will participate jointly. The joint sessions will emphasize the application of physics in the industrial world of to-day. Leaders in various fields have been invited to take part in symposia concerned with the training of physicists for industry and with the applications of physics in industry. While abounding in technical value, these symposia will be addressed to all who are interested in science, whether or not they are specialists in the fields discussed. Every effort is being made to arrange a program of exceptional interest.

The headquarters will be at the Hotel Pennsylvania, and all the meetings will be held at the hotel. Non-scientists as well as engineers and chemists are cordially invited to attend this meeting.

On Thursday morning Dean Homer L. Dodge will speak on the training of physicists for industry from the point of view of the educator, while Dr. A. R. Olpin, of Kendall Mills, will speak from the point of view of the industrialist.

The speakers for the symposium on "Physics in Industry," which will be held on Thursday afternoon and Friday morning, are Messrs. E. C. Sullivan, Zay Jeffries, Paul D. Foote, J. P. Den Hartog, John E. Burchard, O. E. Buckley, Clark B. Millikan and Joseph Slepian. The papers will cover many phases of applied physics. The individual societies are also planning feature programs which will be announced in the near future.

On Friday evening a large joint dinner meeting of all the societies will be held. As a special entertainment feature, John Mulholland, president of the Society of American Magicians, will perform.

RECENT DEATHS

DR. EDWIN OAKES JORDAN, professor emeritus of bacteriology at the University of Chicago, died on September 2 at the age of seventy years.

DR. BERNARD SMITH, director of the British Geological Survey and Museum of Practical Geology, London, died on August 19 at the age of fifty-five years. Dr. Smith joined the Geological Survey in 1906; in 1931 he was appointed assistant to the director, Sir John Flett, and in July, 1935, he succeeded him as director. Dr. Smith was awarded the Bigsby medal of the Geological Society in 1927 and was elected fellow of the Royal Society in 1923.

WILLIAM RINTOUL, for ten years manager of the research organization of Imperial Chemical Industries, Ltd., died on August 25 at the age of sixty-six years.

PROFESSOR BENJAMIN GEORGE CORMACK, emeritus professor of botany at the Anderson College of Medicine, Glasgow, died on August 12 at the age of seventy years.

PROFESSOR JULIUS TANDLER, head of the Russian Health Institute, Moscow, previously federal minister of health in Vienna and professor of anatomy at the University of Vienna, died on August 26. He was sixty-two years old. Dr. Tandler attended the first International Hospital Congress at Atlantic City in 1929. He returned to the United States last year and lectured at the Columbia-Presbyterian Medical Center and at Mount Sinai Hospital.

DR. LUIGI DEVOTO, professor of pathology in the University of Pavia, an authority on occupational diseases, died on July 20, aged seventy-two years.

THE recent death is announced of the geologist, Dr. Krishna Kumar Mathur, principal of the Science College, Benares Hindu University.

SCIENTIFIC NOTES AND NEWS

DR. T. WAYLAND VAUGHAN, who recently retired as director of the Scripps Institution of Oceanography, La Jolla, will make his home in Washington, D. C., where he will continue his oceanographic work in connection with the U. S. Geological Survey and the U. S. National Museum. Before going to La Jolla in 1925, Dr. Vaughan had been senior geologist in the survey and associate in marine sediments at the museum.

PROFESSOR WILLIAM ERNEST CASTLE, who joined the faculty of Harvard University in 1897 as instructor in zoology, becoming professor in 1908, and who retired with the title emeritus last spring, has joined the faculty of the University of California, where he plans to continue his work on genetics. He is expected to take up his residence at Berkeley next month.

AFTER serving as head of the department of zoology at Oberlin College for twenty-three years, Professor Robert A. Budington has requested that that office be transferred to Dr. Charles G. Rogers, professor of comparative physiology in the department. In other respects Dr. Budington will continue in the same relation as hitherto to the program of zoological instruction.

Nature reports that at the annual summer Conference of Advisory Plant Pathologists at the University of Leeds, Dr. Geo. H. Pethybridge, mycologist to

the Ministry of Agriculture and Fisheries for the last twelve years, and previously for many years in the Department of Agriculture in Ireland, was presented with a radio receiving set, as a mark of appreciation on the occasion of his approaching retirement from official service.

WE also learn from *Nature* that the following awards have been made by the Royal Aeronautical Society: the Silver Medal to B. N. Wallis, for his work on geodetic construction; the Simms Gold Medal to W. S. Farren, for his inventions of new methods of the measurement of drag and his designs of scientific apparatus for aeronautical research; the Taylor Gold Medal to E. F. Relf, for his paper read before the society on the compressed air tunnel; the Sir Charles Wakefield Gold Medal to C. R. Fairey, for his work on the development of flaps; the Busk Memorial Prize to R. P. Alston, for his paper read before the society on wing flaps and other devices as aids to landing. At a recent meeting of the Amulree Committee the following awards were made on the recommendation of the Council of the Royal Aeronautical Society: the British Gold Medal for Aeronautics, as already announced in SCIENCE, to Dr. Hugo Eckener for his technical achievements in lighter-than-air craft, and the British Silver Medal for Aeronautics to A. J. Rowledge, for his scientific achievements in the development of aircraft engines.

Industrial and Engineering Chemistry states that the John M. Goodell prize, annually awarded to a member of the American Water Works Association for the most notable contribution to the science and practice of water-works development as recorded in the journal of the association, has been given for the year 1935 to Mathew M. Braidech, senior chemist, Baldwin Filtration Plant, Department of Public Utilities, Cleveland, for his paper entitled "The Spectrographic Determination of Minor Chemical Constituents in Various Water Supplies in the United States." H. E. Jordan, of the Indianapolis Water Company, has been awarded the John M. Diven Memorial Medal for outstanding service to the association.

IN recognition of the work of Dr. Edwin E. Osgood, assistant professor of biochemistry at the University of Oregon, on the growing of bone marrow, the Oregon State Board of Higher Education has approved increased funds for additional help, working facilities, materials and salary, looking forward to the establishment of a department of experimental medicine at the University of Oregon Medical School when deemed advisable.

OFFICERS of the Royal Anthropological Institute elected at the recent annual meeting are: *President,* Dr. H. S. Harrison; *Vice-president,* Dr. H. J. Fleure; *Honorary Secretary,* Dr. R. W. Firth; *Honorary Treasurer,* H. Coote Lake; *Honorary Editor,* R. U. Sayce.

THE REV. CHARLES A. BERGER, of Woodstock College, Maryland, was elected president of the Eastern States Division of the American Association of Jesuit Scientists at the concluding session of the fifteenth annual convention held at Holy Cross College, Worcester, Mass. He succeeds the Rev. Henry M. Brock, of Weston College.

LEWIS M. HEADLEY, of the Johns Hopkins University, has been appointed associate professor of mechanical engineering at the Iowa State College. He has been in charge of instruction in machine design at the Johns Hopkins University for the past seven years, and last year served as consulting engineer for the Pennsylvania Railroad electrification project.

PROMOTIONS in the College of Letters and Science of the University of Wisconsin have been announced as follows: Dr. H. A. Schuette and Dr. V. W. Meloche, of the department of chemistry, to full and associate professorships, respectively; to associate professorships, Dr. I. S. Sokolnikoff, mathematics, and Dr. C. A. Herrick, zoology. Professor A. H. Uhl has been named director of the course in pharmacy. In the College of Agriculture, Dr. C. A. Elvehjem, of the department of agricultural chemistry, and Dr. Charles L. Fluke, of the department of economic entomology, have been promoted to full professorships, and Dr. M. R. Irwin, of the department of genetics, has been advanced to an associate professorship. In the College of Engineering, R. R. Benedict, L. C. Larson and K. F. Wendt have been named assistant professors.

DR. J. BROOKES KNIGHT has been appointed curator of Paleozoic invertebrate paleontology in the department of geology at Princeton University.

DR. JOHN CLYDE HOSTETTER, director of research at the Corning Glass Works, who supervised the casting of the 200-inch telescope mirror for the California Institute of Technology, returned to the United States on September 1 after attending the International Conference of Glass Technologists in London as the official delegate of the National Research Council.

DR. W. W. MCLAUGHLIN, chief of the Division of Irrigation of the U. S. Bureau of Agricultural Engineering, has sailed for Europe as a delegate from the United States Government to the International Snow Survey Conference, which opens at Edinburgh on September 14.

DR. AND MRS. K. M. MEISTER, of the Plant Breeding Experiment Station in Saratov, in southern Russia, are making a four-months tour of the United

States and Canada to study cereals and allied crops of the North American continent.

DR. HUGH CABOT, of the Mayo Clinic, Rochester, Minn., lectured at St. Thomas's Hospital, London, on August 24 and 25.

DURING the past academic year the Stanford Chapter of Sigma Xi held public meetings addressed by the following scientific men: Professor Ernest O. Lawrence, on "Atoms: New and Old"; Dr. C. B. Bridges, on "The Relation between Genes and Chromosomes," and Professor Ross G. Harrison, on "The Study of Growth and Development by Grafting Embryonic Tissue between Animal Species." The chapter initiated on May 28 twenty-eight members and thirty-one associates. The initiation address was delivered by Professor W. F. Durand, national president of Sigma Xi, whose subject was "The Place of Science in Civilization." Officers for the year 1936–37 were elected as follows: *President,* P. H. Kirkpatrick; *Vice-president,* S. B. Morris; *Secretary-Treasurer,* E. L. Grant, and *Assistant Secretary-Treasurer,* D. M. Whitaker.

THE new public health laboratory of the Board of Health of New York City will be dedicated with formal exercises on the afternoon of October 6. Addresses will be given by Dr. Thomas Parran, Surgeon-General of the United States Public Health Service; Professor C.-E. A. Winslow, of Yale University; Dr. William H. Park, founder and director emeritus of the laboratory; Dr. Charles Gordon Heyd, president of the American Academy of Medicine; Dr. Anna Williamson, for many years assistant to Dr. Park; Dr. George McCoy, director of the National Institute of Public Health; Dr. Augustus Wadsworth, director of the New York State Laboratory at Albany, and Mayor F. H. La Guardia. The laboratory has been built with $700,000 from funds appropriated by the Public Works Administration, of which thirty per cent. was an outright grant and seventy per cent. a long term loan. The laboratory will be known as the William Hallock Park Research Laboratory, in honor of its founder.

THE Committee on Scientific Research of the American Medical Association invites applications for grants of money to aid in research on problems bearing more or less directly on clinical medicine. Preference is given to requests for moderate amounts to meet specific needs. For application forms and further information, please address the committee at 535 North Dearborn Street, Chicago.

WILLIAM H. DUNHAM, of Evanston, Ill., has presented to the Field Museum, Chicago, his private herbarium, consisting of 2,000 mounted sheets of plants. This collection is said to be of much local historical interest, because many of the specimens were gathered in the Chicago area, principally along the north shore, beginning about fifty years ago. Many of them are from areas now covered by buildings, where all natural vegetation disappeared long ago. The herbarium also contains many plants from other parts of the United States.

THE Georgia Rehabilitation Corporation has deeded to the University of Georgia a tract of land of 1,900 acres, estimated to be worth about $50,000, bringing the total number of acres of the campus to 3,500. The College of Agriculture and the George Foster Peabody School of Forestry will use the land for experiments and demonstrations.

THE Plant Science Seminar held its annual meeting from August 17 to 21 at a camp in the San Bois mountains, nine miles north of Wilburton, Oklahoma. The next seminar will be held in the East, probably on the Jersey coast. Officers elected for 1937 are: *President,* Dr. L. K. Darbaker, University of Pittsburgh; *Vice-president,* Dr. Elmer H. Wirth, University of Illinois, and *Secretary-Treasurer,* Dr. Loyd E. Harris, University of Oklahoma.

IN the search for superior germ plasm for the improvement of live stock in this country, the U. S. Department of Agriculture has imported from England several animals of breeds and types that are mostly little known in the United States. The shipment, which supplements importations of cattle, horses and dogs from several European countries within the last year, includes 3 South Devon cattle, 4 large black hogs, 22 white Wyandotte chickens and 11 white Austrian turkeys. After undergoing the necessary period of Federal quarantine, the South Devon cattle will be used by the Bureau of Dairy Industry and the hogs and poultry for experiments by the Bureau of Animal Industry. The South Devon cattle, a large breed, are noted for both beef and milk production. Bulls and steers attain a weight of approximately 1,800 pounds and the best cows yield upward of 16,000 pounds of milk annually. The large black hogs were obtained in Suffolkshire. The white Wyandotte chickens were obtained from various points in England and are to be used in comparisons with the same and other breeds of the United States. White Austrian turkeys also were obtained from England. The breed is similar to the white Holland turkey raised to some extent in the United States.

THE *New York Times* writes that severe storms and fog have been seriously impeding the operations of the Bowdoin College Scientific Expedition. A gale destroyed the party's wind generator, which was used for a source of electric power, and damaged meteoro-

logical equipment. The expedition's cruising boat, *The Scientist,* was recently lost in the fog and darkness off Kent's Island. Losing its course because of a four-knot tide, the vessel was entirely dependent upon radio for navigation. Signals were erected to lead it to the anchorage. Dr. A. O. Gross, leader of the expedition, reported that during the last month fourteen days of fog were experienced. Considerable scientific equipment was reported injured by the 90 per cent. average humidity. The main objective, the establishment of a scientific station on the isolated sea island, has been realized. Elaborate recording instruments have been installed to obtain weather information. An observer will operate this equipment during the winter, when the island is practically cut off from the rest of the world.

The Cornell Alumni News states that Dr. Frederick Bedell, professor of physics at Cornell University, on July 31 won a decision of a judicial referee in his suit against the Dictograph Products Company, Inc., to recover royalties and other payments amounting to more than $90,000 for the use of a bone conduction hearing device which he had perfected. Trial began last March 9 after almost a year of preliminary skirmishing between opposing counsel. A patent received by Professor Bedell is noted by the referee as proving that the instrument in question is, as claimed, a new invention.

THE department of physics of the University of Toronto in cooperation with the Meteorological Service of Canada offers a course in meteorology leading to an A.M. degree. It is open to graduates of recognized universities who have specialized in mathematics and physics, and consists of lecture courses in mathematics, applied mathematics, physics and dynamic meteorology, together with practical work in the use of meteorological instruments and weather forecasting. These sessions run from October 1 to May 24.

IN order to coordinate four hitherto separate collections, a Museum of Natural History has been created for the University of Oregon and the Oregon state system of higher education. Combined will be the formerly independent museum collections consisting of the Condon Museum of Geology, Herbarium, Oregon State Museum of Anthropology and Museum of Zoology, with Dr. L. S. Cressman as director. This organization will integrate the activities of the different parts and make more effective their use in the educational program of the University of Oregon. Although each unit is to retain its identity and have its own curator, the four units are to be coordinate for administrative purposes, have one budget and one administrative officer.

AT a meeting held on July 8, the board of trustees of the Colorado State Medical Society, according to the *Journal* of the American Medical Association, approved the establishment of the Colorado Medical Foundation. The plan to organize the institution was adopted at the 1935 meeting of the society, when authority for its creation was granted to the board of trustees by the House of Delegates. Its objective is to serve as a sound financial background for the membership of the society and its income "shall be used exclusively for charitable or educational purposes and the necessary expenses incident thereto." Although the fund is now small, *Colorado Medicine* points out, it is provided that until the foundation reaches the sum of $100,000, not more than 10 per cent. of its net annual income may be turned over to the treasurer of the state medical society for expenditure. After it reaches $100,000 and until it reaches $1,000,000, up to 50 per cent. of the net annual income may be utilized. After it reaches the million dollar figure, the portion of the income to be used, and the amount to be left in the fund to accumulate, will be determined by the officers and trustees of the society. The principal of the fund will never be expended. Any donor to the fund, however, may stipulate how his contribution may be expended and whether the principal and income shall be used in full or in part.

A CORRESPONDENT of the *Journal* of the American Medical Association writes that the work of installation at the center for the study of leprosy is proceeding rapidly. This institution has been established in accordance with an arrangement between the League of Nations and the Brazilian government with the philanthropic cooperation of Dr. Guilherme Guinle. Its inauguration recently took place at the office of the secretary of the exterior in the presence of high authorities, of the specialists on the staff of the new institution, and of the representative of the League of Nations, Dr. Etienne Burnet. The preparatory work of the International Center of Leprology has been started. The center is already organized with its complete personnel, having its seat at the Instituto Oswaldo Cruz, the director of which is Professor Carlos Chagas, who is also director of the International Center of Leprology, and with the installation of a pavilion especially constructed for this purpose at the Hospital-Colonia of Curupaity, in Jacarépaguá, a leprosarium exclusively erected for the sick of the federal district and under the direction of the national department of public health. This new pavilion has two stories with wards for two and four patients and a capacity of fifty patients, large verandas and recreation and lecture rooms. On the first floor are the consultation room and treatment rooms. The non-contagious cases of the disease will be treated in private clinics, leaving the beds in the leprosarium

for the isolation of the contagious cases. In the Hospital-Colonia of Curupaity is the section of clinical and experimental therapeutics. The school of Curupaity owes its importance in the center to the visit made to the colony in 1931 by Professor Nocht, well-known German expert, who went to Brazil for the League of Nations subsequent to the original proposition made by Professor Chagas.

DISCUSSION

CONCERNING FALLING CHIMNEYS

OCCASIONALLY one sees a photograph of a tall chimney caught in the act of falling to the ground. A characteristic feature of the fall is that the chimney may crack in mid-air soon after it starts to topple over, but the top of the chimney is observed to break *backward* instead of forward. The same phenomenon sometimes accompanies the felling of a tall tree. One may be tempted to speculate upon the cause of this peculiar behavior, for on first thought one might expect the top of the falling chimney to break over and fall forward. However, if the motion is considered as a *rotation* taking place about an axis at the base, it is evident that the break must be closely associated with the moment of inertia of the falling object. A simple analysis shows that, since all points of the chimney are moving with angular acceleration along the arcs of circles prior to the break, the center of percussion of the chimney is the point which has the natural acceleration of a particle moving under gravity along the same path. All parts of the chimney below its center of percussion are retarded; all parts above move with acceleration *greater* than they would have if constrained to move along the same paths under gravity alone. Hence there is an inertial reaction of the upper portion of the chimney which is opposite to the direction of motion, and the top lags behind. Breaks, if they occur at all, appear first above the center of percussion (Fig. 1a). Air

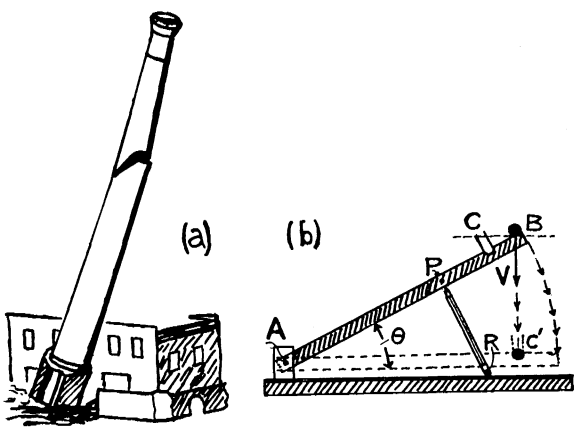

FIG. 1

resistance plays only a minor part, for such breaks develop before speeds commonly encountered in windstorms are reached. The gist of the matter is simply that the top of the chimney, barring such a break, would reach the ground sooner than could a freely moving particle traversing the same path under gravity alone. One might say that the "weight" of the upper portion of the falling chimney is effectively directed backward.

No doubt such an explanation of this interesting phenomenon is well known to engineers. However, two simple demonstrations have occurred to the author to illustrate the fact that the upper end of a toppling object moves with a linear acceleration greater than gravity would impart to a freely moving particle on the same path. The first illustration is effected with very limited facilities: simply take a meter stick and any heavy object, such as a paper weight. Support the object upon the right end of the stick while holding it horizontally with the index fingers of both hands. Release both ends at once, whereupon the stick and the object will be seen to fall together. Repeat the experiment, but this time place the index finger of the left hand *under* one end of the stick so that when the stick is released at the right end it will be forced to rotate about the left forefinger while falling. One might expect that since the left end of the stick is now restrained from falling, the right end would descend with vertical acceleration less than g and that the freely falling object would maintain contact with the right end of the stick or even get ahead of it. But the stick falls away from the object!

The second illustration is effected by means of a simple but entertaining gadget. A uniform stick AB (Fig. 1b) of any length (50 to 100 cm is convenient) is pivoted freely at A about a horizontal axis. At the end B there is bored a slight indentation just deep enough to retain a half inch steel ball. A light paper cylindrical cup is attached to the stick at C, where AC is 0.85 AB. The cup itself can be about 0.10 AB in height. Prop the stick AB by a lead pencil PR (eraser end at R to prevent slipping) in such a position that B is vertically above C′, the position occupied by C when the stick is horizontal. If, now, the prop is suddenly knocked out and the stick AB is allowed to fall, the freely falling ball B will drop into the cup! The whole motion is so rapid that the eye can scarcely follow it, but it proves conclusively that the end of the stick descends with vertical acceleration *greater than the acceleration of gravity*. The only condition imposed is that the angle θ shall not be too