NASA CR-134964
OR 14,177

BIBLIOGRAPHY OF INFORMATION ON MECHANICS OF STRUCTURAL FAILURE (HYDROGEN EMBRITTLEMENT, PROTECTIVE COATINGS, COMPOSITE MATERIALS, NDE)

By James L. Carpenter, Jr.

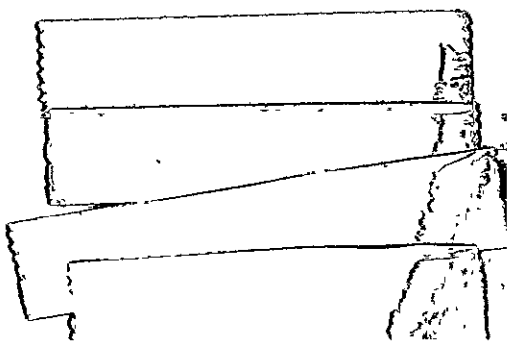
MARTIN MARIETTA CORPORATION
Orlando Division
Orlando, Florida 32805

Prepared for

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LEWIS RESEARCH CENTER
AEROSPACE SAFETY RESEARCH AND DATA INSTITUTE
CLEVELAND, OHIO 44135

George Mandel, Project Manager

Contract NAS 3-19530
June 1976



1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NASA CR-134964		

4. Title and Subtitle	5. Report Date
BIBLIOGRAPHY OF INFORMATION ON MECHANICS OF STRUCTURAL FAILURE (HYDROGEN EMBRITTLEMENT, PROTECTIVE COATINGS, COMPOSITE MATERIALS, NDE)	JUN 1976
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
James L. Carpenter, Jr.	OR 14,177
	10. Work Unit No.

9. Performing Organization Name and Address	11. Contract or Grant No.
Martin Marietta Corporation Orlando, Florida 32805	NAS 3-19530
	13. Type of Report and Period Covered
12. Sponsoring Agency Name and Address	Contractor Report
National Aeronautics and Space Administration Washington, D. C. 20546	14. Sponsoring Agency Code

15. Supplementary Notes

Project Manager: George Mandel
Aerospace Safety Research and Data Institute, Lewis Research Center, Cleveland, Ohio 44135

16. Abstract

This Bibliography is comprised of approximately 1600 reference citations related to four problem areas in the mechanics of failure in aerospace structures. The bibliography represents a search of the literature published in the period 1962-1976, the effort being largely limited to documents published in the United States.

Listings are subdivided into the four problem areas: Hydrogen Embrittlement; Protective Coatings; Composite Materials; and Nondestructive Evaluation. An author index is included.

The Bibliography is a companion volume to NASA CR-134962, Hydrogen Embrittlement of Structural Alloys - A Technology Survey, and NASA CR-134963, NDE - An Effective Approach to Improved Reliability and Safety - A Technology Survey.

17. Key Words (Suggested by Author(s))		18. Distribution Statement
Bibliographies	NDT Methods	
Composite Materials	Protective Coatings	
Hydrogen Embrittlement	Test Procedures	
Inspection Procedures	Gas Turbine Engines	
NDE Methods	Aerospace Structures	
NDI Methods		

19. Security Classif (of this report)	20. Security Classif. (of this page)
Unclassified	Unclassified

* For sale by the National Technical Information Service, Springfield, Virginia 22151

FOREWORD

This Bibliography is comprised of approximately 1600 reference citations related to the mechanics of structural failure in the environments defined in the Introduction. The literature search which resulted in the bibliography was begun as a part of NASA Lewis Research Center Contract NAS-3-16681 and continued under Contracts NAS 3-17640 and NAS 3-19530.

The purpose of this publication is to provide, in easy reference form, a survey of the pertinent literature published in the period 1962-1976. Documents referenced that are dated earlier than this period have been included because of the frequency of their citation as referenced, usually because they are regarded as "classics". It therefore provides a basis for broadening the information base produced for the Aerospace Safety Research and Data Institute.

It is recognized that the bibliography is an incomplete listing as any bibliography for such a broad subject must always be. Nevertheless, it is hoped that it will contribute as a guide to those who seek related information. This Bibliography is a companion volume to NASA CR-134962, Hydrogen Embrittlement of Structural Alloys - A Technology Survey, and NASA CR-134963, NDE - An Effective Approach to Improved Reliability and Safety - A Technology Survey.

TABLE OF CONTENTS

INTRODUCTION

This Bibliography includes more than 1600 reference citations related to problem areas in the mechanics of failure in aerospace structures. These reference citations document the work and conclusions of more than 1800 specialists investigating the behavior of aerospace structural materials in selected environments. Particular attention is devoted to materials used in gas turbine engines and to analysis, inspection, and test methodology related to this application.

This is the fourth bibliography, published under the auspices of the Aerospace Safety Research and Data Institute, NASA Lewis Research Center, containing references pertaining to the problem areas listed below:

- Life prediction of materials at high temperatures and exposed to monotonic and cyclic loading - Includes information on low cycle and thermal fatigue particularly as it applies to turbine buckets in the gas turbine engine and high cycle fatigue data for materials used in components such as engine bearings.

- Fracture toughness data on various structural materials - Available data are categorized with respect to test methods, K_{IC} versus K_C, and other peculiar parameters considered by the investigators. In particular, data derived from ASTM standard tests are identified.

- Fracture mechanics analyses - capabilities and limitations - A significant amount of publications deal with linear elastic fracture mechanics which assumes plane strain. Attempts were made to identify any work that was done, taking into account elastic-plastic theories.

- Hydrogen embrittlement of superalloys - This subject is of interest regarding turbine buckets, which are exposed to high temperatures. It will be of increasing importance if additional interest develops in using hydrogen as the fuel in gas turbine engines.

- Protective coatings - Airbreathing engines operating in contaminated environments are in need of protection against attack by the contaminants. Information on the various candidate coatings and the effects of combustion products of contaminants in jet fuels on engine components is of prime interest. For example, the sulfur ordinarily contained in JP fuels reacts with salt present in shipboard and offshore environments and the resulting compounds attack turbine buckets severely.

- Composite materials data on low cycle and thermal fatigue - The aim is to search for data related to composite structural materials used for aerospace applications.

- NDE (Nondestructive Evaluation) - The objective is to identify documents pertaining to the nondestructive testing of aircraft structures or related structural testing and the reliability of the more commonly used evaluation methods.

The first of these problem areas was the subject of NASA CR-134750, Life Prediction of Materials Exposed to Monotonic and Cyclic Loading - A Technology Survey, and a complementary bibliography, NASA CR-134751. The second and third problem areas were reviewed in NASA CR-134752, Fracture Toughness Testing - A Technology Survey, and its complementary bibliography, NASA CR-134753.

This bibliography complements NASA CR-134962, Hydrogen Embrittlement of Structural Alloys - A Technology Survey, and NASA CR-134963, NDE - An Effective Approach to Improved Reliability and Safety - A Technology Survey. The bibliography includes but significantly expands the information base published in NASA CR-121202, Bibliography of Information on the Mechanics of Structural Failure.

The Bibliography is divided into five parts. Four sections are comprised of citations in the last four problem areas listed above. All references are listed alphabetically using the surname of the principal author. When an author could not be identified, a corporate source is cited. The last section of the bibliography is a complete author index, including the names of co-authors.

Each entry includes the author or corporate source, the title, a publication source, and the date. The format used is unique to the purpose of the bibliography. All entries preceded by an asterisk (*) are included in the Aerospace Safety Research and Data Institute data base, i.e., ASRDI Forms 102A were completed for them. The remaining citations are either references cited by authors whose work has been abstracted or are valid references that could not be researched under the current contract because of funding limitations. When it could be readily established, the entry has been qualified to show its availability from one or more of the several government or government-sponsored information distribution centers.

Alternate sources for the references in the bibliography are identified as follows:

"A" Numbers, e.g., A73-12005
Hard copy and/or microfiche of these citations may be purchased from the NASA-sponsored Technical Information Service operated by the AIAA, 750 Third Avenue, New York, New York 10017.

"AD" Numbers, e.g., AD-734304
Hard copy and/or microfiche/microfilm of AD numbers that are unclassified and unlimited in distribution may be purchased from the National Technical Information Service, Springfield, Virginia 22151.

Hard copy and/or microfiche/microfilm of AD numbers that are limited distribution and available only to qualified registered users may be ordered directly from the Defense Documentation Center, Cameron Station, Alexandria, Virginia 22314.

"N" Numbers, e.g., N69-16367
Hard copy and/or microfiche of these citations may be purchased from the National Technical Information Service, Springfield, Virginia 22151.

The order of precedence for information included in the citations in this bibliography is:

1. Author
2. Title
3. Original source, i.e., technical report number of proceedings, journals, etc.
4. Date of publication
5. Alternative source

A particular effort has been made to highlight the date of publication because of its relevance in the field of research that is continually changing.

In general, the source for all references is an activity in the United States of America. It is recognized that considerable foreign literature exists in these subject areas and that only a fragment of it is referenced. The problem of translation is a constraint, but more significantly, time did not permit an adequate survey of foreign literature of interest.

An author index at the end of the bibliography lists the name of each author or co-author cited in the report. An asterisk (*) is used to identify the authors or co-authors of documents that we abstracted and included in the data base compiled by the Aerospace Safety Research and Data Institute.

PROBLEM AREA 4

Hydrogen embrittlement of superalloys - This subject is of interest regarding turbine buckets, which are exposed to high temperatures. It will be of increasing importance if additional interest develops in using hydrogen as the fuel in gas turbine engines.

HYDROGEN EMBRITTLEMENT

A

*Adsitt, N. R., Dessau, P., and Witzell, W. E.: Flexural Fatigue Testing of Titanium Forging Material in Liquid Hydrogen, in Fatigue and Fracture Toughness - Cryogenic Behavior, ASTM STP-556, 44-54 (1974).

Ailor, W. H.: Handbook on Corrosion Testing and Evaluation, Wiley, New York, N. Y. (1970).

Aitchison, I.: The Effect of Orientation of Hydride Precipitates on the Fracture Toughness of Cold-Rolled Zercalo Y-2 and 2.5NB Zirconium ASTM STP-458, 160-178, Atomic Energy of Canada, Ltd. Available as N70-76430.

Albrecht, W. M. and Bennett, R. E.: Reaction of Hydrogen with Titanium at 300°F, Battelle Memorial Inst. Report (February 1957).

Allen, R. E., Jansen, R. J., Rosenthal, P. C. and Vitovec, F. H.: Analysis of Probable Mechanisms of High-Temperature Hydrogen Attack of Steel, Proc. API 42, 452-462 (1962).

Annand, R. R. and Martin, R. L.: A New Inhibitor for Corrosion in Aerated Sour Waters, Paper presented at AIME, Oil Field Water Handling Conf., Los Angeles, CA (December 1972).

B

*Bachelet, E. J. and Troiano, A. R.: Hydrogen Gas Embrittlement and the Disc Pressure Test, NASA CR-134551 (1973). Available as N74-17238.

Barnett, W. J. and Troiano, A. R.: Crack Propagation in Hydrogen Induced Brittle Fracture of Steel, Trans. AIME 209, 486 (1959).

*Barsom, J. M.: Mechanisms of Corrosion Fatigue Below K_{ISCC}, Inst. J. Fract. Mech. 7, No. 2, 163-182 (June 1971).

*Barth, C. F. and Steigerwald, E. A.: Evaluation of Hydrogen Embrittlement Mechanics, Met. Trans. 1, 3451-3455 (December 1970).

Barth, C. F. and Steigerwald, E. A.: Evaluation of Hydrogen Embrittlement Mechanisms, Met. Trans. 2, 1988 (1971).

*Barth, C. F. and Steigerwald, E. A.: Evaluation of Hydrogen Embrittlement Mechanisms, TRW Equipment Labs., Cleveland, OH (July 1970). Available as AD-709164.

*Barth, C. F., Steigerwald, E. A., and Troiano, A. R.: Hydrogen Permeability and Delayed Failure of Polarized Martensitic Steels, Corrosion 25, No. 9, 353-358 (September 1969).

*Barth, C. F. and Troiano, A. R.: Cathodic Protection and Hydrogen in Stress Corrosion Cracking, Corrosion 28, No. 7, 259-263 (July 1972). Available as A72-37765.

Barton, R. J., The Mechanism of Transport of Hydrogen Across a Solution - Metal Interface, Hydrogen Embrittlement in Metal Finishing, Reinhold Pub. Co., NY, 20-45 (1961).

Battelle Memorial Institute: Stress Corrosion Cracking of Aluminum, DMIC Memorandum No. 202 (15 February 1965).

*Beachem, C. D., A New Model for Hydrogen Assisted Cracking (Hydrogen Embrittlement), Met. Trans. 3, No. 2, 437-451 (February 1972).

Beck, F. H.: Stress Corrosion Cracking of Titanium Alloys, Ohio State University Research Foundation (Report 2267-2. 11 July 1967).

*Beck, F. H. and Fontana, M. G.: Stress Corrosion Cracking of Titanium Alloys, NASA CR-117177. (December 1970). Available as N71-20462.

Beck, T. R.: Electrochemical Aspects of Titanium Stress Corrosion Cracking, Proc. Conference on Fundamental Aspects of Stress Corrosion Cracking. 11-15 September 1967, NACE (1969).

Beck, T. R.: Stress Corrosion Cracking of Titanium Alloys - Preliminary Report on Ti-8Al-1Mo-1V Alloy and Proposed Mechanism. Boeing Scientific Research Labs (July 1966). Available as AD-640229.

Beck, R. R.: The Theory of Stress Corrosion Cracking in Alloys, NATO. Scientific Affairs Dir., Amsterdam, Holland (1971).

Beck, T. R., Blackburn, M. J., and Speidel, M. O.: Stress Corrosion Cracking of Titanium Alloys: SCC of Aluminum Alloys, Polarization of Titanium Alloys in HCl and Correlation of Titanium and Aluminum Behavior, Contract NAS 7-489 Quarterly Progress Report No. 11 (March 1969).

Beck, W., Jankowsky, E. J., and Fischer, P.: Hydrogen Stress Cracking of High Strength Steels, NADC-MA-7140 (1971).

Beck, W., Subramanyan, P. K., and Williams, F. S.: Interpretation of Some Hydrogen Embrittlement Phenomena, Corrosion 27, No. 3, 115-118 (March 1971).

Benjamin, W. D. and Steigerwald, E. A.: Effect of Composition on the Environmentally Induced Delayed Failure of Precracked High Strength Steel, Met. Trans. 2, 606-608 (1971).

Benjamin, W. D. and Steigerwald, E. A.: Stress Corrosion Cracking Mechanisms in Martensitic High Strength Steel, AFML-TR-67-98 (1967).

Benson, Jr., R. B., Dann, R. K., and Roberts, Jr. L. W.: Hydrogen Embrittlement of Stainless Steel, Trans. AIME 242, No. 10, 2199-2205 (1968). Available as A69-10062.

Bergman, P. A., Sims, C. L., and Betram, A. N.: Development of Hot Corrosion Resistant Alloys for Marine Gas Turbine Service, in Hot Corrosion Problems Associated with Gas Turbines, ASTM STP-421, 38-60 (1967).

Bernstein, I. M.: The Role of Hydrogen in the Embrittlement of Iron and Steel, Mater. Sci. Eng. 6, No. 1, 1-19 (1970).

*Bernstein, I. M. and Thompson, A. W.: Alloy Design to Resist Hydrogen Embrittlement in Strengthening Mechanisms and Alloy Design, Edited by J. K. Tien and G. S. Ansell, Academic Press (1975).

Bernstein, I. M. and Thompson, A. W., Eds.: Hydrogen in Metals, ASM, Metals Park, OH (1974).

*Birnbaum, H. K., Grossbeck, M., and Gahr, S.: The Effect of Hydrogen on the Mechanical Properties and Fracture of Zr and Refractory Metals, Illinois Univ., Urbana (November 1973). Available as DA-770235 and N74-17274.

Birnbaum, H. K. and Wert, C.: Berichte der Bunsen Gesell. fürPhys. Chem. 76, 806 (1972).

Bixler, W. D.: Flaw Growth of Inconel 718 and 5 Al - 2.5 Sn (ELI) Titanium in a High Purity Gaseous Hydrogen Environment, Boeing Report D180-10142-1, Seattle, WA (September 1970).

Bixler, W. D.: Flaw Growth of Inconel 718 and 5 Al - 2.5 Sn (ELI) Titanium in a High Purity Gaseous Hydrogen Environment, Aerojet Nuclear Systems Co., CA (August 1971).

Blackburn, M. J. and Williams, J. C.: Metallurgical Aspects of Titanium Stress Corrosion Cracking, Proc. Conf. Fundamental Aspects Stress Corrosion Cracking. 11-15 September 1967. Ohio State Univ., NACE (1969).

Blackburn, M. J. and Smyrl, W. H.: Stress Corrosion and Hydrogen Embrittlement Critical Review, Titanium Sci. Technol., Proc. Int. Conf., 2nd, 2577-2609 (1973).

Bland, L. M.: Aircraft Structural Life Prediction and Considerations of Thermical Environment, Proc. Tewksbury Symp. Fracture, Effects of Chemical Environments of Fracture Processes, Melbourne Univ., Australia (4-6 June 1974).

* Blombery, R. I.: Fracture of High Strength Steels in Gaseous Hydrogen, Proc. Tewksbury Symp. Fracture, Effects of Chemical Environments of Fracture Processes, Melbourne Univ., Australia, 109-121 (4-6 June 1974).

Bockris, J. O., Beck, W., Grenshaw, M. A., Subramanyan, P. K., and Williams, F. S.: The Effect on the Chemical Potential of Hydrogen in Iron and Steel, Acta Met. 19, 1209-1219 (November 1971).

Bomberger, H. B.: The Corrosion Resistance of Titanium, RMI TR-D-15. Reactive Metals, Inc. (28 March 1966).

Boniszewski, T. and Smith, G. C.: The Influence of Hydrogen on the Plastic Deformation, Ductility and Fracture of Nickel, Acta Met. 11, 165 (1963).

Boyd, J. D.: Precipitation of Hydrides in Titanium Alloys, Trans. ASM. 62 (1969).

Boyd J. D., Haynie, F. H., Boyd, W. K., Wood, R. A., Williams, D. N., and Jaffee, R. I.: The Effect of Composition on the Mechanism of Stress Corrosion Cracking of Titanium Alloys in N_2O_4 and Aqueous and Hot-Salt Environments, Battelle Memorial Institute (29 February 1968).

*Boyd, W. K. and Vaughan, D. A.: Stress Corrosion and Hydrogen Embrittlement and Their Relation to Surface Phenomena of a Component, Battelle Memorial Inst. (1973). Available as A74-13952.

Boyd, W. K. and Hyler, W. S.: Factors Affecting Environmental Performance of High Strength Bolts, J. Struct. Div. (ASCE) 99, 1571-1588 (1973).

Brabers, J. J.: Theory of Stress Corrosion Cracking in Alloys, NATO Science Committee (1971).

Braski, D. N.: Preliminary Investigation of Effect of Environmental Factors on Salt Stress Corrosion Cracking of Ti-8Al-1Mo-1V at Elevated Temperatures, NASA TM-X-1048 (1964).

Brennen, D. and Hayward, D. O.: Hydrogen Desposition, Phil. Trans. A(GB)258, 375-390 (1965).

Bretin, L. and Fidelle, J.: Study of Materials Behavior in the Presence of Hydrogen and Its Isotopes: Resistance of Specialty Steels to Embrittlement by Hydrogen and Deuterium, Introduced Cathodically or Under Pressure, Creusot-Loire Internal Report C.Ph 129 (August 1971).

Brown, B. F.: Application of Fracture Mechanics to Stress Corrosion Cracking, Metals Mater. 2, No. 12, 171-183 (1968).

Brown, B. F.: Environmentally Assisted Fracturing: Research and Standards, Stand. News 3, No. 5, 8-16 (May 1975).

Brown, B. F.: Stress-Corrosion Cracking: A Perspective View of the Problem, NRL Report 7130 (16 June 1970). Available as AD-711589.

Brown, B. F., Ed.: Stress Corrosion Cracking in High Strength Steels and in Aluminum and Titanium Alloys, Naval Research Lab., Washington, DC (1972).

Brown, B. F.: Stress Corrosion Cracking of Metals - A state of the Art, ASTM STP-518 (1972).

Brown, B. F.: Theory of Stress Corrosion, NATO Science Committee (1971).

Brown, B. F., Fujii, C. T. and Dahlberg, E. P.: Methods for Studying Solution Chemistry Within Stress Corrosion Cracks, J. Electrochem. Soc. 116, No. 2, 218-219 (February 1969).

Brown, R. H., Sprowls, D. O., and Shumaker, M. B.: The Resistance of Wrought High Strength Aluminum Alloys to Stress Corrosion Cracking, ASTM STP-518, 87-118 (1972).

Bucci, R. J., Paris, P. C.., Loushin, L. L. and Johnson, H. H., A Fracture Mechanics Consideration of Hydrogen Sulfide Cracking in High Strength Steels, ASTM STP-513, Part 1, 292-307 (September 1972).

Buck, O., Frandsen, J. D., Ho, C. L., and Marcus, H. L.: The Effect of Gaseous Environments on Crack Tip Closure, Proc. Int. Conf. Strength Metals and Alloys, 3rd, (1973).

Buck, O., Frandsen, J. D., and Marcus, H. L.: Crack Tip Closure and Environmental Crack Propagation. Eng. Fract. Mech. (In press April 1974)

Burke, J., Mehta, M. L. and Narayan, R., Hydrogen in Metals, Proc. Int. Conf., Paris (1972).

C

Cabral, U. Q., Hache, A., and Constant, A.: Determination of Annealing Brittleness by Corrosion Tests Under Tension in the Presence of Hydrogen, C. R. Acad. Sci. Paris, France, 260, No. 26, 6887-6890 (23 June 1965). Available as A65-28628.

Cadenhead, D. A. and Wagner, N. J.: Low Temperature Hydrogen Adsorption on Copper-Nickel Alloys, J. Phys. Chem. 72, 2775-2781 (August 1968).

Campbell, J. E.: Effects of Hydrogen Gas on Metals at Ambient Temperature, DMIC S-31, Battelle Memorial Institute. Columbus, OH (April 1970).

Carter, C. S.: Effect of Prestressing on the Stress-Corrosion Resistance of Two High-Strength Steels Met. Trans. 3, No. 2, 584-586 (February 1972). Available as A72-19941.

Carter, C. S.: Observations on Stress Corrosion Crack Propagation Characteristics in High Strength Steels, Boeing Sci. Res. Lab. Report D6-25274 (1970).

*Carter, J. J.: Nondestructive Detection and Evaluation of Stress Corrosion Cracking, Proc. Tewksbury Symp. Fracture, 3rd, Effects of Chemical Environment on Fracture Processes, Melbourne, Australia (4-6 June 1974).

Carter, C. S.: Stress Corrosion Crack Branching in High Strength Steels, Eng. Fracture Mech. 3, No. 1 (1971).

Cataldo, C. E.: Effects of Hydrogen on Metals, NASA TB69-10372 (September 1969).

Cavett, R. H. and Van Ness, H. C.: Weld J. Weld. Res. Suppl. 42, 316s-319s (July 1963).

Chandler, W. T. and Walter, R. J.: Hydrogen Effects in Refractory Metals, Refractory Metal Alloys, I. Machlin, R. T. Begley, and D. E. Weisert, Eds., Plenum Press, 197-250 (1968).

Chandler, W. T. and Walter, R. J.: Hydrogen Effects in Refractory Metals, Symp. Metallurgy Technol. Refractory Metal Alloys, AIMMPE/NASA, Washington, DC (25-28 April 1968).

Chandler, W. T. and Walter, R. J.: Hydrogen Environment Embrittlement of Metals and Its Control, Proc. Hydrogen Economy Miami Conf. (18-20 March 1974).

*Chandler, W. T. and Walter, R. J.: Testing to Determine the Effect of High-Pressure Hydrogen Environments on the Mechanical Properties of Metals, in Hydrogen Embrittlement Testing, ASTM STP-542, 170-197 (January 1974).

Cherepanov, G. P: On the Crack Growth Owing to Hydrogen Embrittlement. Eng. Fract. Mech. 5, No. 4, 1041-1050 (December 1973). Available as A74-22517.

*Cherepanov, G. P.: On the Theory of Crack Growth Due to Hydrogen Embrittlement, Corrosion 29, No. 8, 305-309 (August 1973).

Chew, B.: A Void Model for Hydrogen Diffusion in Steel, J. Metal Sci. 5, 195 (1971).

Chitty, J. A. and Smeltzer, W. S.: Sulfidation Properties of a Nickel-20 w/o Chromium Alloy at 700°C and Low Sulfer Pressures, J. Electrochem. Soc. 120, No. 10, 1362-1368 (October 1973).

Clark, Jr., W. G. and Kim, D. S.: Effect of Synthetic Sea Water on the Crack Growth Properties of HY 140 Steel Weldments, Eng. Fract. Mech. 4, No. 3, 499-510 (September 1972).

Cotterill, P.: The Hydrogen Embrittlement of Metals. Prog. Mater. Sci. 9, No. 4, 241-259 (1961).

Cotterill, P., The Hydrogen Embrittlement of Metals, in Progress in Metal Physics 9, 201-301, Pergamon Press, NY (1961).

Coulter, A. W. and Claiborne, T. S.: Stress Corrosion Cracking of Oil Field Tubing in Aqueous Hydrochloric Acid, Materials Protection 7, 23 (June 1968).

Cox, T. B. and Gudas, J. P.: Investigation of the Fracture of Near-Alpha Titanium Alloys in High Pressure Hydrogen Environments, Proc. Int. Conf. Effect of Hydrogen on Behavior of Materials, Moran, WY (September 7-11 1975).

Crooker, T. W., Judy, R. W., and Cooley, L. A.: Subcritical Crack Growth in Several Titanium Alloys, NRL Report 2160 (September 1970).

Curtis, R. E.: Relationship Between Composition, Microstructure, and Stress Corrosion Cracking in Titanium Alloys, Boeing Research Report D6-23716, Renton, WA (October 1968).

D

*Das, K. B.: An Ultrasensitive Hydrogen Detector, in Hydrogen Embrittlement Testing, ASTM STP-543, 106-123 (January 1974).

*Das, K. B.: Exploratory Development on the Hydrogen Embrittlement of High Strength Steel During Machining, AFML-TR-73-244 (1973). Available as AD-770216 and N74-17265.

Das, K. B.: Exploratory Development on the Hydrogen Embrittlement of High Strength Steel During Machining, Corrosion 31, No. 2, 72-74 (February 1975).

Das, K. B.: Hydrogen Concentration Gradients Measurement Beneath the Original Surface of Corroded/Ruptured Ti 8-1-1 Alloy, NASA Contract PR No. 365916, Final Report (1971).

*Das, K. B. and Marceau, J. A.: Hydrogen Induced Damage in Pickled and Anodized Ti-6 Al-4V Alloy Surfaces, Corrosion 30, No. 9, 324-327 (September 1974).

*Dautovich, D. P., and Floreen, S.: The Stress Intensities for Slow Crack Growth in Steels Containing Hydrogen. Met. Trans. 4, 2627-2630 (November 1973).

Davis, A. and Courtsouradis, D.: Dry Corrosion of Cobalt, Chromium and Co-Cr, Ni-Cr and Fe-Cr Alloys in Hydrogen Sulfide Atmosperes, Cobalt 17, 23-26 (December 1962).

Davidson, T. E., Uy, J. C., and Lee, A. P.: Tensile Fracture Characteristics of Metals Under Hydrostatic Pressures to 23 Kilobars, Acta Met. 14, No. 8, 937-948 (1966).

Davidson, T. E. and Ansell, G. S.: Structure Sensitivity of Effects of Pressure Upon Ductility of Fe-C Materials, Trans. ASM 61, No. 2, 242-254 (1968).

Davis, R. A.: Stress Corrosion Cracking Investigation of Two Low Alloy High Strength Steels, Corrosion 19, No. 2, 45 (1963).

Dawson, D. B., and Pelloux, R. M.: Corrosion Fatigue Crack Growth of Titanium Alloys in Aqueous Environments, Met Trans. 5, 723-731 (March 1974). Available as A74-24109.

Dean, S. W. and Copson, H. R.: Stress Corrosion Behavior of Maraging Nickel Steels in Natural Environments, Corrosion 21, No. 3, 95-103 (March 1965).

Dexter, H. B.: Salt Stress Corrosion of Residually Stressed Ti-8Al-1Mo-1V Alloy Sheet After Exposure at Elevated Temperatures, NASA TN-D3299 (1966).

Dibari, G. A.: Electroplating on 18 Percent Nickel Maraging Steel - Relative Resistance to Hydrogen Embrittlement (November 1965).

Dieter, Jr., G. E.: Mechanical Metallurgy, McGraw-Hill, New York, NY (1961).

DiRusso, E., Conserva, M., Gatto, F. and Markus, H.: Thermochemical Treatments on High Strength Al-Zn-Mg-Cu Alloys, Met. Trans. 4, 1133-1144 (1973).

Donachie, Jr., M. J., Danesi, W. P., and Pinkowish, A. A.: Effects of Salt Atmosphere on Crack Sensitivity of Commercial Alloy at 600 to 900°F. Stress-Corrosion Cracking of Titanium, ASTM STP-397, 179-193 (1966).

Donachie, Jr., M. J., Sprague, R. A., Russell, R. N., Boll, K. G., and Bradley, E. F.: Sulfidation of Hot Section Alloys in Gas Turbine Engines, in Hot Corrosion Problems Associated with Gas Turbines, ASTM STP-421, 85-104 (1967).

*Dougherty, E. E.: Methods for Minimizing the Embrittling Effect of Hydrogen in Electroplaing High Strength Alloy Steel Items, Frankford Arsenal Report IEP-60-6110-2 (March 1963). Available as AD-653156.

Dull, D. L. and Raymond, L.: A Method of Evaluating Relative Susceptibility of Bolting Material to Stress Corrosion Cracking, Paper presented at WESTEC Conf., (March 1972).

*Dull, D. L. and Raymond, L.: Electromechanical Techniques, in Hydrogen Embrittlement Testing, ASTM STP-543, 20-33 (January 1974).

*Dull, D. L. and Raymond, L.: Stress History Effect on Incubation Time for Stress Corrosion Crack Growth in AISI 4340 Steel, Met. Trans. 3, (November 1972).

*Dull, D. L., and Raymond, L.: Surface Cracking of Inconel 718 During Cathodic Charging, Met. Trans. 4, 1635 (1973).

Dunegan, H. L. and Green, A. T.: Factors Affecting Acoustic Emission Response from Materials, Mater. Res. Stand. 11, No. 3, 21 (1971).

Dunegan, H. L. and Tetelman, A. S.: Nondestructive Characterization of Hydrogen-Embrittlement Cracking by Acoustic Emission Techniques, Eng. Fract. Mech. 2, 387-402 (1971).

Duttweiler, R. E. and Wagner, R.: An Investigation of Stress Corrosion Failures in Titanium Compressor Components (August 1964). Available as AD-471844.

*Dvoracek, L. M.: Sulfide Stress Corrosion Cracking of Steels, Corrosion 26, No. 5, 177-188 (May 1970).

E

Ekvall, R. A., Frank, R. G., and Young, W. R.: T-111 Alloy Cracking Problems During Processing and Fabrication. Recent Advances in Refractory Alloys for Space Power Systems, NASA SP-245, 221-260 (1970).

Elsea, A. R. and Fletcher, E. E.: Hydrogen Induced Delayed Brittle Failures of High Strength Steels. DMIC Report 196 (20 January 1964). Available as N64-22452.

*Elsea, A. R. and Fletcher, E. E.: Hydrogen Movement in Steel-Entry, Diffusion and Elimination. DMIC Report 219 (1965).

Elsea, A. R. and Fletcher, E. E.: The Effects of High-Pressure, High-Temperature Hydrogen on Steel, DMIC Report No. 202 (1964).

Engle, R. B., Dunegan, H. L.: Acoustic Emission: Stress-Wave Detection as a Tool for Nondestructive Testing and Material Evaluation, Int. J. Nondestruct. Test. 1, 109 (1969).

Evans, G. M. and Rollason, C.: Influence of Nonmetallic Inclusions on the Apparent Diffusion of Hydrogen in Ferrous Materials, J. Iron Steel Inst. 207, 1484 (1969).

F

Farrell, K.: Cathodic Hydrogen Absorption and Severe Embrittlement in a High Strength Steel, Corrosion 26, No. 3, 105-110 (March 1970).

*Farrell, K. and Quarrell, A. G.: Hydrogen Embrittlement of an Ultrahigh Tensile Steel, J. Iron Steel Inst. 202, 1002-1011 (1964).

Fast, V. D., Interaction of Metals and Gases, Academic Press (1965).

Fayet, A. P.: Influence of Hydrogen on the Mechanical Properties of Charpy V-Notch Specimens of Low Carbon Steel, AROD 4800-4, Stanford Univ. TR-4, SU-DMS-66-8 (September 1966). Available as AD-643944.

Feige, N. G. and Murphy, T. J.: Environmental Effects on Titanium Alloys, TMCA Annu. Conf. 2nd (April 1966).

Ficalora, P. J., Hu, Y-L, and Liu, H. W.: Catalytic Dissociation and Stress Corrosion Cracking, Proc. Int. Cong. Fract., 3rd Munich (8-13 April 1973).

*Fidelle, J. P.: Quick Pressure Hydrogen Embrittlement Test of Metal Discs, Colloquium Hydrogen in Metals, Valduc, Edited by Le Centre D'Etudes de Bruyeres - le - Chatel, 91 France, 131 (September 1967).

Fidelle, J. P.: Hydrogen Embrittlement and Stress Corrosion Cracking of Austenitic Stainless Steels in Chloride Media, French AEC Report R-4361 (October 1972).

Fidelle, J. P., Allemand, L. R., Roux, C. and Rapin, M.: In Hydrogen in Metals, J. P. Fidelle and M. Rapin, Eds. Valduc Colloquium, Commissariat a` l'Energie Atomique. France. 131-172 (September 1967).

*Fidelle, J. P., Bernardi, R., Broudeur, R., Roux, C. and Rapin, M.: Disk Pressure Testing of Hydrogen Environment Embrittlement, in Hydrogen Environment Embrittlement Testing, ASTM STP-543, 221-253 (January 1974).

*Fidelle, J. P., Broudeur, R., Porrovani, C., and Roux, C.: Disk Pressure Technique, in Hydrogen Embrittlement Testing ASTM STP-543, 34-47 (1974).

Fidelle, J. P., Deloron, J. M., Roux, C. and Rapin, M.: Influence of Surface Treatments and Coatings on Pressurized Hydrogen Embrittlement of High Strength Steels, Case of 35Ni-Cr-16Mo Steel, NASA-TT-F-12-099 (February 1969).

Fidelle, J. P., Legrand, J., and Couderc, C.: A Fractographic Study of Hydrogen Gas Embrittlement in Steels, Paper No. F-71-8, AIM Fall Meet., Detroit, MI (October 1971).

Fidelle, J. P. and Troiano, A. R.: Hydrogen Embrittlement and Stress Corrosion Cracking, in Proc. Int. Cong. Hydrogen in Metals, Paris, France (1972).

Fischer, P.: Applications of the Lawrence Corrosion Detection Gauge (CDG-2), NADC-72251-VT (1972).

Fischer, P.: Evaluation of the Lawrence Hydrogen Detection Gauge for the Prevention of Hydrogen Embrittlement, NADC-MA-7151 (1972).

*Fischer, P. and Jankowsky, J.: Determination of Hydrogen Generated by Paint Removers on Cadmium Plated Steel by electrochemical Permeation Method, NADC-72045 VT (May 12, 1972). Available as DA-747634.

*Fletcher, E. E., Berry, W. E. and Elsea, A. R.: Stress-Corrosion and Hydrogen-Stress Cracking of High Strength Steel, DMIC-232, Battelle Memorial Inst. (July 1966).

*Fletcher, E. E. and Elsea, A. R.: The Effects of High Pressure, High Temperature Hydrogen on Steel, DMIC-202, Battelle Memorial Inst. (March 1964).

*Fletcher, E. E. and Elsea, A. R.: Hydrogen Movement in Steel, - Entry, Diffusion, and Elimination, DMIC-219 (June 1965).

*Flieder, W. G., Richard, C. E. Buchmann, O. A., and Walters, F. M.: An Analytical Study of Hydrogen Cooled Panels for Application to Hypersonic Aircraft, NASA CR-1650 (April 1971).

Floreen, S., Hayden, H. W., Kenyon, N.: Stress Corrosion Cracking Behavior of Maraging Steel Composites, Corrosion 27, 519-524 (1971).

Fontana, M. G.: 1970 Campbell Memorial Lecture, Met. Trans. 1, 3251 (1970).

Fontana, M. G.: Corrosion Cracking of Metallic Materials, AFML-TR-69-16 (February 1969). Available as DA-849870.

Frandsen, J. D., Morris, W. L., and Marcus, H. L.: Fatigue Crack Propagation of Nickel-Copper Alloy in Low Pressure Hydrogen, Proc. Hydrogen in Metals Conf. Seven Springs, PA (September 1973).

Frandsen, J. D., Paton, N. E., and Marcus, H. L.: The Influence of Gaseous Environments on Fatigue Crack Growth in a Nickel-Copper Alloy. Met. Trans. (In press April 1974)

*Frandsen, J. D., Paton, N. E., and Marcus, H. L.: The Influence of Low-Pressure Hydrogen Gas on Crack Growth in T. D. Nickel and T. D. Nichrome. Scripta Meta, 7, 409 (1973).

Frandsen, J. D., Stocker, P. J., and Marcus, H. L.: Fatigue Crack Propagation of Inconel 718 in Gaseous Environments, NAR Science Center Report SCTR-72-15 (1972).

Frauenfelder, R.: Permeation of Hydrogen through Tungsten and Molybenum, J. Chem. Phys. 48, 3955-3965 (May 1968).

Freche, J. C. and Waters, W. L.: A Nickel Base Alloy, WAZ-20, With Improved Strength in the 200 to 2200 F Range, ASM Mater. Eng. Expo. Cong., NASA Lewis Research Center (13-16 October 1969). Available as A70-15097.

Freedman, A. J.: Development of an Accelerated Stress Corrosion Test for Ferrous and Nickel Alloys, Northrop Corp., Report NOR-68-58 (April 1968).

Frick, V., Janser, G. R., and Brown, J. A.: Space Shuttle Materials, Soc. Aerosp. Mater. Process Eng. 3, 597-634 (1971).

Fricke, E., Stuwe, H. P. and Vibrans, G.: Met. Trans. 2, No. 9, 2697-2700 (September 1971).

G

Gallagher, J. P.: Corrosion Fatigue Crack Growth Behavior Above and Below K_{ISCC}, NRL Report 7064 (May 1970).

Gallagher, J. P.; and Sinclair, G. M.: Environmentally Assisted Fatigue Crack Growth Rates in SAE 4340 Steel, J. Basic Eng. 91, 598-602 (1969).

Gangloff, R. P. and Wei, R. P.: Embrittlement of 18Ni Maraging Steel by Low Pressure Gaseous Hydrogen, Proc. Int. Conf. on Effect of Hydrogen on Behavior of Materials, (September 7-11, 1976).

*Gerberich, W. W.: Effect of Hydrogen on High-Strength and Martensitic Steels, Materials/Metal Working Technology Series, No. 2, 115-147 (1974).

*Gerberich, W. W.: On the Pressure Dependency of Threshold Stress Intensity, Eng. Fract. Mech. 6, No. 2, 405-407 (September 1974).

Gerlach, Jr., and Hamel, H. J.: High Temperature Sulfidation of Tungsten and Molybdenum in H_2/H_2S Mixtures and in Sulfur Vapor, Metall. 24, No. 5, 488-494 (May 1970).

*Gest, R. N. and Troiano, A. R.: Environmental Induced Failure of a High Strength Aluminum Alloy, PhD Thesis of R. Gest, Case Western Reserve Univ. (1972).

Gest, R. N. and Troiano, A. R.: Hydrogen Embrittlement and Stress Corrosion Cracking in Aluminum Alloys, Int. Cong. Hydrogen in Metals, Paris, France (1972).

Gestov, L. B.: Study of Heat-Resisting Materials for Gas Turbine Components, in Thermal Engineering, 53-57, Heating and Ventilating Research Assoc. Bracknell, England (May 1970). Available as N70-76804.

Giggins, C. S. and Pettit, F. S.: Second Annual Report on Oxide Scale Adherence Mechanisms, USAF Contract F33615-72-C-1702 (July 1974).

Giuliani, L., Mirabile, J., and Sarracine, M.: Embrittlement Kinetics of N80 Steel in H_2S Environment, Met. Trans. 5, No.9, 2069-2073 (September 1974).

*Gray, H. R.: Effects of Hot-Salt Stress Corrosion on Titanium Alloys. Metals Eng. Quart. 12, 10-17 (November 1972). Available as A73-13268.

Gray, H. R.: Effects of Initial Hydrogen Content of a Titanium Alloy on Susceptibility to Hot-Salt Stress-Corrosion, NASA TM-X-2404 (November 1971). Available as N72-12457.

*Gray, H. R.: Embrittlement of Nickel-, Cobalt-, and Iron-Base Superalloys by Exposure to Hydrogen, NASA CR-7805 (January 1975).

*Gray, H. R.: Hot-Salt Stress-Corrosion of Titanium Alloys: Generation of Hydrogen and Its Embrittling Effect, NASA TN-D-5000 (January 1969).

*Gray, H. R.: Hydrogen Environment Embrittlement. NASA TM-S-68088 (1972).

*Gray, H. R.: Ion and Laser Microprobes Applied to the Measurement of Corrosion Produced Hydrogen on a Microscopic Scale, Corrosion 28, No. 2, 47-54 (February 1972). Available as A72-23477.

Gray, H. R.: Opening Remarks, Hydrogen Embrittlement Testing, ASTM STP-543 (1974).

*Gray, H. R.: Testing for Hydrogen Environment Embrittlement: Experimental Variables, in Hydrogen Embrittlement Testing, ASTM STP-543, 133-151 (1974).

Gray, H. R.: NASA TN-D-6498 (1971).

Gray, H. R.: Proc. Int. Conf. Stress Corros. Cracking, Atlanta, GA. Nat. Assoc. Corros. Eng. (1972).

*Gray, H. R.: Role of Hydrogen in Hot-Salt Stress Corrosion of a Titanium Alloy, NASA TN-D-6188 (February 1971). Available as N71-17348.

Gray, H. R. and Troiano, A. R.: How Hydrogen Affects Maraging Steel, Metal.Progr. 85, No. 4, 74-78 (April 1964).

Gray, H. R. and Troiano, A. R.: Resistivity Study of Hydrogen Traps in Maraging Steel, Memoires Scientifiques Rev. Metallng. 65, No. 7/8, 543-548 (1968).

Green, J. A. S. and Hayden, H. W.: Influence of Two Modes of Loading on The Stress Corrosion Susceptibility of Ti-8Al-1Mo-IV Alloy in Various Chloride-Containing Environments, in Hydrogen in Metals, ASM, 235-249 (1974).

*Green, J. A. S, Hayden, H. W., and Montague, W. G.: The Influence of Loading Mode on the Stress Corrosion Susceptibility of Various Alloy/Environment Systems, Martin Marietta Labs. Report MML-TR-75-30C (August 1975).

Green, J. A. S., Hayden, H. W., and Montague, W. G.: Stress-Corrosion Cracking Mechanisms in 7075-T6 Aluminum Alloy, Proc. of Int. Conf. on Effect of Hydrogen on Behavior of Materials, Moran, WY (September 7-11, 1975).

Green, J. A. S. and Latanision, R. M.: Factors Controlling the Corrosion Behavior of Titanium-Nickel Alloys in Saline Solutions, Corrosion 29, No. 10, 386-392 (October 1973).

Green, J. A. S. and Montague, W. G., Observations on the SCC of an Al-5% Zn-2.5Mg. Ternary and Various Quanternary Alloys; 1st Technical Report to ONR, Martin Marietta Corp., Baltimore, MD (August 1974)..

Green, J. A. S. and Sedricks, A. J.: Surface Films and Stress-Corrosion Cracking in Titanium Aluminum Alloys. Met. Trans. 2, 1809 (July 1971).

*Greer, J. B., Factors Affecting the Sulfide Stress Cracking Performance of High Strength Steels, Mater. Perform.f11-22, NACE (March 1975).

*Greer, J. B., Von Rosenberg, E. L., and Martinez, J.: Effect of Temperature and State of Stress on Hydrogen Embrittlement of High Strength Steels, Corrosion 28, No. 10, 378-384 (October 1972).

*Greszczuk, L. B.: Stress Concentrations and Failure Criteria for Orthotropic and Anisotropic Plates With Circular Openings, Proc. Conf. Compos. Mater. Test. Des., 3nd, ASTM STP-497 (1972).

Groenveld, T. P. and Elsea, A. R.: Effect of Hydrogen in the Properties of Reactor Steels Below 400°F, Battelle Columbus Lab. (December 1971).

*Groenveld, T. P. and Elsea, A. R.: Mechanical Testing Methods, in Hydrogen Embrittlement Testing, SATM STP-543, 11-19 (1974).

Groenveld, T. P. and Elsea, A. R.: Effect of Hydrogen in the Properties of Reactor Steels Below 400°F, Battelle Columbus Lab. (December 1971).

*Groenveld, T. P. and Elsea, A. R.: Mechanical Testing Methods, in Hydrogen Embrittlement Testing, ASTM STP-543, 11-19 (1974).

Groenveld, T. P., Fletcher, E. E. and Elsea, A. R.: Review of Literature on Hydrogen Embrittlement, Special Report on Contract NAS 8-20029 (January 1966).

*Groenveld, T. P., Fletcher, E. E., and Elsea, A. R.: A Study of Hydrogen Embrittlement of Various Alloys, Final Report, NASA Contract NAS 8-20029 (January 23, 1969).

Groenveld, T. P., Fletcher, E. F. and Elsea, A. R.: A Study of Hydrogen Embrittlement of Various Alloys, NASA-CR-77374 (June 1966).

H

Hagen, D. I. and Donaldson, E. E.: Interaction of Hydrogen with A(100) Niobium Surface, Surface Sci. 45, 61-76 (1974). Available as A74-46094.

Hancock, G. G. and Johnson, H. H.: Hydrogen, Oxygen and Subcritical Crack Growth in a High Strength Steel, Trans. AIME 236, No. 4, 513-516 (April 1966).

*Hanna, G. L., Troiano, A. R., and Steigerwald, E. A.: A Mechanism for the Embrittlement of High-Strength Steels by Aqueous Environment, Trans. ASM 57, No. 3, 658-671 (September 1964).

Hardie, D. and Bowker, R.: The Effect of a Gaseous Hydrogen Environment on the Fracture Behavior of HY-150 Type Steel, Proc. Int. Conf. on Effect of Hydrogen on Behavior of Materials, Moran, WY (September 7-11, 1975).

*Harris, Jr., J. A., Scarberry, R. C., and Stephens, C. D.: Effects of Hydrogen on the Engineering Properties of Monel Nickel-Copper Alloy K-500, Corrosion 28, 57 (1972).

Harris, Jr., J. A., Schratt, J. F., and Van Wanderham, M. C.: Creep-Rupture Properties of Materials in High Pressure Gaseous Hydrogen at Elevated Temperatures, Paper SAMPE Natl. Tech. Conf., 3rd, Huntsville, AL (October 1971).

Harris, Jr. J. A., and Van Wanderham, M. C.: Influence of Elevated Temperature on Metals in Gaseous Hydrogen, Pratt and Whitney Aircraft, West Palm Beach, FL, PWA FR-5082 (April 1972).

*Harris, Jr. J. A., and Van Wanderham, M. C.: Properties of Materials in High Pressure Hydrogen at Cryogenic, Room, and Elevated Temperatures, NASA CR-119884 (June 1971). Available as N71-33728.

Harris, Jr., J. A., and Van Wanderham, M. C.: Properties of Materials in High Pressure Hydrogen at Cryogenic, Room, and Elevated Temperatures, NASA CR-124394 (1973).

*Harris, Jr., J. A. and Van Wanderham, M. C.: Various Mechanical Tests Used to Determine the Susceptibility of Metals to High Pressure Hydrogen, in Hydrogen Embrittlement Testing, ASTM STP-543, 198-220 (January 1974).

Harrison, R. W. and Smith, J. P.: Advanced Refractory Alloy Corrosion Loop Program, NASA CR-72818 (November 1970).

*Hayden, H. W. and Floreen, S.: Effect of Various Modes of Loading on the Stress Corrosion Cracking of a Maraging Steel, Corrosion 27, No. 10, 429-433 (October 1971).

Harston, J. D. and Scully, J. C.: Fractographic Observations on the Stress Corrosion Cracking of Some Austenitic Stainless Steel in $MgCl_2$ Solutions at 154°C, Corrosion 26, No. 9, 387-395 (September 1970).

Hartbower, C. E., Reuter, W. G., and Crimmins, P. P.: Mechanisms of Slow Crack Growth in High Strength Steels and Titanium, AFML-TR-67-26 (1969).

Hartman, A.: On the Effect of Oxygen and Water Vapor on the Propagation of Fatigue Cracks in 2024-T3 Alclad Sheet, Int. J. Fract. Mech. 1 167-188 (September 1965). Available as A66-21338.

Hatch, A. J., Rosenberg, H. W., and Erbin, E. F.: Effects of Environment on Cracking in Titanium Alloys. Stress Corrosion Cracking of Titanium, ASTM STP-397, 122-136 (1966).

Haynes, R. and Maddocks, P. J: Hydrogen Embrittlement of Titanium, J. Met. Sci. 3, 190-195 (1969).

*Haynie, F. H. and Boyd, W. K.: Electrochemical Study of the Mechanism of Stress Corrosion Cracking in an Aluminum-Zinc-Magnesium Alloy, in Fundamental Aspects of Stress Corrosion Cracking, 580-589, NACE, Houston, TX (1969).

Heimerl, G. J. and Braski, D. N.: A Stress Corrosion Test for Structural Sheet Materials, Mater. Res. Stand. 5, No. 1, 18-22 (January 1965).

Heimerl, G. J., Braski, D. N., Royster, D. M., and Dexter, H. B.: Salt Stress Corrosion of Ti-8Al-1Mo-1V Alloy Sheet at Elevated Temperatures, in Stress-Corrosion Cracking of Titanium, ASTM STP-397, 194-214 (1966).

Hickman, B. S., Williams, J. C., and Marcus, H. L.: Transgranular and Intergranular Stress Corrosion Cracking of Titanium Alloys, Reprint submitted to Int. Interfaces Conf. (April 1969).

*Hirth, J. P. and Johnson, H. H.: Hydrogen Problems in Energy Related Technology, Corrosion 32, No. 1, 3-26 (January 1969).

*Hofmann, W. and Rauls, W., Ductility of Steel Under Influence of External High Pressure Hydrogen, Weld. J. Res. Supp. 44, No. 5, 225S-230S (May 1965).

Holman, W. R., Crawford, R. W., and Paredes, Jr., F.: Hydrogen Diffusion in Beta-Titanium Alloy, Trans. AIME 233, 1836-1839 (October 1965).

*Holzworth, M. L.: Hydrogen Embrittlement of Type 304L Stainless Steel, Corrosion 25, No. 3, 107-115 (March 1969). Available as A69-26616.

Holzworth, M. L. and Louthan, Jr., M. R.: Hydrogen-Induced Phase Transformations in Type 304L Stainless Steels, Corrosion 24, No. 4, 110-124 (April 1968).

Hose, D. G.: Effects of Vacuum and Inert Atmosphere Heat Treatment on the Stress-Dorrosion-Cracking Resistance of Several Titanium Alloys, Presented ARPA Review, Lehigh Univ. (August 1966).

Hudak, Jr., S. J.: The Kinetics of Hydrogen Enhanced Crack Growth in High Strength Steels, MS Thesis, Lehigh Univ. (1972).

Hudgins, C. M.: The Effect of Temperature on the Aqueous Sulfide Stress Cracking Behavior of an N-80 Steel, NACE Canadian Western Regional Conf. (1971).

Hudgins, C. M. and McGlasson, R. L.: The Effects of Temperature (70-400°F) on the Aqueous Sulfide Stress Cracking of and N-80 Type Steel, Paper presented at NACE Canadian Western Regional Conf. (February 1971).

Hudson, R. M., Riedy, K. J., and Stragand, G. L., Influence of Cold-Reduction and Heat Treatment Combinations on Hydrogen Solubility and Premeability in Steel, Corrosion 17, No. 7, 334T-336T (1961).

Hughes, P. C., Lamborn, I. R., and Liebert, B. B.: Delayed Fracture of a Low-Alloy High-Strength Steel at Controlled Corrosion Rates, J. Iron and Steel Ind., 728-731 (July 1965).

Hyter, W. H.: Multiple Step Chronium Plating Hydrogen Embrittlement, McDonnell Douglas Corp. Report LR-DAC-5322 (1970).

I

*Inam Khokhar, M., Beck, F. H. and Fontana, M. G.: Role of pH on the Stress Corrosion Cracking of Titanium Alloys, Corrosion 29, No. 11, (November 1973).

Interrente, C. G.: Interpretive Report on Effect of Hydrogen in Pressure Vessel Steels, WRC Bull. No. 145 (1969).

Ivanova, V. S. Gurevich, S. E., Kopev, I. M., Kudryashov, U. G., and Stepanov, V. N.: Fatigue Embrittlement of Metalic Materials, AFFTD-HT-23-258-69 (June 1969. Available as AD-696519.

J

*Jankowsky, E. J.: A Comparison of Various Test Methods for Detecting Hydrogen Embrittlement, NADC-MA-7066 (1971). Available as AD-726165.

Jervolino, G. and Barndolini, F.: Control of Hydrogen Absorption in Electroplating Processes, AGARD-CP-64-70-N7IS (April 1970).

Jewett, R. P., Walter, R. J., Chandler, W. T., and Fromberg, R. P., Hydrogen Environment Embrittlement of Metals, NASA CR-2163 (1973).

Johnson, H. H.: Hydrogen Embrittlement, Science 179, No. 4070, 228-230 (January 1973).

*Johnson, H. H.: Hydrogen Gas Embrittlement, in Hydrogen in Metals, Proc. Int. Conf. on the Effects of Hydrogen on Materials Properties and Selection and Structural Design, Champion, PA (September 23-27, 1973).

*Johnson, H. H.: On Hydrogen Brittleness in High Strength Steels, In Fundamental Aspects of Stress Corrosion Cracking, NACE, 439-445 (1969).

*Johnson, H. H., Morlet, J. G. and Trioano, A. R.: Hydrogen Crack Initiation and Delayed Failure in Steel, Trans. Met. Soc. AIME 212, 526-541 (August 1958).

Johnson, H. H. and Paris, P. C.: Subcritical Flaw Growth, Eng. Fract. Mech. 1, No. 3, 3-45 (June 1968).

Johnson, R. D., Johnson, B. H., Morlet, J. G., and Troiano, A. R.: Effects of Physical Variables on Delayed Failure in Steel, WADC-TR-56-220 (1956).

Johnson, R. E.: The Science, Technology and Application of Titanium, R. I. Jaffee adn N. E. Promisel, Eds., Pergamon Press, 1175-1186 (1970).

*Jonas, O.: Influence of Preloading on the Sustained Load Cracking Behavior of Maraging Steels in Hydrogen, Corrosion 28, No. 8, 299-304 (August 1973).

Jonas, O. and Wei, R. P.: An Exploratory Study of Delay in Fatigue Crack Growth, Int. J. Fract. Mech. 7, 116-118 (March 1971). Available as A71-25059.

Judy, Jr., R. W. and Goode, R. J.: Procedure for Stress Corrosion Cracking Characterization and Interpretation to Failure-Safe Design for High Strength Steels, Proc. 26th Annual Conf. NACE (1970).

Judy, Jr. R. W. and Goode, R. J.: Stress Corrosion Cracking Characteristics of Alloys of Titanium in Salt Water, Contract: NONR-610(09) and NONR-760(31), Naval Res. Lab., Washington, DC (July 12, 1967).

Judy, Jr., R. W. and Goode, R. J.: Stress Corrosion Cracking of High Strength Steels and Titanium Alloys, Weld. J. 51, No. 9, 437S-448S (September 1972).

K

*Kamachi, K. and Miyata, S.: An X-Ray Study of Hydrogen Induced Phenomena Affecting Mechanical Behavior of Austenitic Stainless Steels, Proc. Int. Conf. Mech. Behavior Mater., Kyoto, Japan (15-20 August 1971).

*Keeton, S. C.: Hydrogen Embrittlement and the Iron Titanium Hydride Energy Storage Systems, Sandia Labs (Livermore) Report SAND 74-8218 (November 1974).

*Keeton, S. C.: Hydrogen Embrittlement and a Superconducting Power Transmission System, Sandia Labs (Livermore) Report SAND 74-8218 (November 1974).

*Kerns, G. E. and Staehle, R. W., Slow Crack Growth of High Strength Steel in Chlorine and Hydrogen Halide Gas Environments, Scripta Met. 6, 1189-1194 (1972).

Ketcham, S. J.: Chemical Milling of Alloy Steels, NAEC-AML-2418 (March 1966). Available as AD-631952.

Ketchem, S. J.: Chemical Milling of Metals and Alloys - Its Effect on Stress Corrosion Susceptibility and Hydrogen Embrittlement, NAMC-AML-1236 (May 1961. Available as AD-648980.

*Keys, L. H., Kemp, H., and Bursle, A. J.: Hydrogen Assisted Cracking in Austenitic Stainless Steels, Proc. Tewksbury Symp. Fracture Effects of Chemical Environment of Fracture Processes, Melbourne Univ., Australia, 122-140 (4-6 June 1974).

Kies, J. A., Smith, H. L., Romine, H. E., and Bernstein H.: Fracture Testing of Weldments, in Fracture Toughness Testing and Its Applications, ASTM STP-381 (1965). Available as A65-30778.

*Kim, C. D. and Loginow, A. W.: Techniques for Investigating Hydrogen-Induced Cracking of Steels with High Yield Strength, Corrosion 24, No. 1, 313-318 (1968).

Klier, E. P., Muvdi, B. E., and Sachs, G., The Response of High Strength Steels in the Range of 180 to 300 Ksi to Hydrogen Embrittlement from Cadmium Plating, Proc. ASTM 58, 605 (1958).

Klima, S. J., Nachtigall, A. J. and Hoffman, C. A., Preliminary Investigation of Effect of Hydrogen on Stress-Rupture and Fatigue Properties of and Iron-, a Nickel-, and a Cobalt-Base Alloy, NASA-TN-D-1453 (December 1962).

Koehl, B. G., Williams, D. N., and Bartlett, E. S.: Investigation of the Reaction of Titanium With Hydrogen, NASA CR-92389 (18 March 1969).

*Koehl, B. G., Hodge, W, and Williams, D. N.: An Investigation of the Reaction of Titanium with Hydrogen, NASA CR-65456 (July 1966).

*Kortovich, C. S. and Steigerwald, E. A.: A Comparison of Hydrogen Embrittlement and Stress Corrosion Cracking in High Strength Steels, Eng. Fract. Mech. 4, No. 4, 637-651 (December 1972). Available as A73-18479.

Kosanke, H. D.: Hydrogen Sensitive Neutron Radiography, Trans. ANS 14, 533 (1971).

*Kummick, A. J. and Johnson, H. H.: Steady State Hydrogen Transport Through Zone Refined Irons, Met. Trans. 6A, 1087-1091 (May 1975).

Kummick, A. J. and Johnson, H. H.: Hydrogen Transport Through Annealed and Deformed Armco Iron, Met. Trans. 5, No. 5, 1199-1206 (May 1974).

L

*Landes, J. D. and Wei, R. P.: The Kinetics of Subcritical Crack Growth Under Sustained Loading. Inst. J. Fract. Mech., 9, No. 3, 277293 (September 1973). Available as A73-12551.

Lane, Jr., I. R., Cavallero, J. L., and Morton, A. G. S.: Fracture Behavior of Titanium in the Marine Environment, MEL R&D Phase Report 231/65, U.S. Navy Marine Engineering Lab., Annapolis, MD (1965).

Lane, Jr., I. R., Cavallero, J. L., and Morton, A.G.S.: Sea Water Embrittlement of Titanium, ASTM STP-397, (1966).

Lasater, R. M., Kenney, B. R. and Knox, J. A.: Prevention of Hydrogen Sulfide Cracking of High Strength Carbon Steels in Acid Systems, NACE 23rd Annual Conf. (1967).

Latanision, R. M., Macmillan, N. H., and Lye, R. G.: On the Surface Physics of Metal Electrodes, Martin Marietta Corp., Baltimore, MD. RIAS Tech. Report 72-12c (June 1972).

Latanision, R. M. and Opperhauser, Jr., H.: Further Observations on the Effect of Grain Boundary Segregation in the Hydrogen Embrittlement of Nickel, MMC TP-74-17C. Martin Mareitta Corp., Baltimore, MD (July 1974).

*Latanision, R. M. and Opperhauser, Jr., H.: The Intergranular Embrittlement of Nickel by Hydrogen: The Effect of Grain Boundary Segregation. Met. Trans. 5, No. 2, 483-492 (February 1974).

Latanision, R. M., and Staehle, R. W.: Plastic Deformation of Electrochemically Polarized Nickel Single Crystals, Acta Met. 17, No. 3, 307-319 (1969).

Latanision, R. M. and Staehle, R. W.: The Effect of Continous Hydrogenation in the Deformation of Nickel Single Crystals, Scr. Met. 2, 667-672 (1968).

Latanistion, R. M. and Staehle, R. W.: Stress-Corrosion Cracking of Iron-Nickel-Chromium Alloys, Proc. Conf. on Fundamental Aspects of Stress-Corrosion Cracking, NACE, Houston, 214-307 (1969).

Latanision, R. M. and Westwood, A. R. C.: Surface and Environment-Sensitive Mechanical Behavior, Advances in CorrosionScience and Technology, Plenum Press, New York (1970).

*Lawrence, Jr., S. C.: Hydrogen Detection Gage, Hydrogen Embrittlement Testing, ASTM STP-543, 83-105 (1974).

Laws, J. S., Frick, V. and McConnell, J.: Hydrogen Gas Pressure Vessel Problems in the M-1 Facilities, NASA-CR-1305, National Aeronautics and Space Administration (March 1969).

Leckie, H. P.: Stress-Corrosion Characteristics of a Ti-7Al-2Cb-1 Ta Alloy, Corrosion 23, 187-191 (July 1967). Available as A67-37465.

Lee, H. H. and Uhlig, H. H.: Effect of Nickel in G-Ni Stainless Steels on the Critical Potential for Stress Corrosion Cracking, J. Electrochem. Soc. 117, No. 1, 18-22 (January 1970). Available as AD-701496.

LeGrand, J., Caput, M., Conderc, C., Broudeur, R., and Fidelle, J. P.: Contribution to the Study of Hydrogen Embrittlement in a Stable Austenitic Steel, Mem. Sci. Rev. Met. 68, 861-869 (1971).

LeGrand, J. and Conderc, C.: A Fractographic Study of Hydrogen Gas Embrittlement in Steels, Trans. AIME (1972).

Lessmann, G. G. and Gold, R. E.: Determination of the Weldability and and Elevated Temperature Stability of Refractory Metal Alloys, Long-Time Temperature Stability and Refractory Metal Alloys, NASA CR-1608 (1970).

Levy, M.: Anodic Behavior of Titanium and Commercial Alloys in Sulfuric Acid, Corrosion 23, 236-244 (August 1967).

Lingwall, R. G. and Ripling, E. J.: Elevated Temperature Stress Corrosion of High Strength Sheet Materials in the Presence of Stress Concentrators, NASA CR-88979 (August 1967).

Liu, H. W.: Stress-Corrosion Cracking and the Interaction Between Crack-Tip Stress Field and Solute Atoms, J. Basic Eng. 92, 633 (September 1970).

*Liu, H. W. and Ficalora, P. J.: Catalytic Dissociation, Hydrogen Embrittlement, and Stress Corrosion Cracking, Int. J. Fract. Mech. 8, 223-226 (June 1972). Available as A72-34256.

Liu, H. W., Hu, Y., andFicalora, P. J.: Catalytic Dissociation and Hydrogen Assisted Cracking, Paper presented at Western Metal and Tool Conf. (WESTEC) (12-16 March 1973).

Livanov, V. A., Bukhanova, A. A., and Kolachev, B. A.: Hydrogen in Titanium, Daniel Davey and Co., Inc. New York (1962).

Livanov, V. A., Kolachev, B. A., and Bukhanova, A. A.: Hydrogen Embrittlement of Titanium and Its Alloys, The Science Technology and Application of Titanium. R. Jaffee and N. Promisel, Eds., Pergamon Press (1970).

Logan, H.: The Stress Corrosion of Metals, John Wiley and Sons, New York (1966).

Logan, H. L., McBee, M. J., Becktoldt, C. J., Sanderson, B. T., and Ugiandky, G. M.: Chemical and Physical Mechanisms of Salt Stress-Corrosion Cracking in the Titanium 8-1-1 Alloy, in Stress-Corrosion Cracking of Titanium, ASTM STP-397, 215-229 (1966).

Logan, H. L., McBee, M. J., and Kahn, O. J.: Evidence for an Electromechanical-Mechanical Stress Corrosion Fracture in a Stainless Steel, Corros. Sci. 5, No. 10, 729-730 (1955).

Longson, B.: The Hydrogen Embrittlement of Niobium, TRG Report 1035 (January 1966).

Lorenz, P. M.: Effect of Pressurized Hydrogen Upon Inconel 718 and 2219 Aluminum, NASA CR-100208 (February 1969).

Lounamaa, K. and Braggstron, G.: Cracking in Hydrogen Charged Tensile Test Specimens, J. Iron and Steel Inst. (London) 203, Pt. 7, 702-706 (1965).

Louthan, Jr., M. R.: Effects of Hydrogen on the Mechanical Properties of Low Carbon and Austenitic Steels, Hydrogen in Metals, Proc. Int. Conf. on the Effects of Hydrogen on Materials Properties and Selection and Structural Design, Champion, PA (September 23-27, 1973).

Louthan, Jr., M. R.: Stress Orientation of Titanium Hydride in Titanium, Trans. AIME, 227 (October 1963).

*Louthan, Jr., M. R., Caskey, Jr., G. R., Donovan, J.A., and Rawl, Jr., D. E.: Hydrogen Embrittlement of Metals, Mater. Sci. Eng. 10, No. 6, 357-368 (December 1972).

*Louthan, Jr., M. R., Donovan, J. A., and Rawl, Jr., D. E.: Effect of High Dislocation Density on Stress Corrosion Cracking and Hydrogen Embrittlement of Type 304L-Stainless Steel, Corrosion 29, No. 3, 108-111 (March 1973).

Lucas, W. R.: Report of the Ad Hoc Committee on Failure of High Strength Materials, NASA Marshall Space Flight Center, Huntsville, AL (1971).

Luhan, J. V. and Summerson, T. L.: Development of 7049-T73 High Strength, Stress Corrosion Resistant, Aluminum Alloy Forgings, Metals Eng. Quart. 10, 35-42 (November 1970).

Lyle, J. P. and Cebulak, W. S.: Properties of High Strength Aluminum P/M Products, Metals Eng. Quart. 14, 52-63 (1974).

M

MacKay, T. L., Gilpin, C. B., and Tiner, N. A.: Stress Corrosion Cracking of Titanium Alloys at Ambient Temperature in Aqueous Solutions, Quarterly Progress Report SM-49105-03, Missile and Space Division, Astropower Lab (April 1967).

Mahoney, M. W. and Paton, N. E.: The Effect of Oxygen, Nitrogen, and Hydrogen on the Mechanical Properties of Cb-752, J. Less Common Metals (1973).

Marcus, H. L., Peistrup, J. N., and Fine, M. E.: Precipitation in 17-7PH Stainless Steel, Trans. ASM 58, 176-182 (June 1965). Available as A66-10412.

Marcus, H. L. and Stocker, P. J.: In Specialists Meeting on Stress Corrosion Testing Methods, AGARD Conference Proc. No. 98, 16-1 - 16-6 (January 1972).

Marcus, H. L., Williams, J. C., and Paton, N. E.: The Influence of Gaseous Environments on Corrosion Fatigue, Corros. Fatigue, NACE (1972).

Marek, M. and Hochman, R.: Stress Corrosion Cracking of Austenitic Stainless Steel, Corrosion 26, 5-6 (1970).

Marquez, J., Matsushima, I., and Uhlig, H. H.: Effect of Cold Rolling on Resistance of Ni-Fe Alloys to Hydrogen Cracking, Corrosion 26, No. 8, 215-222 (August 1970).

*Martin, R. L.: Hydrogen Penetration and Damage to Oil Field Steels, Mater. Perform. 13, No. 7, 19-23 (July 1974).

Matsushima, I., Deegan, D., and Uhlig, H. H.: Stress Corrosion and Hydrogen Cracking of Stainless Steel, Corrosion 22, No. 1, 23-27 (January 1966).

Mauney, D. A. and Starke, Jr. E. A.: Technical Note, Explanation of the Cleavage Plane in Stress Corrosion Cracking of Alpha Phase Titanium-Aluminum Alloys. Corrosion 25, No. 4 (April 1969).

*Mauney, D. A., Starke, Jr., E. A., and Hochman, R. F.: Hydrogen Embrittlement and Stress Corrosion Cracking in Ti-Al Binary Alloys, Corrosion 29, No. 6, 241-244 (June 1973).

*McCoy, R. A. and Gerberich, W. E.: Hydrogen Embrittlement Studies of a Trip Steel, Met. Trans. 4, 539-547 (February 1973).

McCoy, R. A., Gerberich, W. E., and Zackay, V. F.: On the Resistance of Trip Steel to Hydrogen Embrittlement, Met. Trans. 1, 2031-2034 (1970).

McGreen, J. and Grenshaw, M. A.: The Electromhemical Introduction of Hydrogen into Metals, Proc. Conf. Fundamental Aspects Stress Corros. Cracking (11-15 September 1967)

McGuire, M. F., Hehemann, R. F., and Troiano, A. R.: Stress Corrosion Cracking and Hydrogen Embrittlement in 410 Stainless Steel, Int. Cong. Hydrogen in Metals, Paris, France (1972).

McMahon, Jr., C. J.: In Temper Embrittlement in Steel, ASTM STP-407, 127-167 (1968).

McMahon, Jr., C. J. and Coffin, L. F.: Elimination of Oxygen Induced Intergrandular Brittleness in Iron by Addition of Scavengers, Met. Trans. 1, No. 4, 929-937 (April 1970).

McNabb, A. and Foster, P. K.: A New Analysis of the Diffusion of Hydrogen in Iron and Ferritic Steels, Trans. AIME 227, 618-627 (1963).

*McNitt, R. P: Unmasking Hydrogen Embrittlement, Machine Design 44 , 62-66 (30 November 1972)). Available as A73-14425.

McPherson, W. B.: Hydrogen Embrittlement - Potential Shuttle Impact, NASA TM-X-64 (1969).

McPherson, W. B. and Cataldo, C. E.: Recent Experience in High Pressure Gaseous Hydrogen Equipment at Room Temperature, TR-D8-1411, American Society of Metals, Metals Park, OH (October 1968).

*Mehta, M. L. and Burke, J.: Role of Hydrogen in Stress Corrosion Cracking of Austenitic Stainless Steels, Corrosion 31, No. 3, 108-110 (March 1975).

*Meyn, D. A.: Cleavage in Ti-8Al-1Mo-1V Caused by Hydrogen Gas, Met Trans. 3, 2302-2305 (1972).

*Meyn, D. A.: Effect of Hydrogen on Fracture and Inert-Environment Sustained Load Cracking Resistance of Alpha-Beta Titanium Alloys, Met. Trans. 5, 2405-2414 (November 1974).

Mihelic, J. L. and Troiano, A. R.: Solute Induced Embrittlement in Steel and Several Face-Centered Cubic Alloys, ARL 64-101 (June 1964).

Moss, T. A. Davis, R. L., and Barna, G. J.: Refractory Alloy Requirements for Space Power Systems. Recent Advances in Refractory Alloys for Space Power Systems, NASA SP-245 (1970).

Mostovoy, S., Crosley, R. P., and Ripling, E. J.: J. Mater. 2, 661-681 (September 1967).

Mostovoy, S., Smith, H. R., Lingwall, R. G., and Ripling, E. J.: A Note on Stress Corrosion Cracking Rates, Eng. Fract. Mech. 3, No. 3, 291-299 (October 1971).

Mueller, W. M., Backledge, J. P. and Libowitz, G. G.: Metal Hydrides, Academic Press, New York, (1968).

Mukherjee, A. K.: The Possible Role of Hydrogen in the Stress Corrosion Cracking of Titanium Alloys, Boeing Report No. D6-23621 (September 1967).

N

Nathan, C. C., Dulaney, C. L., and Leary, M. J.: Localized Corrosion - Cause of Metal Failure, in ASTM STP-516 (1972).

*Nanis, L.: Fundamental Corrosion Studies: Hydrogen Embrittlement, Pennsylvania Univ. Report UPH-TR-002 (December 1970). Available as AD-715807.

National Materials Advisory Board: Hot Corrosion in Gas Turbines, NMAB-260 (May 1970).

Neff, D. V., Mitchell, T. E., and Troiano, A. R.: The Influence of Temperature, Transormation, and Strain Rate on the Ductility Properties of Austenitic Stainless Steels, Trans. ASM 62, 858-868 (December 1969). Available as A70-21965.

Nelson, G. A.: Interpretive Report on Effect of Hydrogen in Pressure Vessel Steels, WRC Bull. No. 145, 38 (1969).

*Nelson, H. G.: Environmental Hydrogen Embrittlement of an Alpha-Beta Titanium Alloy - Effect of Hydrogen Pressure, Met. Trans. 4, 364-367 (1973).

Nelson, H. G.: Environmental Hydrogen Embrittlement of Titanium - A Qualitative Comparison with Stress Corrosion Cracking, Proc. Conf. Mechanisms of Stress Corrosion Cracking in Titanium Alloys, Atlanta, GA (1971).

*Nelson, H. G.: Testing for Hydrogen Environment Embrittlement: Primary and Secondary Influences, Hydrogen Embrittlement Testing, ASTM STP-543, 152-169 (January 1974).

*Nelson, H. G.: The Kinetic and Mechanical Aspects of Hydrogen-Induced Failure in Metals, NASA TN-D-6691 (April 1972).

*Nelson, H. G, Tetelman, A. S., and Williams, D. P.: The Kinetic and Dynamic Aspects of Corrosion Fatigue in a Gaseous Hydrogen Environment, in Corrosion Fatigue: Chemistry, Mechanics and Microstructure, NACE, 359-365 (1972).

Nelson, H. G. and Williams, D. P: Quantitative Observations of Hydrogen-Induced Slow Crack Growth in Low Alloy Steel, NASA TM-X-62253 (March 1973).

*Nelson, H. G. Williams, D. P., and Stein, J. E.: Environmental Hydrogen Embrittlement of an α-β Titanium Alloy: Effect of Microstructure, Met. Trans. 3, 369-475 (February 1972). Available as A72-19933.

*Nelson, H. G., Williams, D. P., and Tetelman, A. S.: Embrittlement of a Ferrous Alloy in a Partially Dissociated Hydrogen Environment, Met. Trans. 2, No. 4, 953-959 (April 1971).

*Nelson, R. S., Mazey, D. J., and Barnes, R. S.: The Thermal Equilibrium Shape and Size of Holes in Solids, Phil. Mag. 11, 91-111 (1965).

*Newberg, R. T. and Uhlig, H. H.: Stress Corrosion Cracking Behavior of Prepacked 18-8 Stainless Steel. J. Electrochem. Soc. 120, 1629-1632 (December 1973).

Newberg, R. T. and Uhlig, H. H.: Stress Corrosion Cracking of 18% Cr Ferritic Stainless Steels. J. Electrochem. Soc 119, No. 8, 981-986 (August 1972). Available as A72-38300.

Newman, J. F. and Shréir, L. L.: Role of Hydrides in Hydrogen Entry into Steel from Solutions Containing Promoters, Corrs. Sci. 9, No. 8, 631-641 (August 1969).

Nielsen, N. A.: Observations and Thoughts on Stress Corrosion Mechanisms, Corrosion-NACE 27, No. 5 (May 1971).

Novak, S. R. and Rolfe, S. T.: Comparison of Fracture Mechanics and Nominal Stress Analysis in Stress Corrosion Cracking, Corrosion 26, No. 4, 121-130 (April 1970).

Novak, S. R. and Rolfe, S. T.: Comparison of Fracture Mechanics and Nominal-Stress Analyses in Stress Corrosion Testing (Proc. 26th Annual Conf. NACE (1970).

Novak, S. R. and Rolfe, S. T.: Modified WOL Specimen for K_{ISCC} Environmental Testing, J. Mater. 4, No. 3, 701-728 (1969).

Nunes, J., Anctil, A.A., and Dula, E. B.: Low Temperature Flow and Fracture Behavior of Tantalum, AMRA TR-64-22, Army Materials Research Agency (August 1964). Available as AD-448479.

O

*Ohno, J. M.: Embrittlement and Stress-Corrosion Cracking in Titanium-Aluminum Base Alloys, Bencix Tech. J., 1-9 (Spring 1969).

Ohno, J. M.: Mobility of Hydrogen in Stressed Ti Alloy, Boeing Memo (18 January 1965).

*Oriani, R. A.: Discussion of Embrittlement of 4130 Steel by Low-Pressure Gaseous Hydrogen, Met. Trans. 1, 2346-2347 (1970).

Oriani, R. A.: The Diffusion and Trapping of Hydrogen in Steel, Acta Met. 18, 147-157 (January 1970).

Oriani, R. A.: Hydrogen in Metals, in Fundamental Aspects of Stress Corrosion Cracking, NACE, Houston, TX, 32-49 (1969).

Oriani, R. A.: Proc. Int. Conf. Stress Corrosion Cracking and Hydrogen Embrittlement of Iron-Base Alloys, Firminy, France (June 1973).

*Oriani, R. A. and Josephic, P. H.: Equilibrium Aspects of Hydrogen-Induced Cracking of Steels, Acta Met. 22, 1065-1074 (September 1974). Available as A74-44784.

*Oriani, R. A. and Josephic, P. H.: Testing of the Decohesion Theory of Hydrogen-Induced Crack Propagation, Scr. Met. 6, No. 8, 681-688 (1972). Available as A72-39003.

*Orman, S. and Picton, G.: The Role of Hydrogen in the Stress Corrosion Cracking of Titanium Alloys, Corrs. Sci. 14, 451-459 (July 1974).

*Owen, C. V. and Scott, T. E.: Relation between Hydrogen Embrittlement and the Formation of Hydride in the Group V Transition Metals, Met. Trans. 3, No. 7, 1751-1726 (July 1972).

P

*Padawer, G. M. and Adler, P. N.: Development of a Nuclear Microprobe Technique for Hydrogen Analysis in Selected Materials, AD-770856 (1973).

Papazoglou, T. P. and Hepworth, M. T.: The Diffusion of Hydrogen in Titanium, Trans. AIME 242, 682-685 (April 1968).

*Papp, J, Hehemann, R. F., and Troiano, A. R.: Hydrogen Embrittlement of High Strength FCC alloys, Hydrogen in Metals, ASM Materials/Metal Working Technology Series No. 2, 657-668 (1974).

*Paris, P. C. and Sih, G. C.: Stress Analysis of Cracks, in Fracture Toughness Testing and Its Applications, ASTM STP-381 (April 1965).

*Paton, N. E., Hickman, B. S., and Leslie, D. H.: Behavior of Hydrogen in Alpha Phase Ti-Al Alloys, Met. Trans. 2, 2791-2796 (1971). Available as A71-44282.

Paton, N. E. and Mahoney, M. W.: The Effect of Oxide Thickness on the Hot Salt Stress Corrosion Susceptibility of Ti-6A-4V. Corrosion 28, (1972).

*Paton, N. E. and Williams, J. C.: Effect of Hydrogen on Titanium and Its Alloys, Hydrogen in Metals, Proc. Int. Conf. on the Effects of Hydrogen on Materials Properties and Selection and Structural Design, Champion, PA (September 23-27, 1973).

*Payer, J. H., Preban, A. G., and Leckie, H. P.: Hydrogen-Stress Cracking of Low Carbon Martensitic Steel, Corrosion 32, No. 2, 52-56 (February 1976).

Pelloux, R. M.: Mechanics of Formation of Ductile Fatigue Striations, Trans. ASM 62, 281 (1969).

Perkins, W. G. and Begeal, D. R.: Permeation and Diffusion of Hydrogen in Ceramvar and Copper, Ber. Buns. Phys. Chem. 76, 863 (1972).

Petersen, V. C. and Bomberger, H. B:: The Mechanism of Salt Attack on Titanium Alloys, Stress Corrosion Cracking of Titanium, ASTM STP-397, (1966).

*Peterson, J. A., Gibala, R., and Troiano, A. R.: Hydrogen Induced Embrittlement and Internal Friction in Stable Austenitic Steel, Congress Hydrogen in Metals, Valduc Colloquium, 200 (September 1967).

Peterson, M. H., Brown, B. F., Newbegin, R. L., and Groover, R. E.: Stress Corrosion Cracking of High Strength Steels and Titanium Alloys in Chloride Solutions at Ambient Temperature, Corrosion 23, No. 5, 142-148, (May 1967).

Pettit, D. E., Fedderson, C. E., and Mindlin, H.: Flaw Growth Behavior of Inconel 718 at Room and Cryogenic Temperature, NASA CR-101942 (1969).

*Phalen, D. I and Vaughan, D. A.: The Role of Surface Stress on Hydrogen Absorption by 4340 Steel. Corrosion 24, No. 8, 243-246 (August 1968).

Phelps, E. H.: A Review of the Stress Corrosion Behavior of Steels with High Yield Strength, in Proc. Conf. Fundamental Aspects of Stress Corrosion Cracking, NACE (1969).

Phelps, E. H. and Loginow, A. W.: Stress Corrosion of Steels for Aircraft and Missiles, Corrosion 16, No. 7, 325T (July 1969).

Piper, D. E. and Fager, D. N.: The Relative Stress-Corrosion Susceptibility of Titanium Alloys in the Presence of Hot Salt. Stress-Corrosion Cracking of Titanium, ASTM STP-397, 31-52 (1966).

Poirier, J. and Fidelle, J. P.: Demonstration of Metal Sensitivity to Hydrogen by Means of Very Small Disks; Application to Various High Strength Steels, GMC 13-69-98, CEA, Brouyères-le-Châtel, France (1969).

*Pollock, W. J.: The Role of Atomic Hydrogen in the Stress Corrosion Cracking of Two Ultrahigh Strength Steels in Gaseous Environments, Proc. Tewksbury Symp. Fracture, 3 rd, Melbourne, Australia (4-6 June 1974).

Powell, D. T. and Scully, J. C.: Stress Corrosion Cracking of Alpha Titanium Alloys at Room Temperature, Corrosion 24, No. 6, 151-158 (June 1968).

Preece, C. M. and Westwood, A. R. C.: Temperature-Sensitive Embrittlement of FCC Metals by Liquid Metal Solutions, Trans. ASM 62, No. 2, 418-425 (1969).

Pride, R. A. and Woodward, J. M.: Salt-Stress-Corrosion Cracking of Residually Stressed Ti-8Al-1Mo-1V Sheet of 550°F, NASA TM-X-1082 (April 1965).

Pritchett, L. D.: Hydrogen Control during Cadmium Plating of Steel, Paper at Meet. AIA Quality Assurance Committee, Denver, CO (April 1971).

Pritchett, L. D.: Hydrogen Control during Cadmium Plating of Steel, Qual. Prog. 9 (December 1971).

R

Radon, J. C,, and Pollock, A. A.: Acoustic Emissions and Energy Transfer During Crack Propagation, Eng. Fract. Mech. 4, 295 (1972).

Rath, B. B. and Bernstein, I. M.: The Relation Between Grain-Boundary Orientation and Intergranular Cracking, Met. Trans. 2, 2845-2851 (October 1971).

Raymond, L. and Kendall, E. G.: Hydrogen Stress Cracking of 17-4 PH Stainless, Aerospace Corp. Report TR-0158 (3250-10)-6 (August 1967).

Read, H. J.: Hydrogen Embrittlement in Metal Finishing, Reinhold Pub. Corp., New York, NY (1961).

Read, R. P. and Gunter, C. J.: Stress Induced Martensitic Transformations in 18Cr-8Ni Steel, Trans. AIME 230, 1713-1720 (December 1964).

*Reid, L. H.: Hydrogen Stress Cracking of a Reformer Reactor, Proc. API, Sec. III - Refining 53, 431-436 (1973).

Rhodes, P. R., Mechanisms of Chloride Stress Corrosion Cracking of Austenitic Stainless Steels, Corrosion 25, No. 11, 462 (November 1969).

Rideout, S. P., Louthan, Jr., M. R. and Selby, C. L.: Basic Mechanisms of Stress-Corrosion Cracking of Titanium, Stress Corrosion Cracking of Titanium, ASTM STP-397, 137-151 (1966).

*Rinker, J. G. and Hochman, R. F.: Hydrogen Embrittlement of 4340 Steel as a Result of Corrosion of Porous Electroplated Cadmium, Corrosion 28, No. 6, 231-232 (June 1972).

Robinson, H. A., Frost, P. D., and Parris, W. M: Effect of Hydrogen on Some Mechanical Properties of Titanium Alloy Heat-Treated to High Strength. AIME Trans. 212, No. 4, 464-469 (August 1958).

Rodgers, H. C.: Hydrogen Embrittlement of Metals, Science 159, No. 3819, 1057-1064 (March 1968).

Ross, E. W.: Rene 100 - A Sigma-Free Turbine Blade Alloy. J. Metals 19, 12-14 (December 1967).

Ryder, J. T. and Gallagher, J. P.: Environmentally Controlled Fatigue Crack-Growth Rates in SAE 4340 Steel Temperature Effects, Trans. ASME 92, 133 (1970).

S

Sakaki, T. and Nakamura, T.: The Effects of Lattice Strains on the Hydrogen Embrittlement of a Quench and Tempered Low Alloy Steel, Trans. Iron Steel Inst. Jap. 14, No. 3, 195-202 (1974).

Sanderson, G., Powell, D. T., and Scully, J. C.: in Fundamental Aspects of Stress Corrosion Cracking, NACE, Houston, TX, 638-649 (1969).

Sanderson, G., Powell, D. T., and Scully, J. C.: Stress Corrosion Cracking of Ti Alloys in Aqueous Chloride Solutions at Room Temperature, Corros. Sci. 8, No. 7, 473-481 (July 1968).

Sanderson, G. and Scully, J. C.: Hydride Formation in Corroded Titanium Alloys. Corrosion Sci. 6, 541 (1969).

Sanderson, G. and Scully, J. C.: Hydride Formation in Thin Foils of Dilute Ti-Al Alloys, Trans. AIME 239, No. 12, 1883-1887 (December 1967).

Sanderson, G. and Scully, J. C.: Stress Corrosion of Titanium Alloys in Aqueous Magnesium Chloride Solutions at 154°C, Corrosion 24, No. 3, 75-82 (March 1968).

Sanderson, G. and Scully, J. C., Stress Corrosion of Ti Alloys in Metholic Solutions, Corros. Sci. 8, No. 7, 541-548 (July 1968).

Sandoz, G.: Effects of Alloying Elements on the Susceptibility to Stress Corrosion Cracking of Martensitic Steels in Salt Water, Met. Trans. 2, No. 4, 1005-1063 (April 1971).

*Sandoz, G.: Subcritical Crack Propagation in Ti-8Al-1Mo-1V Alloy in Organic Environments, Salt Water, and Inert Environments, Proc. Conf. Fundamental Aspects of Stress Corrosion Cracking, NACE, Houston, TX (1969).

Sanrock, G. D. and Leonard, L.: Cold Reduction as a Means of Reducing Embrittlement of a Cobalt-Base Alloy, NASA TN-D-3528 (August 1966).

Sawicki, V. R.: Hydrogen Induced Cracking in a High Strength Steel, PhD Dissertation, Cornell Univ., NY (1971).

*Schultz, J. W. and Hulsizer, W. R.: Laboratory Development of Corrosion Resistant Nickel-Base Superalloys for Gas Turbines, MCI-75-27, 335-356 (1975).

Schulz, B. J. and McMahon, Jr., C. J.: Alloy Effects in Temper Embrittlement of Alloy Steels, ASTM STP-499, 104-135 (.972).

Scully, J. C.: Theory of Stress Corrosion Cracking in Alloys, Brussels, Belgium (19710.

Seagle, S. R., Seeley, R. R. and Hall, G. S., Applications and Related Phenomena in Titanium Alloys, ASTM STP-432, 107-188 (1968).

Sedricks, A. J. and Green, J. A. S.: Stress Corrosion of Titanium in Organic Liquids, J. Metals 23, 48-54 (1971).

Sedricks, A. J., Green, J. A. S., and Novak, D. L.: Electromechanical Behavior of Ti-Ni Alloys in Acidic Chloride Solutions, Corrosion 28, No. 4, 137-142 (April 1972). Available as A72-24321.

Seys, A. A.: Pitting Corrosion of Austenitic Stainless Steel in Chloride Environment, PhD Thesis, Univ. Leuven, Belgium (1972).

*Seys, A. A., Barbers, M. J., and Van Haute, A. A.: Analysis of the Influence of Hydrogen on Pitting Corrosion and Stress Corrosion of Austenitic Stainless Steel in Chloride Environment Corrosion 30, No. 2, 47-52 (February 1974).

Sherman, D. H., Owen, C. V., and Scott, T. E.: The Effect of Hydrogen on the Structure and Properties of Vanadium, Trans. AIME 242, 1775-1784 (1968).

Shively, J. H., Hehemann, R. F. and Troiano, A. R.: Hydrogen Permeability in a Stable Austenitic Stainless Steel Under Anodic Polarization, Corrosion 22, No. 9, 253-256 (September 1966).

Shively, J. H., Hehemann, R. F., and Troiano, A. R.: Hydrogen Permeability in a Stable Austenitic Stainless Steel Under Anodic Polarization, Corrosion 23, 215-217 (1967).

Shupe, D. S. and Stickney, R. E.: Thermodynamics of the Solubility and Permeation of Hydrogen in Metals at High Temperature and Low Pressure, J. Chem. Phys. 51, 1620-1625 (August 1969).

Simenz, R. F., Van Orden, J. M., and Wald, G. G.: Environmental Effects Studies on Selected Titanium Alloys, Stress-Corrosion Cracking of Titanium, ASTM STP-397, 53-79 (1966).

Simpson, C. J. and Ells, C. E.: Delayed Hydrogen Embrittlement in Zr-2.5 wt. percent Nb, J. Nucl. Mater 52, No. 2, 289-295 (October 1974).

Sims, C. T. and Hagel, W. C.: The Superalloys, John Wiley and Sons, New York, NY (1972).

Sink, G. T.: Hydrogen Embrittlement of High-Strength Steels, McDonnell Douglas Paper 5377 (June 30, 1969).

Smialowski, M.: Hydrogen in Steel, Pegamon Press (Oxford) (1962).

Smith, D. P., Hydrogen in Metals, Univ. Chicago Press (1948).

*Smith, G. C.: Effect of Hydrogen on Nickel and Nickel-Base Alloys, Hydrogen in Metals, Proc. Int. Conf. on the Effects of Hydrogen on Materials Properties and Selection and Structural Design, Champion, PA (September 23-27, 1973).

Smith, J. A., Peterson, M. H., and Brown, B. F., Electromechanical Conditions at the Tip of an Advancing Stress Corrosion Crack in AISI 4340 Steel, Corrosion 26, No. 12, 539-542, (December 1970). Available as A71-19973.

Snape, E., Schaller, F. W., and Forbes, R. M.: A Method for Improving Sulfide Cracking Resistance of Low Alloy Steels, Corrosion 25, No. 9, 380 (September 1969).

Snape, E.: Roles of Composition and Microstructure in Sulfide Cracking of Steel, Corrosion 24, No. 9, 261-282 (September 1968).

Snape, E.: Sulfide Stress Corrosion of Some Medium and Low Alloy Steels, Corrosion 23, No. 6, 154-172 (June 1967).

*Speidel, M. O.: Hydrogen Embrittlement of Aluminum Alloys?, Hydrogen in Metals, Proc. Int. Conf. on the Effects of Hydrogen on Materials Properties and Selection and Structural Design, Champion, PA (September 23-27, 1973).

*Speidel, M. O.: Stress Corrosion Cracking of Aluminum Alloys, Met. Trans. 6A, No. 4, 631-655 (April 1975).

Spitzig, W. A., Talda, P. M., and Wei, R. P.: Fatigue-Crack Propagation and Fractographic Analysis of 18 Ni 250 Maraging Steel Tested in Argon and Hydrogen Environments. Eng. Fract. Mech. 1, 155-165 (June 1968).

Staehle, R. W.: Theory of Stress Corrosion Cracking in Alloys, 223-286, J. C. Scully, Ed., NATO, Brussels (1971).

Staley, J. T.: Stress Corrosion Cracking in Aluminum Alloys, Metals Eng. Quart. 13, 52-57 (November 1973).

*Stanley, J. K.: Solutions to Some Stress Corrosion Cracking Problems in Aerospace Situations, Proc. Joint Aerospace and Marine Corrosion Technol. Seminar, 1st, Houston, TX (1969).

Stavros, A. J. and Paxton, H. W.: Stress Corrosion Cracking Behavior of an 18 Pct Ni Maraging Steel, Met. Trans. 1, 3049-3055 (1970).

Steele, L. E.: USA Studies on Irradiation Effects to Advanced Pressure Vessel Materials, NRL-MR-1947 (December 1968). Available as AD-684067.

Steigerwald, E. A. and Benjamin, W. D.: Effect of Composition on the Environmentally Induced Delayed Failure of Precracked High Strength Steel, Met. Trans. 2, No. 2, 606-608 (1971).

*Steigerwald, E. A., Schaller, F. W. and Troiano, A. R.: Discontinuous Crack Growth in Hydrogenated Steel, Trans. AIME 215, 1048-1052 (1959).

Steinman, J. B., Van Ness, H. C. and Ansell, G. S.: Effect of High-Pressure Hydrogen Upon Notch Tensile Strength and Fracture Mode of 4140 Steel, Weld, J. Res. Suppl. 44, No. 5, 221S-224S (1965).

Stephens, J. R.: Exploratory Investigation of Y, La, and Hf Coatings for Nitridation Protection of Chromium Alloys, Met. Trans. 3, 2075-2086 (August 1972). Available as A72-39290.

*Stephens, J. R.: Role of Hf and Zr in the Hydrogen Embrittlement of Ta and Cb Alloys, NASA TM-X-68293 (September 1973). Available as N73-29525.

Stephens, J. R. and Garlick, R. G.: Compatibility of Tantalum, Columbium, and Their Alloys With Hydrogen in Presence of Temperature Gradient, NASA TN-D-3546 (1966).

*St. John, C. and Gerberich, W. W.: The Effect of Loading Mode on Hydrogen Embrittlement, Met. Trans. 4, 589-594 (February 1973).

Stone, L. H. and Freedman, A. H.: Cyclic Hot-Salt Stress Corrosion of Titanium Alloys, AFML-TR-67-289 (September 1967). Available as AD-825239. See Also AD-489108.

Strafford, K. N. and Hampton, A. F.: Sulphidation of Chromium and Some Chromium-Molybdenum Alloys; Kinetic and Morphological Features of the Process, J. Less-Comm. Met. 21, No. 3, 305-324 (July 1970).

Straumanis, M. E.: Mechanisms of Metallic Corrosion Processes and Hydrogen Embrittlement. Missouri Univ. (April 1968). Available as AD-669006.

Strickland, G., Reilly, J. J. and Wiswall, R. H.: In Proc. of the Hydrogen Economy Miami Energy Conf., Miami Univ. (March 1974

Stuhrke, W. F. and Carpenter, Jr., J. L.: Fracture Toughness Testing Data - A Technology Survey, NASA CR-134752 (January 1975).

Sturges, C. M. and Miodownik, A. P.: The Interaction of Hydrogen and Dis= locations in Iron, Acta Met. 17, 1197-1207 (September 1969).

Sullivan, A. M.: Stress Corrosion Crack Velocity in 4340 Steel, Eng. Fract. Mech. 4, No. 1, 65-76 (March 1972).

*Sullivan, T. L.: Uniaxial and Biaxial Fracture Toughness of Extra-Low Interstitial 5Al-2.5Sn Titanium Alloy Sheet at 20°K, NASA TN-D-4016 (June 1967).

Sullivan, T. L. and Orange, T. W.: Continuity Gage Measurement of Crack Growth on Flat and Curved Surfaces at Cryogenic Temperatures, NASA TN-D-3747 (1966).

Suss, H.: Stress Corrosion - Causes and Cures. Mater. Des. Eng. (April 1965).

Sutcliffe, J. M., Fessler, R. R., Boyd, W. K., and Parkins, R. N.: Stress Corrosion Cracking of Carbon Steel in Carbonated Solutions, Corrosion 28, No. 8, 313 (August 1972).

Swann, P. R., Stress Corrosion Failure, Sci. Amer. 214, No. 2, 72-81 (February 1966).

*Swisher, J. H., Ketton, S. C., Sest, A. J. and Jones, A. T.: Survey of Hydrogen Compatibility Problems in Energy Storage and Energy Transmission Applications, Sandia Report SAND 74-8219 (September 1974).

Syrett, B. C.: Lattice Dilatation and Hydrogen Embrittlement Cracking, Corrosion 29, 23-27 (1973).

T

Taketani, H.: Sustained Load Failures in Maraging Steel Weldments, Eng. Fract. Mech. 4, No. 2, 267-276 (June 1972).

Telseren, A. and Doruk, M.: Temperature Dependence of Water Enhanced Fatigue - Crack Growth in Mild Steel, Eng. Fract. Mech. 6, No. 2, 283-286 (September 1974).

Tetelman, A. S.: Acoustic Emission and Fracture Mechanics Testing of Metals and Composites, UCLA - Eng - 7249 (1972).

Tetelman, A. S.: The Hydrogen Embrittlement of Ferrous Alloys, in Fracture of Solids, 671-708 (1962).

Tetelman, A. S.: The Mechanism of Hydrogen Embrittlement in Steel, in Fundamental Aspects of Stress Corrosion Cracking, 446-460, NACE, Houston, TX (1969).

*Tetelman, A. S.: Recent Developments in Classical (Internal) Hydrogen Embrittlement, Hydrogen in Metals, Proc. Int. Conf. on the Effects of Hydrogen on Materials Properties and Selection and Structural Design, Champion, PA (September 23-27, 1973).

*Tetelman, A. S. and Robertson, W. D.: Mechanism of Hydrogen Embrittlement Observed in Iron-Silicon Single Crystals, Trans. AIME 224, No. 4, 775-783 (1962).

Tetelman, A. S., Wagner, N. J., and Robertson, W. D.: An X Ray Investigation of the Effects of Hydrogen in Iron, Acta Met. 9, 205-215 (1961).

Theu, G. J. and Staehle, R. W., Proc. Int. Conf. Stress Corrosion Cracking and Hydrogen Embrittlement of Iron Base Alloys, Firminy, France (June 1973).

*Thompson, A. W.: Behavior of Sensitized 309S Stainless Steel in Hydrogen. Mater. Sci. Eng. 14, 253-264 (1974).

*Thompson, A. W.: Ductility Losses in Austenitic Stainless Steels Caused by Hydrogen, Hydrogen in Metals, Proc. Int. Conf. on the Effects of Hydrogen on Materials Properties and Selection and Structural Design, Champion, PA (September 23-27, 1973).

*Thompson, A. W.: Hydrogen Compatibility of Dispersion - Strengthened Alloys, Met. Trans. 5, No. 8, 1855-1861 (August 1974).

*Thompson, A. W.: Hydrogen Embrittlement of Stainless Steels by Lithium Hydride, Met. Trans. 4, No. 12, 2819-2825 (December 1973). Available as A74-15680.

Thompson, A. W.: The Mechanism of Hydrogen Participation in Ductile Fracture, Proc. Int. Conf. on Effect of Hydrogen on Behavior of Materials, Moran, WY (September 7-11, 1975).

*Thompson, A. W. and Posey, W. N.: Effect of Hydrogen on Iron-Nickel-Cobalt Sealing Alloys, J. Test. Eval. 2, No. 4, 240-242 (July 1974).

Thompson, A. W. and Wilcox, B. A.: Deformation and Fracture of Dispersion-Strengthened Nickel Charged with Hydrogen, Scripta Met. 6, 689-696 (August 1972). Available as A72-39004.

Thompson, D. H.: Stress Corrosion Cracking of Copper Metals, Stress Corrosion Cracking of Metals - State of the Art, ASTM STP-518, 39-57 (Spetember 1972).

Tien, J. K.: Diffusion and Other Mechanisms of Hydrogen Transport, Proc. Int. Conf. on Effect of Hydrogen on Behavior of Materials, Moran, WY (September 7-11, 1975).

Tiffany, C. F.: Fracture Control of Metallic Pressure Vessels, NASA SP-8040 (1970).

Tiller, W. A. and Schrieffer, R.: A Hydrogen Pump for Stress Corrosion Cracking, Scripta Met. 4 (1970).

Tiner, N. A. and Gilpin, C. B: Microprocesses in Stress Corrosion of Martensitic Steels, Corrosion 22, No. 10, 271-279 (1966).

Tiner, N. A., Gilpin, C. B., and Toy, S. M.: A Microstructural Study of Stress Corrosion Cracking in Martensitic 4340 Steel, Douglas Aircraft Co. Paper No. 3381 (June 1965).

Tiner, N. A., MacKay, T. L., Asunmaa, S. K., and Ingersoll, R. G.: Use of Electron Microautoradiography for Evaluating Microsegration of Hydrogen in Titanium Alloys. ASM Trans. Quart. 61, No. 2, 195-202 (June 1968).

*Townsend, Jr., H. E.: Effects of Zinc Coatings on the Stress Corrosion Cracking and Hydrogen Embrittlement of Low-Alloy Steel, Met Trans. 6A, No. 4, 877-883 (April 1975).

*Toy, S. M.: Neodymium Detection System, Hydrogen Embrittlement Testing, ASTM STP-543, 124-130 (1974).

Toy, S. M. and Phillips, A.: Hydrogen Emanation and Distribution in Metals and Alloys, Corrosion 26, No. 7, 200-207 (July 1970).

Treseder, R. S. and Swanson, T. M.: Factors in Sulfide Corrosion Cracking of High Strength Steels, Corrosion 24, No. 2, 31-37 (February 1968).

Troiano, A. R.: General Keynote Lecture, Hydrogen in Metals, Proc. Int. Conf. on the Effects of Hydrogen on Materials Properties and Selection and Structural Design, Champion, PA (September 23-27, 1973).

*Troiano, A. R.: The Role of Hydrogen and Other Interstitials in the Mechanical Behavior of Metals, Edward DeMille Campbell Memorial Lecture, Trans. ASM 52, 54 (1960).

Troiano, A. R. and Whiteman, M. B.: Hydrogen Embrittlement of Austenitic Stainless Steel, Corrosion 21, No. 2, 53-56 (1965).

*Tucker, T. R. and Fujii, C. T.: Acoustic Emissions and Stress-Corrosion Cracking in High-Strength Alloys, DA-785009 (August 1974).

Turley, R. V. and Avery, C. H.: Elevated-Temperature Static and Dynamic Sea-Salt Stress Cracking of Titanium Alloys. Stress-Corrosion Cracking of Titanium, SATM STP-397, 1-30 (1966).

U

Uhlig, H. H.: Corrosion and Corrosion Control: An Introduction to Corrosion Science and Engineering, Corrosion and Corrosion Control. John Wiley, New York, NY (1971). Available as A73-13125.

Uhlig, H. H. and Cook, Jr., E. E.: Mechanism of Inhibiting Stress Corrosion Cracking of 18-8 Stainless Steel in $MgCl_2$ by Acetates and Nitrates, J. Electrochemical Soc. 116, No. 2, 173-177 (1969).

*Uhlig, H. H. and Newberg, R. T.: Differentiating Stress Corrosion Cracking from Hydrogen Cracking of Ferritic 18-8 Stainless Steels, Corrosion 28, No. 9, 337-339 (1972). Available as A72-43127.

V

Van der Sluys,W. A.: Mechanisms of Environment Induced Subcritical Flaw Growth in AISI 4340 Steel, Eng. Fract. Mech. 1, 447-462 (1969).

Van der Sluys, W. A.: Mechanisms of Environment Induced Subcritical Flaw Growth in AISI 4340 Steel, T & AM Report No. 292, Illinois Univ., Urbanna (1966). Available as AD-639668.

*Vandervoort, R. W.: Tensile and Fracture Properties of Austenitic Stainless Steel 21-6-9 in High Pressure Hydrogen Gas, Metals Eng. Quart. 12, 10-16 (February 1972). Available as A72-19479.

Van Leeuwen, H. P.: An Analysis of Hydrogen-Induced Cracking, Proc. Int. Conf. on Effect of Hydrogen on Behavior of Materials, Moran, WY (September 7-11, 1975).

*Van Leeuwen, H. P.: Embrittlement by Internal and by External Hydrogen, Corrosion 31, No. 5, 154-159 (May 1975).

Van Leeuwen, H. P.: Hydrogen Embrittlement of the Circumferentially Notched Round Specimen, National Aerospace Lab, NLR-TR-72113-U, Amsterdam, Holland (August 1972). Available as N73-23917.

Van Leeuwen, H. P.: The Kinetics of Hydrogen Embrittlement: A Quantitative Decision Model, Eng. Fract. Mech. 6, No. 1, 141-162 (March 1972).

*Van Leeuwen, H. O.: On the Decohesion Model of Hydrogen Embrittlement, Corrosion 32, No. 1, 34-37 (January 1976).

Van Leeuwen, H. P.: A Quantitative Model of Hydrogen Induced Grain Boundary Cracking, NLR TR-72024-C (1972).

*Van Leeuwen, H. P.: A Quantitative Model of Hydrogen Induced Grain Boundary Cracking, Corrosion 29, No. 5, 197-204 (May 1973).

Van Wanderham, M. C. and Harris, Jr., J. A.: Low Cycle Fatigue of Metals in High Pressure Gaseous Hydrogen at Cryogenic, Ambient, and Elevated Temperatures, Presented at WESTEC Conf., Los Angeles, CA (1971).

Van Wanderham, M. C. and Harris, Jr., J. A.: Properties of Materials in High Pressure Hydrogen at Cryogenic, Room, and Elevated Temperatures, Final Report Contract NAS 8-26191 (June 1975).

Vaughan, D. A. and Phalen, D. I.: The Effect of Hydrogen on the Structural Properties of Stainless Steel as Related to Its Corrosive Behavior, Metals Eng. Quart. 5, No. 3, 39-43 (August 1965).

Vaughan, D. A. and Phalen, D. I.: Reactions Contributing to the Formation of Susceptible Paths for Stress Corrosion Cracking, in Stress Corrosion Testing, SATM STP-425, 209-227 (1976).

*Vaughan, D. A. and Phalen, D. I.: The Role of Surface Stress on Hydrogen Absorption by 4340 Steel, Corrosion 24, No. 8, 243-246 (August 1968).

Vaughan, D. A., Phalen, D. I., Peterson, C. L. and Boyd, W. K.: Relationship between Hydrogen Pickup and Susceptible Paths in Stress Corrosion Cracking of Type 304 Stainless Steel, Corrosion 19, 315t (1963).

Vennett, R. M and Ansell, G. S.: Effect of High Pressure Hydrogen Upon Tensile Properties and Fracture Behavior of 304L Stainless Steel, Trans. ASM 60, No. 2, 242-251 (June 1967).

Vennett, R. M. and Ansell, G. S.: A Study of Gaseous Hydrogen Damage in Certain FCC Metals, Trans. ASM 62, 1007-1013 (December 1969). Available as A70-21965.

*Vitovec, F. H.: Growth Rate of Fissures During Hydrogen Attack of Steels, Proc. API 44, 179-188 (1964).

*Vitt, R. S. and Ono, K.: Hydrogen Solubility in Alpha Titanium, Met. Trans. 2, 608-609 (1971). Available as A71-19991.

*Vrable, J. B.: Stress-Corrosion and Hydrogen-Embrittlement Behavior of Line-Pipe Steel in Underground Environment, W. Va. Univ., Eng. Exp. Sta. Bull. No. 106, 299-310 (1972).

W

Wagner, Jr. J. B.: Sulfur in the Corrosion of Superalloys, Northwestern Univ. Report on Contract DA-ARO-D-31-124-73-C8 (March 1974). Available as AD-779542.

Walter, R. J. and Chandler, W. T.: Compatibility of Tantalum and Columbrium Alloys with Hydrogen, AIAA J. 4, 302-314 (1966).

Walter, R. J. and Chandler, W. T.: Effect of High-Pressure Hydrogen on Metals, Paper D8-14.2, ASM Fall Meeting, Detroit, MI (October 1968).

Walter, R. J. and Chandler, W. T.: Effects of High Pressure Hydrogen on Metals at Ambient Temperature, NAR-Rocketdyne, Canoga Park, CA Report R-7780-1 (1969).

Walter, R. J. and Chandler, W. T.: Effects of High Pressure Hydrogen on Metals at Ambient Temperature, Final Report, Contract NAS 8-19 (February 28, 1969).

Walter, R. J. and Chandler, W. T.: Effect of High-Pressure Hydrogen on Storage Vessel Materials, Rocketdyne Report No. R-6851 (January 1967).

Walter, R. J. and Chandler, W. T.: Effects of High-Pressure Hydrogen on Storage Vessel Materials, ASM Report No. W8-2.4 (1968).

Walter, R. J. and Chandler, W. T.: Effect of Hydrogen Environments on Inconel 718 and Ti-6Al-4V (STA), presented at AIME Meeting, Las Vegas, NV (May 1970).

*Walter, R. J. and Chandler, W. T.: Influence of Hydrogen Pressure and Notch Severity on Hydrogen Embrittlement, Mat. Sci. Eng. 8, 90-97 (1971).

Walter, R. J., Hayes, H. G. and Chandler, W. T.: Influence of Gaseous Hydrogen on Metals, NASA CR-119917 (May 1971).

Walter, R. J., Hayes, H. G., and Chandler, W. T.: Mechanical Properties of Inconel 718, Waspaloy, A-286, and Ti-5Al-2.5An ELI in Pure Gaseous H_2, Rocketdyne Report R-8187 (April 1970).

*Walter, R. J., Jewett, R. O. and Chandler, W. T.: On the Mechanism of Hydrogen Environment Embrittlement of Iron- and Nickel-Base Alloys, Mater. Sci. Eng. 5, No. 2, 98-110 (January 1970).

Walter, R. J. and Ytterhus, J. A.: Behavior of Columbium and Tantalum in Hydrogen Environments, Rocketdyne Research Report RR-67-7 (September 1967).

*Wanhill, R. J. H.: A Consideration of Cleavage in Alpha Titanium, Acta Met. 21, 1253-1258 (1973).

Watson, G. K.: Preliminary Evaluation of T-111 Clad UN Fuel Specimens from 2500 Hour 1040°C (1900°F) Lithium Loop Test, NASA TM-X 52998 (1971).

*Watson, G. K. and Stephens, J. R.: Effect of Aging at 1040°C (1900°F) on the Ductility and Structure of a Tantalum Alloy T-111, NASA TN-D-6988, (October 1972). Available as N72-32549.

Wayman, M. L. and Smith, G. C.: The Effects of Hydrogen on the Deformation and Fracture of Nickel-Iron Alloys, Acta Met. 19, 227-231 (March 1971).

Wayman, M. L. and Smith, G. C.: The Hydrogen Embrittlement of Fe-Ni Martensites, Met. Trans. 1, 1189 (May 1970).

*Wei, R. P.: Fatigue-Crack Propagation in High Strength Aluminum Alloy, Int. J. Fract. Mech. 4, 155-170 (1968).

Wei, R. P. and Landes, J. D.: Correlation Between Sustained Load and Fatigue Crack Growth in High Strength Steels, Mater. Res. Stand. 9, No. 7, 25-28 (July 1969).

Wei, R. P. and Ritter, D. L.: The Influence of Temperature on Fatigue Crack Growth in a Mill Annealed Ti-6Al-4V Alloy, J. Mater. 7, No. 2, 240-250 (1972).

*Weil, B. L.: Stress-Corrosion Crack Detection and Characterization Using Ultrasound, Mater. Eval, 27, No. 6, 135-139 and 144 (1969). Available as A69-32334.

*Weiner, L. C.: Kinetics and Mechanism of Hydrogen Attack on Steel, Corrosion 17, 137-143 (1961).

Wessel, E. T.: State of the Art of the WOL Specimen for K_{IC} Fracture Toughness Testing, Eng. Fract. Mech. 1, 77-103 (June 1968).

West, J. M.: A General Model for Stress Corrosion Cracking Propagation, Metal Sci. J. 7, 169-172 (1973). Available as A74-20516.

*Westfall, W. L. and Schwab, R. C.: Hot Corrosion Behavior of Several Newly Developed Nickel-Base Superalloys, Report 3199, Naval Research and Development Lab., Annapolis, MD (February 1970). Available as AD-864927L.

Westlake, D. G.: The Combined Effects of Oxygen and Hydrogen on the Mechanical Properties of Zirconium, Trans. AIME 233, 368 (1965).

*Westlake, D. G.: A Generalized Model for Hydrogen Embrittlement, Trans. ASM 62, No. 4, 1000-1006 (1969).

Westlake, D. G.: Hydrogen Embrittlement: A Resistometric Study of Niobium (Columbium) - Hydrogen Alloys, Trans. AIME 245, 287-292 (February 1969).

Westlake, D. G.: Mechanical Behavior of Niobium-Hydrogen Alloys, Trans. AIME 245, 1969 (1969).

*Westphal, D. A. and Worzala, F. J.: Hydrogen Attack on Steel, ASM Materials/ Metalworking Technology Series No. 2, 79-89 (1974).

*Westwood, A. R. C.: Control and Application of Environment Sensitive Fracture Processes, in Proc. Tewksbury Sump. Fracture, Effects of Chemical Environments on Fracture Processes, Melbourne Univ., Australia (June 1974).

Westwood, A. R. C. and Goldheim, D. L.: Mechanism for Environmental Control of Drilling in MgO and CaF_2 Monocrystals, J. Amer. Ceram. Soc. 53, No. 3, 142-147 (1970).

Whiteman, M. B. and Troiano, A. R.: Hydrogen Embrittlement of Austenitic Stainless Steel, Corrosion 21, No. 2, 53-56 (February 1965).

Whiteman, M. B. and Troiano, A. R.: The Influence of Hydrogen on the Stacking Fault Energy of an Austenitic Stainless Steel, Physica Status Solidi 7, K109-K110 (November 1, 1964).

Wicks, B. J. and Lewis, M. H.: The Effect of Impurities on the Flaw Stress of Magnesium Oxide Single Crystals, Phys. Stat. Solidi. 6, No. 1, 281-294 (1971).

Wickstrom, W. A. and Etheridge, B. R.: Investigation into the Compatibility of Hydrogen and Titanium, Adv. Cryogenic Eng. 13, 334 (1968).

*Wilcox, B. and Smith, G. C.: Intercrystaline Fracture in Hydrogen-Charged Nickel, Acta Met. 13, No. 3, 331-343 (1965).

Wilcox, B. and Smith, G. C.: The Portevin-le-Chatelier Effect in Hydrogen Charged Nickel, Acta Met. 12, 371-376 (1964).

Wilde, B. E.: Mechanism of Cracking of High Strength Martensitic Stainless Steels in Sodium Chloride Solution, Corrosion 27, No. 8, 326-333 (1971).

Williams, D. N.: The Hydrogen Embrittlement of Titanium Alloys. J. Inst. Metals 91, 147-152 (1962-1963).

*Williams, D. N., Subcritical Crack Growth in Two Titanium Alloys, Met. Trans. 4, 675-680 (1973).

Williams, D. N., Subcritical Crack Growth under Sustained Loads, Met. Trans. 5, 2351-2358 (November 1974).

Williams, D. N., Koehl, B. G. and Bartlett, E. S.: The Reaction of Titanium with Hydrogen Gas at Ambient Temperatures, J. Less-Common Metals 19, 385 (1969).

Williams, D. N. and Maykuth, D. J.: Reaction of Titanium with Gaseous Hydrogen at Ambient Temperatures, DMIC Tech. Note (February 4, 1966).

Williams, F. N.: Studies of the Mechanism of Crack Propagation in Salt Water Environments of Candidate Supersonic Transport Titanium Alloy Materials, Battelle Memorial Institute, SST-66-1 (January 1966). Available as AD-47825L.

*Williams, F. N. and Wood, R. A.: The Reaction of a Titanium Alloy with Hydrogen Gas at Low Temperatures, J. Less-Common Metals 31, No. 2, 239-247 (May 1973).

Williams, D. P.: Gaseous Hydrogen Embrittlement of Aerospace Materials, Presented IAF Int. Cong., 22nd. Brussels, Belgium (20-25 September 1971).

*Williams, D. P. and Nelson, H. G.: Embrittlement of 4130 Steel by Low-Pressure Gaseous Hydrogen, Met. Trans. 1, No. 1, 63-68 (January 1970).

*Williams, D. P. and Nelson, H. G.: Gaseous Hydrogen-Induced Cracking of Ti-5Al-2.5Sn, Met. Trans. 13, No. 8, 2107-2113 (August 1972). Available as A72-39292.

Williams, D. P. and Nelson, H. G.: Kinetics of Slow Crack Growth and Gas Permeation of 4130 Steel in Gaseous Hydrogen, Presented at Symp. Effect of Gaseous Hydrogen on Metals, Mater. Eng. Cong., Detroit, MI (1968).

Williams, J. C.: Some Observations on the Stress Corrosion Cracking of Three Commercial Titanium Alloys, Trans ASM 60, No. 4, 646-650 (December 1967). Available as A68-15769.

Williams, J. C., Paton, N. E., Stocker, P. J., and Marcus, H. L.: Aqueous Stress Corrosion Cracking and Stress Corrosion Fatigue of a High Strength Titanium Alloy, Proc. Nat. SAMPLE Tech. Conf., Huntsville, AL (October 1971).

Wilshaw, T., Rau, C. A., and Tetelman, A. S.: General Model to Predict Elastic-Plastic Stress Distribution and Fracture Strength of Notched Bars in Plane Strain Bending, Eng. Fract. Mech. 1, No. 1, 191-211 (1968).

Wilson, W. K., Clark, Jr., W. G., and Wessel, E. T.: Fracture Mechanics Technology for Combined Loading and Low-to-Intermediate Strength Metals, Westinghouse Report, Contract CAAE 07-67-C-4021 (November 1968).

Windle, A. H. and Smith, G. C.: The Effect of Hydrogen on the Deformation and Fracture of Polycrystalline Nickel, Metal Sci. J. 4, 136-144 (July 1970).

Wood, T. W. and Daniels, R. D., The Influence of Hydrogen on the Tensile Properties of Columbium, Trans. AIME 233, 898 (1967).

Y

Yang, J. N.: Probability of Stress Corrosion Fracture Under Random Loading, Eng. Fract. Mech. 4, No. 4, 737-748 (December 1972).

*Yoshino, K. and McMahon, Jr., C. J.: The Cooperative Relation Between Temper Embrittlement and Hydrogen Embrittlement in a High Strength Steel. Met. Trans. 5, No. 2, 363-370 (1974).

Young, D. J., Smeltzer, W. W., and Kirkaldy, J. S., Nonstoichiometry and Thermodynamics of Chromium Sulfides, J. Electrochem. Soc. 120, No. 9, 1221-1224 (September 1973).

*Young, D. J., Smeltzer, W. W. and Kirkaldy, J. S.: Sulfidation Properties of Nickel - 20 wt. % Molybdenum Alloy in Hydrogen - Hydrogen Sulfide Atmospheres at 700°C, Oxid. Metals 7, No. 3, 149-161 (1973). Available as A74-19225.

Z

Zweben, C.: Tensile Failure of Fiber Composites. J. AIAA 6, 2325-2331 (December 1968). Available as A69-12514.

PROBLEM AREA 5

Protective coatings - Airbreathing engines operating in contaminated environments are in need of protection against attack by the contaminants. Information on the various candidate coatings and the effects of combustion products of contaminants in jet fuels on engine components is of prime interest. For example, the sulfur ordinarily contained in JP fuels reacts with salt present in shipboard and offshore environments and the resulting compounds attack turbine buckets severely.

PROTECTIVE COATINGS

A

*Anderson, P. J., Boone, D. H., and Paskiet, G. F: A Comparison of the Effect of Inward and Outward Diffusion Aluminide Coatings on the Fatigue Behavior of Nickel-Base Superalloys. Oxid. Metals 4, No. 2, 113-119 (1972). Available as A72-40916.

*Angerman, C. L.: Long-Term Oxidation of Superalloys, Oxid. Metals 5, No. 2, 149-167 (1972).

Arutyunov, A. V. and Banchila, S. N.: Thermal Properties of Tantalum-Tungsten Alloys at High Temperature, High Temp. 10, No. 1, 166-168 (October 1972). Available as A73-13192.

B

Baker, F. R.: Further Development of Coatings for Protection of Dispersion Strengthened Nickel From Oxidation, AFML-TR-67-320 (August 1967).

*Barrett, C. A., and Evans, E. B.: Cyclic Oxidation Evaluation - Approaching Application Conditions. NASA TM-X-68252 (May 1973).

Barrett, C. A., and Lowell, C. E.: Comparison of Isothermal and Cyclic Oxidation Behavior of 25 Commercial Sheet Alloys at 1150°C. NASA TN D-7615 (April 1974).

Barrett, C. A., Santoro, G. J., and Lowell, C. E.: Isothermal and Cyclic Oxidation at 1000° and 1100°C of Four Nickel-Base Alloys: NASA-TRW VIA, B-1900, 713C, and 738X. NASA TN-D-7484 (November 1973).

Barth, C. F.: Evaluation of the Stress Corrosion Susceptibility of Titanium Sheet Alloy Coated With High Temperature Sealants, TRW Equipment Labs, ER-6841-3 (November 1966). Available as AD-802628.

*Bartlett, E. S. and Browning, M. F.: Investigation of Corrosion-Resistant Coatings for Service at 2500°C, Battelle Memorial Institute, Columbus, OH (July 1972). Available as AD-901571.

Bartlett, E. S., Browning, M. F., Bower, W. K., Felton, G. W., and Stowell, W. R.: Investigation of Corrosion-Resistant Coatings for Service at 2500 F, Battelle Memorial Institute. Final Engineering Report for Period 9 June 1971 - 8 May 1972 (July 1972). Available as AD-801571L.

Bartlett, R. W. and Gage, P. R.: Investigation of Mechanism for Oxidation Protection and Failure of Intermetallic Coatings for Refractory Metals, ASD-TDR-63-753, Part II (July 1964).

Bartocci, R. C.: Behavior of High-Temperature Coatings for Gas Turbine Engines, ASTM STP-421, 169 (June 1966).

Beauregard, R. J.: Feasibility Study of Columbium Alloy Castings. AVCO Lycoming Div. Stratford, CT. Final Report, AMMCR CR-70-5(F) (November 1971). Available as AD-739572.

*Bergman, P. A.: Hot Corrosion in Gas Turbine Alloys, Corrosion 23, No. 3, 72-81 (March 1967).

Bergman, P. A., Sims, C. L., and Beltran, A. N.: Hot Corrosion Problems Associated With Gas Turbines, ASTM STP-421 (June 1966).

Betteridge, W.: The Nimonic Alloys, Edward Arnold, Ltd., London, England (1959).

*Betts, R. K.: Selection of Coatings for Hot-Section Components of the LM-1500 Marine-Environment Engine, R67FPD357 (October 1967). Available as AD-829663.

Bitzer, E. B., Rexer, J., and Fenish, R. G.: High Temperature Protective Coatings for Refractory Metals. Contract No. NASw-1030, Progress Report No. 1 (February 1965).

Blankenship, C. P. and Oldrieve, R. E.: An Evaluation of Alloys and Coatings for Use in Automobile Thermal Reactors, SAE Paper No. 740091 (March 1974). Available as A74-22150.

*Bredzs, N. T., Miller, F. N., and Peaslee, R. L.: Alloy Coatings for High Temperature Protection, Metals Eng. Quart., 12-18 (February 1974). Available as A74-24224.

*Brentnall, W. D.: Tungsten Reinforced Oxidation Resistant Columbium Alloys. Solar. San Diego, CA. RDR 1635-1, Naval Air Systems Command. Washington, D. C. (February 1969). Available as AD-874412.

C

*Cornie, J. A. and Goodspeed, R. C.: Development of a Ductile Oxidation Resistant Columbium Alloy. Westinghouse Electric Corp. (July 1969). Available as AFML-TR-69-64 and AD-863464.

D

Danek, G. J.: State-of-the-Art Survey on Hot Corrosion in Marine Gas Turbine Engines. Report 32/65. U.S. Navy Marine Engineering Lab. Anapolis, MD (March 1965).

*Dapkumas, S. J.: Evaluation of Hot-Corrosion Behavior of Thermal Barrier Coatings, MCIC-75-27, 481-502 (1975).

Davis, S. O., Watson, D. C., and Haulman, C. R.: Evaluation of Resistance Versus Radiant Heating Method on the Stress Rupture Properties of Coated C013 Columbium Alloy in Air at 2400°F. AFML-TR-64-339 (April 1965).

Deadmore, D. L.: Cyclic Oxidation of Cobalt-Chromium-Aluminum-Yttrium and Aluminide Coatings on IN-100 and VIA Alloys in High Velocity Gases. NASA TN-D-6842 (July 1972).

DeCrescente, M. A. and Bornstein, N. S.: Formation and Reactivity Thermodynamics of Sodium Sulfate With Gas Turbine Alloys. Corrosion 28, No. 5, 127-133 (1968).

*Dickson, D. T., Wimber, R. T., and Stetson, A. R.: Very High Temperature Coatings for Tantalum Alloys, AFML-TR-66-317. Solar. San Diego, CA (October 1966). Available as AD-801881.

*Doi, H., Onoda, T., and Harada Y.: Hot Corrosion of Gas Turbine Rotor Blade Materials Due to Long Term Testing, ASME Paper 72-GT-87, Proc. Gas Turbine and Fluids Eng. Conf. Prod. Show, San Francisco, CA. 26-30 March 1972. Available as A72-25662.

Donty, R. A. and Schwartzbart, H.: Cobalt Base Surfacing of Inconel 718, Weld. J. Supp., 550s - 556s (December 1973).

E

Ebihara, W. T., Lin, K. C., and Kmieciak, H. A.: Development and Characterization of High Temperature Coatings for Tantalum Alloys. Third Interim Progress Report. ER-6972-3. Contract AF 33(615)-5011 (April 1967). Available as AD-815714.

Epner, M.: Activities of Chromalloy Division in the Development of Refractory Composites (Ductile Aluminum Based Coatings), AFML-TR-65-207 (August 1965).

Epremian, E. and Criscione, J. M.: Research on High Temperature Coatings for Graphite Progress Report No. 3, Contract No. AF 33(657)-11253 (March 1964).

F

Fitzgerald, B. and Rusert, E. L.: Evaluation of the Fused Slurry Silicide Coating Considering Component Design and Reuse, AFML-TR-70-154 (December 1970).

G

*Gadd, J. D.: Advancement of Protective Coating Systems for Columbium and Tantalum Alloys, AFML-TR-65-203 (April 1965). Available as AD-476344.

Gadd, J. D.: Corrosion Resistant Coatings for Refractory Metals and Superalloys, International Plansee Seminar, 6th. Reutte/Tyrd, Austria (June 1968).

Gadd, J. D., Fisch, H. A., Kmieciak, H. A., and Jones, E. E.: Vacuum Pack and Vacuum Slip-Pack Processes for Coating Refractory Metals, Electrochem. Technol. 1, No. 11-12, 379-388 (November-December 1968).

Garlick, R. G., and Lowell, C. E.: Alloy Composition Effects on Oxidation Products of VIA, B-1900, 713C, and 738X - A High Temperature Diffractometer Study. NASA TM-X-2796 (June 1973).

Gebler, K. A.: Electrophoretic Deposition of Refractory Metals Coatings, RTDIR-8-344/61, Vitro Labs. (December 1966). Available as AD-805992.

Gedwill, M. A., and Grisaffe, S. J.: Evaluation of NiCrAl and FeCrAlY Claddings on TD-Ni-Cr; Mach 1 Burner Rig Test at 2100°F (1149°C), NASA TM-X-52916 (1970).

*Gerdman, D. A., Berner, W. E., Cherry, J. A., and Petrak, G. J.: The Evaluation of Materials for Aerospace Systems, AFML-TR-69-178 (June 1969). Available as AD-857617.

Giggins, C. S. and Pettit, F. S.: The Oxidation of TD NiCr (Ni-20Cr-2 vol pct ThO_2) Between 900 and 1200 C, Met. Trans. 2, 1071-1078 (April 1971). Available as A71-26015.

Gilbert, J. R. B., Broomfield, R. W., and Rogers, D. H.: Corrosion of Chromium Alloys in Gas Turbine Exhaust Gas. Proc. European Conf. Corros., 5th, Paris, France (24-28 September 1973); Rueil-Malmaison, Hauts-de-Seine, France. Societe de Chimie Industrielle, 463-465 (1973). Available as A74-22705 or as A74-22756.

*Goebel, J. A., Felten, E. J., and Pettit, F. S.: Hot Corrosion Mechanisms for Nickel and Cobalt Base Alloys, MCIC-75-27, 93-114 (1975).

Goebel, J. A. and Pettit, F. S.: Na_2SO_4 - Induced Accelerated Oxidation (Hot Corrosion) of Nickel, Metall. Trans. 1, 1943-1954 (1970).

Goebel, J. A. and Pettit, F. S.: Second Annual Report on Hot Corrosion Mechanisms for Cobalt-Base Alloys, WPAFB Contract F33615-72-C-1757 (June 1974).

Goward, G. W.: Materials and Coatings for Gas Turbine Hot-Section Components, Proc. Gas Turbine Materials Conf. (October 1972).

Goward, G. W., Boone, D. H., and Giggins, C. S.: Formation and Degradation Mechanisms of Aluminide Coatings on Nickel Base Superalloys, ASM 60, 228-241 (1967).

Graham, L. D. and Gadd, J. D.: Hot Corrosion Behavior of Coated and Uncoated Superalloys, TRW, Inc. Paper No. 112, 69th Meet. ASTM (1966).

Grisaffe, S. J.: Protective Coatings for Superalloys, NASA SP-227 (1970).

Grisaffe, S. J. and Klechka, E. W.: Process for Producing Nickel Aluminide Coating Low Alloy Stainless Steel, Patent Application, NASA-CASE-LEW 11267-2 (July 1967).

Gulbransen, E. A. and Jansson, S. A.: Heterogeneous Kinetics at Elevated Temperatures, Plenum Press (1970).

H

Hanik, D. K., Shockley, Q. O., and Hodshire, H. O.: Advanced Coatings on Superalloy Blades and Vanes for Hot Corrosion and Oxidation Resistance, SAE Paper No. 690480 (May 20, 1969).

Hart, A. B. and Cutler, A. J. B., Deposition and Corrosion in Gas Turbines, Applied Science Pub. Ltd., London (1972).

Hauser, H. A. and Holloway, J. F.: Evaluation and Improvement of Coatings for Columbium Alloy Gas Turbine Engine Components, AFML-TR-66-186-PT-1 (July 1966).

*Hill, V. L. and Rausch, J. J.: Protective Coatings for Tantalum-Base Alloys, AFML-TR-64-354-PT-2, (January 1966). Available as AD-479902.

Hill, V. L. and Rausch, J. J.: Protective Coatings for Tantalum Base Alloys, AFML-TR-64-354-PT-3, (September 1966).

Hill, V. L. and Rausch, J. J.: Protective Coatings for Tantalum Base Alloys, IITRI-B6013-16, 5th Quarterly Report (September 1964).

Hollaway, J. F. and Hauser, H. A.: Evaluation and Improvement of Coatings for Columbium Alloy Gas Turbine Engine Components, AFML-TR-66-188-Pt-1 (July 1966). Part 2 (May 1968).

Holloway, J. F., Hauser, H. A., and Bradley, E. F.: Coated Columbium for Gas Turbine Engine Application, SAE Nat. Air Transport. Meet., Atlanta, GA (May 1971).

*Ishchenko, I. I. and Omel'chenko, V.I.: Effect of Heat Resistant Coatings on Fatigue Life of Heat Resistant Alloys, Problemy Prochnosti V Mashinostroenii (Moscow) No. 10, 76-81 (1971).

J

Jackson, J. D.: Corrosion of Titanium, Battelle Memorial Institute, DMIC Memo-218 (September 1966). Available as AD-803701.

Jaffee, R. I. and Stringer, J.: High Temperature Oxidation and Corrosion of Superalloys in the Gas Turbine - A Review, High Temperatures - High Pressures, 3, No. 2, 121-135, 1971. Available as A72-17611.

James, W. A.: A State-of-the-Art Survey of Methods Being Used for the Evaluation of Coatings for Superalloys and Refractory Metals, AGARD Report 509 (May 1965).

Jankowsky, E. J.: Evaluation of Chromalloy A-12 Coating, NADC-MA-6867 (December 1968). Available as AD-845466L.

Johnson, D. E. and Newton, E. H.: Metal Filaments for High Temperature Fabrics, ASD TDR 62-180, Part II (1963).

Jones, E. E.: Development of Repair and Process Coatings for Air-Cooled Nickel Alloy Turbine Blades, TRW, Inc. ER-7410-2 (20 May 1970).

Jones, E. E. and Peck, J. V.: Development of Repair and Reprocess Coatings for Air Cooled Nickel Alloy Turbine Blades, AFML-TR-71-278 (December 1971). Available as AD-892786L.

K

Kaufman, M.: Examination of the Influence of Coatings on Thin Superalloy Sections, NASA CR-121115 (January 1973).

Kmieciak, H. A., Lin, K, C., and Gadd, J. D.: Development and Characterization of High Temperature Coating for Tantalum Alloys, Fourth Interim Progress Report, TRW, Inc. ER 6972-4, Thompson Ramo Wooldridge (17 July 1967). Available as AD-820638.

*Kriege, O. H. and Boone, D. H.: Nondestructive Characterization of Diffusion Aluminide Coatings, Mater. Eval. 32, No. 2, 38-44 (February 1974).

Krier, C. A.: Coatings for the Protection of Refractory Metals From Oxidation, DMIC Report 161 (1961).

Kubaschewski, O. and Hopkins, B. E.: Oxidation of Metals and Alloys, Butterworths, London, England (1967).

L

Leckie, H. P.: A Comparison of the Stress Corrosion Behavior of Some High Strength Steels, U. S. Steel, ARL-B-23104 (July 1968). Available as AD-835922L.

Leggett, H., Schwab, D. E., and Cook, J. L.: Mechanical and Physical Properties of Superalloy and Coated Refractory Alloy Foils, AFML-TR-65-147 (May 1965).

Levine, S. R.: Cyclic Furnace and High Velocity Oxidation of an Aluminide-Coated High-Strength Nickel Alloy (B-1900), NASA-TM-X-2370 (1971). Available as N71-35585.

Levine, S. R., and Caves, R. M.: Thermodynamics and Kinetics of Pack Aluminide Coating Formation on IN-100. NASA TM-X-71423 (October 1973).

Levinstein, M. A.: Enriched Aluminide Coatings for Dispersion Strengthened Nickel Materials, NASA CR-121250 (August 1973).

Levy, M., Falco, J. J., and Herring, R. B.: Oxidation of Columbium (Niobium) and Coated Columbium Alloys, J. Less-Common Metals 34, 321-343 (1974). Available as A74-22217.

Lisin, V. N., Kolotov, O. A., Shetulov, D. I., and Sokolov, L. D.: Recording of Metal Hardening During Fatigue Testing at Elevated Temperatures, Ind. Lab. 38, 750-752 (November 1972). Available as A73-13287.

Lowell, C. E.: Cyclic and Isothermal Oxidation Behavior on Some Ni-Cr Alloys, Oxid. Metals 7, No. 2, 95-115 (1973). Available as A74-13833. See also NASA TN-D-7267 (1973).

Lowell, C. E. and Deadmore, D. L., Formation and Breakdown of a Protective Layer of Chromium Sesquioxide on L-605 Alloy at 1100°C; Oxid. Metals 7, No. 1, 55-69 (1973). Available as A74-11327.

*Lowell, C. E., Levine, S. R., and Grisaffe, S. J.: Environmental Effects and Surface Protection of High Temperature Alloys: A Review of NASA-Lewis Programs, MCIC-75-27, 535-554 (1975).

Lowell, C. E., and Sanders, W. A.: Mach 1 Oxidation of Thoriated Nickel Chromium at 1204°C (2200°F) Oxid. Metals 5, No. 3 (1972).

Lowell, C. E., and Santoro, G. J.: The 1200°C Cyclic Oxidation Behavior of Two Nickel and Aluminum Alloys (Ni_3Al and NiAl) with Additions of Chromium, Silicon and Titanium. NASA TN D-6838 (June 1972).

Lyashenko, B. A.: Ostrobrod, N. L., Pozen, N. L., and Shkolyar, V. S., Apparatus for Investigations Into Long-Term Strength and Creep of Coated Materials Above 1400°C in Air, Strength of Mater. 4, No. 2, 246-247 (September 1972). Available as A73-12219.

Machlin, I. and Gilmore, C. M.: Oxidation Resistant Structural Metals for High Temperature Application, Metal Progress 90, No. 3, 101-104 (September 1966).

Marnoch, K.: Research of High Temperature Oxidation Resistant Hafnium-Tantalum Systems, Third Quarterly Report, Contract AF 33(615)-1628 (February 1965).

Maykuth, D. J., Hallowell, J. B., and Ogden, H. R.: Coatings for Tantalum Base Alloys, ASD-TDR-63-232 (April 1963).

McKee, D. W. and Romeo, G.: Effect of Methane on Sulfur Dioxide and Sodium Sulfate-Induced Corrosion of Nickel-Base Alloys, Met. Trans. 5, No. 5, 1127-1139 (May 1974).

Miller, F. M. and Bredzs, N. T.: Protecting Metals in Corrosive High-Temperature Environments, Metal Progress, 80-84 (March 1973).

Monson, L. A. and Pollock, W. I.: Development of Coatings for Protection of Dispersion Strengthened Nickel From Oxidation, Part 1, Oxidation Studies, Coating Development and Coating Analysis, AFML-TR-66-47 (March 1966).

Moore, V. S.: Evaluation of Coatings for Cobalt and Nickel-Base Superalloys, NASA Contract NAS 3-9401, Solar. Task 1 Report (September 1967).

Moore, V. S., Brentnall, W. D., and Stetson, A. R.: Evaluation of Coatings for Cobalt-and Nickel Base Alloys, NASA CR-72359 (January 31, 1969).

*Moore, V. S., Brentnall, W. D., and Stetson, A. R.: Hot Corrosion of Coated Superalloys in a Gas Turbine Environment (Part 3), Solar, San Diego, CA Report RDR-1626-3 (May 1, 1969). Available as AD-853-209.

Moore, V. S. and Stetson, A. R.: Evaluation of Coated Refractory Metal Foils, RTD-TDR-63-4006 Part 1, Solar (September 1963).

Moore, V. S. and Stetson, A. R.: Hot Corrosion of Coated Superalloys in a Gas Turbine Environment, Solar, Final Report (December 15, 1970).

Moore, V. S. and Stetson, A. R.: Hot Corrosion Resistant Aluminide Coatings of Controlled Composition for Nickel-Base Superalloys, Final Report, Naval Air Propulsion Test Center, Contract N00 156-71-C-1020 (July 1973).

Moore, V. S., Wermuth, F. R., and Stetson, A. R.: Hot Corrosion Resistant Aluminide Coatings of Controlled Composition for Nickel-Base Superalloys, Solar Second Semiannual Report (July 21, 1972).

N

Negrin, M.: Protective Coatings for Chromium Alloys, Semiannual Reports 1 and 2, NASA Contract NAS 3-7273, Chromalloy (May and November 1966).

*Nejedlik, J. F.: Development of Improved Coatings for Nickel- and Cobalt-Base Alloys, AFML-TR-70-208, TRW Equipment Group, Cleveland, OH, ER-7305-F (December 1970). Available as AD-883046.

Nejedlik, J. F.: Effect of Aluminide Coatings on the Stress-Rupture Properties of Cast U-700 and TRW-NASA Vl-A, TRW, Inc., TRW-TM-4418 (June 1970).

Nejedlik, J. F.: Superalloy Coating Interactions and Corrosion, TRW, Inc., Cleveland, OH, TRW-TM-4418 (February 1970).

*Newhart, J. E. and Wagner, W. W.: The Development of a Full-Scale Aircraft Turbine Engine Controlled Environment Corrosion Test, Corrosion/72, NACE, St. Louis, MO, Paper No. 76 (20-24 March 1972). Available as A72-24320.

*Newhart, J. E.: Protective Coating Systems for Navy Aircraft Turbine Engines, Paper No. 113, Proc. Interm. Corros. Forum Devoted Exclusively to the Protection and Performance of Materials, Corrosion /73, Anaheim, CA (19-23 March 1973).

Nolting, H. J. and Jefferys, R. A.: Oxidation Resistant High Temperature Protective Coatings for Tungsten, AFML-TDR-641227 (July 1964).

O

Ohnysty, B., Stansfield, O. M., Stetson, A. R., and Metcalfe, A. G.: Task II - Development of Technology Applicable to Coatings Used in the 3000 to 4000 Degree F. Temperature Range, AFML-TDR-69-294 (29 January 1965).

Ortner, M. H. and Klock, S. J.: Development of Protective Coatings for Tantalum T-222 Alloy, Final Summary Report, Contract NAS 3-7613 (December 1966).

P

Perkins, R. A.: Oxidation Protection of Structures for Hypersonic Re-Entry, Summary Refract. Compos. Working Group Meet., 6th, ASD-TDR-63-610 (June 1962).

Perkins, R. A. and Packer, C. M.: Coatings for Refractory Metals in Aerospace Environments, AFML-TR-65-351 (September 1965).

Petrusha, J. A. and Talboom, F. P.: Superalloy Coatings for Components for Gas Turbine Engine Applications, AFML-TR-66-15, Pratt and Whitney Aircraft, PWA-2731 (February 1966).

Pettit, F. S.: Oxidation Mechanisms for Nickel-Aluminum Alloys at Temperatures between 900°C and 1300°C, Trans. AIME 239, 1296-1305 (September 1967). Available as A67-38773.

Pokhmurskii, V. I.: Effect of Some Diffusion Coatings on Structure and Stressed State and Stability of Steels Under Different Conditions, Avtoref. Dokt. Diss., Kiiga (1969).

*Priceman, S. and Kubick, R.: Development of Protective Coatings for Columbium Alloy Gas Turbine Blades, AFML-TR-71-172 (February 1972). Available as AD-748837.

*Priceman, S. and Sama, L.: Development of Fused Slurry Silicide Coatings for the Elevated-Temperature Oxidation Protection of Columbium and Tantalum Alloys, AFML-TR-68-210 (July 1968). Available as AD-850243.

Priceman, S. and Sama, L.: Development of Slurry Coatings for Tantalum, Columbium, and Molybdenum Alloys, AFML-TR-65-204, (September 1965).

Q

Quigg, H. T. and Schirmer, R. M.: Effect of JP-5 Sulfur Content on Hot Corrosion of Superalloys in Marine Environment, Progress Report No. 2, BuWEPS Contract 64-0443-d, Phillips Petroleum (December 1964).

*Quigg, H. T. and Schirmer, R. M.: Effect of Sulfur in JP-5 Fuel on Hot Corrosion of Coated Superalloys in Marine Environment, Phillips Petroleum Co. Bartlesville, OK, Report 4706-67R (April 1967). Available as AD-814757. See also AD-860191L, AD-864270L, and AD-870020L.

*Quigg, H. T., Schirmer, R. M., and Bagnett, L.: Effect of Sulfur in JP-5 Fuel on Hot Corrosion of Coated Superalloys in Marine Environment, Phillips Petroleum Co. Report 5644-70 (March 1970). Available as AD-870020L. See also AD-814757, AD-860191L, and AD-864270.

Quigg, H. T., Schirmer, R. M., and Bagnett, L.: Effect of Sulphur in JP-5 Fuel on Hot Corrosion of Turbine Blade Materials in Marine Environments, Phillips Petroleum Co. Final Report (January 1971).

R

Rausch, J. J.: Protective Coatings for Tantalum Base Alloys, AFML-TR-64-354 (November 1964).

Redden, T. K.: Ni-Al Coating-Base Metal Interactions in Several Nickel-Base Alloys, Trans. AIME 242, 1695-1702 (August 1968).

Rhee, S. K. and Spencer, A. R.: Oxidation of Udimet 500, Oxid. Metals 8, No. 1, 11-18 (1974). Available as A74-25049.

Rishin, V. V., Lyashenko, B. A., Akinin, K. G., and Nadezhdin, G. N.: Temperature Dependence of Adhesion Strength and Elasticity of Some Heat-Resistant Coatings, Problemy Prochnosti, No. 1, 115-118 (January 1973). Available as A74-20896.

Ryan, K. H.: Comparative Evaluation of Coated Alloys for Turbine Components of Advanced Aircraft Gas Turbine Engines, AFML-TR-71-173 (January 1972).

Ryan, K. H.: Investigation of Hot Corrosion of Nickel Base Superalloys Used in Gas Turbine Engines, Air Force Contract AF-33(615)-5211, Allison Quarterly Progress Reports 2 and 3 (October 1966 and April 1967).

*Ryan, K. H., Hodshire, J. O., and Shockely, Q. O.: Development of Ductile Corrosion Resistant Coatings for Turbine Components, MCIC-75-27, 237-258 (1975).

S

Sakae, Y. and Harada, Y.: Protection of Sulfidation Attack on Gas Turbine Blade Alloys Treated by Chromium Diffusion Coating. Preprint of 1971 Gas Turbine Conf. Prod. Show, Tokyo, Japan (4-7 October 1971).

Sama, L.: High Temperature Oxidation Resistant Coatings for Tantalum Base Alloys, ASD-TDR-63-160 (February 1963).

Sanders, W. A., Barrett, C. A., and Probst, H. B.: Evaluation of High-Gas-Velocity and Static Oxidation Behavior of Fused-Salt-Aluminided IN 100 Between 1038°C and 1149°C, NASA TN-D-6400 (1971). Available as N71-29713.

Santoro, G. J., Deadmore, D. L., and Lowell, C. E.: Oxidation of Alloys in Nickel-Aluminum System with Third Element Additions of Chromium, Silicon, and Titanium at 1100°C, NASA TN-D-6414 (1971). Available N71-30521.

Schirmer, R. M. and Quigg, H. T.: Effect of JP-5 Sulfur Content on Corrosion of Superalloys in Marine Environments, Phillips Petroleum Co. Research Division Report 4370-66R (July 1966).

Schmidt, F. F. and Ogden, H. R.: The Engineering Properties of Tantalum and Tantalum Alloys, DMIC Report 189, Battelle Memorial Institute Columbus, OH (13 September 1963).

*Schultz, J. W. and Hulsizer, W. R.: Laboratory Development of Corrosion Resistant Nickel-Base Superalloys for Gas Turbines, MCI-75-27, 335-356 (1975).

Shoemaker, H. E. and Stetson, A. R.: Silicide Coatings for Tantalum and Columbium Alloys, Final Report, NASA Contract NAS 3-9412 (August 1969).

Simonetti, G.: Laboratory Research on Turbine Blade Materials-Corrosion, CIMAC Permanent Committee (1965).

Smialek, J. L.: Fused Silicon-Rich Coatings for Superalloys, NASA TM X-3001 (March 1974).

Smialek, J. L., and Lowell, C. E.: Effects of Diffusion on Aluminum Depletion and Degradation of NiAl Coatings, J. Electrochem. Soc. 121, No. 6, 800-805, (June 1974).

Smialek, J. L. and Lowell, C. E.: Effects of Diffusion on Aluminum Depletion and Degradation of NiAl Coatings, NASA TM-X-68274 (September 1973). Also available as N73-29555.

Srp, O. O. and Geyer, N. M.: Proc. Int. Symp. High Temp. Technol. 421-445, Butterworth and Co., London, England (1964).

Stetson, A. R.: Development of Coatings for Columbium-Base Alloys - Basic Property Measurements and Coating System Development, AFML-TR-67-139-PT 1 (1967).

*Stetson, A. R., Cook, H. A., and Moore, V. S.: Development of Protective Coatings for Tantalum Base Alloys, AFML-TR-65-205PT 1. (June 1965). Available as AD-469639.

Stetson, A. R. and Metcalfe, A. G.: Development of Coatings for Columbium-Base Alloys, AFML-TR-67-139-PT 1 (September 1967).

*Stetson, A. R. and Moore, V. S.: Development of Coatings for Columbium Base Alloys, Part III - Evaluation of the V-(Cr-Ti)-Si Coating for Gas Turbines, RDR 1380-6-PT 3 (August 1967). See also AFML-TR-67-139 PT 3 available as AD-825774.

*Stetson, A. R. and Moore, V. S.: A New Development-Controlled Composition Reaction Sintered Coatings for Superalloys, MCIC-75-27, 457-480 (1975).

Stickley, G. W.: Effect of Several Coatings on Fatigue Strengths of Some Wrought Aluminum Alloys, J. Mater. 1, 19-33, May 1966. Available as A66-29071.

*Stinebring, R. C.: Nondestructive Testing of High Temperature Coatings, Mater. Res. Stand. 12, 18-19 and 53 (April 1972). Available as A72-26287.

Stinebring, R. C.: The Development and Application of Nondestructive Testing Techniques for Evaluating High Temperature Protective Coatings, AFML-TR-69-218 (August 1969).

Stinebring, R. C. and Cannon, R.: Development of Nondestructive Methods for Evaluating Diffusion-Formed Coatings on Metallic Substrates, AFML-TR-67-178 (1967). Available as AD-823889.

Stringer, J.: Hot Corrosion in Gas Turbines, MCIC-72-08 (1972).

*Talboom, F. P.: Elam, R. C, and Wilson, L. W.: Evaluation of Advanced Superalloy Protection Systems, NASA CR-72813, Pratt and Whitney, PWA-4055 (December 1970). Available as N71-17669.

Talboom, F. P. and Petrusha, J. A.: Superalloy Coatings for Coatings for Components for Gas Turbine Engine Applications, AFML-TR-66-15 (February 1966).

Tenney, D. R., Young, C. T., and Herring, H. W.: Oxidation Behavior of TD-NiCr in a Dynamic High Temperature Environment, Met. Trans. 5, No. 5, 1001-1012 (May 1974).

Terekhova, V. A.: Aluminizing Nickel Base Alloys, Metallov. Term. Obrab. Metallov. No. 10 (1965).

Tingley, G. L.: Mechanical Properties of Titanium Coatings, Paper Presented at the New York Univ. Titanium Metallurgy Course (8-11 September 1969).

W

Wachtell, R. L.: Coating Systems Based on Diffusion Concepts, Chromalloy American Corp., ASTM Annu. Meet., 69th., Atlantic City, NJ (27 June - 1 July 1966).

Wallwork, G. R. and Hed, A. Z.: Mapping of the Oxidation Products in the Ternary Co-Cr-Cl System, Oxid. Metals 3, No. 3, 213-227 (May 1971). Available as A71-32870.

Wallwork, G. R. and Hed, A. Z.: Selection of an Alloy Composition in the Ternary Co-Cr-Al Systems for Oxidation Resistance, Oxid, Metals 3, No. 3, 243-250 (May 1971). Available as A71-32872.

Wallwork, G. R. and Hed, A. Z.: Some Limiting Factors in the Use of Alloys at High Temperatures, Oxid. Metals 3, No. 2, 171-184 (March 1971). Available as A71-23972.

Wallwork, G. R. and Hed, A. Z.: The Oxygen of Ni-20 wt. % Cr^{-2} Th O_2, Oxid. Metals 3, No. 3, 229-241 (May 1971). Available as A71-32871.

Warmuth, D. B., Gadd, J. D., and Jefferys, R. A.: Advancement of High Temperature Protective Coatings for Columbium Alloys, Part 2, ASD-TDR-934 PT-2 (April 1964).

Weatherford, W. D., Valtierra, M. L., and Ku, P. M.: Experimental Study of Spline Wear and Lubrication Effects, ASLE Trans. 9 (1966).

Weiss, R. O., Hill, M. L., and Keller, C. A.: An Evaluation of Coated B66 Columbium Alloy at Elevated Temperatures, J. Spacecr. Rockets 5, No. 2 (February 1968).

Wheaton, H. L.: Study of the Hot Corrosion of Superalloys, Contract AF-33 (615)-5212, Lycoming Quarterly Progress Reports 1, 2, and 3 (July 1966 - April 1967).

*Whelan, E. P. and Trenouth, J. M.: Sodium Sulphate Induced Rapid Oxidation of a Chromium-Titanium-Silicon Coating on Niobium Alloy B-66, J. Less-Common Metals 33, 153-170 (1973). Available as A74-11459.

White, J. E.: Development of Oxidation Resistant Tungsten-Base Alloys. AIAA Struct. Mater. Conf., 6th, Palm Springs, CA (5-7 April 1965).

Whitfield, M. G. and Paryuchowski, R. S.: Sulfidation Resistant Coatings, Reprint No. 115, ASTM Annu. Meet., 69th, Atlantic City, NJ (27 June - 1 July 1966).

Wimber, R. T.: Development of Protective Coatings for Tantalum Base Alloys, Summary Report, AFML TDR-294-PT II (July 1965).

Wimber, R. T. and Stetson, A. R.: Development of Coatings for Tantalum Alloy Nozzle Vanes, Final Report, NASA Contract NAS 3-7276 (July 1967).

Wolf, J. S. and Sandrock, G. D.: Some Observations Concerning the Oxidation of the Cobalt-base Superalloy L-605/HS-25, NASA TN-D-4715 (1968). Available as N68-29954.

*Wright, I. G.: Oxidation of Iron-, Nickel-, and Cobalt-Base Alloys, MCIC-72-07 (June 1972). Available as AD-745473.

Wurst, J. C.: The Evaluation of High Temperature Materials, AFML-ML-TDR-64-62, Univ. of Dayton Research Institute (March 1964). Available as AD-601638.

Wurst, J. C., Berner, W. E., Cherry, J. A., and Gerdman, D. A.: The Evaluation of Materials for Aerospace Applications, AFML-TR-67-165 (June 1967).

Wurst, J. C., Cherry, J. A., Gerdman, D. A., and Hecht, N. L.: The Evaluation of Materials Systems for High Temperature Aerospace Applications, AFML-TR-65-339-PT 1, Univ. of Dayton Research Institute (July 1966).

*Wurst, J. C. and Geyer, N. M.: The Evaluation of High Temperature Protective Coatings, Mater. Res. Stand. 12, 8-17 (April 1972). Available as A72-26286.

Z

Zelenyuk, E. E., Krivenyuk, V. V. and Sosnovskii, L. A.: Creep and Long-Term Strength of Molydenum with Boron Silicide Coating in a Vacuum at 1000-1400°C, Problemy Prochnosti, No. 2, 53-56 (February 1973). Available as A74-21882.

Zerlaut, G. A.: Development of Space Stable Thermal Control/Coatings, IITRI-U6002-94, IIT Research Institute (November 1970). Available as NASA CR-103039.

PROBLEM AREA 6

Composite materials data on low cycle and thermal fatigue - The aim is to search for data related to composite structural materials used for aerospace applications.

COMPOSITE MATERIALS

A

Adams, D. F.: Elastoplastic Crack Propagation in a Transversely Loaded Unidirectional Composite, J. Compos. Mater. 8, No. 1, 38-54 (January 1974).

Adams, D. F., Doner, D. R. and Thomas, R. L.: Mechanical Behavior of Fiber-Reinforced Composite Materials, AFML-TR-67-96 (May 1967).

Adsit, N. R. and Witzell, W. E.: Fracture Toughness of Aluminum-Boron Composites, Proc. SAMPE, 1, 391-398 (1969).

Ahmad, I. and Barranco, J. M.: Reinforcement of Magnesium With Brittle and Ductile Filaments, St. Louis Symp. Advan. Compos., 5th Washington Univ., St. Louis, MO (April 1971).

*Ahmad, I., Barranco, J. M., Hefferman, K. J., and Loomis, K. E.: Metal Matrix Composites for High Temperature Application, Watervliet Arsenal Report WVT-7266 (December 1972). Available as AD-756867.

Ahmad, I., Greco, V. P., and Barranco, J. M.: Reinforcement of Nickel With Some High Strength Filaments. J. Compos. Mater. 1, No. 1 (January 1967).

Alexander, J. A.: Engineering Uses of Filament Reinforced Metal Matrix Composites, Metals Eng. Quart. 10, No. 2, (1970).

*Alexander, J. A.: Research on Boron Reinforced Metal Matrix Composites, AFML-TR-67-101 (June 1967).

Alexander, J. A. and Carlson, R. G.: Failure Processes in Metal Matrix Composites, AFML-TR-73-290 (1973).

Alexander, J. A., Cunningham, A. L., and Chuang, K. C.: Investigation To Produce Metal Matrix Composites With High Modulus Low Density Continuous Filament Reinforcements, AFML-TR-67-391 (February 1968).

Allison Division, General Motors, Beryllium Wire Metal Matrix Composites Program, Contract No. N00019-69-C-0532 and N00019-69-C-9234, Progress Reports (July 1967 - April 1969).

Allred, R. E. and Hoover, W. R.: Elastic-Plastic Poisson's Ratio of Borsic-Aluminum, J. Compos. Mater. 8, No. 1, 15-28 (January 1974).

Altman, J. M.: Composite, Low-Cost Secondary Airframe Structures, Rockwell International Report NA-74-571-5 (November 15, 1975).

Antony, K. C. and Chang, W. H.: Mechanical Properties of Al-B Composites. Trans. ASM. 61, No. 3, (September 1968).

Ashton, J. E., Halpin, J. C., and Petit, P.H.: Primer on Composite Materials: Analysis, Technomic Publishing Co. (1969).

Ashton, J. E. and Waddoups, M. E.: Analysis of Anistropic Plates. J. Compos. Mater. 3 (1969).

Ashton, J. E. and Whitney, J. M.: Theory of Laminated Plates, Technomic Publishing Co. (1971).

Assi, V. D. and Tsai, S. W.: Anistropic Strength of Composites, Exp. Mech., 283-288 (September 1965)

Aulenbach, T. H., Schulz, W. J., and McGarry, F. J: Fracture Toughness Testing of Fibrous Glass Resin Composites. SPI Annu. Conf., 25th., Washington, DC (6-9 February 1970).

B

Bacon, J. F.: Investigation of the Kinetics of Crystallization of Several High Temperature Glass Systems, Report J910939-3 United Aircraft Research Lab. (September 1970).

*Bailey, J. E. and Barker, H. A.: Ceramic Fibres for the Reinforcement of Gas Turbine Blades, Proc. Universal Conf. Ceram. Sci., 6th., North Carolina State Univ., Raleigh, NC, December 1970, Plenum Press, 341-360 (1971).

Baker, A. A.: The Effect of Fibre Diameter and Discontinuous Fibers on the Fatigue of a Fibre-Reinforced Metal. Appl. Mater. Res. 5, No. 4, 210-217 (October 1966). Available as A67-17712.

Baker, A. A.: The Effect of Fibre Volume Fraction and Interfacial Bond on the Fatigue of Alumium Reinforced With Stainless Steel Wires. Appl. Mater. Res. 5, No. 3, 143-153 (July 1966).

Baker, A. A.: The Fatigue of Fibre-Reinforced Alumium. J. Mater. Sci. 3, No. 4, 412-423 (July 1968).

Baker, A. A. and Cratchley, D.: Metallographic Observations on the Behavior of Silica Reinforced Aluminum Under Fatigue Loading. Appl. Mater. Res. 3, No. 4, 215-222 (October 1964).

Baker, A. A. and Cratchley, D.: Stress-Strain Behavior and Toughness of a Fibre Reinforced Metal. Appl. Mater. Res. 5, No. 2, 92-103 (April 1966).

Baker, A. A. and Jackson, P. W.: Silica Fibre Reinforcement of Aluminum. Glass Technology, 9, No.2, 36-41 (April 1968).

Baker, A. A., Mason, J. E., and Cratchley, D.: High-Strain Fatigue Studies of Composite Material. J. Mater. Sci. 2, No. 3, 229, (August 1966).

Barker, A. J.: Charpy Notched Impact Strength of Carlon-Fiber Epoxy Resin Composites, Int. Carbon Fibers Conf. Exhib., Plastics Institute, England (1971).

*Barker, R. M., Lin, F., and Dana, J. R.: Three-Dimensional Finite Element Analysis of Laminated Composites. Computers and Structures, 2, 1013-1029 (1972). Available as A73-13687.

*Baromeo, C. and Courtney, T. H.: Partitioning of Stress Between Fiber and Matrix During Tensile Deformation of the Al-Al3Ni Eutecic Composite. Met. Trans. 4, 1821-1828 (August 1973).

Bartlett, R. W. and Jorgensen, P. J.: Microstructure and Growth Kinetics of the Fibrous Composite Subscale Formed by Internal Oxidation of $SmCo_5$, Met. Trans. 5, 355-361 (February 1974).

Baskey, R. H.: Fiber-Reinforced Metallic Composite Materials, AFML-TR-67-196 (September 1967). Available as AD-825364.

Bayles, B. J., Ford, J. A. and Salkind, M. J.: The Effect of Elevated-Temperature Exposure on the Microstructure and Tensile Strength of Al_3Ni Whisker-Reinforced Aluminum, Trans. Met. Soc. AIME 239, 844-849 (June 1967). Available as A67-31372.

*Beasley, R. M. and Clapper, R. B.: Thermal-Structural Composites for Aerospace Applications. ASTM STP-379, 91-105 (February 1965).

Beaumont, P. W. R.: The Effect of Environment on Fatigue and Crack Propagation in Carbon-Fibre-Reinforced Epoxy Resin, Paper No. 49, Plastics Institute Int. Conf. Carbon Fibres, Their Composites and Applications, London, England (2-4 February 1971). Available as A71-20892.

*Beckwith, S. W., Schapery, R. A., and Webb, L. D.: Literature Survey of the Field of Fiber-Reinforced Plastic Composites: Part II (August 1970 - July 1971), Texas A&M Univ. CMR-1 (August 1971). Available as PB-210305.

Bell, J. E. and Hoggatt, J. T.: Development of Processing Techniques for Carbon Composites in Missile Interstage Applications, AFML-TR-69-98. (May 1969).

Berg, C. A. and Rinsky, A.: Fiber Science and Technology 3, 294 (1971).

*Berg, C. A. and Salama, M.: Compressive Fatigue in Fiber Reinforced Materials. J. Mater. 7, 216-230 (June 1972). Available as A72-33319.

Bieniek, M. P. and Freudenthal, A. M.: Forced Vibrations of Cylindrical Sandwich Shells. J. Aerosp. Sci. 29, 180-184 (February 1962).

*Birchfield, E. B., Cole, T. T., and Impellizzeri, L. F.: Reliability of Step-Lap Bonded Joints, AFFDL-TR-75-26 (April 1975).

*Boller, K. H..: Effect of Notches on Fatigue Strength of Composite Materials, AFML-TR-69-6 (July 1969). See also AD-853045.

Boller, K. H.: Effect of Pre-Cyclic Stresses on Fatigue Life of Plastic Laminates with Unwaven Fibers, AFML- TR-64-168 (September 1964). Available as AD-606769.

Boller, K. H.: Effect of Tensile Mean Stresses on Fatigue Properties of Plastic Laminates Reinforced with Unwoven Glass Fibers, AFML-TDR-69-86 (March 1964). Available as AD-605412.

Boller, K. H.: Fatigue Characteristics of RP Laminates Subjected to Axial Loading, Modern Plastics 41, No. 10, 145-150, and 188 (June 1964).

Boller, K. H.: Fatigue Characteristics of Two New Plastic Laminates Reinforced With "S" Glass Fibers Under Cyclic Axial or Shear Loading, AFML-TR-66-54 (March 1966).

Boller, K. H.: Fatigue Fundamentals for Composite Materials, ASTM STP-460, 217-235 (1969).

Boller, K. H.: Fatigue Strength of Plastic Laminates Reinforced With Unwoven 'S' Glass Fibers, AFML-TR-64-403 (December 1964).

Boller, K. H.: Resume of Fatigue Characteristics of Reinforced Plastic Laminates Subjected to Axial Loading, ASD TDR-63-768 (July 1963).

*Bonfield, W. and Markham, A. J.: Compatibility Limits in Sapphire Whiskers-Nickel Composite. J. Mater. Sci. 8, 1431-1438 (1973).

*Bortz, S. A.: Metal-Reinforced Ceramic Composites for Turbine Vanes (March 1972). Available as A72-25643.

Botsco, R.: A Sonic Test System for Nondestructively Evaluating Composite Structures, J. Acoustical Soc. Amer. 24, No. 6, 1348-1349 (December 1967).

Bower, C. M. and Siegmund, D. F.: Crack Theory and Stress Analysis of Composite Materials, Monsanto Research Corp. HPC-65-2 (September 1965). Available as AD-488381L.

Breinan, E. M. and Kreider, K. G.: Met. Trans. 1, 93 (1970).

*Breinan, E. M. and Kreider, K. G.: Transverse Creep and Stress-Rupture of Borsic-Aluminum Composites and Borsic-Aluminum Composites Containing Stainless Steel and Titanium, Met. Trans. 4, 1155-1165 (April 1973).

Brentnall, W. D. and Toth, I. J.: Advanced Aluminum Matrix Composites, TRW International Report. TM-4588 (February 1971).

*Brentnall, W. D. and Toth, I. J.: High Temperature Titanium Composites. TRW Equipment Labs., Cleveland, OH. TRW ER 7568 (August 1973). Available as AFML-TR-73-322.

Broutman, L. J. and Krock, R. H.: Modern Composite Materials, Addison-Wesley (1967).

*Broutman, L. J. and Rotem, A.: Impact Strength and Toughness of Fiber Composite Materials, Illinois Institute of Technology, Chicago, IL (November 1972). Available as AD-753101 and AFOSR-TR-72-2289.

Broutman, L. J. and Sahu, S.: Progressive Damage of a Glass Reinforced Plastic During Fatigue, Proc. Annu. SPI Tech. Manage. Conf., 24th (February 1969).

Broutman, L. J. and Sahu, S.: The Effect of Interfacial Bonding on the Toughness of Glass Filled Polymers, Proc. Annu. SPI Conf., 26th (1971).

*Buchanan, E. R. and Tarshis, L. A.: Carbide Reinforcement in Two Directionally Solidified Alloyed Nickel Eutectic Alloys. Met. Trans. 4, No. 8, 1895-1904 (August 1973).

Buchanan, E. R. and Tarshis, L. A.: Strengths and Failure Mechanisms of a Co-15Cr-13TaC Directionally Solidified Eutectic Alloy, Met. Trans. 5, No. 6, 14-13-1422 (June 1974).

*Buntin, W. D. and Love, T. S.: An Aluminum Sandwich Panel Fatigue Test Under Mach 2.4 Cruising Conditions. ASTM STP-338, 179-192 (1963).

Burningham, N. W. and Rumpel, W. F.: Properties of Boron Fibers and Composites. Polymer Eng. Sci. 7, No. 2, 124-127 (April 1967).

C

Calcote, L. R. and Grimes, G. C.: Investigation of Structural Design Concepts for Fibrous Aircraft Structures. Vol. II. Technology Appraisal, Empirical/Theoretical Methodology, AFFDL-TR-67-29 (January 1967).

Calow, C. A. and Moore, A.: No Hope for Ceramic Whiskers or Fibers as Reinforcement of Metal Matrices at High Temperature, J. Mater. Sci. 7, 543-548 (May 1972). Available as A72-33206.

*Cannell, J. C.: The Compatibility of Whiskers of Silicon Nitride, Silicon Carbide and Alumina With Metallic Matrices at High Temperatures, Explosives Research and Development Establishment, England (August 1968). Available as AD-741573.

Carlson, C. E., DelGrosso, E. J., and Varholak, E. M.: Mechanical Properties of Braze-Bonded Borsic-Al Composites, SAMPE Symp. Vol. 15, 101-115 (1970).

Chamis, C. C.: Computer Code for the Analysis of Multilayered Fiber Composites - Users Manual, NASA TN-D-7013 (1971).

Chamis, C. C.: Failure Criteria for Filamentary Composites, NASA TN-D-5367 (1969). See also A69-21479 and ASTM STP-460.

Chamis, C. C.: Important Factors in Fiber Composite Design. Proc. Annu. SPI Tech. Conf., 24th, Washington, DC (February 1969).

Chamis, C. C.: Science of Advanced Materials and Process Engineering, Paper 1-4-5, Vol. 14, Western Periodicals Co. (1968).

Chamis, C. C., Hanson, M. P., and Serafini, T. T.: Designing for Impact Resistance With Unidirectional Fiber Composites, NASA TN-D-6463 (1971).

*Chamis, C. C., Hanson, M. P., and Serafini, T. T.: Impact Resistance of Unidirectional Fiber Composites. Composite Materials: Testing and Design, Proc. ASTM Conf., 2nd, Anaheim, CA (20-22 April 1971). PP. 324-349. 1972. Available as A72-25472 and ASTM STP-497.

Chang, C. I.: Brittle Fracture and Failure Criteria of Particulate Composites, AIAA/ASME/SAE Struct., Struct. Dyn. Mater. Conf., 15th, Las Vegas, NV (17-19 April 1974).

*Chang, G. C.: A Study on Fracture Toughness of Advance Structural Composites, AD-764070 (July 1973).

Chen, E. P. and Sih, G. C.: Interfacial Delamination of a Layered Composite Under Anti-Plane Strain, J. Compos. Mater. 5, 12-23 (1971).

Chen, P. E. and Lin, J. M.: Transverse Properties of Fibrous Composites. Mater. Res. Stds. 9, No. 8, 29-33 (August 1969). Available as A69-37354.

Cheng, S.: On the Theory of Bending of Sandwich Plates, Proc. U. S. Nat. Cong. Appl. Mechanics, 4th. 511-518 (1962).

Cheng, Y. F.: Failure Phenomena of Some Fiber-Reinforced Composite Strips With a Hole, R-WV-T-6-40-73, Watervilet Arsenal, NY (October 1973). Available as AD-771060 and N74-18216.

Chiao, T. T. and Moore, R. L: A Tensile Test Method for Fibers, J. Compos. Mater. 4, 118 (1970).

*Chiao, T. T. and Moore, R. L.: Strength Retention of S-Glass Epoxy Composites, J. Compos. Mater. 6, 156-159 (January 1972).

*Chiao, T. T. and Moore, R. L.: Stress-Rupture of S-Glass/Epoxy Multifilament Strands, J. Compos. Mater. 5, 2-11 (1971).

Chorne, J., Bruch, C. A., and Sutton, W. H.: Development of Composite Structural Materials for High Temperature Applications, NASC Contract NOw-66-0443-d (January 1967).

Clary, R. R. and Cooper, P. A.: Vibration Characteristics of Aluminum Plates Reinforced With Boron-Epoxy Composite Material, J. Compos. Mater. 7, 348-365 (July 1973).

Cline, H. E. and Walter, J. L.: The Effect of Alloy Additions on the Rod-Plate Transition in the Eutectic NiAl-Cr, Met. Trans. 1, 2907-2917 (October 1970). Available as A70-45244.

Cline, H. E., Walter, J. L., Lifshin, E., and Russell, R. R.: Structures, Faults, and the Rod-Plate Transition in Eutectics, Met. Trans. 2, 189-194 (January 1971). Available as A71-18681.

Clougherty, E. V.: Research and Development of Refractory Oxidation Resistant Diborides, AFML-TR-68-190 (July 1970).

Compton, W. A. and Steward, K. P.: Test Specifications Manual - Composite Materials for Turbine Compressors, AFML-TR-68-31 (April 1968).

Conliffe, C. H.: Advance Composite Material in Turbo Machinery Components, AFML-TR-68-366 (February 1969).

Cooper, G. A.: Micromechanics of Fracture and Fracture Toughness of a Composite Material, Inter-Service Met. Res. Council Paper No. ISMET 4108/JCM (1969).

Cooper, G. A. and Kelly, A.: Tensile Properties of Fibre-Reinforced Metals: Fracture Mechanics, J. Mech. Phys. Solids 15, No. 4, 279-297 (July 1967).

Cordier, K. L. and Cross, W. B.: Materials Technology Advancement Program for Expandable Manned Space Structures, NASA CR-66949 (August 1970).

Cornish, R. H., Nelson, H. R., and Dally, J. W.: Compressive Fatigue and Stress Rupture Performance of Fiber Reinforced Plastics, Proc. Annu. SPI Tech. Manage. Conf., 19th, Section 9-E (February 1964).

Courtney, T. H. and Wulff, J.: Matrix-Limited Fatigue Properties in Fibre Composite Materials, AFOSR67-0650 (July 1966). Available as AD-648544.

Courtney, T. H. and Wulff, J.: Matrix-Limited Fatigue Properties in Fibre Composite Materials, J. Mater. Sci. 1, 383-388 (November 1966). Available as A67-13529.

Crane, R. L.: An Investigation of the Mechanical Properties of Silicon Carbide and Sapphire Filaments, AFML-TR-72-180 (September 1972).

Crane, R. L. and Tressler, R. E.: Effect of Surface Damage on the Strength of C-Axis Sapphire Filaments. J. Compos. Mater. 5, 537 (October 1971).

*Cremens, W. S.: Manufacturing Methods for Thermal Expansion Molding of Advanced Composite Aircraft Structures, AFML-TR-75-110 (August 1975).

Cunningham, A. L. and Alexander, J. A.: The Fabrication Evaluation and Mechanical Properties of Aluminum Matrix Composites, in Advances in Structural Composites, SAMPE. Western Periodicals Co. Vol. 12, Paper AC-15 (October 1967).

D

Dally, J. W. and Alfirevich, I.: Application of Birefringent Coatings to Glass-Fiber-Reinforced Plastics, Exp. Mech. 9, 97-102 (1969).

Daniel, I. M. and Rowlands, R. E.: Determination of Strain Concentration in Composites by Moire Techniques. J. Compos. Mater. 5, 250-254 (April 1971).

*Daniel, I. M. and Rowlands, R. E.: Experimental Stress Analysis of Composite Materials. ASME Paper No. 72-DE-6 (1972).

Dastin, S.: Advanced Filamentary Composites for Primary Aircraft Structures, in Polyblends and Composites, Proc. Appl. Polymer Symp. 6-7 June 1969, Interscience Publishers, New York, NY (1970).

Davidge, R. W. and Tappin, G.: The Effective Surface Energy of Brittle Materials. J. Mater. Sci. 3, 165-173 (1968).

Davies, L. G., Powers, W. M., and Shaver, R. G.: Low Cost Metal Matrix Composite Fabrication, SAMPE Nat. Symp. Exhibit (21-23 April 1971).

Davis, J. W., McCarthy, J. A., and Schurb, J. N.: The Fatigue Resistance of Reinforced Plastics, Mater. Des. Eng. 60, No. 7, 87-91 (December 1964).

Davis, L. W.: Aluminum-Boron Composites. Refractory Compos. Meet., 14th, AFML-TR-62-129 (August 1968).

Davis, L. W.: Methods of Making Metal Matrix Composites, SME Paper EM 70-124 (1970).

Dean, A. V.: Reinforcement of Ni Base Alloys With High Strength Tungsten Wire, J. Inst. Metals 95, 79-86 (1967).

Dean, A. V.: The Reinforcement of Nickel-Base Alloys With High Strength Tungsten Wires, NGTE-R-266, Nat. Gas Turbine Establishment, England (April 1965).

Decker, R. F. and Dewitt, R. R.: Trends in High Temperature Superalloys, J. Metals 139-145 (February 1965).

*Devine, T. M., Floreen, S., and Hayden, H. W.: Fracture Mechanisms in Maraging Steel-Iron Laminates, Eng. Fract. Mech. 6, 315-323 (1974).

Dobyns, A., Avery, J., Blaisdell, R. and Figge, I. E.: Advanced Composite Lattice Structure for Improved Structural Integrity, AIAA/ASME/SAE Struct., Struct. Dyn. Mater. Conf., 15th, Las Vegas, NV (17-19 April 1974).

Dokmeci, M. C.: Stress and Strain Analysis in Elastic Laminated Composite Beams, J. Elasticity 3, No. 1, 27-43 (March 1973). Available as A74-21179.

Dolowy, Jr., J. F. and Webb, B. A.: Fabrication and Heat Treatment Effects on Aluminum-Boro Composites, Washington Univ., St. Louis, MO (March 1969).

Donat, R. C.: Fatigue Tests on a Boron-Epoxy Laminate, J. Compos. Mater. 4, 124-128 (January 1970).

Doner, M., DiPrinio, J. C., and Salkovitz, E. I.: Low Cycle Fatigue Behavior of Ni-Cr Lamallar Eutectic Composites at Elevated Temperatures, Met. Trans. 5, 433-439 (February 1974).

Dudnik, G. I., Banas, F. P., and Aleksandrov, B. V.: Nature of Failure of Reinforced Sheets Subjected to Thermal Cycling, Problemy Prochnosti, No. 1, 99-100 (January 1973). Available as A74-20892.

Duhl, D. N. and Sullivan, C. P.: Some Effects of Hafnium Additions on the Mechanical Properties of a Columnar Grained Nickel-Base Superalloy, J. Metals 23, 38-40 (1971).

Dunlevey, F. M. and Wallace, J. F.: The Effect of Thermal Cycling on the Structure and Properties of a Co, Cr, Ni-TaC Directionally Solidified Eutectic Alloy, Met Trans. 5, No. 6, 1351-1356 (June 1974).

E

Eisenmann, J. R. and Kaminski, B. E.: Fracture Control for Composite Structures, J. Eng. Fract. Mech. 4, No. 4, 907-913 (December 1972).

*Eisnmann, J. R., Kaminski, B. E., Reed, D. L., and Wilkins, D. J.: Toward Reliable Composites: An Examination of Design Methodology, J. Compos. Mater. 7, 298=308 (July 1973).

*Elliott, S. Y.: Fabrication Processing, in Applications of Composite Materials, ASTM STP-524, 163-185 (February 1973).

Ellison, E. G. and Boone, D. H.: Some Mechanical Properties of Boron-Tungsten Boride Filament, J. Less-Common Metals 13, 103-111 (July 1967). Available as A67-35728.

England, A. H.: The Stress Boundary Value Problem for Plane Strain Deformations of an Ideal Fiber-Reinforced Material, J. Inst. Math. Its Appl. 9, 310-322 (1972). Available as A72-37371.

* England, A. H., Ferrier, J. E., and Thomas, J. N.: Plane Strain and Generalized Plane Stress Problems for Fibre-Reinforced Materials, J. Mech. Phys. Solids 21, 279-301 (1973). Available as A73-41546.

*England, A. H. and Rogers, T. G.: Plane Crack Problems for Ideal Fiber-Reinforced Materials, Quart. J. Mech. Appl. Math. 26, Part 3, 303-320 (1973). Available as A73-41014.

Endogan, F.: Fracture Problems in Composite Materials, Eng. Fract. Mech. 4, No. 4, 811-840 (December 1972).

*Ericksen, R. H.: Room Temperature Creep of Borsic-Aluminum Composites. Met. Trans 4, 1687-1693 (July 1973).

Ewins, P. D. and Ham, A. C.: The Nature of Compressive Failure in Unidirectional Carbon Fiber Reinforced Plastics. AIAA/ASME/SAE Struct., Struct. Dyn. Mater. Conf., 15th, Las Vagas, NV (17-19 April 1974).

F

Fahmy, A. and Ragi, A. N.: Thermal Expansion of Graphite-Epoxy Composites. J. Appl. Phys. 41, 5112 (1970).

*Farag, M. M. and Flemings, M. C.: Structure and Strength of Al, Cu-Al_3Ni Directionally Solidified Composites, Met. Trans. 6A, 1009-1015 (May 1975).

Fechek, F. J.: Advanced Composites Efforts - A Status Report of Air Force Programs With Graphite-Reinforced Composites, ASME Des. Eng. Conf. Show. Paper 71-DE-13 (14-22 April 1971). Available as A71-27323.

Felde, A.: The Notching Effect With Glass Fiber Reinforced Plastics. WPAFB, OH (1966). Available as AD-636651.

Feltner, C. E. and Laird, C.: Cyclic Stress Strain Response of FCC Metals and Alloys, Acta Met. 15, 1621 (1967).

Fitzrandolph, J., Phillips, D. C., Beaumont, P., and Tetelman, A. S.: Fracture Energy and Acoustic Emission of a Boron-Epoxy Composite, J. Mater. Sci. 7, 289 (1972).

Fleck, J. N. and Goldstein, M.: Beryllium Reinforced Aluminum, Nat. SAMPE Symp., 15th, Los Angeles, CA (April 1969).

Fleck, J. N., Smith, E. G., and Laber, D.: Explosive Welding of Metal Matrix Composites, J. Compos. Mater. 3, 699 (October 1969).

Floreen, S., Hayden, H. W., and Kenyon, N.: Stress Corrosion Cracking Behavior of Maraging Steel Composites, Corrosion 27, 519-524 (1971).

Floreen, S., Hayden, H. W., and Pilliar, R. M.: Fracture Behavior of an Fe-Cu Microduplex Alloy and Fe-Cu Composites, Trans. Met. Soc. AIME 245, 2529-2536 (1969).

Floreen, S., Hayden, H. W., and Steigelman, J. Q.: Fracture Modes in Laminated Steel-Nickel Composites, Trans. Quart. ASM 62, 812-815 (1969).

Forest, J. D.: Design and Application of Boron/Aluminum to Flight Structures, Proc. Des. With Compos. Mater., Inst. Mech. Eng., London, England 28 October 1971). Available as A72-14745.

Forest, J. D. and Christian, J. L.: Development and Application of Aluminum-Boron Composite Material, AIAA Paper 68-975 (October 1968).

Forest, J. D. and Christian, J. L.: Development and Application of High Matrix Strength Aluminum-Boron Metals, Eng. Quart. (February 1970).

*Forest, J. D. and Christian, J. L.: Space Structures, in Applications of Composite Materials, ASTM STP-524, 134-162 (February 1973).

*Friedrich, L. A.: Impact Resistance of Hybrid Composite Fan Blade Materials, NASA CR-134712 (May 1974). Available as PWA-TM-5022.

*Friedrich, L. A. and Preston, Jr., J. L.: Impact Resistance of Fiber Composite Blades Used in Aircraft Turbine Engines, NASA CR-134502 (May 1973).

Frye, E. R.: Filament Wound Carbon Structures, Presented ASME/UNM Compos. Tech. Symp. (January 1970).

Frye, E. R. and Rayner, R. M: Observations of Failure Modes in Carbon Composite Materials, Proc. SAMPE Nat. Tech. Conf. Exhibit., 4th, Palo Alto, CA (17-19 October 1972). Available as A73-13042.

Gales, R. G. and Wood, W. A.: Evaluating Potential Fatigue Performance of Composites (Cu/W and Cu/Mo) From Microstructural Behavior, in Metal Matrix Composites, ASTM STP-438, 218-228 (1968).

Garmong, G.: Elastic-Plastic Analysis of Deformation Induced by Thermal Stress in Eutectic Composites: I. Theory; II. Thermal Expansion: III. Thermal-Cycling Damage, Met. Trans. 5, No. 10, 2183-2205 (October 1974).

*Garmong, G. and Williams, J. C.: Monotonic and Fatigue Deformation of Ni-W Directionally Solidified Eutectic, Met. Trans. 6A, No. 9, 1711-1719 (1975).

Gerard, G. and Lakshmikantham, C.: Structural Design Synthesis Approach to Filamentary Composites, NASA CR-964 (November 1967).

*Giltrow, J. P.: Some Mechanical Properties of Carbon Fibre Reinforced Thermoplastics, TR 68080, Royal Aircraft Establishment (March 1968). Available as AD-855351.

Giltrow, J. P. and Lancaster, J. K.: Friction and Wear of Polymers Reinforced With Carbon Fibers, Nature 214, No. 5093, 1106 (1967).

Glenny, R. J. E.: Fibrous Composites With High Melting-Point Matrices, Proc. Roy. Soc. London, England, Series A, 319, No. 1536, 33-44 (6 October 1970).

*Graff, J., Stoltze, L., and Varholak, E. M.: Impact Resistance of Spar-Shell Composite Fan Blades, NASA CR-134521 (July 1973).

Greszczuk, L. B.: Microbricking Failure of Circular Fiber-Reinforced Composites. AIAA/ASME/SAE Struct., Struct. Dyn. Mater. Conf., 15th, Las Vegas, NV (17-19 April 1974). Available as AIAA Paper No. 74-354.

Greszczuk, L. B.: New Test Technique for Shear Modulus and Other Elastic Constants of Filamentary Composites, AF/ASTM Symp. Stand. Filament Reinforced Plastics, Dayton, OH (21-23 September 1966).

Grimes, G. C., Pope, B. J., and Ferguson, J. H.: Investigation of Structural Design Concepts for Fibrous Aircraft Structures, Vol. III, Technology Appraisal - Experimental Data and Methodology, AFFDL-TR-67-29 (November 1967).

Habin, L. M.: Survey of Modern Development in the Analysis of Sandwich Structures. Appl. Mech. Rev. 93-95 (February 1965).

*Hackman, L. E.: Military Aircraft, in Applications of Composite Materials, ASTM STP-524, 43-75 (February 1973).

Hagemaier, D. J., McFaul, H. J., and Parks, J. T.: Nondestructive Testing Techniques of Fiberglass, Graphite Fiber, and Boron Fiber Composite Aircraft Structure, Douglas Aircraft Co. Paper 5756, ASNT Spring Conf., Los Angeles, CA (9-12 May 1970). Available as A70-27465.

Hagerup, E.: Flexural Fatigue Testing of Polyesters, J. Appl. Polymer Sci. 7, No. 3, 1093-1116 (May 1963).

*Hallse, R. L. and Rizley, J. H.: Fused Silica as an Aerospace Material, ASTM STP-379, 15-24 (February 1965).

Halpin, J. C. and Tsai, S. W.: Environmental Factors in Composite Materials Design, AFML-TR-67-423 (1967).

*Halpin, J. C.: Structure-Property Relations and Reliability Concepts, J. Compos. Mater. 6, 208-231 (April 1972).

*Halpin, J. C.: Structure-Property Relationships for Composites, Proc. Int. Conf. New Mater. Conv. Ind., 1st, Lyons, France (22-24 September 1971). Available as A73-13587.

Halpin, J. C., Kopf, J. R., and Goldberg, W.: Time Dependent Static Strength and Reliability for Composites, J. Compos. Mater. 4, 462 (1970).

Halpin, J. C. and Pagano, N. J.: Consequences of Environmentally Induced Dilation in Solids, Proc. Annu. Meet., 6th, Soc. Eng. Sci. (1969).

Halpin, J. C. and Pagano, N. J.: The Laminate Approximations for Randomly Oriented Fibrous Composites, J. Compos. Mater 3, 720 (1969).

*Halpin, J. C. and Waddoups, M. E.: Dynamic Problems Existing In the Design and Development of Composite Aircraft Structures, Proc. Joint Nat. and Western Appl. Mech. Conf., La Jolla, CA 26-28 June 1972).

Hanby, K. R.: Fiber Reinforced Metal-Matrix Composites, Battelle Memorial Institute, DMIC Report S-33 (1 July 1971).

Hanby, K. R.: Review of Recent Developments - Fiber Reinforced Metals. Battelle Memorial Institute (October 1969). Available as AD-859946.

*Hancock, J. R.: Fatigue of Boron-Aluminum Composites, AFML-TR-72-113 (November 1972). Available as AD-757213.

Hancock, J. R.: Mechanisms of Fatigue in Filament-Reinforced Metals, in Proc. Air Force Conf. Fatigue Fract. Aircr. Struct. Mater. Miami Beach, FL 15-18 December 1969, AFFDL-TR-70-144 (September 1970).

*Hancock, J. R.: The Initiation and Growth of Fatigue Cracks in Filament Reinforced Aluminum Alloys, ASTM STP-497 (1972). Available as A72-25480.

Hancock, J. R. and Swanson, G. D.: Toughness of Filamentary Boron/Aluminum Composites, in Composite Materials: Testing and Design, ASTM STP-497, 299-310 (1972). Available as A72-25470.

Hanley, D. P.: Design and Test of Prototype Graphite Fiber/Plastic Fuselage Component. Annu. SPI Meet., 26th, Washington, DC (February 1971).

Hanson, M. P.: Tensile and Cyclic Fatigue Properties of Graphite Filament-Wound Pressure Vessels at Ambient and Cryogenic Temperatures, NASA TN-D-5354 (1969).

*Hanson, M. P.: Effect of Temperature on the Tensile and Creep Characteristics of PRD 49 Fiber/Epoxy Composites, Symp Compos. Mater. Eng. Des., 6th, St. Louis, MO (11-12 May 1972). Available as A72-32137.

Harris, B, Beaumont, P., and Moncunill de Ferran, E.: Strength and Fracture Toughness of Carbon Fiber-Polyester Composites, J. Mater. Sci. 6, 238 (1971).

Harris, B. and Ellison, E. G.: Creep and Tensile Properties of Heavily Drawn Tungsten Wire, ASM Trans. Quart. 59, No. 4, 744-754 (December 1966).

Hashin, Z.: Theory of Fiber Reinforced Materials, NASA CR-1974 (March 1972).

Hashin, Z. and Rotem, A.: A Fatigue Failure Criterion for Fiber Reinforced Materials, Technion Research and Development Foundation. Haifa, Israel, MED Report No. 39, Sci Report No. 3 (March 1973). Available as AFOSR-TR-73-0686 and AD-760146.

Haskin, L. B. and Schlereth, F. H.: Mechanical Failure Detection, AD-712128 (March 1970).

Hedgepeth, J. M. and Van Dyke, P.: Local Stress Concentration in Imperfect Filamentary Composite Materials, J. Compos. Mater. 1, 294-309 (1967).

Hegemier, G. A. and Bache, T. C.: A Continuum Theory for Wave Propagation Parallel to the Laminates, J. Elasticity 3, No. 2, 125-140 (June 1973). Available as A74-21186.

Herman, M.: Beryllium Wire-Metal Matrix Composites Program, Allison Report EDR-5950 (31 July 1968).

Herring, H. W.: Selected Mechanical and Physical Properties of Boron Filaments, NASA TN-D-3202 (1966). Available as N66-15230.

Hersh, M. S.: Fatigue of Boron/Aluminum Composites. NASA CR-123515. (December 1971). Available as X72-10074.

Hertzberg, R. W., Lemkey, F. D., and Ford, J. A.: Mechanical Behavior of Lamellar (Al-Cu Al_2) and Wisker Type (Al-Al_3Ni) Unidirectionally-Solidified Eutectic Alloys, Trans. TMS-AIME 233, 342-354 (February 1965).

*Herzog, J. A.: The Metal Composites, Their Reinforcing Components, and Their Problem Areas, AFML-TR-67-50 (March 1967). Available as AD-815454.

Hilton, P. D. and Sih, G. C.: Extension of Anisotropic Laminates With Internal Cracks, Proc. Southeastern Conf. Theoretical Appl. Mech., 6th., Tampa, FL (23-24 March 1972). Available as A73-13333.

Hofer, Jr., K. E. and Olsen, E. M.: An Investigation of the Fatigue and Creep Properties of Glass Reinforced Plastics for Primary Aircraft Structures, IITRI (April 1967).

Hoffman, C. A.: Effects of Thermal Loading on Composites With Constituents of Differing Thermal Expansion, NASA TN-D-5926 (1970).

*Hoffman, C. A.: Effects of Thermal Loading on Foil and Sheet Composites With Constituents of Differing Thermal Expansivities, J. Eng. Mater. Technol., Trans. ASME, 47-54 (January 1973).

*Hoffman, C. A. and Weeton, J. W.: Metal - Metal Laminar Composites for High Temperature Applications, NASA TM-X-68056 (1972). Available as N72-32541.

Hoffman, C. A. and Weeton, J. W.: A Study of Stress-Rupture and Ductility Properties of Thin Laminae Composites, Met. Trans. 5, 309-312 (January 1974).

Hoffmanner, A. L.: Study of Methods To Produce Composite Beryllium Blades, Final Report, Contract NOw-65-0281-1 (August 1966).

Holmes, R. D. and Wright, D. W.: Creep and Fatigue Characteristics of Graphite/Epoxy Composites, ASME Paper 70-DE-32 (May 1970).

Hoover, W. R. and Allred, R. E.: Effect of Crack Length and Bond Strength on the Delamination Process in Borsic-Al Composites, Sandia Labs Report SLA-73-911 (September 1973). Available as N74-18199.

Hoover, W. R. and Allred, R. E.: The Effect of Crack Length and Bond Strength on the Delamination Process in Borsic-Al Composites, J. Compos. Mater. 8, No. 1, 55-64 (January 1974).

Hordan, M. J. and Wright, M. A.: Development of Film Reinforced Laminate Aluminum Composites, DMIC Memo 243, 10-12 (May 1969).

Hough, R.: Development of Manufacturing Process for Large Diameter Carbon Base Monofilament by Chemical Vapor Deposition, NASA CR-72770 (November 1970).

Howlett, B. W., Mintz, D. C., and Old, C. R.: The Fabrication and Properties of Carbon-Fibre Metal Composites, Int. Conf. Carbon Fibres, Their Compos, Applicat., London, England (2-4 February 1971).

*Hunter, Jr., A. R.: Testing 1-mil Molybdenum-Faced Foil Sandwich up to 1800°F, ASTM STP-397 (February 1965).

I

Ishai, O. and Lavengood, R. E.: The Mechanical Performance of Bi-directional Fiber-Glass Plymeric Composites, Israel J. Technol. 8, 101 (1970).

Isida, M. and Itagaki, Y.: Stress Concentration at the Tip of a Central Traverse Crack in a Stiffened Plate Subjected to Tension, Proc. U. S. Cong. Appl. Mech., 4th., Berkeley, CA (1963).

J

Jackson, P. W., Baker, A. A., and Braddick, D. M.: Some Aspects of the Fracture of Boron-Aluminum Composites, J. Mater. Sci. 6, 427-438 (1971).

Jackson, P. W., Baker, A. A., Cratchley, D., and Walker, P. J.: The Fabrication of Components from Al Reinforced With SiO_2 Fibers, Powder Metallurgy 11, No. 21, 1-22 (1968).

Jackson, P. W. and Cratchley, D.: The Effect of Fiber Orientation on Tensile Strength of Fibre Reinforced Metals, J. Mech. Phys. Solids 14, No. 1, 49 (1966).

Jackson, P. W. and Marjoram, J. R.: Compatibility Studies of Carbon Fibres with Nickel and Cobalt, J. Mater. Sci. 5, 9-23 (January 1970). Available as A70-20048.

Jacobson, M. J.: Acoustic Fatigue Design Information for Fiber Reinforced Structures, AFFDL-TR-68-107 (October 1968).

Jacobson, M. J.: Stress and Deflection of Honeycomb Panels Loaded by Spatially Uniform White Noise, AIAA Journal 6, No. 8, 1503-1510 (August 1968).

Jacobson, M. J., Preston, J. L., Burke, D. L., and Weingarten, V. I.: Investigation of Honeycomb Structure Response to Vibration and Acoustic Excitation, Northrop Corp. NOR 66-64 (January 1966).

Jacobson, M. J. and Wenner, M. L.: Dynamic Response of Curved Composite Panels in a Thermal Environment, AFSOR 66-2647 (November 1966).

Jech, R. W., McDanels, D. L., and Weeton, J. W.: Fiber Reinforcement Metallic Composites, Proc. Sagamore Ord. Mater. Res. Conf. 6th. Syracuse, NY (August 1959).

Jeck, R. W., Weber, E. P., and Schwope, A. D.: Fiber Reinforced Titanium Alloys, Proc. Reactive Metals Conf., Vol. 2, International Science Publishers. New York, NY (1960).

Jenkinson, P. M.: Fatigue Properties of Tatanium and Nickel-Base Sandwich Construction, Forest Products Lab. Madison, WI, FSRP-FPL-147 (December 1970). Available as AD-716731.

*Johns, R. H.: FOD Impact Testing of Composite Fan Blades, NASA TM-X-71544 (1974).

Jones, B. H.: Determination of Design Allowables for Composite Materials in Composite Materials: Testing and Design, ASTM STP-460, 307-320 (1969). Available as A70-21900.

Joseph, E.: Processing Parameters for Diffusion-Bonded Al-Boron Filament Composites, Thesis, Air Force Institute of Technology (1967).

*June, R. R. and Lager, J. R.: Commercial Aircraft, in Applications of Composite Materials, ASTM STP-524, 1-42 (February 1973).

K

*Kaminski, B. E.: Fatigue and Fracture of Advanced Composite Materials, Presented Bus. Aircr. Meet. Wichita, KS (3-6 April 1973). Available as SAE Paper No. 730337 and A73-34688.

Kaminski, B. E., Lemon, G. H., and McKague, E. L.: Development of Engineering Data for Advanced Composite Materials. Static and Thermophysical Properties, AFML-TR-70-108-VOL-1 (1972).

Kaufman, L.: Investigation of Boride Compounds for Very High Temperature Applications, Semi-Annual Report 1, Contract AF 33(657)-8635, Man Labs, Inc., Cambridge, MA (October 1962).

Kaufman, L. and Clougherty, E. V.: Investigation of Boride Compounds for Very High Temperature Applications, Semi-Annual Report 2, Contract AF 33(657)-8635, Man Labs, Inc., Cambridge, MA (April 1963).

Kaufman, L., Clougherty, E. V., and Nesor, H.: Investigation of Fracture Mechanics of Boride Composites, NASA Technical Report, Contract NASW 2088 (July 1971).

Kaufman, L. and Nesor, H.: Stability Characterization of Refractory Materials Under High Velocity Atmospheric Flight Conditions, AFML-TR-69-84 (March 1970).

*Kaufman, L. A.: Investigation of the Fracture Mechanics of Boride Composites. NASA CR-126246 (January 1972). See Also N72-21555.

Kelly, A.: Interface Effects and the Work of Fracture of a Fibrous Composite, National Physics Lab. NPL-IMS-10 (February 1970).

Kelly, A.: Role of the Interface in the Fracture of Fiber-Composite Materials, in Interfaces in Composites, ASTM STP-452, 90-106 (1969). Available as A70-10481.

Kelly, A. and Davies, G. J.: The Principles of the Fiber Reinforcement of Metals, Met. Rev. 10, No. 37 (1965).

Kelly, A.: Strong Solids, Clarendon Press (1966).

Klein, M. J., Reid, M. L., and Metcalfe, A. G.: Compatibility Studies for Viable Titanium Matrix Composites, AFML-TR-69-242 (October 1969) and AFML-TR-70-237 (September 1970).

*Klingholz, R. and Kurtze, G.: Structural Configurations for Increasing Fatigue Life at Elevated Temperatures, AFML-TR-67-29 (February 1967). Available as AD-814869.

*Klypin, B. A., Maslov, A. M., and Maslenkow, S. B.: Reinforcement of Heat Resistant Alloys With Filaments, Metallovedenie 1 Termicheskaya Obrabotka Metallov. No. 8, 2-6 (August 1971). Available as ZD 476785 and UDC 69-419.4.

*Kocher, L. H. and Cross, S. L.: Reinforced Cutouts in Graphite Composite Structures, Bell Aerospace Co. Buffalo, NY (1972). Available as A72-25475.

Konish, Jr., H. J. and Cruse, T. A.: A Study of Fracture Phenomena in Fiber Composite Laminates, Carnegie-Mellon. Pittsburgh, PA (September 1973). Available as AFML-TR-73-145-VOL-3; AD-771796; SM-73-13; and N74-18212.

Konish, Jr., H. J., Swedlow, J. L., and Cruse, T. A.: Experimental Investigation of Fracture in an Advanced Fibre Composite, J. Compos. Mater. 6, 114-125 (1972).

Kreider, K. G.: Mechanical Testing of Metal Matrix Composites, ASTM STP-460, 203-214 (1969).

Kreider, K. G., Dardi, L., and Prewo, K.: Metal Matrix Composite Technology, AFML-TR-71-204 (December 1971). See also AFML-TR-70-193 (1970).

Kreider, K. G. and Leverant, G. R.: Boron Fiber Metal Matrix Composites by Plasma Spraying, AFML-TR-66-219 (July 1966).

Kreider, K. G. and Marciano, M.: Mechanical Properties of Borsic Aluminum Composites, Trans. Met. Soc. AIME 245, 1279 (June 1969). Available as A69-35926.

Kreider, K. G. and Prewo, K. M.: The Transverse Strength of Boron Fibers, in Composite Materials: Testing and Design, ASTM STP-497, 539-550 (1972). Available as A72-25484.

Kreider, K. G., Schile, R. D., Breinan, E. M., and Marciano, M.: Plasma Sprayed Metal Matrix Fiber Reinforced Composites, AFML-TR-68-119 (July 1968).

*Krysiak, J. E.: Investigation of High Temperature Bearing Materials Under Atmospheric and Simulated Conditions, AFFDL-TR-66-181 (September 1967). Available as AD-822649.

L

Lackman, L. M. and Pagano, N. J: On the Prevention of Delamination in Composite Laminates, AIAA/ASME/SAE Struct., Struct. Dyn. Mater. Conf., 15th., Las Vegas, NV (17-19 April 1974). Available as AIAA Paper No. 74-355.

*Lakshmikantham, C.: Analysis of Transverse Cracks in Stiffened Fiber-Composite Strip Under Tension, AMMRC TR-71-1 (January 1971). Available as AD-719696.

Lamkey, F. D. and Thompson, E. R.: Nickel and Cobalt Eutectic Alloys Reinforced by Refractory Metal Carbides, Met. Trans. 2, 1537-1544 (June 1971). Available as A71-32169.

Lancaster, J. K.: The Effect of Carbon Fiber Reinforcement on the Friction and Wear of Polymers, R.A.E. Technical Report 66378 (1966).

Langdon, T. G., Cropper, D. R., and Pask, J. A.: Creep Mechanisms in Ceramic Materials at Elevated Temperatures, Proc. Univ. Conf. Ceramic Sci., 6th., North Carolina State Univ. (7-9 December 1970).

*Lare, P. J., Ordway, F., and Hahn, H.: Fabrication and Testing of Sapphire Filament Reinforced Superplastic Ni-Cr-Fe Alloy Composites, Artech Corp., Falls Church, VA, Final Report J7308-FR (May 1975).

Larson, J. V.: Cryogenic High Modulus Composites, Quart. Prog. Report No. 38. 1 April - 30 June 1970, NASA Contract C-10360-B (July 1970).

Lavengood, R. E. and Anderson, R. M.: Matrix Properties Controlling Torsional Fatigue Life of Fiber Reinforced Composites, Proc. Annu. SPI Tech. Manage. Conf., 24th., Section 11-E (February 1969).

Lawley, A., Gaigher, H. L., and Schuster, S.: Deformation Characteristics of thin Foils and Composites, Franklin Institute. Philadelphia, PA Report F-A2366 (January 1964).

Lawson, W. H. S. and Kerr, H. W.: Mechanical Behavior of Rapidly Solidified Al-Al_2Cu and Al-Al_3-Ni Composites, Met. Trans. 2, 2853-2859 (October 1971). Available as A71-44286.

Leeds, D. H.: Observations on the Thermal Shock Resistance of TiC-C Alloys, Refractory Compos. Working Group, 8th., ASD/NASA Meet., Dallas, TX (January 1964).

Leggett, H.: Ceramic Radomes Development - Alumina "A" Sandwiches and Multilayers, SM-49195, Douglas Aircraft Co. (September 1966).

Leggett, H., Leonard, B. G., and Edlin, V. E.: Status of the Prestressed Chemically Consolidated Ceramic Program at Douglas Aircraft Co., Paper No. 3770, Presented Refractory Inorganic Compos. Meet. (January 1966).

Lemkey, F. D. and Salkind, M. J.: Properties of Carbide Whisker Reinforced Refractory Metals From Melts, Crystal Growth, ICCG, Boston, MA (1966).

Lenoe, E. M.: Micromechanics of High Strength Low Density Boron Filament Reinforced Al Metallic Composites, AFML-TR-67-125-PT.1 (May 1967).

Lenoe, E. M., Murro, R. P., Beaumont, S., and War, J.: Micromechanics of High Strength, Low Density Boron Filament Reinforced Metallic Composites, AFML-TR-67-125-PT.2 (1968).

Long, J. R.: The Evaluation of the Mechanical Behavior of Metal Matrix Composites Reinforced with SiC-coated Boron Fibers, AFML-TR-69-291 (1969).

Lovelace, A. M.: Advanced Composites, AIAA Annu. Meet. Tech. Display, 10th., Washington, DC, 28-30 January 1974. See AIAA Paper 74-242.

Lovelace, A. M. and Tsai, S. W.: Composites Enter the Mainstream of Aerospace. Vehicle Design, Aeronaut. Astronaut. 8, 54 (1970).

*Lum, P. T., Chait, R., and Hickey, Jr., C. F.: The Toughness of High Hardness Laminar Composite Steel as Influenced by Specimen and Crack Orientation, Met. Trans. 6A, 1093-1100 (May 1975).

Lynch, C. T. and Kershaw, J. P.: Metal Matrix Composites, CRC Press, Cleveland, OH (1972). Available as A72-41528.

M

Mandell, J. F., McGarry, F. J., Wang, S. S., and Im, J.: Stress Intensity Factors for Anisotropic Fracture Test Specimens of Several Geometries, J. Compos. Mater. 8, No 1, 106-116 (April 1974).

Mangiapane, J. A.: Advanced Composite Engine Development Program, AFML-TR-70-89. Parts 1 and 2 (April 1970).

Mangiapane, J. A.: Composite Materials: Metal-Matrix and Polymer-Matrix, Pratt and Whitney Co. (October 1970).

Manning, S. D. and Lemon, G. H.: Plan for Developing Structural Criteria for Composite Airframes, Proc. Annual Reliability and Maintainability Symp., 155-162 (1974).

*Manno, A.: Navy Aircraft Program in Advanced Composites, ASME Paper No. 72-DE-3 (May 1971).

*Martin, G., Moore, J. F., and Tsang, S.: The Radiography of Metal Matrix Composites, Mater. Eval. 30, No. 4, 78-86 (April 1972). Available as A72-27199.

*May, L. C. and Goad, R. C.: Manufacturing Methods for Fabrication and Assembly of Advanced Composite Primary Structure, AFML-TR-75-111 (July 1975).

McCandless, L.: Chemical Preparation and Physicomechanical Properties of Silicon Carbide and Silicon Nitride Fibers, Presented Southeast Regional Meet. of the ACS (5-8 November 1969).

*McCartney, R. F., Richard, R. C., and Trozzo, P. S.: Fracture Behavior of Ultrahigh-Strength-Steel Laminar Composites, ASM Trans. Quart. 60, No. 3, 384-394 (September 1967).

McCullough, R. L.: Fundamental Concepts of Fiber Reinforced Resin Composites, Marcel Dekher. New York NY (1971).

McDanels, D. L., Jech, R. W., and Weeton, J. W.: Analysis of Stress-Strain Behavior of Tungsten-Fiber-Reinforced Copper Composites, Trans. Met. Soc. AIME 233, 636-642 (April 1965). Available as A66-15324.

McDanels, D. L., Signorelli, R. A., and Weeton, J. W.: Analysis of Stress-Rupture and Creep Properties of Tungsten Fiber Reinforced Composites, NASA TN-D-4173-D (Spetember 1967).

McDonald, J. E. : Composite Technology and Carbon/Carton Materials. Sandia Labs, Proc. ASME/Univ. of New Mexico Symp., 10th. (29-30 January 1970)

McGarry, F. J. and Mandell, J. F.: Fracture Toughness of Fiber Reinforced Composites, Research Report R70-79, Massachusetts Institute of Technology (December 1970).

*Meade, L. E.: Structural Fabrication Guide for Advanced Composites, Lockheed (Marietta, GA) Report IR-426-5 (III) (August 25, 1975).

Melill, J., Ecker, L., Greenspan, H. J., and Lorenz, R.: Development and Evaluation of Diffusion Bonded Laminated Sections, North American Aviation, RTDIR-9122/3 (December 1966). Available as AD-805408.

Menke, G. D. and Toth, I. J.: The Time Dependent Mechanical Behavior of Composite Materials, AFML-TR-70-174. (June 1970).

Menke, G. D. and Toth, I. J.: The Time Dependent Mechanical Behavior of Metal Matrix Composites, AFML-TR-71-102 (May 1971).

Mettes, David G. and Lockwood, Paul A.: The Mechanical Properties of Laminates Reinforced With Performance Glass Fiber Fabric, Proc. Annu. SPI Tech. Manage. Conf., 21st., Section 4-C (February 1966).

Meyerer, W. J.: The Feasibility of Forming a Boron Fiber Reinforced Aluminum Composite by a Hot Extrusion Process, AFML-TR-68-127 (August 1968).

*Mills, A. L.: Advanced Composites Production/Service Experience, LTV Aerospace Report IR-471-3 (VIII) (December 1975).

Mills, G. J., Brown, G., and Dauksys, R. J.: Effects of Prestressing Graphite/Epoxy Pregeg on Laminate Strength Properties. AIAA/ASME/SAE Struct., Struct. Dyn. Mater. Conf., 15th., Las Vegas, NV (17-19 April 1974).

*Mocerino, N. J.: Production Validation/Composite Secondary Airframe Structure, Rockwell International Corp. Report NA-75-622 (November 12, 1975).

Moon, F. C. and Mow, C. C.: Wave Propagation in a Composite Material Containing Dispersed Rigid Spherical Inclusions, Rand Corp. RM-6139-PR (December 1970).

Morris, A. W. H. and Burwood-Smith, A.: Fiber Strengthened Nickel-Base Alloy High Temperature Turbines. AGARD CP-73-71 (Jnauayr 1971).

Morris, A. W. H. and Steigerwald, E. A.: An Investigation of the Fatigue Behavior of Tungsten-Reinforced and Steel-Reinforced Silver Composites. Trans Met. Soc. AIME. 239, 730-739 (1967).

Mulhern, J. F., Rogers, T. G., and Spencer, A. J. M.: A continuous Model for Fiber-Reinforced Plastic Materials, Proc. Roy. Soc., Series A, 301, 473-492 (November 1967). Available as A68-11970.

*Mullin, J. V. and Mehan, R. L.: Evaluation of Composite Failures Through Fracture Signal Analysis, J. Test Mater. 1, No. 3, 215-219 (May 1973). Available as A73-32250.

N

Nakayama, J.: Direct Measurement of Fracture Energies of Brittle Materials, J. Amer. Ceramics Soc. 48, 583-587 (1965).

*Neuschaefer, R. W. and Beal, J. B.: Assessment of and Standardization for Quantitative Nondestructive Testing, NASA TM-X-64706 (September 30, 1972). Available as N73-14483.

Newman, J. and Smyrl, W. H.: Fluid Flow in a Propagating Crack, Met. Trans. 5, 469-474 (February 1974).

*Novak, R. C.: Fabrication of Aluminum-Carbon Composites, NASA CR-121266 (August 1973). Available as N73-29557 and United Aircraft Corp. Report No. M911326-13.

*Novak, R. C. and DeCrescente, M. A.: Impact Behavior of Unidirectional Resin Matrix composites Tested in the Fiber Direction, Proc. ASTM Conf., 2nd., Anaheim, CA (20-22 April 1971).

O

Ogorkiewicz, R. M. and Mucci, P. E. R.: Testing of Fibre Plastics Composites in Three Point Bending, Composites 2 (September 1971).

*Ogorkiewicz, R. M. and Sayigh, A. A. M.: Deflection of Carbon Fibre/Acrylic Foam Sandwich Beams, Composites, 254-257 (November 1973). Available as A74-10322.

Ogorkiewicz, R. M. and Sayigh, A. A. M.: Deflection of Polypropylene Sandwich Mouldings Under Bending Loads, Plast. Polym. 40 (April 1972).

Ogorkiewicz, R. M. and Sayigh, A. A. M.: Plastic Sandwich Beams Under Bending Loads of Short Duration, J. Mech. Eng. Sci. 9 (1967).

*Old, C. F. and Nicholas, M.: Prospects for Metal Matrix Composites, Int. Conf. Carbon Fibers, Their Place in Modern Technology, Paper No. 13, London (18-20 February 1974).

Ostashev, V. V.: Interaction of Elements of Reinforced Composite Material Under Cyclic Loads, Problemy Prochnosti, No. 1, 107-111 (January 1973). Available as A74-20894.

Otto, O. R. and Bohlmann, R. E.: Boron Aluminum Crippling Strength Shows Improvement, AIAA/ASME/SAE Struct., Struct. Dyn. Mater. Conf., 15th., Las Vegas, NV (17-19 April 1974).

Outwater, J. O. and Murphy, M. C.: On the Fatigue of Epoxy Resin, Modern Plastics 47, 160. (September 1970).

Outwater, J. O. and Murphy, M. C.: On the Fracture Energy of Unidirectional Laminates, Proc. Annu. Tech. Conf. Reinforced Plastics/ Composites Div., SPI, 24th (1969). Available as A69-20493.

*Ovens, Jr., W. G. and McEvily, Jr., A. J.: Fatigue Behavior in Torsion of a Unidirectionally Solidified Eutectic, Connecticut Univ. Report No. UC-MET-10-1972 (1972). Available as AFOSR-TR-72-2347 and AD-753689.

Owen, M. J.: Fatigue Testing of Fibre Reinforced Plastics, Composites 1, 346-355 (December 1970). Available as A71-16928.

*Owen, M. J. and Bishop, P. T.: Fatigue Properties of Glass-Reinforced Plastics Containing a Stress Concentrator, J. Phys. D. 6, 2057-2069 (1973).

Owen, M. J. and Morris, S.: Fatigue Behavior of Orthogonally Cross-Plied Carbon-Fibre-Reinforced Plastics Under Axial Load, Paper No. 51, Plastics Inst. Conf. on Carbon Fibres, Their Composites and Applications, London (1971). Available as A71-20912.

Pagano, N. J. and Whitney, J. M: Geometric Design of Composite Cylindrical Characterization Specimens, AFML TR-70-130 (1970).

Papirno. R. P. and Campo, J.: Development of Test Procedures for In-Situ Component Stress-Strain Properties of Composites, AMMRC-PTR-73-3 (March 1973). Available as AD-765449.

Patsis, A. V., Serafini, T. T., Hanson, A. P., and Chamis, C. C.: A Novel Procedure for Selecting Matrices for Specified Composite Strength, Paper for Annu. SPI Conf., 27th., NASA Lewis Research Center, Unpublished Data (February 1972).

Pattnaik, A. and Lawley, A.: Deformation and Fracture in Al-$CuAl_2$ Eutectic Composites, Drexel Univ. Department of Metallurgical Engineering, TR-5 (January 1971). Available as AD-718360.

*Pattnaik, A. and Lawley, A.: Effect of Elevated Temperature Exposure on the Structure, Stability, and Mechanical Behavior of Aluminum-Stainless Steel Composites, Met. Trans. 5, 111-122 (January 1974. Available as A74-18437.

*Pepper, R. T. and Pentry, R. A.: Mechanical Properties of Aluminum-Graphite Composites Prepared by Liquid Phase Hot Pressing, J. Compos. Mater. 8, No. 1, 29-37 (January 1974).

Perry, A. J., Nicoll, A. R. Phillips, K., and Sahm, P. R.: The Copper-Boron Eutectic - Unidirectionally Solidified, J. Mater. Sci. 8, 1340-1348. Available as A73-44035.

Peterson, G. P. and Tsai, S. W.: Status of Development of Advanced Composites, Proc. Symp. Compos. Mater., 4th., Tokyo, Japan (August 1971).

Petit, P. H.: An Applications Study of Advanced Composite Materials to the C-130 Center Wing Box, NASA CR-66979 (1970).

Petker, I., Lunde, G. A., and Holmes, W. D.: Boron Polymide Fan Blades - A Fabrication Study, Nat. Aeronaut. Space Eng. Manufact. Meet. (28-30 September 1971).

Petrasek, D. W.: High Temperature Strength of Refractory-Metal Wires and Consideration for Composite Applications, NASA TN-D-6881 (1972).

Petrasek, D. W. and Signorelli, R. A.: Preliminary Evaluation of Tungsten Alloy, Fiber - Ni Base Alloy Composites for Turbojet Engine Application, NASA TN-D-5575 (February 1970).

Petrasek, D. W., Signorelli, R. A., and Weeton, J. W.: Refractory-Metal Fiber Nickel-Base Alloy Composites for Use at High Temperatures, NASA TV-D-4787 (September 1968).

Pichler, H. R.: Plastic Deformation and Failure of Ag-Steel Filamentary Composites, Trans. Met. Soc. AIME 233, 112-116 (1965).

Piekarski, K. and Helmer, M.: Fracture Energy of Lamellar Eutectic, Eng. Fract. Mech. 4, No. 1, 129-132 (March 1972).

Pinnel, M. R. and Lawley, A.: Correlation of Uniaxial Yielding and Substructure in Aluminum-Stainless Steel Composites, Met. Trans. 1, 1337-1374 (1970).

Pipes, R. B. and Pagano, N. J.: Interlaminar Stresses in Composite Laminates Under Uniform Axial Fatigue Extension, J. Compos. Mater. 4 (1970).

Pipkin, A. C. and Rogers, T. G.: Plane Deformation of Incompressible Fiber-Reinforced Materials, J. Appl. Mech. 38, 634-640 (September 1971).

Pipkin, A. C. and Sanchez, V. M.: Existance of Solutions of Plane Traction Problems for Ideal Composites, J. Appl. Math. 26, No. 1 (January 1974).

Precht, W. and Preece, C. M.: Evaluation of Metal Composites for Use in Weapon Components, Rock Island Arsenal Lab., IL. R-RR-T-6-50-73 (July 1973). Available as AD-766288.

*Premont, E. J. and Stubernranch, K. R.: Impact Resistance of Composite Fan Blades, NASA CR-134515 (May 1973).

Prewo, K. M. and Kreider, K. G.: High Strength Boron Fiber Reinforced Composites, J. Compos. Mater. 6, 338-357 (July 1972). Available as A72-43491.

Prewo, K. M. and Kreider, K. G.: Transverse Tensile Properties of Boron Fiber Reinforced Aluminum Matrix Composites, Met. Trans. 3, No. 8, 2201-2211 (August 1972). Available as A72-39302.

Prosen, S. P.: Composite Materials Testing. ASTM STP-460, 5-12 (1969). Available as A70-21876.

Q

Quatinetz, M., Weeton, J. W., and Herbell, T. P.: Refractory Metal Base Alloy Composites. Patent Application, NASA-CASE-XLE-03940-2 (11 July 1972).

R

Rao, P. N. and Hofer, K. E.: An Investigation of Fatigue Behavior of Reinforced Plastics for Primary Aircraft Structures, IITRI Report No. D6002 (July 1969).

*Rao, P. N. and Hofer, Jr., K. E.: Investigation of the Influence of Material Variables on Fatigue Mechanisms in Composites, ITT Research Institute. Chicago, IL, IITRI-D6058-FR (December 1970).

Reifsnider, K. L., Stinchcomb, W. W., Williams, R. S., and Marcus, L. A.: Heat Generation in Composite Materials During Fatigue Loading, AFOSR-TR-73-1961 (May 1973).

Robinson, E. Y.: A Statistical Model for Static Fatigue of Multi-Filament Strands, Fibre Science and Technology 2, 171 (1970).

*Robinson, E. Y. and Chiao, T. T.: Analysis of Stress-Rupture Data from S-Glass Composites, UCRL-73358. Preprint (19 August 1971).

Rogers, C. W.: Structural Design With Composites, in Fundamental Aspects of Fiber Reinforced Plastic Composites, R. T. Schwartz and H. S. Schwartz, Eds., Interscience, New York, NY (1968).

Rosen, B. W.: Fiber Composite Materials. ASM, Metals Park, OH (1965).

*Rosen, B. W.: Stiffness of Fiber Composite Materials. Composites, Article 3 in Series, Compos. Mater. Des., 16-25 (January 1973).

Rosen, B. W., Dow, N. F., and Hashin, Z.: Mechanical Properties of Fibrous Composites, NASA CR-31 (1964).

Ross, C. A.: Studies on the Dynamic Compression of Composite Materials, University Microfilms, Ann Arbor, MI, 72-9718 (1972).

*Rossi, R. C.: Thermal-Shock-Resistant Materials, Proc. Universal Conf. Ceram. Sci., 6th., North Carolina State Univ., Raleigh, NC (7-9 December 1970).

Rossi, R. C., Pepper, R. T., and Riley W. C.: Development of Aluminum-Graphite Composites, Proc. Annu. Meet. Amer. Ceram. Soc., 72nd., Philadelphia, PA (6 May 1970).

Rotem, A. and Lifshitz, J. M.: Longitudinal Strength of Unidirectional Fibrous Composite Under High Rate of Loading, Annu. SPI Conf., 26th. Section 10-G (1971).

Rupert, C. L.: Acoustic Test of Boron Fiber Reinforced Composite Panels Conducted in the Air Force Flight Dynamics Lab's Sonic Fatigue Test Facility, Shock Vib. Bull., 39, Part 4, 101-115 (April 1969).

*Ruzauskas, E. J. and Hay, R. D.: Fracture Modes in Metal-Matrix Composites, General Electric Co. and Drexel Univ., Philadelphia, PA, J. Compos. Mater 6, 414-419 (1972).

S

*Sahu, S. and Broutman, L. J.: Mechanical Properties of Particulate Composites. Polymer Eng. Sci., 12, No. 2 91-100 (March 1972). Available as A73-12428

Saint-John, C. F. and Street, K. N.: B-Al Composite Failure Under Combined Torsion and Tension Loading, J. Compos. Mater. 8, No. 3, 266-274 (July 1974).

*Salkind, M. J.: Fatigue of Composites, In Composite Materials: Testing and Design. ASTM STP-497, 143-169 (1972). Available as A72-25461. See also NASA SP-309 (May 1971). Available as N72-29895.

*Salkind, M. J.: VTOL Aircraft, in Applications of Composite Materials, ASTM STP-524, 76-107 (February 1973).

Salkind, M. J. and George, F. D.: Fatigue and Bonding of Al_3Ni Whisker Reinforced Aluminum, United Aircraft Corp., G910583.4 (July 1968). Available as AD-838871.

Salkind, M. J. and George, F. D.: The Charpy Impact Behavior of Al_3Ni Whisker Reinforced Aluminum. AIME. Trans. Met. Soc. 242, 1237-1247 (1968).

Salkind, M. J., George, F. D., Lemkey, F. D., and Bayles, B. J.: Investigation of the Creep, Fatigue, and Transverse Properties of Al_3Ni Whisker and $CuAl_2$ Platelet Reinforced Aluminum, United Aircraft Corp. E910344-3 (May 1966). Available as AD-633241. See also AD-482341.

Salkind, M. J., Lemkey, F. D., and George, F. D.: Whisker Composites by Eutectic Solidification, in Whisker Technology, A. P. Levitt, Ed., Wiley-Interscience, New York, NY (1970).

Sandhu, R. S.: Nonlinear Response of Unidirectional and Angle Ply Laminates, AIAA/ASME/SAE Struct., Struct. Dyn. Mater. Conf., 15th., Las Vegas, NV (17-19 April 1974).

*Sarian, S.: Elevated Temperature Stability of Carbon-Fibre, Nickel-Matrix Composites: Morphological and Mechanical Property Degradation, J. Mater. Sci. 8, 251-260 (1973). Available as A73-26047.

Sarian, S. and Strong, S. L.: Mechanical Properties of Stress-Graphitised Carbon Fibers, Thermally Induced Relaxation and Recovery, Fibre Sci. Technol. 4, No. 1, 67-69 (July 1971).

Sattar, S. A., Stargardter, H., and Randall, D. G: The Development of JT8D Turbofan Engine Composite Fan Blades, AIAA Paper No. 69-464 (June 1969).

Schaefer, W. H., Christian, J. L., Davis, L. W., and Cornish, R. H.: Evaluation of the Structural Behavior of Filament Reinforced Metal Matrix Composites. Vol. II - Materials Development, AFML-TR-69-36-VOL-2 (January 1969). Available as AD-855866. See also AD-855760 (for Vol. 1) and AD-855751 (for Vol. III).

Schapery, R. A.: Thermal Expansion Coefficients of Composite Materials Based on Energy Principles, J. Compos. Mater. 2, 380 (1968).

Scheirer, S. T., Toth, I. J., and Menke, G. D.: The Time Dependent Mechanical Behavior of Metal Composites, AFML-TR-72-149 (September 1972).

Schjelderup, H. C. and Purdy, D. M.: Advanced Composites - The Aircraft Material of the Future, AIAA Aircr. Des. Operat. Meet., 3rd. Seattle, WA (12-14 July 1971).

Schuster, D. M. and Scala, E.: Properties of Wisker Composites, In Whisker Technology, A. P. Levitt, Ed., 403-441, Wiley-Interscience. New York, NY (1970). Available as A71-14951.

Scop, P. M. and Argon, A. S.: Statistical Theory of Strength of Laminated Composites, J. Compos. Mater 1, 92 (1967).

*Sedor, G. and Watterson, R. K.: Low Cycle Compressive Fatigue Failure of E Glass-Epoxy Composites, AFOSR-TR-72-0322 (March 1972). Available as Ad-744113 and ASLR TR 162-2.

Sedriks, A. J., Green, J. A. S., and Novak, D. L.: Corrosion Behavior of Aluminum-Boron Composites in Aqueous Chloride Solutions, Met. Trans. 2, 871 (March 1971).

Sheehan, J. E. and Hirschorn, J. S.: Fiber Breakage During Powder Metallurgy Fabrication of Aluminum-Boron Composites, ASM (September 1969).

Shimizu, H. and Dolowy, Jr., J. F.: Fatigue Testing and Thermal-Mechanical Treatment Effects on Aluminum-Boron Composites, ASTM STP-460, 192-202 (1969).

Shockey, P. D., Anderson, J. D., and Hofer, K. E.: Structural Airframe Application of Advanced Composite Materials. VOL. V - Mechanical Properties - Fatigue, AFML-TR-69-101-VOL-5 (March 1970). Available as AD-867017.

Shuez, W. J.: Aeropropulsion Applications Technology, Air Force Mater. Symp. (1971).

Sierakowski, R. L., Nevill, Jr., G. E., Ross, C. A., and Jones, E. R.: Experimental Studies of the Dynamic Deformation and Fracture of Filament Reinforced Composites, Proc. AIAA/ASME Struct., Struct. Dyn. Mater. Conf., 11th. Denver, CO (22-24 April 1970).

*Signorelli, R. A., Serafini, T. T., and Johns, R. H.: Material and Structural Studies of Metal and Polymer Matrix Composites, NASA TM-X-68101 (1972). Available as A73-12621.

*Sih, G. C. and Chen, E. P.: Torsion of a Laminar Composite Debonded Over a Penny-Shaped Area, J. Franklin Inst. 293, No. 4, 251-261 (April 1972). Available as A72-32247.

Sih, G. C., Chen, E. P., and Huang, S. L.: Fracture Mechanics of Plastic-Fiber Composites, Eng. Fract. Mech. 6, No. 2, 343-359 (September 1974).

Sih, G. C., Paris, P. C., and Irwin, G. R.: On Cracks in Rectilinearly Anisotropic Bodies, Int. J. Fract. Mech 1, No. 3, 189-203 (1966).

Smith, S. H., Porter, T. R., and Engstrom, W. L.: Fatigue Crack Propagation Behavior and Residual Strength of Bonded Strap Reinforced, Lamellated and Sandwich Panels, AFFDL-TR-70-144 (December 1969).

Smith, T. R. and Gwen, M. J.: Fatigue Properties of RP-1, Modern Plastics 46, No. 4, 124-125 and 128-132 (April 1969).

Soliman, F. Y. and Wallace, J. S.: The Effect of Strain Rate on the Fracture of Advanced Fiber-Reinforced Composites, AFFDL-TR-70-144 (December 1969).

*Stansbarger, D. L.: Low Cost Manufacturing Concepts of Advanced Composite Primary Aircraft Structures, AFML-TR-75-145 (September 1975).

Stapley, A. J. and Beevers, C. J.: The Stability of Saphire Whiskers in Nickel at Elevated Temperatures. Part 1. General Morphological and Chemical Stability, J. Mater. Sci. 8, 1287-1295 (1973). Available as A73-44032.

*Steinhagen, C. A. and Salemme, C. T.: Impact Resistance of Composite Blades, NASA CR-134707 (December 1974).

*Steinhagen, C. A. and Salemme, C. T.: Impact Resistance of Current Design Composite Fan Blades Tested Under Short-Haul Operating Conditions, NASA CR-134533 (July 1973).

Stinchcomb, W. W., Reifsnider, K. L., Marcus, L. A., and Williams, R. S.: Effects of Cyclic Frequency on the Mechanical Properties of Composite Materials, AFOSR-TR-73-1907 (July 1973).

Stuhrke, W. F.: Solid State Compatibility of Boron-Aluminum Composite Material, DMIC Memo 243, 43-46 (May 1969).

Stuhrke, W. F.: The Mechanical Behavior of Aluminum-Boron Composite Materials. Metal Matrix Composites, ASTM STP-438 (1968).

Stuhrke, W. F. and Carpenter, Jr., J. L.: Life Prediction of Materials Exposed to Monotonic and Cyclic Loading - A Technology Survey, NASA CR-134750 (January 1975).

*Stusrud, R. W., Herman, M., and Sippel, G. R.: Beryllium-Metal Matrix Composite Compressor Blade Program. Detroit Diesel Allison Report No. EDR-7704 (December 1972).

Sullivan, T. L. and Chamis, C. C.: Some Important Aspects in Testing High-Modulus Fiber Composite Tubes Designed for Multiaxial Loading, NASA TM-X-68045 (April 1972). Available as N72-23583.

Summer, E. V.: Development of Ultrahigh Strength Low Density Al Plate Composites, Final Report, NAS 8-11508, Harvey Report HA-2263 (July 1966).

Summer, E. V.: The Effect of Heat Treatment on the Physical Properties of Some Boron-Aluminum Alloy Matrix Composites, Advances in Structural Composites, SAMPE, Western Periodicals Co., Vol. 12 (October 1967).

Sun, C. T. and Sierakowski, R. L.: Studies of the Dynamic Impact of Jet Engine Blades, Shock Vib. Bull. 43, Part 4, 11-19 (June 1973).

Sutton, W. H.: Whisker Composite Materials - A Prospectus for the Aerospace Designer. Astronaut., Aeronaut. 4, No. 8, 46-51 (August 1966).

Sutton, W. H. and Chorne, J.: Development of High-Strength, Heat-Resistant Alloys by Whisker Reinforcement, Metals Eng. Quart. 3, No. 1, 44-51 (February 1963).

Sutton, W. H. and Chorne, J.: Factors Affecting the Tensile Strength of Metals Reinforced With Strong Fibers, Syracuse Univ. Press (1966). Available as A67-13311.

Swanson, G. D. and Hancock, J. R.: Off-Axis and Transverse Tensile Properties of Boron Reinforced Aluminum Alloys, in Composite Materials: Testing and Design, ASTM STP-497, 469-482 (1972). Available as A72-25479.

*Swearengen, J. C. and Covert, T. F.: An Improved Test for Interfacial Shear Strength, Sandia Labs Report available as A73-40922 (1973).

T

Taig, I. C.: Design of Airframe Components in Carbon Fiber Composite, Designing With Composite Materials, Proc. Inst. Mech. Eng., London, England (28 October 1971). Available as A72-14746.

Takaku, A. and Arridge, R. G. C.: The Effect of Interfacial Radial and Shear Stress on Fiber Pull-Out in Composite Materials, J. Phys. D. 6, 2038-2047 (1973).

Tattersall, H. G. and Tappin, G.: The Work of Fracture and Its Measurement in Metals, Ceramics and Other Materials, J. Mater. Sci. 1, 296-301 (1966).

Tauchert, T. R. and Moon, F. C.: Propagation of Stress Waves in Fiber Reinforced Composite Rods, Proc. AIAA/ASME Struct., Struct. Dyn. Mater. Conf., 11th., Denver, CO (22-24 April 1970).

Tetelman, A. S.: Fracture Processis in Fiber Composite Materials, In Composite Materials: Testing and Design, ASTM STP-460 (1969).

Tetelman, A. S. and McEvily, Jr., A. J.: Fracture of Structural Materials, John Wiley, New York, NY (1967).

Thies, D. J., Sanders, L. R., and Neff, R. M.: Effects of Fabrication Defects on Boron/Epoxy Composites, AIAA/ASME/SAE Struct., Struct. Dyn. Mater. Conf., 15th., Las Vegas, NV (17-19 April 1974).

*Thomas, R. L.: Strength Characteristics of Boron Aluminum Composite Subjected to Combined Stress, AFML-TR-74-214 (October 1974).

Thompson, A. W.: Fatigue and Creep Properties of Reinforced Plastics. Plastics Inst. Trans. 30, No. 85, 39-50 (February 1962).

Thompson, E. R., George, F.D., and Kraft, E. H.: Investigation To Develop a High Strength Eutectic Alloy With Controlled Microstructure, United Aircraft Corp., J910868-4 (July 1970). Available as AD-873832.

*Thompson, E. R., Kraft, E. H., and George, F. D.: Investigation To Develop A High Strength Eutectic for Aircraft Engine Use, United Aircraft Corp., K911052-4 (July 1971). Available as AD-887395.

Tiffany, D. F.: On the Prevention of Delayed Time Failures of Aerospace Pressure Vessels, J. Franklin Inst. 290, 567 (1970).

Timoshenko, S.: Strength of Materials, Part I, Van Nostrand, New York, NY (1955).

Timoshenko, S.: Strength of Materials, Part II, 3rd Edition, Van Nostrand, New York, NY (1963).

*Tirosh, J.: The Effect of Plasticity and Crack Blunting on the Stress Distribution in Orthotropic Composite Materials, J. Appl. Mech. Trans. ASME, 785-790 (September 1973).

*Tirosh, J. and Berg, C. A.: On the Shear Toughening by Stiff Fiber Reinforcement, Int. J. Fract. 9, No. 1, 1-18 (March 1973). Available as A74-12522.

Tirosh, J. and Stein, P.: The Elastic Interaction of a Crash with a Stiff Fiber in Mode III Loading, Int. J. Fract. 9, 363-365 (1973). Available as A74-12565.

Toth, I. J.: An Exploratory Investigation of the Time Dependent Mechanical Behavior of Composite Materials, AFML TR-69-9 (April 1969). Available as AD853544.

Toth, I. J.: Creep and Fatigue Behavior of Unidirectional and Cross-Plied Composites, Composite Materials: Testing and Design, ASTM STP-460, 236-253 (1969).

Toth, I. J., Brentnall, W. D., and Menke, G. D.: Environment, Application, Cost and Future (Composites), J. Metals, 37-42 (December 1972).

*Toth, I. J., Brentnall, W. D., and Menke, G. D.: Fabricating Aluminum Matrix Composites. A Survey of Aluminum Matrix Composites, J. Metals 24, 19-25 (September 1972). Available as A72-41996.

*Toth, I. J., Brentnall, W. D., and Menke, G. D.: Mechanical Properties of Aluminum Matrix Composites, J. Metals, 72-78 (November 1972).

Toth, I. J. and Shimmin, K. D.: Fatigue and Fracture of Metal-Matrix Composites, AFFDL-TR-70-144 (December 1969).

Toy, A.: Mechanical Properties of Be Filament Reinforced Aluminum Composites, J. Mater. 3, No. 1, 43 (March 1968).

Toy, A., Attridge, D. G., and Sinizer, D. I.: Development and Evaluation of the Diffusion Bonding Process as a Method To Produce Fibrous Reinforced Metal Matrix Composite Materials, AFML-TR-66-350 (November 1966).

Tsai, S. W.: Mechanics of Composite Materials, AFML-TR-66-149, I and II (1966). Available as N67-24003.

Tsai, S. W.: Structural Behavior of Composite Materials, NASA CR-71 (1964).

Tsai, S. W., Halpin, J. C., and Pagano, N. J.: Composite Materials Workshop, Technomic Publishing Co. (1968).

Tsai, S. W. and Wu, E.: A Generalized Theory of Strength for Anisotropic Materials, J. Compos. Mater. 5, 58-81 (1971).

Tressler, R. E. and Moore, T. E.: Mechanical Property and Interface Reaction Studies of Titanium-Alumina Composites, Metals Eng. Quart. (February 1971).

Turner, M. J.: Optimization of Structures To Satisfy Flutter Requirements, AIAA Journal 7, No. 5 (1969).

U

Upp, J. W., Pepper, R. T., Kendall, E. G. and Rossi, R. C.: High-Temperature Properties of Aluminum-Graphite Composites, Aerospace Corp. TR-0059 (6250-10)-9 SAMSO TR-408 (30 October 1970). Available as AD-718153.

V

Veltri, R. and Jacob, B.: Development of Large Diameter Carbon-Monofilament, NASA CR-121229 (1973).

Vicario, Jr., A. A.: Design and Analysis of Advanced Composite Chambers, AIAA Paper No. 76-190, AIAA Aerosp. Sci. Meet., 14th., Washington, DC (26-28 January 1976).

Vidoz, A. E., Camahort, J. L., and Crossman, F. W.: Development of Nitrided Boron Reinforced Metal Matrix Composites, J. Compos. Mater. 3, No. 2, 254-261 (April 1969). Available as A69-28671.

W

Waddoups, M. E.: Advanced Composite Material Mechanics for the Design and Stress Analyst, General Dynamics Report No. FZM-4763 (1967).

Waddoups, M. E., Eisenmann, J. R., and Kaminski, B. E.: Macroscopic Fracture Mechanics of Advanced Composite Materials, J. Compos. Mater. 5, 446-454 (October 1971). Available as A72-11983.

Waddoups, M. E., Jackson, S. K., and Rogers, C. W.: The Integration of Composite Structures Into Aircraft Design, J. Compos. Mater. 6, (April 1972).

Wadsworth, N. J. and Watt, W.: Some Preliminary Experiments on Improving the Bond Strength Between R. A. E. Carbon Fibers and Resins, RAE Technical Memo CPM 68 (1967).

*Wagner, N. J.: Review of Recent Developments Fiber-Reinforced Metals (6 January 1967). Available as AD-805016.

*Wakashima, K., Kawakubo, T. and Umekawa, S.: The Effect of Thermal History on the Axial Tensile Behavior of an Aligned Fiber Composite, Met. Trans. 6A, No. 9, 1755-1760 (September 1975).

Walsh, P. F.: Linear Fracture Mechanics in Orthotropic Materials, Eng. Fract. Mech. 4, No. 3, 533-542 (September 1972).

*Walter, J. L. and Cline, H. E.: Structures and Properties of Cobalt Base-TAC Eutectic Alloys. Met. Trans. 4, 1775-1784 (August 1973).

Warnes, L. A.: The Compatibility of Silicon Nitride Whiskers With Metalic Matrices at Elevated Temperatures, Explosives Research and Development Est., England. No. 17/R.65 (16 July 1965). Available as AD-477233.

Waters, W. J., Signorelli, R. A., and Johnston, J. R.: Performance of Two Boron-Modified S-816 Alloys in a Turbojet Engine Operated at 1650°F, NASA Memo 3-3-59E (1959).

Watterson, R. K.: High Compressive Stress, Low Cycle Fatigue of Composite Material, SM Thesis, Department of Ocean Engineering, MIT (May 1970).

Weeton, J. W.: Fiber Metal Composites, Syracuse Univ. Press (1966). Available as A67-13310.

Welge, R. T.: Application of Boron/Epoxy Reinforced Aluminum Stringers and Boron/Epoxy Skid Gear for the CH54B Helicopter Tail Cone. Phase 2: Fabrication Inspection and Flight Test, NASA CR-112101 (28 August 1972). Available as N72-29009.

Whitney, J. M.: Effects of Constituent Material Properties on the Stability of Fiber Reinforced Composite Plates, in Fundamental Aspects of Fiber Reinforced Plastic Composites, R. T. Schwartz and H. S. Schwartz, Eds., Interscience, New York, NY (1968).

Whitney, J. M: Experimental Determination of Shear Modulus of Laminated Fiber-Reinforced Composites, Exp. Mech. 7, No. 10, 447-448 (October 1967).

Whitney, J. M. and Riley, M. B.: Elastic Properties of Fiber Reinforced Composite Materials, AIAA Journal, 1537-1542 (September 1966).

Wilkining, W. W. and Backofen, W. A.: Deformation Processing of Anisotropic Metals, Final Report. Contract N00019-70-C-0071 (August 1970).

Wilkins, D. J. and Love, T. S.: Combined Compression-Torsion Buckling Test of Laminated Composite Cylindrical Shells, AIAA/ASME/SAE Struct., Struct. Kyn. Mater. Conf., 15th, Las Vegas, NV (17-19 April 1974). Available as AIAA Paper No. 74-379.

Williams, J. C. and Garmong, G.: Microstructural Studies of a Ni-W Directionally Solidified Eutectic Composite, Met. Trans. 6A, No. 9, 1699-1709 (September 1975).

Williams, R. S. and Reifsnider, K. L.: Investigation of Acoustic Emission During Fatigue Loading of Composite Specimens, J. Compos. Mater. 8, 340-355 (October 1974).

*Winsa, E. A. and Petrasek, D. W.: Pendulum Impact Resistance of Tungsten Fiber/Metal Matrix Composites, in Composite Materials: Testing and Design, Proc. ASTM Conf., 2nd, Anaheim, CA (20-22 April 1971). Available as A72-25473.

Withers, J. C.: The Fabricability of Multilayer Beryllium Wire Reinforced Aluminum Composites by Chemical Vapor Deposition, GTC Technical Report 155.5-1 (July 1968).

Withers, J. C. and Abrams, E. F.: The Electroforming of Composites, Plating, 605-611 (June 1968).

Wolff, E. G. and Hill R. J.: Research on Boron Filament/Metal Matrix Composite Materials, AFML-TR-67-140 (June 1967).

Wright, G. C.: The Dynamic Properties of Fiber Reinforced Plastic Beams, Institute of Sound and Vibration Research, Southampton, England, ISVR-TR-51 (September 1971). Available as N72-12926.

Wright, M. A.: The Effects of Elevated Temperatures on the Structural Properties of Fiber Composite Materials Suitable for Use in Space Shuttle and Other Space Vehicles (October 1972). Available as NASA CR-124369 and N73-30541.

*Wright, M. A. and Intwala, B. D.: The Effect of Elevated Temperatures on the Mechanical Properties of B-Al Composites, J. Mater. Sci. 8, 957-963 (1973).

Wu, E.: Fracture Mechanics of Anisotropic Plates, in Composite Materials Workshop, Technomic Publishing Co., Stamford, CT (1968).

Y

Young, J. H. and Carlson, R. G.: Advanced Composite Material Structural Hardware Development and Testing Program, AFML-TR-70-140 (July 1970).

Zimmer, J. E.: Fracture Mechanics of a Fiber Composite, J. Compos. Mater. 6 (1972).

Zweber, C.: An Approximate Method of Analysis for Notched Unidirected Composites, Eng. Fract. Mech. 6, No. 1 1-10 (March 1974).

Zweben, C.: On the Strength of Natched Composites, J. Mech. Phys. Solids 19, 103-116 (1971).

Zweben, C.: A Bounding Approach to the Strength of Composite Materials, Eng. Fract. Mech. 4, No. 1, 1-8 (March 1972).

PROBLEM AREA 7

NDE (Nondestructive Evaluation) - The objective is to identify documents pertaining to the nondestructive testing of aircraft structures or related structural testing and the reliability of the more commonly used evaluation methods.

NDE (NONDESTRUCTIVE EVALUATION)

A

Abbott, N. S.: Effect of Mechanical Processing Upon Penetrant Inspection Sensitivity, TIS Number CP020GF012.20, Report MDC A1181, McDonnell Aircraft Company (June 1971).

Agarwal, A. B. L.; Frederick, J. R., and Felbeck, D. K.: Detection of Plastic Microstrain in Aluminum by Acoustic Emissions, Met. Trans. 1, No. 4, 1069 (April 1970).

Alburger, J. R.: A Closed-Loop Water-Washable Inspection Penetrant System, ASNT Spring Meet., Los Angeles, CA (March 1974).

Alburger, J. R.: Dimensionable Transition Effects in Visible Color and Fluorescent Dyed Liquids, Annu. Corp. Instrument Soc. Amer., 23rd, New York, NY (October 1968).

Alburger, J. R.: Instruments and Test Methods as Employed in an Inspection Penetrant Material Specification, Symp. Nondestructive Evaluation, 9th, San Antonia, TX (April 1973).

Alburger, J. R.: Measurement and Control of Penetrant Indication Stability ASNT Spring Meet., Los Angeles, CA (March 1972).

*Alburger, J. R.: The New Science of Inspection Penetrants, Prevention of Structural Failure - The Role of Quantitative Nondestructive Evaluation Amer. Soc. Metals/Materials Metalworking Technol. Series No. 5, 17-36 (1975).

Alburger, J. R.: A New, Significant Penetrant Parameter - Indication Depletion Time Constant, Proc. ASNT Spring Conf., Los Angeles, CA (1973).

Alburger, J. R.: Signal-to-Noise Ratio in the Inspection Penetrant Process, ASNT Fall Meet., Chicago, IL (October 1973).

Alburger, J. R.: A Simplified Method of Dimensional Sensitivity Measurement for Inspection Penetrants, ASNT Spring Meet. (March 1969).

*Alers, G. A.: Major Problem Areas - Metal and Alloy Systems, AFML-TR-73-69, (April 1973).

*Alers, G. A.: Measurement of Hardness vs. Depth Contours by Ultrasonic Velocity, Proc. Conf. Automated Inspection and Product Control at IITRI (15-17 October 1974).

Alers, G. A. and Liu, Y. C.: Calculation of Elastic Anisotropy in Rolled Sheet, Trans. ASME 236, No. 4, 482-489 (April 1966).

Alers, G. A. and Nadler, H.: Rockwell Science Center, Technical Report SCTR-71-8 (August 1971).

Alexander, J. A.: Research on Boron Reinforced Metal Matrix Composites, AFML-TR-67-101 (June 1967).

Allen, R. E. and Perkins, R. J.: Strengthening Fe-Cr-Al-V Oxidation Resistant Alloys, NASC Contract N00019-72-C-0271 (1972).

Alzofon, F. E.: The Relative Contributions of Emissivity and Thermal Conductivity in Nondestructive Testing, Trans. of Infrared Sessions, ASNT Spring Conf. (1965).

Alzofon, F. E. and Rohr, W. A.: Detection of Flaws in Adhesive-Bonded Metallic Honeycomb by Infrared Nondestructive Testing, ASNT Spring Conf. (1966).

American Society for Nondestructive Testing, Recommended Practice No. SNT-TC-1A for Personnel Qualification and Certification in Nondestructive Testing (June 1975).

Andrews, H. C.: Computer Techniques in Image Processing, Academic Press, New York, NY (1970).

Anderson, R. T.: Eddy Current Testing, Prevention of Structural Failure - The Role of Quantitative Nondestructive Evaluation, Amer. Soc. Metals Materials/Metalworking Technol. Series No. 5, 54-67 (1975).

*Anderson, R. T., DeLacy, T. J., and Stewart, R. C.: Detection of Fatigue Cracks by Nondestructive Testing Methods, NASA CR-128946 (March 1973).

Anderson, T. T., Gavin, A. P., Karvinen, J. R., Price, C. C., and Reimann, K. J.: Detecting Acoustic Emission in Large Liquid Metal Cooled Fast Breeder Reactors, in Acoustic Emission, ASTM STP-505, 250-269 (1972).

Apple, W. R.: Infrared Nondestructive Inspection - A Status Report, Mater. Res. Stand. (May 1969).

Aprahamian, R. and Bhuta, P. G.: NDT by Acousto-Optical Imaging, Mater. Eval. 29, No. 5, 112-116 (May 1971).

*Arndt, W. R. and Krenzer, J. L.: Investigation of the Application of Coherent Acoustic Imaging to Nondestructive Testing, AMMRC-CR-70-14 (April 1970). Available as AD-711085.

* Arndt, W. R. and Kreuzer, J. L.: Investigation of the Application of Coherent Acoustic Imaging to Nondestructive Testing, AD-750184 (April 1971).

Arnold, J. S.: Development of Nondestructive Tests for Structural Adhesive Bonds, WADC Tech. Report 54-231, Part 3 (April 1965).

Auld, B. A.: Acoustic Waves in Fields of Solids, Wiley Interscience, New York, NY (1973).

Bailey, C. D. and Pless, W. M.: Acoustic Emission Used to Nondestructively Determine Crack Locations in Aircraft Structure Fatigue Specimens, Symp. NDT, 9th, San Antonio, TX (April 1973).

Bailey, W. H. and Kraska, L. H.: Penetrant Brightness Measurement Test, AFML-TR-70-141 (July 1970).

Baker, G. S.: Acoustic Emission and Prefracture Processes in High-Strength Steels, AFML-TR-67-266 (March 1968).

*Balderston, H. L.: The Broad Range Detection of Incipient Failure Using the Acoustic Emission Phenomena, Acoustic Emission, ASTM STP-505, 297-317 (1972).

Barton, J. R. and Lankford, J.: Magnetic Perturbation Inspection of Inner Bearing Races, NASA CR-2055 (May 1972).

Baxter, W. J.: A Study of Plastic Deformation by Exoelectron Emission, Vacuum 22, No. 11, 571 (1972).

Beachem, C. D.: A New Model for Hydrogen Assisted Cracking, Met. Trans. 3, 437 (1972).

Beal, J. B.: Ultrasonic Emission Detector Evaluation of Strength of Bonded Materials, in Nondestructive Testing: Trends and Techniques, NASA SP-5082 (1967).

Beal, J. B. and Brown, R. L.: Advanced Radiographic Imaging Techniques, Mater. Eval. 31, 133-144 (1973).

Belcher, C. B. and Bray, A. H.: Determination of Magnesuim in Iron by Atomic Absorption Spectrophotometry, Analytica Chemica Acta 26, 322 (1962).

Benson, R. W.: Development of Nondestructive Methods for Determing Residual Stress and Fatigue Damage in Metals, Final Report, Contract NAS 8-20208 (1968).

Bentley, P. G., Burton, E. J, Cowan, A., Dawson, D. G., and Ingham, T.: Acoustic Emission and Pressure Vessel Failure, Proc. ASME Int. Conf. Pressure Vessel Technology, 2nd, San Antonio, TX, 643-654 (October 1973).

Benton, E. V., Henke, R. P., and Tobias, C. A.: Heavy-Particle Radiography Science 182, 474-476 (November 2, 1973).

*Berger, H.: A Television System for Ultrasonic Imaging, Argonne National Lab. Report ANL-7042 (1966).

Berger, H.: Neutron Radiography, Elsevier Pub. Co., Amsterdam (1965).

Berger, H.: Neutron Radiography, in Res. Techniques in Nondestruct. Test., Academic Press, New York, NY (1970).

Berger, H.: Nondestructive Measurements: How Good Are They?, Mehl Honor Lecture presented at ASNT Fall Conference, Atlanta, GA (October 13, 1975).

*Berger, H.: Radiographic Nondestructive Testing, ASTN Stand. News 3, No. 3, 21-28 (March 1975).

*Berger, H.: The Present State of Neutron Radiography and Its Potential, Mater. Eval. 30, No. 3, 55-65 (March 1972).

Berger, H.: Ultrasonic Imaging Systems for Nondestructive Testing, J. Acoust. Soc. Amer. 45, No. 4, 857-867 (April 1969).

Berger, H. and Dickens, R. E.: A Review of Ultrasonic Imaging Methods, with a Selected Annotated Bibliography, Argonne National Lab. Report ANL-6680 (1963).

Berger, H. and Motz, J. W.: A Qualitative Discussion of Quantitative Radiography, in Prevention of Structural Failure - The Role of Quantitative Nondestructive Evaluation, Amer. Soc. Metals Materials/ Metalworking Technol. Series 5, 37-53 (1975).

*Betz, C. E.: Principles of Magnetic Particle Testing, Magnaflux Corp., Chicago, IL (1966).

*Betz, C. E.: Principles of Penetrants, Magnaflux Corp., Chicago,IL (1963).

*Beyer, N. S. and Staroba, J. S.: Research and Development in Color Radiography, Mater. Eval. 26, No. 8, 167-172 (1968).

Bill, R. C.: An Acoustic Emission Study of the Deformation Mechanisms of Polycrystalline Aluminum and Copper, PhD Thesis, Univ. Michigan, Ann Arbor (1970).

*Bill, R. C. and Frederick, J. R.: Use of Acoustic Emission in Nondestruct Testing, Univ. Michigan Report 01971-4-P, AFSC Contract F33615-68-C-1703 (1970).

*Birchfield, E. B., Cole, R. T., and Impellizzeri, L. F.: Reliability of Step-Lap Bonded Joints, AFFDL-TR-75-26 (April 1975).

Birchon, D., Dukes, P., and Taylor, J.: Some Aspects of Defect Location and Assessment in Pressure Vessels Using Acoustic Emission Techniques, Proc. ASME, 2nd, San Antonio, TX, 699-684 (October 1973).

Birks, L. S.: Electron Probe Micoranalysis, John Wiley Interscience Publishers, Easton, PA (1963).

Bishop, C. R.: Nondestructive Evaluation of Fatigue Cracks, Rockwell International-Space Division SD73-SH-0219, (September 1973).

Bogachev, I. N., Mints, R. I., and Kortov, V. S.: Application of the Method of Exoelectron Emission in Metal Science, Metal Sci Heat Treatment, 591 (July - August 1966).

*Bogart, H. G.: Cost/Effectiveness in Nondestructive Testing, Mater. Eval. 26, No. 3, 23A-26A (March 1968).

Bohun, A.: Exoelektronenemission Von Ionenkristallen, Phy. Stat. Sol 3, 779 (1963).

Bohun, A.: L'emission Exoelectronique des Corps Solides, J. Physique 26, 149 (1965).

Boll, K. G.: Advanced Composite Engine Development Program, AFML-TR-72-108 (July 1972).

Bolstad, D. A., Davis, R. A., Quist, W. E. and Roberts, E. G.: Measuring Stress in Steel Parts by X-Ray Diffraction, Metal Prog. 84, No. 1, 88-124 (1963).

Botsco, R. J.: Acoustical Testing of Honeycomb Structure from One Accessible Side (Resonance Technique), NAA Report CD-3804 (2 June 1964).

*Botsco, R. J.: Nondestructive Testing of Composite Structures with the Sonic Resonator, Mater. Eval. 24, No. 11, 617-623 (November 1966). Available as A67-12630.

Botsco, R. J.: Nondestructive Testing of Plastics with Microwaves, Plastics Design and Processing, Part 1 (November 1968).

Botsco, R. J.: Eddy-Sonic Test Method, Mater. Eval. 26, No. 2, 21 (February 1968).

Bratton, R. J. and Holden, A. N.: Ceramic Progress in Gas Turbines for Power Generation, In Ceramics for High Performance Applications, Brook Holl Pub. Co., Chestnut Hill, PA (1974).

Brenden, B. B.: Acoustical Holography as a Tool for Nondestructive Testing, Mater. Eval. 27, No. 6, 140-144 (June 1966).

Brentnall, W. D., Klein, M. J. and Metcalfe, A. G.: Tungsten Reinforced Oxidation Resistant Colombian Alloys, Final Report, NASC Contract N00019-69-C-0137 (1969).

*Brentnall, W. D. and Toth, I. J.: Metal Matrix Composites for High Temperature Turbine Blades, TRW Systems Report ER-7634-F (April 29, 1974). Available as DA-782398.

Breynat, G. and Dubus, M.: Utilization of Small Accelerator Neutron Generators in Neutron Radiography, Mater. Eval. 27, No. 10, 220 (October 1969).

*Bridges, W. H. and McClung, R. W.: Computerized Information Retrieval - For Nondestructive Testers a Nondestructive Memory, Mater. Eval. 27, No. 9, 199-204 (September 1969).

Bridges, W. H. and Pilloton, R. L.: A Thesaurus of Keywords on Nuclear Fuel Technology, ORNL-TM-1285 (November 1965).

Brosens, P. J., Hakimi, N. A. G., and Khabbaz, G. R.: Detection of Fatigue Damage with Rayleigh Waves, ARL-TR-60-307 (August 1960).

Brotzen, F. R.: Emission of Exoelectrons from Metallic Materials, Phys. Stat. Sol. 22, 9 (1967).

Brown, S. P.: Cholesteric Crystals for Nondestructive Testing, Proc. ASNT Symp. on NDT of Welds and Materials Joining (1968).

Brown, T. A.: Reconstructing Trianages from Thickness Functions, Rand Report RM-5199-PR (November 1966).

Brown, W. D.: X-Ray Attenuation and Absorption Coefficients, Boeing Co. Report D1-125065-1 (1966).

Bryant, L. E.: Flash Radiography of Electron Beam Welding, Mater. Eval. 29, No. 10, 237-240 (1971).

*Buchanan, J. R. and Hutton, F. C.: Analysis and Automated Handling of Technical Information at the NSIC, Nuclear Safety 8, 95-102 (1966-1967).

Buchanan, R. A.: Analysis of Test Data on PVRC Specification No. 3, Ultrasonic Examination of Forgings, Revisions I and II (January 14, 1974).

Buchanan, R. A. and Talbot, T. F.: Analysis of ND Examination of PVRC Plate-Weld Specimen 251J (May 21, 1973).

Burrows, M. L.: A Theory of Eddy Current Flaw Detection, University Microfilms, Inc. Ann Arbor, MI (1964).

*Bushnell, J. C.: Correlation of NDT and Mechanical Properties, in Proc. Conf. on Automated Inspection and Product Control, IITRI (14-17 October 1974).

Byler, W. H. and Hays, F. R.: Fluorescence Thermography, Mater. Eval. 19, No. 3, 177 (March 1961).

C

Campbell, W. J.: Energy Dispersion X-Ray Analysis Using Radioactive Sources, in X-Ray and Electron Methods of Anal., Progr. Anal. Chem. 1, 36-54 (1968).

Carpenter, Jr., J. L. and Stuhrke, W. F.: Hydrogen Embrittlement of Structural Alloys - A Technology Survey, NASA CR-134962 (June 1976).

Carpenter, Jr. J. L. and Stuhrke, W. F.: NDE - An Effective Approach to Improved Reliability and Safety - A Technology Survey, NASA CR-134963 (June 1976).

*Carter, J. J.: Nondestructive Detection and Evaluation of Stress Corrosion Cracking, Proc. Tewksbury Symp. Fracture, Effects of Chemical Environments of Fracture Processes, 3rd, Melbourne, Australia (June 4-6, 1974).

Caustin, E. L.: B-1 USAF/Rockwell International NDI Demonstration Program, Los Angeles Division (1972-1973).

*Caustin, E. L.: Impact of NDT Materials Characterization on Design, Manufacture and Repair, AFML-TR-73-69, 198-225 (April 1973).

*Caves, R. M. and Grissaffe, S. J.: Electron and Ion Microprobes Applied to Characterize and Aluminide Coating on IN-100, NASA TN-D-6317 (May 1971).

*Chambers, R. H. and Hoenig, S. A.: New Techniques in Nondestructive Testing by Acoustical and Exo-Electron Emission, AD-691230 (February 1969).

Champagne, E. and Kersch, L. A.: Control of Holographic Interferometric Fringe Patterns, J. Optical Soc. Amer. 59, 1535A (November 1969).

Chick, B., Hikata, A., Anderson, G., Findley, W., Elbaum, C., and Truell, R.: Ultrasonic Methods in the Study of Fatigue and Deformation in Single Crystals, ASD-TDR-62-186-PT.2 (April 1963).

Chretien, N., Bernard, P., and Barrachin, B.: Inspection of Steel Pressure Vessels by Acoustic Emission, in Proc. ASME Int. Conf. Pressure Vessel Technol., 2nd, San Antonio, TX (October 1973).

Chuang, K. C.: Application of the Optical Correlation Measurement to Detection of Fatigue Damage, Mater. Eval. 26, No. 6, 116 (June 1968).

*Chuang, K. C. and Marom, E.: Feasibility of Using Optical Correlation Technique for Detecting Impending Fatigue Failure, AD-690 216 (April 1969).

Clark, Jr., W. G.: Ultrasonic Detection of Crack Extension in the W.O.L. Type Fracture Toughness Specimen, Mater. Eval. 25, No. 8, 185 (August 1967).

Clark, Jr., W. G. and Ceschini, L. J.: An Ultrasonic Crack Growth Monitor, Mater. Eval. 27, No. 8, 180 (August 1969).

Clayton, R. N., Gragg, J. E., and Brotzen, F. R.: Electron Emission from Aluminum after Quenching, J. Appl. Phys. 37, 149 (1966).

Clemens, R.: Application of NDT for Adhesive-Bonded Structures for F-5 and T-38 Aircraft, in Proc. AFML-Aerospace Conf. NDT Compos. Structures, Dayton, OH (March 1969).

*Coleman, W. J., Reich, F. R., Erickson, M. D., and Kelly, W. S.: On-Line Automatic High Speed Inspection of Cartridge Cases, ASTM Stand. News 3, 31-34 (March 1975).

*Collins, R. V.: The Role of NDT in an Electric Utility, Mater. Eval. 30, No. 8, 174-180 (1972).

*Collins, R. V.: Significant Reduction in Utility Maintenance Costs Through Ultrasonics, Mater. Eval. 24, No. 2, 109-110 (February 1966).

Cook, J. F.: Eddy Current Crack Detection in Fastener Holes, Report H177, McDonnell Aircraft Co., St. Louis, MO (31 March 1969).

Cook, J. L.: Development of Nondestructive Test Techniques for Multi-directional Fiber Reinforced Resin Matrix Composites, AFML-TR-70-239 (February 1971).

*Cook, J. L., Reinhardt, W. W., and Zimmer, J. E.: Development of Non-destructive Test Techniques for Multidirectional Fiber Reinforced Resin Matrix Composites, AFML-TR-71-187 (October 1971). Available as-746592.

*Cooper, T. D.: Operational Demands for NDT Systems, AFML-TR-73-69, 109-170 (April 1973).

Corle, R. R.: The Use of Acoustic Emission to Improve Motor Case Reliability, Reprint No. 73-1258, AIAA/SAE Propulsion Conf., 9th, Las Vegas, NV (1973).

*Corle, R. R. and Schliessmann, J. A.: Flaw Detection and Characterization using Acoustic Emission, Mater. Eval. 31, No. 6, 115-120 (June 1973).

Corten, H. T.: Fracture Mechanics of Composites, in Fracture 7, 675 (1972).

Couchman, J. C., Yee, B. G. W., and Chang, F. H.: Energy Partitioning of Ultrasonic Waves Beyond the Critical Angle at Flat Boundaries, Ultrasonics (March 1974).

*Couchman, J. C., Yee, B. G. W., and Chang, F. H.: The Role of the Digital Computer in NDE, in Prevention of Structural Failure - The Role of Quantitative Nondestructive Evaluation, Amer. Soc. Metals Materials/ Metalworking Technol. Series 5, 37-53 (1975).

Cox, C. W.: Data Handling Techniques, in Techniques in Nondestructive Testing, R. S. Sharpe, Ed., Academic Press, New York, NY (1970).

Crewe, A. V.: The Potentials of Scanning Microscopy, Proc. Electron Microscopy Soc. Amer. 26, 352 (1968).

Cribbs, R.: Microwaves in NDT, in Proc. AFML-Aerospace Conf. NDT of Compos. Structures, Dayton, OH (March 1969).

Crites, N. A.: Grover, H., and Hunter, A. R., Experimental Stress Analysis by Photoelastic Techniques, Prod. Eng. 33, No. 18, 57-69 (September 1962).

Cross, N. O.: Status of Acoustic Emission as a Nondestructive Testing Technique for Pressure Vessels, ASME Petrolum Mechanical Engineering Conf., 27th, New Orleans, LA (September 1972).

*Cross, N. O., Loushin, L. L., Thompson, J. L.: Acoustic Emission Testing of Pressure Vessels for Petroleum Refineries and Chemical Plants, ASTM STP-505, 270-296 (May 1972).

Cross, B. T., and Tooley, W. M.: Advancement of Ultrasonic Techniques Using Reradiated Sound Energies for Nondestructive Evaluation of Weldments, Automation Industries, Inc. Report TR-67-53, Boulder, CO (August 1967).

Crowe, J. C., Libby, H. L. and Storpik, J. R. : Application of the Eddy Current Method to High Speed Thickness Measurement, Proc. Symp. NDE, 9th, San Antonio, TX (25-27 April 1973).

Cutforth, D. C.: Dimensioning Reactor Fuel Specimens from Thermal Neutron Photographs, Nuclear Technol. 18, No. 1, 67-70 (1973).

Cutforth, D. C.: On Optimizing an Sb-Be Source for Neutron Radiographic Applications 26, No. 4, 49 (April 1963).

D

*Davis, R. L.: The Computer Can't Replace the Inspector, in Proc. Conf. on Automated Inspection and Product Control, IITTI (14-17 October 1974).

Day, C. K.: An Investigation of Acoustic Emission for Defect Formation in Stainless Steel Weld Coupons, Battelle Report BNWL-902 (1968).

*Deak, C. K.: Internal Standard Method for the Rapid Identification of Metals by Atomic Absorption Spectrophotometry, Mater. Res. Stand. 10, No. 11, 12-13 and 36-37 (November 1970).

*Der Boghosian, S.: A Report Guide to Radiographic Testing Literature, AD-749258 (June 1972).

*Deveraux, H. R. and Robinson, D. L.: The Application of Acoustic Techniques for Integrity Analysis of Piping, in Prevention of Structural Failure - The Role of Quantitative Nondestructive Evaluation, ASM Materials/Metalworking Technol. Series No. 5, 204-214 (1975).

*DiBenedetto, A. T., Gauchel, J. V., Thomas, R. L., and Barlow, J. W.: Nondestructive Determination of Fatigue Crack Damage in Composites Using Vibration Test, J. Mater. 7, 211-215 (June 1972).

Dodd, C. V.: Solutions to Electromagnetic Induction Problems, Oak Ridge Lab. Report ORNL-TM-1842 (1967).

Dodd, C. V. and Deeds, W. E.: An Infrared Microscope System for the Detection of Internal Flaws in Solids, ASNT Spring Conf., Los Angeles, CA (13 March 1969).

Dodd, C. V., Deeds, W. E., and Luquire, J. W.: Integral Solutions to Some Eddy Current Problems, Int. J. Nondestruct. Test. 1, No. 1, 29-90 (1968).

*Dodd, C. V., Deeds, W. E., and Spoeri, W. G.: Optimizing Defect Detection in Eddy Current Testing, Mater. Eval. 29, No. 3, 59-63 (March 1971).

Dunegan, H. L.: Incipient Failure Diagnosis by Use of Acoustic Emission, Meet. Mechanical Failures Prevention Group, 11th, Williamsburg, VA (April 1970).

*Dunegan, H. L.: Quantitative Capabilities of Acoustic Emission for Predicting Structural Failure, in Prevention of Structural Failure - The Role of Quantitative Nondestructive Evaluation, Amer. Soc. Metals, Material/Metalworking Technol. Series No. 5, 86-113 (1975).

Dunegan, H. L. and Green, A. T.: Factors Affecting Acoustic Emission Response from Materials, Mater. Res. Stand. 11, No. 3, 21 (1971).

Dunegan, H. L. and Green, A. T.: Factors Affecting Acoustic Emission Response from Materials, Acoustic Emission, ASTM STP-505, 100-113 (1972).

Dunegan, H. L. and Harris, D. O.: Acoustic Emission - A New Nondestructive Testing Tool, Lawrence Radiation Lab., Report UCLA-70760 (January 1968).

Dunegan, H. L. and Harris, D. O.: Acoustic Emission - A New Nondestructive Testing Tool, Proc. Annual. Symp. NDT of Welds and Materials Joining, 3rd, Los Angeles, CA (March 1968).

Dunegan, H. L. and Harris, D. O.: Acoustic Emission-A New Nondestructive Testing Tool, Ultrasonics 7, No. 3, 160-166 (July 1969).

Dunegan, H. L., Harris, D. O., and Tatro, C. A.: Fracture Analysis by Use of Acoustic Emission, Eng. Fract. Mech. 1, No. 1, 105-122 (June 1968).

*Dunegan, H. L., Harris, D. O., and Tetelman, A. S.: Detection of Fatigue Crack Growth by Acoustic Emission Techniques, Mater. Eval. 28, No. 10, 221-227 (October 1970).

Dunegan, H. L., Harris, D. O., and Tetelman, A. S.: Detection of Fatigue Crack Growth by Acoustic Emission Techniques, Proc. Symp. Nondestruct. Eval. Components Mater. Aerospace Weapons Systems, Nucl. Appl., 7th, ASNT and Southwest Research Inst., San Antonio, TX 20-31 (1969).

Dunegan, H. L. and Tetelman, A. S.: Acoustic Emission. Res. Devel.(May 1971).

Dunegan, H. L. and Tetelman, A. S.: Nondestructive Characterization of Hydrogen Embrittlement Cracking by Acoustic Emission Techniques, Eng. Fract. Mech. 2, No. 4, 387-402 (June 1971).

Dyer, C. H. and Criscuolo, E. L.: Measurement of Spatial Frequency Response of Certain Film Screen Combinations to 10 - Mev X-Rays, Mater Eval. 24, No. 11, 631-634 (November 1966).

E

Ehret, R. M.: Fracture Control Methods for Space Vehicles, Rockwell International Report SD-73-SH-0171-1-2 (January 1974).

*Ehret, R. M.: Fracture Control Methods for Space Vehicles: Vol. 2 Assesment of Fracture Mechanics Technology for Space Shuttle Applications, NASA CR-134597 (August 1974). Available as N74-35280.

Elber, W.: The Significance of Fatigue Crack Closure, ASTM STP-486, 230 (1971).

Elkins, J. D., Sachs, R. D., and Austin, L. A.: An Investigation of Ultrasonic Data Analysis Using a Multichannel Analyzer or Equivalent Circuitry, Union Carbide Corp., Oak Ridge, TN (December 1969).

*Ellerington, H.: Ultrasonic Reference Standards Key to Reliable Ultrasonic Inspection, Mater. Eval. 28, No. 11, 251-256 (November 1970).

Elliott, J. G.: An Investigation of Ultrasonic Goniometry Methods Applied to Carbon Fibre Composite Materials, AERE Report NDT 64 (1973).

Engle, R. B. and Dunegan, H. L.: Acoustic Emission: Stress Wave Detection as a Tool for Nondestructive Testing and Material Evaluation, Int. J. Nondestruct. Test. 1, No. 1, 109 (1969). Also available as Lawrence Radiation Lab Report UCRL-71267 (September 1968).

Erf, R. K: Holographic Nondestructive Testing, Academic Press, New York, NY (1974).

Erf, R. K., Waters, J. P., Gagosz, R. M., Micheal, R., and Whitney, G.: Nondestructive Holographic Techniques for Structural Inspection, AFML-TR-72-204 (October 1972).

*Erf, R. K., Gagosz, R. M., Waters, J. P., Stetson, K. A., and Aoas, H. G.: Nondestructive Holographic Techniques for Structures Inspections, AFML-TR-74-130 (October 1974).

Evangelides, J. S. and Meyer, R. A.: Investigation of the Properties of Carbon-Carbon Composites and Their Relationship to Nondestructive Test Measurements, AFML-TR-70-213 (January 1971).

Evans, A. G.: Fracture Mechanics Determinations, in Fracture Mechanics of Ceramics, 1. Concept, Flaw and Fractography, Plenum Press (1974).

Evans, A. G. and Fuller, E. R.: Crack Propagation in Ceramic Materials Under Cyclic Loading Conditions, Met. Trans. 5, 27-33 (1974).

Evans, A. G. and Wiederhorn, S. M.: Crack Propagation and Failure Prediction in Silicon Nitride at Elevated Temperatures, J. Mater. Sci. 9, 270-278 (1974).

Evans, A. G. and Wiederhorn, S. M.: Proof Testing of Ceramic Materials - An Analytical Basis for Failure Prediction, NBS Report NBSIR-73-147 (March 1973). Available also as AD-759373.

F

Fassel, V. A. and Mossotti, V. G.: Atomic Absorption Spectra of Vanadium, Titanium, Niobium, Scanduim, Yttrium and Rhenium, Analytical Chem. 35, 252 (1963).

*Fate, W. A.: Pulsed Ultrasonic Measurements in Ceramic Materials at High Temperatures, in Ceramics for High Performance Applications, 687-695, Brook Hill Pub. Co., Chestnut Hill, MS (1974).

Feddersen, C. E.: Fatigue-Crack Propagation in D6AC Steel Plate for Several Flight Loading Profiles in Dry Air and JP-4 Fuel Environments, AFML-TR-72-20 (January 1972).

Ferusic, S.: Determination of the Fatigue Strength of Welded Joints with Artificial Flaws by Radiographic Examination, Materialpruefung 15, No. 5, 157-160 (1973).

Feinstein, L. and Hruby, R. J.: Surface Crack Detection by Microwave Methods Symp. on Nondestructive Evaluation of Aerospace and Weapons Systems Components and Materials, 6th, San Antonia, TX (17-19 April 1967).

Fitch, C. E.: Acoustic Emission Signal Analysis in Flat Plates, Battelle Report BNWL-1008 (1969).

*Fletcher, E. E. and Elsea, A. R.: Hydrogen Movement in Steel - Entry Diffusion and Elimination, DMIC Report 219 (June 1966).

Foerster, F.: New Results of NDT by the Magnetic Leakage Field Method, Nondestruct. Test. 4, No. 4, 154-259 (1971).

*Fontana, M. G. and Graff, K. F.: Corrosion Cracking of Metallic Materials: Part II - Acoustic Emission Experiment and Theory, AFML-TR-72-102-PT2 (August 1972).

Foster, B. E. and Evans, J. W.: X-Ray Mass Attenuation Coefficients in the Range of 50 to 150 kVp, Nondestructive Testing (ASNT Journal) 21, 51 (January-February 1963).

*Fowler, K. A. and Papadakis, E. P.: Observation and Analysis of Simulated Ultrasonic Acoustic Emission Waves in Plates and Complex Structures, in Acoustic Emission, ASTM STP-505, 222-237 (1972).

Frank, L. M. and Kubiak, E. J.: Nondestructive Methods of Development for the Evaluation of Thin and Ultrathin Sheet Materials, AFML-TR-67-276 (July 1967).

*Frankel, H.: Improvement of Eddy Current Inspection, Watervliet Arsenal (NY) Report WVT-6941 (October 1969).

*Frederick, J. R.: Acoustic Emission as a Technique for Nondestruct Testing, Mater. Eval. 28, No. 2, 43-47 (February 1970).

Frederick, J. R., Ultrasonic Engineering, John Wiley and Sons, Inc., New York, NY (1965).

Frederick, J. R.: Use of Acoustic Emission in Nondestructive Testing, Michigan Univ. Report 01971-1P (May 1969).

Frederick, J. R.: Use of Acoustics in Nondestructive Testing Michigan Univ. Report 01971-2-T (November 1969).

Frederick, J. R.: Use of Ultrasonic Surface Waves in the Determination of Residual Stress in Metals, J. Acoust. Soc. Amer. 32, 1499 (November 1960).

*Frederick, J. R. and Feldbeck, D. K.: Dislocation Motion as a Source of Acoustic Emission, in Acoustic Emission, ASTM STP-505, 129-139 (1972).

*Fry, W. J. and Dunn, F.: Ultrasonic Absorption Microscopy and Spectroscopy Proc. Symp. Phys. Nondestructive Testing, Southwest Res. Inst., San Antonio, TX, 33-57 (1962).

Frederick, S. F.: Service Life of Reusable Structures Based on NDT, McDonnell Douglas Astronautics Report MDC-G2668 (December 1971).

G

Gardner, C. G.: Radiography in Nondestructive Testing - A Survey, NASA SP-5113, Southwest Research Institute (1973).

Gardner, C. G. and Barton, J. R.: Recent Advances in Magnetic Field Methods of Nondestructive Evaluation for Aerospace Applications, Proc. Conf. AGARD, No. 64 - Advanced Technology for Production of Aerospace Engines, 18-1 - 18-g (1970).

*Gardner, C. G. and Kusenberger, F. N: Quantitative Nondestructive Evaluation by the Magnetic Field Pertubation Method, in Prevention of Structural Failure - The Role of Quantitative Nondestructive Evaluation, Amer. Soc. Metals/Materials Metalworking Technol. Series No. 5, 67-85 (1975).

Gause, R. L.: Ultrasonic Analysis of Cold-Rolled Aluminum, in Nondestructive Testing, Trends and Techniques, NASA SP-5082 (1967).

Gerberich, W. W. and Hartbower, E. C.: Monitoring Crack Growth of Hydrogen Embrittlement and Stress Corrosion Cracking by Acoustic Emission, Pro. Conf. Fundam. Aspects Stress Corros. Cracking, Ohio State Univ., Columbus,OH (1967).

Gerberich, W. W. and Hartbower, C. E.: Some Observations on Stress-Wave Emission as a Measure of Crack Growth, Int. J. Fract. Mech. 3, 3 (September 1967).

*Gericke, O. R.: Overview of Nondestructive Inspection Techniques, in Fracture Mechanics of Ceramics--Concepts, Flaws, and Fractography, Plenum Pub., New York, NY (1974).

Gericke, O. R.: Ultrasonic Spectroscopy, in Research Techniques in Nondestructive Testing, Academic Press, New York, NY (1970).

Gericke, O. R. and Grubinskas, R. C.: Utilization of the Liquid Surface Levitation Effect as a Means of Ultrasonic Image Conversion for Materials Inspection, J. Acoust. Soc. Amer. 45, 872-880 (April 1969).

*Gibson, J. A.: Review of Nondestructive Testing Techniques for Detecting Lack of Penetration in Aluminum Fusion Welds, Redstone Arsenal Report RSIC-701 (October 1967).

*Gillis, P.P.: Dislocation Motions and Acoustic Emissions, in Acoustic Emission, ASTM STP-505, 20-29 (1972).

Gonzalez, H. M. and Cagle, C. V.: Nondestructive Testing of Adhesive Bonded Joints, Pacific Area Nat. Meet., 4th, (October 4, 1962).

*Goldspiel, S.: The Need for a Quantitative Approach to Nondestructive Testing, Mater. Eval. 23, No. 5, 224-242 (May 1965).

Gopal, R.: Final Report of Westinghouse Participation in Acoustic Emission Tests at the EBOR Site, EEI-TVA Rp79 Addendum Report, 49-88 (May 1973).

Graham, L. J. and Alers, G. A.: Investigation of Acoustic Emission from Ceramic Materials, AD745000 (May 1972). Available as N73-10575.

*Graham, L. J. and Alers, G. A.: Microstructural Aspects of Acoustic Emission Generation in Ceramics, in Fracture Mechanics of Ceramics--Concepts, Flaws and Fractography, Plenum Pub., New York, NY (1974).

Graham, L. J. and Alers, G. A.: Spectrum Analysis of Acoustic Emission in A533-B Steel, Mater. Eval. 32, No. 2, 31-37 (February 1974).

Grala, E. M.: Characterization of Alpha Segregation Defects In Titanium 6Al-4V Alloy, AFML TR-68-304 (1968).

Green, A. T.: Detection of Incipient Failures in Pressure Vessels by Stress-Wave Emissions, Nucl. Safety 10, 4-18 (January-February 1969).

*Green, A. T.: Development of Nondestructive Testing Technique to Determine Flaw Criticality, AD-859314 (August 1969).

Green, A. T.: Stress Wave Detection in Saturn S-II, NASA CR-61161 (December 1966).

Green, A. T.: Stress Wave Emission and Fracture in 6AL-4V Titanium, Metals Eng. Quart. 11, 61 (1971).

Green, A. T. and Hartbower, C. E.: Stress Wave Analysis Technique for Detection of Incipient Failure, Aerojet-General Corp. Report Robert RA/FA-DSR (November 30, 1967).

Green, D. R.: High Speed Image Transducer for Practical NDT Applications, Mater. Eval. 28, No. 5, 97-102 and 110 (May 1970).

Green, D. R.: Principles and Applications of Emittance Independent Infrared Nondestructive Testing, Applied Optics 7, 1779-1789 (September 1968).

*Green, D. R.: Thermal and Infrared Nondestructive Testing of Composites and Ceramics, Mater. Eval. 29, No. 11, 241-248 (November 1971).

Green, D. R.: Thermal Impedance Method for Nondestructive Testing, Mater. Eval. 25, No. 10, 231-236 (October 1967).

Green, D. R.: Thermal Surface Impedance for Plane Heat Waves in Layered Materials, J. Appl. Phys. 37, 3095-3099 (July 1966).

Green, D. R. and Dixon, N. E.: Thermal and Ultrasonic Test Methods for Carbon/Carbon Structures, Proc. Annu. ASME/UNM Symp., 10th, New Mexico Univ. (January 29-30, 1970).

Green, D. R. and McCullough, L. D.: An Electro-Thermal Nondestructive Testing Method, Battelle-Northwest Report BNWL-1273 (December 1969).

Green, R. E. and Pond, R. B.: An Ultrasonic Technique for Detection of Onset of Fatigue Damage, Annual Report, Contract F44620-71-C-0062 (1973).

Greenberg, H.: An Engineering Basis for Establishing Radiographic Acceptance Standards for Porosity in Steel Weldments, ASME Paper 64-WA/MET-3, ASME Annu. Meet. (1964).

Groh, G. and Kock, M.: 3-D Display of X-Ray Images by Means of Holography, Applied Optics 8, 1740-1741 (1970).

Gulley, Jr., L. R.: AFML Round Robin Results on (1) Delta Scan and (2) Magnetic Particle, AFML, WPAFB, Dayton, OH (March 1971).

Gulley, Jr., L. R.: An Investigation of the Effectiveness of Magnetic Particle Testing, Technical Memorandum AFML/MX 73-5 (October 1973).

*Gully, Jr., L. R.: NDE Horror Stories, in Proc. Interdisciplinary Workshop for Quantitative Flaw Definition, AFML-TR-74-238 (November 1974).

H

Hagemaier, D. J.: Nondestructive Testing of Bonded Honeycomb Structures, Nondestruct. Test. PT. 1 (December 1971); PT. 2 (February 1972).

*Hagemaier, D. J.: State of the Art Inspection of Aircraft Structures, in Prevention of Structural Failure - The Role of Quantitative Nondestructive Evaluation, ASM Materials/Metalworking Technol. Series No. 5, 161-187 (1975).

*Hagemaier, D. J.: State of the Art Inspection of Aircraft Structures by Nondestructive Testing, Mater. Eval. 33, No. 9, 217-226 (September 1975).

Hagemaier, D. J.: Ultrasonic Maintenance Inspection of Aircraft Structures, Douglas Aircraft Co. Paper No. 6179 (1973).

*Hagemaier, D. J., Adams, C. J., and Meyer, J. A.: Nondestructive Testing of Brazed Rocket Engine Components, Weld. J. (Miami, FL) 47, 789-792 and 795-801 (October 1968).

Hagemaier, D. J., Halchak, J., and Basl, G.: Detection of Titanium Hydride by Neutron Radiography, Mater. Eval. 27, No. 1, 193 (January 1969).

*Hagemaier, D. J., McFaul, N. J., and Parks, J. T.: Nondestructive Testing Techniques for Fiberglass, Graphite Fiber and Boron Fiber Composite Aircraft Structures, Mater. Eval. 28, No. 9, 194-204 (September 1970).

Hagemaier, D. J. and Meyer, J. A.: Braze Bond Inspection of Open-Face Honeycomb Seals Using Low Viscosity Liquid, Mater. Eval. 26, No. 10, 211-214 (October 1968).

Hagemaier, D. J. and Posakony, G. J.: Ultrasonic Testing of Melt-Through Welds in Small-Diameter, Thin-Walled Tubing Couplers, Mater. Eval. 26, No. 11, 221-226 (November 1968).

Halmshaw, R.: Direct-View Radiological Systems, Res. Techniques in Nondestruct. Academic Press, New York, NY (1970).

Halmshaw, R.: Physics of Industrial Radiology, Heywood Books, London (1966).

Halmshaw, R. and Hunt, C. A.: Proc. Int. Conf. Nondestructive Testing, 6th (Hanover, Germany), M, 51-62 (1970).

Hannah, K. V., Cross, B. T., and Tooley, W. M.: Development of the Ultrasonic Delta Technique for Aluminum Welds and Materials, NASA CR-61952, (May 15, 1968).

Hardrath, H. F.: Fatigue and Fracture Mechanics, J. Aircr. 8, No. 3 129-142 (March 1971).

Harris, D. O. and Dunegan, H. L.: Continuous Monitoring of Fatigue Crack Growth by Acoustic Emission Techniques, Dunegan/Edevco Tech. Rep. DE-73-2 (February 1973).

Harris, D. O. and Dunegan, H. L.: Verification of Structural Integrity of Pressure Vessels by Acoustic Emission and Periodic Proof Testing, in Testing for Prediction of Material Performance in Structures and Components, ASTM STP-515, 158-170 (1972).

Harris, D. O., Dunegan, H. L. and Tetelman, A. S.: Detection of Fatigue Crack Growth by Acoustic Emission Techniques, Lawrence Radiation Lab Report UCRL-71457 (March 1969).

Harris, D. O., Dunegan, H. L. and Tetelman, A. S.: Prediction of Fatigue Lifetime by Combined Fracture Mechanics and Acoustic Emission Techniques, AFFDL-TR-70-144, 459-471 (September 1970). See also Lawrence Radiation Lab Report UCRL-71760 (October 1969).

Harris, D. O., Tetelman, A. S., and Darwish, F. A. I.: Detection of Fiber Cracking by Acoustic Emission, Dunegan Corp. Tech. Rpt. DRC-71-1 (December 1971). See also ASTM STP-505, 238-249 (1972).

*Hart, S. D.: The Use of Ultrasonic Instruments for Determination of Exfoliation Corrosion, NRL Memo Report 2040 (September 1969). Available as AD-861632L.

Hartbower, C. E.: Application of SWAT to the Nondestructive Inspection of Welds, Weld. J. 35, No. 2 (February 1970).

Hartbower, C. E., Climent, F. J., Morais, C. F. and Crimmins, P. P.: Stress Wave Analysis Technique Study on Thick-Walled Type A302-B Steel Pressure Vessels, Contract NAS 9-7759 (July 1969).

Hartbower, C. E., Gerberich, W. W., and Crimmins, P. P.: Characterization of Fatigue-Crack Growth by Stess-Wave Emission, Contract NASI-4902 (1966).

Hartbower, C. E., Gerberich, W. W., and Crimmins, P. P.: Monitoring Subcritical Crack Growth by Detection of Elastic Stress Waves, Weld. J. Res. Supp. 47, 1-S to 18-S, (1968).

Hartbower, C. E., Gerberich, W. W., and Liebowitz, H.: Investigation of Crack-Growth Stress-Wave Relationships, Eng. Fract. Mech. 1, 291 (1968).

*Hartbower, C. E., Morais, C. F., Reuter, W. G., and Crimmins, P. P.: Acoustic Emission from Low-Cycle High Stress Intensity Fatigue, Eng. Fract. Mech. 5, No. 3, 765-789 (September 1973).

*Hartbower, C. E., Morais, C. F., Reuter, W. G., and Crimmins, P. P.: Development of a Nondestructive Testing Technique to Determine Flaw Criticallity, AFML-TR-71-218 (January 1972).

Hartbower, C. E., Reuter, W. G. and Crimmins, P. P.: Mechanisms of Slow Crack Growth in High Strength Steels and Titanium, AFML-TR-67-26 (1969).

*Hartbower, C. E., Reuter, W. G., Morais, C. F., and Crimmins, P. P.: Use of Acoustic Emission on the Detection of Weld and Stress Corrosion Cracking, in Acoustic Emission, ASTM STP-505, 187-221 (1972).

Hartmann, F.: Three-Dimensional Analysis of Weld Defects, North American Rockwell, Space Division Rpt. SD-67980 (June 1968).

*Hartmann, F.: X-Ray Mapping of Flaws by Computer Graphics, Mater. Eval. 27, No. 8, 169-179 (August 1969).

Hasenkamp, F. A.: Radiographic Laminography, Sandia Labs. SLA-73-0964 (November 1973).

Haskins, J. J. and Wilkinson, C. D.: Neutron Radiography: Some Applications for NDT, ASNT Spring Conf., Los Angeles, CA (March 1969).

*Hastings, C. H.: Nondestructive Tests as an Aid to Fracture Prevention Mechanics, Franklin Institute 290, No. 6, 589-598 (December 1970).

*Heine, H. J.: Using Nondestructive Testing Effectively, Foundry 103, No. 4, 22-29 (April 1975).

*Herr, J. C.: Human Factors in NDE, in Prevention of Structural Failure - The Role of Quantitative Nondestructive Evaluation, ASM Materials/ Metalworking Technol. Series No. 5, 226-241 (1975).

Hertz, R. H.: The Photographic Action of Ionizing Radiations, Wiley-Interscience, New York, NY (1969).

*Hess, P. W.: Neutron Radiography, NOL Report NOLTR 70-6 (January 1970). Available as AD-709548.

*Ho, C. L., Marcus, H. L. and Buck, O.: Ultrasonic Surface-Wave Detection Techniques in Fracture Mechanics, Exper. Mech. 42-48 (January 1974).

Hoenig, S. A.: New Techniques in Nondestructive Testing (Exoelectron Emission Phase), AFML-TR-71-140-PT-1 (1971).

*Holloway, J. A., Stuhrke, W. F. and Berger, H.: Low Voltage and Neutron Radiographic Techniques for Evaluating Boron Filament Metal Matrix Composites, AFML-TR-67-193 (February 1968).

Holmes, V.: Ultrasonic Measurement of Stress, McDonnell Co. Report R513-716 (1969).

*Hovland, H.: The Human Element in Nondestructive Testing, Mater. Eval 27, No. 12, 13A-19A (December 1969).

Hutton, P. H.: Acoustic Emission Detection in the Presence of Hydraulic Noise, Battelle Report BNWL-933 (1968).

Hutton, P. H.: Acoustic Emission - A New Tool for Evaluating Structural Soundness, Battelle Report BNWL-SA-2449 (April 1969).

Hutton, P. H.: Acoustic Emission - What It Is and Its Application to Structural Soundness of Solids, Battelle Report BNWL-FA-2983 (February 1970).

*Hutton, P. H.: Acoustic Emission Applied Outside the Laboratory, in Acoustic Emission, ASTM STP-505, 114-128 (1972).

Hutton, P. H.: Acoustic Emission in Metals as an NDT Tool, Mater. Eval. 26, No. 7, 125-128 (July 1968).

Hutton, P. H.: Crack Detection in Pressure Piping by Acoustic Emission, Nuclear Safety Quarterly Report, Battelle Report BVWL-537 (September 1976).

Hutton, P. H.: Detecting Acoustic Emission in the Presence of Hydraulic Noise, Nondestruct. Test. 111-114 (May 1969).

Hutton, P. H.: Nuclear Reactor System Noise Analysis, Dresden I Reactor, Battelle Report BNWL-867 (1968).

*Hutton, P. H. and Ord, R. N.: Acoustic Emission, in Research Techniques in Nondestructive Testing, Academic Press (1970).

I

Iacobellis, S. F.: Liquid Rocket Engines: Their Status and Their Future, AIAA Paper No. 66-828, Boston, MS (1966).

Iddings, F. A. and Bostrom, N. A.: Neutron Radiography with a Cockcroft-Walton Accelerator, Mater. Eval. 27, No. 10, 215 (October 1969).

J

Jackson, Jr., C. N., Gray, W. H., and Shaw, C. B.: Real-Time X-Ray Inspection System for Fast Flux Test Facility Fuel, Mater. Eval. 31, 199-204 (1973).

Jacobs, J. E.: Performance of the Ultrasound Microscope, Mater. Eval. 25, No. 3, 41-45 (March 1967).

*Janney, D. H., Hunt, B. R., and Ziegler, R. K.: Concepts of Radiographic Image Enhancement, Mater. Eval. 30, No. 9, 195-203 (1972).

*Johnson, K. V.: Structural Reliability Methods, in Prevention of Structural Failure - The Role of Quantitative Nondestructive Evaluation, ASM Materials/Metalworking Technol. Series No. 5, 215-225 (1975).

Jolly, W. D.: An In Situ Weld Defect Detector, Acoustic Emission, Battelle Report BNWL-817 (1968).

Jolly, W. D.: The Application of Acoustic Emission to In-Process Inspection of Welds, Mater. Eval. 28, No. 6, 135-144 (June 1970).

Jolly, W. D.: The Use of Acoustic Emission as a Weld Monitor, Battelle Report BNWL-SA-2727 (September 1969).

Jolly, W. D., Davis, T. J., and Compton, M. R.: Evaluation of the Acoustic Emission System, EEI-TVA Rp 79 Report No. 6 (January 7, 1972).

*Kahn, H. L.: Quantitative Analysis by Atomic Absorption, Mater. Res. Stand. 5, No. 7, 337-340 (July 1965).

Kahn, H. L. and Slavin, W.: An Atomic Absorption Spectrophotometer, Appl. Opt. 2, 931 (1963).

*Kamm, H. W. and Kraska, I. R.: A Review of Nondestructive Methods for the Detection of Concealed Cracks, AFML-TR-71-120 (July 1971).

*Karplus, H. B., Semmler, R. A., and Arneson, B. E.: Evaluation of Nondestructive Testing Techniques of Diffusion Coatings, AFML-TR-67-358 (May 1968). Available as AD-836775.

Kelly, M. P. and Bell, R. L.: Detection and Location of Flaw Growth in the EBOR Nuclear Reactor Vessel, Dunegan/Edevco Report No. 73-4 (February 1973).

Kennedy, J. C. and Woodmansee, W. E.: Signal Processing in Nondestructive Testing, Boeing Report SAOPI-FOI, RB2 (April 25, 1973).

*Kersch, L. A.: Advanced Concepts of Holographic Nondestructive Testing, Mater. Eval. 29, No. 6, 125-129 and 140 (July 1971).

Kimoto, S. and Hashimoto, H.: Scanning Electron Microscopy, Symp. Proc., IITRI, 65-78 (1968).

*Kimoto, S. and Russ, J. C.: The Characteristics and Applications of the Scanning Microscope, Mater. Res. Stand. 9, No. 1, 8-16 (January 1969).

*Kirchner, W. R.: A Manager Looks at Nondestructive Testing, Mater. Eval. 23, No. 6, 271-278 (June 1965).

*Klima, S. J. and Freche, J. C.: Ultrasonic Detection and Measurement of Fatigue Cracks in Notched Specimens, Exp. Mech. 9, No. 5, 193-202 (1969).

Klima, S. J., Lesco, D. J. and Freche, J. C.: Ultrasonic Techniques for Detection and Measurement of Fatigue Cracks, NASA TN-D-3007 (September 1965).

Kloster, W.: F-111 USAF/General Dynamics NDI Human Factors Study Program, General Dynamics, Fort Worth Division (1971).

Koehler, A. M.: Proton Radiography, Science 160, No. 3825, 303-304 (1968).

Koehler, A. M. and Berger, H.: Proton Radiography: in Research Techniques in Nondestructive Testing, 1-30, Academic Press (1973).

Korpel, A.: Visualization of the Cross Section of a Sound Beam by Bragg Diffraction of Light, Appl. Phys. Lett. 9, No. 12, 425 (1966).

Kosanke, H. D.: Hydrogen Sensitive Neutron Radiography, Trans. ANS 14, 5.33 (1971).

Kossowsky, R.: Creep and Fatigue in Si_3N_4 as Related to Microstructure, in Ceramics for High Performance Applications, Brook Hill Pub. Co., Chestnut Hill, PA (1974).

*Kossowsky, R.: Defect Detection in Hot-Pressed Si_3N_4, in Proc. Army Mater. Technol. Conf., 2nd, Hyannis, MS (13-16 November 1973).

*Kraska, I. R. and Kamm, H. W.: Eddy Current Inspection of Turbine Blades, AFML-TR-70-266 (October 1971). Available as AD-743105.

*Kraska, I. R. and Prusinski, R. G.: Development and Field Evaluation of a Thin Sheet Inspection System, AFML-TR-70-315 (April 1971).

Krautkramer, J. and Krautkramer, H.: Ultrasonic Testing of Materials, Springer, New York, NY (1969).

Kreuzer, J. L.: Ultrasonic Three-Dimensional Imaging Using Holographic Techniques, AMRA-CR-12F (31 March 1967).

*Kriege, O. H. and Boone, D. H.: Nondestructive Characterization of Diffusion Aluminide Coatings, Mater. Eval. 32, No. 2, 38-44 (February 1974).

Krogstad, R. S. and Moss, R. W.: Electron Emission During Metal Fatigue, Proc. Symp. Physics Nondestruct. Test., Dayton, OH (September 1965).

Kubiak, E. J. and Hosek, R.: Development of Nondestructive Testing Methods for the Evaluation of Thin and Ultrathin Sheet Materials, AFML-TR-66-304 (July 1966).

Kubiak, E. J. and Kraska, I. R.: Evaluation of Thin Sheet Materials by FM Lamb Waves, AFML-TR-68-295 (September 1968).

*Kula, E. B. and Anctil, A. A.: Tempered Martensite Embrittlement and Fracture Toughness in 4340 Steel, AMRA-TR-67-03 (January 1967). Available as AD-651066.

Kusenberger, F. N., Barton, J. R., and Donaldson, W. L.: Nondestructive Evaluation of Metal Fatigue, AFOSR Final Scientific Report 67-1288 (April 1967).

*Kusenberger, F. N., Francis, P. H., Leonard, B. E., and Barton, J. R.: Nondestructive Evaluation of Metal Fatigue, AFOSR-69-1429TR (April 1969). Available as AD-688892.

Kusenberger, F. N., Lankford, Jr., J. Francis, P. H., and Barton, J. R.: Nondestructive Evaluation of Metal Fatigue, AFOSR-TR-1206 (March 1970). Available as AD-705653 and N70-36417.

*Kusenberger, F. N., Leonard, B. E., Barton, J. R., and Donaldson, W. L.: Nondestructive Evaluation of Metal Fatigue, AFOSR-65-0981 (March 1965). Available as AD-619685.

Kusenberger, F. N., Leonard, B. E., Francis, P. H., Barton, J. R., and Donaldson, W. L.: Nondestructive Evaluation of Metal Fatigue, AFOSR Scientific Report, 1967-1968 (April 1968).

Kusenberger, F. N., Leonard, B. E., Pasley, R. L., Barton, J. R., and Donaldson, W. L.: Nondestructive Evaluation of Metal Fatigue, AFOSR-66-0648 (1966).

Kusenberger, F. N., Ko, W. L., Lankford, Jr., J., Francis, P. H., and Barton, J. R.: Nondestructive Evaluation of Metal Fatigue, AFOSR-TR-73-1070 (April 1973). Available as AD-762608 and N73-29541.

*Kutzcher, E. W., Zimmermann, K. H., and Botkin, J. L.: Thermal and Infrared Methods for Nondestructive Testing of Adhesive-Bonded Structures, Mater. Eval. 26, No. 7, 143-168 (July 1968).

L

*Landis, F. P., Merchant, R. W., and Zemany, P. D.: The Electron Microprobe as a Tool in Materials Engineering, Mater. Res. Stand. 5, No. 5, 219-229 (May 1965).

Landry, K., Powers, J., and Wade, G.: Ultrasonic Imaging of Internal Structure by Bragg Diffraction, Appl. Phys. Lett. 15, No. 6, 186 (1969.

*Lare, P. J., Ordway, F., and Hahn, H.: Fabrication and Testing of Sapphire Filament Reinforced Superplastic Ni-Cr-Fe Alloy Composites, Artech Corp. Report J7308-FR (May 1975).

*Lauer, G.: Computer Aided NDT, AFML-TR-73-69, 364-383 (April 1973).

Leendertz, J. A. and Butters, J. N., An Image-Shearing Speckle-Pattern Interferometer for Measuring Bending Moments, J. Phys. E. (Sci. Instrum.) 6, 1107 (1973).

Libby, H. L.: Introduction to Electromagnetic Nondestructive Test Methods, Wiley, New York, NY (1971).

Lifshitz, J. M. and Rotem, A., Determination of Reinforcement Unbonding of Composites by a Vibration Technique, J. Compos. Mater. 3, 412-423 (July 1969).

Liptai, R. G., Dunegan, H. L., and Tatro, C. A.: Acoustic Emission Generated During Phase Transformations in Metals and Alloys, Lawrence Radiation Lab Report UCRL-50525 (September 1968).

*Liptai, R. G., Harris, D. O., Engle, R. B., and Tatro, C. A.: Acoustic Emission Techniques in Materials Research, Int. J. Nondestructive Testing 3, No. 3, 215-275 (December 1971).

Liptai, R. G. and Tatro, C. A.: Acoustic Emission - A Surface Phenomenon, in Proc. Symp. Nondestruct. Test. Aircraft and Missile Components (1963).

*Liptai, R. G., Harris, D. O., and Tatro, C. A.: An Introduction to Acoustic Emission, in Acoustic Emission, ASTM STP-505, 3-10 (1972).

*Liu, A. F.: Fracture Control Methods for Space Vehicles: Vol. I, Fracture Control Design Methods, NASA CR-134596 (August 1974). Available as N74-35279.

Lockyer, G. E.: Investigation of Nondestructive Methods for the Evaluation of Graphite Materials, AFML-TR-67-128 (April 1968).

Lockyer, G. E. and Proudfoot, E. A.: Development of Nondestructive Tests for the Evaluation of Bonded Materials, AVCO Report AVADT-0123-69-CT (1969).

Lockyer, G. E. and Proudfoot, E. A.: Nondestructive Determination of Mechanical Properties of Refractory Materials, Amer. Ceramics Soc. Bull. 46, 521 (1967).

Lomacky, O., Ang, A. H.-S. and Amin, M.: Fatigue and Fracture Probability Analysis of Pressure Vessels, ASME Paper No. 71-PVP-47, Congress on Pressure Vessels and Piping (May 1971).

LoPilato, S. A. and Carter, S. W.: Unbond Detection Using Ultrasonic Phase Analysis, Mater. Eval. 24, No. 12, 690 (December 1966).

*Lord, R. J.: Evaluation of the Reliability and Sensitivity of NDT Methods for Titanium Alloys, AFML-TR-73-107 (June 1974).

Lord, W. and Oswald, D. J.: Leakage Field Methods of Defect Detection, Int. J. Nondestruct. Test. 4, 249-274 (1972).

Lovelace, J., Luini, L., and Cook, D.: Ultrasonic Inspection of Hull Butt Welds, Final Report Contract NObs-90445 (January 14, 1966).

Luquire, J. W., Dodd, C. V., Deeds, W. E., and Spoeri, W. G.: Computer Programs for Some Eddy Current Problems, Oak Ridge Lab. Report ORNL-TM-2501 (August 1969).

Luz, H.: The Non-Destructive Testing of Bars and Billets for Surface Defects by Magnetic Leakage Methods, Nondestruct. Test. 6, No. 1, 16-24 (1973).

M

MacDonald, D. E. and Wood, W. A.: Application of Scanning Electron Microscopy to Study of Mechanisms of Metal Fatigue (1971). Available as AD-719927.

*Madison, R. B. and Irwin, G. R.: Fracture Analysis of Kings Bridge, Melbourne, J. Struct. Div. 97, No. ST9 (September 1971).

Magnani, N. J.: Acoustic Emission and Stress-Corrosion Cracking of U-4-1/2 Wt. % Nb, Exp. Mech. 13, No. 12, 526-530 (December 1973).

Maley, D. R.: Nondestructive Evaluation of Material Properties Through the Use of Thermal Inspection System, AFML-TR-66-192 (1966).

Maley, D. R.: Two Thermal Nondestructive Testing Techniques, Automation Industries Report TR-65-25 (August 1969).

*Mann, Jr., L. and Young, M. H.: Data Analysis and Correlation with Digital Computers - Nondestructive Testing, AD-876922 (1970). See also *AD-734321 (September 1971).

Manson, S. S. and Hirschberg, M. H.: Low Cycle Fatigue of Notched Specimens by Consideration of Crack Initiation and Propagation, NASA TN-D-3146 (June 1967).

Markham, M. F.: Measurements of the Elastic Constants of Fibre Composites by Ultrasonics, Composites 1, 145 (1970).

*Martin, B. G.: The Measurement of Surface and Near-Surface Stress in Aluminum Alloys Using Rayleigh Waves, Mater. Eval. 32, No. 11, 229-234 (November 1974).

Martin, B. G.: Rayleigh-Wave Velocity, Stress and Preferred Grain Orientation in Aluminum, Non-Destructive Testing - Research and Practice 7, 199 (August 1974).

Martin, G. and Moore, J. F., Research and Development of Nondestructive Testing Techniques for Composites, AFML-TR-66-270 (February 1967).

*Martin, G., Moore, J. F. and Tsang, S.: The Radiography of Metal Matrix Composites, Mater. Eval. 30, No. 4, 78-86 (1972).

*Masubushi, K.: Nondestructive Measurement of Residual Stresses in Metals and Metal Structures, AD-467033 (April 30, 1965).

McClung, R. W.: Techniques for Low Voltage Radiography, ORNL-3252 (March 1, 1962).

*McCullough, L. D. and Green, D. R.: Electrothermal Nondestructive Testing of Metal Structures, Mater. Eval. 30, No. 4, 78-91 (April 1972).

*McFaul, H. J.: The Philosophy of Nondestructive Testing as an Adjunct to the Design Process and Product Analysis, Mater. Eval. 30, No. 4, 18A-22A (April 1972).

McGonnagle, G.: Nondestructive Testing, Gordon and Breach, New York, NY (1969).

McKannan, E. C., Ultrasonic Measurement of Stress in Aluminum, in Nondestructive Testing, Trends and Techniques, NASA SP-5082 (1967).

McLean, A. F., Fisher, E. A., and Bratton, R. J.: Brittle Materials Design, High Temperature Gas Turbine, Interim Report, 1 January 1973 to 30 June 1973, Contract AMMRC-CTR-73-32 (September 1973). Also available as AD-914451L.

*McMaster, R. C., Nondestructive Testing Handbook, 2 Vols., Roland Press (1959).

*McMaster, R. C.: Potenitals of Automated Nondestructive Examination, Proc. IITRI Conf. on Automated Inspection and Product Control (October 1975).

McMaster, R. C.: The Prevention of Technological Disasters, Mater. Eval. 27, No. 3, 17A-22A (1969).

*McMasters, R. C. and Hoyt, H. L.: Xeroradiography in the 1970's, Mater. Eval. 29, No. 12, 265-274 (December 1971).

*McMaster, R. C., Rhoten, M. L., and Mitchell, J. P.: The X-Ray Vidicon Television Image System, Mater. Eval. 25, No. 3,46-52 (1967).

Meinke, W. W., and Scribner, B. F., Eds.: Trace Characterization - Chemical and Physical, NBS, Washington, DC (1967).

Merhib, C. P. and Rodgers, E. H.: A Report Guide to Thermal Testing Literature, AD-612043 (August 1964).

Metherell, A. F., El-Sum, H. M. A., and Larmore, L.: Acoustical Holography (1969).

Metherell, A. F., Spinak, S., and Pisa, E. J.: Subfringe Interferometric Holography for Linearly Recording Small Displacements, J. Optical Soc. Amer. 59, 1534A (November 1969).

Michaels, T. E.: Acoustic Emission of Zircaloy-2 During Tensile and Fatigue Loading, Battelle Report BNWL-727 (August 1968).

*Mills, A. L.: Advanced Composites Production/Service Experience, LTV Aerospace Report IR-471-3 (VIII) (December 1975).

Minkoff, J. B., Hilal, S. K., Koig, W. F., Arm, M., and Lambert, L. B.: Optical Filtering to Compensate for Degradation of Radiographic Images Produced by External Sources Appl. Optics 7, No. 4, 633-641 (April 1968).

Mints, R. I., Kortov, V. S., Aleksandrov, V. L., and Kryuk, V. I.: Exo-electron Emission During Cyclic Loading of Austenitic Steels, Phys. Met. Metallogr. 26, 681 (1968).

*Mitchell, D. K., Meister, D. P, and Randall, M. D.: Investigation and Development of a Technique to Enhance Ultrasonic Flaw Response in Metals, AD-901873L (July 27, 1972).

Mitchell, J. R., Egle, D. M., and Appl, J. F.: Detecting Fatigue Cracks with Acoustic Emission, in Proc. Oklahoma Academy of Sciences 53, 121-126 (1973).

Mool, D.: Testing of Composite Compatibility Laminates, Unpublished Boeing Development Report (January 1970).

*Mool, D. and Stephenson, R.: Ultrasonic Inspection of a Boron/Epoxy-Aluminum Composite Panel, Mater. Eval. 29, No. 7, 159-164 (July 1971).

*Moore, J. F., Tsang, S., and Martin, G.: The Early Detection of Fatigue Damage, AFML-TR-71-185 (September 1971). Available as AD-730348.

*Moore, J. F., Tsang, S., Thompson, D. O., and Hoenig, S. A.: Nondestructive Detection of Structural Damage Uniquely Associated with Fatigue, AFML-TR-74-131 (July 1974).

Morse, P. M. and Ingard, K. U.: Theoretical Acoustics, McGraw-Hill Book Co. New York, NY (1968).

Mueller, H. J: Exo-Electron Emission and Related Electron Emissions, AD-276213 (December 1969).

*Mullin, J. V. and Mehan, R. L.: Evaluation of Composite Failures Through Fracture Signal Analysis, J. Test. Mater. 1, No. 3, 215-219 (May 1973). Available as A73-32250.

Musser, C. W.: NDT Systems for Establishing Weld Integrity of Space Vehicles, Mater, Eval. 27, No. 2, 42-48 (February 1969).

N

*Nakamura, Y.: Acoustic Emission Monitoring for Detection of Cracks in a Complex Structure, Mater. Eval. 29, No. 1, 8-12 (January 1971).

Nakamura, Y., McCauley, B. O., Gardner, A. H., Redmond, J. C., Hagemeyer, J. W., and Burton, G. M.: Development of an Acoustic Emission Monitoring System, General Dynamics/Fort Worth Report ERR-FW-901 (1969).

*Nakamura, Y., Veach, C. L., and McCauley, B. O.: Amplitude Distribution of Acoustic Emission Signals, in Acoustic Emission, ASTM STP-505, 164-186 (1972).

National Materials Advisory Board: Nondestructive Evaluation, NMAB-252 (June 1969).

*Neuschaefer, R. W.: Assuring Saturn Quality Through Nondestructive Testing, Mater. Eval. 27, No. 7, 145-152 (July 1969).

Neuschaefer, R. W. and Beal, J. B.: Assessments of and Standardization for Quantitative Nondestructive Testing, NASA TM-X-64706 (September 30, 1972). Available as N73-14483.

Newhouse, V. L. and Bendick, P. J.: An Ultrasonic Random Signal Flow Measurement System, J. Acoust. Soc. Amer. (August 1974).

*Newhouse, V. L., Furgason, E. S., and Bilgutay, N. M.: Advanced Concepts in Structural Materials and Testing, Part 1 - The Application of Random Signal Correlation Techniques to Ultrasonic Flaw Detection in Solids, AD-782349 (July 15, 1974).

*Niskala, J. H. and Carson, R. D.: Automated Cracked Nut Sorting with Eddy Current NDT, Mater. Eval. 27, No. 7, 153-158 (July 1969).

*Noone, M. J. and Mehan, R. L.: Observation of Crack Propagation in Polycrystalline Ceramics and Its Relationship to Acoustic Emissions, Plenum Press (1974).

*Noronha, P. J. and McKannan, E. C.: A Review of the State of the Art of the Nondestructive Testing of Flight Pressure Vessels, in Prevention of Structural Failure - The Role of Quantitative Nondestructive Evaluation, ASM Materials/Metalworking Technol. Series No. 5, 188-203 (1975).

*Norris, T. H.: Nondestructive Testing of Bonded Joints: The Control of Adhesive Bonding in the Production of Primary Aircraft Structures, Nondestruct. Test. (Guilford, England) 7, 335-339 (December 1974).

Nowakowski, M.: X-Ray Television Techniques for Nondestructive Testing, Proc. NASA Technology and Trends Symp., 2nd (1968).

Noyzis, Jr., J. W.: Reliability of Airframe Inspections at the Depot Maintenance Level, Boeing, Wichita, KA, Boeing Report No. 1554, (No date).

O

Oatley, C. W., Nixon, W. C., and Pease, R. F.: Scanning Electron Microscopy, in Advances in Electronics and Electron Physics, 21, 181-247, Academic Press, New York, NY (1965).

O'Brien, J. R. and Pullen, K. E.: Radioactive Nondestructive Test Method, Boeing Co. Report D180-14227-1 (December 1971).

Ono, K.: Recent Developments in Acoustic Emission as Applied to Welding Defects, UCLA-ENG-7375 (September 1973).

*Ono, K., Stern, R., and Long, Jr., M.: Application of Correlation Analysis to Acoustic Emission, in Acoustic Emission, ASTM STP-505, 152-163 (1972).

P

*Packman, P. F.: Fracture Toughness and NDT Requirements for Aircraft Design, J. Non-Destructive Testing, 314-324 (December 1973).

*Packman, P. F., Malpani, J. K., and Wells, F. M.: Probability of Flaw Detection for Use in Fracture Control Plans, Interim Report on AFOSR Contract F44620-73-C-0073 (March 1975).

*Packman, P. F., Malpani, J. K, Wells, F. M., and Yee, B. G. W.: Reliability of Defect Detection in Welded Structures, Interim Report on AFOSR Contract F44620-73-C-0073 (1975).

Packman, P. F., Pearson, H. S., Owens, J. S., and Marchese, G. B: The Applicability of a Fracture Mechanics Nondestructive Testing Design Criterion, AFML-TR-68-32 (May 1968).

Packman, P. F., Pearson, H. S., Owens, J. S., and Young G.: Definition of Fatigue Cracks through Nondestructive Testing, J. Mater., 666 (September 1969).

*Padawer, G. M and Adler, P. N.: Development of a Nuclear Microprobe Technique for Hydrogen Analysis in Selected Materials, AD-770856 (1973).

Padden, H.: Fokker Bond Testing of Composites, Proc. AFML Aerospace Conf. NDT of Composite Structures, Dayton, OH (March 1969).

Padilla, V. E. and Parks, J. W.: Definition of Fatigue Crack Geometry by Eddy Current Techniques, in Proc. Symp. Nondestructive Evaluation of Components and Materials in Aerospace, Weapon Systems and Nuclear Applications, 7th (1969).

*Paris, P. C. and Sih, G. C.: Stess Analysis of Cracks, ASTM STP-381, 30-83 (April 1965).

Parish, W. and Pullen, D. A. W.: Recent Developments in the Radiography of Highly Radioactive Specimens at AERE Harwell, Brit. J. Nondestructive Testing 7, No. 1, 3-10 (1965).

Parry, D. L.: Nondestructive Flaw Detection by Use of Acoustic Emission, Phillips Petroleum Co. Report TID-4500 (May 1967).

Parry, D. L. and Robinson, D. L.: Incipient Failure Detection by Acoustic Emission: A Development and Status Report, USAEC Tech. Report IN-1398 (July 1970).

*Pasztor, L. C., Raybeck, R. M., and Dulski, T. R.: Review of Recent Work in the Rapid Identification of Steels, Mater. Res. Stand. 10, No. 8, 8-11 and 32-35 (August 1970).

*Pettit, D. E. and Hoeppner, D. W.: Fatigue Flaw Growth and NDE Evaluation for Preventing Through-Cracks in Spacecraft Tankage Structures, NASA CR-128600 (September 25, 1972). Available as N73-12935.

Pilloton, R. L., NUFTIC, An Information Center on Nuclear Fuel Technology, ORNL-TM-1358 (March 1966).

Pollack, A. A.: Stress Wave Emission During Stress Corrosion Cracking of Titanium Alloys, Boeing Co. Report D1-82-0658 (October 1967).

*Posakony, G. J.: Flaw Characterization: How Good is Ultrasound?, in Prevention of Structural Failure - The Role of Quantitative Nondestructive Evaluation, Amer. Soc. Metals Materials/Metalworking Technol. Series No. 5, 1-61 (1975).

Posakony, G. J.: Ultrasonic Techniques for Remote Inspection of Nuclear Reactor Vessels, Proc. Conf. Periodic Inspection of Pressure Vessels, London (May 1972).

Pritchett, L. D., Raatz, C. F., Senske, R. A., and Woodmansee, W. A.: Detection of Cracks Under Installed Fasteners, AFML-TR-74-80 (April 1974).

Proudian, A. P., Carangi, R. L., Jacobson, G., and Muntz, E. L.: Electron Radiography: A New Method of Radiographic Imaging, Radiology 110, 667-671 (1974).

Pullen, D. A. W.: High Energy Radiography: A New Technique in the Development of Efficiency and Integrity of Aero Gas Turbine Engines, Mater. Eval. 32, 25-30; 37 (1974).

R

*Raatz, C. F., Senske, R. A., and Woodmansee, W. E.: Detection of Cracks Under Installed Fasteners, AFML-TR-74-80 (April 1974).

Randon, J. C. and Pollock, A. A.: Acoustic Emissions and Energy Transfer During Crack Propagation, Eng. Fract. Mech. 4, 295 (1972).

Ramsey, J. A.: Exoelectron Emission from Deformed Metal Surfaces, J. Australian Inst. Metals 10, 323 (1965).

Ranby, R. W.: Electroluminescent Storage and Display Panels for Radiography, Research Techniques in Nondestructive Testing 2, R. S. Sharpe, Ed., Academic Press, New York, NY 89-119 (1973).

Rasmussen, J. G., Prediction of Fatigue Failure Using Ultrasonic Surface Waves, Mater. Eval. 20, No. 2, 103 (February 1962).

Rasmussen, J. G: Prediction of Fatigue Failure Using Ultrasonic Surface Waves, Nondestruct. Test. (March-April 1962).

*Rathmann, D. W.: Magnetic Pertubation Scanning - A New Nondestructive Testing Method, Mater. Res. Stand. 6, No. 8, 398-402 (August 1966).

Ravera, R. J. and Sih, G. C.: Transient Analysis of Stress Waves Around Cracks under Antiplane Strain, J. Acoust. Soc. Amer. 47, No. 3

Redman, J. D.: Use of Holography to Make Truly Three-Dimensional X-Ray Images, Nature 220, 58-60 (1968).

*Reeves, C. R.: A Mechanized Eddy Current Scanning System for Aircraft Struts, Mater. Eval. 31, No. 3, 48-52 (March 1973).

Regalbuto, J. A.: Correlation of Pulse-Echo Measurements with Tensile Strength of Diffusion Bonded Joints, Mater. Eval. 30, No. 3, 66 (March 1972).

*Reifsnider, K. L. and Sawyesr, S.: A Correlation between Pulse-Echo Ultrasonic Attenuation and Hardness, AD-717099 (December 1970).

*Reifsnider, K. L., Stinhcomb, W. W., Williams, R. S., and Marcus, L. A.: Heat Generation in Composite Materials during Fatigue Loading, AFOSR-TR-73-1961 (May 1973).

Renken, C. J. and Selner, R. H.: Refractory Metal Tubing Inspection Using Ultrasonic and Pulsed Eddy Current Methods, Mater. Eval. 24, No. 5, 257 (May 1966).

Renshaw, T.: A10 USAF/Fairchild Hiller NDI Demonstration Program, (September 1973).

Reynolds, W. N.: Problems of Nondestructive Testing in Carbon Fibres and Their Composites, Proc. Int. Conf. Carbon Fibres, The Plastics Inst., London (1971).

*Reynolds, W. N. and Wilkinson, S. J.: The Propagation of Ultrasonic Waves in CFRP Laminates, Ultrasonics, 109-114 (May 1974). Available as A74-44349.

Rhodes, Jr., J. E.: Analysis and Synthesis of Optical Images, Amer. J. Phys. 21, 337-343 (May 1953).

Rhoten, M. L. and Carey, W. E.: Neutron Radiography of Pyrotechnic Cartridges, Mater. Eval. 24, No. 8, 422 (August 1966).

Rogers, E. H. and Merhib, C. P.: A Report Guide to Magnetic Particle Testing Literature, AD-617758 (June 1965).

Rohy, D. A., Duffy, T. E., and Compton, W. A.: Radiation Pryometer for Gas Turbine Blades, SAE Paper No. 720159, 10-14 (January 1972).

*Rollins, Jr., F. R.: Acoustic Emission from Boron-Aluminum Composites During Tensile Fracture and Fatigue, AD-731710 (October 1971).

Romrell, D. M.: Acoustic Emission Monitors Crack Growth in Ceramics, Battelle Report BMWL-SA-3064 (March 1970).

Rosenfeld, A., Picture Processing by Computer, Academic Press, New York, NY (1969).

*Rothfusz, R. W.: Automated Jet Engine Blade Inspection, AFML-TR-72-193 (December 1972). Available as AD-906309L.

Rothman, E.: Electronic Signal Processing Techniques, Phases I and II, ARPA Order No. 1246 (July 1969 and May 1970).

*Rummel, W. D. and Rathke, R. A.: Detection and Measurement of Fatigue Cracks in Aluminum Alloy Sheet by Nondestructive Evaluation Technique, in Prevention of Structural Failure - The Role of Quantitative Nondestructive Evaluation, ASM Materials/Metalworking Technol. Series No. 5, 146-160 (1975).

*Rummel, W. D., Rathke, R. A., Todd, Jr., P. H., and Mullen, S. J.: The Detection of Tightly Closed Flaws by Nondestructive Testing (NDT) Methods, Martin Marietta Aerospace Report MCR-75-212 (October 1975) Contract NAS 9-13578).

Rummel, W. D., Todd, Jr., P. H., Frecska, S. A., and Rathke, R. A.: The Detection of Fatigue Cracks by Nondestructive Testing Methods, NASA CR-2369 (February 1974).

Rummel, W. E., Todd, Jr., P. H., Rathke, R. A., and Castner, W. L.: The Detection of Fatigue Cracks by Nondestructive Test Methods, Mater. Eval. 31, No. 10, 205-212 (October 1974).

Rumsey, Jr., H. and Posner, E. C.: Joint Distribution with Prescribed Moments, Amer. Math. Stat. 36, No. 1, 286-298 (1965).

Ryan, M. C.: Color Radiography, Mater. Eval. 26, No. 8, 159-162 (August 1968).

S

Sachs, H. L.: Infrared Physics, Argonne Lab. Report 6515, Proc. Symp. Phys. Nondestruct. Test., 2nd (October 3-5, 1961).

*Sachs, R. D., Elkins, J. D., and Smith, J. H.: Ultrasonic Data Analysis Using a Computer, Mater. Eval. 30, No. 6, 121-125 and 135 (June 1972).

Sattler, F. S.: Nondestructive Flaw Definition Techniques for Critical Defect Determination, NASA CR-72602 (January 1970).

Sattler, F. J. and Matay, I. M.: Advanced Nondestructive Testing Techniques for Titanium Billets and Ingots, AFML TR-70-118 (June 1970).

Schliekelmann, R. J.: Nondestructive Testing of Adhesive Bonded Metal Joints, Nondestruct. Test. (April 1972 and June 1972).

*Schmid, D. M. and Wolf, J. E.: Rapid Nondestructive Identification and Comparison of Metals, Mater. Res. Stand. 10, No. 11, 14-15 (November 1970).

*Schmitz, G. and Frank, L.: Nondestructive Testing for Evaluation of Strength of Bonded Materials, NASA CR-67983 (September 1965).

*Schmeeman, J. G.: The Realm of Industrial X-Ray, Mater. Eval. 38, No. 12, 19A-26A (December 1970).

Schofield, B. H.: Acoustic Emission Under Applied Stress, ASD-TDR-63-509 (May 1964).

Schofield, B. H.: A Study of the Applicability of Acoustic Emission to Pressure Vessel Testing, AFML-TR-66-92 (November 1966). Available as AD-809369.

Schofield, B. H.: Investigation of Applicability of Acoustic Emission, AFML-TR-65-106 (May 1965).

*Schofield, B. H.: Research on the Sources and Characteristics of Acoustic Emission, in Acoustic Emission, ASTM STP-505, 11-19 (1972).

Scholl, A. W. and Crumrine, D. S.: Confirmatory Test for Cadmium in the Presence of Copper, Chemist Analyst 56, No. 1, 22 (1967).

Schoeer. R.: Research on Exploratory Development of Nondestructive Methods for Crack Detection, AFML-TR-67-167-PT1 (August 1967).

*Schuldies, J. J.: Surface Evaluation Using Acoustic Emission, in Fracture Mechanics of Ceramics - Concepts, Flaws and Factography, 189-200, Plenum Press (1974).

Schultz, A. B., Warwick, D. N., DiBenedetto, A. T., Gauchel, J. V., and Thomas, R. L.: Non-Destructive Determination of Composite Material Properties Using Vibration Tests, NASA Report Contract NGR-26-008-063 (May 1971).

*Schultz, A. W.: Correlation and Analysis of Ultrasonic Test Results in Evaluating Reinforced Resin Laminates, Mater. Res. Stand. 7, No. 8, 341-345 (August 1967).

*Schultz, A. W.: Development and Application of Nondestructive Methods for Predicting Mechanical Properties of Advanced Reinforced Nonmetallic Composites, AFML-TR-71-168 (September 1971). Available as AD-752251.

Searles, C.: Thermal Image Inspection of Adhesive Bonded Structures, Proc. ASNT Symp. NDT of Welds and Joining, Evanston, IL (1968).

*Sellers, B. and Brinkerhoff, J.: Signature Comparison Technique for Rapid Alloy Sorting with a Radioisotope Excited X-Ray Analyzer, Mater. Res. Stand. 10, No. 11, 16-18 (November 1970).

*Serabian, S.: An Assessment of Education in Nondestructive Testing - Present Status and the Future Needs (Parts 1 and 2), Mater. Eval. 27, No. 4, 14A-20A and 30A-33A (April 1969); Mater. Eval. 27, No. 5, 18A-20A, 22A-24A, and 29A-30A (May 1969).

*Sessler, J. G.: Improvement in Crack Detection by Ultrasonic Pulse-Echo with Low Frequency Excitation, AD-708747 (May 1970).

Sessler, J. G. and Weiss, V.: Improvement in Flaw Detection by the Ultrasonic Pulse-Echo Technique with Simultaneous Low Frequency Excitation, Syracuse Univ. Res. Corp. Final Report, ARPA Contract N00140-69-C-0121 (November 1969).

*Seydel, J. A.: Improved Discontinuity Detection in Ceramic Material Using Computer-Aided Ultrasonic Nondestructive Techniques, Proc. Army Mater. Technol. Conf., 2nd (November 1973).

Seydel, J. A. and Frederick, J. R.: A Computer Processed Ultrasonic Pulse-Echo NDT System, Mater. Eval. 31, No. 2 (February 1973).

Sharpe, R. S.: Industrial Uses of X-Ray Microscopy, J. Royal Microscopical Soc. 86, Part 3, 271-284 (1967).

*Sharpe, R. S.: Research Techniques in Nondestructive Testing, Academic Press (1970).

Shaw, C. B. and Cason, J. L.: Portable Neutron Radiographic Camera Using Californium-252, Mater. Eval. 29, No. 2, 40 (February 1971).

Sherwood, A. E.: Rapid Non-Destructive System for Identifying Thirteen Plated Coatings and Common Metals Electroplating and Metal Finishing 20, No. 11, 354-355 (November 1967).

*Sinclair, N.: Considerations for Establishing Ultrasonic Test Acceptance Standards, Mater. Eval. 25, No. 5, 118-125 (May 1967).

Singh, R. S.: Welding Defects from Stereoradiographs, Photogramm. Eng. 37, 1249-1254 (1971).

*Singh, J. J., Davis, W. T., and Crews, Jr., J. H.: The Application of Acoustic Emission Techniques to Fatigue Crack Measurement, NASA TN-D-7695 (October 1974).

*Smiley, R. W.: Service Correlation - The Key to Successful Nondestructive Testing, Mater. Res. Stand. 6, No. 3, 149-154 (March 1966).

Smith, R. E.: Ultrasonic Elastic Constants of Carbon Fibres and Their Composites, J. Appl. Phys. 43, 2555 (1972).

Smith, S. and Morton, T. M.: Acoustic Emission Detection Techniques for High Cycle Fatigue Testing, Exp. Mech. 13, No. 5 (May 1973).

*Sneeringer, J. W., Hacke, K. P., and Roehrs, R. J.: Practical Problems Related to the Thermal Infrared Nondestructive Testing of a Bonded Structure, Mater. Eval. 29, No. 4, 88-92 (April 1971).

*Southwest Research Institute (San Antonio, TX), Nondestructive Testing - A Survey, NASA SP-5113 (1973).

*Southworth, H. L., Steel, N. W., and Torelli, P. P.: Practical Sensitivity Limits of Production Nondestructive Testing Methods in Aluminum and Steel, AFML-TR-74-241 (November 1974).

Spanner, J. C.: Methods and Reasons for Measuring the Chloride Content in Liquid Penetrant Materials, Mater. Eval. 30, No. 6, 126-135 (June 1972).

Spanner, J. C.: A Selective Review on the Utilization of Acoustic Emission Techniques for Materials Research and Structural Integrity Analysis, M. S. Thesis, Washington State Univ. (1970).

*Speich, G. R. and Fisher, R. M.: Acoustic Emission during Martensite Formation, in Acoustic Emission, ASTM STP-505, 140-151 (1972).

Sproat, W. H.: Reliability Analysis of C-5A Pylon Inspection, Lockheed-Georgia Internal Document No. LG-72-ER0107 (No date).

Sproat, W. H.: Reliability Evaluation of Nondestructive Inspection Methods Using C-130 Wing Boxes, Lockheed-Georgia Internal Document No. LG-72-ER0107 (No date).

Staats, H. N.: Data Extraction in Nondestructive Testing, Nondestruct. Test. 15, No. 1, 44-46 (1957).

Stenton, F. G. and Merhib, C. P.: A Report Guide to Ultrasonic Testing Literature, AD-689455 (April 1969).

Stetson, K. A.: Moire Method for Determining Bending Moments from Hologram Interferometry, Opt. Tech. 2, 80 (1970).

Stewart, I.: NDT Protects the Innocent, Mater. Eval. 29, No. 12, 17A-19A (1971).

Stinchcomb, W. W., Reifsnider, K. L., Marcus, L. A., and Williams, R. S.: Effects of Cylic Frequency on the Mechanical Properties of Composite Materials, AFOSR-TR-73-1907 (July 1973).

*Stinebring, R. C.: Nondestructive Testing of High Temperature Coatings, Mater. Res. Stand. 12, No. 4, 18-19 (1972).

Stinebring, R. C. and Cannon, R.: Development of Nondestructive Methods for Evaluating Diffusion Formed Coatings.

*Stusrud, R. W., Herman, M., and Sippel, G. R.: Beryllium-Metal Matrix Composite Compressor Blade Program, Detroit Diesel Allison Report EDR-7704 (December 1972).

Swann, R. T. and Pittman, C. M: Analysis of Effective Thermal Conductivities of Honeycomb-Core and Corrugated-Core Sandwich Panels, NASA TN-D-714 (April 1961).

Swindlehurst, W.: Acoustic Emission, Non-Destruct. Test. 6, No. 3, 152-158 (1973).

T

*Tang, W. H.: Probabilistic Updating of Flaw Information, J. Test Eval. 1, No. 6, 459-467 (November 1973).

Tatro, C. A.: Acoustic Emission Sensors and Instrumentation, Lawrence Livermore Lab. Report TED-4500, UC-38 (January 1973).

Tatro, C. A.: Design Criteria for Acoustic Emission Experimentation, in Acoustic Emission, ASTM STP-505, 84-99 (1972).

*Tedrow, T. L.: Survey on In-Motion Radiography, Martin Marietta Corp., Report DEN 69-0217 (December 1968).

*Tetelman, A. S.: Acoustic Emission and Fracture Mechanics Testing of Metals and Composites, UCLA - Eng - 7249 (1972).

*Tetelman, A. S. and Chow, R.: Acoustic Emission Testing and Microcracking Processes, in Acoustic Emission, ASTM STP-505, 30-40 (1972).

*Tetelman, A. S. and Evans, A. G.: Failure Prediction in Brittle Materials Using Fracture Mechanics and Acoustic Emission, in Fracture of Ceramics 2, No. 3, 895-924 (1973).

*Thompson, D. O.: Advanced NDE Techniques, in Prevention of Structural Failure - The Role of Quantitative Nondestructive Evaluation, Amer. Sco. Metals, Materials/Metalworking Technol. Series No. 5, 114-145 (1975).

*Thompson, D. O.: Proc. Interdisciplinary Workshop on Nondestructive Testing - Materials Characterization, AFML-TR-73-69 (April 1973). Available as AD-760174.

*Thompson, D. O.: Proc. Interdisciplinary Workshop for Quantitative Flaw Definition, AFML-TR-74-238 (November 1974). Available as AD-A003672.

*Thompson, D. O.: Review of Quantitative NDE, Symposium Sponsored by ARPA/AFML Center for Advanced NDE, Science Center, Rockwell International, Thousand Oaks, CA (July 15-17, 1975).

Thurstone, F. L., Ultrasound Holograms for the Visualization of Sonic Fields, J. Acoust. Soc. Amer. 42, 1148(A) (1967).

Tiede, D. A.: Improved Detection of Tight Defects in Aluminum by Application of a Tensile Load, McDonnell Douglas Astronautics Report MDC-G2081 (1971).

Tiffany, C. F. and Masters, J. N.: Applied Fracture Mechanics, in Fracture Toughness Testing and Its Applications, ASTM STP-381, 249-308 (1965).

*Tittman, B. R.: Strength Prediction by Ultrasonic Defect Characterization, in Proc. Conf. Automated Inspection and Product Control at IITRI (15-17 October 1974).

*Tittman, B. R. and Alers, G. A.: An Acoustic Surface Wave Method for Rapid, Nondestructive Texture Evaluation, Met. Trans. 3, 1307-1308 (May 1972). Available as A72-30615.

Tittman, B. R. and Thompson, R. B.: Measurement of Physical Property Gradients with Elastic Surface Wave Gradients, in Proc Conf. New NDT Techniques, Southwest Research Institute (April 1973).

*Tomlinson, R. and Underhill, P.: Production Neutron Radiographic Facility for Routine NDT Inspection of Special Aerospace Components, ASNT Spring Conf., Los Angeles, CA (March 1969).

Truell, R., Chick, B., Anderson, G., Elbaum, C., and Findley, W.: Ultrasonic Methods for the Study of Stress Cycling Effects in Metals, WADC-TR-60-920 (1961).

Tryon, R. W.: Evaluation of the Radiographic Threashold Detection Level of Subsurface Crack-Like Defects in Aluminum Welds (September 1968).

*Tucker, T. R. and Fujii, C. T.: Acoustic Emission and Stress Corrosion Cracking in High-Strength Alloys, AD-785009 (August 1974).

V

*Vary, A.: Investigation of an Electronic Image Enhancer for Radiographs, Mater. Eval. 30, No. 12, 259-267 (1972).

*Vary, A.: Nondestructive Evaluation Technique Guide, NASA SP-3079 (1973).

*Vary, A.: The Feasibility of Ranking Material Fracture Toughness by Ultrasonic Attenuation Measurements, NASA TM-X-71769 (September 1975).

Vary, A. and Bowles, K. J.: Application of an Electron Image Analyzer to Dimensional Measurements from Neutron Radiographs, Mater. Eval. 32, No. 1, 7-17 (January 1974).

*Vary, A. and Klima, S. J.: A Potential Means of Using Acoustic Emission for Crack Detection Under Cyclic-Load Conditions, NASA TM-X-68228 (April 1973).

Vasilik, D. G. and Murri, R. L.: Mater. Eval. 29, No. 6, 130 (June 1971).

Vaughan, D. A. and Crites, N. A.: Measurement of Stress by X-Ray Diffraction, Prod. Eng. 34, No. 20 (September 1963).

Viktorov, I. A.: Rayleigh and Lamb Waves, Plenum Press (1967).

W

*Waidelich, D. L.: Data Correlation Methods in NDE, in Proc. Conf. Automated Inspections and Product Control, IITRI (15-17 October 1974).

Waidelich, D. L.: Pulsed Eddy Currents, in Research Techniques in Nondestructive Testing, R. S. Sharpe, Ed., Academic Press, New York, NY (1970).

Wallace, R. M., Van Wanderham, M. C., and Pearson, H. S.: Investigation of Fatigue Crack Propagation in Ti-6Al-2Sn-4Zr-6Mo and IN-100 Using Acoustic Emission Techniques, ASNT Fall Meet., Chicago, IL (October 1973).

Warman, E. A.: Neutron Radiography in Field Use, Mater. Eval. 23, No. 11, 543 (November 1965).

Waters, J. P., Aas, H. G., and Erf, R. K.: Investigation of Applying Interferometric Holography to Turbine Blade Stress Analysis, UARL-J990798-13 (February 1970). Available as AD-702402.

Waugh, R. G.: Product Liability: A Growing Challenge for Nondestructive Inspection, presented at ASNT Fall Conference, Atlanta, GA (October 14, 1975).

*Weil, B. L.: Stress Corrosion Crack Detection and Characterization Using Ultrasound, Mater. Eval. 27, No. 6, 135-139 and 144 (June 1969). Available as A69-32334.

*Weldon, W. J.: NDT Techniques for Airline Maintenance Inspection, Qual. Prog. 3, 22-24 (November 1970).

Wells, D. R.: NDT of Sandwich Structures by Holographic Interferometry, Mater. Eval. 27, No. 11, 225-231 (November 1969).

Werkema, M. S. and Tedrow, T. L.: Advanced Radiography Techniques: Continuous Scan Inspection and Laminography, Martin Marietta Corp. (Denver) Final Report TOS-414 (December 1967).

Whaley, H. L. and Cooke, K. V.: Ultrasonic Frequency Analysis, Mater. Eval. 28, No. 3, (1970).

Whittemore, W. L., Larson, J. E., and Shoptaugh, J. R.: A Flexible Neutron Radiography Facility Using a TRIGA Reactor Source, Mater. Eval. 29, No. 5, 93 (May 1971).

*Wiederhold, P. R.: Infrared Pyrometer for Temperature Monitoring of Train Wheels and Jet Engine Rotors, Mater. Eval. 32, No. 11, 239-243 and 248 (November 1974).

Wiederhorn, S. M.: Subcritical Crack Growth in Ceramics, In Fracture Mechanics of Ceramics, 2. Microstructure, Materials and Applications, Plenum Press (1974).

Wiederhorn, S. M.: Reliability, Life Prediction and Proof Testing of Ceramics, in Ceramics for High-Performance Applications, Brook Hill Publishing Company (1974).

Wilkinson, S. J. and Reynolds, W. N.: The Propagation of Ultrasonic Waves in Carbon Fibre Reinforced Plastics, J. Appl. Phys. 7, 50 (1974).

Willett, R. E.: Thermal Conductivity of Cupro-Nickel Alloys at Elevated Temperatures, J. Mater. 4, 744-756 (December 1968).

*Williams, R. S. and Reifsnider, K. L.: Investigation of Acoustic Emission During Fatigue Loading of Composite Specimens, J. Compos. Mater. 8, 340-355 (October 1974).

Wood, H. A.: The Role of Applied Fracture Mechanics in the Air Force Structural Integrity Program, AFFDL-TM-70-5 (June 1970).

*Wood, H. A. and Tupper, N.: Fracture Mechanics Aircraft Structural Design Applications and Related Research, in Proc. Int. Cong. Fracture, 3 rd, Munich (8-13 April 1973).

Wood, W. A.: Elastic Fatigue in Titanium Studied by Scanning Electron Microscopy, George Washington Univ. TR-2 (April 1970).

Wood, W. A., Cousland, S. M., and Sargant, K. R.: Systematic Microstructural Changes Peculiar to Fatigue Deformation, Acta Met. 11, 643 (1963).

Wood, W. A. and MacDonald, D. E.: Metal Fatigue at Ultrasonic Frequency, in Proc. Int. Symp. on High Power Ultrasonics, Graz, Austria (17-19 September 1970).

Wood, W. A., Reimann, W. H., and Sargant, K. R.: Comparison of Fatigue Mechanisms in BCC Iron and FCC Metals, Trans. AIME 230, 511 (1964).

Woodmansee, W. E.: Cholesteric Liquid Crystals and Their Application to Thermal Nondestructive Testing, Mater. Eval. 24, No. 10, 564 (October 1966).

Woodmansee, W. E. and Southworth, H. L.: Detection of Material Discontinuities with Liquid Crystals, Mater. Eval. 26, No. 8, 149-154 (August 1968).

Y

*Yee, B. G. W.: Currently Used NDT Material Characterization Techniques, AFML-TR-63-69, 171-197 (April 1973).

*Yee, B. G. W., Couchman, J. C., Chang, F. H. and Packman, P. F.: Assessment of NDE Reliability Data, NASA CR-134991 (October 1975).

Yee, B. G. W., Kerlin, E. E., and Gardner, A. H.: Computer-Automated Ultrasonic Inspection System for Aircraft Forging, AFML-TR-73-194 (October 1973). Available as AD-775736 and N74-23076.

Yoshida, T. and Hirano, K.: Measurement of Residual Stress in Weldments by X-Ray Diffraction Method, J. Jap. Weld. Soc. 33, No. 7, 533-537 and 538-543 (1964).

*Youshaw, R. A.: A Survey of the Ultrasonic Inspection of Welds, NOL Report NORTR-67-29 (February 1967).

Z

Zackay, V. F., Parker, E. R., Dieter, F., and Busch, R.: The Enhancement of Ductility in High Strength Steels, California Univ. Lawrence Radiation Lab., Report UCRL-17455 (March 1967).

Zall, D. M and Bolander, E. H.: In Situ Identification of Alloys-Spot Testing Alloys for Submarine Construction, Mater. Protection 6, No. 7, 37-38 (July 1967).

Ziebold, T. O. and Ogilvie, R. E.: Quantitative Analysis with the Electron Microanalyzer, Analytical Chemistry 35, 621 (May 1963).

Zoller, L. K.: Prospectus for NDT in the Saturn and Advanced Space Flight Programs, Mater. Eval. 24, No. 11, 637-640 (November 1966).

Zimmer, J. E.: Correlation between Acoustic Velocity and Density for a Porous Material, Paper at ASNT Spring Meet., Los Angeles, CA (March 1970).

Zimmer, J. E. and Cost, J. R.: Determination of the Elastic Constants of a Unidirectional Fiber Composite Using Ultrasonic Velocity Measurement, J. Acoustical Soc. Amer. 47, No. 3, 795-803 (March 1970).

*Zisfein, M. B. and Tarpley, W. B.: Critical Thoughts on Structural Mechanics and NDE, AFOSR-70-2870TR (September 1970). Available as AD-720899.

Zurbrick, J. R.: Development of Nondestructive Tests for Predicting Elastic Properties and Constant Volume Fractions in Reinforced Plastic Composite Materials, AFML-TR-68-233 (February 1969).

Zurbrick, J. R.: Development of Nondestructive Tests for Quantitatively Evaluating Glass Fiber Reinforced Laminates, AGML-TR-67-170 (December 1967). Available as AD-825951.

Zurbrick, J. R.: Mystery of Reinforced Plastics Variability - Nondestructive Testing Holds the Key, Mater Res. Stand. 8, No. 7, 25-36 (July 1968).

Zurbrick, J. R.: Nondestructive Test Technique Development Based on Quantitative Prediction of Bond Strength, AVCO Report AVSD-0331-70-RR (July 1970).

*Zurbrick, J. R. Proudfoot, E. A., and Hastings, C. H.: Nondestructive Test Technique Development for the Evaluation of Bonded Materials, AD-753753 (November 1971).

AUTHOR INDEX

BEST SELLERS

FROM NATIONAL TECHNICAL INFORMATION SERVICE

NTIS

U.S. Service Industries in World Markets: Current Problems and Future Policy Development
PB-262 528/PAT 423p PC$11.00/MF$3.00

Federal Information Processing Standards Register: Guidelines: for Automatic Data Processing Physical Security and Risk Management. Category: ADP Operations. Subcategory: Computer Security
FIPSPUB-31/PAT 97p PC$5.00/MF$3.00

Federal Personnel Management Handbook for Librarians, Information Specialists and Technicians
PB-261 467/PAT 287p PC$9.25/MF$3.00

Handbook for Sampling and Sample Preservation of Water and Wastewater
PB-259 946/PAT 278p PC$9.25/MF$3.00

Historical Trends in Coal Utilization and Supply
PB-261 278/PAT 631p PC$16.25/MF$3.00

Electronic Message Systems for the U.S. Postal Service
PB-262 892/PAT 60p PC$4.50/MF$3.00

Interagency Task Force on Product Liability Legal Study
PB-263 601/PAT 1274p PC$31.25/MF$3.00

NIOSH Analytical Methods for SET P
PB-258 434/PAT 63p PC$4.50/MF$3.00

Interagency Task Force on Product Liability—Briefing Report: Executive Summary
PB-262 515/PAT 56p PC$4.50/MF$3.00

NIOSH Analytical Methods for SET Q
PB-258 435/PAT 40p PC$4.00/MF$3.00

Mini and Micro Computers in Communications
ADA-031 892/PAT 72p PC$4.50/MF$3.00

Fuel Consumption Study. Urban Traffic Control System (UTCS) Software Support Project
PB-259 003/PAT 71p PC$4.50/MF$3.00

MEDLARS Indexing Manual. (Part I): Bibliographic Principles and Descriptive Indexing, 1977
PB-254 270/PAT 134p PC$6.00/MF$3.00

Coal Transportation Capability of the Existing Rail and Barge Network, 1985 and Beyond
PB-260 597/PAT 152p PC$6.75/MF$3.00

Proceedings of the Workshop on Solar Energy Storage Subsystems for the Heating and Cooling of Buildings, Held at Charlottesville, Virginia on April 16-18, 1975
PB-252 449/PAT 191p PC$7.50/MF$3.00

HOW TO ORDER

When you indicate the method of payment, please note if a purchase order is not accompanied by payment, you will be billed an additional $5 00 *ship and bill* charge. And please include the card expiration date when using American Express.

Normal delivery time takes three to five weeks. It is vital that you order by number or your order will be manually filled, insuring a delay. You can opt for *airmail delivery* for $2.00 North American continent; $3.00 outside North American continent charge per item. Just check the *Airmail Service* box. If you're really pressed for time, call the NTIS Rush Handling Service (703) 557-4700. For a $10.00 charge per item, your order will be airmailed within 48 hours. Or, you can pick up your order in the Washington Information Center & Bookstore or at our Springfield Operations Center within 24 hours for a $6.00 per item charge.

You may also place your order by telephone or if you have an NTIS Deposit Account or an American Express card order through TELEX. The order desk number is (703) 557-4650 and the TELEX number is 89-9405.

Thank you for your interest in NTIS. We appreciate your order.

METHOD OF PAYMENT

- ☐ Charge my NTIS deposit account no. _____
- ☐ Purchase order no. _____
- ☐ Check enclosed for $_____
- ☐ Bill me. Add $5.00 per order and sign below. (Not available outside North American continent.)
- ☐ Charge to my American Express Card account number

Card expiration date_____

Signature_____

☐ Airmail Services requested

NAME_____

ADDRESS_____

CITY, STATE, ZIP_____

Item Number	Quantity		Unit Price*	Total Price
	Paper Copy (PC)	Microfiche (MF)		
			Sub Total	
			Additional Charge	
			Enter Grand Total	

All prices subject to change. The prices above are accurate as of 7/77

Foreign Prices on Request.

Clip and mail to

NTIS

National Technical Information Service
U.S. DEPARTMENT OF COMMERCE
Springfield, Va. 22161
(703) 557-4650 TELEX 89-9405