News and Notes

Report of the Committee on Battery Additives

THE Committee on Battery Additives of the National Academy of Sciences reported on Oct. 30 to Secretary of Commerce Sinclair Weeks that in its opinion there is no merit in the battery additive AD-X2 and that no further tests of it are necessary. The Committee completely upheld the competency of the tests conducted by the staff of the National Bureau of Standards, and states further that the quality of work of the Bureau in this field is better now than at any past time. The following scientists composed the ad hoc committee:

Zay Jeffries, Chairman, Vice President (retired), General Electric Company, Chemical Division;

Elmer K. Bolton, Director of Chemical Department (retired), E. I. du Pont de Nemours and Company;

William G. Cochran, Professor of Biostatistics, Johns Hopkins University;

J. P. Fugassi, Professor of Physical Chemistry, Carnegie Institute of Technology;

John G. Kirkwood, Professor of Chemistry, Yale University;

Victor K. LaMer, Professor of Chemistry, Columbia University;

Lewis G. Longsworth, Member, Rockefeller Institute for Medical Research;

Joseph E. Mayer, Professor of Physical Chemistry, University of Chicago;

Fred E. Terman, Dean, School of Engineering, Stanford University;

Samuel S. Wilks, Professor of Mathematical Statistics, Princeton University.

A summary of the most significant portion of the report follows:

Summary of finding on AD-X2. We find no data obtained from any well-designed scientific experiment which is inconsistent with the hypothesis that AD-X2 behaves like a corresponding mixture of sodium and magnesium sulfates, and is substantially neutral in its effect upon a lead acid storage battery. These experiments included a total of over 400 cells, a substantial number of which were selected or approved for tests by Pioneers. Limited information on field performance was provided by an additional 300 cells.

Conclusion on AD-X2. We conclude that the relevant data now available to us regarding the effects of AD-X2 are adequate to support the position of the National Bureau of Standards that the material is without merit.

Recommendation regarding further tests. We were impressed with the fact that although this additive has been available for six years, no tests have come to our attention which have, under proper controlled conditions, shown advantages for AD-X2. The four main tests on which we felt we must rely for relevant evidence were all conducted either for Mr. Ritchie or in accordance with procedures which he thought should show the merits of AD-X2.

We recommend that no additional tests on the merit of AD-X2 be undertaken by this Committee or under its supervision. We could not propose new tests which would do more than reinforce the very considerable reliability of the conclusion we have drawn from the information now available, and to make a substantial improvement even in this regard would require elaborate tests involving hundreds of cells and extending over a period of years.

Finding on the competency of the National Bureau of Standards. To assist in appraising the quality of the work of the Bureau of Standards in the field of lead acid storage battery testing, we obtained brief biographies of scientists and engineers in the Electrochemical Section and in the Statistical Engineering Laboratory. We also obtained biographies of some scientists and engineers in other sections of the Bureau because they have been called upon for assistance in battery testing. We explored the past work of the Bureau in the battery field and noted that many important contributions had been made over the years. We made a study of the Bureau's work in testing battery additives. We were apprised of the cooperative activities of the Bureau with other laboratories, both in the United States and in other countries. We visited the laboratories of the Electrochemical Section and found them well equipped. We noted the efficient manner in which the Statistical Engineering Laboratory cooperates with the Electrochemical Section, both in the design and in the interpretation of experiments. We have made a special study of the Bureau's work in connection with tests and researches on sodium and magnesium sulfates and on AD-X2.

These studies indicated to us that the Bureau staff was very competent but we examined carefully the suggestions of others that the Bureau was incompetent. These suggestions are mainly covered by seven "complaints" and the interpretation that the M.I.T. tests disprove the conclusions of the Bureau on AD-X2. We wish briefly to discuss these.

A. *Complaints.*

Complaint 1. The Bureau's tests prior to January 1952 were insufficient to support the conclusions regarding the merits of AD-X2.

Answer. We cannot say exactly how much testing is sufficient. The tests do appear to be meager. Dr. Randall's statements, however, regarding the composition of AD-X2 and the Bureau's long experience with sodium and magnesium sulfates would not have led it to expect AD-X2 to be an exception. Also, if the Bureau was looking for effects of great magnitude, extensive tests would not be required. As evidence has accumulated, the conclusions of the Bureau's earlier tests have been substantiated. In view of the skill and long experience of the Bureau organization, definitive results should be produced with a minimum of testing.

Complaint 2. The Bureau discriminated against AD-X2 by distributing or making possible the distribution of Circular 504.

Answer. If AD-X2 was no different from comparable mixtures of sodium and magnesium sulfates, there was no reason why it should have been excepted.

Complaint 3. In reporting the results of the Ordnance Corps field tests on Page 28 of Circular 504, the Bureau was not justified in considering the untreated new batteries as controls for the 100 old batteries.

Answer. The complaint is valid.

Complaint 4. The batteries used in the Bureau tests described in Circular 504 were in a mechanically unsound condition because of a very high degree of overcharging and, therefore, do not represent a fair test under the conditions prescribed in Pioneers' claim for AD-X2.

Answer. We have been informed that the charging was stopped as soon as the rate of gassing showed a rapid increase and, therefore, it appears that the batteries were not overcharged. When the Bureau gave treated and untreated batteries the enormous overcharge prescribed in the Randall Bench Test, no effect was observed which would support the contention that an overcharge would have invalidated the tests reported in Circular 504.

Complaint 5. The merits of AD-X2 cannot be shown in laboratory tests.

Answer. We believe that if the benefits were as claimed, laboratory tests would reveal them.

Complaint 6. The June tests were not conducted exactly in accordance with the wishes of the manufacturer and, therefore, are without value.

Answer. The criticisms of the tests do not relate to major items. It is our opinion that the changes made improved the design of the tests.

Complaint 7. Certain of the personnel of the National Bureau of Standards were not objective and approached the AD-X2 tests with biased minds.

Answer. We found no evidence of this but ample evidence of healthy objectivity. In so far as the contact between the Bureau personnel and "outsiders" in the field of lead acid batteries is concerned, we found the relationships to be essentially those which could be expected among people having confidence in one another, with the common objective of arriving more nearly at the truth.

B. *The M.I.T. Report.*

It has been said that there is a controversy between the Bureau of Standards and the Massachusetts Institute of Technology. This impression arose, not because there is a controversy of any importance, but because of the interpretation put on the M.I.T. report by a consultant of the Small Business Committee of the United States Senate and the publicity relating to this interpretation. This interpretation was that the "results" in the M.I.T. report "give complete support to the claims of the manufacturer" (of AD-X2). We have dealt with this interpretation earlier but here we wish only to consider the M.I.T. report with reference to any bearing it may have on the competency of the Bureau.

If certain of the "results" (and more particularly [a]), in the M.I.T. report are correct, then there is an inconsistency not only between the M.I.T. report and the Bureau's reports, but also between the M.I.T. report on the one hand and, on the other, the Dean report, the Dirkse report and the U.S. Testing Company data.

We believe that we know the source of this inconsistency. The M.I.T. tests were not well designed for old batteries differing markedly in the characteristics of the cells. We believe it is possible to deduce from the data in the report that in the majority of the cell parings it happened that the better cells were treated with AD-X2 and that these same cells, which were initially in better condition, were the ones which showed up to better advantage in the tests. In certain of the cell selections where pre-tests were made, the treated and untreated cells had somewhat the same characteristics and the results showed no advantage for AD-X2. Had all the cell pairings been selected in this way, we believe the results of Dr. Weber's tests would have been consistent with those of the Bureau of Standards.

By far the most important result in the report is (a) which reads as follows:

> "(a) Among the cells in any chosen battery, all cells in such battery having been subjected to the same previous history, except for treatment with AD-X2, treated cells showed larger capacities than did untreated cells, both being subjected to the same conditions of discharge."

If our conclusion is correct that the cell pairings favored AD-X2, the validity of result (a) is in doubt. With reference to result (b) on sediment, in other tests no difference between treated and untreated cells was observed. There is no disagreement on result (c) regarding bubble size. Result (d) on plate appearance is not correlated with battery performance. Result (e) on loss of liquid would be influenced by cell selection. Result (f) on temperature change concerns differences of small magnitudes which do not uniformly favor the treated cells and which also may be influenced by the cell selection. Result (g) on hydrometer readings, besides not being correlated with battery performance, has not been observed by other testing groups. Result (h) is valid for very dilute electrolytes.

We are of the opinion, therefore, that the M.I.T. report casts no adverse reflections on the quality of the work of the Bureau of Standards on AD-X2.

Conclusions regarding the work of the National Bureau of Standards. We conclude from our studies and investigation that the quality of the work of the National Bureau of Standards in the field of lead acid storage battery testing is excellent. This statement is made without reservations.

Our opinion is that the quality of the work of the Bureau is better now than at any time in the past. This is partly because of the closer cooperation of the Bureau's Statistical Engineering Laboratory with the Electrochemical Section in the design and in the interpretation of battery tests.

Editorial comment: In considering the conclusion of the famous battery affair, scientists should take account of a number of aspects. There is first the magnificent statement by Secretary Weeks "that [the above] scientific evaluation is an assurance to the public and a source of satisfaction to me and to the Bureau. I shall do all in my power to aid the Bureau in maintaining this high level of scientific service to the nation." Secretary Weeks has in fact learned a lot since the outbreak of the "Astin affair" about the nature of scientific evaluation and the proper relations to be maintained between scientific and administrative heads in branches of the government. It is encouraging to see that others, who apparently were not so able to modify their views, have left the Administration. In fact, if the outcome of the episode were restricted to a re-evaluation of the functions of the NBS and its relations to the head of the Department within which it operates, much good might yet come of the affair célèbre. But that is by no means all that has happened. The crucial outcome, like that in the approach to the transfer of Camp Detrick to

industrial management (see SCIENCE, Nov. 13, p. 584), is the effect upon the morale of the scientific staff. Administrators must unfailingly endeavor to learn the primary axiom of scientific production: *Key scientists are unique and irreplaceable.* It follows that morale is more important than money or politics, and that he who destroys morale in a scientific laboratory of the government is an enemy of the people. It also follows that when charges of incompetence, or of subversion, are directed at scientists in government laboratories, whatever investigation is necessary should be conducted with the greatest of care not to injure morale. In the past this has very clearly not been done, and not alone in the present case. These facts indeed raise the question whether the nation would not profit by having all its scientific institutions collected into one department, under the leadership of a man who by training and experience knows the nature and problems of scientific enterprise, instead of being scattered as now in numerous departments and independent agencies, some of which are administered with insight while others exhibit a sad lack of it. Without endorsing the idea, we may profitably weigh the pros and cons.

(*These comments by the editor are not to be taken as the official views of the AAAS.*)

Science News

A rare type of ancient spider dating back 250 million years to the Carboniferous Age was among the 45,353 specimens brought back by three **American Museum of Natural History entomological expeditions** to the western United States and Mexico, according to Mont A. Cazier, Chairman of the Museum's Department of Insects and Spiders. Nocturnal spiders, beetles, and geometrid moths were the main quarry, respectively, of the three expeditions, which went out to discover new species and to extend the range of the species already collected and described.

Willis J. Gertsch, Curator in the Department of Insects and Spiders, accompanied by his 17-year-old son John, traveled for two months in a red jeep and trailer along the California coastal ranges and back down along the Sierras to find out more about the spider fauna of the Southwest. Among the 10,000 insects, spiders, and miscellaneous vertebrates brought by Dr. Gertsch was a rare spider, discovered in Kings Canyon, Calif., that dates back to the Carboniferous Period. A member of the hypochilid family, the spider is an ancient type of which few representatives are remaining today. They have been discovered in China, Tasmania, southern Chile, and in the southern Appalachians in this country. Many nocturnal running spiders, the trapdoor spiders and their relatives the turret spiders, were collected by Dr. Gertsch, who also brought back some of the turrets and trapdoor nests of these spiders. According to Dr. Gertsch, California has a remarkable spider fauna, most of which have not yet been described.

Long horned beetles, tiger beetles, snout beetles, butterflies, wasps, and scorpions were among the 30,000 insects and spiders collected by the expedition which went to central Mexico. This expedition, sponsored by David Rockefeller, was staffed by Dr. and Mrs. Charles Vaurie. Dr. Vaurie is a Research Associate in Ornithology and his wife is an Assistant in Entomology. Covering 10,000 miles in their two and one half months' trip, the two scientists gathered specimens in Guanajuato, Jalisco, Sinaloa, Aguas Calientes, Nayarit, and Colima. They traveled by carryall, equipped with a small tent, air mattresses, about 200 tins of canned food, and lanterns, nets, and cigar boxes for collecting.

The third expedition, led by Frederick Rindge, Associate Curator in the Department of Insects and Spiders, who was assisted by his wife, returned from the Rockies with 5353 insects and spiders of which there were 3770 butterflies and moths, 177 spiders, and 1406 miscellaneous insects. Dr. Rindge is particularly interested in the members of the moth family, Geometridae, more commonly known as inch worms. He and Mrs. Ridge traveled 5638 miles during their one-month trip. Much time was spent on the Snowy Range in Wyoming at a height of 11,000 feet in search of moths that frequent areas of high altitude.

The specimens collected on these expeditions will contribute to a study currently being undertaken by the Department of Insects and Spiders on the geographical distribution of the insect fauna of Mexico and Central America and its interrelation with that of the United States. This study is of interest not only to entomologists but also to students of public health and genetics.

The **dearth of science teachers** so frequently discussed in this country is not a unique situation, as one realizes in reading a recent statement in the October issue of *Discovery,* pp. 299–301. In Great Britain, as here, salaries are low, hours are long, and it is extremely difficult to attract university students to the teaching profession. There is a sharp contrast between the men working in the humanities and the men working in science.

"A school advertised for a Physics Master, only four replies were received, all from graduates with only pass degrees; at the same time the school advertised for a French Master, the result was 82 replies, seven from men with a first class degree. Prewar all the Science staff at this school had honor degrees, the last three science masters to join had pass degrees only. It is interesting that Scotland is taking the lead to remedy the situation. A committee has been appointed headed by Sir Edward Appleton to enquire into the supply of science and mathematic teachers, and even more important to suggest remedies."

It will bear watching to see what this committee is recommending, and how far these recommendations could be used in the United States.

Mine roofs can be "sewed" into place with half-inch wire rope cemented into deep holes bored in the

mine's roof, a Norwegian mine engineer has found. Similar in function to roof bolting, the technique involves drilling holes of 1.25 inches in diameter in the mine roof about 6 to 9 feet apart and 6 to 9 feet in length. Loops of half-inch wire rope are shoved into the holes. Then one-eighth-inch pipe is pushed into the hole to act as an air vent. A special plug is inserted in the opening of the hole and cement grout is forced into the hole under pressure. The grout spreads through fissures in the earth that the long hole has penetrated and, upon hardening, effectively "glues" the fissures back together.

"Success of this method is attributed to the fact that loose rock is cemented into one solid block which is suspended by the wire rope loops in the drill holes from solid rock overlying the loose rock," C. C. Austin, retired official of the Goodman Manufacturing Co., reports in the *Engineering and Mining Journal.*

As developed by Einar Trofte n, chief mine engineer at the Sulitjelma Gruber mine in Norway, the technique is called "roof sewing" because the loops are made of one continuous length of wire rope. Running from hole to hole, this wire rope dangles slightly below the mine roof and resembles loose stitches of thread in cloth.

Scientists in the News

Theodore E. Boyd of Scarsdale, N. Y., has been appointed Assistant Director of Research for the National Foundation for Infantile Paralysis. Dr. Boyd has been a member of the Research Department of the Foundation since 1947.

The following new appointments have been made at Hahnemann Medical College and Hospital, Philadelphia:

Madison Baldwin Brown, formerly Executive Vice-President, Administrator, and Medical Director of Roosevelt Hospital in New York City, has been named Medical Director of Hahnemann Hospital.

In September **C. George Tedeschi,** who had been Assistant Professor of Pathology at Boston University, assumed his work as Professor and Head of the Division of Pathology. Dr. Tedeschi came to America in 1939 from Italy, where he had been Professor of Pathology at the University of Ferrara.

William H. Ramsey, an assistant surgeon for Pennsylvania and Bryn Mawr hospitals in Philadelphia, has been appointed Associate Professor of Surgery (Proctology).

A. H. Burr and **C. O. Mackey** of the College of Engineering at Cornell University have been appointed to endowed professorships. Both are in the Sibley School of Mechanical Engineering. Prof. Burr, Head of the Department of Machine Design, has been named Hiram Sibley Professor, and Prof. Mackey, Head of the Department of Heat-power Engineering, becomes John Edson Sweet Professor of Engineering. Prof. Burr is spending a sabbatical leave this year in Brazil, where he is helping to reorganize engineering courses at the Institute of Aeronautics in São José dos Campos.

Charles M. Gruber of Jefferson Medical College, and **Otto F. Kampmeier** of the University of Illinois, have been appointed heads of the departments of Pharmacology and Anatomy, respectively, at the School of Medicine, College of Medical Evangelists, Loma Linda.

Jacob I. Hartstein, Chairman of the Education Department at Long Island University, has been named Dean of the Graduate School. For 15 years Dr. Hartstein has been associated with the university's education and psychology departments.

Last month **Weikko A. Heiskanen** of Ohio State University flew to Finland to receive an award from the Wihuri Foundation, the country's largest scientific foundation. Dr. Heiskanen was honored in recognition of his "high international reputation in geodesy and geophysics and his achievements in the Finnish cultural life."

H. Van Zile Hyde, Chief of the Division of International Health, Public Health Service, has been appointed by the President to serve as United States representative on the Executive Board of the World Health Organization.

Seymour Korkes, formerly an assistant professor of pharmacology at New York University, has become Associate Professor of Biochemistry at the Duke University School of Medicine.

Maurice E. Krahl, Associate Professor of Biological Chemistry, Washington University School of Medicine, St. Louis, has been appointed Professor of Physiology at the University of Chicago.

C. H. Long, formerly a member of the physics staff at Miami University, Oxford, Ohio, is now Associate Professor of Physics at Rose Polytechnic Institute, Terre Haute, Ind.

Conrad E. Ronneberg has returned to his duties as Professor of Chemistry and Chairman of the Department of Chemistry at Denison University after being away for a year on sabbatical and special leave.

The 1954 William H. Nichols Medal of the American Chemical Society's New York Section has been awarded to **Charles Phelps Smyth,** Professor of Chemistry at Princeton University. The medal is conferred annually to stimulate original research in chemistry. It will be formally presented to Dr. Smyth in March.

Daniel Leigh Weiss, formerly research assistant in pathology at Mount Sinai Hospital, New York City, has been appointed Director of Laboratories and Pathologist at the District of Columbia General Hospital, Washington. He has also been appointed Adjunct Professor of Pathology at Georgetown University Medical School and Clinical Adjunct Pro-

fessor of Pathology at George Washington University Medical School.

Gordon R. Williams, formerly an engineer with the firm of Knappen-Tippetts-Abbett-McCarthy, Consulting Engineers, has become an associate professor in the Department of Civil and Sanitary Engineering at the Massachusetts Institute of Technology.

The Office of International Relations, National Academy of Sciences—National Research Council, has provided the following information concerning the travel plans of scientific **visitors to the United States:**

G. Asboe-Hansen, Laboratory for Connective Tissue Research, University Institute of Medical Anatomy, University of Copenhagen, Denmark. Feb. 15–Mar. 30. Will attend Conference on Connective Tissues. c/o Josiah Macy, Jr. Foundation, New York City.

A. Albu, Engineer and Labour Member of Parliament; Hon. Joint Secretary of the Parliamentary and Scientific Committee. Due in autumn for a lecture tour under the auspices of British Information Services.

Sir Edward Bullard, Director of National Physical Laboratory, London. Arrives during November for a geophysical conference in Los Angeles and the Pacific Science Congress, Manila. c/o U.K. Scientific Mission, Washington.

S. Chapman, Professor of Geophysics, University of Alaska. Until Dec. 15 will be at 720 State Street, Ann Arbor, Mich.; until Mar. 1 will be at University of Alaska; and until May 15 will be at Dept. of Physics, New York University.

K. G. Denbigh, University of Cambridge, England. Specialist in thermodynamics and chemical kinetics. Sept. 12–Dec. 23 for visiting professorship at University of Minnesota.

H. Groppe, specialist in engineering and organization for the Inland Waterway Engineering Sect., Federal Ministry of Transportation, Bonn, Germany. Arrived Oct. 15 for 90 days. c/o Mr. Wilfred Brunner, U.S. Department of Labor (OILA).

J. E. Hartshorn, Industrial Editor of *The Economist,* London. Arrived Oct. 5 for 8-wk study of research in industry. c/o U.K. Scientific Mission, Washington.

A. V. Hill, Honorary Research Associate, University of London. Will attend Columbia University Bicentennial and AAAS meeting.

H. A. Krebs, Professor of Biochemistry, University of Sheffield, England. Feb. to Apr. Will visit Johns Hopkins, Chicago, and Wisconsin universities.

N. Kurti, Clarendon Laboratory, Oxford. Will attend International Low Temperature Conference in Houston, and visit laboratories in U.S. c/o U.K. Scientific Mission, Washington.

W. Lane-Petter, Medical Research Council, London. Nov. 25–Dec. 16. Will attend Animal Care Panel, Chicago. c/o U.K. Scientific Mission, Washington.

E. J. Le Fevre, Mechanical Engineering Research Organization, London. Nov. 29–Dec. 23. Will attend A.S.M.E. meeting. c/o U.K. Scientific Mission, Washington.

A. C. Locke. Arrived Sept. 15 for 3-yr. stay as Executive Assistant to the Director of the U.K. Scientific Mission, Washington.

K. A. G. Mendelssohn, F.R.S., University Demonstrator, Clarendon Laboratory, Oxford. December through January. Will attend Conference on Low Temperatures, and will be at Stanford University and Berkeley, Calif.

L. B. Pfeil, F.R.S., Director, Mond Nickel Company, London. Nov. 10–Dec. 16. c/o Mr. T. H. Wickenden, International Nickel Co., Inc., 67 Wall St., New York 5.

R. E. O. Williams, Public Health Laboratory, England. Arrived Nov. 7 for a month. Will attend American Public Health Association meeting in New York. c/o U.K. Scientific Mission, Washington.

H. V. Tuominen, Chief Geologist, Suomen Malmi Oy (Finnish Ore Company), Helsinki. Is Assistant Professor of Geology for 1953–54 at Lehigh University.

H. Nutzhorn, industrial psychologist, Textile Plant, Nordhorn, Germany. Arrived Oct. 15 for 60 days. c/o Mr. Wilfred Brunner, U.S. Department of Labor (OILA).

V. Schytt, Chief Glaciologist, Norwegian, British, and Swedish Antarctic Expedition, 1949–52. Will spend year in The College of Liberal Arts, Northwestern University.

J. A. L. Robertson, Ministry of Supply. Will be Physical Metallurgical Liaison Officer, U.K. Scientific Mission, Washington.

Education

The Educational Committee of the American Medical Writers' Association, under the chairmanship of Richard M. Hewitt of the Department of Publications, Mayo Clinic, has been instrumental in the establishment of **courses in medical journalism** at two universities in the Middle West. The University of Illinois School of Journalism has a pilot student testing a 4-year course that has been outlined, and the University of Missouri School of Journalism has announced its willingness to institute a similar program next year in cooperation with its newly enlarged medical school.

The American Medical Writers' Association has appealed to its members to assist the new educational project by making suggestions for interesting qualified high school students in the courses, and by making scholarship funds available.

The Kellogg Gull Lake Biological Station of Michigan State College will begin classes and research in 1954. The 32-acre estate that will serve as headquarters for the station was a gift of the Kellogg Foundation following World War II. This year an additional grant of $45,000 was given to M.S.C. by the Founda-

tion to remodel the estate and to acquire certain basic equipment. H. J. Stafseth, head of the college's Division of Biological Science, has been named director of the station.

Courses will be offered for the first time next summer. These are expected to be especially appealing to elementary school teachers as well as to graduate and undergraduate biology students. The subjects covered will include nature study, botany, zoology, entomology, parasitology, bacteriology, fisheries, and wildlife. From 75 to 100 students can be accommodated during the summer. Those interested in the courses being offered next season should communicate with Dr. Walter F. Morofsky, Executive Secretary and Resident Director, The Kellogg Gull Lake Biological Station, Department of Entomology, Michigan State College, East Lansing.

Research activity of **New York University's College of Engineering** increased 14 per cent during the last year and passed the $2,000,000 mark. The annual expenditure for sponsored research was $2,017,000, as compared with $1,758,000 the previous year. In 10 years the rate of operation has increased twentyfold. The staff, totaling 405, is five times as large as during the first year of operation.

States with the highest number of doctors per capita have the largest number of young men and women who want **to enter medical school,** according to statistics compiled by the Association of American Medical Colleges and reported in the October issue of *The Journal of Medical Education.* It is suggested that the common economic, educational, and cultural factors which attract doctors also stimulate students to become doctors.

The District of Columbia had the largest number of applicants for admission to medical schools this fall—19 per 100,000 population, while the doctor ratio is 31 per 10,000 population. New York ranked second with 18 applicants per 100,000 population and a doctor ratio of 20 per 10,000.

The study shows that chances of gaining admission to medical schools are greater for students living in states having state-supported schools. Ten states have no medical schools at all and four have only private schools. All private and some state medical schools accept some out-of-state applicants, but generally students from states not supporting medical education are not accepted in as great a proportion.

Grants and Fellowships

Argonne National Laboratory has announced that applications for temporary research appointments in biology, chemistry, engineering, medicine, metallurgy, and physics are being accepted. The Laboratory reserves positions each year for faculty members on leave, postdoctoral investigators, and graduate students wishing to use its unique research facilities.

Appointments will ordinarily be made for a period of approximately one year, although applications for the summer, or for other periods less than a year, will be considered in cases where useful results can be anticipated in the shorter time. Each applicant must be endorsed by his own academic institution. Further information and applications may be obtained by communicating with J. C. Boyce, Associate Laboratory Director, Argonne National Laboratory, P.O. Box 299, Lemont, Ill.

The **Harvard School of Public Health** has received a fellowship grant for $3000 from **Swift & Company** to be used to assist in research on the metabolism of cholesterol in the cebus monkey, now being conducted in the school's Department of Nutrition by George V. Mann, Assistant Professor of Nutrition. Recently Dr. Mann has succeeded in producing for the first time a type of hardening of the arteries in the cebus monkey. This is of considerable interest because it is a step toward a better understanding of arteriosclerosis.

The **Institute of Industrial Health of the University of Cincinnati** will accept applications for a limited number of fellowships offered to qualified candidates who wish to pursue a graduate course of instruction in preparation for the practice of industrial medicine. Any registered physician, who is a graduate of a Class A medical school and who has completed satisfactorily at least 2 years of training in a hospital accredited by the American Medical Association, may apply for a fellowship in the Institute of Industrial Health. (Service in the Armed Forces or private practice may be substituted for one year of training.)

The course of instruction consists of a 2-year period of intensive training in industrial medicine, followed by one year of practical experience under adequate supervision in industry. Candidates who complete the course of study satisfactorily will be awarded the degree of Doctor of Industrial Medicine.

During the first 2 years, the stipends for the fellowships vary, in accordance with the marital status of the individual, from $2100 to $2700 in the first year and from $2400 to $3000 in the second year. In the third year the candidate will be compensated for his service by the industry in which he is completing his training. A one-year course, without stipend, is also offered to qualified applicants. Requests for additional information should be addressed to the Institute of Industrial Health, College of Medicine, Eden and Bethesda, Cincinnati 19, Ohio.

The **Lalor Foundation,** through a grant to the **Marine Biological Laboratory,** Woods Hole, Mass., is offering a limited number of postdoctoral fellowships in the fields of biochemistry, biophysics, and physiology, designed primarily for young scientists desiring to work not less than two consecutive months during the summer on investigations for which the opportunities provided by the Marine Biological Laboratory are particularly appropriate. The stipend is intended to cover laboratory fees, travel, and living expenses at Woods Hole. *Completed applications should be received by Jan. 31.* Blanks and further information may be secured from the Director, Marine Biological Laboratory, Woods Hole, Mass.

The **Mount Desert Island Biological Laboratory,** Salisbury Cove, Me., has received a grant of $1000 from **The Ciba Pharmaceutical Products, Inc.** This sum is being made available for general support of the summer program, which features basic research in the fields of renal physiology and electrolytic balance, and of tissue culture.

The **Muscular Dystrophy Associations of America, Inc.** has awarded the following grants-in-aid:

Massachusetts Institute of Technology. M. Lubin. The relation between surface activity and the contractile force of muscle, 1 yr., $5832.

University of California Medical Center. W. H. Blahd. Studies in neuromuscular diseases, 1 yr., $12,561.48.

The **Pennsylvania Academy of Sciences** has awarded the 1953 **AAAS Research Grant** jointly to A. W. Shively of Franklin and Marshall College for his project on abnormal plant growth, and to Robert M. Wotton of the University of Pittsburgh for his research on the nature of intracellular fat metabolism.

The **Standard Oil Company of Indiana** has established a research fellowship at **Iowa State College** for basic research on the physiological action of herbicides to be carried out under the direction of W. E. Loomis of the Department of Botany. C. M. Switzer of the Ontario Agricultural College and the University of Toronto has been appointed to the fellowship for the year 1953–54.

The Department of Biological Sciences at **Stanford University** has announced the establishment of a limited number of **Eli Lilly Fellowships in Biology.** These will be awarded to students at the predoctoral level at stipends ranging from $1000 to $2000. Inquiries should be addressed to Dr. V. C. Twitty, Chairman of the department.

The **Union Carbide and Carbon Corporation** has established a senior-year technical scholarship program at 41 engineering colleges and universities. The scholarships, individually sponsored by various divisions of the corporation, will cover the full tuition for a student's senior year, and $200 for books and fees. The program, which includes one or more senior-year scholarships at each of the participating universities, went into effect this fall. The selection of scholarship recipients will be made by the universities themselves in accordance with their normal procedures. This will include consideration of the student's past performance and his potential for engineering and scientific study, as well as his potential for successful employment in industry.

In the Laboratories

The **Department of Physics at Tennessee Agricultural and Industrial State University** has announced that the facilities of its infrared spectroscopy laboratory are available to the research laboratories of industrial concerns and universities in the southeastern section of the country. For samples furnished, the laboratory will supply spectrograms and analyses of spectra embracing the spectral region 2 to 25 microns.

Heyden Chemical Company and **American Cyanamid Company** have signed an agreement for the sale by Heyden to Cyanamid of Heyden's Antibiotic Division, including the plant located at Princeton, N.J., and Heyden's patent rights and processes relating to the manufacture of antibiotics. The acquisition will increase Cyanamid's facilities in the pharmaceutical field, providing for the production of penicillin, streptomycin, and neomycin. The two latter products have not heretofore been manufactured or sold by American Cyanamid.

The **Monsanto Chemical Company** plans to have completed a new application research and development center in Springfield, Mass., by late 1954. The additional 44,000 square feet of floor space is expected to provide working facilities for approximately 125 chemists, engineers, and other technically trained personnel who will provide customer service for product and market development in the field of plastics.

In order to facilitate the exchange of new scientific information, **Southwest Research Institute** plans to publish a monthly technical calendar for free distribution to 25,000 scientists and engineers in the Southwest region. Charles E. Balleisen, former supervisor of the institute's engineering mechanics laboratory, has been appointed editor of the pamphlet.

Meetings and Elections

The **American Pharmaceutical Association** has elected the following officers for 1953–54: pres., F. Royce Franzoni, Washington, D.C.; 1st v. pres., John A. MacCartney, Detroit, Mich.; 2nd v. pres., Joseph B. Sprowls, Philadelphia, Pa.; sec., Robert P. Fischelis, Washington, D.C.; treas., Hugo H. Schaefer, Brooklyn, N.Y.

Principal officers for 1953–54 of the **American Society for Horticultural Science** are: pres., F. P. Cullinan, Plant Industry Station, Beltsville, Md.; v. pres., E. S. Haber, Iowa State College; sec.-treas., F. S. Howlett, The Ohio State University. Representatives to the AAAS Council are H. B. Tukey, Michigan State College, and S. L. Emsweller, Plant Industry Station, Beltsville, Md.

The **American Society of Limnology and Oceanography** elected the following officers for 1953–54: pres., W. M. Cameron, University of British Columbia; v. pres., M. B. Schaeffer, Scripps Institution of Oceanography; sec.-treas., G. L. Pickard, University of British Columbia; members-at-large, E. C. LaFond, U.S. Navy Electronics Laboratory, and K. O. Emery, University of Southern California.

New officers of the **American Society of Parasitologists** are: pres. elect, Clay G. Huff, Naval Medical Research Institute, Bethesda, Md.; v. pres., Donald B. McMullen, Army Medical Graduate Division, Wash-

ington, D.C.; sec., A. C. Walton, Knox College. E. R. Becker of Iowa State College is president for 1954, and R. M. Stabler of Colorado College is treasurer.

A new chemical society, the **Chemische Gesellschaft in der Deutschen Demokratischen Republik,** has been founded in the Russian Zone of Germany. Prof. Dr. E. Thilo is president, and Dipl.-Ing. Kaiser is secretary. The Board members are as follows: Prof. Dr. H. Bertsch, Berlin; Prof. Dr. H. Franck, Berlin; Dr. Heyder, Bitterfield; Dr. W. Schirmer, Leuna; Prof. Dr. A. Simon, Dresden; Prof. Dr. W. Treibs, Leipzig.

In recognition of the need for an organization to disseminate knowledge on high vacuum technology, stimulate exchange of ideas, and encourage research on new processes and equipment, the **Committee on Vacuum Techniques, Inc.** (CVT) has been established. This committee is a non-profit Massachusetts corporation which embraces membership from industry employing vacuum processes, universities engaged in high vacuum research, and manufacturers of vacuum equipment and components.

At a meeting held in New York City in June, some 60 representatives of industry, the universities, and equipment manufacturers discussed the nature of an organization which would best serve their needs. Dr. Henry Barton of the American Institute of Physics described various problems associated with the formation of a technical society. He suggested that the group should be kept on an informal basis and concentrate on service to the vacuum field. A strong opinion was advanced that one of the most useful functions of such an organization would be the standardization of nomenclature, testing techniques, and equipment performance ratings. Considerable confusion has resulted in the understanding of such fundamentals, since high vacuum is employed by a broad variety of fields such as electronics, food, metallurgy, coating, distillation, pressure vessel testing, optics, and nucleonics.

The following chairmen of standing committees have been elected: Joseph B. Merrill of high Vacuum Equipment Corporation, Permanent Organization Committee; Harry Bliven of Vacuum Electronic Equipment Corp., Finance and Budget Committee; Everett M. Brown of Consolidated Vacuum Corp., Arrangements Committee; Rudy A. Koehler of General Electric Co., Program Committee; John H. Durant of National Research Corp., Publicity and Publications Committee; Benjamin B. Dayton of Consolidated Vacuum Corp., Standards Committee; Frederick McNally of Jarrell-Ash Co., Education Committee.

The new committee plans to sponsor a High Vacuum Symposium in June, 1954, at Asbury Park, N.J. Programming plans are well underway. The Committee on Vacuum Techniques, Box 1282, Boston 9, Massachusetts, is soliciting membership applications from individuals and companies involved in high vacuum technology.

The 2nd Conference on Scientific Editorial Problems will be held Dec. 27 during the annual meeting of the AAAS. Leading editors, publishers, and scientists will participate in the conference and all interested persons are invited to attend.

Marian Fineman, Chief, Editorial Branch, Dugway Proving Ground, is Chairman of the meeting. Speakers will include: W. Albert Noyes, Jr. (Senior Scientific Advisor to the Chief Chemical Officer; Editor, *Journal of the American Chemical Society*), "Probable Trends in Scientific Publications as Viewed from the Editor's Office"; Milton O. Lee (Managing Editor, *American Journal of Physiology*), "Problems in Financial Management of Scientific Journals"; George S. Tulloch (Editor, *Bulletin of The Brooklyn Entomological Society*), "Problems of the Editor of a Small Journal"; Ruth C. Christman (Acting Executive Editor, THE SCIENTIFIC MONTHLY and SCIENCE, and Associate Editor, Interscience Publishers), "Illustrations for Scientific Publications"; Richard M. Hewitt (Section of Publications, The Mayo Clinic), "Exposition as Applied to Medicine: Some of the Difficulties"; and Joseph D. Elder (Science Editor, The Harvard University Press), "Jargon, Good and Bad."

The Conference on Scientific Editorial Problems was organized in 1952 "To bring before the AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE some of the important problems that confront those who prepare scientific manuscripts, who are concerned with the preparation of technical reports, or who edit and produce scientific publications."

The H. H. Wills Physical Laboratory of the University of Bristol, England, in cooperation with the International Union of Pure and Applied Physics (particularly its Commission for the Physics of the Solid State) and with The Institute of Physics, is organizing a conference on **Defects in Crystalline Solids** to be held from July 13–17, 1954, in Bristol. While not excluding other subjects in the field, the organizers propose to give particular attention to defects such as dissolved atoms, vacancies and F-centres, to microwave resonance methods of investigating their properties, and to the way in which they react with dislocations. Thus dislocations will be discussed in their chemical aspects, as influencing diffusion and precipitation in the solid state, rather than in relation to plastic flow.

It is hoped that a number of authors from overseas will personally present their papers, and with this in mind the conference has been arranged to follow immediately after the General Assembly of the International Union of Pure and Applied Physics. Board and lodging will be provided in Wills Hall, a student hall of residence, on special terms, or at hotels. The conference is open to any scientist interested in this field, subject to the limitations of seating accommodation.

Further particulars may be obtained from the Secretary, H. H. Wills Physical Laboratory, Royal Fort, Bristol 8, or from the Secretary, The Institute of Physics, 47, Belgrave Square, London S.W.1. Those

wishing to attend the conference are asked to apply to the former, marking the envelope "1954 Conference," and stating whether they wish to be accommodated at Wills Hall or at a hotel and for what nights accommodation is required.

Glutathione was the subject of a 2-day symposium sponsored jointly by the National Science Foundation and the Office of Naval Research and administered by Columbia University. About 50 leading biochemists from the United States and foreign countries exchanged views on the role which glutathione plays in enzyme actions, growth, and the creation of body energy.

Five sessions were scheduled to discuss the organic chemistry of sulfhydryl compounds and glutathione; biosynthesis of glutathione and its role in peptide synthesis; methods for determination of glutathione; glutathione as a coenzyme; and the relation of glutathione to metabolism and disease. The proceedings of the symposium will be published in monograph form.

The symposium was directed by the following committee: Sidney Colowick, Johns Hopkins University; Arnold Lazarow, Western Reserve University; Ephraim Racker, Yale University; David Schwarz, Schwarz Laboratories, Mount Vernon, N. Y.; Earl R. Stadtman, National Institutes of Health; Heinrich Waelsch, Columbia University.

For the first time the **International Botanical Congress,** which will be held in Paris from July 2–14, 1954, will include a section exclusively devoted to phycology. French phycologists hope that many of their foreign colleagues will attend the meetings of this section. The preliminary program of these meetings will include: (1) comparative cytology of algae applied to classification; (2) biochemistry of algae applied to classification; (3) morphology and development of algae—particularly life-cycles and classification of chlorophyceae; (4) ecology, floristics and geographical distribution of algae (marine and fresh-water).

Phycologists who intend to submit communications to the Congress are requested to send to the secretaries of the Section of Phycology, *before Jan. 15, 1954,* a brief summary (written in English or in French) not to exceed 5000 letters or spaces for original communications for the program of the meetings, or 2000 letters or spaces for sundry communications.

Phycological excursions are planned:

A. Before the Congress (last week of June).
   1) Marine: Along the Côte des Albères (Mediterranean Sea) at the Laboratoire de Biologie marine de l'Université de Paris in Banyuls-sur-Mer.
   2) Fresh-water: In Auvergne at the Laboratoire Biologique de Besse en Chandesse de l'Université de Clermont-Ferrand.

B. After the Congress (from July 15 to July 21).
   1) Marine: Along the Coast of Britanny on the Channel, at the Station Biologique de Roscoff de l'Université de Paris, including, if possible, an excursion for fresh-water algae in inner Britanny and a visit to a factory for production of iodine and algine from algae.
   2) Fresh-water: To subalpine lakes around Aix-les-Bains at the Laboratoire d'Hydrobiologie de l'Ecole Nationale des Eaux et Forêts du Lac du Bourget.

All matters concerning the Section of Phycology and the phycological excursions must be addressed to the secretaries of the Section: Prof. J. Feldmann, (marine algae), and Dr. P. Bourrelly (fresh-water algae), Institut Oceanographique, 195 rue St. Jacques, Paris 5.

The **3rd International Congress of Alpine Meteorology** is to be held at Davos-Platz, Switzerland, April 12–14, 1954. The following four subjects, in their relation to Alpine regions, are proposed for discussion on the program: synoptic meteorology; radiation; bioclimatology; and snow and ice. The meeting is being arranged by the two institutes in Davos, the Observatoire physico-météorologique de Davos (Dr. W. Mörikofer) and the Institut fédéral pour l'étude de la neige et des avalanches, Weissfluhjoch-Davos (Dr. M. de Quervain). These organizations wish to invite their colleagues and friends abroad to participate in the congress. Inquiries should be addressed to the observatory.

The 8th international congress of the **International Society for Cell Biology** (Cytology Congress) will be held in Leiden, Holland, Sept. 1–7, 1954. The officers of the Society are:

Pres.: E. Newton Harvey, Princeton University, Princeton, N. J., U.S.A.

Past pres.: J. Runnström, Wenner-Gren Institute, Stockholm, Sweden.

Vice presidents: E. Fauré-Fremiet, Laboratoire d'Embryogénie Comparée, Collège de France, Paris, France; Honor B. Fell, Strangeways Research Laboratory, Cambridge, England; G. C. Heringa, Histologisch Laboratorium, Universiteit van Amsterdam, Amsterdam, Netherlands.

Sec.-treas.: J. F. Danielli, Dept. of Zoology and Animal Biology, King's College, London.

Assist.-treas. in the U.S.A.: J. S. Nicholas, Dept. of Zoology, Yale University, New Haven, Conn.

P. J. Gaillard of the Laboratory for Experimental Histology, University of Leiden, is Chairman of the Dutch Committee. Correspondence should be addressed to the Secretary, Dr. W. H. K. Karstens, Botanical Laboratory, State University, Nonnensteig 3, Leiden.

Full members of the Society, and candidates for membership approved by the International Committee, are automatically entitled to attend the Congress and to introduce one guest. The International Committee has prepared a program of symposia including the following topics: induced enzyme synthesis; the formation of the intracellular matrix in plant and

animal tissues; (left open: to be filled by Dutch Committee); biochemistry of gene action; thyroid secretion; nuclear and chromosome structure; mitochondria; cell division and mitotic poisons; morphogenetic interactions between cells; virus synthesis; the active cell surface; submicroscopic structure of cytoplasm. Speakers will be announced by the Dutch Committee at a later date.

There will be no programs of general papers, but members and invited guests may contribute a paper to be read by title if accompanied by an abstract of 300–400 words. These abstracts will be published before the Congress, and should be sent as soon as possible to the Secretary of the Dutch Committee.

The 45th **New England Intercollegiate Geological Conference** met at Hartford, Conn., on Oct. 9–10, with 150 participants. Cosponsors were Trinity College and the Connecticut Geological and Natural History Survey, now celebrating its semicentennial.

Trips were led by John Rogers (triassic bedrock), Robert M. Gates (Western crystallines), R. F. Flint and R. V. Cushman (surficial geology of the Connecticut Valley), Janet M. Aitken (Eastern crystallines), and John Rodgers (New Haven area). The Geology Department of Dartmouth College (A. H. McNair, Chairman) will be host for the 47th meeting in October, 1954.

The Potato Association of America has elected the following officers for 1953–54: pres., J. W. Scannell, Ottawa, Canada; v. pres., Arthur Hawkins, Storrs, Conn.; sec., R. W. Hougas, Madison, Wis.; treas., John C. Campbell, New Brunswick, N.J.; past pres., J. H. Muncie, East Lansing, Mich.

Miscellaneous

The Arctic Institute of North America, with the joint support of the Army, Navy, and Air Force, has prepared an ***Arctic Bibliography.*** It consists of three bound volumes, 4500 pages, which list or summarize more than 20,000 scientific papers and reports pertaining to the Arctic, and also official documents, books of exploration, and general magazine articles. Previously, the most recent complete bibliography of the Arctic was published in Vienna in 1878.

The bibliography is the work of a Directing Committee under the direction of Henry B. Collins of the Smithsonian Institution. The editor is Marie Tremaine. The three-volume set, up to date through 1949, is available at the Government Printing Office at a price of $12.57. A fourth volume is in press and a fifth, now in preparation, will cover material through 1953.

Ancient **bloodletting,** called "The Art of Phlebotomy," was done with stone lancets, leeches, and by various other means. A permanent exhibit on bloodletting has been opened at the Smithsonian Institution in Washington.

A second printing has made available again Stanford Research Institute's report to the United States Atomic Energy Commission on the **"Industrial Uses of Radioactive Fission Products."** Copies may be obtained from SRI's Public Relations Office, Stanford, Calif., for $1.50 each.

Submitted in Sept. 1951, but unavailable in the last few months, the publication reports the findings of a team of economists, market analysts, and engineers after studying more than 60 representative enterprises.

The Society of Protozoologists announces a new ***Journal of Protozoology,*** to begin publication in the spring of 1954. Papers concerned with original work on any aspect of the study of protozoa may now be submitted to the Editor, William Trager, The Rockefeller Institute for Medical Research, 66th St. and York Ave., New York 21, N.Y.

The journal will consist of 4 issues per year. The annual subscription will be $9 for all except graduate students, for whom it will be $6. Inquiries regarding subscriptions and membership in the Society of Protozoologists should be addressed to Norman D. Levine, Secretary, College of Veterinary Medicine, University of Illinois, Urbana, Illinois.

At a meeting of the American Pharmaceutical Association last summer Harry J. Loynd, the president of Parke, Davis and Co., stated that **new drugs** are being discovered at the rate of about two a year. Not very long ago the drug industry and medical profession felt much was being accomplished if one new drug was discovered every 25 years.

Volumes I and II of ***The Palaeobotanist,*** a journal published by the Birbal Sahni Institute of Palaeobotany, 53 University Rd., Lucknow, India, can be obtained from the Registrar of the Institute for 50 and 20 rupees, respectively.

A change has been made in the arrangements for representation of the **United Kingdom's Ministry of Agriculture and Fisheries** in Washington, D.C. The technological liaison that has hitherto been part of the work of the Agricultural Attaché's office will in future be carried out by a group in the United Kingdom Scientific Mission.

Research programs relating to materials or products that can be bought from private manufacturers have been dropped by the **U.S. Bureau of Reclamation.** The reorganization was ordered by Secretary of the Interior Douglas McKay, following the report of a survey group which spent two months studying the reclamation work.

The survey report criticized research involving paints and herbicides for which the Bureau laboratory developed composition specifications for manufacturers. Research concerning hydraulics and the physical and chemical characteristics of earth and rocks under varying conditions of load, hydraulic flow, and exposure will be continued.