the committee. The American Institute of Physics is represented on the committee by J. W. Buchta of the National Science Foundation.

The Southeastern Section of the American Physical Society, at its Twentieth Meeting, held at the University of Tennessee in Knoxville April 1–3, elected the following officers for 1954–55: Chairman, W. M. Nielsen, Duke; Vice-chairman, M. S. McCay, Chattanooga; Secretary, Dixon Callihan, ORNL; Treasurer, Robert Lagemann, Vanderbilt; and Member, Executive Committee, R. C. Williamson, Florida.

Publications

The Directory of Commercial and College Laboratories, hitherto compiled and published by the National Bureau of Standards of the U. S. Department of Commerce, will be published in the future by the American Society for Testing Materials, according to a recent agreement between the two organizations. First published in 1927, the Directory has been periodically revised. It provides interested persons with information concerning the location of testing laboratories together with the types of commodities and the nature of the investigations the laboratories are prepared to undertake. Until the revised ASTM Directory is completed, the present Directory, NBS Miscellaneous Publication M187, published in 1947, will continue to be available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Investigation of Electron Tube Reliability in Military Applications is the title of a 97-page report published by Aeronautical Radio, Inc., 1520 New Hampshire Ave., N.W., Washington 6, D. C., and available for $.50 from L. E. Davis of that organization. The subject of this study, which was sponsored by the Bureau of Ships, is of considerable importance, since it is estimated that from one-half to two-thirds of military equipment failures are due to faulty tubes. According to the report "an over-all 3-to-1 improvement in tube reliability could eventually cut maintenance costs by not less than a half-billion dollars a year, even if the improved tubes cost five times as much as the original types". Aeronautical Radio's investigation involved collecting defective tubes and controlled testing of several of the least reliable tube types. An evaluation of tube weaknesses and a discussion of factors contributing to the unreliability is incorporated in the report.

The Optical Industry Directory has as its purpose "to supply information concerning the sources of the materials, tools, components, finished instruments, design facilities, and services available to those interested in the Optical Industry and its products." The result is a compilation of American optical manufacturers, distributors, and designers, foreign optical manufacturers, optical industry personnel, and a classified products listing. The Directory is published by the Optical Publishing Company, Huntington, Long Island, New York, and sells for $5.00.

Summer Programs

Mechanical Properties of Metals is to be the topic of this summer's conference on the chemistry and physics of metals, held August 16–20 at New Hampton School in New Hampshire as part of the Gordon Research Conferences, AAAS. Purpose of the conferences is to stimulate research "by fostering a free and informal exchange of ideas between persons actively interested in the subjects under discussion". Further information can be obtained from W. George Parks, Colby Junior College, New London, New Hampshire.

Laboratory courses at Brooklyn Polytechnic this summer will cover: Progress in Polymerization and Copolymerization Techniques (June 28–July 2); Properties of Macromolecules in Solution, Including Polyelectrolytes and Other Water Soluble Polymers (July 12–July 16); and Industrial Applications of X-Ray Diffraction (August 23–September 3). The courses are intended "as an experimental program for teaching modern laboratory techniques to meet the growing demand by scientists, particularly industrial scientists, for advanced instruction in the use of specialized physical tools in chemistry and physics". Inquiries should be addressed to Mrs. Doris Cattell, Secretary, Summer Laboratory Courses, Polytechnic Institute of Brooklyn, 99 Livingston Street, Brooklyn 1, New York.

Grants for Research

Thirty-six unclassified physical research contracts have been awarded recently by the Atomic Energy Commission, of which six are new contracts and the rest renewals. The new contracts are with the University of Buffalo, applications of isotopes in chemical kinetics (G. M. Harris); Columbia University, helium in the atmosphere and lithosphere (J. L. Kulp); Bartol Research Foundation, neutron scattering measurements (C. E. Mandeville); Providence College, the nature of gaseous negative ions formed by electron impact (M. A. Fineman); Rutgers University, anionic complexes and polymers of oxy-acids of some of the transition elements (E. R. Allen); and University of Texas, effects of biological slimes on sea water (E. W. Steel).

A total of $30 000 in grants for the support of fundamental research in West Germany has been awarded by the Research Corporation as the start of a five-to-ten-year program of that magnitude. The financing of the program is to come from royalties collected in Germany on American patents on the manufacture of vitamin B_1 that were assigned to the Research Corporation by the developers of the process. Physics, chemistry, and biochemistry are the principal fields involved in the present eleven grants. Among the latter are: research concerning deviations from the thermic balance in the outer layer of the sun, P. ten Bruggencate; research concerning the velocity and mechanism of high-speed ionic reactions, M. Eigen; and luminous phenomena in active nitrogen, U. Stille.

Kodak reports to laboratories on:

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Microprint reader

Now on sale is the *Kodagraph Microprint Reader*, a sleek and unobtrusive instrument intended to create enthusiasm for the microprint idea among those who have had doubts about the comfort of reading microprint day in and day out. This one takes any size of microprint card from 8½" x 14" down and thus involves no commitment to any one size. Anyone interested enough to drop a post card to Eastman Kodak Company, Industrial Photographic Division, Rochester 4, N. Y., will be directed to the nearest dealer who can demonstrate why this reader is worth $300.

Beyond pH

The lady is Dr. Marion Maclean Davis of the Physical Chemistry Section, National Bureau of Standards. Many a practical chemist who got his academic training a couple of decades ago might do well to acquaint himself with what she has been up to since he left the halls of ivy. The result could be a more sophisticated approach to the subject of acids and bases.

Doctor Davis' big contribution has been to chart the shoals in applying water-based concepts of "pH" to the non-aqueous organic liquids that have proliferated in lubricants, transformer oils, motor fuels, dry-cleaning solvents, automotive antifreezes, refrigerants, plastic molding preparations, and other products. For a thorough introduction to Davis, send 20¢ to the Superintendent of Documents, Washington 25, D. C., and ask for Research Paper RP1825. There is much theory in it and much practical working procedure featuring an acidic indicator for use in hydrocarbons—*Tetrabromophenolphthalein Ethyl Ester.*

Unlike familiar indicators, this one does more than simply indicate the passing of a certain pH range by a change in color. It can assume virtually any hue on the color map. Thanks to Doctor Davis and her colleagues, these hues convey considerably more chemical information than just the degree of basicity or acidity.

In the paper mentioned will be found directions for the preparation of Tetrabromophenolphthalein Ethyl Ester. *These you can now conveniently skip. The least we can do to honor Doctor Davis' work is to take the compound out of the "not available commercially" class in which she found it. Eastman 6810 is the number, and $2.50 is the price per gram from Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company).*

Catalog

There is a tradition in our sales department to encourage correspondence on business that looks like small potatoes to the average cost accountant. Unaware of the historical relationship between us and the scientific user of photographic materials, he might well question the exchange of two or three long letters leading up to a recommendation that an order be placed with a dealer for one dozen 1" x 3" *Kodak Autoradiographic Plates, Type No-Screen,* retailing at $2.15.

Noble as this outlook may be, we are now making an attempt to save time and stationery for the scientist and ourselves through the medium of a booklet that summarizes the facts about the various materials, familiar and obscure, which we offer for scientific photography. If it does nothing else, it should at least suggest useful questions to ask.

Covered are our offerings in the following categories: 1) for general photography and photomicrography, 2) for the specialized recording of radiation, 3) for general spectrochemistry, 4) for the deep ultraviolet, 5) for the infrared, 6) for autoradiography and nuclear particle tracks, 7) for electron imagery, 8) for the finest image detail, 9) for modifying spectral distribution, 10) for attenuating light, 11) for other photographic techniques.

"Kodak Photographic Materials and Light Filters for the Laboratory" is the title, and Eastman Kodak Company, Industrial Photographic Division, Rochester 4, N. Y., are the people who hope to lighten their correspondence load by sending a copy of it to you free.

Advice on diffraction

The atomic number of chromium is 24, of copper 29, of molybdenum 42. *K*-emission from targets of one or another of these elements is commonly used for x-ray diffraction work. The higher the atomic number, the shorter the wavelength of the *K*-radiation. It takes more photographic silver to stop—and therefore respond to—short-wavelength photons than those of longer wavelength. Thus it comes about that for chromium *K*-radiation, as example, there is considerably less difference between the speeds of our slowest and fastest x-ray films than there is for the *K*-radiation from molybdenum.

Kodak Industrial X-ray Film, Type K is our fastest for x-ray diffraction. Like most x-ray films, it has emulsion on both sides. There is also *Kodak Single-Coated X-ray Film.* It has a little more than half the speed of *Type K* for chromium *K*-radiation but less than a quarter of *Type K* speed for molybdenum *K*-radiation. (The profusion of *K's* here is purely coincidental; we can clear up the confusion, if any, by sending you our free chart "Kodak Films for X-ray Diffraction.") There may be instances where an x-ray diffractionist needs this higher speed for the shorter-wavelength radiation but is inconvenienced by the parallax associated with the presence of two images on opposite sides of the base.

Though we doubt this combination of circumstances comes up frequently, we can perform a slight but perhaps useful service by showing a couple of easy ways to remove one of the images. Economically this has advantages over the tricky and expensive business of launching a special, extra-silver-rich, single-coated film. Researchers with modest budgets who regard film as the least expensive and most versatile x-ray receptor for diffraction patterns will agree, we hope.

Write Eastman Kodak Company, X-ray Division, Rochester 4, N. Y., for a reprint on removing the second image, for a copy of the x-ray diffraction film selection chart, or for the address of the nearest Kodak X-ray Dealer. It is he who can sell you 25 feet of 35mm Kodak Industrial X-ray Film, Type K *for $2.61 or 100 sheets of 4" x 5"* Kodak Single-Coated X-ray Film *for $7.43.*

Prices quoted are subject to change without notice.

This is one of a series of reports on the many products and services with which the Eastman Kodak Company and its divisions are . . . *serving laboratories everywhere*

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TRADE-MARK

The National Science Foundation on April 30th announced the award of 159 grants totaling about $1.36 million for basic research in the natural sciences and to support studies and conferences on science, scientific information exchange, compilation of scientific personnel information, education in the sciences, and travel of American scientists to international scientific meetings. This group of awards, the third to be announced during fiscal year 1954, brings the total since 1951 to more than 800 awards worth more than $7 million. Approximately 18% of the funds made available in the current group of awards are for work in physics. Grants in support of basic research in physics have been made to the following institutions (the names of the "principal scientists" are given in the parentheses): University of Alabama, cloud chamber search for free magnetic poles (Arthur E. Ruark); Antioch College, glow discharge oscillations (Albert B. Stewart and Gwilym E. Owen); Brigham Young University, definitive physical characteristics of tones (Harvey Fletcher); Bryn Mawr College, direction correlations and forbidden beta-spectra (John R. Pruett); University of Chicago, mass spectrometric investigations (Mark G. Inghram); University of Colorado, polarization measurements of the zodiacal light during total solar eclipse of June '54 (William A. Rense); Columbia University, theory of nuclear quadrupole effects (Henry M. Foley); Cornell University, thermal conductivity and crystal imperfections (R. L. Sproull); Johns Hopkins University, intermediate state of superconductivity (Hans Meissner); Louisiana State University, theory of photonuclear reactions (J. S. Levinger); University of Maryland, origin of ultra-high-energy cosmic rays (S. Fred Singer); University of Michigan, use of bubble chambers in the study of high-energy nuclear interactions (Donald A. Glaser); University of Minnesota, atomic mass determinations (Alfred O. C. Nier); University of North Carolina, the intensities of infrared absorption bands (J. W. Straley); Northwestern University, Hall effect in single crystals at low temperatures (Jules A. Marcus); Ohio State University, nuclear orientation at low temperatures (J. G. Daunt and P. S. Jastram); Reed College, conduction and trapping in ionic crystals (Frederick C. Brown); Wisconsin Alumni Research Foundation, high-energy accelerator problems (D. W. Kerst); Yale University, definition and law in the physical sciences (Henry Margenau).

In addition, the Foundation has provided funds for the support of a number of conferences, including those to be held at the following institutions: University of California at Los Angeles (The Significance and Possibilities of High-Speed Computing in Meteorology), Indiana University (Stellar Atmospheres), University of Michigan (Multidimensional Analysis), Swarthmore College (Astronomy Research in Colleges), University of California (Summer Conference for Teachers of Astronomy), Columbia University (Nuclear Physics in Engineering Education), University of Illinois (Solid State Physics in Engineering Education). Grants have also been made to meet travel expenses of selected groups of scientists planning to attend the Third General Assembly and Congress of the International Union of Crystallography, the World Power Conference in Rio de Janeiro, and the Eighth General Assembly of the International Union of Pure and Applied Physics, and other international meetings to be held this summer.

A forty-eight percent increase in expenditures for fundamental research and fellowship programs for 1954–55 has been announced by the Shell Fellowship Committee, 50 West 50th Street, New York 20, N. Y., on behalf of Shell Chemical Corporation, Shell Development Company, Shell Oil Company, and Shell Pipe Line Corporation. The increase will raise expenditures next year to $263 500 from the current year's $177 500. Grants for fundamental research are made to university departments to aid them in expanding research in their particular fields. A new feature was incorporated in the research grants for 1954–55, in recognition of the considerable contributions allied schools and departments make to the over-all accomplishments of a university's scientific departments. Each $5000 grant designated for a specific science department will be supplemented by an unrestricted grant of $2500 to be used by the schools as they see fit. Schools receiving research grants are: California Institute of Technology, Carnegie Tech, Cornell, University of Chicago, Harvard, Massachusetts Institute of Technology, Northwestern, Notre Dame, Princeton, Rice Institute, University of Rochester, St. Louis University, Stanford, and Yale. The grants and fellowships are in several fields of science, including physics.

Wendell F. Hess, director of research at Rensselaer Polytechnic Institute, Troy, New York, since 1952, died of a heart attack April 21. He was fifty-one years old. Dr. Hess had conducted research and had taught at Rensselaer since his graduation from the Institute in 1925, becoming head of the metallurgical engineering department in 1947.

Ellis L. Manning, chief of the external research section of the chemical physics branch at the Squier Signal Laboratory, died on March 27 at the age of fifty-three. Mr. Manning received his Master's degree from St. Lawrence University in 1925, remaining there, as instructor and assistant professor of physics, until 1927. He later served as physicist and assistant to the executive engineer at the General Electric Company's research laboratory. Previous to his association with the Signal Corps Engineering Laboratories, he was supervisor of science for the New York State Education Department (1938–46) and head of the physics section at the U. S. Merchant Marine Academy (1946–48). Mr. Manning was the author of the book *Excursions in Science*. He was a member of the American Physical Society, the American Institute of Electrical Engineers, and the American Chemical Society.