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September 16, 1955

Vol. 24, No. 3

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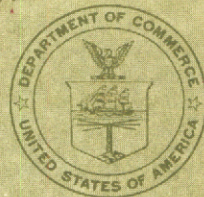
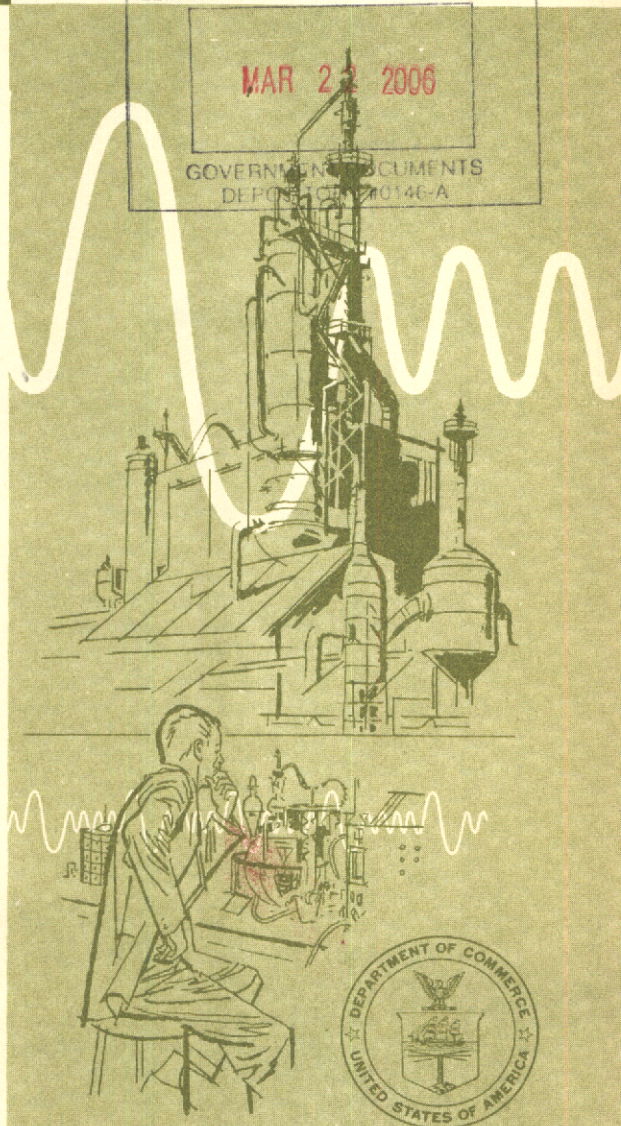
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OFFICE OF TECHNICAL SERVICES  
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U. S. DEPARTMENT OF COMMERCE  
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The printing of this publication has been approved by the Director of the Bureau of the Budget, August 22, 1955.



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## APPAREL

Development of the E14R4 individual protective cover,  
by John A. Davis. U. S. Chemical Corps. Chemical  
and Radiological Laboratories, Army Chemical  
Center, Md. Nov 1954. 20p photos. Order from  
LC. Mi \$2.00, ph \$2.75. PB 117934

1. Chemical warfare agents - Protection 2. Covers,  
Protective - Tests 3. CC CRL R 414.

## CHEMICALS AND ALLIED PRODUCTS

### Organic Chemicals

Analytical procedure for estimation of ground contamination by methyl salicylate, by Alfred L. Woolridge and Carter G. Wood. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Md. Apr 1955. 10p photo, graphs, tables. Order from LC. Mi \$1.50, ph \$1.50. PB 117737

Jacobson and Harper's method for colorimetrically determining methyl salicylate was modified for analysis of field samples by using sampling pans described in CRLR 406, (PB 117738). This modified method was sensitive to even 0.9 mg./sq.m. of methyl salicylate. Project 4-08-04-005. CC CRL R 482.

Field sampling technique for estimation of ground contamination by liquid CW agents or simulants, by Alfred L. Woolridge and Carter G. Wood. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Md. Apr 1955. 9p photos, table. Order from LC. Mi \$1.50, ph \$1.50. PB 117738

Using the sampling pan with an effective sampling area of 0.0182 sq.m., ground contamination as low as 0.9 mg./sq.m. of methyl salicylate, 2.4 mg./sq.m. of mustard, and 4.0 mg./sq.m. of dimethyl hydrogen phosphite was determined. In all cases laboratory recovery of the agents from the sampling pan was greater than 96%. While it is expected that recovery of other agents from these sampling pans will be of a high order, the minimum detectable quantity per unit area will depend upon the sensitivity of the analytical method. Project 4-08-04-005. CC CRL R 406.

Preparation of certain organic compounds for the Naval Research Laboratory. Final report, by C. R. Noller. Stanford University. Dept. of Chemistry, Stanford, Calif. Oct 1941. 43p. Order from LC. Mi \$2.75, ph \$6.50. PB 117873

Contract B-16, NDCrc 10.

1. Chemical compounds, Organic - Preparation  
2. Cyclopentene - Derivatives - Preparation  
3. Cyclohexane - Derivatives - Preparation 4. NDRC B-89 5. OSRD 151.

Preparation of compounds requested by the Naval Research Laboratory. Progress report to Sep 15, 1941, by Roger Adams and C. S. Marvel. Illinois University. Dept. of Chemistry, Urbana, Ill. Dec 1941. 11p. Order from LC. Mi \$2.00, ph \$2.75. PB 117872

1. Chemical compounds, Organic - Preparation  
2. Stearic acid, 12-Keto - Preparation 3. Stearic acid, 4-Keto - Preparation 4. 8-Pentadecanesulfonic acid - Preparation 5. 1-Dodecanesulfonic acid - Preparation 6. 2,4-Hexadiene - Preparation 7. NDRC B-129 8. OSRD 186.

Pure quadruple spectra of CH<sub>3</sub>I and CF<sub>3</sub>I vapor, by Fred Sterzer and Yardley Beers. New York University. College of Engineering. Research Division.



Apr 1955. 31p diagr, graphs, table. Order from  
LC. M1 \$2.50, ph \$5.25. PB 117783

The weighted average for the measured frequencies and corresponding values of  $\epsilon_{\text{PQ}}$  for the six lines which were observed for  $\text{CF}_3\text{I}$  is  $-1933.99 \pm 0.25$  Mc/sec, which is in good agreement with some previous observations of microwave rotational transitions. The  $\text{CF}_3\text{I}$  spectrum is very much weaker than that of  $\text{CH}_3\text{I}$ . The  $\epsilon_{\text{PQ}}$  value of the latter is  $-2142.5 \pm 2$  Mc/sec. Comparisons with previous data and some theoretical explanations are presented. Contract AF 18(600)-968, Low frequency absorption project. Report no. 289.5.

Steric effects in displacement reactions. Part II-VI  
Purdue University. Dept. of Chemistry, Lafayette,  
Ind. Jul 1954. 91p drawing, graphs, tables. Order  
from LC. M1 \$4.50, ph \$12.75. PB 117573

Contract N7onr-394, T. O. III, NR-055-127. Contents: Part II. Rates of reaction of alkyl iodides with the monoalkylpyridines. Steric strain in the activated complex, by Herbert C. Brown and Arno Cahn (Based on thesis by Arno Cahn, Aug 1950). - Part III. Base strengths of pyridine, 2,6-lutidine, and the monoalkylpyridines, by Herbert C. Brown and Xavier R. Mihm (Based on thesis by Xavier R. Mihm, Aug 1951). - Part IV. Heats of reaction of methanesulfonic acid with the monoalkylpyridines, by Herbert C. Brown and Robert R. Holmes (Based on a thesis by R. R. Holmes, Aug 1953). - Part V. Heat of reaction of pyridine with boron trifluoride. A convenient calorimeter for measuring the heat of formation of molecular addition compounds, by Herbert C. Brown and Raymond H. Horowitz (Based on a thesis by R. H. Horowitz, Jan 1951). - Part VI. Heats of formation of the addition compounds of boron trifluoride with the monoalkylpyridines. A linear relationship involving sterically hindered reactants, by Herbert C. Brown and Raymond H. Horowitz (Based on same thesis).

Steric factors in organic chemistry, by Shalom Sarel  
and Melvin S. Newman. Ohio State University Re-  
search Foundation, Columbus, Ohio. Aug 1954.  
21p tables. Order from LC. M1 \$2.25, ph \$4.00.  
PB 117784

The object of this research program was to learn more about steric factors in hydrolysis of esters of acetic acid. In this final report the synthesis of the alkyl acetates is described and the physical properties etc., of all compounds used in this research are tabulated. Final report under Contract no. Nonr-495(04), NR 055 298. OSURF Proj 497 Final report.

Studies on hydrazine, by Harry E. Gunning. Illinois  
Institute of Technology. Dept. of Chemistry,  
Chicago, Ill. Aug 1954. 13p tables. Order from  
LC. M1 \$2.00, ph \$2.75. PB 117781

Investigation covers: A. The thermal decomposition of hydrazine on various surfaces. B. Hydrazine synthesis by the photolysis of ammonia at  $1849 \text{ \AA}$  in a flow system. C. Hydrazine synthesis by the mercury-6( $^3\text{P}_1$ )-photosensitized decomposition of

ammonia in a flow system. D. Mercury photosensitization studies on the boron hydrides. E. Synthesis of  $\text{Ti(II)}$  and  $\text{Ti(III)}$  compounds by the photolysis of  $\text{TiX}_4$  in various solvents. F. The mercury-6( $^3\text{P}_1$ )-photosensitized decomposition of ethyleneimine. Final report for the period Jul 1, 1951 to Aug 31, 1954 under Contract N7onr-32912, Project no. 092 162. For Technical reports 2-3 under this contract see PB 114673 and PB 115927.

Study of the rate of reaction of  $\text{NO}_2$  with various alcohols at low temperatures and pressures, by John F. Kaemmerer, Thomas G. Collins, Pietro Raimondi, and J. C. Treacy. University of Notre Dame. Dept. of Chemical Engineering, Notre Dame, Ind. Jun 1954. 14p graphs. Order from LC. M1 \$2.00, ph \$2.75. PB 117403

Contract ONR 392(00).

1. Nitrogen oxides - Reactions with alcohols  
2. Nitrogen oxides - Reactions - Effects of temperature  
3. Nitrogen oxides - Reactions - Effect of pressure.

Velocity-diameter measurements and reaction rates of PETN, RDX, and EDNA, by M. A. Cook. Utah  
University. Institute for the Study of Rate Processes.  
Explosives Research Group, Salt Lake City, Utah. Aug 1954. 22p graphs, tables. Order from LC. M1 \$2.25, ph \$4.00. PB 117815

Velocity-diameter curves were obtained for PETN, FDX, and EDNA in plastic tubes of constant wall thickness. Particle size effects were clearly evident, although the experimental error and uncertainties associated with confinement were such as to prevent a check of the predictions of the Eyring surface burning law with the relatively narrow range of particle size used. The reaction rates obtained in the detonation head theory were in fair agreement with those extrapolated from isothermal decomposition data extrapolated to detonation conditions by the Eyring surface burning law and absolute reaction rate theory. Those of the nozzle and curved front theories were 30 to 150 times too large. Contract no. N7-onr-45107, Project no. 357-239. UU ISRP TR 37.

## Plastics and Plasticizers

Plastics in building, the uses, past and present, and the potentialities of plastics in building as reported at a conference conducted by the Building Research Institute, Oct 27 and 28, 1954, at the Chamber of Commerce of the United States in Washington, D. C. National Research Council. Division of Engineering and Industrial Research. Building Research Institute. Apr 1955. 151p photos, drawings, graphs, tables. Order from NAS-NRC Publications Office, 2101 Constitution Ave., N. W., Washington 25, D. C. \$5. PB 117373

Editor: Charles R. Koehler. Contents: Part I: An introduction to plastics in building: Plastics used in building construction, by Edward B. Cooper. -



Physical and engineering properties of plastics, by Albert G. H. Dietz. - Evaluating plastics for building applications, by Tyler S. Rogers. - Part II: Specific uses of plastics in building: Light-transmitting panels, by John S. Berkson. - Glazing and interior illuminations, by Orville L. Pierson. - Plastic thermal insulations and vapor seals, by R. N. Kennedy. - Plastics in structural panels, by A. T. Waidelich. - Surfacing and decorative uses of plastics in building, by Hiram McCann. - Plastic piping, by Joseph S. Whitaker. - Plastic ducts and conduits, by Raymond B. Seymour. - Part III: Standards and codes for plastics in building: Standards for plastics products, by Gordon M. Kline. - Building code regulation of plastic building materials, by Frederick J. Rarig. - Part IV: Future uses of plastics in building: Future of plastics in building, by Johan A. Bjorksten. - Round table and general discussion. - Part V: Summaries of the conference: For the plastics industry, by Robert K. Mueller. - For the building industry, by H. N. Huntzicker. - Appendix: A discussion of the building code regulation of plastic building materials, by S. H. Ingberg. - A report on sprayed-on plastic sheetings, by Guy A. Rotherstein. NRC 337.

### Inorganic Chemicals

Condensations by acids and bases (Condensations, displacements, eliminations and rearrangements), by Charles R. Hauser. Duke University. Dept. of Chemistry, Durham, N. C. Aug 1954. 13p. Order from LC. Mi \$2.00, ph \$2.75. PB 117782

Lists reports of research under this contract, printed or in press, and summarizes results. Final report under Contract no. N7onr-455-Task Order II, Project no. 055-120.

Electron microscope method for the determination of the particle size distribution and particle shape of colloidal and ball-milled lead azide, by Seymour M. Kaye. U. S. Picatinny Arsenal. Samuel Feltman Ammunition Laboratories, Dover, N. J. Feb 1955. 31p photos, graphs, tables. Order from LC. Mi \$2.50, ph \$5.25. PB 117841

The method involves the measurement of 200 particles of lead azide by means of the electron microscope at sufficient magnification to resolve the smaller particles (0.05 microns) present in each field. The data is assembled and the cumulative frequency is plotted against the midpoints of the statistical cells on logarithmic probability paper. The geometric mean is read directly from the graph, and the standard deviation is obtained by a simple calculation. Dept. of the Army project 505-01-0032. Ordnance project TA1-2707. PA TR 2133.

Exchange studies with complex ions: Preparation of  $K_3Co(CN)_5Br$  and  $K_3Co(CN)_5I$  by an atom transfer reaction, by Arthur W. Adamson. University of Southern California. Dept. of Chemistry, Los Angeles, Calif. Aug 1954. 9p table. Order from LC. Mi \$1.50, ph \$1.50. PB 117766

The new compounds  $K_3Co(CN)_5Br$  and  $K_3Co(CN)_5I$  are described. They were prepared by the reaction  $2Co(CN)_5^{-3} + X_2 = 2Co(CN)_5X$  which appears to be a bona fide example of an atom transfer oxidation process. A possible mechanism for the reaction is suggested, and an explanation of why it takes place with aqueous bromine and triiodide ion but not with chlorine.

Vibrational structure of the electronic spectra of simple molecules, II: Vibrational analysis of the 3000-5000A absorption system of  $ClO_2$ , by J. B. Coon and E. Ortiz. Texas. Agricultural and Mechanical College. Dept. of Physics, College Station, Texas. May 1955. 21p graph, tables. Order from LC. Mi \$2.25, ph \$4.00. PB 117785

Contract AF 18(600)-439. OSR TN 55-119. AAF Technical note.

1. Chlorine dioxide - Spectrographic analysis  
2. Chlorine dioxide - Absorption spectra  
3. Spectroscopy, Molecular  
4. Molecules - Vibration - Theory.

## ELECTRICAL MACHINERY

### Electronics

Analysis of an electron beam modulated by a traveling microwave field, by O. T. Purl. Illinois. Engineering Experiment Station. Electrical Engineering Research Laboratory, Urbana, Ill. May 1955. 141p photos, drawing, diagrs, graphs, tables. Order from LC. Mi \$6.00, ph \$19.00. PB 117775

This study has been undertaken to provide information about the velocities and trajectories of the electrons in the beam of a traveling wave tube. A beam analyzer has been employed which gives directly on a fluorescent screen the AC velocity content of the electrons as a function of their phase position throughout one complete cycle of the input signal. Contract AF 19(604)-524. AAF CRC TN 55-375.

Automasts: An automatically-recording test of electronics trouble shooting, by Glenn L. Bryan Nicholas A. Bond, Jr., Harold R. LaPorte, Jr., and Stanley A. Summers. University of Southern California. Dept. of Psychology, Los Angeles, Calif. Aug 1954. 49p photos, diagrs. Order from LC. Mi \$2.75, ph \$6.50. PB 117914

This report is one of a series concerned with the analysis and measurement of electronics trouble shooting behavior. An automatically recording testing device called the AUTOMASTS is described in detail. Problems used in the device and procedures for administering the test are presented. Proposals for scoring the response records are introduced along with suggestions for research applications of the instrument. Technical report no. 11 under Contract Nonr-288(02), Project NR 53-093. See also PB 113940, PB 115171.



Average rate of reverse recovery of semi-conductor diodes, by John A. DiGiorgio, Jr. U. S. Air Force. Air Research and Development Command. Cambridge Research Center. Electronics Research Directorate. Communications Laboratory, Cambridge, Mass. Nov 1954. 21p diagsr, graphs. Order from LC. Mi \$2.25, ph \$4.00. PB 117731

Using a Western Electric 276E mercury-type fast-switching relay, the reverse recovery time of several types of point contact and junction diodes was measured and the experimental results were tabulated. The results showed that some silicon-bonded devices possess both the needed fast switching for megacycle pulse-type computer circuits and the low reverse saturation current. AAF CRC TR 55-103.

Behavior of electromagnetic fields at edges, by Josef Meixner. New York University. Institute of Mathematical Sciences. Division of Electromagnetic Research. Dec 1954. 15p diagsr, graphs. Order from OTS. 50 cents. PB 111667

Two cases are treated in detail, namely 1) A region consisting of a conducting wedge and two different dielectric wedges with a common edge. 2) A region consisting of two different dielectric wedges with a common edge. It is also shown that near such edges electrostatic and magnetostatic fields will exhibit the same behavior as the electromagnetic field. Contract no. AF-19(22)-42. NYU RR EM-72. AAF CRC TN 55-180.

Development of trochotrons, by J. Bjorkman and L. Lindberg. Sweden. Kungl. Tekniska Hogskolan, Stockholm. 1954. 133p photos, drawings, diagsr, graphs. Order from LC. Mi \$5.75, ph \$17.75. PB 117111

The present work, performed during 1948-1951, describes the development of two new designs, the cylindrical and the binary types. Electronic phenomena, such as space charge effects, noise and oscillations are of great importance. The experimental investigations are described and optimum design and operating conditions are discussed. The main application of the cylindrical trochotron is as a decade counter for random pulses. It is capable of very high counting rates,  $10^7$  pulses per second have been reached. The binary trochotron is applicable to calculating machines. A pyramid selector and an adder are described. Electrical engineering series, vol. 5, no. 7. Acta polytechnica 149.

Diffraction by a metal plate lens for arbitrary incidence and polarization, by R. A. Hurd. National Research Council of Canada. Radio and Electrical Engineering Division. Mar 1955. 15p diagr, graphs. Order from National Research Council of Canada, Ottawa, Canada. 25 cents. PB 117909

Using the residue method of Berz and Whitehead, the diffraction problem of a plane wave of arbitrary angle of incidence and arbitrary polarization on a parallel plate lens has been solved. Formulae for the reflection coefficients have been derived for a number of cases. NRCC 3599. NRCC ERB 359.

Diffraction by a wide slit, by S. N. Karp and A. Russek. New York University. Institute of Mathematical Sciences. Division of Electromagnetic Research. Feb 1955. 42p diagsr, tables. Order from LC. Mi \$2.75, ph \$6.50. PB 117780

Approximate expressions for the near and far fields, taking into account the interaction between the edges, are derived in terms of the well-known solutions for the field produced when an isolated conducting half-plane is excited by: a) a plane wave, and b) a line source. Results of numerical calculation are given for the case of a plane wave normally incident on the slit. Twelve values of slit width ranging from .96 to 2.5 wavelengths are considered. A comparison of transmission coefficients is also given. A brief discussion of the case of line-source excitation is included. Contract AF 19(122)-42. NYU RR EM-75. AAF CRC TN 55-366.

Distribution of space charge in the Hull magnetron diode, by John A. Bradshaw. Harvard University. Cruft Laboratory. Aug 1954. 73p diagsr, graphs. Order from LC. Mi \$3.75, ph \$10.25. PB 117905

If, in a magnetron diode, the current is not limited by cathode temperature, then the radial dependence of the potential and the charge density functions may be found before cutoff from Langmuir's solution, modified by effects of increasing transit time. In the cutoff transition and after cutoff, the cathode temperature, as reflected in the distribution of electronic velocities at emission, affects the potential and density functions. Data on anode current characteristics are compared with calculations based on models that include these temperature effects. The electronic distribution in phase space is stated in a form which could be verified and refined by further experiments. Contract N5ori-76, Task order 1, NR-071-012. HU CL TR 201.

Electrohydrodynamics, I: Equilibrium of a charged gas in a container, by Joseph B. Keller. New York University. Institute of Mathematical Sciences. Division of Electromagnetic Research. Jan 1955. 19p. Order from LC. Mi \$2.00, ph \$2.75. PB 117757

Contract AF 19(604)-926.

1. Electrohydrodynamics - Theory 2. Fluids - Viscosity - Measurements 3. Gases, Ionized - Equilibrium constants 4. NYU RR MH-1 5. AAF CRC TN 55-293.

Electromagnetic delay line. Final report for July 15, 1953 - July 15, 1954 under Contract DA36-039-sc-52641, by H. G. Nordlin. Federal Telecommunication Laboratories, Nutley, N. J. Sep 1954. 175p diagsr, graphs, tables (part fold). Order from LC. Mi \$6.75, ph \$22.75. PB 117942

The objective of this development is to achieve an efficient distributed-parameter delay line with suitable band-pass characteristics between 10 kilocycles and 10 megacycles per second. Functionally this delay line will also serve as a flexible interconnecting cable between equipments or units re-



quiring such delay. Details of the technical requirements are included in the appendix to this report. Dept. of the Army project no. 3-26-00-602. Signal Corps project no. 2006C. SIG Contract DA36-039-sc-52641 Final report.

Electron guns and focusing structures for high-current-density electron beams, by Otway O'M. Pardee. Syracuse. University. Institute of Industrial Research. Dept. of Mathematics, Syracuse, N. Y. Jun 1954. 46p diagrs. Order from LC. Mi \$2.75, ph \$6.50. PB 117541

The design of electrostatic focusing structures for high-current-density electron beams is studied in this paper by considering both exact and approximate solutions for the electron beam flow field. Particular emphasis is placed on exact flow fields. Some well known solutions are used as well as some new ones developed for curvilinear flow. By a new method, an approximate solution is obtained for a nearly parallel beam of constant velocity. Formulas required in the design of apertured disk and disk loaded rod structures are developed for use with this parallel beam. An appendix gives a new algorithmic variational method for solving certain boundary value problems. It seems useful for computers. Final report under Contract Nonr 679(00).

Electronic scanning techniques. Final report on item 4(b) of Contract DA-36-039-sc-213: Research investigation of electronic scanning techniques and methods of facsimile recording, by C. J. Young, M. Artz, and M. M. Carpenter. Radio Corporation of America. RCA Laboratories Division. David Sarnoff Research Center, Princeton, N. J. Aug 1952. 78p photos, diagrs. Order from LC. Mi \$3.75, ph \$10.25. PB 117924

Using the available television tubes, two scanning methods are considered: (1) by camera tube such as Orthicon, Vidicon, Image Dissector etc., or (2) by flying spot. Parallel studies were undertaken on the two methods, and the factual data on them is given in separate sections of this report. It was found that scanning by camera tube showed considerable promise for the future, but that presently available camera tubes were not well suited to the facsimile application. The second method was chosen therefore for the experimental model. RCA Lab. order no. 14087. SIG Contract DA36-039-sc-213, Final report.

Final report under Contract N9onr-88200, Project NR 010-202, by H. C. Corben. Carnegie Institute of Technology. Dept. of Physics. Jun 1953. 4p. Order from LC. Mi \$1.50, ph \$1.50. PB 117840

Summary of Technical reports no. 1-4.

1. Electrons - Diffusion 2. Relativity - Theory 3. Electron field - Theory 4. Nuclear reactions - Theory.

Investigation of atmospheric radio noise. Progress report no. 7, 1 Jan-31 Mar 1955, under Contract AF 19(604)-876, by A. W. Sullivan, S. P. Hersperger, R. F. Brown, E. L. Aiton. Florida. Engi-

neering and Industrial Experiment Station. Dept. of Electrical Engineering, Gainesville, Fla. Apr 1955. 42p photos, diagrs, graphs, tables. Order from LC. Mi \$2.75, ph \$6.50. PB 117733

Two new tasks were assigned: First, a device for measuring the probability distribution has been constructed and the device was designated the UF/NM-2A Noise Meter. Second, equipment was fabricated and studies initiated of the waveform of a lightning stroke as the ground wave propagates over a distance of 500 to 1000 miles. Operational tests of the equipment used in the study of the propagation of an atmospheric noise pulse have been completed and field measurements of waveforms are being conducted. Studies of the probability distribution of atmospheric noise in a narrow-band amplifier prior to detection have yielded measurements of the distribution. Efforts are being made to obtain a mathematical description of the pre-detection distribution. For 1st-6th reports see PB 113559, 113764, 116122-116123, 116501, 116979. AAF CRC TN 55-370.

Investigation of the iterative synthesis of distributed amplifiers, by Howard B. Demuth. Stanford University. Electronics Research Laboratory, Stanford, Calif. Aug 1954. 70p diagrs, graphs, tables. Order from LC. Mi \$3.25, ph \$9.00. PB 117915

Contract N6onr 251(07), NR 073 360. Appendix A. Equal ripple derivations. - Appendix B. Phase characteristics.

1. Amplifiers - Synthesis 2. Moore's iterative synthesis method (Amplifiers) 3. Mathematical equations and solutions 4. SU ERL TR 77.

Microwave noise study, by Winston M. Gottschalk and David Middleton. Raytheon Manufacturing Co. Research Division, Waltham, Mass. Order separate parts described below from LC, giving PB number of each part ordered.

Quarterly report no. 1, Feb 1, 1953-May 1, 1953, under Contract AF 19(604)-636. May 1953. 48p photos, diagr, graphs. Mi \$2.75, ph \$6.50. PB 117937

Continuation of Contract AF 19(122)-473.

1. Oscillators, Microwave - Noise - Measurement 2. Vacuum tubes, Magnetron - Noise - Measurement 3. Vacuum tubes, Klystron - Noise - Measurement 4. Noise - Mathematical analysis.

Final report under Contract AF 19(604)-1158, Feb 1, 1954-Dec 31, 1954. Jan 1955. 20p diagrs, graphs. Mi \$2.00, ph \$2.75. PB 117760

For Quarterly report 1-2 see PB 116251. For Quarterly reports nos. 2-4, and final report under previous contract see PB 112376, PB 113560, PB 114493, PB 115664.

1. Oscillators - Noise 2. Vacuum tubes, Magnetron - Noise 3. Instruments, Measuring - Noise 4. Noise - Mathematical analysis 5. Vacuum tubes, Klystron - Noise - Theory 6. AAF CRC TR 55-154.

Model tests of a surface-wave transmission line for long distance communication, by G. Goubau and C. E. Sharp. U. S. Signal Corps Engineering Laboratories, Fort Monmouth, N. J. May 1954. 35p diagsr, graphs. Order from LC. Mi \$2.50, ph \$5.25. PB 117788

This memorandum summarizes the results of experimental studies conducted with a scale model of a surface wave line for the transmission of wide band signals over long distances. These studies supplement previous experiments with a full scale line of two miles length. Along with the procedures used and the results of the experimental study with the model line, formulas and other information are given which may be applied for the design of more efficient surface wave lines. Signal Corps project no. 132A. Dept. of the Army project no. 3-99-12-021. Bibliography: p. 17-20. SCEL TM M-1588.

Positive solution to a single-channel non-synchronous communications problem, by Bobby Buchanan. U. S. Air Force. Air Research and Development Command, Cambridge Research Center. Electronics Research Directorate. Communications Laboratory, Cambridge, Mass. Oct 1954. 18p diagsr, tables. Order from LC. Mi \$2.00, ph \$2.75. PB 117730

This report develops a systematic method of spacing messages in time from n independent transmitters, all of which transmit on the same channel in such a way that at least one message from each transmitter will be received by a single receiver without interference within a specified interval of time. AAF CRC TR 55-102.

Propagation of a pulse in an inhomogeneous medium, by F. G. Friedlander. New York University. Institute of Mathematical Sciences. Division of Electromagnetic Research. Mar 1955. 48p diagsr. Order from LC. Mi \$2.75, ph \$6.50. PB 117779

An approximation is found whose inverse Laplace transform can be calculated; it applies when a shadow, in the usual sense of geometrical optics, is formed, and it describes the variation of the solution immediately behind the diffracted front which propagates into the shadow. Contract AF-19(122)-42. NYU RR EM-76. AAF CRC TN 55-367.

Qualification approval of electron tube types (magnetrans) AF-RK 6517/QK358 and AF-RK 6518/QK254, by Nicholas W. Fedrick. U. S. Air Force. Air Research and Development Command. Rome Air Development Center, Griffiss Air Force Base, Rome, N. Y. Mar 1955. 76p photos, fold. drawings, fold. graphs, tables. Order from LC. Mi \$3.75, ph \$10.25. PB 117749

1. Vacuum tubes, Magnetron - Tests 2. AF-RK 6517/QK358 (Vacuum tube) 3. AF-RK 6518/QK254 (Vacuum tube) 4. AAF RADC TR 55-4.

Quarterly scientific report no. 7, covering period Jan 1, 1955-Apr 1, 1955 under Contract no. AF 19(804)-786, by D. B. Brick and A. R. Vobach.

Harvard University. Cruft Laboratory. May 1955. 20p photos, diagsr. Order from LC. Mi \$2.00, ph \$2.75. PB 117771

Contents: 1. Investigation of optical current distributions, by D. B. Brick and A. R. Vobach. - 2. Current distributions on cylinders excited by spherical waves, by D. B. Brick. - 3. Variational corrections to cylindrical scattering at high frequencies, by R. D. Kodis. - 4. Back-scattering measurements, by R. V. Row. - 5. Scattering of plane waves by obstacles, by S. I. Rubinow. AAF CRC TN 55-184. HU CL Q SR 7.

Radiation field of rhombic antennas using metal supports. Final technical report, 15 Apr 1952 to 15 Nov 1952, by D. F. Bowman. Weldon and Carr, Washington, D. C. Dec 1952. 55p photos, diagsr, graphs, table. Order from LC. Mi \$3.00, ph \$7.75. PB 117761

The use of metal supports instead of wooden poles is desirable in the construction of rhombic antennas in which heights of 100 feet or more are required. The effect of these metallic members on the electrical performance of the antenna is not completely known. The objectives of the work are: to determine the effects on the radiation patterns with special attention to the vertical component of the radiation pattern, to determine the effects on the input impedance, and if any of the determined effects degrade the performance seriously, to determine the effects of placing the side supports at a wider spacing from the antenna conductor. Dept. of the Army project 3-99-12-022. Signal Corps project: 15-132B. Contract DA36-039-sc-15537, Final report.

Reduction of power-line radio interference, by J. C. Senn and A. W. Gosley. U. S. Naval Civil Engineering Research and Evaluation Laboratory, Port Hueneme, Calif. Feb 1955. 32p photos, diagsr, graphs, tables. Order from OTS. \$1.00. PB 111666

This report is a discussion of the work done on an isolation filter for reduction of power-line radio interference. Construction details of the filter and subsequent tests are described. Results of tests are tabulated and indicate that in general it is impractical to bury a power line in the earth as a filter. Project NY 411 002. Interim report. NCEREL TM M-095.

Reflectometer for h-f band, by O. Norgorden. U. S. Naval Research Laboratory. Sep 1949. 9p diagsr. Order from OTS. 50 cents. PB 111682

The general principles of reflectometer or directional-coupler design at the ultra-high frequencies have been applied to the lower frequencies (2- to 30-Mc band). Theoretical design equations, given for an approximate equivalent circuit of the reflectometer, show that the circuit parameters are independent of the frequency. The sensitivity of the device is approximately proportional to the frequency. NRL R 3538.



Research for determining the time element in photoelectric emission. Quarterly report no. 5, for the period, 1 Nov 1954 - 31 Jan 1955, under Contract AF 18(600)-1018, by G. L. Clark, D. F. Holshouser and H. M. Von Foerster. Illinois. Engineering Experiment Station. Electrical Engineering Research Laboratory. Electron Tube Research Section, Urbana, Ill. Feb 1955. 28p diagsr, graphs. Order from LC. Mi \$2.25, ph \$4.00. PB 117773

Project no. R-115-032.

1. Kerr cell
2. Photoelectric cells - Design
3. Shutters, Optical
4. Time interval methods.

Scale model measurements of low frequency transmitting antennas, by Sidney Rosenberg and Paul Wilson. U. S. Air Force. Air Research and Development Command. Rome Air Development Center, Griffiss Air Force Base, Rome, N. Y. Mar 1955. 91p photos, drawings (part fold.), diagsr, graphs, fold. tables. Order from LC. Mi \$4.50, ph \$12.75. PB 117748

This report presents tests and evaluation of different types of antenna tower modifications made to increase radiation efficiency and RF bandwidth of high-Q, 625-foot radio towers, of both grounded and base-insulated types, used in connection with the operation of long distance navigation systems employing wide-band pulse transmissions. All data was obtained from measurement of scale models. AAF RADC TR 55-8.

Scattering from a dielectric prolate spheroid, by John C. Johnson. Tufts College. Dept. of Physics. Research Laboratory of Electronics, Medford, Mass. Feb 1955. 102p diagsr. Order from LC. Mi \$4.25, ph \$14.00. PB 117750

Solutions of the electromagnetic wave equation in prolate spheroidal coordinates are investigated to determine if functions similar to those used by Mie can be constructed. Approximate solutions are found that are useful for both low and high eccentricities of the  $\xi$  coordinate. A numerical example of back scattering of the 3.2 cm microwave by a prolate spheroidal ice pellet is presented. Scientific report no. 3 under Contract AF 19(604)-550.

Some characteristics of image orthicon camera tubes, by H. L. Wuerffel and D. E. Webb. U. S. Naval Research Laboratory. Mar 1955. 44p photos, diagsr (1 fold), graphs, tables. Order from OTS. \$1.25. PB 111658

It is the purpose of this report to formulate the general characteristics of these tubes and to establish a basis for predicting their performance under such abnormal operation, by treating the image section of the tube as a triode and by taking into account target leakage and target-to-mesh capacity. The equations which have resulted and which have been experimentally verified show that the signal current is independent of the scanning rate and is a function of photocathode exposure for a large range of exposure times. It is advantageous to substitute light for exposure time in the study of rapid motion. NRL R 4498.

Static magnetic storage and delay line, by An Wang and Way Dong Woo. Harvard University. Computation Laboratory. Jan 1950. 6p diagsr, graphs. Order from LC. Mi \$1.50, ph \$1.50. PB 117874

Reprinted from Journal of Applied Physics, Vol. 21, no. 1, 49-54, Jan 1950.

1. Lines, Delay
2. Cores, Magnetic.

Step discontinuities in waveguides, by W. Elwyn Williams. New York University. Institute of Mathematical Sciences. Division of Electromagnetic Research. Apr 1955. 34p table. Order from LC. Mi \$2.50, ph \$5.25. PB 117777

The method developed by Wiener and Hopf for solving a certain class of integral equations is applied to the problem of a discontinuity in cross-section of a rectangular waveguide. We consider the two-dimensional acoustic problem of two channels of infinite width and different heights joined together with a short step. The present analysis is extended to cover the case where the larger channel is capable of supporting the mode above the fundamental without attenuation. Contract no. AF-19(122)-42. NYU RR EM-77. AAF CRC TN 55-374.

Storage of video signals on simple mosaics, by Robert A. McConnell. Massachusetts Institute of Technology. Radiation Laboratory. Feb 1946. 99f photos, drawings, diagsr, graphs. Order from LC. Mi \$4.50, enl pr \$14.00. PB 117675

Contract OEM sr-262.

1. Data storage systems
2. Signals, Visual - Storage
3. Electron beams - Collecting devices
4. Tubes, Television
5. MIT Rad Lab 743
6. NDRC Div 14.

Study of the generation and detection of electromagnetic waves in the millimeter wave region. Report no. 3 under Contract AF 19(604)-1115, Dec 1, 1954 to Feb 28, 1955, by J. H. Rohrbaugh. New York University. Washington Square College of Arts and Science. Physics Dept. Mar 1955. 43p photos, drawings, diagsr. Order from LC. Mi \$2.75, ph \$6.50. PB 117767

Continuation of earlier studies performed under Contract AF 19(122)-4 from Sep 1, 1948 to May 31, 1954.

1. Bolometers - Design
2. Waves, Electromagnetic - Generation
3. Waves, Electromagnetic - Detection
4. Equations, Electromagnetic
5. Harmonic functions
6. Spectrometers - Design
7. AAF CRC TN 55-192.

Tables of radial solutions of the Dirac equation for the scattering of high energy electrons by a point charge, by A. E. Glassgold and Evelyn W. Mack. Massachusetts Institute of Technology. Laboratory for Nuclear Science, Cambridge, Mass. Aug 1954. 44p tables. Order from LC. Mi \$2.75, ph \$6.50. PB 117906

Contract N5ori-07806, NR-026-001.

1. Atomic power - Research 2. Tables, Mathematical 3. Electrons - Scattering - Tables 4. Electrons - Scattering - Theory 5. Dirac equation (Electron scattering) 6. MIT LNS TR 65.

UHF filtering networks. Scientific report no. 3 under Contract no. AF 19(604)-962, 1 Feb 1954 to 30 Apr 1955, by D. E. Mode. Lehigh University, Institute of Research, Bethlehem, Pa. Apr 1955, 22p diags, graph. Order from LC. M1 \$2.25, ph \$4.00. PB 117778

Methods for computing the voltage breakdown and the power handling capacity at this breakdown voltage of an obstacle in a filter structure are derived. The method chosen is a graphical one in which a field plot is made subject to Maxwell's equations. From this plot the breakdown voltage and power handling capacity are obtained. Some relations between loaded Q, percentage bandwidth, and skirt selectivity are discussed. AAF CRC TN 55-373.

Ultrasonic propagation in solid materials. Interim research report no. 3 under Contract no. AF 19-(604)-1095 from Jan 3, 1955 to Apr 1, 1955. Andersen Laboratories, Inc., West Hartford, Conn. Apr 1955. 10p diags. Order from LC. M1 \$1.50, ph \$1.50. PB 117768

For 1st-2d reports see PB 116609, 116981.  
1. Radiation, Ultrasonic - Propagation 2. Solids - Ultrasonic properties 3. Lines, Delay - Design 4. Ultrasonics - Research 5. Waves, Ultrasonic - Propagation 6. AAF CRC TN 55-369.

## Generators, Motors, Transmission

Instruction book for radio transmitting equipment Navy Model TED, by Federal Telephone and Radio Corporation, Clifton, N. J. U. S. Bureau of Ships. May 1951. 175p fold diags, tables. Order from LC. M1 \$6.75, ph \$22.75. PB 117845

Contracts NObsr-39187 and NObsr-43268.  
1. Radio transmitters - Operation 2. TED (Radio transmitter) 3. NAVSHIPS 91357.

Junction-transistor circuits for square-wave generators, by Carlos Martin. Stanford University. Electronics Research Laboratory, Stanford, Calif. Aug 1954. 52p graphs. Order from LC. M1 \$3.00, ph \$7.75. PB 117916

This work comprises a review of junction transistor multivibrators with the aim of finding a practical frequency-controllable square-wave generator. Analysis of the different multivibrators is developed in a manner similar to that used for vacuum-tube multivibrators. The transistor is replaced by equivalent passive T networks, the element values of which are taken from the characteristic curves or from measurements at the proper operating points. Contract N6onr 251(07), NR 373-360. SU ERL TR 78.

Keyed oscillator for time-delay generation, by Clark C. Watterson. U. S. Naval Research Laboratory. May 1955. 22p diags, graphs. Order from LC. M1 \$2.25, ph \$4.00. PB 117789

A keyed oscillator circuit which simultaneously produces a sine and a cosine wavetrain for each keying pulse fed to the oscillator has been developed. A design procedure is given for the oscillator, and the bandwidth requirements of subsequent circuits handling the wavetrains are considered. A time-delay generator incorporating the oscillator was designed. Appendix A: Oscillator analysis. NRL R 4522.

Research and development leading to the establishing of designs and fabrication of samples for miniature variable air capacitors. Final report, Mar 15, 1953 to Mar 15, 1954, under Signal Corps Development no. DA 36-039-sc-42677, by H. C. Goshia and W. F. Reiter. All Star Products, Inc., Defiance, Ohio. Apr 1954. 18p diags, tables. Order from LC. M1 \$2.00, ph \$2.75. PB 117762

Dept. of the Army project: 3-26-00-602. Signal Corps project: 2006C.  
1. Capacitors, Air - Miniaturization 2. SIG Contract DA 36-039 sc-42677, Final report.

Summable divergent integrals and a far field paradox. Scientific report, no. 2, Dec 1, 1954 to Apr 30, 1955 under Contract no. AF 19(604)-1307, by Jack Kotik. Technical Research Group, New York, N. Y. May 1955. 15p. Order from LC. M1 \$2.00, ph \$2.75. PB 117769

1. Mathematical equations and solutions 2. Fourier analysis 3. Waves, Electromagnetic - Scattering - Theory 4. AAF CRC TN 55-371.

Transistor regenerative pulse amplifier for power application, by Joseph F. Spades and A. William Carlson. U. S. Air Force. Air Research and Development Command, Cambridge Research Center. Electronics Research Directorate. Communications Laboratory, Cambridge, Mass. Dec 1954. 9p diags. Order from OTS. 50 cents. PB 111665

To obtain power greater than the maximum available from a single transistor, two or more transistors are operated in parallel. This parallel operation is accomplished by means of common-base and common-collector connections, but with each emitter returned through a separate path. With ten Western Electric type 1729 transistors, a 15-v 0.2-u sec pulse can be developed across 240 ohms. AAF CRC TN 54-101.

Variable-frequency magnetic-coupled multivibrator, by Roland L. VanAllen. U. S. Naval Research Laboratory. May 1955. 11p photos, diags, graphs. Order from LC. M1 \$2.00, ph \$2.75. PB 117926



A magnetic-coupled multivibrator has been developed, based on the principle that frequency can be controlled in inverse proportion to magnetic flux. Multivibrator action of the circuit results from the use of two switching devices, such as transistors or vacuum tubes, with their switching rates controlled via the magnetic core material employed. Experimental results are discussed for circuits operating at frequencies up to 800 kc. This frequency, however, does not represent a theoretical upper limit. NRL R 4543.

## FOOD AND KINDRED PRODUCTS

Methods for evaluation of nutritional adequacy and status, a symposium sponsored by the Quartermaster Food and Container Institute for the Armed Forces, Quartermaster Research and Development Command, U. S. Army Quartermaster Corps and Medical Nutrition Laboratory, Research and Development Division, Office of the Surgeon General, Oriental Institute, University of Chicago, Feb 25-26, 1954. Edited by Harry Spector and Martin S. Peterson and T. F. Friedemann. National Research Council. Advisory Board on Quartermaster Research and Development. Committee on Foods. Dec 1954. 318p photos, graphs, tables. Order from Quartermaster Food and Container Institute for the Armed Forces, 1819 W. Pershing Drive, Chicago 9, Ill. Free of charge. PB 117846

Contents: I. Introduction: Problems, purposes, and scope of the symposium, by Charles Glen King. - Importance of nutritional status and methodology to the Army, by Lt. Col. Tyron E. Huber. - Controls in measuring nutritional response, by E. W. Cramp-ton. - II. Evaluation of protein adequacy: Biological value of proteins and amino acid interrelationships, by H. H. Mitchell. - Rat repletion method, by Paul R. Cannon. - Introductory studies on quantitative relationships between tissue enzymes and dietary protein, by J. N. Williams, Jr. - Other methods of evaluation, by James B. Allison. - III. Evaluation of vitamin adequacy: Blood levels, by Otto A. Bessey. - Evaluation of vitamin adequacy: Urinary excretion tests, by Walter G. Unglaub and Grace A. Goldsmith. - Some considerations in making therapeutic trials, by William J. McGanity and William J. Darby. - Vitamin adequacy and specific metabolic functions, by Esmond E. Snell. - IV. Evaluation of mineral adequacy: Balance studies with macroelements, by D. M. Hegsted. - Specific functions of trace elements in blood formation, by G. E. Cartwright, C. J. Gubler and M. M. Wintrobe. - Other functions, by George K. Davis. - V. Evaluation of military rations by animal experimentation: Rats, by Harry Spector. - Nutrition and performance in animals, by Josef Brozek. - Monkeys and dogs, by C. A. Elvehjem. - Nutritive value of Army rations as determined with growing chicks, by M. L. Scott, L. C. Norris, L. A. Maynard and Harry Spector. - VI. Evaluation of nutritional status of populations: Nutrition survey methods, by W. H. Sebrell, Jr. and J. M. Hundley. - Clinical examination, by Norman Jolliffe. - Physical performance, by Josef Brozek. - Physiological alterations in organic functions, by Robert E. Johnson. - Some aspects of nutritional

problems of seriously wounded soldiers, by Stanley M. Levenson and Hyman Rosen. - VII. Aspects of nutritional status reflected by body composition, by Morton I. Grossman. - Measurement of body compartments in nutritional research: Comment on selected methods, by Josef Brozek. - Body fluid compartments and indices of body composition, by David E. Bass. - Relation of body composition to metabolic activities, by William R. Best. - Body composition I: In vivo estimation of fat and water content from specific gravity (density) determinations, by Albert R. Behnke. - Body composition, II: In vivo estimation of body fat, from measurements of gaseous desorption or absorption, by Albert R. Behnke.

Study of the interrelationships of dietary protein and amino acids with tissue enzyme activity. Final report, June 30, 1951-June 30, 1954, under Contract Nonr-38300, Project 120-087, by J. N. Williams, Jr. Wisconsin University, Madison, Wis. May 1954. 3p. Order from LC. M1 \$1.50, ph \$1.50. PB 117935

Abstracts publications resulting from work on this contract.

1. Proteins - Derivatives - Enzyme action
2. Amino acids - Reactions
3. Nitrogen - Metabolism
4. Enzymes - Physiological effects.

## FUELS AND LUBRICANTS

Aviation gasoline contamination detection kit. Part I: Development, by J. A. Krynitisky and W. D. Garrett. U. S. Naval Research Laboratory. Apr 1955. 24p photos, graphs, tables. Order from OTS. 75 cents. PB 111683

A simple test for the determination of small quantities of JP-5 (or other similar materials) in aviation gasoline has been developed and standardized. This test is based on the relative heights to which such fuels will wet a calibrated paper under controlled conditions of air flow. The effects of fifteen different variables and conditions have been defined and methods are presented by which these are either eliminated or compensated. NRL R 4516.

Development of qualification test methods for gear lubricants. Armour Research Foundation, Chicago, Ill. Contract DA-11-022-ord-905. Order separate parts described below from LC, giving PB number of each part ordered.

Progress report no. 28, Feb 15-Mar 15, 1955, by J. N. Foster and H. Ruwe Barton. Mar 1955. 44p photos, tables. M1 \$2.75, ph \$6.50. PB 117513

Appendix A: Report to CLR Moisture Corrosion Sub-Panel on repeatability and differentiation of gear lubricants. - Appendix B: Detailed procedure for conducting moisture corrosion tests in accordance with the proposed procedure.

1. Gears - Lubrication - Corrosion tests  
2. Corrosion - Tests - Methods 3. Lubricants - Tests  
4. ARF Proj L 030, Report no. 28.

Progress report no. 29, Mar 15, 1955 to Apr 15, 1955, by D. L. Powell and H. Ruwe Barton. Apr 1955. 9p. Mi \$1.50, ph \$1.50. PB 117719

This report is confined to the work conducted on the instrumentation phase of the project. The development of equipment is proceeding in three general areas. These are: 1) the adaption of the existing Chevrolet equipment to mobile testing in an automobile; 2) the fabrication and assembly of the instrumentation and equipment for a 3/4 ton Dodge axle for testing in the laboratory; 3) the purchasing, fabricating and assembling of equipment for torque measurements in the field on the M37 and M211 trucks. ARF Proj L 030, Report no. 29.

Progress report no. 30 for the period Apr 15, 1955 to May 15, 1955 under Contract no. DA 11-022-ord-905. Jun 1955. 32p photos, tables. Mi \$2.50, ph \$5.25. PB 117825

Project no. TB5-3010.

1. Gears - Lubrication - Corrosion tests 2. Lubrication - Testing equipment 3. Corrosion - Tests - Humidity 4. ARF Proj L 030, Report no. 30.

Evaluation of the Alemite oil-mist lubricator as a means for disseminating CW agents, by L. Janofsky, H. M. Lewis, C. Elliott. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Md. Oct 1953. 23p photo, drawings, graph, tables. Order from LC. Mi \$2.25, ph \$4.00. PB 117574

The object of this report was to determine the suitability of using the Alemite automatic lubricating system as a means of producing airborne clouds of chemical agents in test chambers. Further testing was discontinued because of unfavorable over-all results. Project 4-04-15-007. CC CRL R 118.

Influence of deuterium and hydrogen on the flame velocities of  $N_2O-H_2-N_2$  mixtures, by Leland A. Watermeier. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Feb 1955. 29p photos, drawings, diags, graphs, tables. Order from LC. Mi \$2.25, ph \$4.00. PB 117758

The soap bubble method employing a Schlieren photographic technique was used to determine the flame velocities of hydrogen-nitrous oxide and deuterium-nitrous oxide gas mixtures using nitrogen as a diluent. The apparatus used in this investigation includes a new bubble and spark gap holder and a repetitive spark technique for following the history of the explosion. The flame velocities of gas mixtures with varying amounts of hydrogen or deuterium are presented together with their respective space velocities and expansion ratios. The results are correlated at various flame temperatures with diffusion and thermal conductivity. The diffusion and thermal

theories are discussed and compared with the data. Project 503-02-001. APG BRL R 925.

Partially fluorinated esters and ethers as temperature-stable liquids. Part II: Physical and chemical properties, by C. M. Henderson, C. M. Murphy, and H. Ravner. U. S. Naval Research Laboratory. Mar 1955. 26p tables. Order from OTS. 75 cents. PB 111684

Properties of interest in lubrication and hydraulics have been determined on a new series of esters derived from alkyl glycols and fluorinated acids,  $H(CF_2)_nCOOH$ , and also alkyl acids and fluorinated alcohols,  $H(CF_2)_nCH_2OH$ . Their properties are compared with those of similar esters derived from  $F(CF_2)_nCOOH$  and also  $F(CF_2)_nCH_2OH$ . NRL R 4493.

Study of fast reactions in fuel-oxidant systems. Technical report no. 7: Ignition delay with rapidly mixed liquid reactants, by Louis Baker, Jr. and Martin Kilpatrick. Illinois Institute of Technology. Dept. of Chemistry, Chicago, Ill. Aug 1954. 251p photos, diags, graphs, tables. Order from LC. Mi \$9.25, ph \$32.75. PB 117824

The report includes the design of an apparatus to contact the reactants rapidly, to mix efficiently, and to record ignition as a function of time. As mixing cannot be studied solely as a function of ignition, the apparatus also permits measurement of the injection rate and the change in pressure with time. The systems studied were hydrazine and nitric acid; hydrazine, ammonia and nitric acid; aniline and nitric acid; and hydrazine and hydrogen peroxide. Contract no. N7onr-32913; Project NR 051-056.

## HIGHWAYS AND BRIDGES

Dynamic response of floating bridges to transient loads, by J. P. Romualdi, E. D'Appolonia and E. T. Mavis. Carnegie Institute of Technology. Dept. of Civil Engineering, Pittsburgh, Pa. Aug 1954. 131p photos, diags, graphs. Order from LC. Mi \$5.75, ph \$17.75. PB 117791

Experimental tests were conducted to verify the importance of the influence of virtual mass on the transient oscillations of floating structures. From known impulses calculated solutions were obtained neglecting virtual mass and damping. These results are compared with experimental results. An experimental procedure for determining virtual mass is also presented. Contract no. Nonr-760(03).

Relocation of public utilities due to highway improvement; an analysis of legal aspects. Highway Research Board. 1955. 211p photos, diags, tables. Order from NAS-NRC Publications Office, 2101 Constitution Ave., N. W., Washington 25, D. C. \$6.00. PB 117746



This monograph is a factual analysis of over 250 of the most important judicial decisions and all constitutional and statutory provisions affecting public utility relocation occasioned by highway improvement. Legal materials relating to the occupancy of highway rights-of-way by utilities have also been included. It is intended to assist the public interest by delineating the fundamental legal relationships that exist between the highway departments and public utilities, insofar as such relationships are revealed by the pertinent court decisions, the statutes and constitutions. HRB SR 21. NRC 353.

Soil freezing, presented at the thirty-third annual meeting, Jan 12-15, 1954. Highway Research Board. 1955. 41p photos, drawings, diags, graphs, tables. Order from NAS-NRC Publications Office, 2101 Constitution Ave., N. W., Washington 25, D. C. 60 cents. PB 117468

Contents: 1. Freezing-and-thawing tests on mixtures of soils and calcium chloride, by E. J. Yoder. 2. Frost determination by electrical resistance, by Elmer F. Rowland, Lewis H. Stolzy, and George A. Crabb, Jr. 3. Frost action on small footings, by W. A. Trow. HRB Bul 100. NRC 348.

Tests on large culvert pipe, presented at the thirty-third annual meeting, Jan 12-15, 1954. Highway Research Board. 1955. 22p photos, drawings, diags, graphs, tables. Order from NAS-NRC Publications Office, 2101 Constitution Ave., N. W., Washington 25, D. C. 45 cents. PB 117630

Contents: 1. Tests of large-diameter reinforced-concrete pipe, by John G. Hendrickson, Jr. - 2. Deflections of timber-strutted corrugated-metal-pipe culverts under earth fills, by M. G. Spangler and Donald L. Phillips. HRB Bul 102. NRC 350.

Trends in land acquisition. Presented at the thirty-third annual meeting, Jan 12-15, 1954. Highway Research Board. 1955. 88p graphs, tables. Order from NAS-NRC Publications Office, 2101 Constitution Ave., N. W., Washington 25, D. C. \$1.50. PB 117454

Contents: Report of Committee on Land Acquisition and Control of Highway Access and Adjacent Areas, by David R. Levin. - Bringing zoning up to the automobile era, by Hugh R. Pomeroy. - Protection of highways and feeder streets through subdivision controls, by J. H. Beuscher. - Zoning approach to the Chicago parking problem, by Robert J. Kelly. - Controlling the use of access, by Clifton W. Enfield and John C. McLean. HRB Bul 101. NRC 349.

Vehicle climbing lanes. Papers presented at the thirty-fourth annual meeting, Jan 11-14, 1955. Highway Research Board. 1955. 40p photos, diags, graphs, tables. Order from NAS-NRC Publications Office, 2101 Constitution Ave., Washington 25, D. C. 60 cents. PB 117770

Contents: 1. Simplified climbing-lane design theory and road-test results, by T. S. Huff and F. H.

Scrivner. - 2. Motor-vehicle performance on ascending grades, by Robert F. Dunn. - 3. Truck congestion on uphill grades, by William E. Willey. NRC 354. HRB Bul 104.

## INSTRUMENTS

Analysis of sampled data systems and the digital computers in the frequency domain, by Rubin Boxer. U. S. Air Force. Air Research and Development Command. Rome Air Development Center, Griffiss Air Force Base, Rome, N. Y. Apr 1955. 103p diags, graphs, tables. Order from LC. M1 \$4.75, ph \$14.00. PB 117922

Systems and circuitry are analyzed which are distinguished by the fact that their inputs and outputs are non-continuous, i.e., discrete functions of time. Typical difference equations representing integration and differentiation programs of digital computers are analyzed. Limitations of the methods developed are illustrated and discussed. AAF RADC TR 55-7.

Bathythermograph data analyzer, by Leo G. Killian. Cook Electric Co. Cook Research Laboratories, Skokie, Ill. Jun 1954. 35p photos, diags. Order from LC. M1 \$2.50, ph \$5.25. PB 117745

This report is limited to a brief general description of the data analyzer and its functioning. Those interested in a more detailed account are referred to Final Progress Report FPR 35-1 of the Cook Research Laboratories. Descriptive report PR 53-1. Contract NONr-08602. Cook Project P-417.

Comparison of two types of dew duration recorders, by R. H. Shaw. Iowa State College. Dept. of Agronomy, Ames, Iowa. Feb 1955. 22p photos, graphs, table. Order from LC. M1 \$2.25, ph \$4.00. PB 117722

Contract No. AF 19(604)-589. Scientific report no. 2.

1. Recorders, Dew duration 2. Taylor dew duration recorder (Trade name) 3. Wallin - Polhemus dew duration recorder (Trade name) 4. Dew - Measuring equipment 5. AAF CRC TN 55-294.

Computer components fellowship no. 347. Quarterly report no. 6, second series, Jan 1, 1955 to Mar 31, 1955 under Contract CLN AF 19(604)-943. Mellon Institute of Industrial Research, Pittsburgh, Pa. Apr 1954. 92p photos, drawings, diags, graphs, tables. Order from LC. M1 \$4.50, ph \$12.75. PB 117776

For quarterly reports 1-4, second series see PB 114377, PB 114976, PB 115560, PB 117013. Contents: I. Printed circuits via xerography, by Martin N. Heller. - II. Etched printed circuits via xerography, by F. Schwartz, M. N. Haller, R. L. Serenka. - III. Chemical - machining of metal foils, by R. L. Serenka, F. A. Schwartz. - IV. Insulating

films, by C. H. T. Wilkins, A. Milch. - V. Refractory capacitors, by C. H. T. Wilkins, A. Milch. - VI. Chemically - deposited electroluminescent phosphors, by R. E. Freund. - VII. Electroluminescent brighteners of dielectric - imbedded phosphors, by J. J. Mazenko, F. A. Schwartz. - VIII. Electroluminescent brighteners, by F. A. Schwartz, J. J. Mazenko, E. R. Michalik, R. E. Freund. - IX. Photoconductive films, by A. Milch. - X. Scale-of-two R. F. pulse counter, by F. A. Schwartz, A. Milch, R. T. Steinbeck, J. J. Mazenko. AAF CRC TN 55-384.

Determination of moisture in aluminum soaps by moisture-balance method, by Roger A. Reynolds and Samuel Sass. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Md. Mar 1955. 10p tables. Order from LC. Mi \$1.50, ph \$1.50. PB 117747

A commercially available instrument that requires only one-eighth the time required by the presently used Dean-Stark procedure was tested and found satisfactory for the determination of water in both napalm and octal. Excellent agreement was obtained when specimens of aluminum soaps were analyzed by both the Dean-Stark and moisture-balance methods. Project 4-09-05-001. CC CRL R 416.

Ground position indicator for radar navigation and bombing, by Britton Chance, Ivan Greenwood, William Tull, and John Gray. Massachusetts Institute of Technology. Radiation Laboratory. Jun 1944. 222f photos, drawings, diagrs (part fold), graphs (1 fold), tables. Order from LC. Mi \$8.25, enl pr \$30.25. PB 117674

Describes an accurate method of position and wind indication based upon a combination of navigation and radar data. Complete details of equipment designed to coordinate the bombing and navigation facilities of GPI with APS-1K radar are included. Reports of flight and component tests of earlier models are given. Contract OEM sr-262. Appendix A. PPI resettability tests, by I. A. Greenwood. - Appendix B. Study of displacement and rate tracking devices for wind setting in GPI, by D. Sayre. - Appendix C. Omission of sec 0 cam from GPI, by H. M. James. - Appendix D. Great Circle navigation with GPI, by H. M. James. - Appendix E. Use of GPI in conjunction with the Norden bombsight for optical bombing in broken overcast, by R. N. Close. - Appendix F. Air position indicator and associated components, by J. P. Palmer and W. F. Wright. - Appendix G. Extension of GPI navigational procedure to include true course and time of arrival determinations. - Appendix H. Errors in GPI bombing, by E. H. Bartelink and A. J. Siegert. MIT Rad Lab S-19. NDRC Div 14.

Time-delay networks for an analog computer, by W. J. Cunningham. Yale University. Dunham Laboratory of Electrical Engineering, New Haven, Conn. Aug 1954. 33p diagrs, graphs. Order from LC. Mi \$2.50, ph \$5.25. PB 117814

Networks having one, two, three, and four pairs of

roots are investigated in detail, and numerical data about them are presented in tabular form. These tables allow selection of a particular network appropriate to the problem being analyzed. Report no. 6 under Contract Nonr-433(00).

## MEDICAL RESEARCH AND PRACTICE

Annual report, 1st, 1 Feb 1953-1 Jun 1954, prepared by Hallowell Davis, Donald H. Eldredge and staff of the Office of the Executive Secretary. Armed Forces - National Research Council Committee on Hearing and Bio-Acoustics, St. Louis, Mo. Jun 1954. 25p. Order from LC. Mi \$2.25, ph \$4.00. PB 117853

CHABA report no. 2. Contract Nonr1151(01), Project NR 140-069.  
1. Acoustic research 2. Noise - Physiological effects 3. Communications, Audio.

Otitis externa: A clinical study, by James E. Lett. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Mar 1955. 7p tables. Order from LC. Mi \$1.50, ph \$1.50. PB 117849

Detailed histories of 139 patients with external otitis were analyzed at Randolph Field during the summer of 1952. The three drugs chosen for treatment (2.5 percent sodium sulfadiazine, 0.1 percent polymyxin B, and 5 percent sulfamylon) all proved to be effective agents. Sodium sulfadiazine appeared to be the most effective in reducing duration of the disease. AAF SAM Proj 21-1601-0006, Report no. 4.

## METALS AND METAL PRODUCTS

Aging study of metal plating on quartz crystals, by R. J. Raudebaugh and R. B. Belser. Georgia Institute of Technology. State Engineering Experiment Station, Atlanta, Ga. Order separate parts described below from LC, giving PB number of each part ordered.

Quarterly report no. 1, May 1, 1952 to Aug 1, 1952. Aug 1952. 77p photos, graphs, tables. Mi \$3.75, ph \$10.25. PB 117726

Crystals coated with aluminum and gold by the evaporation technique and subjected to artificial aging cycles by heating have continued to show stability superior to similarly coated crystals naturally aged only. Tests on crystals coated with copper, palladium, indium and nickel are also reported. Project no. 163-176, Continuation of Project no. 163-105, carried out under Contract no. DA-36-039-sc-147 (For 8th report under that Contract see PB 117335). Dept. of the Army project: 3-24-03-020. Signal Corps project: 33-862A. SIG Contract DA36-039-sc-42453, Quarterly report no. 1.

Quarterly report no. 2, Aug 1, 1952 to Nov 1, 1952. Nov 1952. 49p photos, graphs, tables. Mi \$2.75, ph \$6.50. PB 117727

Studies of the properties and structures of sputtered metal films are reported as related to their use as coatings for piezoelectric crystals. Extensive studies of the resistivities of sputtered films of gold and silver, in the range 250-1,500 angstroms thickness, have shown that initial resistivities for such films are determined to a large degree by the sputtering rates at which the films are deposited. A rough correlation between the sputtering rates of metals and their specific heats has been discovered. Project no. 163-176. Dept. of the Army project: 3-24-02-020. Signal Corps project: 33-862A. SIG Contract DA36-039-sc-42453, Quarterly report no. 2.

Quarterly report no. 3, Nov 1, 1952 to Feb 1, 1953. Feb 1953. 53p photos, graphs, tables. Mi \$3.00, ph \$7.75. PB 117728

Both silver and gold sputtered films appear to be more resistant to aging by heating and to natural aging than evaporated metal films of equal thickness. This resistance to change appears to be related to their superior performance as stable coatings for quartz crystals. Experiments on electroplated metal films of silver, copper and nickel are described. Electroplated films, from preliminary data, appear to be satisfactory as coatings for quartz crystals. Project no. 163-176. Dept. of the Army project: 3-24-02-020. Signal Corps project: 33-862A. SIG Contract DA36-039-sc-42453, Quarterly report no. 3.

Abstracts of 4th & 5th quarterly reports, 1 Feb 1953-1 Aug 1953, by M. F. Timm. Oct 1953. 3p. Mi \$1.50, ph \$1.50. PB 117729

Abstract of experiments on application of sputtered films of gold, platinum, rhodium and other metals upon quartz crystals. Project no. 862A. SIG Contract DA36-039-sc-42453, Quarterly reports 4-5, Abstract.

Application of fundamental concepts of bonding metals and ceramics, by Harold A. Barr, Louis Marchi, Harold H. Rice, James A. Stavrolakis. Armour Research Foundation, Chicago, Ill. Oct 1953. 49p photos, drawings, tables. Order from LC. Mi \$2.75, ph \$6.50. PB 117936

Contract AF 33(616)-97. Summarizes work from 21 Apr 1953 to 21 Oct 1953.

1. Cermets, Magnanese-boride-silicon 2. Adhesives - Plastic to metal 3. Bonding - Materials 4. AAF WADC TR 53-356.

Application of X-ray fluorescence to trace analysis, by Martin B. Cavanagh. U. S. Naval Research Laboratory. Apr 1955. 5p graphs, table. Order from OTS. 50 cents. PB 111685

The elements hafnium, niobium, tantalum, thorium,

and uranium, which do not lend themselves readily to spectrochemical or chemical analysis, have been determined in micro quantities in iron by the application of X-ray fluorescence techniques. The iron and other impurities are removed by means of electrodeposition in mercury, and the residual elements are concentrated on a mylar film for X-ray examination. Five micrograms of these elements can be determined in the presence of each other to within 10% of the amount present. NRL R 4528.

Characterization of oxidation catalysts: Vanadium pentoxide, by Mack F. Hughes and George Richard Hill. Utah. University. Institute for the Study of Rate Processes, Salt Lake City, Utah. Jun 1954. 112p photo, diags, graphs, tables. Order from LC. Mi \$5.00, ph \$15.25. PB 117860

Contract N7-onr-45103, Project NR-051-192. Appendices: - A. Surface area determination of vanadium pentoxide catalyst. - B. Kinetic data. - C. Glossary of symbols. 1. Catalysts, Vanadium pentoxide 2. Catalysts, Oxidation 3. UU ISRP TR 13.

Comparative tests of condenser tube materials. U. S. Naval Engineering Experiment Station, Annapolis, Md. Work performed with the cooperation of International Nickel Co., Inc. under Contract NObs-50596. Order separate parts described below from LC, giving PB number of each part ordered.

First progress report, including several varieties of 90-10 copper-nickel alloys, by W. G. Schreitz. May 1951. 53p photos, drawing, tables. Mi \$3.00, ph \$7.75. PB 117940

Corrosion test results are reported for a variety of condenser tube alloys which were tested in sea water in order to determine a suitable substitute for the 70-30 copper-alloy. Twelve experimental condensers each containing twenty 5/8-inch OD tubes were constructed for test. Results of test for five of the condensers after 4.7 months operation in clean sea water at 10 ft per second form the basis of the report. Tubes installed in the first group of condensers consisted mainly of 90-10 and 70-30 copper-nickel alloys modified with iron and aluminum. The second group of condensers, currently under test, contains tubes of Admiralty and aluminum brass, Alclad, titanium, Hastelloy "C", and a group of austenitic stainless steels. NS-643-064. NAV EES 4A966845.

Second progress report, by W. G. Schreitz and W. L. Williams. Jul 1952. 38p photos, drawing, tables. Mi \$2.50, ph \$5.25. PB 117939

The present report contains results on eight additional condensers operated over periods ranging from 5.4 to 18 months. Five of the latter condensers are still under test. Copper-nickel alloys of the 70-30 and 90-10 types with various iron contents, aluminum brass, aluminum bronze with and without iron, admiralty metal, and a modified composition "G" bronze, were among the alloys tested. Also included were



Hastelloy "C", titanium, and various stainless steels. One aluminum condenser was included in the experiments. NS-643-078. NAV EES 4A(2)-966845.

I. Deformation studies of metals at elevated temperatures. II. Iron-chromium-nickel ternary system. III. Effect of structure and composition on the strength properties of stainless steel, by N. J. Grant, H. C. Chang, F. C. Monkman, P. E. Price. Massachusetts Institute of Technology. Dept. of Metallurgy, Cambridge, Mass. Aug 1954. 3p. Order from LC. Mi \$1.50, ph \$1.50. PB 117907

Periodic status report no. 8, Jun 1954-Aug 1954, under Contract no. N5-ori-07881, NR-039-007. For 6th-7th reports see PB 116312 and PB 117129.

1. Metals - Deformation 2. Chromium-nickel alloys - Deformation 3. Chromium-iron-nickel alloys - Deformation 4. Steel, Stainless - Strength 5. Alloys, High temperature - Structure.

Effect of rare-earth additions on the high-temperature properties of a cobalt-base alloy, by J. E. Breen and J. R. Lane. U. S. Naval Research Laboratory. Apr 1955. 19p photo, graphs, tables. Order from OTS. 50 cents. PB 111687

Three alloys of the same base composition but with 0 to 2% rare earths added were cast from a split heat. Stress rupture tests were run at 1500<sup>o</sup>, 1600<sup>o</sup>, and 1700<sup>o</sup>F. The high-temperature strength and ductility were increased in both as-cast and aged material at all temperatures, with the greatest benefit occurring at 1500<sup>o</sup>F. No improvements in room-temperature tensile properties were noted. NRL R 4523.

Extrusion of titanium, by Alvin M. Sabroff, W. Maxwell Parris, and Paul D. Frost. Battelle Memorial Institute, Columbus, Ohio. Mar 1955. 77p photos, drawing, graphs, tables. Order from OTS. \$2.00. PB 111696

Extrusion tests were conducted on unalloyed titanium and the Ti-3Mn-complex alloy to study the effects of extrusion temperature and die design and to evaluate various lubricants and die materials. Lubricants containing graphite, molybdenum disulfide, and mica produced acceptable surface finishes. The best results were obtained with these materials suspended in a Bentone grease. Titanium carbide, chromium carbide, and cobalt-base alloys showed promise as die materials. Contract no. AF 33(038)-3736, Project no. 7351. AAF WADC TR 54-555.

Fracturing under impulsive loading, by John S. Rinehart and John Pearson. U. S. Naval Ordnance Test Station, Inyokern, Calif. Aug 1952. 89p photos, diagrs, tables. Order from LC. Mi \$4.00, ph \$11.50. PB 117956

This paper is devoted primarily to a discussion of the fracturing of plates, rods, tubes, and various other kinds of metal objects under the very high and rapidly applied stresses that are generated by explosive

charges. Particular attention is paid to, (1) examples of the types of fractures that occur, (2) conditions that lead to these fractures, and (3) to the very pronounced effects that the physical properties of the materials play in the fracturing processes. Invited paper, Fluid Dynamics Division, American Physical Society, Salt Lake City, Utah, June 1952. NOTS TM 930.

Friction, wear, and surface damage of metals as affected by solid surface films, by Edmond E. Bisson, Robert L. Johnson, Max A. Swikert and Douglas Godfrey. U. S. National Advisory Committee for Aeronautics. May 1955. 60p photos, drawing, diagrs, graphs, tables. Order from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 117580

A summation is presented of NACA results obtained from friction and wear investigations from 1946 to 1954. The results are consistent with theoretical predictions that solid surface films of low shear strength can serve to reduce both friction and surface damage. Metallic oxides can have very marked effects. Wear studies show that the ability of materials to form surface films is an important factor in wear. NACA TN 3444.

Fundamentals of the transition temperature phenomenon in steel. Quarterly progress report no. 11, under Contract Nonr 266(07), 1 Apr 1954 - 30 Jun 1954, by N. Gensamer, J. O. Brittain, L. C. Chang and H. Hahn. Columbia University, School of Mines, New York, N. Y. Aug 1954. 7p graph. Order from LC. Mi \$1.50, ph \$1.50. PB 117792

For 9th-10th reports see PB 116097, PB 116880.  
1. Steel - Transition temperature 2. Steel - Friction coefficients 3. Iron - Hydrogenation.

Heterogeneity of surfaces. Adsorption of gases on metals: Molybdenum and the thermodynamics of adsorption, by A. C. Zetlemoyer, J. J. Chessick, and F. H. Healey. Lehigh University. William H. Chandler Laboratory, Bethlehem, Pa. May 1952. 89f drawings, graphs, tables. Order from LC. Mi \$4.00, enl pr \$12.75. PB 117672

The heterogeneous nature of a molybdenum powder surface both before and after reduction of surface oxide has been studied by measurements of the physical and chemical adsorption of gases over a wide range of pressures and by evaluation of the important thermodynamic functions of the adsorption process. A procedure for the reduction and degassing of molybdenum powder has been developed which gives a metal surface apparently free of both chemisorbed oxygen and hydrogen. The efficiency of the reduction process was tested by determining the amount of oxygen chemisorbed by the freshly reduced surface. Technical report no. 4, 1 Jun 1951 to 31 May 1952, under Contract N8onr-74300, Project no. NRO 57-186.

Interaction of deuterium and saturated hydrocarbons on nickel catalysts, by H. C. Rowlinson, Robert L. Burwell, Jr. and Richard H. Tuxworth. Northwestern University, Evanston, Ill. Aug 1954. 28p graph, tables (1 fold). Order from LC. Mi \$2.25, ph \$4.00. PB 117913

The interaction of deuterium and a variety of alkanes and cycloalkanes on evaporated nickel films and on a reduced nickel oxide catalyst leads to very similar results. Isotopic exchange occurs conveniently at 150-200° to produce species with from one to all hydrogen atoms exchanged. Technical report no. 8 under Contract N7onr 54006, Project no. NR 055-199.

Kavitaciya nerovnostey poverchnosti i vizivaemaya eyou zroziya (Cavitation due to roughness of a surface and the erosion caused by it), by K. K. Shalnev. Translated by I. C. Lecompte, edited by F. A. Raven. Apr 1955. 14p photo, diagr, graphs. Order from LC. Mi \$2.00, ph \$2.75. PB 117565

The erosion due to cavitation caused by surface roughness will be particularly destructive when the tips of the roughnesses project from the boundary layer, since the frequency of the peeling off of cavitation bubbles from the tips of the roughnesses may attain frequencies customary in devices designed for accelerated testing of materials with respect to cavitation erosion. This conclusion is confirmed in many instances of blade erosion in the vicinity of scratches, abrasions and other minor roughnesses. Translated from Proceedings of the National Academy of Sciences, USSR, vol. 78, no. 1, 1951, p. 33-36. NAVSHIPS T 576-A. STS 205A.

Magnetostrictive distortions in some ferromagnetic and antiferromagnetic lattices, by Helen M. A. Urquhart. Carnegie Institution of Technology. Dept. of Physics. Laboratory for Magnetics Research, Pittsburgh, Pa. Jul 1954. 82p drawings, diagrs, graphs, tables. Order from LC. Mi \$4.00, ph \$11.50. PB 117477

The magnetostrictive distortions in ferromagnetic iron-cobalt alloys and antiferromagnetic  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> (hematite) were measured using the resistance strain gauge method. In the case of FeCo, single crystal magnetostriction constants were obtained for the range 0-70% cobalt. Small single crystals in the form of oblate spheroids were employed for the measurements. Contract N7onr 30307, Project NR 018-603. Contribution no. 5.

Selbsterregte schwingungen bei der bearbeitung der metall (Self-excited vibrations in the machining of metals), by J. Tlustý, translated and edited by F. A. Raven. May 1955. 65p photos, diagrs, graphs. Order from LC. Mi \$3.25, ph \$9.00. PB 117921

By measurement and experiment on all principal types of machine tools, the characteristic properties of the phenomenon of self-excited vibrations were determined. The effect of individual cutting variables in approximately 2000 cases was studied and the results were tabulated in an appropriate manner. Translated from Acta Technica Academiae Scientiarum

Hungaricae, Budapest, Vol. 8, Nos. 3/4, 1954, pp. 319-360 (Magyar Tudományos Akadémia, Budapest). NAVSHIPS T 586. STS 213.

Studies in the behavior of certain non-ferrous metals at low temperatures. Final report vol. II under Contract DA-36-039-sc-15393, by Alfred Bomemann and Theodore Gela. Stevens Institute of Technology. Peirce Memorial Laboratory for Metallurgy, Hoboken, N. J. Dec 1953. 79p photos, diagrs, graphs, tables. Order from LC. Mi \$3.75, ph \$10.25. PB 117755

The effect of additions of lead, bismuth, antimony and zinc upon the rate of transformation of white to the brittle gray variety of tin at low temperatures has been studied experimentally. Signal Corps Project 2005-M08-Metals. For vol. I of final report see PB 111657. SIG Contract W36-039-sc-15393, Final report, vol. II.

Summary of progress in the investigation of phase relationships between metals and oxides in air at high temperatures, by J. F. McMahon. Alfred University, Alfred, N. Y. Jul 1949. 69f photos, drawings, diagrs, graphs, table. Order from LC. Mi \$3.25, enl pr \$10.25. PB 117798

Summarizes progress in method, equipment and results obtained during 3 years of study to determine 1) rate of oxidation in mixtures by weight change measurements, 2) interdiffusion of cations between freshly oxidized metal and ceramic oxides, determined by grinding away successive thin layers from samples of metal fired in contact with oxide and determining concentrations spectrographically, and 3) reaction products in metal ceramic mixtures fired at various lengths of time at 1400°C., and, in certain cases, other temperatures, identifying the phases by X-ray diffraction and petrographic examination. Contract N6ori-143, NR 032-022.

## METEOROLOGY AND CLIMATOLOGY

Daylight luminescence and infrared absorption, by Byron E. Cohn, David M. Gates, James Shackleton, Marvin E. Juza, Theodore F. Maher, Alfred A. Goddard, James N. Brooks, Frank S. Speck and Thayer Masoner. Denver. University. Dept. of Physics. n.d. 167p photos, diagrs, tables. Order from LC. Mi \$6.50, ph \$21.50. PB 117957

Material on luminescence has been divided into sections: a. Discussion b. Equipment c. Experiments d. Information on skylight at higher elevations e. Polarization properties of grating spectrographs. The development of the biaxial pointing control equipment is discussed. In conjunction with the biaxial control a sky brightness equipment was developed. This led to the development of a photocell amplifier of special utility. Final report under Contract AF 19(604)-224. Infrared research was transferred to Contract AF 19(604)-1005. AAF CRC TR 55-250.

Distribution of horizontal divergence in a topographically perturbed zonal current, by Masamichi Oi. Florida. University. Dept. of Meteorology. Aug 1954. 31p photo, diagrs, tables. Order from LC. Mi \$2.50, ph \$5.25. PB 117904

Contract Nonr-988(01) Project NR 082 071.  
1. Currents, Air 2. Flow, Incompressible - Theory  
3. Vortex motion - Theory.

Earthquake pressures on fluid containers: Eighth technical report under Contract N6 onr-244, Task Order 25, Project NR-081-095, by G. W. Housner. California Institute of Technology. Earthquake Research Laboratory, Pasadena, Calif. Aug 1954. 42p diagrs, graphs. Order from LC. Mi \$2.75, ph \$6.50. PB 117930

With known solutions as checks on accuracy it is possible to derive solutions by an approximate method which avoids partial differential equations and series and presents solutions for a number of cases in simple closed form. The approximate method appeals to physical intuition and makes it easy to see how the pressures arise. It thus seems to be particularly suitable for engineering applications. The problem of the rectangular tank is treated in some detail.

Estimating soil tractionability from climatic data. Final report under Contract no. AF 19(604)-193, by C. W. Thornthwaite. Johns Hopkins University. Laboratory of Climatology, Centerton, N J. 1954. 81p diagr, graphs, tables. Order from LC. Mi \$4.00, ph \$11.50. PB 117467

Publications in climatology, vol. VII, no. 3. Contents:  
1. Introduction, by C. W. Thornthwaite. 2. General approach to the problem, by D. B. Kringold. 3. Summary of investigations undertaken: a. Investigation of Thornthwaite's evapotranspiration formula and procedure, by John R. Mather. - b. Investigation of infiltration rates of soils and rainfall intensities, by D. B. Kringold. - 4. Computation of soil moisture, by C. W. Thornthwaite and J. R. Mather. - 5. Preparation of climatic maps for various areas, by John R. Mather. - 6. Interpretation of ground conditions in terms of soil tractionability, by C. W. Thornthwaite. - 7. Summary and future work, by C. W. Thornthwaite. - Appendix L. Scientific reports and other publications under Contract: Abstracts of Scientific reports no. 1-2. - Economic feasibility of supplemental irrigation, by D. B. Kringold (Reprinted from Agricultural Engineering, vol. 35, no. 1, p. 22-27, Jan 1954). - Estimating infiltration, by D. B. Kringold and O. Beenhouwer (Reprinted from Agricultural Engineering, vol. 35, no. 10, p. 719-725, Oct 1954). - Determination of soil moisture from climatic data, by John R. Mather (Reprinted from Bulletin of the American Meteorological Society, vol. 35, no. 2, p. 63-68, Feb 1954). - Appendix II: Hydro-pedological constants and mechanical properties of soils, by D. B. Kringold.

Experimental study of the effects of aerosols of a number of pure chemicals on the freezing characteristics of supercooled liquid droplets, by Charles

L. Hosler and G. Robert Spalding. Pennsylvania State University. Mineral Industries Experiment Station. Dept. of Meteorology. Feb 1955. 87p photos, diagrs, graphs, tables. Order from LC. Mi \$4.00, ph \$11.50. PB 117826

A series of experiments have been conducted to contribute to our knowledge of the formation of the ice phase in clouds. The roles of droplet size, type of condensation nuclei and the size of the condensation nuclei were examined. Water samples used in the investigation were either enclosed in glass capillaries, in the form of droplets deposited on a metal surface or took the form of droplets formed by creating a cloud in an expansion type cloud chamber. Final report under Contract no. AF 19-(604)-140. See also PB 108100. AAF CRC TR 55-261.

Final report on Office of Naval Research Contract Nonr-390(00), Project NR 046 716, by Otto Struve. California. University, Berkeley, Calif. 1954. 7p tables. Order from LC. Mi \$1.50, ph \$1.50. PB 117790

This project has been in effect between June 14, 1951 and August 14, 1954. It was devoted to the study of a special group of stars designated by the names of two typical representatives of the group,  $\beta$ Canis Majoris and  $\beta$ Cephei. In the course of our work half a dozen new members of the group have been discovered. We have also carried out detailed studies of ten of them, both photoelectrically and spectrographically.

High humidities at high temperatures, by Arthur V. Dodd. U. S. Army. Quartermaster Research and Development Command. Environmental Protection Division, Quartermaster Research and Development Center, Natick, Mass. May 1955. 27p graphs, tables. Order from LC. Mi \$2.25, ph \$4.00. PB 117804

An analysis is made of summer humidities at three stations under the influence of the hot Persian Gulf, and one station in the southwest United States near the warm waters of the Gulf of California. At the Persian Gulf stations, Bahrein Island, Dhahran, and Abadan, the low dew points tend to be associated with high temperatures, and conversely, higher dew points tend to be associated with low temperatures. At El Centro, California, no clear relationship between temperature and dew point trends was found. Project reference 7-83-03-008A. QMC EP TR-9.

Hydrides and borohydrides of light weight elements and related compounds. Annual technical report for the period Aug 1, 1953 to Jul 31, 1954 under Contract N6-ori-20, T. O. 10, Project NR 356-255, by H. I. Schlesinger and Grant Urry in co-operation with W. Henle, L. Hohnstedt, J. Kerrigan, J. Murib, and T. Parsons. Chicago. University, Chicago, Ill. Aug 1954. 25p tables. Order from LC. Mi \$2.25, ph \$4.00. PB 117823

For earlier reports see PB 109214, PB 109541, and PB 111421.

1. Borohydrides - Reactions
2. Borohydrides - Solubility
3. Lithium borohydride - Chemical reactions
4. Hydrazine - Chemical reactions
5. Boron compounds - Thermal decomposition.

K voprosu o srednem godovom raspredelenii temperatury v zemnoi atmosfere s uchedom materikov i okeanov (On the mean annual distribution of temperature in the earth's atmosphere with respect to continents and oceans), by E. N. Blinova. Translated by David Kraus. Apr 1955. 22p graphs, tables. Order from LC. Mi \$2.25, ph \$4.00.

PB 117883

The problem of the mean annual distribution of temperature in the earth's atmosphere is solved. Radiation (long-wave and solar, short-wave) and turbulent heat conduction (vertical and horizontal) are taken into account. Computations are given for the zonal case and a comparison is made with empirical data. Translated by American Meteorological Society under Contract AF 19(604)-1364, from *Izvestiia Akad. Nauk SSSR, Seria geogr. i geofiz.* 11(1):3-14, 1947.

Mean molecular weight of the upper atmosphere, by Warren E. Thompson. U. S. Air Force. Air Research and Development Command. Cambridge Research Center. Geophysics Research Directorate, Cambridge, Mass. May 1955. 30p graphs. Order from OTS. 75 cents. PB 111706

Photochemical dissociation of the molecular constituents of the upper atmosphere results in a monotonic decrease with altitude of the mean molecular weight of air. Numerous theoretical papers and limited experimental data have been reviewed in order to determine the extent of molecular dissociation. Accordingly, the variation of mean molecular weight with altitude, dependent upon dissociation of molecular oxygen only, has been determined. AAF CRC TR 55-208. AAF GRD P 36.

Practical aspect of tropical meteorology, by C. E. Palmer, C. W. Wise, L. G. Stempson and G. H. Duncan. California. University. Institute of Geophysics, Oahu Research Center, Oahu, Hawaiian Islands. Mar 1955. 200p diagrs, maps, tables. Order from LC. Mi \$7.25, ph \$25.25. PB 117586

Discusses 1) how the tropical forecaster may use climatological information, 2) differences in evaluation of tropical data, 3) wind analysis, 4) methods of analyzing wind and weather distribution in tropical regions, 5) correlation of wind and weather patterns, and 6) the genesis and movement of tropical cyclones. Special report no. 2 under Contract AF 19(604)-546. Appendix: Theoretical aids to analysis. AAF CRC TN 55-460.

Solare aktivität und atmosphäre (Solar activity and the atmosphere), by Heinrich Koppe. Translated by David Kraus. Apr 1955. 34p graphs, tables. Order from LC. Mi \$2.50, ph \$5.25. PB 117881

It is shown by statistical analysis of a somewhat larger sample of observational data that there is a significant (better-than-chance) correlation between geomagnetic disturbances and atmospheric pressure oscillations over Scandinavia. With regard to the weather-induced biological and physico-chemical reactions, new relationships are found linking them to the solar component of cosmic radiation and to the production of neutrons. Translated by American Meteorological Society under Contract no. AF 19-(604)-1364, from *Zeitschrift für meteorologie* vol. 6, hft. 12, p. 369-378, 1952.

Some aspects of hurricane forecasting. U. S. Air Force. Air Weather Service, Andrews Air Force Base, Washington, D. C. May 1955. 11p diagrs. Order from LC. Mi \$2.00, ph \$2.75. PB 117941

Revisions and additions to edition of 20 June 1951. 1. Hurricanes - Forecasting 2. AAF AWS TR 105-76A.

Study on the morphology of magnetic storms, March 1, 1954 to March 31, 1955, by Masahisa Sugiura. Alaska. University. Geophysical Institute, College, Alaska. Apr 1955. 123p diagrs, graphs, maps, tables. Order from LC. Mi \$5.25, ph \$16.50. PB 117703

Contract no. AF 19(604)-1048. Scientific report no. 1. Thesis - University of Alaska. 1. Harmonic analysis 2. Climatology - Research 3. Geomorphology - Research 4. Storms, Magnetic - Theory.

Effect of vertical ion transport on the night time E-region, by H. R. Peiffer and A. P. Mitra. Pennsylvania State University. Ionosphere Research Laboratory, State College, Pa. Jun 1954. 38p diagrs, graphs. Order from LC. Mi \$2.50, ph \$5.25. PB 117707

This report considers the effect of vertical ion transport on the ionization distribution of the nighttime E-region. The nature and magnitude of the tidal velocities and of the recombination coefficient, which enter into the calculations, are obtained from various sources, both experimental and theoretical. Contract no. AF 19(122)-44. PSC IRL SR 63.

Study of the sodium flash, by Harold E. Cronin and Carl L. Noeicke. Geo-Science, Inc., Washington Grove, Md. Mar 1955. 178p diagrs, graphs, tables. Order from LC. Mi \$6.70, ph \$22.75. PB 117721

Electrophotometric recordings of the sodium enhancement at twilight have been made from Aug 1953 through Jan 1955. The tabulated data is given in Appendix B. Recordings of the 6300 Å line of oxygen have been made since Sep 1954, and the tabulated data is given in Appendix C. After a short discussion of the equipment, plots are given of the monthly mean ratios of sodium to background light



for individual months and as an annual variation curve. Contract AF 19(604)-640. Appendix A: Instrumentation. - Appendix B: Tabulated data of the ratio of sodium to background light with solar depression. AAF CRC TR 55-265.

Theory of the solar magnetic field, by Eugene N. Parker. Utah. University. Dept. of Physics, Salt Lake City, Utah. Aug 1954. 35p diags. Order from LC. Mi \$2.50, ph \$5.25. PB 117818

Using the basic principles of operation of the terrestrial hydromagnetic dynamo, it is shown that the solar convective zone will generate traveling dynamo waves consisting of toroidal and poloidal magnetic fields. An investigation of the dynamics of hydromagnetic dynamos indicates that the poloidal field will be strongest above middle latitudes and the toroidal field below, in agreement with the observed nonuniform rotation and the appearance of sunspots in low latitudes. Technical report no. 6 under Contract Nonr 1288(00): Earth's magnetism and magnetohydrodynamics.

Über die hohen wolken. (High clouds), by Werner Schwerdtfeger. Translated by James Gough, Jr. Dec 1954. 90p graphs, tables. Order from LC. Mi \$4.50, ph \$11.50. PB 117856

The principal finding of this paper: The origin of pure cirrus can be traced to the (predominantly advective) cooling of a layer in the upper troposphere and, hence, to the formation of a high-level (perhaps, only thin) convective layer. The great variety of individual cirrus forms develop in and below this layer under the influence of the formation of ice fall-streifen and of turbulence in the sense of Wegener. Thus the occurrence of all independent high clouds is linked to two different processes in the upper troposphere: a) the cited convective process or b) the known processes of upglide and mixing at a more or less intensive frontal zone, possibly in connection with wave motions and moist-unstable formations. Contract AF 19(604)-203. Translated from Deutsches Reichsamt für Wetterdienst, Wissenschaftliche abhandlungen, V(I):1-34.

Variation of the virtual height of the ionosphere at sunrise, by Bernard A. Wambsganss. Stanford University. Radio Propagation Laboratory, Stanford, Calif. May 1955. 115p photo, diags, graphs, table. Order from LC. Mi \$5.00, ph \$15.25. PB 117813

Part I of this report presents a sampling of records obtained during six years of low frequency ionospheric observation. The 310 kc records included show that it is possible to observe, by pulse methods, electron densities between the E- and F-layers. Before sunrise these layers are at times observed simultaneously on 310 kc. A trace usually appears on these records at or near the F-layer before ground sunrise. This trace, referred to as the sunrise effect, progresses downward in either a continuous or stepwise manner to the approximate height of the nighttime E-layer. Also presented in Part I is a resume of related works. Part II of the report

contains the analyses of the empirical data relating to the E region. Contract AF 19(604)-795. AAF CRC TN 55-198.

World gravity measurements. Woods Hole Oceanographic Institution, Woods Hole, Mass. Contract N6onr-27704 (NR-081-091). Order separate parts described below from LC, giving PB number of each part ordered.

Period June 1949-Jan 1952. Supplementary report (corrections to Reference no. 52-59), by George P. Woollard. Jul 1954. 9p. Mi \$1.50, ph \$1.50. PB 117842

Unpublished manuscript.

1. Gravity - Measurement 2. WHOI Ref 54-54.

Jan 1952-May 1954, by George P. Woollard, William A. Black and William E. Bonini. Jul 1954. 124p map, diagr, graphs, tables. Mi \$5.25, ph \$16.50. PB 117847

Gravity values and descriptions of new observation sites are reported for South and Central America, the Canadian Arctic and Europe. Comparative values, as obtained by other investigators are given for points of common measurement. Corrected values are given for earlier observations made under this program in Central and South America. Technical report under Contract N6onr-27704 (NR-081-091). Unpublished manuscript. See also PB 112211, 116842 and PB 112377. WHOI Ref 54-53.

Zur theorie der resonanzverbreiterung von spektrallinien (Theory of spectral-line broadening due to resonance effect), by J. Frenkel. Translated by James Gough, Jr. Mar 1955. 17p. Order from LC. Mi \$2.00, ph \$2.75. PB 117882

Translated by the American Meteorological Society under Contract AF 19(604)-1364, from Zeitschrift für physik, 59:198-207, 1930.

1. Spectral lines - Broadening - Theory - Germany  
2. Resonance, Electromagnetic - Germany  
3. Electrons - Exchange reactions - Germany.

## ORDNANCE AND ACCESSORIES

Investigation of investment cast front sight, caliber .30 M1 rifle, by E. D. Warner and J. F. Panda. U. S. Armory, Springfield, Mass. Oct 1954. 23p photos, drawings (fold), tables. Order from LC. Mi \$2.25, ph \$4.00. PB 117931

Two hundred investment cast front sights were procured from Hitchiner Manufacturing Company. Random castings were examined metallurgically and checked dimensionally. After finish-machining and heat-treatment, the castings were subjected to abuse and endurance firing tests at ambient and sub-zero temperatures. All castings performed satisfactorily. This component has been standardized as an alternative means of manufacture. SA TR 11-1084.

Investigation of investment cast plate recoil, caliber .30 carbines, M1, M2 and M3, by J. F. Panda and E. D. Warner. U. S. Armory, Springfield, Mass. Sep 1954. 22p photo, (1 fold) drawing, tables (1 fold). Order from LC. Mi \$2.25, ph \$4.00.

PB 117932

Two hundred investment cast plate recoils were obtained from Hitchiner Manufacturing Company, Milford, New Hampshire. Castings selected at random were examined metallurgically and were checked dimensionally. After heat-treatment, nine castings were submitted for endurance firing tests at ambient and sub-zero temperatures. All nine castings performed satisfactorily. Investment castings have been approved as an alternative method of manufacturing. Results of firing tests indicated that the life of investment cast recoil plates is satisfactory. SA TR 2-1203.

Ordnance inspection handbook: Sampling inspection by variables. U. S. Ordnance Corps. Jun 1954. 47p graphs, tables. Order from LC.

Mi \$3.30, ph \$7.80.

PB 118000

1. Ordnance - Inspection 2. Sampling 3. ORD M 608-10.

## PHOTOGRAPHIC AND OPTICAL GOODS

Boreal fringe areas of marsh and swampland.

Oklahoma. University. Research Institute.

Contract Nonr-982(01) Project NR 387 008. Order separate parts described below from LC, giving PB number of each part ordered.

Technical report no. 3: A photo identification key for the winter (non-foliage) season; keys and vegetation type descriptions, by Merle P. Meyer. Jun 1954. 92p photos. Mi \$4.50, ph \$12.75.

PB 117466

For Technical reports no. 1-2 see PB 115830, 116917.

1. Forests and forestry 2. Marshes - Vegetation 3. Photography, Aerial - Interpretation.

Technical report no. 4: Final and summary report, by John W. Morris and Harry E. Hoy. Jul 1954. 35p photo, maps. Mi \$2.50, ph \$5.25.

PB 117844

The research resulted in: 1) The development of seasonal keys which will aid photo interpreters working in a boreal fringe area of bog, marsh and swampland, and 2) which show relative locations of swamps, bogs and marshes.

Instructional film research reports (Rapid mass learning). Pennsylvania State College, State College, Pa. Jan 1953. 840p. Order from OTS. \$8.

PB 113995

Formerly available only on loan (See USGRR v. 22, p. 76. Limited supply now available for sale. Compilation of SDC 269-7-1 through SDC-269-7-35.

Investigation of aberration in rotationally symmetrical microwave lens systems, by M. P.

Bachynski and G. Bekefi. McGill University.

Eaton Electronics Research Laboratory, Montreal, Canada. Feb 1955. 74p photos, diags, graphs, tables. Order from LC. Mi \$3.75, ph \$10.25.

PB 117550

The electromagnetic field intensity in various receiving planes has been investigated experimentally at a wavelength of 1.25 cm. for a series of rotationally symmetrical, solid dielectric microwave lens systems. With the lenses illuminated by a point source yielding essentially uniform illumination, the lens pattern was found to deteriorate both in relative intensity and in intensity distribution with displacement of the source off the principal axis of the system. The resulting deterioration of the lens field was interpreted in terms of the aberrations present in ordinary optics. The results obtained were compared with predictions from recent diffraction theories of optical aberrations. Contract AF 19(122)-81. Technical report no. 35. AAF CRC TN 55-194.

Optimum physical viewing conditions for a rear projection daylight screen, by Philip Ash and

Nathan Jaspén. Pennsylvania State College, State College, Pa. Oct 1953. 19p photos, diags, graphs, tables. Order from OTS. 50 cents.

PB 111718

Contract N6onr-269. SPECDEVCON Project 20-E-4. Formerly listed as PB 114019.

1. Motion pictures, Educational - Effectiveness
2. Projectors, Motion picture - Illumination
3. Screens, Motion picture - Rear projection
4. SDC TR 269-7-37.

Photo-analysis key for the determination of ground conditions. Cornell University. School of Civil

Engineering, Ithaca, N. Y. Contract N6onr-264, Task order no. 11, Project no. NR 257-001, Technical report no. 3. Order separate parts described below from LC, giving PB number of each part ordered.

Beach series, Vol. 1: Coastal plain beaches, by J. Amouszegar, D. J. Belcher, R. J. Hodge, H. C. Ladenheim and D. R. Lueder. Feb 1951. 133p photos, fold map, diags, graphs. Mi \$5.75, ph \$17.75.

PB 117944

Includes glossary of terms.

1. Beaches - Trafficability
2. Beaches - Accessibility
3. Photography, Aerial - Beaches
4. Photography, Aerial - Interpretation.

Beach series, Vol. 2: Pocket beaches, by J. Amouszegar, D. J. Belcher, D. R. Lueder. Feb 1951. 32p photos, maps, diagr, table. Mi \$2.50, ph \$5.25.

PB 117946

1. Beaches - Trafficability 2. Beaches - Accessibility 3. Photography, Aerial - Beaches 4. Photography, Aerial - Interpretation.

Beach series, Vol. 3: Miscellaneous beaches, by D. J. Belcher. Feb 1951. 33p photos, maps. Mi \$2.50, ph \$5.25. PB 117947

1. Beaches - Trafficability 2. Beaches - Accessibility 3. Photography, Aerial - Beaches 4. Photography, Aerial - Interpretation.

Land form series, Vol. 1: General analysis, by Ta Liang, R. B. Costello, G. J. Fallon, R. J. Hodge, H. C. Ladenheim, D. R. Lueder and J. D. Mollard. Feb 1951. 136p photos, maps, (fold) diags. Mi \$5.75, ph \$17.75. PB 117943

1. Photography, Aerial - Land forms 2. Photography, Aerial - Interpretation 3. Drainage - Photographic analysis 4. Vegetation - Photographic analysis.

Land form series, Vol. 2: Sedimentary rocks, by Ta Liang, R. B. Costello, G. J. Fallon, R. J. Hodge, H. C. Ladenheim, D. R. Lueder, and J. D. Mollard. Feb 1951. 102p photos, diags. Mi \$4.75, ph \$14.00. PB 117945

1. Photography, Aerial - Interpretation 2. Photography, Aerial - Rocks 3. Sandstone - Analysis 4. Shale - Analysis 5. Limestone - Analysis 6. Coral - Analysis.

Land form series, Vol. 3: Igneous and metamorphic rocks, by Ta Liang, G. J. Fallon, R. B. Costello, R. J. Hodge, H. C. Ladenheim, D. R. Lueder and J. D. Mollard. Feb 1951. 147p photos, diags, fold maps. Mi \$6.00, ph \$19.00. PB 117948

1. Photography, Aerial - Interpretation 2. Photography, Aerial - Rocks 3. Rocks - Distribution 4. Granite - Distribution 5. Basalt - Distribution 6. Lava - Distribution 7. Slate - Distribution.

Land form series, Vol. 4: Waterlaid materials, by Ta Liang, D. R. Lueder, R. B. Costello, G. J. Fallon, R. J. Hodge, H. C. Ladenheim, and J. D. Mollard. Feb 1951. 171p photos, diags. Mi \$6.75, ph \$22.75. PB 117949

1. Photography - Aerial - Interpretation 2. Soils - Trafficability 3. Soils - Analysis.

Land form series, Vol. 5: Glacial materials, by Ta Liang, J. D. Mollard, R. B. Costello, G. J. Fallon, R. J. Hodge, H. C. Ladenheim, and D. R. Lueder. Feb 1951. 142p photos, diags, fold map. Mi \$6.00, ph \$19.00. PB 117950

1. Photography, Aerial - Interpretation 2. Glacial deposits - Analysis 3. Land forms - Analysis.

Land form series, Vol. 6: Windlaid materials, by Ta Liang, R. B. Costello, G. J. Fallon, R. J. Hodge, H. C. Ladenheim, D. R. Lueder, and J. D. Mollard. Feb 1951. 51p photos, diags,

fold map. Mi \$3.00, ph \$7.75. PB 117951

1. Photography, Aerial - Interpretation 2. Sand dunes - Photographic analysis.

## PHYSICS

### General

Computation of horizontal trajectories in the atmosphere, by Guy A. Franceschini, with an appendix by John A. Freeman, Jr. Texas. Agricultural and Mechanical College. Dept. of Oceanography, College, Station, Texas. Jan 1955. 23p diags, maps. Order from LC. Mi \$2.25, ph \$4.00. PB 117636

The method is based on a stepwise solution of the simplified Lagrangian equations of motion. Essentially, the numerical solution is accomplished graphically, and use is made of a displacement computer. Calculations, made for two-hour intervals, require that the initial velocity and pressure field during the trajectory be known. Examples are given which show good agreement between computed and constant-level balloon trajectories. Scientific report no. 5 on Contract AF 19(604)-559 and Scientific report no. 1 on Contract AF 19(604)-1302. Reference 55-13T. A. & M. projects 57 and 108. AAF CRC TN 55-465.

Discrete selection processes, by Marvin L. Minsky. Tufts College, Medford, Mass. Jul 1954. 23p diags. Order from LC. Mi \$2.25, ph \$4.00. PB 117852

This report considers the behavior of those processes by which a system progresses toward an assigned goal through a sequence of discrete trials and evaluations. The report considers a number of schemes on which this selection may be based, and shows how certain "universal" decision procedures may be constructed. It further shows how the introduction of a random element into the system can greatly simplify its construction while improving its efficiency and extending the range of situations in which the system will exhibit acceptable performance. Some attention is devoted to an examination of the relation between these "discrete selection processes" and the processes underlying the performance of ordinary servo-mechanisms. Contract Nonr-494(03), Project NR 145-038. Report no. 1954-494-03-21.

Estimation of the size of a stratified population, by D. G. Chapman and C. O. Junge, Jr. Washington. University. Dept. of Mathematics. Laboratory of Statistical Research, Seattle, Wash. Aug 1954. 16p. Order from LC. Mi \$2.00, ph \$2.75. PB 117895

Technical report no. 16. Contract N8onr-520, Task order II, Project NR-042-038.

1. Population - Estimates 2. Mathematical equations and solutions 3. Variance - Analysis.

N Y. Jan 1955. 17p. Order from LC. Mi \$2.00, ph \$2.75. PB 117551

Fluid flow associated with the impact of liquid drops with solid surfaces, by P. Savic and G. T. Boult. National Research Council of Canada. Division of Mechanical Engineering. Gas Dynamics Section. May 1955. 48p photos, diags, graphs. Order from LC. Mi \$2.75, ph \$6.50. Available for exchange from National Research Council of Canada, Ottawa, Canada. PB 117920

Interim technical report no. 3 under Contract no. AF 19(604)-1015. For Interim technical reports no. 1-2 see PB 116613-116614.

1. Mathematical equations and solutions 2. Maxwell's equation 3. Materials, Anisotropic - Wave propagation - Theory 4. AAF CRC TN 55-191.

A theory is presented of the fluid flow associated with the impact of liquid drops with a solid surface. The shape of the spreading drop is calculated as well as the pressure distribution over the impact plane. Experiments carried out with high speed spark camera bears out the main features predicted by the theory. Experiments with water drops impinging on a hot surface show that the general outline of the pressure distribution is also confirmed. NRCC MT-26.

Multi-stage birth and death process, by Kathleen Elizabeth White. Washington. University. Dept. of Mathematics. Laboratory of Statistical Research, Seattle, Wash. Aug 1954. 31p tables. Order from LC. Mi \$2.50, ph \$5.25. PB 117894

Technical report no. 17. Contract N8onr-520, Task order II, Project NR-042-038.

1. Population - Growth - Theory 2. Probability - Theory.

Handbook of acoustic noise control. Vol. 1: Physical acoustics. Supplement 1, Edited by Stephen J. Lukasik and A. Wilson Nolle. Bolt, Beranek and Newman, Inc. Apr 1955. 315p diags, graphs, tables. Order from OTS. \$8.00. PB 111200s

Non-linear vibration problems treated by the averaging method of W. Ritz, by Karl Klotter. Stanford University. Division of Engineering Mechanics, Stanford, Calif. Contract N6onr-251, Task order 2 (NR-041-943) Technical report no. 17. Order separate parts described below from LC, giving PB number of each part ordered.

This supplement contains additions and revisions to Vol. I which treated the generation and control of various types of noise sources. In some cases, material has been added; in others, sections have been completely rewritten to present the latest experimental or theoretical information available. Contract AF 33(600)-23901. Supplement to PB 111200. AAF WADC TR 52-204, Supplement 1.

Part I: Fundamentals of the method. May 1951. 25p. Mi \$2.25, ph \$4.00. PB 117797

1. Vibration - Theory 2. Equations, Differential - Non-linear 3. Mathematical equations and solutions 4. SU ME TR 17, Part I

Hydromagnetic dynamo theory, I, by Walter M. Elsasser. Utah. University. Dept. of Physics, Salt Lake City, Utah. Aug 1954. 58p diagr. Order from LC. Mi \$3.00, ph \$7.75. PB 117817

Part II: Single degree of freedom systems, single term approximations. Jun 1951. 105f graphs, tables. Mi \$5.00, enl pr \$15.25. PB 117796

1. Vibration - Theory 2. SU ME TR 17, Part II.

Attention is focused on the basic hydromagnetic processes by which the earth's dipole field is generated and maintained. Technical report no. 7 under Contract Nonr 1288(00): Earth's magnetism and magnetohydrodynamics.

Particle size determination of spherical colloidal particles by light scattering. I: The specific turbidity, by Richard M. Tabibian. Wayne University. Dept. of Chemistry, Detroit, Mich. Aug 1954. 74p diags, graphs, tables. Order from LC. Mi \$3.75, ph \$10.25. PB 117786

Instability of a rotating fluid sphere heated from within, by Hitoshi Takeuchi and Yasuo Shimazu. Utah. University. Dept. of Physics, Salt Lake City, Utah. Aug 1954. 25p diags, tables. Order from LC. Mi \$2.25, ph \$4.00. PB 117816

This report describes a method for determining the size of colloidal particles whose dimensions are of the order of the wave length of light, i.e. greater than  $1/10 \lambda$ . The preliminary work was carried out by Epel. The objective here is to extend the data to include larger particle sizes and to make the previously obtained curve more secure. Contract Nonr 736(000), Project no. 330-027. Technical report no. 10.

Technical report no. 8 under Contract no. Nonr-1288(00): Earth's magnetism and magnetohydrodynamics.  
1. Benard's cell problem 2. Mathematical equations and solutions 3. Hydromagnetic theory 4. Terrestrial magnetism - Measurement 5. Flow, Viscous - Coefficients 6. Magnetic fields - Mathematical analysis.

Pressure waves generated by addition of heat in a gaseous medium, by Boa-Teh Chu. U. S. National Advisory Committee for Aeronautics. Jun 1955. 47p diags, graphs, tables. Order from National Advisory Committee for Aeronautics, 1512 'H' St., N. W., Washington 25, D. C. PB 117753

Modes in anisotropic structures, by Bernard Friedman. Technical Research Group, New York,



The analogies between the pressure waves generated by heat release and those generated by (1) mass release, (2) piston motion, or (3) a two-dimensional body in a supersonic stream are established analytically. The exact solution of an idealized problem in which heat is released uniformly at a section of tube with a given rate, large or small, is also constructed. The corresponding problems in three dimensions are also solved. Some applications of the theory are given. NACA TN 3411.

Quartimax method: An analytic approach to orthogonal simple structure, by Jack O. Neuhaus and Charles Wrigley. U. S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center. Personnel Research Laboratory, Lackland Air Force Base, Texas. Dec 1954. 28p tables. Order from LC. Mi \$2.25, ph \$4.00. PB 117833

An analytic method, named "quartimax," for the orthogonal rotation of factor loadings is proposed in this paper. The quartimax method consists of maximizing the sum of fourth powers of factor loadings. It is objective (i.e., nonjudgmental) and is adaptable to high-speed computational devices. The relations of this procedure to Thurstone's "simple structure" and Burt's method of group factor analysis are discussed, and three examples are presented, along with the computational worksheet. Contract no. AF 33(038)-25726. Project no. 7702, Task no. 77054. AAF PTRC TR 54-105.

Rate of dissipation of energy and the energy spectrum in a low-speed turbulent jet, by Wan-Cheng Chiu and Louis N. Rib. New York University. College of Engineering. Research Division, New York, N. Y. Apr 1955. 37p diags, graphs, tables. Order from LC. Mi \$2.50, ph \$5.25. PB 117629

This paper reports a study of the correlation coefficients between eddy velocity components measured at two different points in space, the energy spectrum, and the rate of dissipation of energy in a low-speed turbulent jet. The result of this study shows that the local isotropy proposed by Kolmogoroff prevails. It also gives the order of magnitude of the mean rate of dissipation of energy. Scientific report no. 2 under Contract no. AF 19(122)-261.

Convenient method of determining vapor pressure, by J. M. Leonard and J. D. Bultman. U. S. Naval Research Laboratory. May 1955. 7p diags, table. Order from LC. Mi \$1.50, ph \$1.50. PB 117925

A simple, rapid method of vapor pressure determination has been developed at NRL. The procedure, similar in principle to that of Smith and Menzies, is equally adaptable to solids and liquids. Experiments on nine materials of known vapor pressure characteristics exemplify the utility of the method. NRL R 4534.

Some minimax invariant procedures for estimating a cumulative distribution function, by Om P. Aggarwal. Washington. University. Dept. of Mathematics.

Laboratory of Statistical Research, Seattle, Wash. Aug 1954. 24p table. Order from LC. Mi \$2.25, ph \$4.00. PB 117896

Technical report no. 15. Contract N8onr-520, Task order II, Project NR-042-038.

1. Random distribution - Theory 2. Variance - Analysis 3. Mathematical equations and solutions.

Synoptic analysis of convection in a rotating cylinder, by J. Corn and D. Fultz. U. S. Air Force. Air Research and Development Command. Cambridge Research Center. Geophysics Research Directorate, Cambridge, Mass. Jan 1955. 79p photos, drawing, diags, graphs, tables. Order from OTS. \$2.00. PB 117177

The top surface motions of a liquid in a rotating cylinder which is heated at the rim are analyzed for their streamline and isotach patterns. A series of 35 consecutive analyses are presented and discussed. Measurements of the radial and tangential velocity components were made and the results of certain computations of the angular momentum transport, using these quantities, are presented. AAF CRC TR 55-202. AAF GRD P 34.

Tables of scattering functions for spherical colloidal particles, III, by W. Heller. Wayne University. Dept. of Chemistry. Computation Laboratory, Detroit, Mich. Aug 1954. 14p tables. Order from LC. Mi \$2.00, ph \$2.75. PB 117787

Technical report no. 9 under Contract Nonr 736 (000), Project Nr. 330-027. For Parts I-II see PB 117034, and PB 114756.

1. Particles, Charged - Scattering - Tables  
2. Tables, Mathematical.

## Nuclear

Final report under Contract N6ori-02028, NR 081-096, Task order XXXII, by Harold C. Urey and S. Epstein, H. A. Lowenstein and C. Emiliani. Chicago. University. Institute for Nuclear Studies. Jul 1954. 44p photo, graphs (2 fold), table. Order from LC. Mi \$2.75, ph \$6.50. PB 117479

If the oxygen isotopic composition of water in which a given calcium carbonate has been precipitated is known or reasonably assumed, and if the chemistry involves exclusively equilibrium reactions, the temperature at which the precipitation occurred can be obtained by determining the oxygen isotopic composition of the calcium carbonate. The past climatic history of the earth was studied by measuring the oxygen isotopic composition of the calcium carbonate in well-preserved marine fossils.

Quarterly progress report under Contract N5ori-07856. Massachusetts Institute of Technology. Solid-State and Molecular Theory Group. Order separate parts described below from LC, giving PB number of each part ordered.

Quarterly progress report no. 13, Jul 15, 1954.  
Jul 1954. 66p graphs, tables. Mi \$3.25,  
ph \$9.00. PB 117476

Contents: 1. Some remarks on the basis of the one-electron approximation in the quantum theory of atoms, molecules and crystals, by P. O. Lowdin. - 2. Many-configuration calculations on benzene, by R. McWeeny. - 3. Limited configuration interaction treatment of the NH<sub>3</sub> molecule, by H. Kaplan and S. Bucksbaum. - 4. Theory of scattering in solids, by G. F. Koster. - 5. Calculation of a density of states curve for nickel, by G. F. Koster. - 6. Energy bands in copper, by D. J. Howarth. - 7. Symmetry points in the augmented plane wave method, by M. M. Saffren. - 8. Energy bands in graphite, F. J. Corbatb. - 9. Soft X-ray emission spectra, by A. J. Freeman. - 10. Nuclear electric quadrupole interaction in the KCl molecule, by L. C. Allen. - 11. Magnetic scattering of slow neutrons from oxygen gas, by W. H. Kleiner. - 12. Thermal vibrations in the Cu-Zn system crystals, by H. C. White. - 13. Electron-lattice interaction, by T. D. Schultz.

Quarterly progress report no. 15. Apr 1955.  
55p graphs, table. Mi \$3.00, ph \$7.75.  
PB 117612

Contents: 1. Extension of the valence-bond method, by J. C. Slater. - 2. One-electron energies of atoms, molecules, and solids, by J. C. Slater. - 3. Impurity states arising from degenerate bands in the transition elements, by G. F. Koster and L. P. Howland. - 4. Energy bands in potassium chloride, by L. P. Howland. - 5. An augmented plane wave method as applied to sodium, by M. M. Saffren. - 6. Augmented plane wave method as applied to chromium, by M. M. Saffren. - 7. Augmented plane wave method for iron, by J. H. Wood. - 8. Polarization effects in the fluorine ion, by L. C. Allen. - 9. Electronic energy of the OH molecule, by A. J. Freeman. - 10. Lithium hydride molecule, by A. M. Karo and A. R. Olson. - 11. Doubly excited states of the hydrogen molecule, by H. A. Aghajanian. - 12. Automatic computation of atomic integrals, by R. K. Nesbet. - 13. Program for transforming integrals, by R. K. Nesbet. - 14. Energy bands in graphite, by F. J. Corbato. - 15. Electron-lattice interactions, by T. D. Schultz. - 16. Energy flux due to vibrations of a linear chain of atoms, by E. Schlömann.

Report, 1953-1954. National Research Council.  
Committee on the Measurement of Geologic Time.  
1955. 196p graph, table. Order from NAS-NRC  
Publications Office, 2101 Constitution Ave., N. W.,  
Washington 25, D. C. \$1.75. PB 117736

Contents: Exhibit A: Annotated bibliography of articles related to geologic time, compiled by John Putnam Marble. (32 pages). - Exhibit B. Recent work on natural variations in the ratios of the stable isotopes, by John Putnam Marble. - Exhibit C. On the question of the variation of the isotopic composition of common lead, by G. R. Rik and G. V. Avdzye'iko, translated from Doklady Akademiia Nauk USSR,

vol. 90, p. 829-831, 1953. - Exhibit D. Reports from overseas collaborators. NRC 333.

Summary of the numerical results of a theoretical study of the scattering of neutrons by complex nuclei, by Herman Feshbach, Charles E. Porter, and Victor F. Weisskopf. Massachusetts Institute of Technology. Laboratory for Nuclear Science. Aug 1953. 121f graphs, tables. Order from LC. Mi \$5.75, enl pr \$19.00. PB 117799

Contract N5ori-07806, NR-026-001.  
1. Neutrons - Scattering - Theory 2. Neutrons - Cross sections - Tables 3. Atomic power - Research 4. MIT LNS TR 62.

Theory of multiple Coulomb scattering from extended nuclei, by Leon N. Cooper and James Rainwater. Columbia University, Physics Dept. Nevis Cyclotron Laboratories, Irvington-on-Hudson, N. Y. Jun 1954. 9p graph. Order from LC. Mi \$1.50, ph \$1.50. PB 117576

Joint ONR-AEC program, Contract N6ori-110,  
Task no. 1.  
1. Mesotrons - Scattering - Theory 2. Coulomb functions 3. Atomic power - Research 4. R-81  
5. CU-68.

## PHYSIOLOGY

Man in cold environment, a study in physiology, by Loren D. Carlson. U. S. Air Force. Arctic Aeromedical Laboratory, Ladd Air Force Base, Fairbanks, Alaska. Aug 1954. 167p photos, drawings, diags, graphs, tables. Order from OTS. \$4.25. PB 111716

The monograph discusses heat loss, data concerned with heat input, circulation, metabolic adjustments, the related psychological studies and special aspects of aviation, clothing and shelter. Includes an extensive bibliography. Contract AF 33(038)-422.

## PSYCHOLOGY

Analysis of role distribution in B-29 crews, by William W. Haythorn. U. S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center. Crew Research Laboratory, Randolph Air Force Base, Texas. Dec 1954. 35p diagr, tables. Order from LC. Mi \$2.50, ph \$5.25. PB 117834

The most important factor seems to be the extent to which crew members report that their aircraft commander performs the informal leadership roles normally expected of the formal group leader. The use of analysis of variance for profile analysis is

is considered the major methodological contribution of the report. Project no. 7713, Task no. 77223. AAF PTRC TR 54-104.

Competing messages: The effect of interfering messages upon the reception of primary messages, by Robert W. Peters. U. S. Naval School of Aviation Medicine, Pensacola, Fla. and Ohio State University Research Foundation, Columbus, Ohio. Sep 1954. 12p graph, tables. Order from LC. Mi \$2.00, ph \$2.75. PB 116526

Listeners heard two synchronous and near-synchronous messages under instructions to respond to a designated primary message. The variables under study involved six types of interfering messages, and either (a) a delay of 0.30 second or (b) no delay in the onset of the primary message as compared to the onset of the interfering message. The results indicated that for the types of messages considered, listener reception is most adversely affected when the interfering message is similar to the primary message in phonetic content and temporal pattern. Joint project report no. 27 under Contract N6ONR 22525, Project no. NR 145-993. NMRI Proj NM 001 064.01.27.

Complete Minnesota norms for responses to 100 words from the Kent-Rosanoff word association test, by Wallace A. Russell and James J. Jenkins. Minnesota. University. Dept. of Psychology. Aug 1954. 42p photos, drawings, diags, graphs, tables. Order from LC. Mi \$2.75, ph \$6.50. PB 117888

Studies on the role of language in behavior, Technical report no. 11. Contract N8onr-66216.  
1. Words - Association 2. Kent-Rosanoff word association test 3. Psychological tests.

Effect of vocal inflection on the intelligibility of two-unit signals, by Henry M. Moser, John J. Dreher, and Sol Adler. Ohio State University. Research Foundation, Columbus, Ohio. Mar 1955. 39p tables. Order from LC. Mi \$2.50, ph \$5.25. PB 117724

It is the purpose of this paper to determine if any one of the nine basic vocal inflectional patterns is most effective for transmitting two sequential signals. Contract AF 18(600)316. OSURF Proj 519, Report 23. AAF CRC TN 55-54.

Effects of exposure to white noise on individual test scores: Loudness-balance and intelligibility tests, by John J. O'Neill. U. S. Naval School of Aviation Medicine, Pensacola, Fla. and Ohio State University Research Foundation, Columbus, Ohio. Sep 1954. 16p drawing, diags, graphs, tables. Order from LC. Mi \$2.00, ph \$2.75. PB 116528

The left ears of 16 experimental subjects were individually exposed to 100 decibels of white noise for 30 minutes. Loudness-balance and intelligibility tests were administered immediately before and after this exposure. There was no evidence of auditory fatigue or recruitment above a sensation level

of 50 db. Intelligibility scores were improved for the non-exposed ear but were not altered for the exposed ear. Joint project report no. 29 under Contract N6ONR 22525, Project no. NR 145-993. NMRI Proj NM 001 064.01.29.

Evaluation of an experimental flight grading method for use in the Naval Air Basic Training Command, by Rex D. Danneskjoeld and Woodbury Johnson. Psychological Corporation, New York, and the U. S. Naval School of Aviation Medicine, Naval Air Station, Pensacola, Fla. Aug 1954. 75p diagr, tables. Order from LC. Mi \$3.75, ph \$10.25. PB 117838

Joint project report under Contract Nonr-1162(00) and Project No. NM 001 058.24.  
1. Pilots, Air - Performance records 2. Ability tests - Evaluation 3. Personnel, Naval - Performance - Tests 4. Flight training - Tests 5. NMRI Proj NM 001 058.24.03.

Factors influencing organizational effectiveness. University of Southern California, Los Angeles, Calif. Contract N6-ONR-23815. Order separate parts described below from LC, giving PB number of each part ordered.

V: A survey of district rangers, by Andrew L. Comrey, John M. Pfiffner and Wallace S. High. 1954. 15p. Mi \$2.00, ph \$2.75. PB 117809

Technical report no. 8.  
1. Organization 2. Questionnaires 3. Forest rangers - Questionnaires 4. Personnel, Forestry service - Questionnaires.

VI: Survey of aircraft workers, by Andrew L. Comrey, Wallace S. High and Robert C. Wilson. 1954. 15p tables. Mi \$2.00, ph \$2.75. PB 117808

Technical report no. 9.  
1. Organization 2. Personnel, Flying - Psychological records 3. Questionnaires.

VII: Survey of aircraft supervisors, by Andrew L. Comrey, Wallace S. High and Robert C. Wilson. 1954. 16p tables. Mi \$2.00, ph \$2.75. PB 117806

Technical report no. 10.  
1. Supervisors, Aircraft - Tests 2. Questionnaires 3. Industrial research - Efficiency 4. Personnel, Flying - Psychological records.

VIII: Survey of aircraft foremen, by Wallace S. High, Robert C. Wilson and Andrew L. Comrey. 1954. 14p tables. Mi \$2.00, ph \$2.75. PB 117807

Technical report no. 11.  
1. Industrial research - Efficiency 2. Foremen, Aircraft - Tests 3. Organization 4. Questionnaires.

Final technical report, by A. L. Comrey, J. M. Peiffner, and W. S. High. 1954. 66p graph,

tables. Mi \$3.25, ph \$9.00. PB 117810

The research has been carried out in three main stages: (a) development of hypotheses and instruments for measuring variables related to organizational effectiveness; (b) administration of these instruments in a series of organizations for which criterion data on organizational effectiveness could be obtained; and (c) correlation of variables with the measures of organizational effectiveness.

Final report under Contract Nonr-496(01), by Hadley Cantril. Institute for Associated Research, Hanover, N. H. Jul 1954. 24p. Order from LC. Mi \$2.25, ph \$4.00. PB 117851

Lists publications issued as a result of work under this contract and a sound movie of six of the demonstrations used, findings on relation between speech and personality, work at NMRI in Bethesda, and descriptions of work with aniseikonic glasses, a monocular distorted room, and Wittreich's measuring scale for distortion of objects.

Final report under Contract N7onr-43404 (T. O. #4), by John H. Rohrer. Tulane University. Aug 1954. 3p. Order from LC. Mi \$1.50, ph \$1.50. PB 117897

Summarizes technical reports made under this contract.

1. Psychological tests - Evaluation 2. Psychiatric tests.

Generality of expectancy level as a function of set, by Sanford J. Dean. Stanford University. Dept. of Psychology, Stanford, Calif. Aug 1954. 15p. Order from LC. Mi \$2.00, ph \$2.75. PB 117892

Technical report no. 7 under Contract Nonr-225(01), Project NR-150-087.

1. Similarity - Theory 2. Psychological research.

Human factors in the design of vehicle cab areas, by N. C. Kephart and J. W. Dunlap. Purdue University. Dept. of Psychology. Occupational Research Center, Lafayette, Ind. Dec 1954. 86p photos, diagrs, graphs, tables. Order from LC. Mi \$4.00, ph \$11.50. PB 117889

The objectives of this research were to determine for the middle 90% of the army truck driver population, in height: 1) the location of the steering wheel within the cab and the angle of the toe pan that would meet the comfort requirements of the population; and 2) the ranges of adjustability necessary in the truck seat to meet the comfort requirements of the above portion of the population. Contract no. DA49-007 MD-486, Final report, Jul 1953-Dec 1954.

Influence of leader-keyman relations on combat crew effectiveness, by Fred E. Fiedler. Illinois. University. Dept. of Psychology. Group Effectiveness Research Laboratory, Urbana, Ill. Jun 1954. 34p

diagrs, graphs, tables. Order from LC. Mi \$2.50, ph \$5.25. PB 117859

Two studies dealing with the prediction of team effectiveness are reported. These studies investigated the relationship between the formal leader's interpersonal perception and his team's operating efficiency. Technical report no. 9. Contract N6-ori-07135.

Listener judgements of speaker intelligibility, by John J. O'Neill. U. S. Naval School of Aviation Medicine, Pensacola, Fla. and Ohio State University Research Foundation, Columbus, Ohio. Sep 1954. 10p tables. Order from LC. Mi \$1.50, ph \$1.50. PB 116527

Seven panels of listeners rated speakers on the basis of expected intelligibility score. These ratings were compared to scores obtained on standard intelligibility tests. The test results were further analyzed to determine if speakers from particular Naval Districts were more intelligible. Joint project report no. 28 under Contract N6ONR 22525, Project no. NR 145-993. NMRI Proj NM 001 064.01.28.

Processes affecting "Understanding of others" and "Assumed similarity", by Lee J. Cronbach. Illinois. University. Dept. of Psychology. Group Effectiveness Research Laboratory. Aug 1954. 44p diagrs, tables. Order from LC. Mi \$2.75, ph \$6.50. PB 117822

Technical report no. 10 under Contract N6-ori-07135, Project on social perception and group effectiveness.

1. Group behavior 2. Psychological tests 3. Similarity - Theory 4. Perception, Social - Research.

Profile analysis of Rorschach data, by O. F. Anderhalter, Marilyn K. Rigby, and Walter L. Wilkins. St. Louis University. Dept. of Psychology, St. Louis, Mo. Aug 1954. 41p diagrs, tables. Order from LC. Mi \$2.75, ph \$6.50. PB 117893

Rorschach test data obtained from Marine Corps officer candidates were examined by various statistical methods for their ability to predict membership in two criterion groups. The upper group consisted of 100 men who had successfully passed an intensive leadership screening course, were commissioned, and obtained high leadership grades in Basic School. The lower group were 100 men who had failed to pass the screening course. Contract N7onr-40802 (NR 151-092). Technical report no. 4.

Relationship of verbal communication variables to immediate and delayed retention and to acceptability of training materials, by George R. Klare, James E. Mabry, and Levari M. Gustafson. U. S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center. Training Aids Research Labora-



tory, Chanute Air Force Base, Ill. Dec 1954. 63p tables. Order from LC. Mi \$3.25, ph \$9.00.  
PB 117835

Contract no. AF 33(038)-25726. Project no. 507-011-0001.

1. Communication, Auditory - Training equipment
2. Personnel, Flying - Training
3. AAF PTRC TR 54-103.

Relative discriminability of thirty-one differently shaped knobs, by Darwin P. Hunt and David R. Craig. U. S. Air Force. Air Research and Development Command. Wright Air Development Center. Aero Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Dec 1954. 21p drawings, graphs. Order from OTS. 75 cents. PB 111690

The results of field studies have suggested that a large proportion of the errors made in the operation of controls are attributable to the confusing of one control with another. One feasible way of reducing the frequency of occurrence of this type of error is by designing the controls so that they may be identified by touch. This study was conducted in order to select, from among thirty-one differently shaped rotary control knobs, those that could be distinguished easily by touch alone. AAF WADC TR 54-108.

Research on selection instruments for women Naval officers, by J. C. Nunnally, Jr. American Institute for Research, Inc., Princeton, N. J. Aug 1954. 22p tables. Order from LC. Mi \$2.25, ph \$4.00.  
PB 117839

The best available criteria for validating selection instruments are the military aptitude and the academic course grades at the Indoctrination Unit (W), Newport. The largest problem facing this research is the small number of women officers available for testing. This shortcoming has been overcome in part by a careful consideration of the traits to be measured, the use of some relatively novel approaches to statistical analysis, and considerable time spent in developing predictor instruments specifically for women officers. Contract Nonr 890(01). NAVPERS TB 54-14.

Social structure and motivational pattern in an expressive medium: American and Mexican popular songs, by M. S. Edmondson and Frieda M. Silvert. Tulane University. Urban Life Research Institute, New Orleans, La. Jul 1954. 33p tables. Order from LC. Mi \$2.50, ph \$5.25. PB 117585

Technical report under Onr Contract N7onr 43404.  
1. Sociology - Research 2. Psychology, Social.

Some effects of induced success and failure on judgment behavior, by C. L. Winder and Kenneth R. Wurtz. Stanford University. Dept. of Psychology, Stanford, Calif. Aug 1954. 27p tables. Order from LC. Mi \$2.25, ph \$4.00. PB 117890

Technical report no. 5 under Contract Nonr-225(01), Project NR-150-087.

1. Psychological research
2. Performance tests.

Some relations among linear composites, multiple regression and factor analysis useful in estimating unknown correlations, by John A. Creager. U. S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center. Personnel Research Laboratory, Lackland Air Force Base, Texas. Dec 1954. 24p tables. Order from LC. Mi \$2.25, ph \$4.00.  
PB 117831

Project no. 7702.

1. Factor analysis
2. Correlation functions
3. Mathematical equations and solutions
4. Psychological tests
5. AAF PTRC TR 54-107.

Speed and confidence of judgment as psychological variables, by Laverne C. Johnson. Stanford University. Dept. of Psychology, Stanford, Calif. Jun 1954. 38p tables. Order from LC. Mi \$2.50, ph \$5.25. PB 117858

The investigation is related to a general program of research on thinking in progress in the Dept. of Psychology, Stanford University. Includes a list of technical reports and journal articles. Copies available upon request. Technical report 4 under Contract Nonr225(01), (NR-150-087).

Statistical analysis of the incidence of clustering in the recall of randomly arranged associates, by B. H. Cohen, J. M. Sakoda, and W. A. Bousfield. Connecticut. University, Storrs, Conn. Jul 1954. 19p graph, tables. Order from LC. Mi \$2.00, ph \$2.75. PB 117628

Technical report no. 10 under Contract Nonr-631(00).

1. Memory - Tests
2. Words - Association
3. Words - Memory
4. Psychological tests.

Stress and behavior. I: The behavior interpretation inventory, by Dee G. Applezweig and Mortimer H. Applezweig. Connecticut College. Dept. of Psychology. Motivation Research Project, New London, Conn. Aug 1954. 30p. Order from LC. Mi \$2.25, ph \$4.00. PB 117886

Contract Nonr 996(02), Project NR 172-228, Annual technical report.  
1. Psychological research.

Structural energies of learning: A study of the effect of personality-trend and collective structures on reading rate improvement, by Floyd H. Allport, Everett W. Reimer, John A. Valentine. Syracuse. University. Maxwell Graduate School of Citizenship and Public Affairs. Washington Research Office. Jul 1954. 70p graphs, tables. Order from LC. Mi \$3.25, ph \$9.00. PB 117592

This study was designed to test hypotheses with respect to learning based on the Structural Energetics Formula, which forms a central part of F. H. Allport's Event-Structure Theory. Improvement in reading rate on the part of students enrolled in an Air Force reading improvement course was taken as the dependent variable of all hypotheses.

Study of personality correlates of judgment behavior, by C. L. Winder and Kenneth R. Wurtz. Stanford University. Dept. of Psychology, Stanford, Calif. Aug 1954. 26p graphs, tables. Order from LC. Mi \$2.25, ph \$4.00. PB 117891

Technical report no. 6 under Contract Nonr-225(01), Project NR-150-087.  
1. Personality - Research 2. Psychological research.

Visual noise filtering by human operators. 1: Sequentially coded information, by Irwin Pollack. U. S. Air Force. Air Research and Development Command. Cambridge Research Center. Operational Applications Laboratory, Bolling Air Force Base, Washington, D. C. Jan 1955. 38p diags, graphs. Order from LC. Mi \$2.50, ph \$5.25. PB 117827

1. Communications, Visual - Filtering 2. Communication systems - Design 3. Noise - Filtering 4. AAF CRC TR-54-57.

What Hum RRO is doing. George Washington University. Human Resources Research Office, Washington, D. C. Mar 1955. 55p photos, diags, graphs, table. Order from LC. Mi \$3.00, ph \$7.75. PB 117848

This is the second in a series of Research Bulletins describing a selected group of research tasks. The list is made up from studies finished or nearing completion at the end of 1954. GWU HRRO RB 2.

## RUBBER AND RUBBER PRODUCTS

Study of reaction of ozone with polybutadiene rubbers. Report no. 7, period 1 Jul 1954 thru 31 Dec 1954. Augustana Research Foundation, Rock Island, Ill. Feb 1955. 48p graphs, tables. Order from LC. Mi \$2.75, ph \$6.50. PB 117463

Contract no. DA-11-022-ORD-329, Supplemental agreement no. 5. Project no. TB-4-521. Includes summaries of 1st-6th reports. For 6th report see PB 114988.

1. Rubber, Synthetic - Oxidation 2. Ozone - Absorption 3. Phenylenediamine - Derivatives - Synthesis 4. Antioxidants 5. Antioxidants - Synthesis.

## STRUCTURAL ENGINEERING

Comparison of numerical methods for analyzing the dynamic response of structures, by S. P. Chan and

N. M. Newmark. Illinois. University. Dept. of Civil Engineering, Urbana, Ill. Oct 1952. 88f graphs. Order from LC. Mi \$4.00, enl pr \$12.75. PB 117795

The purpose of this dissertation is to study the accuracy and range of applicability of various step-by-step techniques now available and frequently used in problems of dynamic response of structures. These step-by-step procedures may be classified for convenience of discussion into three groups: 1. Acceleration methods; 2. Difference equation methods; and 3. Numerical solution of differential equations. Contract N6onr-71, Task order VI, Project NR-064-183. ILU CES SR 36.

## TEXTILES AND TEXTILE PRODUCTS

Evaluation of experimental wool synthetic blends in Air Force 18-oz. blue serge, by C. A. Willis and C. W. Long. U. S. Air Force. Air Research and Development Command. Wright Air Development Center. Materials Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Nov 1954. 26p graphs, tables. Order from OTS. 75 cents. PB 111676

A group of twenty-one serge fabrics was evaluated in the laboratory to determine the effects on fabric properties when the fiber and percentage of fiber was varied. The fabrics included the 100% wool standard serge and twenty wool/synthetic blends. The fibers employed in the course of manufacture were wool, Dacron, Orlon, Acrilan, viscose rayon and Dynel. Each synthetic fiber was blended with wool in percentages of 10, 25, 40 and 60. AAF WADC TR 54-52.

Wet-cold I: Effect of moisture on transfer of heat through insulating materials, by Alan H. Woodcock and Thomas E. Dee, Jr. U. S. Climatic Research Laboratory, Lawrence, Mass. Dec 1954. 24p graphs. Order from OTS. 75 cents. PB 111639

Using the basic principles of moisture diffusion and heat transfer, relations between rate of drying, rate of heat transfer, drying time and location of moisture have been derived. Representative computations have been made for completely wicking and completely non-wicking insulating materials. Textile materials with widely different wicking properties were then selected for study. The time course of heat transfer through each of these fabrics after wetting was then determined using a flat plate heated to 92°F. in a constant temperature room at 30°F. and a relative humidity of 75% ± 5%.

## TRANSPORTATION EQUIPMENT

### Aeronautics

#### Aircraft

Application of specification MIL-E-5272 (USAF) environmental testing, aeronautical and associated equipment (general specification for), by J. R. Grimm. U. S. Air Force. Air Material Command, Wright-Patterson Air Force Base, Dayton, Ohio. Jan 1951. 10p. Order from LC. Mi \$1.50, ph \$1.50. PB 117686

1. Airplanes - Materials - Tests 2. Aeronautical equipment - Tests 3. MIL-E-5272 4. AAF MCREOC 51-5.

Design temperature requirements for operation of U.S.A.F. aircraft and equipment, Phase C, aircraft compartment and equipment temperatures (B-36B aircraft), by James G. Law. U. S. Air Force. Air Research and Development Command. Wright Air Development Center. Weapons Systems Division. Climatic Projects Section, Wright-Patterson Air Force Base, Dayton, Ohio. Jan 1952. PB 117685

1. B-36 (Airplane) 2. Airplanes - Equipment - Temperature 3. Airplanes - Temperature measurements 4. AAF WCSE MR-127.

Effects of wind and space charge on corona point discharge, particularly from aircraft, by Seville Chapman. Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y. Oct 1954. 33p tables. Order from LC. Mi \$2.50, ph \$5.25. PB 117732

Contract no. AF 19(122)-475.

1. Aircraft - Electrostatics 2. Aircraft - Electrostatic charge - Measuring equipment 3. Corona discharges 4. Electricity, Static - Elimination 5. CAL RA-766-P-11 6. AAF CRC TN 55-459.

Noise reduction in aircraft air conditioning systems, by G. L. Bonvallet and Henry B. Karplus. Armour Research Foundation, Chicago, Ill. Dec 1953. 59p diags, graphs, tables. Order from OTS. \$1.50. PB 111691

This report describes (a) the findings obtained by discussion of the problem with manufacturers' and military personnel and by examining such of their reports as were available, and (b) tests of the noise characteristics of three different ventilation outlets. It is concluded that the references to noise of the air conditioning systems in flight do not point to it as a predominant noise source. The report discusses techniques whereby noise measurements are made in octave wide bands at a specified distance. The desirability of computing the total sound power is

discussed. Contract no. AF 33(616)-140. AAF WADC TR 53-522.

Principles of canopy design for military aircraft, by Ambrose B. Nutt. U. S. Air Force. Air Research and Development Command. Wright Air Development Center. Aircraft Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Apr 1953. 106f photos, drawings, graphs, tables. Order from LC. Mi \$4.75, enl pr \$15.25. PB 117676

A comprehensive review of all aspects of canopy design for military aircraft is presented. Data on canopy design from many sources are correlated with past service experience and conclusions are drawn relative to desirable and undesirable features of various canopy designs. Basic design considerations, all available and prospective transparent materials, structural aspects, enclosure frame design and jettisoning and testing requirements are included. A complete bibliography is incorporated. AAF WADC TR 53-92.

Snow, frost, and ice elimination from parked aircraft, by Ralph H. Upson. Minnesota. University. Institute of Technology. Dept. of Aeronautical Engineering, Minneapolis, Minn. Contract no. AF 33(616)-413, Project no. 6124, Task no. 60973. Order Part 1 described below from LC, giving PB number.

Part 1: Preliminary investigations for the period 15 Jan to 30 Jul 1953. Aug 1953. 31p graph. Mi \$2.50, ph \$5.25. PB 117952

This report covers a study of scientific periodicals, pamphlets, technical papers, books, and other literature, the investigation of techniques now used or under development by the Department of Defense, other U. S. Government agencies, or by commercial firms including, but not limited to, the application of chemical deicing fluids, ice phobic waxes or other coatings, ice phobic covers for aircraft, electrically heated aircraft covers, infra-red radiant heating, and high velocity air blasts. For Part 2 see PB 117953. AAF WADC TR 53-217.

Part 3: Means of preventing and eliminating snow, frost, and ice from parked aircraft. Sep 1954. 31p graph, table. Order from OTS. \$1.00. PB 111671

The purpose of this report is to present information on the importance of prevention and removal of snow, frost, and ice from parked aircraft. The prediction of precipitation, use of covers and de-icing fluids, and organizing for the removal of such accumulations are contained herein. The report contains suggestions that can be of assistance in getting aircraft off the ground in the least amount of time. AAF WADC TR 53-217, Part 3.

Mach number and yaw-angle determination for conical-flow regimes using two-surface flow angle indicators, by H. S. Sucinski and H. F. Schulte. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Jan 1955. 14p photos, diags, graphs. Order from LC. Mi \$2.00, ph \$2.75. PB 117812

An instrumentation was developed for measuring the surface-flow angle utilizing a rectangular, metal plate, 3/4" x 1/8" x 0.003", driving a capacitive transducer. Correlation of the theory was provided in a series of wind-tunnel experiments. The discussion concerns the governing relations, the solution of the resulting transcendental equations, experimental results, and the possible applications. Contract AF 19(604)-545. Paper delivered as part of the Programme of the meeting of the Division of Fluid Dynamics, American Physical Society on Nov. 22, 1954 at the Hotel Chamberlin, Old Point Comfort, Fort Monroe, Va. MU ERI Proj 2096. AAF CRC 55-289.

Recovery and time-response characteristics of six thermocouple probes in subsonic and supersonic flow, by Truman M. Stickney. U. S. National Advisory Committee for Aeronautics. Jul 1955. 25p photos, drawings, diags, graphs, tables. Order from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 117690

1. Flow, Compressible - Mach number effect  
2. Mach number - Effect 3. Instruments, Measuring - Thermo-technical 4. Probes, Temperature - Design 5. Thermocouples - Design 6. Flow, Subsonic - Pressure distribution 7. Flow, Supersonic - Pressure distribution 8. NACA TN 3455.

Verminderung der flatterneigung von sporn- und bugwerken durch einbau besonders geformter reifen (Reduction of the shimmy tendency of tail and nose-wheel landing gears by installation of specially designed tires), by H. Schrode. Translated by Mary L. Mahler. Jul 1955. 13p diags, graphs. Order from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 117688

An experimental study is made of the shimmy tendency of several conventional and modified German aircraft tires ranging in size from about 11 to 15 inches in diameter. The effects of tire size, shape, loading and wear, type of rolling motion (acceleration or deceleration), trail and rolling velocity on the shimmy tendency are investigated. Translated from Deutsche Versuchsanstalt für Luftfahrt, E. V., Berlin. Technische berichte, bd. 10, 1943, p. 113-116. NACA TM 1391.

#### Engines and Propellers

Radio shielding of aircraft ignition systems. U. S. Air Material Command. Engineering Division. Aircraft Laboratory, Wright-Patterson Air Force

Base, Dayton, Ohio. Jul 1946. 122p photos, drawings, diags, graphs. Order from LC. Mi \$5.25, ph \$16.50. PB 117751

1. Engines, Aircraft - Ignition systems 2. Radio interference - Shielding 3. AAF TN 92-1.

Simplified procedures and charts for the rapid estimation of bending frequencies of rotating beams, by Robert T. Yntema. U. S. National Advisory Committee for Aeronautics. Jun 1955. 92p diags, graphs, tables. Order from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 117697

1. Rayleigh principle (Mathematics) 2. Helicopter blades - Bending moments 3. Beams, Rotating - Bending moments 4. Beams, Cantilever - Bending - Theory 5. Beams, Hinged - Bending moments 6. Loads, Aerodynamic - Theory 7. NACA TN 3459.

Theoretical analysis of incompressible flow through a radial-inlet centrifugal impeller at various weight flows. U. S. National Advisory Committee for Aeronautics. Order separate parts described below from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C.

I. Solution by a matrix method and comparison with an approximate method, by Vasily D. Prian, James J. Kramer and Chung-Hua Wu. Jun 1955. 39p diags, graphs, tables. PB 117754

1. Flow, Incompressible - Theory 2. Cascades (Aerodynamics) - Theory 3. Compressors, Radial - Flow 4. NACA TN 3448.

II. Solution in leading-edge region by relaxation methods, by James J. Kramer. Jun 1955. 19p photos, drawings, diags, graphs, tables. PB 117756

1. Flow, Incompressible - Theory 2. Compressors, Radial - Flow 3. Cascades (Aerodynamics) - Theory 4. NACA TN 3449.

Vliyanii chaenlevich stroy na intensivnost kavitatsionnoy erosii (Effect of clearance jets on cavitation erosion), by K. K. Shalnev. Translated by I. C. Lecompte, edited by F. A. Raven. Apr 1955. 11p photos, diagr, table. Order from LC. Mi \$2.00, ph \$2.75. PB 117774

The damage by cavitation erosion encountered in practice to the walls of the housing and to the rotors of axial turbines and pumps cannot be explained by the direct effect of cavitation developing on bladed rotors. In accordance with the result of the present investigation, a crevice jet over the clearance between the blades and the wall of the housing should protect these walls from the erosion due to the cavitation developing on the blades of hydraulic machines. Translated from Proceedings of the Academy of Sciences, USSR, Vol. 91, no. 5, 1953, p. 1043-1045. NAVSHIPS T 576-B. STS 205B.

Development of an instructor's guide. Final report under Contract Nonr-417(00), RBH Project 256-N, by Charles P. Sparks. Richardson, Bellows, Henry & Co., Inc., New York, N. Y. n.d. 3p. Order from LC. Mi \$1.50, ph \$1.50. PB 117805

1. Instructors, Aviation - Training.

Evaluation of a contact flight simulator when used in an Air Force primary pilot training program. Part II: Effectiveness of training on component skills, by George N. Ornstein, Irwin A. Nichols, and Ralph E. Flexman. U. S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center. Basic Pilot Research Laboratory, Goodfellow Air Force Base, Texas. Dec 1954. 17p tables. Order from LC. Mi \$2.00, ph \$2.75. PB 117830

Project no. 7710, Task no. 77168.

1. Simulators, Flight - Evaluation 2. Personnel, Flying - Training 3. P-1 (Simulator) 4. Link trainers 5. AAF PTRC TR 54-110.

Light plane as a pre-primary selection and training device. III: Analysis of selection data, by Eli S. Flyer and Lawrence R. Bigbee. U. S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center. Personnel Research Laboratory, Lackland Air Force Base, Texas. Dec 1954. 19p graphs, tables. Order from LC. Mi \$2.00, ph \$2.75. PB 117829

Project no. 7701, Task no. 77023.

1. Personnel, Flying - Training 2. Personnel, Flying - Ability tests 3. Personnel, Flying - Psychological records 4. AAF PTRC TR 54-125.

Perception of size of objects at various distances, by Alberta S. Gilinsky. U. S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center. Armament Systems Personnel Research Laboratory, Lowry Air Force Base, Colorado. Dec 1954. 34p photos, diagrs, map, graphs, tables. Order from LC. Mi \$2.50, ph \$5.25. PB 117836

Contract no. AF 18(600)-196. Project no. 7706, Task no. 77116.

1. Visual perception - Training - Size 2. Visual perception - Testing equipment 3. Visual perception - Tests 4. AAF PTRC TR 54-92.

Some considerations in deciding about the complexity of flight simulators, by A. C. Williams, Jr. and Marvin Adelson. U. S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center. Basic Pilot Research Laboratory, Goodfellow Air Force Base, Texas. Dec 1954. 32p tables. Order from LC. Mi \$2.50, ph \$5.25. PB 117832

Contract no. AF 33(038)-25726, Task D. Project no. 508-016-0003. Appendix: Extracts from specification: Trainer, instrument flying, jet propelled aircraft variable characteristic.

1. Simulators, Flight - Evaluation 2. Personnel, Flying - Training 3. Flying, Instrument - Training devices 4. Aircraft, Jet propelled - Flight training 5. AAF PTRC TR 54-106.

Survey of the basic airborne training course at Fort Benning, Georgia, by Charles Windle. George Washington University. Human Resources Research Office, Washington, D. C. Apr 1955. 104p tables. Order from LC. Mi \$4.75, ph \$14.00. PB 117828

Appendices: A. Attitudes of airborne graduates toward airborne training. - B. Attitudes of airborne instructors toward airborne training. - C. Exploratory study on the effect of distraction upon mock tower performance. - D. Attitudes of airborne volunteers prior to airborne training. - E. Comparison between peacetime psychiatric casualty rates of parachutists and non-parachutists. - F. Reasons for permanent disqualification of original enlisted men from five airborne classes. - G. Follow-up study on the effect of distraction upon fear and an exploratory study on the effect of riser length. - H. Follow-up evaluation of the personnel inventory for predicting success in parachute school. - I. Exploratory study on the use of a multiple-choice need-achievement projective test for predicting success in airborne training. - J. Use of interviews for predicting success in airborne training. - K. Considerations regarding informal experiments on airborne training.  
1. Parachute jumping - Training 2. Parachute jumping - Psychological aspects 3. GWU HRRO SR4.

Airports and Airways

Temperature above an airport runway on a hot day, by Arnold H. Glaser, with an appendix by Guy A. Franceschini. Texas. Agricultural and Mechanical College. Dept. of Oceanography, College Station, Texas. May 1955. 41p photos, map, graphs. Order from LC. Mi \$2.75, ph \$6.50. PB 117635

The temperature at any level above an exposed airport runway in bright sunshine is seldom if ever appreciably higher than the temperature at that level above the surrounding terrain. As a result, the temperature taken in a properly exposed instrument shelter is likely to be fairly representative of the temperature of the air at the intake of an aircraft engine upon takeoff. A. & M. project 85. Reference 55-2T. Contract AF 19(604)-997, Scientific report no. 3. AAF CRC TN 55-479.

Aerodynamics

Aerodynamic characteristics of several 6-percent-thick airfoils at angles of attack from 0° to 20°



at high subsonic speeds, by Bernard N. Daley and Douglas R. Lord. U. S. National Advisory Committee for Aeronautics. May 1955. 57p photos, drawings, diags, graphs. Order from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 117581

1. Mach number - Effect
2. Flow, Subsonic
3. Flow, Mixed
4. Wings - Aerodynamics - Theory
5. Angle of attack - Coefficients
6. Airfoils - Aerodynamics
7. NACA TN 3424.

Aerodynamics of a rectangular wing of infinite aspect ratio at high angles of attack and supersonic speeds, by John C. Martin and Frank S. Malvestuto, Jr. U. S. National Advisory Committee for Aeronautics. Jul 1955. 114p diags, graphs, table. Order from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 117689

1. Wings, Rectangular - Aerodynamics
2. Wings, Rectangular - Aspect ratio
3. Angle of attack - Coefficients
4. Flow, Supersonic - Theory
5. Flow, Two-dimensional - Theory
6. NACA TN 3421.

Annual report, 39th, 1953. U. S. National Advisory Committee for Aeronautics. 1955. 1037p photos, drawings, diags, graphs, tables. Order from Superintendent of Documents, Government Printing Office, Washington 25, D. C. \$10.25. PB 117460

Includes Technical reports no. 1111 to 1157.

1. Aeronautical research
2. Aeronautics - Year-books
3. NACA 1111-1157.

Calculation of the wave drag of an arbitrary slender body by means of an electrical analogy tank, by P. J. Pocock. Canada. National Aeronautical Establishment. Mar 1955. 39p photos, drawings, diags, graphs. Order from LC. Mi \$2.50, ph \$5.25. PB 117811

A Malavard type electric analogy tank at the National Aeronautical Establishment is described and its use illustrated by some example problems. NAEC LR-127.

Effect of trailing-edge thickness on lift at supersonic velocities, by Dean R. Chapman and Robert H. Kester. U. S. National Advisory Committee for Aeronautics. Jun 1955. 20p photos, diags, graphs. Order from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 117699

1. Mach number - Effect
2. Reynolds number - Effect
3. Angle of attack - Coefficients
4. Airfoils - Thickness - Effect on lift
5. Lift - Theory
6. Flow, Supersonic - Wind tunnel tests
7. Wings - Lift - Effect of trailing edge
8. NACA TN 3504.

Laminar free convection on a vertical plate with prescribed nonuniform wall heat flux or prescribed nonuniform wall temperature, by E. M. Sparrow.

U. S. National Advisory Committee for Aeronautics. Jul 1955. 34p graphs. Order from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 117692

1. Flow, Laminar - Heat transference
2. Karman-Polhausen method (Boundary-layer computation)
3. Prandtl airfoil theory
4. Turbines, Gas - Cooling
5. Jet engines, Ram jet - Cooling
6. Heat - Transference - Aerodynamics
7. Convection (Free)
8. NACA TN 3508.

Maximum theorems and reflections of simple waves, by P. Germain. U. S. National Advisory Committee for Aeronautics. Jun 1955. 22p. Order from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 117695

1. Mathematical equations and solutions
2. Prandtl-Meyer theory (Aerodynamics)
3. Aerodynamics - Research
4. Brown University, Providence, R. I.
5. NACA TN 3299.

Quadraturverfahren zur berechnung der laminaren und turbulenten reibungsschicht bei ebener und rotationssymmetrischer strömung. (Method of quadrature for calculation of the laminar and turbulent boundary layer in case of plane and rotationally symmetrical flow), by Erich Truckenbrodt. Translated by Mary L. Mahler. May 1955. 40p tables. Order from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 117582

Translated from Ingenieur-archiv, band XX, heft 4, 1952, p. 228.

1. Boundary layer, Laminar - Theory - Germany
2. Boundary layer, Turbulent - Theory - Germany
3. Flow, Two-dimensional - Theory - Germany
4. Flow, Incompressible - Theory - Germany
5. NACA TM 1379.

Shearing effectiveness of integral stiffening, by Robert F. Crawford and Charles Libove. U. S. National Advisory Committee for Aeronautics. Jun 1955. 37p photo, diags, graphs, tables. Order from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 117696

1. Plates, Flat - Stress analysis
2. Plates, Flat - Plastic deformation
3. Computers, Analog - Uses
4. Stiffeners, Longitudinal - Stress distribution
5. NACA TN 3443.

Transonic characteristics of 22 rectangular, symmetrical wing models of varying aspect ratio and thickness, by Warren H. Nelson and John B. McDevitt. U. S. National Advisory Committee for Aeronautics. Jun 1955. 109p photos, diags. Order from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 117698

1. Mach number - Effect
2. Reynolds number - Effect
3. Wings, Rectangular - Aspect ratio
4. Wings, Rectangular - Thickness
5. Wings, Rectangular - Wind tunnel tests
6. Wings, Rectangular - Aerodynamics
7. NACA TN 3501.

Unstable convection in vertical channels with heating from below, including effects of heat sources and frictional heating, by Simon Ostrach. U. S. National Advisory Committee for Aeronautics. Jul 1955. 38p diags, tables. Order from National Advisory Committee for Aeronautics, 1512 'H' St., N. W., Washington 25, D. C. PB 117691

1. Flow, Laminar - Heat transfer
2. Flow, Fluid - Viscosity
3. Rayleigh theory
4. Heat - Transference - Aerodynamics
5. NACA TN 3458.

### Land Transportation

Analysis of risk and exposure in automobile accidents, by Jack W. Dunlap, Jesse Orlansky, Herbert H. Jacobs, Kenneth W. Yarnold, John P. Kishler, Robert J. Schreiber. Dunlap and Associates, Inc., Stamford, Conn. 1953. 67p photo, diags, graphs, tables. Order from LC. Mi \$3.25, ph \$9.00. PB 117801

Analytical study of automobile accidents on the New Jersey Turnpike and on the Merritt Parkway in 1952. A model of risk acceptance has been set up. A theoretical relationship of estimate of risk to density has been derived. The observations, carried out only on a small scale, seem to agree with the mathematical model. Contract DA49-007-MD-239.

Human factors in the design of highway transport equipment; a summary report of vehicle evaluation, by Ross A. McFarland, Jack W. Dunlap, William A. Hall, Alfred L. Moseley. Harvard University. School of Public Health. Jun 1953. 94p diags, tables. Order from LC. Mi \$4.50, ph \$12.75. PB 117800

This report is a summary of the findings on representative trucks widely used in both the civilian and military transport services, in relation to working space, operator's seat, levers and controls, instrument panel, human sizing, comfort, and safety.

Human factors in highway transport safety, by Ross A. McFarland and Alfred L. Moseley. Harvard University. School of Public Health. 1954. 310p photos, drawings, diags, graphs, tables. Order from LC. Mi \$9.00, ph \$39.00. PB 117887

1. Motor vehicles - Accidents
2. Accidents, Traffic - Causes
3. Safety - Research
4. Motor vehicles - Drivers - Psychology
5. Motor vehicles - Equipment - Design.

Personal factors in accident causation, by Jack W. Dunlap, Jesse Orlansky, Herbert H. Jacobs, Kenneth W. Yarnold, John B. Kishler, Robert J.

Schreiber. Dunlap and Associates, Inc., Stamford, Conn. 1953. 33p tables. Order from LC. Mi \$2.50, ph \$5.25. PB 117802

Contract DA-49-007-MD-239.

1. Accidents, Traffic - Causes
2. Motor vehicles - Accidents
3. Motor vehicles - Drivers - Psychology
4. Airplanes - Accidents - Human factors.

### Marine Transportation

Age of deep sea materials, by J. Laurence Kulp. Columbia University. Lamont Geological Observatory, Palisades, N. Y. Aug 1954. 8p. Order from LC. Mi \$1.50, ph \$1.50. PB 117793

Final report under Contract N6onr 271, Task order 18.

1. Sediment, Marine - Analysis
2. Geological time - Determination
3. Radiocarbon - Measurement.

Analysis of radar ice reports submitted by Hudson Bay shipping, by A. D. Hood. National Research Council of Canada. Radio and Electrical Engineering Division. Dec 1954. 13p maps, diags, graphs, tables. Order from National Research Council of Canada, Ottawa, Canada. 25 cents. PB 117908

Ice reports from Hudson Bay shipping were analyzed to determine the effect of radar in reducing the navigational hazard in ice-infested waters, and to locate the ice concentration and ascertain whether or not a seasonal trend was evident. NRCC 3560. NRCC ERB 356.

Bottom sediments and foraminifera from Labrador. Blue Dolphin, 1951 and 1952, by W. D. Athearn. Woods Hole Oceanographic Institution, Woods Hole, Mass. Jun 1954. 22p fold map, tables (1 fold). Order from LC. Mi \$2.25, ph \$4.00. PB 117857

The sediments vary from gravel to silty clay. Of about 60 species for Foraminifera identified from the samples, less than a half dozen are abundant in any area. Only a few species are restricted to a given locality, and these are so uncommon that they may not have shown up in the other areas because of inadequate sampling. Neither depth nor bottom type seem to exert a decisive control over the distribution of species. No explanation can be offered at present for the absence of Foraminifera in the samples from several localities along the Labrador coast. Contract N6onr-27701 (NR-083-004). Unpublished manuscript. WHOI Ref 54-42.

Dynamic model of a two-layer ocean under influence of atmosphere and coastal boundary, by Gordon W. Groves. California. University. Scripps Institution of Oceanography, La Jolla, Calif. Jul 1954. 30p diagr, graphs. Order from LC. Mi \$2.25, ph \$4.00. PB 117843

A mathematic treatment of the action of a two-

layer system of sea water under stresses such as wind and waves. UC SIO Ref 54-22.

Generalized laboratory study of tsunami run-up, by Kenneth Kaplan. U. S. Beach Erosion Board. Jan 1955. 33p diags, graphs, table. Order from LC. Mi \$2.50, ph \$5.25. PB 117743

This presents the results of a study, made on generalized beach and structure shapes, of the relation of tsunami run-up to the wave characteristics. References attached. ENG BEB TM 60.

Graphical approach to the forecasting of waves in moving fetches, by Basil W. Wilson. Texas. Agricultural and Mechanical College. Dept. of Oceanography, College Station, Texas. Apr 1955. 35p diags, graphs. Order from LC. Mi \$2.50, ph \$5.25. PB 117759

Existing deep water forecasting data are assembled in a single chart over which a space-time wind-field representing any given moving wind system (in relation to a particular point on a coast) can be placed by superposition for the evaluation of the characteristics of the waves generated at any specific point in space and time within the wind field. The method is applicable to both approaching and receding storms and permits of decay aspects being taken into account in the usual way. An example is given of the application of the method to the forecasting of wave conditions in the path of a hurricane. Contract DA 49-055-eng-45. Revision and extension of a paper presented at the May 1954 meeting of the American Geophysical Union, Washington, D. C. ENG BEB TM 73.

Hydrodynamic characteristics of pontoons pertinent to a study of their design and operation, by Thomas F. Stelson. Carnegie Institute. Dept. of Civil Engineering, Pittsburgh, Pa. Aug 1954. 48p photo, diags, graphs, tables. Order from LC. Mi \$2.75, ph \$6.50. PB 117929

Seven model pontoons were tested to determine their hydrodynamic properties in vertical movement when partially submerged. The equivalent added weight due to the fluid was obtained by measuring changes in the natural fundamental frequency of a supporting beam for which the relationship between fundamental frequency and attached center-weight was known. The results are in agreement with previous tests and analyses where comparisons can be made. Contract no. Nonr-760(03).

Laboratory study of shock pressures of breaking waves, by Culbertson W. Ross. U. S. Beach Erosion Board. Feb 1955. 25p photos, diags, graphs, table. Order from LC. Mi \$2.25, ph \$4.00. PB 117742

The waves used in the present investigations were from approximately 3.5 to 7.5 inches in height. Maximum observed shock pressures were 21 psi. Data are insufficient to establish definitely the relation between pressure and wave height, but an

approximate linear relationship is indicated. The maximum pressure of 21 psi compares with 80 psi for 10-inch waves observed by Bagnold and 100 psi for 15-foot waves observed by Rouville, Besson and Petry. The elasticity of trapped air prevents occurrence of maximum possible pressures. ENG BEB TM 59.

Laboratory study of the generation of wind waves in shallow water, by Osvald Sibul. California. University, Berkeley, Calif. Mar 1955. 38p photos, drawings, graphs, tables. Order from LC. Mi \$2.50, ph \$5.25. PB 117744

Wind waves in shallow water were studied in a laboratory channel. The experiments were conducted with smooth and rough bottom conditions, and with strips of cheese cloth in the channel to simulate the roughness effects of vegetation in nature. The data indicate that the Sverdrup-Munk-Bretschneider curves may be used to predict the wave heights and periods for relatively deep water. The wave periods are also affected by the depth, but not as much as are the wave heights. Contract DA49-055-eng-31 with the Beach Erosion Board. ENG BEB TM 72.

Marine microbiology. Semi-annual progress report no. 7, 1 Jan-30 Jun 1954, under Contract N6onr-275(18) Project NR 135-020, by Claude E. ZoBell and Richard Y. Morita. California. University. Scripps Institution of Oceanography, La Jolla, Calif. Jun 1954. 19p graphs, tables. Order from LC. Mi \$2.00, ph \$2.75. PB 117850

Object is to determine the effects of high hydrostatic pressures on the occurrence, abundance, and physiological activities of marine organisms. Knowledge of the behavior and biochemical activities of organisms is prerequisite to an understanding of conditions in the sea, where hydrostatic pressures ranging from one to 1050 atmospheres prevail. The ultimate objective of the project is to acquire fundamental facts basic to an understanding of the equation of state in life processes. For report no. 6 see PB 115850. CU SIO Ref 54-24.

Method for the determination of the critical angle of reflection of sound from the bottom of the ocean, by R. R. Goodman. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Aug 1954. 14p diags (part fold). Order from LC. Mi \$2.00, ph \$2.75. PB 117910

A method of measuring the critical angle of bottom reflection by observing the range dependence of the length of a pulsed signal is found. Measurements are made on data for a mud bottom with 0.2 and 0.6 kc sound signals which give values from 72° to 78° as the critical angle of incidence. These values of the critical angle give a velocity of sound in the mud bottom around 1.02 and 1.05 times the velocity of sound in water. Contract N6onr-23221, Project no. NR 261 008. MU ERI Proj M 936.

North Atlantic coast wave statistics hindcast by Bretschneider-Revised Sverdrup-Munk methods, by Thorndike Saville, Jr. U. S. Beach Erosion Board. Nov 1954. 81p diags, graphs, tables. Order from LC. Mi \$4.00, ph \$11.50. PB 117740

Wave characteristics were determined from synoptic weather charts for each station for the three-year period 1948-1950. Fetch areas, and the wind speeds and durations in these areas, were determined directly from the weather maps; these values were used with the curves derived by Sverdrup and Munk and revised by Arthur and later by Bretschneider to obtain the hindcast wave characteristics. Appendices give tables of wave statistics of Penobscot Bay, Maine, off Nauset Beach, Cap Cod, Mass., off New York harbor entrance, and off Chesapeake Bay entrance. ENG BEB TM 55.

North Atlantic coast wave statistics hindcast by the wave spectrum method, by Gerhard Neumann and Richard W. James. New York University. Dept. of Meteorology and Oceanography, New York, N. Y. Feb 1955. 77p photos, drawings, diags, graphs, tables. Order from LC. Mi \$3.75, ph \$10.25. PB 117741

The data presented herein are presented not only by the significant wave parameters, but also by other spectral tabulations. The significant wave compilations may be compared with those presented in Technical Memorandum No. 55 (PB 117740) for the same stations, but obtained by the Sverdrup-Munk relationships. The techniques used in this report are those developed by Neumann, Pierson and James. Contract DA-49-055-eng-32 with Beach Erosion Board. ENG BEB TM 57.

Priblizhnyy gidrodinamicheskii raschet podvodnogo kryla konechnogo razmakha (Approximate hydrodynamic design of a finite span hydrofoil), by A. N. Vladimirov. Jun 1955. 68p diags, graphs, tables. Order from National Advisory Committee for Aeronautics, 1512 "H" St., N. W., Washington 25, D. C. PB 117752

Translated from Central Aero-Hydrodynamical Institute, Rept. 311, 1937.  
1. Hydrodynamics - Theory - Russia 2. Hydrofoils - Design - Russia 3. NACA TM 1341.

Puget Sound and approaches; a literature survey. Vol. III: Physical oceanography, marine biology, general summary, by Peter M. McLellan and others. Washington. University. Dept. of Oceanography, Seattle, Wash. Jun 1954. 208p. Order from LC. Mi \$4.75, ph \$14.00. PB 117854

Contract no. Nonr-447(00), Task Order 477(06). For vols. I-II see PB 114242-114243.  
1. Oceanography - Puget Sound.

Re-analysis of existing wave force data on model piles, by R. Curtis Crooke. U. S. Beach Erosion Board. Apr 1955. 23p diagr, graphs, tables. Order from LC. Mi \$2.25, ph \$4.00. PB 117712

1. Mathematical equations and solutions 2. Waves, Ocean - Pressure 3. Waves, Ocean - Velocity 4. Piles - Effect of wave action 5. Flow, Fluid - Mathematical analysis 6. Structures, Marine - Shock resistance 7. ENG BEB TM 71.

Some results of the Florida current study; preliminary report on the Grand Cayman cruise, 15 Nov 1953 to 15 May 1954, by Ilmo Nela, Frank Chew and Lansing P. Wagner. Miami. University. Marine Laboratory, Coral Gables, Fla. Jul 1954. 41p charts, diags, tables (1 fold). Order from LC. Mi \$2.75, ph \$6.50. PB 117623

Technical report 54-16 under Contract Nonr-840(01).

1. Physallia (Ship) 2. Grand Cayman Cruise 3. Currents, Ocean - Velocity - Measurements - Florida 4. ML 7904.

Temperature measurements at Caplen Pier, by William H. Clayton. Texas. Agricultural and Mechanical College. Dept. of Oceanography, College Station, Texas. Aug 1954. 20p photos, diags, tables. Order from LC. Mi \$2.00, ph \$2.75. PB 117918

A measuring system employing copper-constantan thermocouples for multi-point temperature determination at Caplen Pier is described in detail. A quantitative review of the establishment of accuracy limits ( $\pm .05^{\circ}\text{F}$ ) of this system is also presented. Contract N7onr-48702, Project NR 083-036. A&M Project 24C, Reference 54-62T. Research conducted through the Texas A & M Research Foundation in cooperation with the Gulf Coast Division of the Sun Oil Company.

Thickness of sediments in the Atlantic Ocean, by John L. Stout. Texas. University. Defense Research Laboratory. Oct 1953. 37p 2 fold maps. Order from LC. Mi \$2.50, ph \$5.25. PB 117855

Contract NObsr-52267(847), NE 051247-6. Supplement: Turbulent flow and sediments.  
1. Sediment, Marine - Measuring equipment 2. Sediment, Marine - Analysis 3. Sediment, Marine - Stratification 4. Sedimentation apparatus 5. Oceanography - Research 6. Acoustic measurements - Atlantic Ocean 7. TU DRL A - 76.

## MISCELLANEOUS

Bomb damage analysis. Final report, vol. 1, Phase 1-A: Bibliography, edited by Glenn J. Christensen and Harold S. Walker. Lehigh University. Institute of Research, Bethlehem, Pa. Jun 1949. 595p. Order from LC. Mi \$9.25, ph \$75.00. PB 117955

Contract W-36-034-ORD-7640.  
1. Damage, Bomb - Bibliography.

Handbook of Devils Lake environment, by Fernand de Percin and Edgar Bingham. U. S. Army. Quartermaster Research and Development Command. Environmental Protection Division, Quartermaster Research and Development Center, Natick, Mass. Apr 1955. 58p maps, photos, graphs, tables. Order from LC. Mi \$3.00, ph \$7.75. PB 117803

Project reference 7-83-03-0088.

1. Devils Lake, N. D., - Climate 2. U. S. Army - Supplies 3. QMC EP TR-8.

Proceedings of a Conference on Orientation in Animals, Feb 6 and 7, 1953, Washington, D. C. U. S. Office of Naval Research. 1953. 314p diagr, graph. Order from LC. Mi \$9.25, ph \$40.25. PB 117837

Contents: Section I. Basic mechanisms in animal orientation considered with reference to invertebrate animals: - (A) Fundamental processes in the orientation of invertebrate animals, by G. S. Fraenckel. - (B) Invertebrate orientation with respect to chemoreceptive situations, by Vincent Dethier. - (C) Orientation of arthropods in relation to environmental humidity, by Louis M. Roth. - (D) Problems and results in the study of ant orientation. Section II. Problems in the orientation of aquatic animals. - (A) Analysis of factors initiating parent-stream behavior in salmon, by Arthur D. Hasler. - (B) Physiological control and general timing of fish

migration, by W. S. Hoar. - (C) Orientation in aquatic invertebrates, by Frank A. Brown, Jr. - (D) Orientation in schooling fishes, by James W. Atz. - Section III. Problems in the orientation of flying vertebrates. - (A) Problems concerning acoustic orientation in bats, by Donald Griffin. (B) Problems of orientation in nocturnal bird migration, by George H. Lowery, Jr. - (C) Orientation processes in bird homing, with special reference to homing pigeons, by H. B. Hitchcock. - (D) Sensory-motor and neurophysiological mechanisms in bird migration, by R. Galambos. - Section IV. Problems in the orientation of terrestrial vertebrates. - (A) Ecological bases of orientation, by David E. Davis. - (B) Psychological problems in the orientation of mammals, by T. C. Schneirla. - (C) Space orientation in man, by H. A. Witkin. - (D) Consequences of elimination of stable anchorages in individual and group situations, by Muzafer Sherif. Section V. Summary, appraisal, and discussion.

Subject classification of technical reports. Supplement. U. S. Bureau of Aeronautics. Technical Data Division. Engineering Information Branch. Bibliographic Research Section. Feb 1955. 543p photos, drawings, diagrs, graphs, tables. Order from OTS. \$10.00. PB 111695

Supplement to PB 116157.

1. Subject headings - Aeronautics 2. Reports, Technical - Classification 3. NAVAER TD-4 Supplement.

## ATOMIC ENERGY REPORTS OF INTEREST TO INDUSTRY

The following Atomic Energy reports are listed here because of their interest and usefulness to general industry.

Reports may be purchased in accordance with instructions on the inside front cover of the U. S. GOVERNMENT RESEARCH REPORTS. As PB numbers are not indicated, order by series and number. These reports may also be consulted at any AEC Depository Library. A list of these libraries may be obtained from the U. S. Department of Commerce, Office of Technical Services, Washington 25, D. C.

Reproduction in whole or part of any report listed herein is encouraged by the U. S. Atomic Energy Commission, subject to the approval of authors or originating sites. General inquiries from the industrial press about AEC-developed information should be directed to the Industrial Information Branch, Atomic Energy Commission, Washington 25, D. C.

### Biology and Medicine

Liquid-vapor power cycle, by A. S. Thompson. North American Aviation, Inc., Downey, Calif. n.d. 21p. Order from OTS. 15 cents. AECU-135

Relation between specific ionization of various radiations and their relative biological effectiveness in mammalian systems, by John Furchner. Los Alamos Scientific Laboratory, Univ. of Calif., Los Alamos, N. M. Sep 1954. Contract No. W-7405-eng-36. 101p. Order from OTS. 50 cents. LA-1849

### Chemistry and Chemical Engineering

The behavior of organic compounds at dropping mercury electrode in non-associated anhydrous sol-

vents. Final report, by Stahley Wawzonek, E. W. Blaha, R. Berkey, and D. Thomson. Iowa State Univ., Iowa City, Iowa. Jul 1954. Contract No. AT-11-1-72. 64p. Order from OTS. 35 cents. AECU-2927

The fixation of nitrogen: The power factor. Progress report on research project. Institute for the Study of Rate Processes. Univ. of Utah, Salt Lake City, Utah. Mar 1955. Contract AT(11-1)-82. 15p. Order from LC. Mi \$2.00, ph \$2.75. AECU-3052

Diffusion of carbon atoms in natural graphite crystals, by Manuel A. Kanter. Argonne National Lab. May 1955. Contract W-31-109-eng-38. 43p. Order from LC. Mi \$2.75, ph \$6.50. ANL-5433



- The behavior of uranium, thorium, and other selected materials in bromine trifluoride, bromine pentafluoride, chlorine trifluoride, and fluorine at elevated temperatures, by Lawrence Stein and Richard Vogel. Argonne National Laboratory. May 1955. Contract W-31-109-eng-38. 20p. Order from LC. Mi \$2.00, ph \$2.75. ANL-5441
- Chlorine-36 in nature, by Raymond Davis, Jr. and Oliver A. Schaeffer. Brookhaven National Lab. Jun 1955. 16p. Order from LC. Mi \$2.00, ph \$2.75. BNL-340 (T-59)
- Uranium determination by the isotope dilution technique, by W. E. Duffy and F. H. Tingey. Phillips Petroleum Co., Idaho Operations Office. Jun 1955. Contract No. AT(10-1)-205. 20p. Order from LC. Mi \$2.00, ph \$2.75. IDO-14301
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