ing will take place at the Queen's Hall, Langham Place, in the evening, when short speeches will be made by distinguished representatives of institutions in various parts of the world. Music will be rendered by the Symphony Orchestra of the British Broadcasting Corporation, under the direction of Sir Henry Wood, and the proceedings will be broadcast. On Tuesday morning, September 22, there will be a conference at Kingsway Hall, at the Institution of Electrical Engineers. A conversazione will be held at the Royal Institution and at the Institution of Electrical Engineers at the Royal Albert Hall in the evening.

A private view of the Faraday Exhibition at the Royal Albert Hall will be extended to delegates and visitors on Wednesday morning, September 23. There will be a garden party at the National Physical Laboratory, by invitation of the director, Sir Joseph Tetavel, on September 24. The British Association Centenary Meeting will include a reception of British Association delegates in the Royal Albert Hall. The Faraday Exhibition will be opened to the public by the president of the British Association, the Right Honorable J. C. Smuts, later in the afternoon. In the evening the presidential address to the British Association will be given by General Smuts, at the Central Hall, in Westminster.

THE JOSEPH HENRY LECTURESHIP OF THE PHILOSOPHICAL SOCIETY OF WASHINGTON

THE Philosophical Society of Washington, through its General Committee, has decided to establish a lectureship in honor of its first president, Joseph Henry, Such action at this time is particularly appropriate, since 1931 is the centenary of the discovery of electromagnetic induction, a discovery which has brought honor not only to Henry, but also to Faraday. The purpose and scope of the lectureship can best be shown by quoting the report of the special committee which was adopted by the General Committee:

(1) There is at present in the hands of the treasurer a cash balance . . . and the committee is in agreement that . . . a portion of it be spent . . . in some way which will advance the cause of science and reflect credit on the society.

(2) It is proposed that at suitable intervals of time a speaker be selected to address the society on one of the broad aspects of some field of science, the speaker to review the recent developments or present status of a subject included in or related to the physical sciences.

(3) It is further proposed that the complete address be put in form for publication and submitted to the *Journal* of the Washington Academy of Sciences.

(4) It is further proposed that the aforementioned address shall be called the Joseph Henry Lecture in memory of the first president of the Philosophical Society.

(5) It is further proposed that the first Joseph Henry Lecture be delivered before the society in the fall of 1931, and that thereafter the lecture shall be delivered annually before the society in the spring of the year starting in the spring of 1932.

(6) It is further proposed that the expenses of the speaker incidental to a visit to Washington shall be borne by the society and that in addition an honorarium of one hundred dollars ($100) shall be presented to the lecturer at a suitable time during his visit.

(7) The complete arrangements for any one meeting are to be made by a special committee of three who are to be responsible for selecting the speaker and securing the manuscript in form for publication. No member of the committee should have been a member of the immediately preceding similar committee.

The general committee further provided that the special committee for a given year shall be appointed before October 15 of the preceding year. In accordance with this action, the following committees have been appointed:

For the year 1931: C. G. Abbot, L. H. Adams, *chairman*, R. E. Gibson. For the year 1932: L. J. Briggs, *chairman*, J. H. Taylor, F. E. Wright.

H. L. CURTIS,
President
L. V. JUDSON,
Corresponding Secretary

SCIENTIFIC NOTES AND NEWS

ON the occasion of the centenary meeting of the British Association, which will be held in London in September, the senate of the University of London has decided to confer the degree of doctor of science *honoris causa* on the president, General J. C. Smuts, on Professor Sir F. Gowland Hopkins, president of the Royal Society, and on three former presidents of the Royal Society, Lord Rutherford, Sir Charles Scott Sherrington and Sir Joseph J. Thomson.

THE *Journal* of the American Medical Association states that plans are under way to ask Americans to contribute to a million shilling fund recently started in England as a tribute to Sir Ronald Ross, discoverer of the rôle of the mosquito in the transmission of malaria. Dr. Robert L. Pitfield, Philadelphia, is secretary of the Ross Award Fund of America and will receive checks at his address, 5211 Wayne Avenue, Germantown, Pennsylvania. In addition to Dr. Pitfield, American trustees of the fund are Drs. Thomas McCrae, Joseph McFarland, Francis R. Packard,

Damaso de Rivas, Victor Robinson, Theobald Smith and Frederick L. Hoffman.

THE Roerich Museum has announced the recent election of Professor Chandrasekhara V. Raman, professor of physics at the University of Calcutta, and recipient of a Nobel prize; Professor S. I. Metalnikoff, of the Pasteur Institute, and Dr. E. D. Merrill, director-in-chief of the New York Botanical Gardens, as honorary advisers of the museum.

DR. HOWARD MCCLENAHAN, secretary of the Franklin Institute, has been elected an honorary member of the Royal Institution of Great Britain. The diploma of honorary membership will be formally presented to him at the Faraday Celebration in September. Dr. McClenahan will remain abroad for some time to visit the principal museums of industry and physical science of Europe in order to plan equipment and exhibitions for the new Franklin Memorial and the Franklin Institute Museum.

MR. EDWARD BAUSCH, president of the Bausch and Lomb Optical Company, was awarded the honorary degree of doctor of laws by the University of Rochester at its recent commencement exercises. The award was made in recognition of Mr. Bausch's "noteworthy contribution to optical science in connection with the provision of optical instruments of highest quality for industrial and scientific research."

DR. HOWARD HUNTER CRAVER, director of the chemical division of the Pittsburgh, Pennsylvania, Testing Laboratory, and editor of *The Crucible,* was presented with a gold watch at a dinner preceding a recent meeting of the Pittsburgh section of the American Chemical Society. The watch was given as a token of esteem and appreciation of his services to the Pittsburgh section of the society. Mr. E. E. Marbaker made the presentation speech.

HONORARY doctorates have been conferred by the Institute of Technology at Hannover on Dr. Friedrich Paschen, director of the Physikalisch-Technische Reichsanstalt, Berlin, and on Dr. Hans Stille, professor of geology and paleontology at Göttingen.

THE University of Geneva has awarded its doctorate *honoris causa* to M. Henry Correvon, an expert in Alpine plants and the designer of many Alpine gardens in Switzerland and in England.

AN informal meeting was held at the British Museum on July 11, presided over by the Archbishop of Canterbury, at which a bronze bust was presented to Sir Frederic Kenyon, director of the museum and principal librarian, in recognition of his work for the museum during a period of forty-two years.

FOUR new appointments to the staff of the New York Hospital-Cornell Medical College Association's Center, which will open in September, 1932, are announced by Dr. G. Canby Robinson, its director. The appointments are made a year in advance to enable the men to study the new laboratories and direct their equipment and plan the organization of their departments. The appointments include Dr. Eugene L. Opie, as professor of pathology of the Medical College and pathologist to the hospital; Dr. Herbert S. Gasser, as professor of physiology; Dr. George S. Amsden, as professor of psychiatry and psychiatrist-in-chief of the hospital, and Dr. James M. Neill, as professor of bacteriology and immunology. Professor Opie, now professor at the University of Pennsylvania, succeeds Dr. James Ewing, who will retire as head of the department of pathology after thirty years of teaching in Cornell. He will devote his time to a study of cancer and the problems of the Memorial Hospital, of which he is president of the medical board. Dr. Gasser, now professor of pharmacology in the Medical School of Washington University, St. Louis, succeeds Dr. Graham Lusk, who will retire from the Cornell faculty in 1932 after forty years of teaching. Dr. Neill, who is professor of bacteriology at Vanderbilt University School of Medicine, succeeds Dr. William J. Elser, who will continue as head of the department of applied pathology and bacteriology. Dr. Amsden will open the new department of psychiatry with Dr. William L. Russell.

DR. CHARLES E. SPEARMAN, professor of psychology at University College, London, will retire at the end of the coming academic year, when he will have passed the age of sixty-eight years. Dr. Cyril L. Burt, of the London Day Training College, has been appointed to succeed Dr. Spearman.

DR. FRANCIS BAYARD CARTER has been appointed professor of obstetrics and gynecology at the Duke University School of Medicine. Dr. Edwin C. Hamblen has been appointed associate professor in the department.

DR. HOWARD H. BEARD, assistant professor of biochemistry in the Western Reserve University School of Medicine, has been appointed professor of biochemistry at the Louisiana State University School of Medicine.

DR. JOHN H. PARKER, of the Kansas State Agricultural College, has been appointed acting professor of plant breeding for the year 1931–32 at Cornell University to take the place of Dr. H. H. Love, who is on leave of absence.

DR. GERHARD FUNKHAUSER, formerly of the faculty of the University of Berne and more recently research fellow on the Rockefeller Foundation at the University of Chicago and at Yale University, has been appointed assistant professor in the department of biology of Princeton University.

DR. RAYMOND E. MURPHY has been appointed economic geographer in the school of mineral industries of the Pennsylvania State College.

DR. BURT P. JOHNSON, of the University of Wisconsin, will spend next year investigating virus diseases of plants at the Citrus Experiment Station of the University of California. Dr. Johnson holds a fellowship of the National Research Council and has been research assistant to Dr. B. M. Duggar for the past three years.

MR. ALEXANDER B. KLOTS, of Cornell University, has accepted a position with Ward's Natural Science Establishment as head of the entomological department. He will also be an associate in entomology at the University of Rochester.

DR. WALDO S. GLOCK, of the Ohio State University, has been appointed by the Carnegie Institution of Washington for the year beginning July 1, 1931, as a full-time assistant to Dr. A. E. Douglass, of the Steward Observatory at the University of Arizona, in connection with the work of Dr. Douglass as a research associate of the Carnegie Institution on studies of tree growth and climatic cycles.

DR. T. J. DRAKELEY, since 1919 head of the department of chemistry and of the school of rubber technology at the Northern Polytechnic Institute, London, has been appointed principal of the institute to succeed Dr. R. S. Clay, who will resign on January 1 after serving for twenty-nine years.

DR. A. MURRAY DRENNAN, present professor of pathology in Queen's University, Belfast, has been appointed professor of pathology in the University of Edinburgh.

DR. JOHN F. V. PHILLIPS, who until recently was engaged in ecological research on the tsetse fly problem in Tanganyika Territory, British East Africa, has accepted the position of professor of botany at the University of Witwatersrand, Johannesburg, South Africa.

DR. RICHARD WAGNER, professor of physiology at the University of Graz, has been called to the University of Freiburg im Breisgau.

DR. A. E. LONGLEY, botanist of the U. S. Department of Agriculture, will spend several months at the Scripps Institution of Oceanography making special investigations at the acclimatization station of the department.

MR. FOSTER H. BENJAMIN, who was for some years assistant to Dr. Barnes at Decatur, Illinois, has been transferred to the U. S. Bureau of Entomology and assigned to a position in the National Museum where he will devote most of his time to identification work on North American Lepidoptera. Mr. Benjamin has been for the last three years engaged in work on the Mexican orange worms and the Mediterranean fruit fly for the Plant Quarantine and Control Administration of the U. S. Department of Agriculture.

PROFESSOR ARTHUR H. COMPTON, of the University of Chicago, will during September continue his investigations on the penetrating power and effects of the cosmos rays in the mountains and canyons of Colorado. Dr. Joyce C. Stearns, professor of physics at the University of Denver, is in charge of the expedition, which includes several selected students from both universities. The undertaking is sponsored by the two universities. Members of the expedition will climb Mount Evans, one of the highest Colorado peaks, and will take measurements from this altitude. They will go to Grand Lake to make use of the snow water at a high altitude.

THE British Colonial Office has issued a statement on a Conference of Colonial Directors and Deputy Directors of Agriculture, which was held in London recently to discuss administrative problems in their respective colonies. The conference was opened by the Secretary for the Colonies, and met, normally, under the chairmanship of his agricultural adviser, Mr. F. A. Stockdale. Among those present were the directors of agriculture of Malaya, Kenya and Nigeria, and the principal and commissioner of agriculture of the Imperial College of Tropical Agriculture in Trinidad. The questions discussed related rather to the administration of the agricultural departments than to the technicalities of agricultural research and experimentation. The conference recorded its appreciation of the high standard that has been attained in the training of agricultural officers, and emphasized the necessity for the continuance of the scholarship scheme. Certain suggestions were put forward for the extension of the training now given to the majority of scholars at Cambridge and at the Imperial College of Tropical Agriculture in Trinidad, especially in regard to the economic aspects of agriculture.

DR. UMMA SHUMA SHARGA has recently arrived at Cornell University from the University of Edinburgh to study entomological control methods in this country before returning to India. He will remain in Ithaca about a year.

THE annual meeting of the American Psychological Association will be held from September 10 to 12 at University College, Toronto. Dr. Walter S. Hunter will deliver the presidential address on "The Psychological Study of Behavior" on Friday, September 11.

THE autumn convention of the Electrochemical Society will be held in Salt Lake City, Utah, from September 2 to 5. Dr. Duncan MacRae, of the Edgewood Arsenal, is chairman of the local committee. The headquarters of the meeting will be at Lord Baltimore Hotel. Plans are under way for the sixty-first annual convention of the society to be held in Baltimore from April 21 to 23 in 1932.

THE sixteenth annual meeting of the Optical Society of America will be held at Rochester, New York, from October 22 to 24. In addition to the usual program of papers contributed by members on their own initiative, the meeting will include the following special features: (1) A session devoted to invited papers on "Aerial Photographic Mapping"; (2) a session devoted to invited papers on "Optical Problems in the Motion Picture Industry"; (3) a dinner at the plant of the Bausch and Lomb Optical Company followed by an exhibit illustrating operations of the plant and also some optical phenomena not often seen; (4) the annual society dinner followed by a trip to the University of Rochester to see the new buildings, and (5) the presentation of the Frederic Ives Medal for 1931. Sessions will be held at the Hotel Sagamore, in the auditorium of the new Research Laboratory of the Eastman Kodak Company, and in the Physics Building at the University of Rochester.

THE *Journal* of the American Medical Association announces that the second International Congress of Comparative Pathology will be held in Paris from October 14 to 18, under the chairmanship of Professor Achard, general secretary of the Academy of Medicine. The official topics on the program are: "Vaccination against Tuberculosis," Professor Calmette, Professor Gerlach, of Vienna, Professor Kfouri; "Brucella Infections in Man and Animals," Van der Hoeden, of Utrecht, Martin Kristensen, of Copenhagen, Oluf Bang, of Copenhagen; "Milk as a Pathogenic Agent," Drs. Lesne, Porcher and Tapernoux, of Lyons, Rowel, of Quebec; "Mineral Deficiencies," Simonnet and Randoin, Dr. Sjollema, of Utrecht, H. B. Humphrey, of Washington, D. C., Jacob Eriksson, of Stockholm, Kotte, of Freiburg im Breisgau; "Ultraviruses," Dr. Hauduroy, Professor Flu, of Leyden, Quanjer of Wageningen, Gussow, Canada, and von Brehmer, of Berlin; "Helminthiasis," Professor Joyeux, of Marseilles, and Baer, Stevenel and Lerroux; "Psittacosis," Professor Verge, of Alfort; "Anaphylaxis," Professor L. K. Wolff, of Utrecht; Professor D. Storm van Leuwen, of Leyden, Dr. Koeppenberg, of Groningen.

Industrial and Engineering Chemistry states that the first congress of the new International Association for the Testing of Materials will be held this year, from September 6 to 12, in Zurich, Switzerland, in the buildings of the Swiss Federal Polytechnicum. The association consists of individuals and companies in the various countries. In the United States, the national association through which contacts are established is the American Society for Testing Materials, and many of its members belong to the international body. The objects of the association are to secure international cooperation and the exchange of views and experience on all matters connected with the testing of materials. The chief means of securing this result is the holding of periodical international congresses at intervals of from three to five years. The work does not involve standardization of materials, which is one of the chief functions of the American Society for Testing Materials.

SPECIFIC bequests of more than $175,000 were made in the will of Dr. Richard Alexander Fullerton Penrose, Jr., who left the residue of his estate, valued at $100,000 to Western Reserve University, $50,000 to and the Geological Society of America. The two societies named in the will "are to receive the bulk of the estate in equal parts. The bequests are made in the form of endowment funds and only the income is to be used by the societies." The University of Chicago receives $50,000 to be used for the benefit of *The Journal of Geology,* of which Dr. Penrose was one of the editors for many years. The Economic Geology Publishing Company, incorporated in the District of Columbia, is given $25,000 to be used for the benefit of its journal.

THE will of the late Worcester R. Warner, president of the Warner and Swasey Company, bequeaths $100,000 to Western Reserve University, $50,000 to the Syrian Protestant College at Beirut, and $25,000 each to the American Society of Mechanical Engineers and to the Doshisha College at Kyoto, Japan.

JACOB F. SCHOELLKOPF, of Buffalo, has founded a gold medal to be awarded annually to some chemist in recognition of unusual research in chemistry. It will be presented for the first time at the eighty-second annual convention of the American Chemical Society which meets in Buffalo from August 31 to September 4.

A CORRESPONDENT writes: "The 69-inch reflector for the Perkins Observatory of the Ohio Wesleyan University has reached the final stages of figuring at the optical works of the J. W. Fecker Company, Pittsburgh. The Foucault knife-edge test at the center of curvature exhibits an extraordinarily satisfactory response with temperature changes indicating the excellent quality of the glass which was poured

in the research optical shops of the Bureau of Standards three years ago."

THE *Journal* of the American Medical Association states that a new department of preventive medicine has been established at Tulane University of Louisiana School of Medicine, New Orleans, as the result of an arrangement with the Commonwealth Fund of New York through which the university will participate in the rural health program recently initiated in Mississippi by the fund. An annual appropriation of $25,000 has been allotted by the fund to the school of medicine to establish the new department and to encourage attention to preventive medicine in other clinical departments. Five free scholarships have been established for undergraduate medical students from Mississippi, providing the student with $1,200 a year for four years, with the requirement that after graduation he shall practice at least three years in Mississippi. In addition, fifteen practicing physicians will be sent each year to Tulane for four months' graduate work. Their tuition and transportation to and from New Orleans will be paid by the fund and they will be allowed a monthly stipend of $250. Dr. William Harvey Perkins is head of the new department. The arrangement with Tulane is similar to that made recently with the Harvard University Medical School for practitioners of Massachusetts.

THE Forest Service of the U. S. Department of Agriculture has announced an addition of 16,558 acres of forest land to the national forest area in the Eastern, Southern and Lake states. The National Forest Reservation Commission has approved an expenditure of $52,624 for the purchase of this land. The land acquired will be added to the national forest purchase units which are already protected and administered by the Forest Service for continuous development of forest resources and to safeguard watershed values.

DISCUSSION

THE UNCERTAINTY PRINCIPLE AND FREE WILL

IN his very excellent presentation of the uncertainty principle, published in a recent number of SCIENCE,[1] Professor Darwin concludes with a comment regarding the significance of this principle in connection with the problem of "free will," which should not be allowed to pass without comment. He may be correct in his view that "the question is a philosophic one outside the thought of physics." Yet the reason that he offers to show that the uncertainty principle does not help to free us from the bonds of determinism is inadequate.

Darwin's argument is that "physical theory confidently predicts that the millions of millions of electrons concerned in matter-in-bulk will behave . . . regularly, and that to find a case of noticeable departure from the average we should have to wait for a period of time quite fantastically longer than the estimated age of the universe." He apparently overlooks the fact that there is a type of large-scale event which is erratic because of the very irregularities with which the uncertainty principle is concerned. I refer to those events which depend at some stage upon the outcome of a small-scale event.

As a purely physical example, one might pass a ray of light through a pair of slits which will so diffract it that there is an equal chance for a photon to enter either of two photoelectric cells. By means of suitable amplifiers it may be arranged that if the first photon enters cell A, a stick of dynamite will be exploded (or any other large-scale event performed); if the first photon enters cell B a switch will be opened which will prevent the dynamite from being exploded. What then will be the effect of passing the ray of light through the slits? The chances are even whether or not the explosion will occur. That is, the result is unpredictable from the physical conditions.

Professor Ralph Lillie has pointed out[2] that the nervous system of a living organism likewise acts as an amplifier, such that the actions of the organism depend upon events on so small a scale that they are appreciably subject to Heisenberg uncertainty. This implies that the actions of a living organism can not be predicted definitely on the basis of its physical conditions.

Of course this does not necessarily mean that the living organism is free to determine its own actions. The uncertainty involved may merely correspond to the organism's lack of skill. Yet it does mean that living organisms are not subject to physical determinism of the kind indicated by Darwin.

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[1] C. G. Darwin, SCIENCE, 73, 653, June 19, 1931.

GEOMORPHIC NOMENCLATURE

IN any progressive branch of science there arrives a time when the nomenclature adopted in the early stages of that science becomes inadequate, either be-

[2] Ralph Lillie, SCIENCE, 66, 139, 1927. Lillie draws much the same conclusion as that found here.