

sion of a sharp boundary. Electrons interact with the entire nuclear volume."

In a companion paper L. I. Schiff, also of Stanford, discusses in somewhat greater detail the theoretical interpretation of the electron scattering experiments, with substantially the same conclusions. The explanation for nuclear charge distributions that appear to taper off smoothly from a central peak remains to be found, but certainly some changes from current ideas on the structure of the nucleus can be anticipated.

It might be mentioned that recent work performed at Columbia by Fitch and Rainwater on the proton density distributions inside nuclei, described in the November 1, 1953, *Physical Review*, are in general agreement with these results.

Scientific Manpower

First Year of the SMC

The Scientific Manpower Commission held its first annual meeting in late November 1953. The Commission, it will be recalled, was established by a number of groups of scientific societies, including the AIP, to unite the forces of science in attacking numerous problems under the heading of Manpower. These include the betterment of science teaching in high schools, the dissemination of vocational information, fact-finding on supply and demand, pertinent representations to the public and the government on UMT, Selective Service, the Armed Forces Reserves and, indeed, anything national in scope which may help assure to the nation adequate resources of scientific personnel. It was agreed that nothing less than a major effort, in which all fields of science would unite and then join with the engineers, could hope to make real progress in rectifying the present unsatisfactory manpower situation.

A new President was elected, namely, M. T. Carpenter, Administrative Director, Standard Oil Company of Indiana. A member of the Commission upon nomination by the American Chemical Society, Dr. Carpenter succeeded Howard A. Meyerhoff, the Commission's first President. Dr. Meyerhoff, a member of the Commission upon nomination of the American Geological Institute, will continue to direct SMC activities under the title of Executive Director. As Vice-President, John S. Nicholas of Yale, nominated by the American Institute of Biological Sciences, will succeed E. G. Begle of Yale, nominated by the Policy Committee for Mathematics. The new Secretary-Treasurer is Dael Wolfe of the NRC Commission on Human Resources and Advanced Training, a member upon nomination by the American Psychological Association. He succeeds Milton O. Lee of the Federation of American Societies of Experimental Biology.

There are now 16 members of the Commission, two each from the American Association for the Advancement of Science, American Chemical Society, American Geological Institute, American Institute of Biological Sciences, American Institute of Physics, American Psychological Association, Federation of American Socie-

ties for Experimental Biology, and Policy Committee for Mathematics. Those nominated by the AIP are George R. Harrison, who was re-elected at the meeting for a term to December 31, 1956, and Henry A. Barton, whose present term continues to December 31, 1955. Among other members are Detlev W. Bronk, director of the Rockefeller Institute for Medical Research and President of the National Academy of Sciences, Wallace R. Brode, Associate Director of the National Bureau of Standards and Editor of the *Journal of the Optical Society of America*, Leonard Carmichael, Secretary of the Smithsonian Institution, and other scientists well known to many physicists.

At the Annual Meeting, the Commission voted to enter an arrangement for close cooperation with the Engineering Manpower Commission established several years ago by the Engineers Joint Council, acting for its various member societies. There will be close cooperation in informing the public, school authorities, students, government officials, and others about the manpower situation in science and technology. Fund raising to meet the expenses of such work will also be coordinated by the two organizations.

A basis has already been laid for cooperation with manpower divisions in the Office of Defense Mobilization and the Department of Defense. Contacts with the Selective Service System and the Office of Education have been made. Special research facilities have been made available by the Library of Congress. The Commission is in close touch with the National Science Foundation. M. H. Trytten, Director of the Office of Scientific Personnel of the National Research Council, which has pioneered much of the current effort of scientists to emphasize the importance of professional manpower problems, is in constant consultation.

Among the first specific activities carried on with the initially restricted budget, the following may be mentioned: A survey has been made of vocational guidance literature with an eye to giving students more adequate information for their choice of a career. Cooperation is being extended in this respect to the National Science Teachers Association. An SMC Special Panel on Scientific Personnel has been called into conference and has accepted an assignment to estimate the immediate and future demand for scientists, first in industry and then, as the study progresses, in education and government. Some information has been gathered by the National Science Foundation on government appropriations for research and this is helpful in estimating demand. Conferences have been held with key government officials to urge that deferments for graduate students in science be liberalized and that the call-up of reserve personnel be regulated by a competent board not in the Department of Defense. The Commission has also collaborated with the National Science Foundation and the National Research Council in arranging symposia on manpower problems at the Boston meeting of the AAAS.

The above incomplete list illustrates moves under way to develop the true manpower story of science and then

Kodak reports to laboratories on:

how 3 x 5-inch file cards turn into a library... a useful new photosensitive liquid... how to find out more about cellulose acetate sheeting

Microprint

It's the brutal truth that a man or woman is covering a narrow field indeed if he or she can honestly claim to be abreast of all that's set down on paper about it. A remedy—microprint cards—has been proposed by which a library card catalog can replace the library itself. Almost a decade of development has demonstrated its merit. Since it is based on photography, the time has come to state our position on it:

Before 1954 ends, you will be able to walk into dealers' establishments throughout the United States and be shown the *Kodagraph Microprint Reader*. This is an instrument, weighing less than a standard typewriter, for reading microprint cards with complete comfort. Microprint cards, usually the standard 3" x 5", look like the familiar library catalog card, carrying classification data, perhaps a brief abstract, etc., but, instead of having then to locate the item cataloged if it seems pertinent, it's right there on the back of the card in microprint—as many as 60 pages of the actual text.



"Complete comfort" is very important. Without it there would be no spreading of microprint readers from large libraries to smaller ones and on down to the individual user's office, desk, and even home. With large numbers of users to share the cost, microprint card literature will become vastly more extensive and intensive than it has already grown. Economic barriers to the development of automatic subject-searching equipment will fall. New microprint publishing ventures will flourish—some for profit, some for the promotion of scholarship in fields too sparsely inhabited to support the cost of conventional publication. More industrial organizations will establish microprint systems for the

debulking, speedy dissemination, and storage of private internal data as well as current publication in fields of special interest to the organization.

Our part is to work closely with everybody, supplying technical hints, *Kodagraph Micro-File Film*, *Kodagraph Microprint Paper*, and equipment to turn out microprint cards by the piece or by the peck.

If the possibilities of microprint interest you, we'd appreciate your dropping a note to Eastman Kodak Company, Industrial Photographic Division, Rochester 4, N. Y., to let us know the nature of that interest.

Photo resist



That's a circuit for an item of electronic gadgetry you see here, printed on a bit of limp glass-fiber cloth. It was made by 1) laminating a sheet of copper foil over the cloth, 2) coating a light-sensitive acid resist over the foil, 3) exposing to light through a photographic negative of a drawing of the circuit, 4) washing away the resist where the opaque areas of the negative prevented it from hardening, and 5) etching away the foil where the remaining resist did not protect it.

Printed circuits *per se* are no longer newsworthy. The kind of printed circuit news that is interesting today is of ways to turn them out more efficiently. If, for example, the light-sensitive material could be deposited on the foil-laminated support months in advance instead of just before exposure, the whole process would be considerably streamlined. If the exposure time required could be drastically reduced, that too would help. If atmospheric changes did not affect that exposure time, there would be less spoiled work.

It so happens that we have just placed on the market a material called *Kodak Photo Resist* which

fulfills these conditions. It can be conveniently and quickly processed in a tray. It can also be processed in an ordinary vapor degreaser, with the usual trichloroethylene solvent. It can be dyed. It resists all commonly used acids and alkalis. It resists cyanide plating baths. It requires no "burn in" to adhere to metal. It contains no chromium salts, which are known sometimes to irritate the skin. It is not based on bichromated gelatin, silver halides, or diazo dyes. As a matter of fact, it is based on a photosensitive substance never previously used.

Possibly a few miscellaneous souls other than the photoengravers, photolithographers, color-TV-tube makers, circuit printers, and nameplate makers we had in mind will be glad we took the trouble to work it out.

Kodak Photo Resist, Kodak Photo Resist Developer, and Kodak Photo Resist Dye, along with complete directions for use, are sold by a Kodak Graphic Arts dealer in your vicinity. For help in locating him, write Eastman Kodak Company, Graphic Arts Division, Rochester 4, N. Y.

Kodapak Sheet

Since plasticized cellulose ester sheeting finds use in many technologies even more complex than manufacturing the familiar orchid box,



we have just put out a newly revised pamphlet in which we tabulate a great many of the mechanical, optical, thermal, chemical, and electrical properties of the various forms of Kodapak Sheet. The gist of it is that Kodapak Sheet, which may be readily formed by means of heat and pressure, cemented, or high-frequency sealed, is quite a versatile material.

You can obtain a copy of "Properties of Kodapak Sheet" by writing Eastman Kodak Company, Cellulose Products Division, Rochester 4, N. Y.

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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put it across to the public and the Congress, using the press, radio, service clubs, and many other means to achieve its objectives. The Commission aims to promote a national understanding of the vital need for a sufficient, well-trained, national force of scientists and to inspire a national policy for recruiting and training well-qualified young people with a minimum of inefficiency and uncertainty arising from the needs of the armed forces.

Miscellany

The Award of Honor of the National Safety Council has been presented to the Atomic Energy Commission in recognition of the safety record achieved in the atomic energy program during 1952, when the frequency of occupational injuries per million man-hours worked in all categories of the program decreased 50 percent below the average for the previous three years, and the severity of injuries was reduced 33 percent. The injury rate in the atomic energy program has declined steadily since the end of 1949. Frequency of injuries from accidents in the program dropped from 5.40 per million man-hours in 1949 to 2.51 in 1952. The injury rate for American industry decreased from 10.14 to 8.40 per million man-hours during the same period.

Radioisotope shipments by international airlines have now been made possible as a result of regulations approved in November by the International Air Transport Association Traffic Conference. Under the new code, short-lived radioisotopes can be transported to regions they formerly could not reach. According to Conference Chairman Ray W. Ireland, the new regulations make the airlines the first medium of transportation to have uniform international rules for carrying cargoes that require special handling.

Atmospheric diffusion and penetration into buildings of allergenic pollens and industrial contaminants are being investigated by the University of Michigan's Engineering Research Institute under the sponsorship of the Geophysics Research Directorate of the Air Force Cambridge Research Center. The Department of Civil Engineering and School of Public Health are associated with the Institute in the research program.

A new approach to weather forecasting is about to be put into operation by the U. S. Weather Bureau with the aid of the Navy and Air Force. In brief, the method involves feeding analyzed meteorological data from the weather network into an electronic computer which, on the basis of a mathematical model of the atmosphere, then gives a numerical pressure-field forecast for the next 24 to 36 hours. The project was started in 1946 when John von Neumann and Jules Charney of the Institute for Advanced Study at Princeton were given the problem of developing a feasible forecasting technique.

The limiting magnitude of the 200-inch Hale telescope on Mt. Palomar has been determined to be 23, which means that the minimum brightness of faint ob-

jects capable of being photographed is about 6.3 million times dimmer than the dimmest stars visible to the naked eye. This first definite calibration of the telescope's limiting magnitude, which has been made by William A. Baum of the Mt. Wilson and Palomar Observatories, is somewhat better than the previously estimated figure, and according to Ira S. Bowen, director of the Observatories, "is equal to the most optimistic estimate of hoped-for performance made during the planning of the telescope".

Visual observation of any aurora that may occur during next June's solar eclipse was suggested in 1952 by British geophysicist Sydney Chapman as a possible means of increasing our store of knowledge about this puzzling and spectacular phenomenon. Although there are rare cases of visual observation of daytime auroral displays on record they ordinarily cannot be seen even if present because of the sky brightness. To make their observation more complicated, aurorae are concentrated in a narrow zone in the far northern and southern latitudes. However, the region in which the 1954 eclipse appears total crosses the auroral zone in the vicinity of southern Greenland, with about two minutes of totality available for auroral measurements should any displays occur during the brief period of darkness. In an article in the December issue of *Sky and Telescope*, Chapman and D. W. N. Stibbs consider in detail the possibility of detecting such an aurora, and the value of whatever information could be obtained. In fact, merely establishing the presence of a daytime aurora is of interest.

INSDOC, otherwise the Indian National Scientific Documentation Center, was established in 1951 under an agreement with UNESCO whereby the latter would provide technical assistance for a period of three years. A report by INSDOC covering 1952-1953 describes its current activities, which concern information (mainly bibliographical), document procurement, and scientific translations. The document procurement service involves finding and obtaining copies of scientific or technical articles required by workers in India, with microfilm or photostat copies being supplied in most cases. The translation work turned out to be so great that 23 part-time translators had to be engaged to supplement the permanent INSDOC staff, with over a thousand pages of translations having been prepared so far.

In commemoration of the 80th birthday of William W. Coblentz the November 1953 issue of the *Journal of the Optical Society of America* has been devoted to the applications of infrared to science and technology. Dr. Coblentz, together with Drs. A. H. Pfund and H. M. Randall, did most of the early work in this field, and he has published over 400 papers on the infrared and on other problems in radiometry. The 38 articles in the *Journal* deal mainly with infrared spectrometry and its applications in the study of molecular structure, the composition of the atmosphere, the solar spectrum, certain biological problems, and similar topics.