In order to determine the feasibility of such an undertaking, the trustees of the association appointed a committee consisting of R. C. Archibald, W. D. Cairns, Florian Cajori, H. E. Slaught and D. E. Smith, with power to make such investigation as might seem best. This committee sent a communication to some fifty persons in Europe, Asia and America, asking for an expression of opinion and for permission to use their names as members of an advisory committee. The responses were almost unanimously in favor of the project and in many cases helpful suggestions and proffers of assistance were freely given.

The committee of the association is, therefore, encouraged to proceed a step further, having the friendly cooperation of so large a number of representative persons on three continents. The publication, if undertaken by the association, will, as before, be international in character and will aim to maintain a high standard in its editorial management.

What we need to know is how many subscribers to the new series of *Bibliotheca Mathematica* can be counted upon. It is proposed to keep the general subscription price at five dollars, the same as was formerly charged, notwithstanding the cost of publication has more than doubled since the last volume appeared in 1914, and notwithstanding the number of pages per volume will be maintained and possibly increased. But the association proposes to make a special subscription price, as in the case of all its publications, to its individual and institutional members. The price proposed for the *Bibliotheca Mathematica* to members of the Mathematical Association of America will be four dollars per volume. This can be done only on the basis of a large list of subscribers and through the partial aid of certain subsidy funds.

Subscriptions should be sent to the Secretary of the Mathematical Association of America, Professor W. D. Cairns, Oberlin, Ohio, U. S. A., to whom all communications should be sent.

SCIENTIFIC NOTES AND NEWS

As has already been noted in SCIENCE, the autumn meeting of the National Academy of Sciences will be held in Schenectady, New York, from November 19 to 21. Public addresses will be given by Dr. Harlow Shapley, director of the Harvard College Observatory, on "The Center of the Universe," and by Dr. Irving Langmuir, of the General Electric Company, on "Oil Films on Water."

A MEETING in memory of Edgar Fahs Smith, former provost and Blanchard professor of chemistry in the University of Pennsylvania, will be held on December 4 at four o'clock in the Irvine Auditorium of the university. Addresses will be made by Dr. Francis X. Dercum (class of '87 medical), president of the American Philosophical Society; Dr. Marston Taylor Bogert, professor of organic chemistry in Columbia University, and Dr. Josiah H. Penniman, provost of the university.

DR. HARVEY NATHANIEL DAVIS, formerly professor of mechanical engineering at Harvard University, will be installed as president of the Stevens Institute of Technology at Hoboken, N. J., on November 23. Dr. Davis and President Lowell will make addresses at the inauguration ceremonies. At a scientific session to be held in the morning the principal speakers will be Dr. John Johnston, director of research of the U. S. Steel Corporation, and Dr. Robert A. Millikan, of the California Institute of Technology.

THE Thomas Burr Osborne gold medal of the American Association of Cereal Chemists, established in 1926 and named in honor of Dr. Thomas B. Osborne, of the Connecticut Agricultural Experiment Station, "as a commemoration of his notable services to cereal chemistry," was presented for the first time at the annual convention of that association, the recipient being the person for whom the medal is named. It is intended that this medal shall be awarded only for unusually meritorious contributions to cereal chemistry. In connection with the presentation, C. B. Morison, of the American Institute of Baking, gave a review of Dr. Osborne's forty years of sustained research in biochemistry, more especially in the field of plant proteins. The medal was presented by President Leslie R. Olsen. As Dr. Osborne was unable to attend the convention it was received on his behalf by Dr. Carl L. Alsberg, of Stanford University.

THE Morris Liebmann memorial prize, which was awarded recently to Dr. Walter G. Cady, head of the department of physics at Wesleyan University, was presented to him at a meeting of the Institute of Radio Engineers in New York City on November 7, by Dr. Alfred N. Goldsmith, president of the society. The medal was given for Dr. Cady's "fundamental investigation in piezo-electric phenomena and their application to radio technique." This award is made each year to that member of the institute who in the opinion of the board of directors has made the most important contribution to the radio art.

DR. JOHN W. LIEB, senior vice-president of the New York Edison Company, received the decoration of Officer of the Legion of Honor on November 2, at a meeting of engineers in New York City. The presentation was made by G. Girousse, president of the Société Nord Lumière, on behalf of the French government, "in recognition of services in furthering professional and industrial cooperation between

French and American engineers and in facilitating the interchange of knowledge and experience regarding the construction and operation of central station systems."

THE Chandler lecture will be given this year by Mr. John Arthur Wilson, chief chemist of A. F. Gallun and Sons Company. His subject will be "Chemistry and Leather." Friends of Professor Chandler presented in 1910 to the trustees of Columbia University a sum of money which constitutes the Charles Frederick Chandler Foundation. The income from the fund is used to provide a lecture by an eminent chemist with a medal to be presented to the lecturer in further recognition of his achievements in science. Previous lecturers on this foundation were: Leo H. Baekeland, W. F. Hillebrand, W. R. Whitney, F. Gowland Hopkins, Edgar F. Smith, Robert E. Swain, E. C. Kendall, S. W. Parr and Moses Gomberg.

THE gold medal for outstanding contributions to the technical development of the paper industry has been awarded by the Technical Association of the American Paper and Pulp Industry to William H. Mason, of Laurel, Mississippi, for his process of making insulating board and artificial lumber, and to Ogden Minton, of Greenwich, Connecticut, for his vaccum dryer.

DR. H. B. MCDONNELL, chemist in animal pathology at the Maryland Agricultural Experiment Station, was elected president of the Association of Official Agricultural Chemists at the annual meeting held in Washington on October 29, 30 and 31. He succeeds Dr. Oswald Schreiner, chief of the division of soil fertility of the Bureau of Chemistry and Soils, who presided at the meeting.

DR. CHARLES P. EMERSON, professor of medicine and dean of the medical faculty of the University of Indiana, was elected president of the newly established American Foundation for Mental Hygiene at the annual meeting of the National Committee for Mental Hygiene held in New York City on November 8. It is proposed to raise $1,000,000 for the support of the foundation, of which amount the sum of $150,000 has already been subscribed. Plans for the first international congress on mental hygiene, to be held at Washington in May, 1930, were also adopted.

SIR HUMPHRY ROLLESTON has accepted the position of honorary president of the British Industrial Health Education Society, a body which had its origin in Scotland, but which has now for some time been established in London. The society promotes its objects largely by the provision of health talks and the promotion of free discussion among industrial workers, the only questions which may not be raised at its meetings being those that relate to disputes between employers and employed.

UNDER the auspices of the Rockefeller Foundation three research and teaching fellowships of the value of £500 a year will be established in the medical school of the University of Dublin. The first fellowship began on October 1, last, when Dr. R. A. Q. O'Meara was nominated as Rockefeller Foundation Fellow in Public Health. The two remaining fellowships will be established in October, 1929, and October, 1931, respectively.

DR. CHAS. H. HERTY, industrial consultant with special reference to the natural resources of the southern states, announces the opening of offices in New York City. He will continue his connection with the Chemical Foundation as special representative.

DR. SAMUEL T. ORTON has announced the opening of an office in New York City for the practice of neuropsychiatry, with special attention to the reading disability and speech defects of children. Dr. Orton was for nine years professor of psychiatry and director of the State Psychopathic Hospital of the State University of Iowa. He is this year president of the American Psychiatric Association.

DR. J. AUSTEN BANCROFT has resigned his position as professor of geology at McGill University. His present mailing address is in care of the Anglo-American Corporation of South Africa, Ltd., Broken Hill, Northern Rhodesia, South Africa.

OFFICIAL delegates to the International Conference on Civil Aeronautics, to be held in Washington on December 12, 13 and 14, have been appointed by President Coolidge as follows: Secretary of Commerce Whiting, *chairman;* Senator Bingham, of Connecticut; Nelson T. Johnson, Assistant Secretary of State; F. Trubee Davison, Assistant Secretary of War; W. Irving Glover, Assistant Postmaster-general; Edward F. Warner, Assistant Secretary of the Navy; William F. MacCracken, Assistant Secretary of Commerce; Colonel Charles A. Lindbergh, Orville Wright, Harry Guggenheim, of New York; Lester D. Gardner, of New York, editor of aviation publications, and Professor Joseph S. Ames, of the Johns Hopkins University, a member of the National Advisory Board of Aeronautics.

AN investigation of airplane vibration, particularly with reference to its effect on airplane instruments, is to be made by a special research committee of the American Society of Mechanical Engineers as the result of a conference held recently at society headquarters under the auspices of the aeronautic division.

Those attending the conference were Dr. W. F. Durand, Stanford University; J. Leopold, Consolidated Instrument Company; E. Campbell, Cambridge Scientific Instrument Company; Thomas Carroll and H. E. Reid, both of the National Advisory Committee for Aeronautics; Captain E. E. Aldrin, Standard Oil Company, chairman of the aeronautic division, and Professor Alexander Klemin, Daniel Guggenheim School of Aeronautics, New York University, *secretary* of the division. The program as tentatively outlined includes (1) the collection, from all possible sources of information as to vibration difficulties at present encountered with airplane instruments, and as to causes for such difficulties; (2) the collection of all experimental data on instrument vibration now available; (3) the preparation of a report on the information collected, and the circulation of such conclusions, as might be of service, to instrument manufacturers and airplane designers, and (4) the outlining of further investigations which might subsequently be undertaken by some interested organization.

M. BERNARD TROUVELOT, entomologist of the Versailles Institute of Research in Agriculture and professor of horticulture, who has spent almost a year in studying entomological problems in the United States, has completed his work and is on his way back to France by way of Japan.

DR. D. N. KASHKAROV, professor of zoology, Middle Asiatic State University, Tashkent, Russia, is visiting the United States.

THE ABRAHAM FLEXNER lectureship at the Vanderbilt School of Medicine will be inaugurated by a series of five lectures on "Melistic Structure" by Dr. Heinrich Poll, director of the institute of anatomy at the University of Hamburg.

DR. F. D'HERELLE, professor of bacteriology in the school of medicine of Yale University, formerly director of the bacteriological service in Egypt, will deliver the second Harvey Society Lecture at the New York Academy of Medicine, on Saturday evening, November 24. His subject will be "The Nature of the Ultraviruses."

DR. EDWIN B. FROST, of the Yerkes Observatory of the University of Chicago, gave two lectures during October at Oberlin College, on the Mead-Swing Foundation, and spoke at a chapel service. His subjects were "The Dominion of the Sun" and "The Systems of the Stars."

DR. C. TELFORD ERICKSON, director of the Albanian-American School of Agriculture, gave a lecture at Harvard University on November 15, entitled "Cabbages and Kings."

DR. GEORGE E. UHLENBECK, of the University of Leiden, lectured before the Franklin Institute on November 15, on "The Ideal Gas in Modern Physics."

DR. R. G. GREEN, of the department of bacteriology and immunology of the University of Minnesota Medical School, gave a lecture on November 5 on "Encephalomyelitis of Carnivorous Animals," before the department of animal pathology of the Rockefeller Institute, Princeton.

DR. OSCAR RIDDLE, of the Carnegie Institution, addressed a joint meeting of the Society of Internal Medicine and the Institute of Medicine of Chicago, on the evening of October 26. The subject was "Some interrelations of sexuality, reproduction and internal secretion."

DR. VICTOR EMANUEL EMMEL, professor of anatomy in the college of medicine of the University of Illinois, died suddenly on November 8. Dr. Emmel was fifty years old.

RICHARD C. DRINKER, of Quincy, Massachusetts, consulting metallurgist, formerly of the Bethlehem Shipbuilding Corporation, died on November 5.

THE U. S. Civil Service Commission announces that applications for the position of cytologist to fill the vacancy in the hygienic laboratory at the U. S. Public Health Service, Washington, D. C., must be on file with the commission not later than November 28. The entrance salary is $3,700 a year. The duties are to conduct under general supervision research on the growth of normal and malignant cells in vitro, to study the action of light on cells, to cooperate in radiometric studies and to carry on other research.

THE annual meeting of the American Society of Mechanical Engineers will be held in New York City from December 3 to 7.

THE nineteenth annual exhibition of electrical, optical and other physical apparatus will be held by the British Physical Society and the Optical Society on January 8, 9 and 10 at the Imperial College of Science and Technology, South Kensington.

AT the Annual Conference of Biological Chemists resolutions were adopted protesting against the proposed decrease in the number of hours devoted to biochemistry in the curriculum of medical schools from 200 to 146 and proposing that the prerequisites in chemistry be more definitely prescribed and, if possible, include quantitative analysis.

THE scientific work accomplished by the *Città di Milano,* the base ship of the *Italia* expedition which returned to Spezia on October 20, as reported in the London *Times,* is the subject of an official *communiqué,* summarizing the report submitted by Com-

mander Romagna Manoia, who was in charge of the ship. Observations were made as to the effect of solar rays on magnetic disturbances which bear an intimate connection with the aurora borealis. These observations, which continued for an uninterrupted period of six weeks, were greatly facilitated by their fortunate coincidence with a phase of maximum solar activity. Successful results were obtained with a new Italian type of naval compass which had been modified for use in the Arctic regions. Experiments were also made with the gyroscopic compass, as a result of which the use of this type of instrument is now found possible, even in a latitude exceeding 80°. Further observations were made on the course of the Gulf Stream, and an astronomic mast was erected in Kings Bay which, it is claimed, will henceforth be the mathematical center for the future polar explorers.

THE *Journal* of the American Medical Association writes that the committee appointed by the British government has made an interim report endorsing the American view that ethyl gasoline may be used for automobiles. However, there is a certain amount of opinion in that country among chemists and physicians that such use of this substance is dangerous. In a letter to the *Times*, a well-known chemist, Professor H. E. Armstrong, accuses the committee of accepting American conclusions without critically sifting their sufficiency. He objects to the specious use of the term "ethyl" in such a connection, which is calculated to mislead and fails to warn. Ethyl is the technical name of C_2H_5 and should not be used in any other sense. "The Americans seem to have emphasized lead and to have thought of and tested for little else." But Professor Armstrong holds that lead tetra-ethide is not dangerous primarily as a lead poison but as a poison in itself acting as a whole, as a neutral liquid poison akin to the solvents used in varnishing fabrics, which have caused much serious poisoning. It has a special affinity for fatty tissues and is likely to pass into the nervous system and brain. Though the amount of poison to which we are exposed at present may be homeopathic, it must be remembered that makers are alive to the greater efficiency of high compression for internal combustion in the presence of anti-knock materials.

WITH increased facilities in the way of larger appropriations and new office equipment now at its disposal, the Kentucky Geological Survey, founded originally by the General Assembly in 1854, is at the present time in a position to render a greater public service than ever before. Under the direction of the state geologist, Dr. W. R. Jillson, the offices on the first floor of the old capitol building are open to all every week day as a source for all kinds of information relative to the geology, mineral resources, topography and similar subjects pertaining to Kentucky. Comprehensive indexed rock, ore and fossil collections are maintained at Lexington, Frankfort and at the State Fair at Louisville. Field surveys are now actively in progress with a total personnel of about 100 individuals. Of these, 25 per cent. are assigned to geological and mineral resource investigations while the balance upwards of 75 are engaged in topographic extensions. Nearly 100 separate topographical sheets, over 300 non-duplicating maps and about 60 bound reports are now available at nominal statutory charges.

PROFESSOR ROGER, dean of the Faculté de médecine de Paris, states in his annual report, which is summarized in the *Journal* of the American Medical Association, that the number of medical students continues to increase. The total number of such students for the last three school years was: 1924–1925, 2,510; 1925–1926, 2,515, and 1926–1927, 2,676. The number of students matriculating for the first time was: 1924–1925, Frenchmen, 533; foreigners, 203; total, 736; 1925–1926, Frenchmen, 561; foreigners, 237; total, 798; 1926–1927, Frenchmen, 607; foreigners, 295; total 902.

THE report of the Irrigation Division of the American Society of Civil Engineers on "A National Reclamation Policy" has made public the following statement of principles: The waiving of interest payments to landowners on government reclamation projects is unwise. In the future the government contributions should appear in the assumption of a part of the cost of projected works and not in the granting of relief to the individual farmer such as the waiving of interest charges. The United States Bureau of Reclamation has formulated a program of construction covering the ensuing ten years, involving expenditures of approximately $100,000,000. To the extent that commitments have been made the bureau should fulfill its assumed obligations and the landowner should be required to meet his obligations or surrender his holding in the government project. The regulation of the flow of streams for the prevention of floods and for the best possible utilization of the waters should be undertaken by the states, or jointly by the United States, and the states under such suitable forms of cooperation as may be appropriate under the constitutional authority now delegated to each. They should bear an equitable portion of the cost of water storage and flood control work, and the remainder of the cost should be allocated to flood, control, irrigation, power, development, municipal water supply and other purposes. Agricultural conditions due to overproduction are such at present that it is undesirable for the fed-

eral government, except in the case of commitments already made to bring new areas under cultivation.

UNIVERSITY AND EDUCATIONAL NOTES

HARVARD UNIVERSITY has received an anonymous gift of $3,000,000 to build and endow a residence college of the type of the colleges of the Universities of Oxford and Cambridge.

Two bequests amounting to $700,000 contained in the will of Charles Lennig, who died thirty-seven years ago, have become available to the University of Pennsylvania at the final distribution of the estate. One bequest of $500,000 creates the "Charles Lennig Fund in Aid of Instruction in Theoretical and Practical Mechanics." Its income will be used for the acquisition of scientific works, structures, instruments, machines and material for the Towne Scientific School of the university. The other bequest of $200,000 establishes the "Charles Lennig Beneficiary Fund," the income from which will be devoted to providing free scholarships.

GROUND has been broken on the Columbia University campus for a new building to house the natural science department, which will be erected at a cost of $1,000,000. It will be situated in the southeast corner of the Grove on Amsterdam Avenue, facing 119th Street, and will be ten stories in height. Architecturally it will be almost identical with the Chandler Chemical Laboratories.

DR. ALEXANDER RUTHVEN has been appointed dean of administration with the duties of vice-president of the University of Michigan.

DR. LEON E. SMITH, of the Randal Morgan Laboratory of Physics of the University of Pennsylvania, has accepted the position of professor of physics and head of the department of physics at Denison University, Granville, Ohio.

DR. AMOS M. SHOWALTER, National Research Fellow, 1924–27, has been appointed assistant professor of botany in Washington University.

DR. HARRY HELSON, of the department of psychology of Cornell University, is now associate professor of experimental psychology in Bryn Mawr College, taking the place of Dr. Clarence E. Ferree, who is now at the Johns Hopkins University.

DR. GUY HAROLD SMITH, who was a member of the department of geography of the Ohio State University last year during the absence of Dr. Roderick Peattie, has joined the faculty of the department of geology and geography of the University of Illinois. He will have charge of the courses on weather and climate and geomorphology.

DISCUSSION AND CORRESPONDENCE

ON NUCLEAR DERIVATIVES AND THE LETHAL ACTION OF ULTRA-VIOLET LIGHT

THE bactericidal action of ultra-violet light has been known for fifty years, and has been repeatedly investigated. But few investigators have sought the mechanism of the reaction or the chemical units of the bacterial protoplasm so affected by the ultra-violet energy as to prevent the subsequent multiplication of the cells.

If measured monochromatic ultra-violet energy is used to kill bacteria such as *S. aureus*, lying in a single plane, and its effect is recorded statistically, characteristic and similar curves are produced at each wave-length studied. These curves show that an appreciable amount of energy must be incident on the bacteria before any of them succumb. With longer exposures they succumb along a gradient that is for the most part apparently exponential, but experimental evidence indicates that its course is determined by differences in the resistance of single bacteria, and that the curve is therefore one of probability. Wide differences are found in the incident energies required to produce these curves at different wave-lengths, and if the same points on each gradient (say 50 per cent. destruction) are joined by a smooth curve, its shape is such as to suggest immediately that it is reciprocally related to the absorption of ultra-violet energy by some sensitive element in the bacterial protoplasm.

In 1917 Harris and Hoyt[1] suggested that "the susceptibility of protoplasm to ultra-violet light is conditioned by the selective absorption of the toxic rays by the aromatic amino acid radicals of the proteins." Their conclusion was based on the observation that a screen or filter of an aromatic amino acid solution—tyrosine or aminobenzoic acid, for example—greatly prolonged the exposure to the quartz mercury arc necessary to kill Paramecia, and that therefore these substances must be absorbing the very wave-lengths responsible for the lethal changes in these organisms.

Such a conclusion, however, does not exclude the possibility that other biochemical entities essential to life may also show a selective absorption over the toxic range, and it may be that the lethal reaction is due to some, or some one, of these other substances.

Recently a further search has been made for the substance most probably involved. Since the nucleus

[1] F. I. Harris and H. S. Hoyt, SCIENCE, 1917, N.S. 46: 318.