and anger, are associated with hypothalamus-mediated sympathetic stimulations and the hereby elicited adrenergic cardiac manifestations, such as cardiac acceleration and shortening of the isometric tension period. M.M.

A70-19693
THE EVALUATION OF PHYSICAL PERFORMANCE IN CARDIAC PATIENTS.

J. Naughton (Oklahoma, University, Norman, Okla.) and M. T. Lategola (FAA, Civil Aeromedical Institute, Oklahoma City, Okla.). IN: PHYSICAL ACTIVITY AND AGING. (A70-19689 07-04)
 Edited by D. Brunner and E. Jokl.
 Basel, Switzerland, S. Karger AG (Medicine and Sport. Volume 4), 1970, p. 156-166. 7 refs.
 PHS Grants No. HE-06286-06; No. 1-K3-HE-31, 272-01; No. CD-00170-02.

Description of some of the physiological observations recorded on cardiac patients during a work tolerance test, and demonstration of the manner in which patients might be better screened prior to instituting rehabilitation efforts. The physiological responses recorded during graded exercise in twenty patients with healed myocardial infarction were recorded. The subjects were divided into 2 age-matched groups based on those who survived and those who eventually died. The mean follow-up time was 17.5 months for the survivors and 20.8 months for those who eventually died. A greater elevation of the exercise systolic blood pressure concomitant with a modest decrease of diastolic blood pressure was recorded in the survivors than in those who eventually died. Pulse rate and electrocardiographic responses were not significantly different between the 2 groups of patients. It was concluded that a carefully administered exercise test in which several cardiovascular measurements are recorded simultaneously may be of value in differentiating those cardiac subjects who might respond favorably to rehabilitation programs from those who might not. M.M.

A70-19694
PHYSICAL ACTIVITY AND THE EPIDEMIOLOGY OF CORONARY HEART DISEASE.

A. Keys (Minnesota, University, Minneapolis, Minn.). IN: PHYSICAL ACTIVITY AND AGING. (A70-19689 07-04)
 Edited by D. Brunner and E. Jokl.
 Basel, Switzerland, S. Karger AG (Medicine and Sport. Volume 4), 1970, p. 250-266. 21 refs.
 Research supported by the American Heart Association; PHS Grant No. HE-04697.

Discussion of the relationship between physical activity and the epidemiology of coronary heart disease. It is pointed out that critical analysis of prominent examples of the evidence offered for concluding that lack of physical activity promotes coronary heart disease shows serious faults in the data and in the analyses by the reporting investigators. Better analyses on London busmen, on African nomads, on autopsy data, and on men in the Health Insurance Plan of Greater New York, do not support the hypothesis that lack of physical activity is a major cause of coronary heart disease. It is noted that more and better data and analyses are needed in this field. M.M.

A70-19695
LONG-TERM EPIDEMIOLOGIC STUDIES ON THE POSSIBLE ROLE OF PHYSICAL ACTIVITY AND PHYSICAL FITNESS IN THE PREVENTION OF PREMATURE CLINICAL CORONARY HEART DISEASE.

J. Stamler, D. M. Berkson, H. A. Lindberg, I. T. Whipple, Wilda Miller, Louise Mojonnier, Yolanda F. Hall, R. Soyugenc, and M. J. Levinson (Chicago Health Research Foundation, Chicago, Ill.). IN: PHYSICAL ACTIVITY AND AGING. (A70-19689 07-04)
 Edited by D. Brunner and E. Jokl.
 Basel, Switzerland, S. Karger AG (Medicine and Sport. Volume 4), 1970, p. 274-300. 18 refs.
 Research supported by the American Heart Association, the Chicago Heart Association, the Corn Products Institute of Nutrition; PHS Grants No. H-4197; No. HE-09426.

Brief description of findings of decade-long epidemiologic studies of the relationship between habitual physical activity and the incidence of premature coronary heart disease (CHD). Initial findings of two pilot projects involving exercise of previously sedentary middle-aged men indicate that it is apparently possible to recruit significant numbers of previously sedentary middle-aged men and to activate a high proportion of them as participants in supervised exercise programs involving short duration, high-intensity ergometric exercise. As a result of participation in this program, significant improvements are apparently registered in tests of cardiopulmonary fitness. Short-duration, high-intensity bicycle ergometric exercise appears to enhance fitness. It may be associated with statistically significant reductions in serum cholesterol, blood pressure and skinfold thickness. An overall assessment that data obtained to date in a coronary prevention evaluation program (CPEP) and in other first generation primary prevention studies are apparently indicative of a positive prophylactic effect on mortality, is presented as preliminary, tentative and guarded. M.M.

A70-19738
INVESTIGATIONS OF CHANGES OF RHOENCEPHALOGRAPHY BY ORTHOSTATISM AND VALSALVA'S EXPERIMENT AND OF THE COMPENSATORY EFFECT OF THE ANTI-GRAVITATION (ANTI-G)-SUIT (UNTERSUCHUNGEN ÜBER DIE VERÄNDERUNGEN DER RHOENCEPHALOGRAPHIE DURCH DEN ORTHOSTATISMUS UND DEN VALSALVA'SCHEN VERSUCH UND ÜBER DEN KOMPENSATORISCHEN EINFLUSS DES ANTI-GRAVITATIONS /ANTI-G-/ANZUG).

V. Filcescu (Medizinisches Zentrum für Luftschiffahrt, Bucharest, Rumania).
Zentralblatt für Verkehrs-Medizin, Verkehrs-Psychologie, Luft- und Raumfahrt-Medizin, vol. 15, Dec. 1969, p. 226-233. 16 refs. In German.

Study of the effect of the Anti-G-Suit in changes of rhoencephalography produced by Valsalva's maneuver and the transition from the horizontal position into passive orthostatism on the basis of tests with 25 healthy young human adults. It was found that the employment of the airfilled Anti-G-Suit unmistakably improves the cerebral blood flow at transition into orthostatism and during Valsalva's maneuver. G.R.

A70-19774 #
ADOPTION OF AN 'IMPOSED' RHYTHM BY THE RESPIRATORY NEURONS OF THE MEDULLA OBLONGATA (USVOENIE 'NAVIAZANNOGO' RITMA DYKHATEL'NYMI NEIRONAMI PRODOLGOVATOGO MOZGA).

A. M. Kulik and L. N. Kondrat'eva (Akademii Meditsinskikh Nauk SSSR, Moscow, USSR).
Biulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Dec. 1969, p. 3-7. 11 refs. In Russian.

Investigation of the pulsating activity of respiratory neurons in the medulla oblongata of anesthetized cats during repeated distension of the lungs with a different frequency and a different respiratory volume. Results show that inspirational and expirational

A70-19775

neurons are capable of adapting to a new rhythm of volley activity during repeated distension of the lungs with an air volume exceeding the initial volume. During repeated distension with a hypercapnic mixture and in deep anesthesia, the ability of the respiratory neurons to adjust to a new rhythm drops sharply and totally disappears in bilateral vagotomy. T.M.

A70-19775

ACTIVITY OF RESPIRATORY NEURONS IN THE ABSENCE OF RESPIRATORY MOVEMENTS (AKTIVNOST' DYKHATEL'NYKH NEIRONOV V USLOVIAKH OTSUTSTVIA DYKHATEL'NYKH DVIZHENII).

E. I. Soshnikov, R. A. Durinian, and V. A. Safonov (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR).

Bulleten' Eksperimental'noi Biologii i Meditsiny, vol. 68, Dec. 1969, p. 7-9. 10 refs. In Russian.

Qualitative analysis of the reactions of different groups of neurons in the respiratory center of the medulla oblongata during suspension and forced recovery of respiratory motions. Following an apneatic dose of lysothion, the impulse volleys in the respiratory center neurons are retained, but there is an increase in the duration of the volleys, the number of volleys, the mean frequency in the volley, and the duration of the intervals between the volleys. The distribution of the intervals is not disturbed. Artificial respiration immediately caused a shortened duration of the volleys and reduced the number of impulses in the volley. Discontinuation of artificial respiration resulted in a renewed apneatic pattern of volley activity. T.M.

A70-19777

SEEING AND PERCEIVING AT AERIAL PHOTOGRAPHIC INTERPRETATION (SEHEN UND WAHRNEHMEN BEI DER LUFT-BILDINTERPRETATION).

J. Albertz (Karlsruhe, Universität, Karlsruhe, West Germany). (*Universität Karlsruhe and Firma Carl Zeiss, Photogrammetrische Wochen, 32nd, Karlsruhe, West Germany, Sept. 29-Oct. 10, 1969.*) *Bildmessung und Luftbildwesen*, vol. 38, Jan. 1, 1970, p. 25-34. 12 refs. In German.

Discussion of the principles concerning the observation of a single black-and-white-photo as a basis for aerial photographic interpretation. The distribution of stimuli presented objectively by the photo and the subjectively varying processes in the human brain are examined. There occurs a selection of the stimuli and an interpretation of their two-dimensional and three-dimensional organization. This process is based on experiences gained in the visual perception of the environment. G.R.

A70-19788

FUNCTIONAL ROLE OF THE A-NEURON SYSTEM IN THE VISUAL CORTEX (O FUNKSIONAL'NOI ROLI SISTEMY A-NEIRONOV V ZRITEL'NOI KORE).

V. N. Dumbai, S. A. Chebkasov, and L. N. Podladchikova (Rostovskina-Donu Gosudarstvennyi Universitet, Rostov, USSR).

Fiziologicheskii Zhurnal SSSR, vol. 55, Nov. 1969, p. 1313-1317. 20 refs. In Russian.

Study of the A-neuron activity in the visual analyzer of guinea pigs during retina stimulation by diffuse light, stimulation of nonspecific thalamic nuclei, and polarization by microelectrodes. A-neurons constituted 58% of all the neurons observed. The nature of neuron responses to stimulation of nonspecific thalamic nuclei indicates that the A-neuron group does not perform any particular function in the mechanism of cortical-subcortical relations. The use of polarization by means of extracellular microelectrodes leads to the conclusion that there is no subthreshold influence on A-neurons by the retina. It is argued that A-neurons are highly specialized elements which do not take part directly in the analysis of information arriving in the cortex during stimulation of the retina by diffuse light, but only register its presence. T.M.

A70-19789

INTERACTION OF CERTAIN CORTICAL AND HYPOTHALAMIC INFLUENCES IN INDIVIDUAL NEURONS OF THE RETICULAR FORMATION OF THE MIDBRAIN (VZAIMODEISTVIE KORKOVYKH I GIPOTALAMICHESKIKH VLIANII NA ODINOCHEVNYKH NEIRONAKH RETIKULIARNOI FORMATSII SREDNEGO MOZGA).

V. G. Zilov (Meditsinskii Institut, Moscow, USSR).

Fiziologicheskii Zhurnal SSSR, vol. 55, Nov. 1969, p. 1326-1333. 28 refs. In Russian.

Investigation of the activity of the midbrain reticular neurons in cats in response to individual and coincident cortical and hypothalamic stimulations. The nature of the reaction exhibited by the neurons is described, and it is shown that about 20% of the reticular neurons lacked any response whatsoever. The nonreacting neurons were characterized either by a high frequency of discharge or by an exceptionally regular pattern of activity. Neurons reacting to stimuli were preferentially excited by corticofugal impulses of the first sensorimotor region and were inhibited by the lateral areas of the posterior hypothalamus. In combined cortical and hypothalamic stimuli, the dominant role is played by the hypothalamus. T.M.

A70-19790

PROBLEM OF THE INTERACTION OF SYMMETRICAL MOTOR CENTERS UNDER CONDITIONS OF SUCCESSIVE INNERVATIONS DURING EXERCISE (K VOPROSU O VZAIMODEISTVII SIMMETRICHNYKH DVIIGATEL'NYKH TSENTROV V USLOVIAKH POSLEDOVATEL'NYKH INNERVATSII V PROTSESE UPRAZHNENIIA).

N. N. Khavkina and L. T. Zharova (Leningradskii Gosudarstvennyi Universitet, Leningrad, USSR).

Fiziologicheskii Zhurnal SSSR, vol. 55, Nov. 1969, p. 1358-1363. 12 refs. In Russian.

Investigation of the significance of the inequality of symmetrical motor centers during their interaction under conditions of successive innervations. The problem was studied experimentally in humans during the formation of a simple motor act, using ergographic and electromyographic techniques. The experiments involved work performed by both hands until exhaustion. Results show a dominant significance of right-handedness during different successive innervations. T.M.

A70-19791

CROSS-CORRELATION ANALYSIS OF ELECTROMYOGRAMS DURING DYNAMIC WORK (KROSSKORRELIATSIONNYI ANALIZ ELEKTROMIOGRAMM PRI DINAMICHESKOI RABOTE).

E. N. Artem'eva (Akademiia Nauk SSSR, Institut Vyshei Nervnoi Deiatel'nosti i Neurofiziologii, Moscow, USSR).

Fiziologicheskii Zhurnal SSSR, vol. 55, Nov. 1969, p. 1364-1368. 9 refs. In Russian.

Investigation of the time relationships between motor unit discharges of human musculus biceps brachii and musculus triceps brachii during rhythmical bending and extension of the forearm. The study utilized cross-correlation analysis of electromyograms showing interference patterns. During dynamic work at arbitrary tension of both antagonist muscles, the correlation between their motor unit discharges was either absent or weakly expressed. When only one muscle was arbitrarily tensed, the antagonist showed a nonrandom activity. Significant correlation was evident between the electrical activity of the agonist and antagonist muscles. T.M.

A70-19792

PROBLEM OF THE ORIGIN OF RESPIRATORY WAVES OF INTRACRANIAL PRESSURE (K VOPROSU O PROISKHOZHDENII DYKHATEL'NYKH VOLN VNUTRICHEREPNOGO DAVLENIIA).

G. B. Vainshtein (Akademiia Nauk SSSR, Institut Evoliutsionnoi Fiziologii i Biokhimi, Leningrad, USSR).

Fiziologicheskii Zhurnal SSSR, vol. 55, Nov. 1969, p. 1385-1392. 22 refs. In Russian.

Investigation of the contribution of different factors to the formation of respiratory waves of the cerebrospinal fluid pressure in anesthetized cats and dogs. The factors considered included pleural, abdominal, arterial, and venous pressures. It is concluded that under normal conditions, the respiratory waves of intracranial pressure are generated mainly by respiratory pressure waves in the superior cava, while respiratory waves of arterial and inferior cava pressure are of little importance. T.M.

A70-19793

DATA ON THE PRESENCE OF A SPHINCTER IN THE BREAST SECTION OF THE HUMAN ESOPHAGUS (DANNYE O NALICHII SFINKTERA V GRUDNOM OTDELE PISCHEVODA CHELOVEKA).

N. A. Frizen (Meditsinskii Institut, Yaroslavl, USSR).

Fiziologicheskii Zhurnal SSSR, vol. 55, Nov. 1969, p. 1393-1398. 10 refs. In Russian.

Generalized data on the physiology of the human esophagus obtained during a six-year study of healthy and afflicted subjects under conditions of clinical practice. A constantly functioning sphincter is found in the lower third of the breast region of the esophagus. It closes the epiphrenal ampulla from above to ensure a higher cavity pressure in the epiphrenal ampulla than in the medium ampulla. T.M.

A70-19794

INFLUENCE OF THYROIDECTOMY ON THE ADAPTIVE REACTIONS OF ANIMALS DURING PROLONGED ACTION OF HYPOXIA (VLIANIE TIREOIDEKTOMII NA PRISPOBITEL'NYE REAKTSII ZHIVOTNYKH PRI DLITEL'NOM DEISTVII GIPOKSII).

G. I. Grigor'eva, L. N. Simanovskii, and O. I. Tarakanova (Akademiia Nauk SSSR, Institut Evoliutsionnoi Fiziologii i Biokhimii, Leningrad, USSR).

Fiziologicheskii Zhurnal SSSR, vol. 55, Nov. 1969, p. 1406-1410. 23 refs. In Russian.

Investigation of adaptive reactions in the brain and blood of thyroidectomized rats during training for adaptation to hypoxia. It is shown that the thyroidectomy significantly reduced the rate of glycolysis in the brain, changed the cation content of the blood, and lowered the osmotic resistance of erythrocytes. Thyroidectomized rats did develop adaptive responses to hypoxia, but the changes were not as significant as in intact animals. T.M.

A70-19824

RESPIRATORY RESPONSE TO ACOUSTIC EXCITATION OF MICE.

C. O. Criborn (Färsvarets Forskningsanstalt, Stockholm, Sweden).

Life Sciences, Part I—Physiology and Pharmacology, vol. 9, Jan. 1, 1970, p. 13-20.

Study of changes in the minute volume under acoustic influence in mice, using a new method for measuring and recording the respiratory process without strain on the respiratory organs. It was found that the minute volume of mice increased when they were exposed to a tone of between 1 and 10 kHz from a loudspeaker. This reaction may be used for studying effects on the central nervous system of different agents. In this study the acoustic reaction proved to be a sensitive criterion of effects caused by mebumal and morphine. M.M.

A70-19850

FACILITATION OF VISUAL BACKWARD MASKING BY INCREASING TARGET DURATION—A METHODOLOGICAL EXTENSION.

Dean G. Purcell (Toronto, University, Toronto, Canada) and Alan L. Stewart (York University, Toronto, Canada).

Psychonomic Science, vol. 17, Dec. 25, 1969, p. 360, 361. 6 refs.

National Research Council Grant No. APA 191; Defence Research Board Grant No. 9401-38; NIH Grant No. NB-07622-02.

Discussion of two separate experiments which confirmed the previously reported finding that, within limits, increasing the duration of visual target facilitates backward masking. It is pointed out that the data of the present two experiments cannot be explained directly by reference to either the interstimulus interval or the target-onset/mask-onset interval. G.R.

A70-19926

PYRIDOXINE AND PHENOBARBITAL AS TREATMENT FOR AEROZINE-50 TOXICITY.

Alex Azar, Anthony A. Thomas, and Frederick H. Shillito (Ohio State University, Columbus, Ohio).

Aerospace Medicine, vol. 41, Jan. 1970, p. 1-4. 18 refs.

Contract No. AF 33(615)-2083.

Aerozine-50 is a missile fuel consisting of an equal mixture, by weight, of hydrazine and unsymmetrical dimethylhydrazine (UDMH). UDMH has a vapor pressure approximately 10 times that of hydrazine. Because of this difference, inhalation exposure will result in predominately UDMH intoxication, and hydrazine toxicity will result from skin contamination. Pyridoxine hydrochloride is known to be an effective therapeutic agent for UDMH intoxication. It has been shown to be ineffective in the treatment of hydrazine poisoning. The purpose of this study was to investigate possible therapeutic regimens for Aerozine-50 toxicity. Pyridoxine was found to be an effective treatment for a simulated inhalation and ingestion exposure in mice. The administration of phenobarbital in addition to pyridoxine was necessary to achieve 100% survival of mice simulating skin contamination. A possible therapeutic regimen for Aerozine-50 toxicity is discussed. (Author)

A70-19927 *

PHYSIOLOGICAL ENDPOINTS IN ACCELERATION RESEARCH.

Kenneth R. Coburn (NASA, Washington, D.C.).

Aerospace Medicine, vol. 41, Jan. 1970, p. 5-11. 13 refs.

The problem of duplicating acceleration environments in different laboratories is a difficult one. No two human centrifuges have quite the same performance characteristics and the geometries vary widely. Since the physiological response of man is in part dependent upon these characteristics several suggestions are put forth which could aid in establishing criteria which would enable closer duplication of a given acceleration environment. The location of anatomical structures with regard to geometric references is discussed. Within this context the commonly used physiological endpoints are briefly dealt with and relative advantages and disadvantages of each are mentioned. Certain aspects of the responsibility of the investigator are mentioned as are some aspects of experimentation in which the investigator may also be acting as one of his own subjects. (Author)

A70-19928

CARDIAC OUTPUT AND CORONARY BLOOD FLOW IN STEADY STATE EXERCISE DURING STEADY STATE HYPOXIA.

Philip C. Johnson, Roy J. Kelly, Wilbur L. Smith, Adrian D. LeBlanc, and Lawrence E. Lamb (Baylor University, Houston, Tex.).

Aerospace Medicine, vol. 41, Jan. 1970, p. 12-15.

Research supported by the Jewish Institute for Medical Research; PHS Grant No. HE-05435.

Study of the influence of exercise during hypoxia in 28 subjects accomplishing three different levels of steady-state work during steady-state hypoxia breathing 12% oxygen. Changes from baseline values of CO and systolic pressure correlated well with changes in coronary blood flow with Rb84 measurements, yielding a correlation coefficient of .951. Knowing the changes in CO and systolic pressure,

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the value of coronary blood flow with Rb84 can be estimated. The factors related to this correlation are discussed. The group had a higher value of coronary blood flow with Rb84 per unit of cardiac work than previously observed during exercise at room environment. (Author)

A70-19929

PREVENTION OF MISASSIGNMENTS AMONG VARIOUS AVIATION SPECIALTIES.

Rosalie K. Ambler, George M. Rickus, Jr., and R. F. Booth (U.S. Naval Aviation Medical Center, Aerospace Medical Institute, Pensacola, Fla.).

Aerospace Medicine, vol. 41, Jan. 1970, p. 15-17.

Technological developments continue to generate more intensive specialization in aviation training and to increase the number of advanced training specialties. The problem of assigning trainees to one among several training specialties makes it desirable that a methodology based on results from an unselected experimental sample, randomly assigned across the various specialties, be developed. This design is not feasible in an on-going training situation such as Naval Flight Officer advanced training because input quotas vary, personal choice must be considered, and a random placement approach is judged to be too costly. A personnel decision method that alters the traditional concept of 'assignment' to the concept of 'prevention of misassignment' has been introduced. Multiple regression analyses were applied to quantitative variables from initial screening and basic training for a sample of students from each type of advanced training. The dichotomous criterion of pass vs fail was used to develop prediction equations. These equations have been incorporated into a system that permits immediate feed-back information to personnel officers regarding whether a given personnel decision that they have under consideration would have a high or low probability of favorable outcome. Actuarial data have been obtained that demonstrate significant reduction in failure rates for two specialties with the highest attrition rates. (Author)

A70-19930

LIQUID CRYSTAL TRACE CONTAMINANT VAPOR DETECTOR WITH AN ELECTRONIC INPUT.

W. H. Toliver, Sr., J. L. Ferguson, E. Sharpless, and P. E. Hoffman (USAF, Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio).

Aerospace Medicine, vol. 41, Jan. 1970, p. 18-20.

Contract No. AF 33(615)-67-C-1496.

Trace contaminants such as cyclohexane, chloroform and benzene generate a color response in cholesteric liquid crystals. Combination of the response from two or more liquid crystal systems demonstrate a qualitative and quantitative analytical technique that is applicable to the detection of trace amounts of vapors. Photomultipliers make electronic detection possible. A table of relative responses indicates the factors that contribute to the liquid crystalline phenomenon. (Author)

A70-19931

INFLUENCE OF ROCKET NOISE UPON HEARING IN GUINEA PIGS.

Gerardo Gonzalez, Neil Miller, and Clifton Istre, Jr. (Tulane University, New Orleans, La.).

Aerospace Medicine, vol. 41, Jan. 1970, p. 21-25. 18 refs.

PHS-supported research.

Twenty guinea pigs were exposed to 6 minutes of high intensity rocket booster engine noise. The hearing of the animals were checked before and after exposure utilizing pure tones and the Preyer Reflex. Initial findings support both temporary threshold shift and permanent threshold shift for those animals closest to the engine. Overall sound pressure level readings at 150 feet and 300 feet were 146 dB and 140 dB, respectively. (Author)

A70-19932 *

QUANTITATION OF SERUM PROTEINS ON WHOLE BLOOD—RADIAL IMMUNODIFFUSION TECHNIQUE APPLICABLE TO CAPILLARY BLOOD.

Jane R. Kassay, Francisco Muniz, William C. Levin, and Stephan E. Ritzmann (Texas, University, Galveston, Tex.).

Aerospace Medicine, vol. 41, Jan. 1970, p. 26-28.

PHS Grant No. 5 P01 HE-10893-03; Contracts No. NAS 9-8122; No. NAS 9-8258.

Single radial immunodiffusion for the quantitation of serum proteins has been adapted to capillary blood. Concentrations of IgG, IgA and IgM were determined in 20 healthy adult persons and in 12 patients with various immunoglobulin abnormalities. Values obtained from capillary blood were 8.4 to 9.9 per cent, and those from venous blood were 3.4 to 7.6 per cent below the serum values, whereas, values from venous blood and capillary blood displayed little difference. Reproducibility was plus or minus 4.8 per cent (IgG), plus or minus 3.4 per cent (IgA) and plus or minus 5.2 per cent (IgM), sensitivity was at least 0.02 mg/ml. When equipment is limited, the use of prepared agar plates and fingerstick blood make this a simple technique yielding reliable information. (Author)

A70-19933 *

LOWER BODY NEGATIVE PRESSURE AS AN ASSAY TECHNIQUE FOR ORTHOSTATIC TOLERANCE. I.

Roger A. Wolthuis (Technology, Inc., Dayton, Ohio; NASA, Manned Spacecraft Center, Houston, Tex.), G. W. Hoffler, and R. L. Johnson (NASA, Manned Spacecraft Center, Cardiovascular Laboratory, Houston, Tex.).

Aerospace Medicine, vol. 41, Jan. 1970, p. 29-35. 12 refs.

Contract No. NAS 9-7675.

Seven male subjects each participated in six LBNP experiments. These experiments were separated by at least one week intervals and consisted of 15 minutes of -40 mm Hg LBNP. A trials by subject trend analysis was used to determine the presence or absence of change as a function of time for each measurement in each individual. Measurements showing a trend were characterized by slope and intercept; those not changing with time were averaged. The large, between individual variability of response in the present study indicated that -40 mm Hg is not an optimal level for all subjects where LBNP is used as an orthostatic assay test; the level of reduced pressure used must be tailored to each individual response. In addition, the week to week response variability within each subject was substantial, indicating the difficulty in establishing a valid normal response by a fixed set of trials. (Author)

A70-19934

DELETERIOUS EFFECTS OF CIGARETTE SMOKING AND 100% OXYGEN ON AIRCREW MEMBERS IN HIGH PERFORMANCE AIRCRAFT.

William H. Browning (U.S. Navy, Naval Air Test Center, Patuxent River, Md.).

Aerospace Medicine, vol. 41, Jan. 1970, p. 39-42. 7 refs.

Results of comparative vital capacity measurements made preflight and postflight on jet fighter aircrew breathing 100% oxygen during one hour missions involving brief periods of practice air combat maneuvering at G forces from +0.5 to +6.5. During high G profiles, there was a 7% average loss of vital capacity in flight, with a range from 0 to 37%. Half of the subjects had not recovered the lost volume 30 minutes after landing. Smokers had an in-flight volume loss that was 3½ times that noted among nonsmokers under high G conditions. Nonsmokers had no in-flight loss under low G conditions. Control runs on 20% oxygen-80% air showed no in-flight volume loss. It was concluded that 100% oxygen has a deleterious effect on aircrew members in the air combat environment. This effect is grossly aggravated among cigarette smokers. (Author)

A70-19935 *
EFFECTS OF HYPEROXIA ON RED BLOOD CELL SURVIVAL IN THE NORMAL RAT.

Stephen A. Landaw, H. Saul Winchell (California, University, Berkeley, Calif.), and Henry A. Leon (California, University, Berkeley; NASA, Ames Research Center, Moffett Field, Calif.).
Aerospace Medicine, vol. 41, Jan. 1970, p. 48-55. 22 refs.
 AEC Contract No. W-7405-eng-48.

Investigation of red blood cell (RBC) survival in rats continuously exposed to 100% O₂ at 197 to 450 torr, using the endogenous production of isotopic carbon (C14) monoxide following glycine-2-C14 injection. Following 105 days of exposure red cell mass remained normal, and survival of RBC labeled after the initiation of exposure was normal. For RBC labeled 55 days before exposure, an increased destruction rate was seen, while for RBC labeled 14 days before exposure only a minimal acceleration of senescence was observed. In aquanauts exposed to a pO₂ of 219 torr for 7 to 13 days, no alteration in red cell mass or plasma iron turnover rate was seen. These studies indicate relatively normal erythropoiesis in animals and men subjected to such hyperoxia.

M.V.E.

A70-19936 *
ROLE OF LIPIDS IN DECOMPRESSION SICKNESS.

Stephen M. Pauley (Harbor General Hospital, Torrance, Calif.) and A. T. K. Cockett (Rochester, University, Rochester, N.Y.).
Aerospace Medicine, vol. 41, Jan. 1970, p. 56-60. 52 refs.
 Contract No. NRO-0014-66-CO-295; Grant No. NsG-237-62.

Decompression sickness can no longer be thought of simply as the result of nitrogen bubbles being liberated from solution. The many similarities between fat embolism and decompression sickness have been mentioned and provide the basis for a more complete understanding. Changes in lipid stability probably occur as a result of tissue injury to the liver from nitrogen bubbles. The liver extrudes unstable lipids which may form emboli that occlude the pulmonary vasculature. Rheological changes, i.e., sludging of red blood cells and platelets, occur as a result of the unstable lipids and the bubbles themselves. This results in poor tissue perfusion, vascular damage and extravasation of plasma into extravascular spaces. Shock ensues. Fat enters the systemic arterial circulation via the damaged pulmonary vessels, a-v shunts and/or patent foramen ovals. Prompt treatment is necessary. If lipid emboli are numerous and treatment is delayed, the patient will expire. Immediate treatment with low molecular weight dextran, heparin, and oxygen, are indicated. Heparin in low doses (50 milligrams subcutaneously or intravenously every six hours) may be given without worry of bleeding. Clotting times must be followed. Low molecular weight dextran (500 to 1000 cc per 24 hours) should be given. The use of heparin and low molecular weight dextran may be life saving because frequently the patients reach recompression chambers many hours after altitude and diving accidents occur. Steroids may be beneficial in high doses (1-5 gm/day). (Author)

A70-19937 *
RENAL FUNCTION, WATER AND ELECTROLYTE EXCHANGE DURING BED REST WITH DAILY EXERCISE.

James H. Fuller, Edmund M. Bernauer, and William C. Adams (California, University, Davis, Calif.).
Aerospace Medicine, vol. 41, Jan. 1970, p. 60-72. 33 refs.
 Grant No. NGR-05-004-021.

Investigation of the effect of leg exercise on renal function, electrolyte and water metabolism during bed rest. Eight young adult males underwent nine days of continuous recumbency, during which half exercised 30 min twice daily on a horizontal bicycle ergometer, while the remainder served as controls. Ten days before, and during bed rest, metabolic exchange of water, sodium, potassium, and chloride was calculated; seven days following bed rest, water and electrolyte input was ad libitum and output was measured. Lean body mass (LBM), body fat and total body potassium were measured before and after bed rest. On the first day of recumbency, urinary volumes were increased by 11% and 18%, sodium balance was -71 mEq and -109 mEq, and chloride balance was -61 mEq and -74 mEq

in the exercise and control groups, respectively. Thereafter, these parameters were slightly increased, whereas potassium excretion remained elevated throughout bed rest, with a cumulative loss of 80 mEq in the exercise and 174 mEq in the control group. Loss of LBM and total body potassium and gain of body fat was two to three times greater in the controls. It is concluded that the major influence of exercise consists in the attenuation of degenerative changes in certain maintenance systems—i.e., contraction of plasma volume, elevation of renal plasma flow, and glomerular filtration. M.V.E.

A70-19938 *
PROGRESSIVE ADAPTATION TO CORIOLIS ACCELERATIONS ASSOCIATED WITH 1-RPM INCREMENTS IN THE VELOCITY OF THE SLOW ROTATION ROOM.

James T. Reason and Ashton Graybiel (U.S. Naval Aviation Medical Center, Aerospace Medical Institute, Pensacola, Fla.).
Aerospace Medicine, vol. 41, Jan. 1970, p. 73-79. 5 refs.
 NASA Contract No. R-93.

The purpose of this experiment was to answer specific questions relating to the design of an adaptation schedule effective in protecting against motion sickness in a rotating environment. Ten men with normal vestibular function executed controlled head and body movements at each of ten 1-rpm step increases in the velocity of the Pensacola Slow Rotation Room. On the completion of every movement, subjects were required to indicate whether or not they had detected sensations of vestibular or somatosensory origin. At each velocity step, the movements were continued until each of 24 consecutive movements had elicited a negative response and the subject was judged to be symptom free. When this arbitrary adaptation criterion was reached, the angular velocity was increased by 1 rpm and the procedure repeated. On attaining the criterion at the terminal velocity (10 rpm), the rotation was stopped and the postrotatory phenomena were investigated using the same techniques. The principal finding was that the number of movements necessary to achieve the adaptation criterion was systematically related to the absolute level of angular velocity. Considerably more head and body movements were required to reach the same level of adaptation at faster speeds than at slower speeds, even though the size of the step increment remained constant. There was some evidence to indicate that the amount of stimulation to criterion depended upon the initial magnitude of sensation elicited by the increment. There were also wide individual differences in both the rate of adaptation and the minimum velocity necessary to evoke sensation. (Author)

A70-19939 #
VISUAL ACUITY DECREMENTS ASSOCIATED WITH WHOLE BODY PLUS OR MINUS G_Z VIBRATION STRESS.

Charles R. O'Brian and Morton K. Ohlbaum (USAF, Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio).
Aerospace Medicine, vol. 41, Jan. 1970, p. 79-82. 10 refs.

The fact that vibration has an adverse effect on visual acuity is well established but inadequately quantified. The operational acceleration environments of low altitude terrain avoidance flight, the increasing use of helicopters, and the potential vibration problems associated with space flight launch and reentry all require a better understanding of visual performance under this stress. This study demonstrates that near, intermediate, and distant vision are differentially degraded under vibration stress. A method is presented to describe visual efficiency in terms of a Performance Index that should be useful to aeromedical scientists and clinicians, as well as design engineers. (Author)

A70-19940
PSYCHIATRIC DISORDERS AFFECTING CIVIL AIRCREW IN THE FIFTH AND SIXTH DECADES.

J. R. B. Ball (Melbourne, University, Melbourne; Mental Health Authority, Victoria, Australia).
Aerospace Medicine, vol. 41, Jan. 1970, p. 83-87.

A70-19941

A general review is attempted of psychiatric problems which are of importance during the fifth and sixth decades. In most of the areas considered, opinions either are based on personal experience, or that of colleagues. Illustrative case material is however, not used here because of limitation of space. Neurotic problems would seem to be the most common of all disorders but the various psychotic breakdowns would most often lead to suspension or loss of licence. Attention is also paid to the physician's role in producing iatrogenic forms of psychiatric disorder, and the complications of treatments for psychiatric illnesses. (Author)

A70-19941

PSYCHOLOGICAL MEASURES IN AIRCREW.

A. B. Goorney (Maudsley Hospital, London, England).
Aerospace Medicine, vol. 41, Jan. 1970, p. 87-91. 29 refs.

Fifty operational aircrew of the Royal Air Force each completed (1) a questionnaire of family and personal psychiatric histories, (2) a 'flying situation anxiety rating scale' and (3) the Maudsley and Minnesota Multiphasic Personality Inventories (MPI and MMPI). The investigation was made to obtain details for comparison of flying anxiety casualties from the same population. Eight per cent gave positive family histories of neurosis, 36% personal histories of childhood neurotic traits or timidity, 18% of loss of a parent before age 16. The MPI neuroticism mean score is significantly below and the extraversion mean score above the general population means. The MMPI raw score means closely resemble American aircrew means which differ significantly from the original normative data. Principal Component Analysis reveals 4 major factors within the MMPI. Factors I and II correspond to the MPI neuroticism and extraversion dimensions. (Author)

A70-19942

AEROMEDICAL CONSULTATION SERVICE CASE REPORT—HEMIDIAPHRAGMATIC PARALYSIS.

Earl A. Zimmerman, Thomas M. Zizic, and Timothy N. Caris (USAF, School of Aerospace Medicine, Brooks AFB, Tex.).
Aerospace Medicine, vol. 41, Jan. 1970, p. 92-94. 17 refs.

Paralysis of the hemidiaphragm is usually a manifestation of significant underlying disease. More recently, instances of such a disorder without cause and with a benign course have been recognized. A case of an asymptomatic pilot with idiopathic paralysis of the hemidiaphragm is presented. The clinical picture and aeromedical significance is discussed. (Author)

A70-19943

VISUAL FIELDS IN PARACHUTISTS.

Robert D. Lawrence (U.S. Navy, Naval Air Facility, El Centro, Calif.).
Aerospace Medicine, vol. 41, Jan. 1970, p. 94, 95.

Visual aberrations reported by test parachutists prompted a study of their visual fields to determine if temporary or permanent visual field injury resulted from parachuting. Parachutists had identical baseline fields when compared to a control group of hospital corpsmen. Pre- and post-jump fields were identical for each parachutist, even in jumps in which visual symptoms were reported. Types of visual symptoms in parachutists are described and possible mechanisms are discussed. It is concluded that there is neither temporary nor permanent visual field injury due to parachuting measurable by the technics used in this study. (Author)

A70-19944

PRONENESS TO SYNCOPE OF PILOTS WHO HAVE REPORTED INCIDENTS OF IMPAIRED CONSCIOUSNESS IN FLIGHT.

P. D. Newberry and A. W. Hatch (Canadian Forces Institute of Environmental Medicine, Toronto, Canada).
Aerospace Medicine, vol. 41, Jan. 1970, p. 96-98.

Search for a correlation between proneness to syncope and

episodes of impaired consciousness in pilots during flight. These unexplained episodes suggested the hypothesis that orthostatic syncope might be a major factor among their causes. In order to test this hypothesis, 30 orthostatic-syncope faints were induced in 19 healthy adult males and nine faints in nine aircrewmembers who had reported incidents of impaired consciousness in flight. The mean time to faint was of 8.8 min for the male adults as against 8.2 min for the aircrewmembers. This absence of any significant difference suggests that the factors responsible for orthostatic syncope in these tests are not the major factors responsible for physiological air incidents. M.V.E.

A70-20045

PERCEPTION OF THE VERTICAL WITH BODY TILT IN THE MEDIAN PLANE.

Sheldon M. Ebenholtz (Wisconsin, University, Madison, Wis.).
Journal of Experimental Psychology, vol. 83, Jan. 1970, p. 1-6. 12 refs.
NIH Grant No. MH-13006-03.

In one experiment, 42 subjects were tilted backward in the median plane at angles ranging from 0 (upright) to 90 deg (supine). The subject's task was to set a luminous rod to the apparent vertical, with the rod rotating in the median plane. With slight modification, a second experiment replicated this condition and, in addition, investigated the perception of the upright with lateral tilts of the subject, the line rotating in the frontal plane. Estimates of apparent body orientation (ABO) were also taken. The main results show that A effects and E effects occur with both backward and lateral body tilt. In the former case, ABO was increasingly overestimated as tilt increased. Errors in estimating lateral body tilt first increased, then decreased, and finally showed underestimation at 90 deg. The data are discussed in the context of the constancy of object orientation. (Author)

A70-20046 *

RETROACTIVE INTERFERENCE IN SHORT-TERM RECOGNITION MEMORY FOR PITCH.

Dominic W. Massaro (California, University, San Diego, Calif.).
Journal of Experimental Psychology, vol. 83, Jan. 1970, p. 32-39. 16 refs.
Grant No. NsG(T)-137.

The present studies were carried out to investigate the effects of different retroactive stimuli on pitch discrimination in a short-term recognition memory task. Tones, Gaussian noise, and 'blank' stimuli were employed in the retroactive (interference) interval. The effects of different stimuli in the interference interval are highly dependent on the strategies of S. Tones or noise in the interference (I) interval produce more forgetting than blank I intervals. This result cannot be attributed to the fact that Ss may have rehearsed or hummed the tone during the blank I interval. Therefore, the decrease in accuracy of perceptual memory over time with filled I intervals was attributed to interference rather than decay. A storage-forgetting model of perceptual memory described the quantitative results accurately. (Author)

A70-20047

DIVIDED ATTENTION—A VEHICLE FOR MONITORING MEMORY PROCESSES.

William A. Johnston, Seth N. Greenberg, Ronald P. Fisher, and David W. Martin (Ohio State University, Columbus, Ohio).
Journal of Experimental Psychology, vol. 83, Jan. 1970, p. 164-171. 22 refs.

Contract No. AF 33(615)-68-C-1656.

In four experiments, S performed a tracking task and a verbal task concurrently. The difficulty of word encoding (presentation rate and signal-to-noise ratio) was varied in Exp. I, that of word retention (number of words) was varied in Exp. II, and that of word recall (restriction on output order) was varied in Exp. III and IV. Tracking error was a direct function of the difficulty of the verbal task in all

experiments (p less than .001). The results document the utility of divided attention as a means of monitoring information processing during the encoding, retention, and recall of words. (Author)

A70-20050

STRUCTURAL AND FUNCTIONAL CHANGES IN DNA AFTER EXPOSURE TO HYDROGEN ATOMS AND GAMMA RADIATION.

H. Jung, U. Hagen, M. Ullrich (Karlsruhe, Kernforschungszentrum, Karlsruhe, West Germany), and E. E. Petersen (Karlsruhe, Kernforschungszentrum, Karlsruhe; Freiburg, Universität, Freiburg im Breisgau, West Germany).

Zeitschrift für Naturforschung, Teil b, vol. 24b, Dec. 1969, p. 1565-1573. 33 refs.

The action of hydrogen atoms—generated in an electrodeless high frequency gas discharge—on calf thymus DNA in aqueous solution was investigated. The loss of priming activity was compared with the appearance of single strand breaks in native and denatured DNA, double strand breaks, denatured zones, base damage and rupture of hydrogen bonds. The primary lesions after exposure to H atoms and gamma radiation, respectively, are single strand breaks and base damage. Double strand breaks originating from accumulation of single breaks, and rupture of hydrogen bonds caused by single breaks and base damage, were identified as secondary lesions. In relation to strand breaks arising from radical attack on the sugar-phosphate backbone of the DNA molecule, base damage is about 12.5 times more frequent after H-exposure than after gamma-irradiation. It is concluded from this observation, that single strand breaks are the predominant critical lesions responsible for the loss of the functional activity of DNA. (Author)

A70-20171

EFFECTS OF A QUANTITATED PHYSICAL TRAINING PROGRAM ON MIDDLE-AGED SEDENTARY MEN.

Wayne Siegel (U.S. Public Health Service, Washington, D.C.), Gunnar Blomqvist (American Heart Association, New York, N.Y.), and Jere H. Mitchell (Texas, University, Dallas, Tex.).

Circulation, vol. 41, Jan. 1970, p. 19-29. 27 refs.

Research supported by the Texas Heart Association, the Tarrant County Heart Association, and the Southeast Texas Health Foundation; PHS Grant No. HE-06296.

The effects of a 15-week quantitated training program were evaluated in nine men, 32 to 59 years old. All had been blind for 10 years or more but were otherwise in good health. They were sedentary with a stable activity pattern. Training sessions were held three times per week and consisted of four 3-minute exercise periods on a bicycle ergometer, each followed by a rest period of equal duration. Heart rates at the end of the fourth exercise period averaged 27 beats below individual maximal heart rates. Maximal oxygen uptake increased from 24.0 to 28.5 ml/kg x min or by 19%. Total heart volume and mean serum cholesterol decreased significantly, and psychological tests showed improvement. Five subjects continued exercising at the same intensity but only once weekly for another 14-week period. Mean maximal oxygen uptake decreased to 6% above the control level. Four subjects who discontinued training after 15 weeks were retested at the same time and had a mean value 5% below control maximal oxygen uptake. (Author)

A70-20196

A VIBROPHONOCARDIOGRAM CARDIAC-OUTPUT COMPUTER.

S. A. White (North American Rockwell Corp., Anaheim, Calif.), F. B. Wade (American Data Systems, Chatsworth, Calif.), and D. M. Walton (Beckman Instruments, Inc., Fullerton, Calif.).

Medical Research Engineering, vol. 8, Dec. 1969, p. 13-18. 8 refs.

Vibrophonocardiography provides a noninvasive technique to determine the cardiac stroke-volume output. A cardiac-output computer is described that computes heart rate, isovolumetric contraction time, ejection time, stroke volume, and cardiac output, using signals obtained from precordial vibrations. The prior work

that provides the referenced basis for this on-line computer had historically used an off-line general-purpose computer to reduce laboratory or clinical cardiac data. The machine described in this paper is an on-line device that computes the above-mentioned cardiac parameters on a stroke-by-stroke basis and provides both visual displays and buffered analog voltages proportional to these parameters. This rather simple computer has been constructed from off-the-shelf components, and preliminary laboratory tests have been conducted. (Author)

A70-20197

DIGITIZING RECORDS OF CARDIOVASCULAR STUDIES—THE GRAPH DIGITAL READER.

Edward J. Reininger (McGill University, Montreal, Canada).

Medical Research Engineering, vol. 8, Dec. 1969, p. 19-23. 21 refs.

Medical Research Council of Canada Grant No. MA-2179.

A graph digital reader was developed to facilitate reading the Y values of records at equal intervals along the horizontal or X axis. This electromechanical instrument is operated by actuating motors in order to superimpose the cross hairs set at right angles over the record. Then the values of Y and X are printed on a paper tape. This instrument may have applications other than computing cardiac output, mean systolic blood pressure, and mean diastolic blood pressure; but, as an example, digitizing indicator-dilution curves in the semiautomatic computation of cardiac output and determining the average maximum (peak) or minimum (trough) values of cyclical physiological events are considered. (Author)

A70-20213 *

AUDITORY AVERAGED EVOKED POTENTIALS IN MAN DURING SELECTIVE BINAURAL LISTENING.

D. B. D. Smith, E. Donchin, L. Cohen, and A. Starr (NASA, Ames Research Center, Moffett Field; Stanford University, Palo Alto, Calif.).

Electroencephalography and Clinical Neurophysiology, vol. 28, Feb. 1970, p. 146-152. 21 refs.

Average evoked potentials (AEPs) to clicks were obtained while a subject performed a selective listening task: the stimuli consisted of a series of numbers, letters and clicks, with separate series presented to each ear. Subjects were instructed to attend to one or the other ear and at different times to report the letters or clicks. The results show enhancement of a late positive component of the click AEP when clicks, but not when letters were reported. No differences in the AEP were found for those clicks presented in the attended ear as compared to those in the rejected (non-attendant) ear. (Author)

A70-20214 *

EFFECT OF BINOCULAR FUSION AND BINOCULAR RIVALRY ON CORTICALLY EVOKED POTENTIALS.

James Ingram Martin (Arizona, University, Tucson, Ariz.).

Electroencephalography and Clinical Neurophysiology, vol. 28, Feb. 1970, p. 190-201. 14 refs.

Grant No. NGR-03-002-068.

The purpose of the experiment was to determine the effects of conditions of binocular fusion and binocular rivalry on the cortically evoked potential of adult human subjects. Two stimulus patterns were employed to obtain pattern-characteristic responses to monocular and binocular presentation, together with the subject's perceptual judgement of dominance in conditions of rivalry, yielded 12 different experimental conditions. Correlations and t-statistics were computed for the evoked potentials obtained under several combinations of experimental conditions. The results of the study indicate that the physiological record obtained under conditions of binocular stimulation is not composed of equal contributions from each monocular source. There was no apparent definite relation between the pattern which was perceived under conditions of rivalry and the resulting wave form of the evoked potential. The utilization of cortically evoked potential as a physiological indicator of subjective

phenomena under conditions of binocular rivalry does not appear to be substantiated. A form of electrophysiological dominance appears to exist which seems to be unrelated to either momentary or general perceptual dominance, but may be related to an interaction of the eye-of-origin with the physical characteristics of the stimulus.

(Author)

A70-20222

TOXIC GAS CONTAMINANTS IN ENCLOSED ENVIRONMENTS.

N. L. Crump and T. T. Bartels (McDonnell Douglas Corp., Engineering Laboratories, St. Louis, Mo.).

Contamination Control, vol. 9, Jan. 1970, p. 20-23, 25.

Development of a device for collecting samples of toxic gases from enclosed atmospheres and quantitatively determining the concentration of contaminants by analytical instrumentation. This unit is fabricated from a two-liter round-bottom glass flask and is equipped with two side-arm Teflon-plugged stopcocks angled at 90 degrees. The third side-arm carries a stainless steel fitting in which a rubber septum is fitted. The two stopcocks are used as inlet ports for collecting the sample, purging the system, and cleaning. The rubber septum serves as a port for syringe withdrawal of the sample. Z.W.

A70-20469

The physiology of high altitude.

Raymond J. Hock (Nevada, University, Las Vegas, Nev.). *Scientific American*, vol. 222, Feb. 1970, p. 52-58, 60-62.

Study of the stresses of life at high altitude, notably the lack of oxygen, to meet which a number of changes in body processes are required. It appears from a study of Peruvian Indians that 17,500 ft is the highest altitude at which even acclimatized man can live permanently. High altitude man in the Andes and the Himalayas appears to possess unusual physiological capabilities, which are evidenced by his physiological responses to hypoxia. Investigations made on the deer mouse, which has the ability to live in all climatic zones except extreme desert, are discussed. It appears that mountain natives, both animals and men, show innate physiological differences from their kindred species at sea level. There is a serious objection to considering them a separate strain, however: the lack of genetic isolation. F.R.L.

A70-20476 *

Behavioral contrast and inhibitive stimulus control.

Matthew Yarczower (Bryn Mawr College, Bryn Mawr, Pa.). *Psychonomic Science*, vol. 18, Jan. 10, 1970, p. 1-3. PHS Grant No. MH-08819; Grant No. NGR-39-018-002.

Assessment of the relation between certain response rate changes during discriminative training and inhibitive stimulus control. Inhibitive stimulus control was present early in discriminative training but weakened with continued exposure to the same discriminative training procedures. Presence and absence of inhibitive stimulus control appeared to be related to the presence or absence of behavioral contrast. M.V.E.

A70-20477

Hypoxia and retrograde amnesia.

E. H. Galluscio and A. Grant Young (Louisiana State University, Baton Rouge, La.). *Psychonomic Science*, vol. 18, Jan. 10, 1970, p. 17, 18. 7 refs. Research supported by the Graduate Research Council.

Investigation of the relationship between hypoxia and recent memory loss. Sixteen albino rats were trained to lever press for sucrose and were subjected to one of four treatments: shock only, hypoxia only, shock plus rapid decompression, and shock plus delayed decompression. Results showed that hypoxia following rapid decompression produced amnesia for the foot shock. M.V.E.

A70-20481

Visual aspects.

James R. Hanson. *Air Line Pilot*, vol. 39, Jan. 1970, p. 9.

Discussion of the significance of the understanding of visual collision avoidance for reducing the number of mid-air collisions. Important factors for avoiding collisions are discussed. It is pointed

out that the moving target attracts attention and, therefore, is not hard to see, while the stationary target does not attract attention and is the only target which causes a mid-air collision. G.R.

A70-20550

Proton irradiation of the microorganisms

Micrococcus radiodurans and *Sarcina flava* placed in a meteorite (Obluchenie protonami mikroorganizmov *Micrococcus radiodurans* i *Sarcina flava*, pomeschennykh v meteorit). G. P. Vdovykin, S. S. Abyzov, and T. I. Vdovykina (Akademii Nauk SSSR, Institut Geokhimii i Analiticheskoi Khimii and Institut Mikrobiologii, Moscow, USSR). *Akademiia Nauk SSSR, Doklady*, vol. 189, Nov. 1, 1969, p. 192-195. 15 refs. In Russian.

Experimental study of the resistance of two types of microorganisms (*Micrococcus radiodurans* and *Sarcina flava*) placed in a specimen from the carbonaceous chondrite Migei to irradiation by 600-MeV protons. It is shown that even such radiation-resistant microorganisms as *Micrococcus radiodurans* are destroyed by the action of the penetrating radiation doses used in this experiment. It is thought highly unlikely that microorganisms, even if present at one time in the surface areas of the parent bodies of meteorites, could have survived exposure to high-energy cosmic and solar radiation. The presence of microorganisms on the lunar surface is therefore regarded as doubtful. A.B.K.

A70-20629

Effects of hyperbaric oxygenation on metabolism.

VI—Efficacy of protective agents at 5, 7, 9, and 11 atmospheres of 100% oxygen. William D. Currie, Robert M. Gelein, Jr., and Aaron P. Sanders (Duke University, Durham, N.C.). *Society for Experimental Biology and Medicine, Proceedings*, vol. 133, Jan. 1970, p. 103-105. 7 refs. PHS Grant No. GM-14226-03; Contract No. N 00014-67-A-0251-0002.

Description of the relative protective ability at 5, 7, 9, and 11 ATA of a group of compounds including sulfhydryl compounds, an acid-base buffer, a neuronal inhibitor, and some substrates of oxidative phosphorylation. In experiments on rats it was found that at 5, 7, 9, and 11 ATA of 100% O₂, Cysteine plus succinate offers the greatest protection against O₂ toxicity. Succinate is the most effective single compound for protection against O₂ toxicity. M.M.

A70-20630 *

Life support for large space stations.

T. C. Secord (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.) and A. L. Ingelfinger (NASA, Office of Advanced Research and Technology, Washington, D.C.). *Astronautics and Aeronautics*, vol. 8, Feb. 1970, p. 56-64. 12 refs.

Evaluation of regenerative systems for 1971 to 1975 which will purify air and could reclaim water, and of systems for 1975 to 1980 which could recover oxygen as well. Regenerative systems must have enough reliability and maintainability to operate indefinitely with larger crews with minimum penalties in expendables, power consumed, and fixed weight. Subsystem concepts that offer the most promise in the fields of atmospheric supply, oxygen recovery, carbon dioxide removal and concentration, and water and waste management are discussed. An advanced life support system would recover oxygen with solid electrolyte, remove carbon dioxide in a carbonation cell, and recover water from urine by vapor diffusion. A waste-management subsystem would collect, treat, and store human wastes, used food packages, unused foods, and other refuse. Various systems now under development are briefly described. F.R.L.

A70-20673

Light deflection.

Donald H. McMahon and James B. Thaxter (Sperry Rand Research Center, Sudbury, Mass.). *Sperry Rand Engineering Review*, vol. 22, no. 3, 1969, p. 18-25. 22 refs.

Light beam deflection provides a new method for creating visual displays. Several techniques for producing time-varying displays have been proposed and systematically investigated. These include mechanically driven scanners, acousto-optic analog light beam deflectors, electro-optic prism deflectors, and digital light deflectors. Alternatively, the application of holographic techniques provides a

means for producing three-dimensional fixed display patterns. The past development of the deflection and holographic techniques indicates that they can be profitably combined. (Author)

A70-20675 Visual suitability—A primary factor in head-up displays. Theodore Gold (Sperry Rand Corp., Great Neck, N.Y.) and Edwin F. Potter. *Sperry Rand Engineering Review*, vol. 22, no. 3, 1969, p. 37-43. 5 refs.

Discussion of optical suitability to the visual requirements of pilots as an important consideration in the design of head-up displays. Optical parameters in projection displays are examined. A telecentric viewed system is discussed which was developed to permit binocular disparity tests to be accomplished with dynamic head-up display imagery. Applications of the tests to the optical design of two head-up display systems are described. G.R.

A70-20676 Electronic analysis of the pulmonary function (Elektronische Lungenfunktionsanalyse). Willy Frank (Siemens AG, Erlangen, West Germany). *Elektronik*, vol. 19, Jan. 1970, p. 19, 20. In German.

Discussion of an electronic approach to pulmonary analysis which provides an objective method for measuring the impediment of the passage of the inhaled and exhaled air. The method discussed makes it possible to measure the bronchial flow resistance. An advantage of this method is the wide range of its application in cases of chronic-obstructive bronchitis and in investigations of pharmacodynamic effects. G.R.

A70-20680 * The study of ionizing radiation effects on *Escherichia coli* by density gradient sedimentation. C. E. Hildebrand and E. C. Pollard (Pennsylvania State University, University Park, Pa.). *Biophysical Journal*, vol. 9, No. 1969, p. 1312-1322. 11 refs. Grant No. NGR-39-009-008.

Classification of irradiated cell populations separated by viability, ability to synthesize DNA, and relative content of DNA. Density gradient sedimentation of bacterial cells in cesium chloride has been used to separate cells which have been irradiated with Co60 gamma rays and have lost an appreciable amount of their DNA by subsequent degradation. Analysis of the cell populations in terms of numbers of cells having intact DNA and those having degraded DNA indicates a strong correlation between DNA degradation and cell death, and suggests that DNA degradation is a major but not the only cause of cell death. M.V.E.

A70-20681 * Division patterns from single *Escherichia coli* cells. Warren G. Yeisley and Ernest C. Pollard (Pennsylvania State University, University Park, Pa.). *Biophysical Journal*, vol. 9, July 1969, p. 925-949. 21 refs. Grant No. NGR-39-009-008.

Description of a method for studying the division of single bacterial cells in a uniform environment and review of the observations made. Under optimal conditions the daughters of one single cell are found to divide at different times, a fact which indicates that they are not identical. The spread in generation times can be estimated quantitatively. When cells are irradiated with gamma rays in nutrient broth there is an increase in the spread in generation times, and the number of three-cell progeny rises. The results are consistent with the idea that damage to a segment of DNA has taken place and that there are three growing points on the DNA at any one time. M.V.E.

A70-20696 # Problems in the dynamics of a 'machine/operator' system (Voprosy dinamiki sistemy 'mashina-operator'). V. L. Veits and L. G. Shrago. In: Machine dynamics (Dinamika mashin). (A70-20693 08-15) Edited by S. N. Kozhevnikov. Moscow, Izdatel'stvo Mashinostroenie, 1969, p. 89-99. 10 refs. In Russian.

Description of the dynamic properties of a human operator working to maintain a given process parameter. A justification of a continuous model adopted for the operator is given, taking into

account his learning. A system of differential equations describing the dynamic processes in a closed 'machine/operator' system is obtained, taking into account the statistical character of the external perturbations and errors in measuring the mismatch of the controlled parameter. The range of stability of the system is established. The conditions determining the oscillatory nature of the transients are ascertained, and criteria for judging the quality of the transients are obtained. A study is made of the effect of the psychophysiological characteristics of the operator on the dynamic properties of a 'machine/operator' system, and problems concerning the dynamic accuracy of maintaining a control parameter are considered. The basic conditions for synthesizing the parameters of a machine which is optimal relative to the operator are formulated. A.B.K.

A70-20719 # Significance of the parathyroid glands in the mechanism of adaptation to hypoxia (O znachenii okoloshchitovidnykh zhelez v mekhanizme prisposobleniia k gipoksii). O. G. Lorents and L. N. Krugliak (Tadzhikskii Gosudarstvennyi Meditsinskii Institut, Dushambe, Tadzhik SSR). *Akademiia Nauk Tadzhikskoi SSR, Doklady*, vol. 12, no. 8, 1969, p. 60-63. In Russian.

Study of the high-altitude stability of parathyroidectomized rats, and determination of the possibility of adaptation of these rats to conditions of chronic hypoxia. It is shown that parathyroidectomy is accompanied by an increase in the secretor activity of the adrenal cortex and a decrease in high-altitude stability. In operated rats exposed to chronic hypoxia an increase in the quantity of red corpuscles and hemoglobin, as well as an increase in high-altitude stability, occurs to the same extent as in normal rats. Consequently, removal of the parathyroid glands does not preclude the possibility of adaptation of the organism to an oxygen deficiency. However, owing to the great stress arising from the secretor activity (close to the physiological limit) of the adrenal cortex, it is to be expected that an increase in activity or degree of hypoxia will accelerate functional exhaustion of the adrenal glands. A.B.K.

A70-20724 * Effects of near-zero magnetic fields upon biological systems. Charles C. Conley (NASA, Ames Research Center, Experimental Pathology Branch, Moffett Field, Calif.). In: Biological effects of magnetic fields. Volume 2. Edited by M. F. Barnothy. New York, Plenum Press, 1969, p. 29-51. 46 refs.

Study of the influence of near-zero magnetic fields upon biological systems as basis for an evaluation of the effect of the absence of the terrestrial magnetic field on astronauts. Techniques for produced low magnetic fields are considered and a number of in vivo and in vitro investigations are discussed. As a result of the studies it is suggested that any biological influence which magnetic fields do exert may be detectable only in cases of fairly prolonged exposure of complex sequences of cellular or biochemical events rather than in systems involving the instantaneous application of a direct magnetic force upon a single, specific chemical reaction. G.R.

A70-20726 Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, 192 p. In Russian.

Contents:

Courses of the development of the physiology of vision and of physiological optics in the USSR over 50 years (Puti razvitiia fiziologii zreniia i fiziologicheskoi optiki v SSSR za 50 let). V. G. Samsonova (Akademiia Nauk SSSR, Institut Vyshei Nervnoi Deiatel'nosti i Neirofiziologii, USSR), p. 3-7.

Physiology of human vision and simulation of the visual system (Fiziologiya zreniia cheloveka i modelirovanie zritel'noi sistemy).

Simulation of the color vision process in man (Modelirovanie protsessa tsvetovogo zreniia u cheloveka). D. A. Shklover (Vsesoiuznyi Nauchno-Issledovatel'skii Svetotekhnicheskii Institut,

Moscow, USSR), p. 8-18. 25 refs. (See A70-20727 08-05)

Certain psychophysiological regularities of color perception described by a nonlinear model (O nekotorykh psikhofiziologicheskikh zakonmernostiakh vospriiatiia tsveta, opisivaemykh nelineinnoi model'iu). A. B. Matveev (Moskovskii Energeticheskii Institut, Moscow, USSR), p. 19-26. 10 refs. (See A70-20728 08-04)

Deductive construction of a model for the lower metric of color (Deduktivnoe postroenie modeli nizshei metriki tsveta). Iu. P. Shabanov-Kushnarenko (Khar'kovskii Institut Radioelektroniki, Kharkov, Ukrainian SSR), p. 27-29. 8 refs. (See A70-20729 08-05)

Operator analysis of electroretinograms (Operatorni analiz elektroretinogramm). D. S. Melkonian and L. G. Barsegian (Erevanskii Institut Uovershenstvovaniia Vrachei, Yerevan, Armenian SSR), p. 30-38. 9 refs. (See A70-20730 08-05)

Possible forms of color vision (Vozmozhnye formy tsvetovogo zreniia). N. V. Lobanov (Gosudarstvennyi Opticheskii Institut, Leningrad, USSR), p. 39-42. 5 refs. (See A70-20731 08-04)

Methods of spectral indication (Metody spektral'noi indikatsii). E. B. Rabkin (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Zheleznodorozhnogo Transporta, Moscow, USSR), p. 43-48.

Light and color thresholds of lights on a background of different brightness (Svetovye i tsvetovye porogi ognei na fone raznoi iarkosti). R. L. Fol'b and S. V. Voronina (Vsesoiuznyi Nauchno-Issledovatel'skii Svetotekhnicheskii Institut, Moscow, USSR), p. 49-53. 18 refs. (See A70-20732 08-04)

Color discrimination in persons with low vision (Tsvetozazhlenie u lits s nizkim zreniem). A. I. Kaplan (Nauchno-Issledovatel'skii Institut Defektologii, Moscow, USSR), p. 54-56.

Microinterval analysis of the development of visual perceptions (Mikrointerval'nyi analiz razvitiia zritel'nykh oshchushchenii). P. O. Makarov (Leningradskii Gosudarstvennyi Universitet, Leningrad, USSR), p. 57-60. (See A70-20733 08-04)

Investigation of the critical discreteness interval of the visual analyzer (Issledovanie kriticheskogo intervala diskretnosti zritel'nogo analizatora). L. P. Grigor'eva and E. N. Sokolov, p. 61-67. 15 refs. (See A70-20734 08-04)

The retina as an indicator of cortical induction phases (Setchatka kak vyrazitel' faz korkovoi induksii). P. G. Sniakin and A. P. Anisimova (Akademiia Meditsinskikh Nauk SSSR, USSR), p. 68-71. 9 refs. (See A70-20735 08-04)

Time of visual perception under the action of therapeutic X-ray doses on the diencephalo-hypophysial region (Vremia zritel'nogo oshchushcheniia pri vozdествii terapevicheskikh doz rentgenovskikh luchei na dientsefalo-gipofizarnuiu oblast'). G. I. Nemtsev (Khar'kovskii Nauchno-Issledovatel'skii Institut Gigieny Truda i Profzabolevanii, Kharkov, Ukrainian SSR) and N. S. Kharon (Khar'kovskaia Oblastnaia Glaznaia Bol'nitsa, Kharkov, Ukrainian SSR), p. 72-76. 6 refs. (See A70-20736 08-04)

Functional efficiency of the visual analyzer in the process of working with microscopes (Funktsional'naia rabotosposobnost' zritel'nogo analizatora v protsesse raboty s mikroskopami). N. I. Zoz (Akademiia Meditsinskikh Nauk SSSR, USSR), p. 77-80

Electrophysiology and the biophysics of vision (Elektrofiziologiia i biofizika zreniia).

Short latent processes in the visual system of cats (O korotkolatentnykh protsessakh v zritel'noi sisteme koshki). I. A. Shevelev (Akademiia Nauk SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neurofiziologii, USSR), p. 81-83.

Involvement of the anterior corpus bigeminum in the neuron reaction of the rabbit (O vovlechenii v reaktsiiu neuronov perednego dvukholmiiia krolika). N. V. Dubrovinskaia (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR), p. 84-89.

Influence of prolonged optical and acoustic stimuli on the neuron activity of the corpus geniculatum laterale in the rabbit (Vliianie dlitel'nykh svetovykh i zvukovykh razdrzhitel'ei na aktivnost' neuronov naruzhnogo kolenchatogo tela krolika). T. G. Beteleva (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR), p. 90-95.

The hypothalamus potential evoked by light stimulation of the retina (O vyzvanom svetovym razdrzheniem setchatki potentsiale gipotalamusa). A. S. Novokhatskii (Ukrainskii Nauchno-Issledovatel'skii Institut Glaznykh Boleznei, Ukrainian SSR), p.

96-101. 14 refs. (See A70-20737 08-04)

Potentials evoked by light in healthy people and in patients with different localization of the pathological process in the visual system (Vyzvannye svetom potentsialy u zdorovykh liudei i u bol'nykh s razlichnoi lokalizatsiei patologicheskogo protsessa v zritel'noi sisteme). E. N. Semenovskaia, A. I. Bogoslovskii, and V. K. Zhdanov (Moskovskii Nauchno-Issledovatel'skii Institut Glaznykh Boleznei, Moscow, USSR), p. 102-109.

Photoreactivity of the pigmented epithelium of the eye (Fotoreaktivnost' pigmentnogo epiteliia glaza). M. A. Ostrovskii (Akademiia Nauk SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neurofiziologii, USSR), p. 110-113. 10 refs. (See A70-20738 08-04)

New data on the mechanisms of action of ionizing radiation on the functional properties of the retina (Novye dannye o mekhanizmkh deistviia ioniziruiushchego izlucheniia na funktsional'nye svoistva retiny). G. G. Demirchoglian (Akademiia Nauk Armianskoi SSR, Armenian SSR), p. 114-117. (See A70-20739 08-04)

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Main problems of the physiology of the visual analyzer under extremal conditions (Osnovnye problemy fiziologii zritel'nogo analizatora v ekstremal'nykh usloviakh). Iu. P. Petrov, p. 118-123. 18 refs. (See A70-20740 08-04)

Effect of space flight factors on visual functions (Vliianie faktorov kosmicheskogo poleta na zritel'nye funktsii). Iu. P. Petrov, p. 124-127. 12 refs. (See A70-20741 08-04)

The problem of studying the spatial vision of a flight crew (K voprosu issledovaniia prostranstvennogo zreniia u letnogo sostava). K. S. Petrov, p. 128, 129. (See A70-20742 08-05)

Study of achromatic and chromatic vision sensitivity during short periods of weightlessness (Issledovanie akhromaticheskoi i khromaticheskoi chuvstvitel'nosti zreniia pri kratkovremennom deistvii nevesomosti). L. A. Kitaev-Smyk, p. 130-133. 8 refs. (See A70-20743 08-04)

Role of convergence in distance perception during the landing of an aircraft (Rol' konvergentsii v vospriatii udalennosti pri posadke samoleta). Iu. V. Kamenshchikov, p. 134-137. 6 refs. (See A70-20744 08-05)

Study of dynamic visual acuity (Izuchenie dinamicheskoi ostroti zreniia). M. G. Kozyr'kova, p. 138-141. 6 refs. (See A70-20745 08-04)

Restoration of visual acuity after a bright light flash of short duration (Vosstanovlenie ostroti zreniia posle iarkoi kratkovremennoi vspyskhi sveta). V. A. Khitun, P. A. Korzun, V. I. Shostak, and E. A. Obukhova, p. 142, 143. (See A70-20746 08-05)

Certain features of the action of short-term superbright light flashes on a background of total dark adaptation (O nekotorykh osobennostiakh vozdествiia kratkovremennykh sverkh'iarkikh svetovykh vspyshek na fone polnoi temnovoi adaptatsii). V. I. Shostak, p. 144-146. 8 refs. (See A70-20747 08-05)

Optics and histochemistry of the eye—Methods of investigation (Optika i gistokhimiia glaza—Metody issledovaniia).

Problem of the refraction of the fish eye (K voprosu o refraktsii glaza ryby). P. B. Bogatyrev (Akademiia Nauk SSSR, Institut Morfologii Zhivotnykh, Moscow, USSR), p. 147-154.

Histochemical heterogeneity of the retinal nerve elements (O gistokhimicheskoi raznorodnosti nervnykh elementov setchatki). M. A. Ostrovskii and S. E. Poliak (Akademiia Nauk SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neurofiziologii, USSR), p. 155-157.

A study of the fundus oculi in polarized light (Ob issledovanii glaznogo dna v polarizovannom svete). R. M. Tamarova (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Meditsinskogo Priborostroeniia, Moscow, USSR), p. 158-163. 7 refs. (See A70-20748 08-04)

Use of polarized light to study the anatomy, physiology, and pathology of the fundus oculi (Primenenie polarizovannogo sveta dlia izucheniia anatomii, fiziologii i patologii glaznogo dna). D. I. Mitkikh (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Meditsinskogo Priborostroeniia, Moscow, USSR), p. 164-167. 5 refs. (See A70-20749 08-04)

Methods of investigating the accommodation time in man (O

metodike issledovaniia vremeni akkomodatsii u cheloveka). A. A. Sychev (Khar'kovskii Meditsinskii Institut, Kharkov, Ukrainian SSR), p. 168-170.

Method of constant periods (Metod postoiannykh periodov). A. I. Ivanov (Vsesoiuznyi Nauchno-Issledovatel'skii Svetotekhnicheskii Institut, Moscow, USSR), p. 171-176. (See A70-20750 08-04)

Comparative investigation of the binocular functions during iso- and anisometropia (Srvnritel'noe issledovanie binokuliarnykh funktsii pri izo- i anizometropii). Iu. Z. Rozenblium, p. 177-180.

Reports (Referaty), p. 181-188.

A70-20727 # Simulation of the color vision process in man (Modelirovanie protsessa tsvetovogo zreniia u cheloveka). D. A. Shklover (Vsesoiuznyi Nauchno-Issledovatel'skii Svetotekhnicheskii Institut, Moscow, USSR). In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 8-18. 25 refs. In Russian.

Description of a mathematical model for the human color vision process where the output signals correspond to experimental functions obtained under specific observational conditions. The model is used to explain several characteristic features of the color vision system in man. An electronic analog is outlined which reproduces the main functions of the system and which can be used to develop photoelectric methods of color measurement. The electronic analog is applied to problems involving the color resolution of the eye under different circumstances. T.M.

A70-20728 # Certain psychophysiological regularities of color perception described by a nonlinear model (O nekotorykh psikhofiziologicheskikh zakonomernostiakh vospriiatii tsveta, opisyaemykh nelineinoy model'iu). A. B. Matveev (Moskovskii Energeticheskii Institut, Moscow, USSR). In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 19-26. 10 refs. In Russian.

Description of a mathematical model of human vision based on the spectral sensitivity curves of three color-sensitive receivers (green, red, and blue). Analysis of the model's equations shows that the curves for the dependence of perception on color are more linear for the red and green receivers than for the blue receiver. All achromatic tints are positioned along a hyperbola in perception space, bending toward the axis of the blue receiver. T.M.

A70-20729 # Deductive construction of a model for the lower metric of color (Deduktivnoi postroenie modeli nizshei metriki tsveta). Iu. P. Shabanov-Kushnarenko (Khar'kovskii Institut Radioelektroniki, Kharkov, Ukrainian SSR). In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 27-29. 8 refs. In Russian.

Description of a new formulation of the laws of Grassman without using the operation of color composition. Mathematical models of vision statics are formulated for the first, second, and third models of Grassman, and the equivalence of the vision statics models to Grassman laws is demonstrated. The vision statics models can be generalized for cases involving images changing both in time and in the field of vision. T.M.

A70-20730 # Operator analysis of electroretinograms (Operatornyi analiz elektroretinogramm). D. S. Melkonian and L. G. Barsegian (Erevanskii Institut Uovershenstvovaniia Vrachei, Yerevan, Armenian SSR). In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova.

nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 30-38. 9 refs. In Russian.

Description of a mathematical method for electroretinogram analysis where the retina is considered as a system whose properties are unknown but can be determined by comparing the nature of stimulation to the reaction of the eye. Under given conditions, this relationship between stimulation and reaction is described with the aid of an operator which is both stationary and linear. As a result, its properties can be studied on the basis of the system's amplitude-phase-frequency characteristics. These characteristics were determined experimentally by subjecting the eye to flickering light in the form of sinusoidal and rectangular pulses of different frequencies. T.M.

A70-20731 # Possible forms of color vision (Vozmozhnye formy tsvetovogo zreniia). N. V. Lobanova (Gosudarstvennyi Opticheskii Institut, Leningrad, USSR). In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 39-42. 5 refs. In Russian.

Investigation of the spectral sensitivity of the visual receptors in normal and anomalous trichromats. The results indicate that there are four different forms of the spectral sensitivity function in human retinal receptors. Combinations of these functions in twos and threes yield all the observed types of color vision. T.M.

A70-20732 # Light and color thresholds of lights on a background of different brightness (Svetovye i tsvetovye porogi ognei na fone raznoi iarkosti). R. L. Fol'b and S. V. Voronina (Vsesoiuznyi Nauchno-Issledovatel'skii Svetotekhnicheskii Institut, Moscow, USSR). In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 49-53. 18 refs. In Russian.

Determination of the binocular achromatic and color thresholds of constant and flickering lights on backgrounds of different brightness for four colors: yellow, green, blue, and red. Mean values for seven observers were obtained with 100% reliability of color recognition. The achromatic interval was equal to 1 for red light and reached more than 1000 for blue light. The achromatic interval decreases with increasing background brightness for all colors. T.M.

A70-20733 # Microinterval analysis of the development of visual perceptions (Mikrointerval'nyi analiz razvitiia zritel'nykh oshchushchenii). P. O. Makarov (Leningradskii Gosudarstvennyi Universitet, Leningrad, USSR). In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 57-60. In Russian.

Results of a microinterval analysis showing a regular phased development of human visual color perception. The stages involved consist of preperception, achromatic perception, and chromatic perception. This pattern is evident in color discrimination in the presence of two stimuli. When two short stimuli (initially red and then green) sequentially affect the same retinal region, then the intensification of one (green) masks the appearance of the other (weaker red) stimulus. T.M.

A70-20734 # Investigation of the critical discreteness interval of the visual analyzer (Issledovanie kriticheskogo intervala diskretnosti zritel'nogo analizatora). L. P. Grigor'eva and E. N. Sokolov. In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova.

Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 61-67. 15 refs. In Russian.

Investigation of the critical discreteness interval—i.e., the minimum time interval in which it is still possible to discriminate sequential visual stimuli. Studies involved the dependence of the interval on the location of the stimulus in the field of view, flare brightness, and conditions of adaptation. Significant shortening of the interval is demonstrated with increasing density of the receptor-nerve elements of the retina, with increasing intensity of the afferent signal, and with rhythmic stimulation of the visual system. T.M.

A70-20735 # The retina as an indicator of cortical induction phases (Setchatka kak vyrazitel' faz korkovoi induktsii). P. G. Sniakin and A. P. Anisimova (Akademiia Meditsinskikh Nauk SSSR, USSR). In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 68-71. 9 refs. In Russian.

Results of a study of positive and negative cortical induction as estimated by the retinal mobility index. It is shown that retinal mobility is a good indication of induction intensity and can be used to express the activity of the acoustic, olfactory, and cutaneous analysors. Retinal reactions reflect the formation of human conditional reflexes as well as the phases of positive and negative induction between the sensory centers. T.M.

A70-20736 # Time of visual perception under the action of therapeutic X-ray doses on the diencephalo-hypophysial region (Vremia zritel'nogo oshchushcheniia pri vozdeistvii terapevticheskikh doz rentgenovskikh luchei na diencefalo-gipofizarnuiu oblast'). G. I. Nemtsev (Khar'kovskii Nauchno-Issledovatel'skii Institut Gigieny Truda i Profzabolevanii, Kharkov, Ukrainian SSR) and N. S. Kharon (Khar'kovskaia Oblastnaia Glaznaia Bo'nitsa, Kharkov, Ukrainian SSR). In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 72-76. 6 refs. In Russian.

Investigation of the visual perception time in 26 patients subjected to X-ray treatment of the diencephalic region. Seventeen patients suffered endocrine exophthalmus, and nine suffered optochiasmal arachnitis with disturbed visual function. Under irradiation, all subjects exhibited reduced visual perception time which is interpreted to result from a reduced excitability threshold of the interneuronal synapses of the visual tract. T.M.

A70-20737 # The hypothalamus potential evoked by light stimulation of the retina (O vyzvannom svetovym razdrazheniem setchatki potentsiale gipotalamusa). A. S. Novokhatskii (Ukrainskii Nauchno-Issledovatel'skii Institut Glaznykh Boleznei, Ukrainian SSR). In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 96-101. 14 refs. In Russian.

Demonstration of the presence of direct anatomical couplings between the eye retina and hypothalamus via centripetal and centrifugal fibers. A study was made of the light-evoked potentials in various parts of the hypothalamus of 32 rabbits tested simultaneously. These evoked potentials were found to have a multicomponent structure and were observed most often in the evoked response from the supraoptical, periventricular, and mamillary nuclei. The evoked response with the maximum amplitude was recorded from the mamillary nucleus. Evoked responses from the dorsomedial and ventrimedial nuclei occurred very rarely. Comparing the latencies of the ERGs and evoked responses in the hypothalamus, it is found that the latency of the anterior nuclei of

the hypothalamus often coincides with that of the ERG, while in the mamillary nucleus it is an average of 10 msec greater and in the posterior portion is somewhat shorter. A.B.K.

A70-20738 # Photoreactivity of the pigmented epithelium of the eye (Fotoreaktivnost' pigmentnogo epiteliia glaza). M. A. Ostrovskii (Akademiia Nauk SSSR, Institut Vysshoi Nervnoi Deiatel'nosti i Neirofiziologii, USSR). In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 110-113. 10 refs. In Russian.

Detection (by the EPR method) of the appearance of free radicals in the pigmented epithelium and in a suspension of its melanoprotein granules when acted upon by visible light of physiological intensities. When the light is switched off, the free radicals recombine and disappear, thus distinctly manifesting a reversibility effect—namely, the appearance and disappearance of radicals during repeated switching on and off of the light. During illumination by visible light a photoconductivity is detected in the pigmented epithelium and the melanoprotein granules by a contactless method at a microwave frequency which makes it possible to study the bulk photoconductor properties of a homogeneous system under heterogeneous conditions. When the light is switched off, the conductivity effect disappears. The photoreactivity of the pigmented epithelium thus shown and certain features of the metabolism and structure of its cells and processes give reason to assume that the pigmented epithelium may play a more significant physiological role in the regulation and realization of the photoreceptor act in optical cells (rods and cones) than has hitherto been assumed. A.B.K.

A70-20739 # New data on the mechanisms of action of ionizing radiation on the functional properties of the retina (Novye dannye o mekhanizmax deistviia ioniziruiushchego izlucheniia na funktsional'nye svoistva retiny). G. G. Demirchoghlian (Akademiia Nauk Armianskoi SSR, Laboratoriia Zritel'noi Retseptsii, Armenian SSR). In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 114-117. In Russian.

Study of the effect of ionizing radiation on the frog retina by recording ERGs from an isolated retina bathed in a nutrient fluid. During the action of the ionizing radiation the b-wave of the ERG is found to be reduced. X-ray stimulation with an intensity of 5 r/sec and a duration of 1 sec is found to evoke a response which is similar to the ERG of a retina exposed to a light stimulus of 0.05 lux and the same duration. A.B.K.

A70-20740 # Main problems of the physiology of the visual analyzer under extremal conditions (Osnovnye problemy fiziologii zritel'nogo analizatora v ekstremal'nykh usloviakh). Iu. P. Petrov. In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 118-123. 18 refs. In Russian.

Survey of the literature on studies of disturbances of visual functions due to the action of certain extremal factors. The effects of changes in gravitational conditions, changes in atmospheric pressure and gas composition, mechanical vibrations, and electromagnetic waves of various spectral ranges leading to disturbances such as contraction of the field of vision, reduction of visual acuity, impairment of color vision, hemorrhages, crystalline lens shifts, and pathological vasomotor effects are discussed. Possible mechanisms of these disturbances are suggested. A.B.K.

A70-20741 # Effect of space flight factors on visual functions (Vliianie faktorov kosmicheskogo poleta na zritel'nye funktsii). Iu. P. Petrov. In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 124-127. 12 refs. In Russian.

Study of visual tasks confronting astronauts during space flight, emphasizing the effect of physiological and physical factors acting at various stages of flight on the execution of these tasks. Methods by which the effect of these factors can be attenuated or by which disturbances of the visual functions can be compensated are discussed. A.B.K.

A70-20742 # The problem of studying the spatial vision of a flight crew (K voprosu issledovaniia prostranstvennogo zreniia u letnogo sostava). K. S. Petrov. In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 128, 129. In Russian.

Estimation of the absolute distance perception of 100 pilots and navigators with emmetropic refraction and flight experience ranging from 5 to 25 years. The threshold values of absolute distance perception of the subjects are found to lie in the range from 10 to 12 m. It is suggested that this range be taken as the norm for spatial vision of a flight crew. A.B.K.

A70-20743 # Study of achromatic and chromatic visual sensitivity during short periods of weightlessness (Issledovanie akhromaticheskoi i khromaticheskoi chuvstvitel'nosti zreniia pri kratkovremennom deistvii nevesomosti). L. A. Kitaev-Smyk. In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 130-133. 8 refs. In Russian.

Study of 30 men subjected to short periods of weightlessness (28 to 30 sec) preceded or followed by g forces while flying in an aircraft along a parabolic trajectory. Changes in the color perception of the subjects were noted. In the case of five of the subjects the field of vision and the light sensitivity were also studied. It is found that under conditions of weightlessness there is an increase in sensitivity to yellow and, to a lesser extent, also to red. At the same time, in a number of cases the sensitivity to blue-violet radiation decreases. The scotopic vision threshold also decreases, while the field of vision remains unchanged. A.B.K.

A70-20744 # Role of convergence in distance perception during the landing of an aircraft (Rol' konvergentsii v vospriiatii udalennosti pri posadke samoleta). Iu. V. Kamenshchikov. In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 134-137. 6 refs. In Russian.

Study of the role of convergence in distance perception in the range from 30 to 50 m in the case of 100 men with normal binocular vision, emmetropic refraction, and visual acuity. It is found that in 75% of the men tested convergence increases the accuracy of estimating the distance of an object from 20 to 50%, while in 25% of the subjects convergence has no effect on the threshold of absolute distance perception. A.B.K.

A70-20745 # Study of dynamic visual acuity (Izuchenie dinamicheskoi ostroti zreniia). M. G. Kozyr'kova. In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04)

Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 138-141. 6 refs. In Russian.

Study of the visual acuity of 130 subjects ranging from 20 to 40 years in age, who were required to track an object moving in a horizontal plane. It is found that for an object moving at a rate of 20 deg/sec with an observation time of 1 sec the visual acuity is the same as in a stationary test. When the motion of the object is accelerated to 40 deg/sec or the observation time is shortened to 0.5 sec, the visual acuity is reduced by 0.1. Each subsequent 20 deg/sec increase in the rate of motion decreases the visual acuity by 0.1 to 0.2. In addition, a quantitative study is made of the effect of the direction and duration of the test motion on visual acuity. A.B.K.

A70-20746 # Restoration of visual acuity after a bright light flash of short duration (Vosstanovlenie ostroti zreniia posle iarkoi kratkovremennoi vspyski sveta). V. A. Khitun, P. A. Korzun, V. I. Shostak, and E. A. Obukhova. In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 142, 143. In Russian.

Determination of the time required for restoration of visual acuity after illumination of the entire retina with a flash at two brightnesses (0.14 and 0.35 nit) or after illumination of only the central part of the retina at one brightness. It is found that at a brightness of 0.14 nit visual acuity is restored within 4 to 4.5 min after 10 minutes of 'globe' or flash illumination. Shielding the periphery of the retina has no statistically reliable effect on restoration of visual acuity. A.B.K.

A70-20747 # Certain features of the action of short-term superbright light flashes on a background of total dark adaptation (O nekotorykh osobennostiakh vozdeistviia kratkovremennykh sverkh'iarkikh svetovykh vspyshek na fone polnoi temnovoi adaptatsii). V. I. Shostak. In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 144-146. 8 refs. In Russian.

Study of the restoration of light sensitivity in seven subjects exposed to flashes with brightnesses up to 7.2×10 to the 7th nits. The electrical sensitivity of the eye, the ERG, the EEG, and the critical frequency of the disappearance of an electrical phosphene are also considered. Averaged curves of darkness adaptation after ten minutes of light adaptation to a globe brightness of 2500 apostilbs or after diffuse illumination by a flash with a brightness of 7×10 to the 7th nits for 2.1 msec are obtained, as well as curves for adaptation after illumination under conditions of shielding the central part of the retina. In the latter case the light sensitivity of the periphery is restored faster, thus attesting to the braking effect of the photonic afferent system on the scotopic system in the presence of superbright stimuli. A.B.K.

A70-20748 # A study of the fundus oculi in polarized light (Ob issledovanii glaznogo dna v poliarizovannom svete). R. M. Tamarova (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Meditsinskogo Priborostroeniia, Moscow, USSR). In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 158-163. 7 refs. In Russian.

Detailed description of the fundus oculi studied in polarized light with the polaroids (vessels, optical nerve disk, and yellow spot) in various mutual positions. In the region of the yellow spot the light intensity is found to vary from maximum to minimum with a rotation of the polaroids through 90 deg, while in the remaining

parts of the retina the maximum-to-minimum variation occurs when the polaroids rotate only through 45 deg. In the region of the yellow spot the polarization pattern is visible in the form of two triangles; from this pattern it is possible to judge the degree of damage to the yellow spot. This polarized light study also makes it possible to localize birefringent foci in the membranes of the fundus oculi. An optical model of the yellow spot with a reticular anisotropic layer is proposed. A.B.K.

A70-20749 # Use of polarized light to study the anatomy, physiology, and pathology of the fundus oculi (Primenenie polarizovannogo sveta dlia izucheniia anatomii, fiziologii i patologii glaznogo dna). D. I. Mitkokh (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Meditsinskogo Priborostroeniia, Moscow, USSR). In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 164-167. 5 refs. In Russian.

Analysis of the results of an ophthalmoscopic study of 60 patients, using an apparatus with built-in polaroids to inspect and photograph the fundus oculi. It is found that the structure of the fundus oculi (in particular, the yellow spot) is more easily visible in polarized light, thus facilitating early diagnosis of various diseases of the optical nerve and the yellow spot. It is also noted that by varying the positions of the polaroids it is possible to obtain both black-and-white and colored photographs of the fundus oculi. A.B.K.

A70-20750 # Method of constant periods (Metod postoiannykh periodov). A. I. Ivanov (Vsesoiuznyi Nauchno-Issledovatel'skii Svetotekhnicheskii Institut, Moscow, USSR). In: Physiology of vision under normal and extremal conditions (Fiziologiya zreniia v normal'nykh i ekstremal'nykh usloviakh). (A70-20726 08-04) Edited by V. G. Samsonova. Leningrad, Izdatel'stvo Nauka (Problemy Fiziologicheskoi Optiki. Volume 15), 1969, p. 171-176. In Russian.

Development of a method of constant periods which eliminates subjective responses during threshold measurements by holding fixed the period of the first threshold perception flash. An experimentally established relation between the visual threshold and the flash period (in the time range from 2.5 to 8 sec) makes it possible to obtain all thresholds with the same period. With an increase in the detection probability, if certain observation conditions are observed, a group of periods of nearly the same value begin the figure in the aggregate of threshold periods, thus providing a means of simplifying the method. On the basis of a practical test of the method, it is shown that in certain threshold studies a considerable savings in the time required to carry out an experiment can be achieved, and the accuracy of the results obtained from the experiment is improved. A.B.K.

A70-20761 Current problems of radiation genetics (Sovremennyye problemy radiatsionnoi genetiki). Edited by N. P. Dubinin. Moscow, Atomizdat, 1969. 352 p. In Russian.

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The primary mechanism of radiation damage of chromosomes in the light of the recovery problem (O pervichnom mekhanizme radiatsionnogo porazheniia khromosom v svete problemy vosstanovleniia). N. P. Dubinin and V. A. Tarasov, p. 7-78.

Current state of the problem of the mechanism of occurrence of chromospheric rearrangements (Sovremennoe sostoiianie voprosa o mekhanizme vozniknoveniia khromosomnykh perestroek). N. N. Sokolov and B. N. Sidorov, p. 79-90.

Modification of radiation damage of the genetic apparatus—Postradiation cell recovery (Modifikatsiia radiatsionnogo povrezhdeniia geneticheskogo apparata—Postradiatsionnoe vosstanovlenie kletki). V. P. Paribok and L. Kh. Eidus, p. 91-108.

Relative genetic effectiveness of radiations with different linear

energy transfers (Otnositel'naia geneticheskaiia effektivnost' izlucheniia s razlichnoi lineinoi peredachei energii). N. A. Troitskii, p. 109-134.

Genetic effects of small doses of ionizing radiations in sexual and somatic cells (Geneticheskie efekty malykh doz ioiniziruiushchikh izlucheniia v polovykh i somaticheskikh kletkakh). Ia. L. Glembovskii and S. P. Iarmonenko, p. 135-213.

Genetic mechanisms of carcinogenesis (Geneticheskie mekhanizmy radiatsionnogo kantserogeneza). I. L. Gol'dman and E. L. Iofa, p. 214-241.

Genetic control of radiosensitivity in bacteria (Geneticheskii kontrol' radiochuvstvitel'nosti u bakterii). V. K. Ravin and Iu. P. Vinetskii, p. 242-257.

Radiation genetics of fungi and algae (Radiatsionnaia genetika gribov i vodoroslei). I. A. Zakharov, p. 258-279.

The problem of radiosensitivity of plants (Problema radiochuvstvitel'nosti rastenii). S. A. Valeva, p. 280-301.

Methodological problems in the use of radiations and other mutagenic factors in plant selection (Metodicheskie voprosy primeneniia izlucheniia i drugikh mutagennykh faktorov v seleksii rastenii). V. V. Khvostova, p. 302-312.

Genetic effects of cosmic rays (Geneticheskie efekty kosmicheskikh lucheii). E. N. Vulina, G. P. Parfenov, and V. V. Antipov, p. 313-328.

Genetic consequences of the action of radiation on populations (O geneticheskikh posledstviakh deistviia radiatsii na populiatsii). V. A. Shevchenko and B. V. Shilenko, p. 329-349.

A70-20775 * Characteristics of the enzymatic breakdown of DNA in Escherichia coli in response to ionizing radiation. J. D. Chapman and E. C. Pollard (Pennsylvania State University, University Park, Pa.). *International Journal of Radiation Biology*, vol. 15, no. 4, 1969, p. 323-333. 19 refs. Grant No. NGR-39-009-008.

Characterization of the temperature dependence of DNA degradation in Escherichia coli. An activation energy of 17.2 kcal/mole has been determined for the enzyme function between 20 and 40 deg C. The maximum rate of the breakdown function was measured to be near 42 deg C. At temperatures greater than 45 deg C heat inactivation of the enzyme system in vivo is evidenced. M.V.E.

A70-20791 * Biomedical instrumentation evaluation. Steven Jon Koerber, John G. Webster, and Stuart J. Updike (Wisconsin, University, Madison, Wis.). In: National Electronics Conference, Chicago, Ill., December 8-10, 1969, Proceedings. (A70-20776 08-07) Conference sponsored by the Illinois Institute of Technology, the Institute of Electrical and Electronics Engineers, Northwestern University, and the University of Illinois. Oak Brook, Ill., National Electronics Conference, Inc. (NEC, Proceedings. Volume 25), 1969, p. 273-278. NASA-supported research.

Description of the procedures and criteria to be used in the evaluation, or also redesign of biomedical instrumentation. The procedures are intended to bridge the communication gap between the medical and engineering fields and to establish thorough understanding and close cooperation between originators, users, and implementers of biomedical instrumentation. M.V.E.

A70-20819 Selected potentials of lasers in medicine. Peter C. Belval and R. James Rockwell. In: National Electronics Conference, Chicago, Ill., December 8-10, 1969, Proceedings. (A70-20776 08-07) Conference sponsored by the Illinois Institute of Technology, the Institute of Electrical and Electronics Engineers, Northwestern University, and the University of Illinois. Oak Brook, Ill., National Electronics Conference, Inc. (NEC, Proceedings. Volume 25), 1969, p. 811-816. 19 refs.

Brief review of some of the basic criteria necessary in the design of medical laser systems, and of the general functions which lasers currently perform in the many medical applications under study. It is

shown that lasers of all types and power levels are now being used for biomedical applications. In almost all cases the laser is actually a part of a complex optical-mechanical system which has been designed for a specific clinical or research function. M.M.

A70-20976 # Problems of the toxicology and prophylaxis of acute gasoline poisoning (Voprosy toksikologii i profilaktiki ostrykh otravlenii Benzinom). M. V. Romanovskii. *Voенно-Meditsinskii Zhurnal*, Nov. 1969, p. 58-60. In Russian.

Survey of the current state of knowledge concerning the pathophysiological mechanisms of acute gasoline poisoning, and discussion of some preventive measures which should be exercised when working with this substance. It is shown that a great deal depends on the manner in which the gasoline was ingested by the victim. Various symptoms of poisoning are described in terms of specific effects on different organs and functional systems. T.M.

A70-20977 # Relevant problems of aviatonal medicine (Aktual'nye problemy aviatsionnoi meditsiny). P. K. Isakov. *Voенно-Meditsinskii Zhurnal*, Nov. 1969, p. 61-64. In Russian.

Survey of some problems in aviatonal medicine which have been recently posed by the introduction of radically different aircraft. Attention is given to the necessity of extending medical control to ground-based personnel participating in critical flight operations. The optimization of data flow to the pilot is examined, along with problems involving the physical fitness and training of pilots. Questions of spatial orientation in flight are also considered. T.M.

A70-21000 # Random networks of pulse neurons (O sluchainykh setiakh impul'snykh neuronov). D. Ia. Averbukh. *Avtomatika i Telemekhanika*, Nov. 1969, p. 145-153. 7 refs. In Russian.

Outline of a simplified macroscopic description of random homogeneous networks of pulse neurons based on the use of statistical hypotheses such as the 'chaos hypothesis.' Attention is given to those modes of operation of a pulse neuron which make it possible to describe its function in terms of the frequencies of input and output pulse sequences. Simplified descriptions are given for the neuron itself so that the main equations for the basic circuit elements are already simplified. Experimental results obtained by computer calculations confirm the theoretical results obtained with the aid of the proposed simplified description. T.M.

A70-21043 The eye problem in laser safety. William T. Ham, Jr., A. M. Clarke, Walter J. Geeraets, Stephan F. Cleary, Harold A. Mueller, and Ray C. Williams (Virginia, Medical College, Richmond, Va.). (*International Laser Safety Conference and Workshops, 2nd, Cincinnati, Ohio, Mar. 24, 25, 1969.*) *Archives of Environmental Health*, vol. 20, Feb. 1970, p. 156-160. 12 refs. Contracts No. DA-49-193MD2241; No. DA-49-146-XZ-416.

Discussion of the biological effects of laser radiation on the human eye. It is pointed out that eye damage can range from mild retinal burns, with little or no loss of visual acuity, to severe lesions with loss of central vision, and up to gross overexposure with total loss of the eye. Long-term exposure of the retina to wavelengths in the visible spectrum, at levels not far below the burn threshold, may cause irreversible effects and should be avoided. Long-term exposure of the eye to the near IR wavelengths can result in opacification of the lens and should be avoided. Overexposure of the cornea to UV wavelengths produces a painful inflammation of the corneal epithelium. Overexposure to a Q-switched laser is especially dangerous and can result in loss of the eye. Enough data are currently available to establish tentative safety standards. There is a need for the establishment of national standards to resolve some of the discrepancies as to what constitutes safe exposure levels. At the present time, lasers do not constitute an environmental health hazard to the general public in the sense that water and air pollution and noise do, yet there is no assurance that this may not be the case in the future. M.M.

A70-21044 Thresholds of laser eye hazards. Arthur Vassiliadis, H. Christian Zweng, Norman A. Peppers, Robert R. Peabody, and Richard C. Honey (Stanford Research Institute, Menlo Park, Calif.). (*International Laser Safety Conference and Workshops, 2nd, Cincinnati, Ohio, Mar. 24, 25, 1969.*) *Archives of Environmental Health*, vol. 20, Feb. 1970, p. 161-170. 20 refs. NIH Contract No. 5-ROI-EY-00318-04; Contracts No. AF 33(615)-3060; No. AF 33(615)-67-C-1752; No. AF 41(609)-68-C-0041.

The eyes of rhesus monkeys and humans were exposed to long-pulsed ruby and neodymium, Q-switched ruby and neodymium, and helium-neon (He-Ne) lasers to determine retinal damage thresholds. Rabbit eyes were exposed to a carbon dioxide laser to determine corneal damage thresholds. The data were gathered simulating accidental field exposures. The experimental data show that the white human fundus is appreciably less sensitive to damage from laser radiation compared to the rhesus monkey fundus. In general, the human threshold data obtained are considerably higher than some of the recommended safe levels. Corneal damage levels caused by carbon dioxide laser radiation were reported. The data were shown to be consistent with a simple thermal model. We emphasize that we are presenting experimental observations and are not recommending energy levels for 'safe' laser exposures. (Author)

A70-21045 # US Air Force permissible exposure levels for laser irradiation. John A. Carpenter, David J. Lehmilller, and Thomas J. Tredici (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). (*International Laser Safety Conference and Workshops, 2nd, Cincinnati, Ohio, Mar. 24, 25, 1969.*) *Archives of Environmental Health*, vol. 20, Feb. 1970, p. 171-176. 28 refs.

Description of the establishment by the U.S. Air Force of permissible exposure levels for laser irradiation. Using monkeys as the experimental species, due to their comparable optical quality to human systems, safety exposure levels were established in man by assuming a relationship of one to one between the monkey and humans. Safe laser radiation exposure levels for the ruby, neodymium, argon, and carbon dioxide lasers are tabulated. M.M.

A70-21046 Design considerations for laser eye protection. C. Hermas Swope (American Optical Corp., Framingham, Mass.). (*International Laser Safety Conference and Workshops, 2nd, Cincinnati, Ohio, Mar. 24, 25, 1969.*) *Archives of Environmental Health*, vol. 20, Feb. 1970, p. 184-187.

Brief review of procedures for designing and selecting the proper goggle to be used with a given laser. The basic calculation to be made is that of the energy density that the laser can produce on the retina. This energy density is then compared with the minimum energy density that will produce a retinal lesion. It is pointed out that, in general, the filter goggle should be designed for comfort, light weight, high luminous transmittance, resistance to damage by laser energy, resistance to mechanical and thermal shock, and general stability to the elements, in addition to high attenuation of the laser wavelength or wavelengths. Moreover, the goggle must be designed to meet the specialized requirements imposed by the particular laser system. The design of a device to protect against the frequency-doubled neodymium laser is considered, in order to gain an insight into the problem of the development of laser protective goggles. M.M.

A70-21048 Progress in laser safety in biomedical installations. Leon Goldman (Cincinnati, University, Cincinnati, Ohio). (*International Laser Safety Conference and Workshops, 2nd, Cincinnati, Ohio, Mar. 24, 25, 1969.*) *Archives of Environmental Health*, vol. 20, Feb. 1970, p. 193-196. 7 refs.

Brief review of the laser safety program for biomedical applications of the laser. The specific phases of the laser safety programs are summarized as follows: (1) the introduction of new laser systems in biology and medicine; (2) the need for high output systems in applications of laser systems, especially in the field of laser surgery, except for eye surgery; (3) the definite need for more basic data on changes not only in the target area, but in living tissues

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adjacent to the target area; (4) the question of the significance of maintained chronic exposure, especially from exposures which are considered to be below the minimum reactive doses; and (5) the followup studies of laser exposures in man over a period of years. It is concluded that laser safety programs continue to be important in all phases of laser biomedical applications. In view of the expansion in laser technology with higher output systems of older lasers and increasing use of CW systems, especially for laser surgery, many in IR, increasing uses of new lasers, holography, and atmospheric propagation of laser systems, new programs have to be devised and older guideline figures revised. M.M.

A70-21216 # Effect of high-mountain UV radiation on the photochemical activity of chloroplasts (Deistvie vysokogornoj UF radiatsii na fotokhichimicheskuiu aktivnost' khloroplastov). A. N. Nikitina, G. P. Lebedeva, M. M. Iakubova, and Iu. S. Nasyrov (Akademii Nauk Tadzhikskoi SSR, Institut Fiziologii i Biofiziki Rastenii, Dyushambe, Tadzhik SSR). *Akademii Nauk Tadzhikskoi SSR, Doklady*, vol. 12, no. 10, 1969, p. 57-60. 9 refs. In Russian.

Study of the photochemical activity of chloroplasts of plants subjected to the action of high-mountain UV radiation. A considerable suppression of the photochemical activity of chloroplasts was noted in experiments on pea plants subjected to the action of high-mountain UV radiation. It is believed that disruption of the electron-transport chain reactions of photosynthesis and, in particular, of cyclic phosphorylation is one of the causes of the reduction of the rate of photosynthesis by the action of UV radiation. It is concluded that high-mountain UV radiation plays a regulatory role in photosynthesis, by varying the rates of and relations between the photochemical electron-transport chain reactions and the quantities of and relations between the photosynthesis products. A.B.K.

A70-21264 Vectorcardiogram past forty. A. C. Witham and J. E. Lahman (Georgia, Medical College, Augusta, Ga.). *American Heart Journal*, vol. 79, Feb. 1970, p. 149-159. 33 refs.

Quantitative evaluation of the variations in the vectocardiogram (VCG) of a group over forty years of age in whom every effort was made to exclude heart disease or other factors which influence the VCG. Seventy-five clinically normal individuals with a mean age of 51 were studied with the Helm sponge VCG and compared with a similarly selected group of 133 adults whose mean age was 24 years. Unlike tracings recorded with the Frank VCG or standard ECG, there was no decrease in spatial voltage in the older adults. The latter have more leftward loops in the frontal plane and, as a consequence, higher voltage in the horizontal plane and lower ones in the sagittal. Loops from the older patients show less variability in voltage of Q vectors and of the position of the 20 msec and maximum vectors. A table of normal values for five vectors is presented, and the range further illustrated by nine examples of variants with some features suggesting disease. Clinically silent scars cannot be excluded. M.M.

A70-21265 Results and correlations of multistage exercise tests in a group of clinically normal business executives. Alberto N. Goldberg, John F. Moran, Roderick W. Childers, and Henry T. Ricketts (Chicago, University, Chicago, Ill.). *American Heart Journal*, vol. 79, Feb. 1970, p. 194-200. 27 refs. Research supported by the Chicago Heart Association and the AMA Education and Research Foundation; PHS Grant No. HE-05793-02.

Experimental investigation in which multistage treadmill exercise tests were performed on 91 healthy business executives. Eleven of these subjects exhibited abnormal S-T-segment responses. Although no correlation was found between abnormal exercise responses and the coronary risk factors, the abnormal responders were older and had more abnormalities in the resting ECG. The predictive value of the maximal exercise test will be determined in the long-term followup of these individuals. M.M.

A70-21266 * P waves and P loops in coronary sinus and left atrial rhythms. Sun Hing Lau, Stafford I. Cohen, Emanuel Stein, Jacob I. Haft, Kenneth M. Rosen, and Anthony N. Damato (U.S. Public Health Service Hospital, Staten Island, N.Y.). *American Heart Journal*, vol. 79, Feb. 1970, p. 201-214. 19 refs. NIH Grants No. HE-11829; No. HE-12536; NASA Contract No. T 22416.

Study in dogs and in man of P-wave and P-loop changes during transvenous pacing of specific locations in the coronary sinus and left atrium. During coronary sinus rhythm, the diagnostic criteria for P-wave changes were always met. In addition, inversion of the P wave in Lead V6 was consistently obtained. The P loop was always directed cephalad. Dome-dart P waves in V1 were present in one of 14 patient studies. Pacing the left atrial appendage produced less consistent P-wave changes; dome-dart P waves in V1 were present in 3 of 7 dog studies and in one of 3 patients. The P vector was directed caudad, rightward, and ventrad. Pacing the inferior left atrium in close proximity to the coronary sinus produced P-wave and P-loop chaidential with and indistinguishable from those of coronary sinus rhythm. It is suggested that a common site of impulse formation or a common intra-atrial conduction pathway is utilized. Confirmatory evidence was obtained from intra-atrial electrograms. Additional evidence was obtained from Bachman bundle potential recordings, which indicated a reversal of atrial activation during left atrial rhythm. M.M.

A70-21273 Effect of microwaves on the rabbit eye. L. Birenbaum, S. W. Rosenthal (Brooklyn, Polytechnic Institute, Farmingdale, N.Y.), I. T. Kaplan, W. Metlay, H. Schmidt, and M. M. Zaret (Zaret Foundation, Scarsdale, N.Y.). (*International Microwave Power Institute, Symposium, University of Alberta, Edmonton, Alberta, Canada, May 22, 1969, Paper DA-4.*) *Journal of Microwave Power*, vol. 4, Dec. 1969, p. 232-243. 25 refs. Grant No. DA-DA-17-68-G-9249.

Experiments are described in which the eyes of anesthetized rabbits were exposed at discrete frequencies in the range of 0.8-6.3 GHz. One eye of each animal was irradiated once, and the subsequent effects observed with specific emphasis on lens injuries. This work, done over a five-year period, gives results that compare the cataractogenic thresholds of CW and pulsed power at 5.5 GHz, determine the threshold ocular response to 0.8 GHz, and suggest how lens injury depends on the frequency of microwave power entering the eye. A simple coaxial adaptor that provided a means of achieving broadband exposures is described. In addition, similar work, done at 70 GHz with CW power, suggests the nature of the response of the eye to millimeter wave radiation. (Author)

A70-21289 Excitation and scattering of modes on a dielectric or optical fiber. Allan W. Snyder (University College, London, England). *IEEE Transactions on Microwave Theory and Techniques*, vol. MTT-17, Dec. 1969, p. 1138-1144. 13 refs. Research supported by the General Post Office.

Investigation of modal propagation in the retinal receptors of both human and insect visual systems. The modal excitation on a semiinfinite rod by a uniform wave at oblique incidence is analyzed by a technique similar to that of Kirchhoff. Scattering due to isolated irregularities along the rod is also analyzed. In both analyses, asymptotic expressions for eigenfunctions and eigenvalues are used. This results in analytically simple equations. M.V.E.

A70-21297 # A contribution to the measurement of blood velocity making use of the Doppler effect (Ein Beitrag zur Blutgeschwindigkeitsmessung unter Anwendung des Doppler-effektes). Kurt Fahrbach. Rheinisch-Westfälische Technische Hochschule, Fakultät für Elektrotechnik, Dr.-Ing. Dissertation, 1969. 127 p. 75 refs. In German.

The dissertation investigates the application of the Doppler effect for the determination of the blood velocity, blood pressure, pulse rate and parameters of the vascular structure. The difficulties which up to now stand in the way of an application of the Doppler

effect for blood velocity determinations are analyzed, and methods for overcoming these obstacles are discussed. New methods are described for the determination of the external and internal vascular cross sections and for the measurement of other physiological parameters.
G.R.

A70-21299 # Investigations regarding directional hearing in the meridian plane when the position of the head is fixed (*Untersuchungen zum Richtungshören in der Mediane ebene bei fixiertem Kopf*). Jens Blauert. Rheinisch-Westfälische Technische Hochschule, Fakultät für Elektrotechnik, Dr.-Ing. Dissertation, 1969. 124 p. 92 refs. In German.

The dissertation discusses the problem of the directional hearing in the meridian plane for the case when the head is held in a fixed position taking into consideration an analysis of the concept of sound which goes beyond the German and the American definition. The theories of directional hearing are examined and experimental investigations are discussed. A functional model for the directional hearing is described on the basis of the results of the investigations and the effects of the obtained sound-sensation on the various parts of the ear are considered.
G.R.

A70-21301 # Designing displays for human use. C. H. Baker (Human Factors Research, Inc., Goleta, Calif.). *Naval Research Reviews*, vol. 23, Jan. 1970, p. 1-9.

Discussion of displays which will result in an improved target detection performance. The degree of attention given by humans to various areas of a display field is examined. Displays are discussed which are modified in such a way as to encourage a search pattern in which an equal amount of attention is given to the important parts of a display.
G.R.

A70-21348 # The training of a jet pilot. Kurt A. Woelk. *Dornier-Post* (English Edition), no. 4, 1969, p. 21-25.

Outline of the main problems connected with the training of a jet pilot. The qualifications required of pilot trainees, the training process, and training methods and equipment are discussed. It is pointed out that the German-French plan to develop, produce and introduce a joint trainer aircraft under a joint program may be regarded as a very promising beginning, since it can not only lead to the use of the same trainer but possibly also to the joint training of pilots at the same bases. This would obviously be a further advance in German-French friendship and would represent another step forward toward a united Europe.
M.M.

A70-21436 # Oxygen uptake by the brain as a function of oxygen tension (*Potreblenie mozgom kisloroda v zavisimosti ot ego napriazheniia*). M. K. Kalinina and Iu. S. Aliukhin (Akademiiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR). *Fiziologicheskii Zhurnal SSSR*, vol. 55, Dec. 1969, p. 1481-1486. 22 refs. In Russian.

Use of the venous outflow method and blood gas analysis to investigate the rat brain oxygen uptake without narcosis and under conditions of breathing normal air or hypoxic gas mixtures, containing 10, 7-1/2 or 6% oxygen. The simultaneous determination of brain venous oxygen partial pressure was made by means of a polarographic electrode. The modification of Krogh-Erlang's formula was used for calculation of the lowest oxygen partial pressure in the brain tissue. It was shown that under normal conditions the mean oxygen uptake of the whole brain is 58 microliters/g/min, while that of the grey matter is 79 microliters/g/min. The oxygen tension of venous blood in the brain is 39 mm Hg, while the lowest oxygen partial pressure in the brain tissue is 23 mm Hg. A lowering of venous oxygen partial pressure in the brain down to 24 to 26 mm Hg is accompanied by a twofold increase in the cerebral blood flow, but the oxygen uptake of the brain is maintained at normal level. The critical value of the brain tissue oxygen partial pressure, at which a diminution in brain oxygen uptake began, was estimated as 8 to 10 mm Hg.
(Author)

A70-21437 # Acute hypoxia tolerance after prolonged exposure of animals to hyperoxic atmospheres (*Perenosimost' ostroi gipoksii posle dlitel'nogo prebyvaniia zhivotnykh v srede s povyshehennym soderzhaniiem kisloroda*). N. A. Agadzhanian and A. V. Sergienko. *Fiziologicheskii Zhurnal SSSR*, vol. 55, Dec. 1969, p. 1487-1492. 15 refs. In Russian.

Results of experiments carried out to study the effect of prolonged exposure of animals (white rats) to hyperoxic atmospheres upon their tolerance to acute hypoxia. It was found that in an 89% oxygen atmosphere the tolerance of animals to acute hypoxia increased during the first days but decreased greatly afterwards. After the transfer of animals to a normal atmosphere their altitude tolerance remained greatly reduced and did not recover within two weeks after the experiment had ceased. A prolonged (20 days) exposure of animals to a 53% oxygen atmosphere involved certain peculiarities in the pattern of altitude tolerance changes: hypoxic disturbances developed more slowly and recovered faster after the animals were transferred to a normal atmosphere.
(Author)

A70-21438 # Methods of recording fast and slow precision movements simultaneously with an electroencephalogram and an electromyogram (*Sposoby registratsii bystrykh i medlennykh tochnostnykh dvizhenii sinkhronno s elektroentsefalogrammoi i elektromiogrammoi*). S. A. Kosilov, A. I. Vasiutina, V. A. Ziablov, and A. A. Rigina (Nauchno-Issledovatel'skii Institut Vozrastnoi Fiziologii i Fizicheskogo Vospitaniia, Moscow, USSR). *Fiziologicheskii Zhurnal SSSR*, vol. 55, Dec. 1969, p. 1504-1508. In Russian.

Development of a special procedure for recording both fast and comparatively slow mechanical processes on an electroencephalograph simultaneously with an electroencephalogram and an electromyogram. Methods of recording fast rhythmical motions of the finger and slow precision movements of the wrist simultaneously with an electroencephalogram and an electromyogram are proposed, as well as an electric circuit for recording mechanograms on an electroencephalograph.
A.B.K.

A70-21439 # A miniature cardiac rhythm light indicator (*Malogabaritnyi svetovoi indikator serdechnogo ritma*). I. F. Golovko (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Fizicheskoi Kul'tury, Moscow, USSR). *Fiziologicheskii Zhurnal SSSR*, vol. 55, Dec. 1969, p. 1510-1512. In Russian.

Description of a method of obtaining visual recordings of cardiac rhythm from the flashes of a miniature but fairly powerful indicator tube. The circuitry of the proposed device includes a complex passive filter limiting the passage of signals with frequencies greater than 30 Hz. This, in conjunction with prior complex treatment of the skin according to Vodolazskii's (1959) method, which effectively reduces interelectrode resistance, almost completely eliminates the effect of certain harmful factors on the operation of the device.
A.B.K.

A70-21445 # Biochemical and histoenzymochemical parallels of enzymatic activity in the blood, cardiac muscle and liver in conditions of hypoxia (*Biokhicheskie i gistoenzimochimicheskie paralleli aktivnosti fermentov v krvi, serdtse i pecheni v usloviakh gipoksii*). N. D. Bakradze, M. G. Tkeshelashvili, and L. A. Murvanidze (Tbilisskii Gosudarstvennyi Meditsinskii Institut, Tiflis, Georgian SSR). *Akademiia Nauk Gruzinskoi SSR, Soobshcheniia*, vol. 56, Nov. 1969, p. 441-444. In Russian.

A study has been made of various degrees of experimental hypoxia on the activity of some enzymes—transaminases, lactate dehydrogenase, aldolase, creatinephosphokinase and alkaline phosphatase—in the blood serum. The change in enzymatic activity of the blood serum in conditions of experimental hypoxia is not determined by the passage of enzymes from the cardiac muscle into the blood. It is rather a primary phenomenon reflective of the general response of the biological systems of the organism to unusual conditions (hypoxia).
(Author)

A70-21446 # Formation of delayed reaction under conditions of stable and unstable trace pauses (Formirovanie otsrochennoi reaktzii v usloviakh stabil'nosti i nestabil'nosti sledovoi pauzy). L. A. Firsov (Akademiia Nauk SSSR, Institut Fiziologii, Koltushi, USSR). *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol. 19, Nov.-Dec. 1969, p. 976-981. 18 refs. In Russian.

It has been shown in experiments on apes and monkeys that a delayed trace process proceeds independently of the mechanism of a trace conditioned reflex. It is assumed that the two models of trace reactions (classical trace conditioned reflex and delayed reaction) are functions of different mechanisms of memory. (Author)

A70-21447 # Correlation between electrophysiological and conditioned characteristics in the course of radiation disease (Korrelatsii elektrofiziologicheskikh i uslovnoreflektornykh pokazatelei pri luchevoi bolezni). V. A. Khasabova (Akademiia Meditsinskikh Nauk SSSR, Sukhumi, Georgian SSR). *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol. 19, Nov.-Dec. 1969, p. 982-988. 19 refs. In Russian.

Conditioned and electrophysiological post-radiation disturbances in the central nervous system of monkeys were studied simultaneously and compared with clinical manifestations of the radiation disease. It has been found that in the process of development of the radiation sickness the dynamics of disturbances of higher nervous activity and of changes in the electrical activity of the brain structures are of a phasic nature. Phases of conditioning disturbances correlate well with the changes in the high-frequency components of the cortical bioelectrical activity. (Author)

A70-21448 # Data on functional relationships between the hypothalamus and the hippocampus (Dannye o funktsional'nom vzaimootnoshenii gipotalamusa i gippokampa). A. A. Ungiadze (Akademiia Nauk Gruzinskoi SSR, Institut Fiziologii, Tiflis, Georgian SSR). *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol. 19, Nov.-Dec. 1969, p. 1051-1057. 17 refs. In Russian.

The data obtained in experiments on cats with chronically implanted electrodes have shown that threshold and super-threshold stimulation of the anterior points of the lateral hypothalamus and of the preoptic region induces a drowsy state in the animal, which is deepened as the stimulation continues. In the course of stimulation slow waves appear and become regular in the electrical activity of the neocortex and the hippocampus. Stimulation of the ventro-medial nucleus of the hypothalamus produces a diametrically opposite effect: an arousal and fear reaction, and desynchronization of the activity in the hippocampus, the sensorimotor cortex and the lateral hypothalamus. Super-threshold stimulation of the dorsal and ventral hippocampus brings forth changes in the electrical activity, similar to those due to the stimulation of the ventro-medial hypothalamic nucleus. The author's findings agree with earlier data which point to the presence of direct connections between the hypothalamus and the hippocampus. It may be assumed that different points of the hypothalamus may exert both a synchronizing and desynchronizing effect on the electrical activity of the hippocampus. (Author)

A70-21449 # Peculiarities of the nervous control mechanisms of unconditioned cardiovascular reflexes during ontogenesis (Osobennosti nervnykh mekhanizmov regulatsii bezuslovnykh reflektsov serdечно-sosudistoi sistemy v ontogeneze). Z. V. Beliaeva (Akademiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR). *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol. 19, Nov.-Dec. 1969, p. 1058-1066. 25 refs. In Russian.

Discussion of experiments in which the nervous control of unconditioned cardiovascular reflexes during ontogenesis, particularly the inhibitory vagus function, was studied in healthy children of various age groups. For children between two and three years, sympathetic tonicity prevails over vagal tonicity in the control of the cardiovascular system. This manifests itself in a pronounced increase in the pulse rate in the state of physiological rest. Reflex responses of the vagal center during ontogenesis form later than

those of the sympathetic center. In children of the intermediate and older groups, the percentage of adequate reactions to stimulation of the vagal innervation center increases gradually during ontogenesis. Development of vagal inhibition leads to a more coordinated activity of the blood circulation than in the younger age groups. V.P.

A70-21450 # Comparative characteristics of two modes of operation of the human system of successive conditioned motor reflexes (Sravnitel'naia kharakteristika dvukh rezhimov funktsionirovaniia sistemy posledovatel'nykh dvigatel'nykh uslovnnykh reaktzii cheloveka). I. S. Dobronravova (Akademiia Nauk SSSR, Institut Vysshei Nervnoi Deiatel'nosti i Neurofiziologii, Moscow, USSR). *Zhurnal Vysshei Nervnoi Deiatel'nosti*, vol. 19, Nov.-Dec. 1969, p. 1077-1079. 9 refs. In Russian.

Study of the bioelectrical activity of the brain during two modes of operation of the conditioned reflex system in response to stimulating light pulses. The pulses were 0.5 sec in duration and followed in intervals of 5.5 to 1 sec. Subjects were instructed to compress a rubber ball with the right hand in response to the signal (passive mode) and in timing with the rhythm of the pulse sequence (active mode). Features of the alpha rhythm in EEG recordings are analyzed. T.M.

A70-21460 # The organizing principle of complex living systems. A. S. Iberall (General Technical Services, Inc., Upper Darby, Pa.) and W. S. McCulloch (MIT, Cambridge, Mass.). (*American Automatic Control Council, Joint Automatic Control Conference, 9th, University of Michigan, Ann Arbor, Mich., June 26-28, 1968.*) *ASME, Transactions, Series D—Journal of Basic Engineering*, vol. 91, June 1969, p. 290-294. 16 refs.

Outline of a scheme for a useful way to think about the complex biological organism, man. The proposed scheme is based on physiological findings that the regulating and control functions in the system make use of active processes, exhibiting oscillatory properties. The resulting homeostatic regulation, which was the key concept proposed by Bernard, Sechenov, and Cannon for the living system, emerges from mediation of these oscillators. Because of its dynamic character, the scheme is renamed homeokinesis. The concept may be extended to man's behavioral complex. In outline, it touches on all the time or frequency domains in life—i.e., of the many episodes in man. (Author)

A70-21461 * # An embodiment of some vertebrate command and control principles. W. K. Kilmer (Michigan State University, East Lansing, Mich.), W. S. McCulloch, and J. Blum (MIT, Cambridge, Mass.). (*American Automatic Control Council, Joint Automatic Control Conference, 9th, University of Michigan, Ann Arbor, Mich., June 26-28, 1968.*) *ASME, Transactions, Series D—Journal of Basic Engineering*, vol. 91, June 1969, p. 295-304. 9 refs. Research supported by the Teagle Foundation; NIH Grant No. NB-04985-03; Contracts No. NSR-22-009-138; No. AF 33(615)-1747; Grant No. AF AFOSR 1023-66.

Throughout the life of the vertebrates, the core of the central nervous system, the reticular formation, has retained the power to commit the whole animal to one mode of behavior rather than another. Its anatomy, or wiring diagram, is fairly well known, but to date no theory of its circuit action has been proposed that could possibly account for its known performance. Its basic structure is that of a string of similar modules, wide but shallow in computation everywhere, and connected not merely from module to adjacent module, but by long jumpers between distant modules. Analysis of its circuit actions heretofore proposed in terms of finite automata or coupled nonlinear oscillators has failed. We propose a set of nonlinear, probabilistic, hybrid computer concepts as guidelines for specifying the operational schemata of the foregoing modules. Using the smallest numbers and greatest simplifications possible, we arrive at a reticular formation model consisting of 12 anatomically coupled modules stacked in columnar array. A simulation test of its

behavior shows that despite its 800-line complexity, it still behaves as an integral unit, rolling over from stable mode to stable mode as directed by its succession of input 60-tuples. (Author)

A70-21508 **The pressure-diameter-relationship of the common carotid artery in conscious man (Die Druck-Durchmesser-Beziehung der A. carotis communis des wachen Menschen).** G. Kober and J. O. Arndt (Berlin, Freie Universität, Berlin, West Germany). *Pflügers Archiv*, vol. 314, no. 1, 1970, p. 27-39. 24 refs. In German. Research supported by the Deutsche Forschungsgemeinschaft.

Study of how application of pressures above and below atmospheric to the head and neck region of eight conscious men influences the diameter of the intact common carotid artery, which was measured with an ultrasonic echo-ranging device. The head and neck of the supine subjects was tightened into a box in which the pressure was changed by plus or minus 45 mm of mercury (compared to atmospheric pressure). The transmural arterial pressure was calculated by subtracting the pressure within the box from the arterial pressure as measured directly in the brachial artery. The relationship between transmural pressure and arterial diameter was found to be roughly linear over a pressure range from 50 to 150 mm Hg, the equation of the regression line being $y = 4.8 + 0.0023 x$, sigma 0.54. The calculated pulse wave velocities amounted to 4.04 plus or minus 0.18 (normal transmural pressure), 4.19 plus or minus 0.30 (low transmural pressure), and 4.60 plus or minus 0.29 m/sec (high transmural pressure). The difference between isolated and intact arteries is discussed, as well as the significance of the results for the dynamics of the arterial pulse. (Author)

A70-21513 **General formulation of the cardiovascular control problem—Mathematical models of the mechanical system.** Fred S. Grodins (Southern California, University, Los Angeles, Calif.) and John F. Buonocristiani (Harvard University, Boston, Mass.). *Behavioral Science*, vol. 15, Jan. 1970, p. 88-100. 23 refs.

The history of our notions about cardiovascular regulation and the development of mathematical descriptions of the mechanical cardiovascular system are briefly reviewed. A mathematical model for the ventricle is developed which incorporates most of our current ideas about the fundamental properties of heart muscle (force-length, force-velocity, active state, homeometric autoregulation, series compliance). A FORTRAN program was written for convenient digital simulation, and some of the results of preliminary explorations are described. (Author)

A70-21690 # **Considerations from engineering psychology.** R. C. Casperson (Dunlap and Associates, Inc., Darien, Conn.). In: Recent advances in display media; Proceedings of a Symposium, Cambridge, Mass., September 19, 20, 1967. (A70-21676 08-14) Symposium sponsored by NASA. Los Angeles, Technology Publishing Corp., 1969, p. 133-142. 12 refs.

The engineering psychologist is concerned with two classes of requirements in the development and implementation of display media. The first considers the information required by the human operator to perform effectively in a system. The second defines the human factors that are important for the effective transfer of this information via the display to the human operator. Several studies are reviewed and specific visual phenomena are discussed which point out some of the limitations of the available data concerning human visual performance and the faulty conclusions that can derive from the uncritical use of certain 'cookbook' data. Some general guidelines are suggested for use by media researchers and display designers to assist them in meeting their ultimate goal: the transfer of useful information to man in a form that is compatible with his sensory-perceptual capabilities. (Author)

A70-21722 **Dark adaptation and the rate of pigment regeneration.** W. A. H. Rushton, Anne B. Fulton, and Howard D. Baker (Florida State University, Tallahassee, Fla.). *Vision Research*,

vol. 9, Dec. 1969, p. 1473-1479. 19 refs. AEC Contract No. AT (40-1)-2690; NSF Grant No. GU-2612.

The regeneration of visual pigments in vivo closely follows a monomolecular time course, consequently the regeneration rate is proportional to the quantity of bleached pigment at each moment. The psycho-physical dark adaptation curve follows this same time course, thus log threshold might be raised either by the quantity of pigment still bleached, or by the rate at which regeneration was proceeding. The regeneration after a 5-sec full bleach starts much faster than after a 2-min full bleach, thus the log threshold should be much higher if it is proportional to rate. The pigment regeneration was measured by densitometry and dark adaptation by psycho-physical thresholds after the same bleaches in the same conditions. The log threshold does not follow the rate of regeneration but rather closely the state of regeneration. However there is clearly a second threshold-raising factor which is discussed. (Author)

A70-21723 **Sensitization by annular surrounds—Sensitization and dark adaptation.** Davida Y. Teller and Phyllis J. Gestrin (Washington, University, Seattle, Wash.). *Vision Research*, vol. 9, Dec. 1969, p. 1481-1489. 22 refs. Research supported by the Boeing Co.; PHS Grant No. NB-08070.

Westheimer has shown that the rod threshold at the center of a 45 min of arc adapting disk can be lowered by adding light in the surrounding annular region. He has also shown that a similar sensitization effect does not occur for dark adaptation curves; that is, dark adaptation curves measured on bleached fields of different diameters appear to be identical. The present investigation confirms Westheimer's finding for dark adaptation curves traced downward to the absolute threshold, and extends it to the case of dark adaptation curves traced downward against real light backgrounds of various illuminances. (Author)

A70-21724 **Nonlinearities of the human oculomotor system—Time delays.** G. J. St-Cyr and D. H. Fender (California Institute of Technology, Pasadena, Calif.). *Vision Research*, vol. 9, Dec. 1969, p. 1491-1503. 14 refs. NIH Grants No. NB-03627; No. GM-01335.

Measurements of the gain of the human eye movement control system in two-dimensional tracking tasks show that the system is nonlinear in the sense that it is not possible to predict the response to one class of target motion by linear combination of the responses to other classes of stimuli. It is therefore not valid to represent the system by a linear transfer function and hence a minimum phase lag cannot be calculated. There is thus no theoretical datum with which to compare the actual phase lags of the visual axes in tracking tasks and hence no evidence for a predictor mechanism. The lags of the visual axes can be satisfactorily explained in terms of simple delays which depend on the class of target motion. (Author)

A70-21725 **Distance in stereoscopic vision—The three-point problem.** J. M. Foley (California, University, Santa Barbara, Calif.). *Vision Research*, vol. 9, Dec. 1969, p. 1505-1521. 12 refs. PHS Grant No. MH-08878.

Description of studies concerned with the relation between perceived depth and horizontal disparity. The situation is one in which points of light are presented stereoscopically in otherwise dark surroundings, secondary cues to distance being eliminated. Five experiments were carried out with apparatus which was essentially the same as that used in previous studies by the author. The stimuli consisted of configurations of point sources of light presented in otherwise dark surroundings. The experiments differ primarily in the set of loci occupied by the probe unit. The principal generalization that can be made from the experimental results is that the presence of the probe does affect the disparity required to maintain a constant perceived distance ratio. It does so regardless of its position in depth or direction relative to the two points involved in the judgment. In the four experiments in which the probe moved in depth, it was

noted that the variance of the settings was not constant. At the ends of the convergence angle range, variance tended to be high relative to the no-probe condition, but it reached a minimum lower than in the no-probe condition in the middle of the range. Tests of homogeneity of variance indicate significant differences among variances in only about one-third of the cases.
M.M.

A70-21739 # Cardiovascular aging and aeromedical maintenance programs in professional test pilots. Robert Proper (Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex.). (*Society of Experimental Test Pilots, Symposium, 13th, Beverly Hills, Calif., Sept. 25-27, 1969.*) *Society of Experimental Test Pilots, Technical Review*, vol. 9, no. 4, 1969, p. 217-236.

Review of an aeromedical evaluation and maintenance program conducted since 1955 for the purpose of selecting outstanding candidates for test flying with subsequent maintenance of their aeromedical competence. Minimal morbidity and groundings have occurred, and no aircraft accidents have taken place which were attributable to medical causes. Performance of the group has been outstanding, and it is concluded that the medical results justify further support of the program.
T.M.

A70-21753 Effect of surface electrode number on estimates of cardiac dipole moment. George H. Weiss (National Institutes of Health, Div. of Computer Research and Technology, Bethesda, Md.) and Eugene J. Fischmann (Freedmen's Hospital, Washington, D.C.; Johns Hopkins Hospital, Baltimore, Md.). *IEEE Transactions on Bio-Medical Engineering*, vol. BME-17, Jan. 1970, p. 58-65. 29 refs. Research supported by the Ontario Heart Foundation and the Washington Heart Association.

This study reports on the errors in the calculation of a heart dipole introduced by deleting individual electrode contributions to a surface potential map. The potential at 150 points on each of 6 normal children was available at several instants of the QRS cycle. Although it was impossible to test all possible sets of deleted points, or all possible methods of compensatory weighting of the residual points, the results indicate that a number of electrodes at least as great as 100 is required to produce consistent relative errors of less than 15 percent, if surface potential integration is employed in determining the heart's total dipole moment. (Author)

A70-21792 # Neural limitations of visual excitability. IX—Monocular and interocular changes of sensitivity during flicker stimulation. William S. Battersby (New York, City University, New York, N.Y.) and Joseph F. Sturr (Syracuse University, Syracuse, N.Y.). *Optical Society of America, Journal*, vol. 60, Jan. 1970, p. 121-126. 21 refs. PHS Grants No. B-3691; No. NB-05395.

Study of changes in threshold luminance in response to a test flash as a function of temporal displacement between two conditioning flashes viewed with either the tested eye or the homologous retinal location in the opposite eye. Under both conditions the threshold is found to be elevated most near the beginning of the first flash, falls to a minimum between flashes, and rises again to a secondary maximum near the beginning of the second flash. The form of this function changes dramatically as the interval between the two flashes decreases, the greatest effect being obtained with interocular stimulation. When a train of five conditioning flashes at or near fusion frequency is utilized, temporal oscillations of threshold luminance are detectable with monocular but not with interocular stimulation.
A.B.K.

A70-21793 # Bioeffects of exposure to explosive decompression. IV—On the distension of the thoracic cage and the abdominal cavity in dogs. Hiroshi Fujiwara, Yoshihisa Yamazaki, Tsuneatsu Nanba, Koriyoshi Kaneguchi, and Kenji Miyano (Japan Air Self-Defense Force, Aeromedical Laboratory, Tachikawa, Japan). *Japan Air Self Defence Force, Aeromedical Laboratory, Reports*, vol.

10, June 1969, p. 1-8. 5 refs. In Japanese, with abstract in English.

Experimental investigation in which twenty-four male mongrel dogs were subjected to explosive decompression up to 33.6 mm Hg. The dimensions of the thoracic cage and heart were measured from X-ray photographs taken before decompression, immediately after explosive decompression, and after recompression to the ground level. In other experiments, the sizes of the extirpated lungs in six dogs were measured during decompression from photographs which were taken at successively increasing altitude up to 100,000 ft. The principal results obtained are: (1) the maximum transverse dimension of the thoracic cage was found to be larger immediately after explosive decompression to the altitude of 70,000 ft than control; (2) the maximum transverse dimension of the heart was increased by 28.1% immediately after decompression to the altitude of 70,000 ft than the control; (3) the size of the extirpated lungs increased during exposure to successively increasing altitude, and reached the maximum value at the altitude of 40,000 ft; and (4) the extirpated lungs were ruptured when the closed intratracheal differential pressure exceeded 60 mm Hg.
M.M.

A70-21794 # Relationships between flying safety and human factors from job-satisfaction in JASDF. III. Yukiko Kakimoto, Isao Kuroda, and Yoshinori Kurihara (Japan Air Self-Defense Force, Aeromedical Laboratory, Tachikawa, Japan). *Japan Air Self Defence Force, Aeromedical Laboratory, Reports*, vol. 10, June 1969, p. 31-47. 12 refs. In Japanese, with abstract in English.

Evaluation of job dissatisfaction as a function of career fields, rank order, age, length of service, educational background, total flying hours, and assigned types of aircraft. The principal results obtained are: (1) maintenance groups exhibited the highest rate of dissatisfaction, while pilot groups showed the lowest rate of dissatisfaction; (2) the housing item had the highest rate among the areas of dissatisfaction in the three career fields. The 2nd and 3rd were promotion and pay in maintenance, administrative and personnel groups, while the working time and supervisor items were rated 2nd and 3rd in the pilot group; (3) regarding rank order, the rates of dissatisfaction were low in high rank groups and very high in low rank groups. In pilot groups, however, the rates were low even in low rank orders; and (4) regarding educational background, the rates of dissatisfaction were lowest in the group of the Defense Academy.
M.M.

A70-21841 * Mechanism of changes in brain norepinephrine levels following olfactory bulb lesions. L. A. Pohorecky, F. Larin, and R. J. Wurtman (MIT, Cambridge, Mass.). *Life Sciences, Part I—Physiology and Pharmacology*, vol. 8, Dec. 1, 1969, p. 1309-1317. 11 refs. NIH Grants No. AM-11237; No. MH-17446; Grant No. NGR-22-009-272.

Description of the results of an experimental investigation of the time-course of the changes in brain norepinephrine levels in the rat after olfactory bulb lesions and of the automatic and biochemical mechanism responsible for these changes. It was found that unilateral lesions of the olfactory bulb cause the levels of norepinephrine in the ipsilateral telencephalon to fall and those in the ipsilateral brain stem to rise. These effects are not the result of retrograde changes in adrenergic neurons which terminate within the bulb. Since elevation in brain stem norepinephrine content is not apparent until 21 days after transection of the bulb, it is concluded that it is not simply the consequence of nerve degeneration.
M.M.

A70-21873 Physical exercise, acid-base balance, and adrenal function in newcomers to high altitude. Federico Moncloa, Amador Carcelen, and Luis Beteta (Universidad Peruana, Lima, Peru). *Journal of Applied Physiology*, vol. 28, Feb. 1970, p. 151-155. 16 refs. Grant No. DA-HC-19-68-G-0003.

Newcomers to high altitude show a significant and inverse correlation between CO₂ arterial pressure and either plasma cortisol, urinary 17-OHCS, or urinary 17-KGS. No correlation was demonstrable between CO₂ arterial pressure or pH and indexes of adrenal function. These results are interpreted as indicative that the

adrenal hyperactivity at high altitude is not dependent on alkalosis. During exercise, acidosis is more severe than at sea level and it is associated with a significant decrease in plasma cortisol not observed at sea level. No variation in glucose concentration occurred at high altitude in contrast to a decrease at sea level. (Author)

A70-21874 Nasal airflow with body in various positions. Shanker Rao and Anilkumar Potdar (Gandhi Medical College, Hyderabad, India). *Journal of Applied Physiology*, vol. 28, Feb. 1970, p. 162-165. 9 refs.

The cause of increased resistance to airflow through the 'down side of the nose of subjects in lateral recumbent postures is obscure. We measured ventilation through each nostril during lateral recumbency and while the subject sat with a crutchlike device under the arm. The volumes from the right and left nostril during the right lateral recumbent posture were 3.2 plus or minus 2.2 and 8.1 plus or minus 4.3 liters/min, respectively. In the left lateral position the respective volumes were 6.2 plus or minus 3.8 and 3.1 plus or minus 2.2 liters/min. A similar response was observed in subjects in the sitting position with a crutch under the right or the left arm. The cause of this uniform response in the two situations is discussed. One explanation might be that autonomic reflexes originating from structures near the shoulder and arm result in ipsilateral nasal congestion. (Author)

A70-21935 Circadian rhythm of pilots' efficiency and effects of multiple time zone travel. K. E. Klein, H. Brüner, H. Holtmann, H. Rehme, J. Stolze, W. D. Steinhoff, and H. M. Wegmann (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Flugmedizin, Bad Godesberg, West Germany). *Aerospace Medicine*, vol. 41, Feb. 1970, p. 125-132. 40 refs.

If a standard instrument flight in a supersonic simulator was repeated in intervals of 2 hours the average performance of 12 pilots revealed a sinusoid circadian rhythm curve with the temporal position of peak and trough between 2-3 p.m. and 4-5 a.m., respectively. The amplitude of the diurnal oscillation came to an average of plus or minus 25 (12-49) % of the 24-hours total average as against plus or minus 12% found on average in the same subjects for the simple reaction time. After rapid transportation from Europe to the U.S. and back with a sojourn of 17 days (time shift: 8 h), the duration of resynchronization was about 5 days on average for both directions with a rate of phase adjustment of approximately 1.5 (1-2) h/day. The change in the performance level following transit, in dependence of the coincidence of old and new clock time, was unequal during the course of the day, but in general the level was significantly decreased (up to 40%) at daytime and increased during the late night hours. A performance decrement seen for the 24-hours total average, in comparison to the preflight control, was significant only after the eastward (-8.5%) but not after the westward (-3.3%) flight. The reason for this difference is mainly seen in a greater fatigue due to an unfavorable flight schedule and the more severe sleep loss connected with eastward traveling. (Author)

A70-21936 Cardiac output and coronary blood flow during steady state recumbent exercise. Lawrence E. Lamb, Adrian D. LeBlanc, Wilbur L. Smith, Roy J. Kelly, and Philip C. Johnson (Baylor University, Houston, Tex.). *Aerospace Medicine*, vol. 41, Feb. 1970, p. 132-134. 6 refs. Research supported by the Jewish Institute for Medical Research; PHS Grant No. HE-05435.

CO and $^{84}\text{RbCBF}$ measurements were done in 11 subjects during 20 minutes of steady state exercise and in 4 controls. The percent increase in CO times systolic pressure was compared to percent increase of $^{84}\text{RbCBF}$ during exercise, yielding a .737 correlation coefficient, demonstrating a relationship between an increase in the pressure volume factor to an increase in the $^{84}\text{RbCBF}$ in man. Comparing the percent increase in CO with the percent increase in $^{84}\text{RbCBF}$ yielded a correlation coefficient of .719. In all 11 subjects an increase in cardiac work, as expressed by the pressure

volume factor, was accompanied with an increase in the $^{84}\text{RbCBF}$ factor. There was a clear separation between the results observed in the unexercised controls and the test subjects. (Author)

A70-21937 Use of the helicopter as an emergency vehicle in the civilian environment—Results of a survey-questionnaire. H. S. Turner and H. V. Ellingson (Ohio State University, Columbus, Ohio). *Aerospace Medicine*, vol. 41, Feb. 1970, p. 135-138.

Eighty-four medical schools, 50 State Highway Patrols and 12 private hospitals were surveyed by questionnaires to gather information regarding the present status and the anticipated need for the utilization of the helicopter in civilian medical care. Responses were received from 72 medical schools, 45 State Highway Patrols and eight private hospitals. There was general recognition by medical and police agencies of a need for helicopter transportation in certain situations. The actual utilization in the civilian community is, however, extremely limited and among the active programs the majority rely upon the military forces or Coast Guard for helicopters and crews. The practice has had uniformly high patient acceptance and appears to offer substantial advantages in lowering patient morbidity and mortality. It is likely that expense—both for equipment and crews—is the major factor which prevents full utilization of the helicopter's unique advantages in emergency transportation of civilian patients. (Author)

A70-21938 Protection against accidental decompression by compartmentalization of spacecraft and aircraft. Harald J. von Beckh (USAF, Aeromedical Research Laboratory, Holloman AFB, N. Mex.). *Aerospace Medicine*, vol. 41, Feb. 1970, p. 143-153. 79 refs.

Time of useful consciousness (TUC) and total rescue time (TRT) after decompression of human and animal subjects as they have been reported by several authors, are presented in up-to-date tables. In order to achieve on-board rescue of decompressed crewmembers compartmentalization combined with adequate air lock design is suggested and its operation in said emergencies described. The same principle can be applied to decompression events of High Altitude/Multi Mach Transport Aircraft. (Author)

A70-21939 Operator performance as a function of drug, hypoxia, individual, and task factors. Richard G. Pearson and Gilbert L. Neal (North Carolina State University, Raleigh, N.C.). *Aerospace Medicine*, vol. 41, Feb. 1970, p. 154-158.

Groups of 3 subjects received drug capsules (placebo, Librium, meprobamate) before and after overnight sleep. Alcohol and 12,000 ft. altitude treatments were introduced following initial, morning, task performance in a pressure chamber. Nine males performed under all experimental conditions which included appropriate alcohol and altitude controls. In a 3-hour post-treatment session, subjects rotated periodically among three tasks: (1) tracking with concurrent meter and warning light monitoring, and reaction time assessed during rest periods, (2) problem-solving, and (3) auditory vigilance. The principal and surprising finding was the general lack of drug-alcohol effects on performance. Analyses did reveal high individual and test day variability, and, under certain experimental conditions, better performance under meprobamate. It was concluded that task loads, subject training, and performance feedback operated jointly to mitigate potential decremental effects of drugs and hypoxia. A separate 'hangover' study revealed adverse effects of alcohol upon problem-solving time. (Author)

A70-21940 Radiobiological concepts for manned space missions. John E. Pickering (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Aerospace Medicine*, vol. 41, Feb. 1970, p. 159-165. 8 refs.

Carefully established premission planning doses and maximum operational dose limits are clearly enhanced by clinical judgments when go-no-go decisions are made in the event of an astronaut's

exposure to ionizing radiation. The very nature of extended lunar missions (exploration) and long duration low earth orbit missions are clear cases for evaluating man's clinical response before go-no-go decisions are made. There are well identifiable decision points in mission plans that are best judged by clinical responses if the mission is to avoid performance decrement at critical times, i.e., at the peak of astronaut activity: descent, EVA, ascent, rendezvous, transfer, etc. Careful on-board monitoring of the astronaut's condition and judicious recording and interpretation of actual radiation manifestations with respect to time can and should dissuade premature or unfounded decisions. This philosophy has its greatest merit if one accepts the tenet that man is in the system to make observational judgments and assessments. (Author)

A70-21941 * **Changes in subjective estimates of well-being during the onset and remission of motion sickness symptomatology in the slow rotation room.** James T. Reason and Ashton Graybiel (U.S. Naval Aviation Medical Center, Aerospace Medical Institute, Pensacola, Fla.). *Aerospace Medicine*, vol. 41, Feb. 1970, p. 166-171. 7 refs. NASA-sponsored research.

The onset of motion sickness is characterized by a decline in generalized feelings of well-being. In this study, an attempt was made to quantify these subjective changes during the experimental production of motion sickness in the slow rotation room. A simple eleven-point rating scale was used to measure the well-being state. The nature and the time of onset of symptoms were recorded independently. Systematic relationships were obtained between the amount of stimulation required to produce the Malaise III endpoint and the rate of change of well-being. In general, relatively susceptible individuals showed an immediate decline in well-being at the onset of the stimulus which continued to fall sharply until the endpoint was reached. With increasing resistance to motion sickness, this point of rapid decline ('avalanche phenomenon') was proportionately delayed. The point on the rating scale at which this rapid decline began was relatively consistent across all subjects. Various positions along the well-being scale were consistently associated with specific constellations of symptoms. The recovery of well-being, following the cessation of the stimulus, appeared to be slower in individuals of low susceptibility than in those who were highly susceptible.

(Author)

A70-21942 **Computer analysis and clinical evaluation of postcaloric nystagmus.** G. J. Matz, J. W. Wolfe, and F. A. Brogan (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Aerospace Medicine*, vol. 41, Feb. 1970, p. 172-174.

An analog computer has been helpful in the clinical evaluation of postcaloric nystagmus at the USAF School of Aerospace Medicine. The computer was used to measure the total eye displacement of the fast phase (per unit time—5 sec.), which was printed on an X-Y plotter. The average fast-phase eye displacement should reflect and approximate the average slow-phase eye displacement over a period of time such as 5 seconds. These measurements were used clinically to evaluate patients in the Vestibular Function laboratory and have been helpful in the diagnosis of acoustic neuroma, motion-sick patients, and various neurological patients seen in the Vestibular Function laboratory. The computer measurements compared favorably to hand-scored records. (Author)

A70-21943 **Venous pressure of man in space.** J. L. Duomarco and R. Rimini (Uruguay, University, Montevideo, Uruguay). *Aerospace Medicine*, vol. 41, Feb. 1970, p. 175-178. 23 refs.

A theoretical discussion is presented of venous return to the heart in the absence of gravity. It is hypothesized that in the absence of gravity the systemic and pulmonary veins are slightly distended by hydraulic pressure. This distention is interrupted immediately before the venous passage into the plural medium. At this point the lateral effective pressure is null and the venous collapse is produced. The presence of gravity produces hydrostatic pressure in the ascending

veins and collapse in the descending ones both in a gaseous medium.

Gravity does not affect the situation of the abdominal veins. In fact, whatever the direction of the flow, these veins are only distended by the hydraulic pressure because abdominal and venous hydrostatic pressure are mutually cancelled. (Author)

A70-21944 * **Preliminary investigation of bone change as a result of exposure to reduced atmospheric pressure.** Kenneth R. Coburn (NASA, Washington, D.C.). *Aerospace Medicine*, vol. 41, Feb. 1970, p. 188-190. 18 refs.

This report contains the results of a long bone survey made of U.S. Navy low pressure chamber inside observers in 1954-1955. The incidence of lesions resembling those of aseptic bone necrosis is reported. The distribution of these lesions is compared with those reported in the literature dealing with caisson disease. (Author)

A70-21945 **Studies of the effect of beta-adrenergic blockade on abnormal R-ST segment and T-wave changes.** J. E. Smith, E. B. McKee, and G. J. Kidera (United Airlines, Inc., Washington, D.C.). *Aerospace Medicine*, vol. 41, Feb. 1970, p. 190-195. 5 refs.

In a previous paper 50 cases of asymptomatic persons with non-specific T-wave changes were placed on progressive exercise stress programs. Forty-four of these cases showed rapid changes in the T-waves, returning to normal in one to three months. It was postulated that these people may have had early myocardial ischemia or hypokinesia or a form of cardiovascular reactivity resulting from the medical examination per se. The logical follow-up study for this type of case would be the reaction of these people to drugs and the most likely drug for diagnostic purposes would seem to be propranolol. The drug was given orally except in one case and 2 mgs total dose was used. It was found that this drug can change the abnormal T-wave in most patients showing clinical evidence of cardiovascular reactivity and had no effect on R-ST and T-waves in fixed hypertension. It seemed to have no effect on right or left bundle branch block. It can change the exercise electrocardiogram toward normal in cases of angine pectoris due to coronary heart disease. Beta-adrenergic blockers may be useful to separate cases of stress-induced catecholamine liberation from those with organic cardiovascular disease. (Author)

A70-21946 # **Aeromedical consultation service case report—Clinical entities mimicking vasovagal syncope.** Thomas M. Zizic, Timothy N. Caris, and Earl A. Zimmerman (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Aerospace Medicine*, vol. 41, Feb. 1970, p. 196-200. 30 refs.

Considerable difficulties may be encountered in differentiating vasovagal syncope from other causes of loss of consciousness which are less benign. Although other conditions may not be more ominous with regard to longevity or overall prognosis, they may predispose the individual to further episodes of unconsciousness—a situation obviously incompatible with flying safety. The diagnostic problems involved are illustrated by three cases recently seen at the USAF School of Aerospace Medicine. All of the cases appeared to be caused by vasovagal syncope at first glance, but they resulted in three different diagnoses: (1) atrial fibrillation, (2) an intracranial A-V malformation, and (3) idiopathic epilepsy. Following the presentations of the clinical pictures is a review of the literature pointing out the pathophysiological mechanisms involved and a discussion of the aeromedical significance of the disorders. (Author)

A70-21947 # **Aeromedical consultation service case report—Alternobaric vertigo.** Lawrence J. Enders and Ensor Rodriguez-Lopez (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Aerospace Medicine*, vol. 41, Feb. 1970, p. 200-202. 8 refs.

Alternobaric vertigo is probably not as uncommon an occurrence in the flyer as previously suspected; and the incidence may be on the increase. Yet very little has appeared in the medical literature regarding this potentially serious hazard to flying safety. In

this article the case histories of two patients with alternobaric vertigo recently seen on the USAF School of Aerospace Medicine Aero-medical Consultation Service are presented along with a brief discussion to instill in the aeromedical physician an appreciation for the seriousness of this infrequently diagnosed entity. The most common contributing factors, the currently accepted physiological mechanism and the need to differentiate alternobaric vertigo from other vertiginous diseases are also discussed. (Author)

A70-21948 # An analog computer program for cardiac output in humans using mass spectrometer analysis of expired air. Rudolf G. Bickel, Carl F. Diener, and H. L. Brammell (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). (*Aerospace Medical Association, Scientific Meeting, Bal Harbour, Fla., May 1968.*) *Aerospace Medicine*, vol. 41, Feb. 1970, p. 203-207. 12 refs. USAF-sponsored research.

A computer program for determining cardiac output from respiratory gases is described and initial results given. Studies to confirm the comparability of this technique with standard methods are required, and are underway. (Author)

A70-21949 New graph for thermal tolerance and comfort in air-conditioned spaces. Albert W. Optican (TRW Systems Group, Redondo Beach, Calif.). *Aerospace Medicine*, vol. 41, Feb. 1970, p. 208, 209.

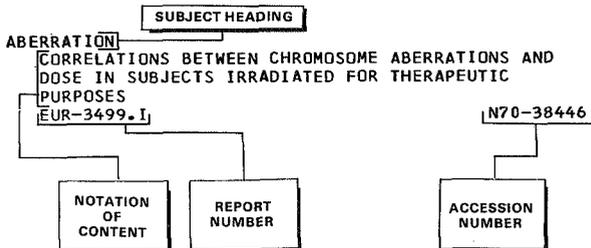
This report presents a new graph for thermal tolerance and comfort in air-conditioned spaces having a room air velocity or turbulence of 15 to 25 feet per minute. The only other graph of this nature in existence today is based upon an air velocity of 200 fpm which air velocity was in turn based upon the air change rate needed in small fighter plane cockpits. (Author)

A70-21949 New graph for thermal tolerance and comfort in air-conditioned spaces. Albert W. Optican (TRW Systems Group, Redondo Beach, Calif.). *Aerospace Medicine*, vol. 41, Feb. 1970, p. 208, 209.

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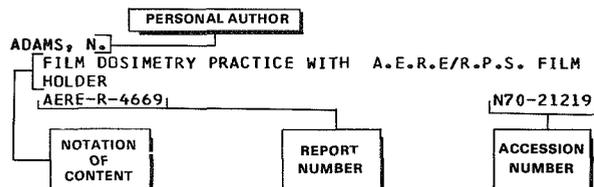
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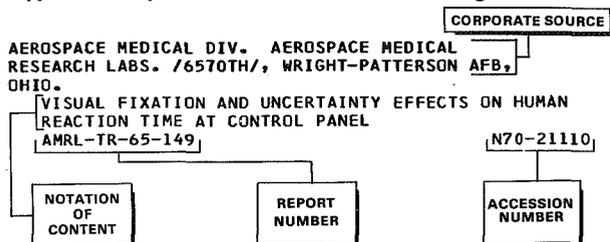
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 Electron microscopic and morphometric study of monkey and dog lungs exposed to beryllium oxide
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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. JOHN F. KENNEDY SPACE CENTER, COCOA BEACH, FLA.
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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. MANNED SPACECRAFT CENTER, HOUSTON, TEX.
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Annotated bibliography and indexes on Aerospace Medicine and Biology - Dec. 1969
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Using polymeric films to control solar radiation and heat energy effects on crop yields
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Influence of atmospheric humidity on enzymic oxidation of withered tea leaves
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- SPACE SCIENCES, INC., WALTHAM, MASS.**
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