of the oxygen content of liquid steel. In this connection non-aging steels have been produced which have superior properties to the ordinary structural steels with regard to the ductility of the steel and its ability to withstand high temperature heat treatment without detriment to its physical properties. This work will be described by Dr. Charles H. Herty, Jr., director of cooperative research, and his assistants.

Following the presentation of papers members of the board will hold the annual business meeting. In the evening an informal dinner will be held at the Hotel Schenley with Dr. Thomas S. Baker, president of the Carnegie Institute of Technology, presiding. The speaker for this meeting will be announced later.

These annual meetings of the board have grown in importance each year, and at the last meeting, despite business conditions and the slackening of industrial research, more than four hundred persons attended.

THE CENTENNIAL OF THE BASIC LAWS OF FARADAY

SEPTEMBER 12 marked the hundredth anniversary of Michael Faraday's discovery of the two basic laws of electrochemistry: Faraday observed that the amount of metal or gas produced at the cathode during electrolysis was directly proportional to the amount of current passing through the cell. The internationally accepted value of the ampere is based on this cell. Faraday furthermore found that upon connecting several cells in series, these cells containing different metal solutions, the amount of metal deposited upon the first cathode was equivalent to that of the second cathode, and this in turn equivalent to that of the third cathode and so on. Or, in other words, the same quantity of electricity sets free the same number of equivalents of substances at the electrodes.

The Electrochemical Society celebrated this centennial on the evening of September 8, the day that had been set aside by the Century of Progress Exposition at Chicago as "Faraday Day." Members and guests gathered in the large auditorium of the Illinois Host Building. Among those present was Mrs. Walter S. Faraday, of Chicago, widow of a grandnephew of Michael Faraday; Professor Robert S. Hutton, Goldsmiths' professor of metallurgy, University of Cambridge, England, and a charter member of the society, gave the principal address. Dr. Hutton reviewed the remarkable career of Faraday, illustrating his address with a series of reproductions of the pages of Faraday's note-book and diary.

Dr. George W. Vinal, of the Bureau of Standards, displayed a number of different types of coulometers which were exact replicas of those used and designed by Faraday. Dr. Vinal also demonstrated the laws of Faraday, using solutions of copper and of silver.

At this meeting the Edward Goodrich Acheson Medal and $1,000 prize were bestowed upon Dr. Colin G. Fink.

RECENT DEATHS

GEORGE HENRY PERKINS, vice-president emeritus of the University of Vermont and dean emeritus of its department of the arts and sciences, died suddenly on September 12. He would have been eighty-nine years old on September 25. When he gave up teaching this summer he had been a member of the faculty for sixty-four years. Dr. Perkins had been state geologist since 1898 and was Howard professor of natural history from 1869 to 1931.

DR. JOHN C. SHEDD, professor of physics in Occidental College from 1916 to 1930, and professor emeritus for the last three years, died on May 20, at the age of sixty-four years.

DR. CHARLES LEWIS BEACH, president emeritus of Connecticut State College, formerly professor of dairy husbandry at the University of Vermont, died at Storrs on September 15, at the age of sixty-seven years. He had been ill for some years and resigned the presidency in 1928.

DR. RAMSAY WRIGHT, who retired in 1912 as professor of biology at the University of Toronto, died on September 6, in Worcestershire, England, at the age of eighty-one years.

DR. WALTER GROSS, professor of pathology and pathological anatomy in the medical faculty at Münster, committed suicide on September 15.

SCIENTIFIC NOTES AND NEWS

DR. FRANK BLAIR HANSON, professor of zoology at Washington University, St. Louis, has been appointed assistant director of the Natural Science Division of the Rockefeller Foundation. Dr. Hanson returned from Paris a year ago after a two-years leave of absence, during which time he was fellowship administrator in Europe of the Rockefeller Foundation.

PROFESSOR HEZZLETON E. SIMMONS, head of the department of chemistry and a specialist in rubber technology at the University of Akron, has been ap-

pointed president to succeed Dr. George F. Zook, who recently became United States Commissioner of Education.

DR. JULIUS STIEGLITZ, professor of chemistry and chairman of the department of chemistry at the University of Chicago, became professor emeritus on July 1. Dr. Stieglitz continues as professor on a special appointment.

DR. E. O. ULRICH, who retired last year as geologist of the U. S. Geological Survey, and Dr. R. Ruedemann, New York State paleontologist, have been elected corresponding members of the Society of Natural History, Frankfurt.

AWARDS of merit for 1933 have been made by the American Congress of Physical Therapy for meritorious work with radium to Dr. Claudius Regaud, associate director at the Curie Institute, Paris; for merit in physical medicine to Dr. Walter J. Turrell, of the University of Oxford; for merit in developing electro-surgery to Dr. Harvey Cushing, of Yale University; for pioneer literary work in physical medicine to Dr. Gustavus M. Blech, of Chicago, and for merit in radiology to Dr. Gustav Bucky, of New York.

DR. ARTHUR ROCHFORD MCCOMAS, past president of the Missouri State Medical Association, was given a testimonial dinner during the recent seventy-sixth annual meeting of the association in Kansas City. Dr. McComas has served as chairman of the council of the association continuously since 1916, except for the year of his presidency in 1922.

THE issue of the *New English Journal of Medicine* for July 13 was in honor of Dr. Robert B. Osgood, who retired in 1931 from the chair of orthopedic surgery at the Harvard Medical School. It contains a foreword by the late Sir Robert Jones.

DR. LLOYD L. DINES, formerly professor of mathematics and junior dean of the college of arts and sciences at the University of Saskatchewan, has been appointed head of the department of mathematics at the Carnegie Institute of Technology.

DR. DONALD K. TRESSLER, chief chemist for the Birdseye Laboratories of Gloucester, Massachusetts, has been appointed chief of research in chemistry and head of the division of chemistry of the New York Agricultural Experiment Station at Geneva. At that station Dr. D. C. Carpenter, of the division of chemistry, has been transferred to the dairy division, where he will engage in special dairy chemistry research.

DR. RAYMOND T. BIRGE, chairman of the department of physics at the University of California, announces that the following research associates of the department will be in residence at Berkeley during the academic year 1933–34: National Research Council fellows—Dr. Robley D. Evans, working with Professor L. B. Loeb, Dr. Wendell H. Furry, working with Professor J. R. Oppenheimer, Dr. F. N. D. Kurie and Dr. Edwin M. McMillan, working with Professor E. O. Lawrence; Professor Rafael Grinfeld, Rockefeller Foundation fellow from La Plata University, working with Professors Birge and F. A. Jenkins (until December, 1933); Dr. R. L. Thornton, Moyse scholar from McGill University, working with Professor Lawrence. In the radiation laboratory of the department, Dr. Malcolm C. Henderson, Dr. John J. Livingood and Dr. M. S. Livingston are continuing as research associates with Professor Lawrence. Other research associates are Dr. John F. Carlson and Dr. Melba N. Phillips, working with Professor Oppenheimer, Dr. Afton Y. Eliason, working with Professor H. E. White, and Dr. Frederick W. Sanders, working with Professor Loeb. Mr. Telesio Lucci continues as research assistant in the radiation laboratory. Among the graduate students are Mr. B. B. Kinsey, Commonwealth fellow from Cambridge University, and Mr. Milton G. White, Charles A. Coffin Foundation fellow.

THE appointment at the University of Cambridge of the following university lecturers for three years from October 1 is announced: A. E. Goodman, Gonville and Caius College, Aramaic; H. L. H. H. Green, Sidney Sussex College, anatomy; R. Williamson, Clare College, pathology; L. R. Shore, St. John's College, and F. Goldby, Gonville and Caius College, have been appointed university demonstrators in the department of anatomy for three years from October 1.

ACCORDING to the *Journal* of the American Medical Association, Professor Dr. Ernst Rüdin, who is associated with the German Research Institute for Psychiatry at Munich, has been appointed a representative of the federal ministry of the interior in the German Society for Racial Hygiene. He has assumed direction of the society and has moved its headquarters from Berlin to Munich. The previous chairman was Professor Eugen Fischer, director of the Kaiser Wilhelm Institute for Research in Heredity and the newly elected rector of the University of Berlin. Through the recent death of James Loeb, of the United States, this institution received a bequest of $1,000,000, as a culmination of many previous gifts during the lifetime of its benefactor.

DR. A. E. KENNELLY, professor emeritus of electrical engineering at Harvard University and the

Massachusetts Institute of Technology, sailed for Europe on September 1.

E. L. KIRKPATRICK, of the Wisconsin College of Agriculture, has been relieved of his duties for one semester to permit him to assist in the federal program, where he will serve as rural relief analyst and adviser to the various groups engaged in that work.

DR. ALBERT C. SMITH, associate curator of the New York Botanical Garden, sailed on September 9 from San Francisco on his way to the Fiji Islands, where he will spend a year gathering plants, traveling on a fellowship from the Bishop Museum in Honolulu in cooperation with Yale University. He will stop for two weeks in Hawaii. At the end of his year's leave of absence he will return to the garden to work on the identification of his specimens.

DR. STILLMAN WRIGHT, formerly limnologist of the U. S. Bureau of Fisheries, one of several skilled investigators lost from the service because of the needs of economy, has sailed from New York for Rio de Janeiro to join the Brazilian Government in a study of fish farming possibilities in the numerous artificial lakes and reservoirs in northeastern Brazil.

DR. GEORGE GAYLORD SIMPSON, associate curator of vertebrate paleontology at the American Museum of Natural History, and Coleman S. Williams, his assistant, left for Buenos Ayres on September 9. On this excursion, the expedition, which is financed by H. S. Scarritt, of New York, will seek relics of extinct South American mammals.

BARNUM BROWN, of the American Museum of Natural History, is continuing exploration in Montana and Wyoming of the Lower Cretaceous beds of those states, especially on the Crow Indian Reservation in Montana. *Natural History* reports that this is the third season devoted to this field. In 1931 and 1932 twelve dinosaur skeletons were excavated and two large Sauropod skeletons were discovered, partly explored and re-covered, near Graybull, Wyoming, in the Bighorn Basin. These two skeletons are covered by ten feet of sandstone, which Mr. Brown plans to remove over an area of 65 x 45 feet, but the skeletons will not be removed this year.

DR. REUBEN L. KAHN, director of laboratories of the University Hospital and assistant professor of bacteriology, University of Michigan, is sailing for Rome, at the invitation of the Volta Foundation of the Royal Academy of Italy. The foundation has arranged immunological meetings to take place in Rome from September 25 to October 1. Dr. Kahn will present two papers. One is entitled, "The New Serology of Syphilis"; the other, "Tissue Reactions in Immunity."

THE Italian section of the Permanent International Commission on Labor Medicine and the Italian Society of Industrial Medicine will sponsor a celebration of the third centennial anniversary of the birth of Bernardino Ramazzini on October 4, at the University of Milan. Representatives of most of the countries of Europe will attend and will discuss the influence of Ramazzini on industrial medicine in the various states. The following day a special meeting devoted to discussion of ancylostomiasis will be held at the clinic, with the foreign physicians as participants. In addition to the Milan celebration, the universities of Modena, Padova and Parma, with which Ramazzini was associated at various times, will hold ceremonies in his honor, on October 6.

Industrial and Engineering Chemistry reports that the international technical committee of the third Congress of Technicians and Chemists in Agricultural Industries recently met in Paris to organize another of these congresses, to be held in Paris from March 28 to April 5, 1934. The congress was undertaken by the French Association of Chemists of Agricultural Industries under the patronage of the French Ministry of Agriculture and the above dates have been tentatively set.

STEVENS INSTITUTE OF TECHNOLOGY is planning for the first week in December of the current year a celebration at Hoboken, New Jersey, of the fiftieth anniversary of the graduation from the institute of Frederick Winslow Taylor. The celebration is planned to occur during the annual meetings of the American Society of Mechanical Engineers and the Taylor Society. The cooperation also of various other bodies having primary interest in modern management is assured. These bodies and the various engineering colleges are being invited to send delegates, and greetings are being solicited from men in other countries whose names have been associated either with Taylor's philosophy specifically or with modern management generally. As tentatively contemplated at the present time, the celebration will include an afternoon and evening with the possibility that some features may occupy the morning hours. Arrangements are being made for something impressive and historically significant in the way of a demonstration of metal-cutting. The Stevens Institute students are working on two dramatic sketches illustrative of incidents in Taylor's career as a student and at Bethlehem. There will be an interesting exhibit of Tayloriana supported by many contributions from Mrs. Taylor and from men associated with Taylor's activities over the period from 1883 until his death. At a reception during the afternoon, it is expected that members of Mr. Taylor's family and many of his associates will be

present. There will be an informal dinner in Hoboken and in the evening a commemorative meeting with an address by some person of national reputation.

THE *Journal* of the American Medical Association writes: "The council of the Royal College of Surgeons is advertising all over the English-speaking world the vacancy caused by the resignation of Sir Arthur Keith as conservator of the museum and director of research. Advertisements have been sent not only to the English medical journals and the *Times* but to the Australian, New Zealand and Canadian medical journals and to the *Journal* of the American Medical Association. The duties include charge of the museum in all departments, the laboratory at Lincoln's Inn Fields and the Buckston Brown research farm. The conservator has to report to the Museum Committee on all objects offered either as donations or for purchase or in exchange to complete the catalogue of the collection and to continue and correct it from time to time. He has to register particulars of every specimen acquired by the college and to classify and arrange all additions to the collection. His whole time is to be at the disposal of the college and he is required to deliver lectures illustrated by the contents of the museum. The salary offered is $5,500 per annum with an honorarium for lectures, which amounts to about $500. Grants are also made to defray expenses in journeys abroad to inspect other collections. All applications must be received by October 7."

A NEW section has been established in the Agricultural Adjustment Administration to handle codes and problems in connection with the capture, processing and distribution of fish and fish products. R. H. Fiedler, chief of the Division of Fishery Industries of the Bureau of Fisheries, has been detailed as chief of the new section. Lawrence T. Hopkinson, of the United States Tariff Commission, and Robert S. Hollingshead, of the Foodstuffs Division of the Bureau of Foreign and Domestic Commerce, both of whom are experienced in matters concerned with the fisheries and fishery industries, also have been detailed to the section. The fisheries section will have jurisdiction over codes affecting the fishery industries, with the exception of matters pertaining to hours of labor and rates of pay, which come under the National Recovery Administration.

SERIOUS curtailment of the work of the Bureau of Public Administration at the University of California during the ensuing year, which was threatened by the drastic cut in state support, has been made unnecessary by the receipt of a gift of $20,000 from the Rockefeller Foundation of New York, according to an announcement made by President Robert Gordon Sproul following the September meeting of the regents.

STANLEY F. MORSE, consulting agricultural engineer, has formulated and is directing the ten-year agricultural development program of Sumter County, South Carolina. The objects of this program are (a) to reduce the costs of producing farm products, (b) to raise standardized products of marketable quality, (c) to market these products through the Farmers' Exchange that has been organized. To secure basic facts on which to build this program the South Carolina Experiment Station, under the direction of Professor H. W. Barre, has made an agricultural economic survey of Sumter County, the results of which are embodied in Bulletin 288. To provide additional data a new soil survey of this county is also being made. The successful carrying out of this program is being based largely on the cooperative efforts of the farmers themselves who are working on the principle that "the best help is self-help." Mr. Morse was formerly professor of agriculture and director of agricultural extension of the University of Arizona, and his experience as an agricultural consultant has included thirteen foreign countries.

ACCORDING to a correspondent of the London *Times*, the Adelaide University and Museum scientific expedition, which has spent some time in the interior of Australia studying the social organization, customs, language and physical characteristics of the aboriginals, has returned to Adelaide. It has brought back a collection of plaster casts of faces and busts and specimens of native handiwork, as well as cinema and sound records. The chief protector of aborigines, Mr. McLean, and Dr. Cecil Hackett, of the University of Adelaide, were out of touch with civilization for ten weeks, and the other eight members of the expedition camped in the Musgrave Ranges, 300 miles north of Oodnadatta. Mr. McLean, who is specially reporting to the government, said that the aborigines were in good condition and he had not heard any evidence of their ill-treatment by whites. Those not in contact with whites had retained their primitive vigor and independence, and were reproducing themselves at the normal rate.

THE Department of the Interior, through the Bureau of Reclamation, announces that the area around the 115-mile lake which will be formed when the great Boulder Dam is completed will be set aside as a public reservation and recreation park. Camping, fishing and boating parties will use the free sites around the shores. The Federal Government is planning a network of new roads, through the bureau of public roads. These roads will top the transcontinental lines, connect Boulder Canyon region with Zion Park and Grand Canyon routes. Overland traffic of the

Santa Fé trail will go across the top of the dam, which will serve as a bridge across the Colorado. At Black Canyon, the dam will form a wall of smooth cement, 700 feet in height.

THE final report on the production of electricity in the United States in 1932, released by the Department of the Interior through the Geological Survey, shows that a total of 83,153,000,000 kilowatt-hours was produced for public use in 1932. Of this total 41 per cent. was produced by the use of water power and 59 per cent. by the use of fuels. The proportion of the total output produced by the use of water power was more in 1932 than ever before. The total output in 1932 was 9.4 per cent. less than in 1931, which in turn was 4.4 per cent. less than in 1930, and the output in 1930 was 1.5 per cent. less than in 1929, the year of maximum output. The output by the use of water power in 1932 was 11.4 per cent. greater than in 1931, and the output by the use of fuels was about 20 per cent. less than in 1931. The total output in 1932 was about 14.5 per cent. less than in 1929; the demand for electricity has therefore held up well in comparison with other industries during the three years of the depression. The increase in efficiency in the use of coal, oil and gas in the generation of electricity, which has been accomplished consistently each year since 1919, was continued during 1932. The average amount of coal and coal equivalent of oil and gas consumed in generating 1 kilowatt-hour of electricity at public-utility plants was 1.51 pounds. In 1919 the consumption of coal per kilowatt-hour was 3.2 pounds. The steady continuation of this increase in efficiency, especially during these three years of unfavorable load conditions, speaks well for the operators of public-utility power plants.

DISCUSSION

HAILSTONE DAMAGE TO BIRDS

ON Thursday night, April 20, 1933, Baton Rouge, Louisiana, and vicinity was visited by a local thunder storm accompanied by considerable hail. Most of the hail fell between 8:30 and 9 o'clock in the evening. The hailstones varied in size a great deal, the maximum size reported being as large as "hens' eggs," according to the newspapers.

The center of the storm apparently passed through the city of Baton Rouge, coming from the west and traveling slightly northeast from here. Hail was reported about twenty-five miles west of Baton Rouge and about twenty miles east. The width of the hail-storm apparently was not over twenty miles across.

Many thousands of dollars worth of damage was done in the city of Baton Rouge, with relatively little damage at distances north and south six to eight miles away.

One of the interesting results of this storm was the enormous destruction of bird life. On the morning following the storm, many dead birds were found on the campus of the Louisiana State University and reports from the immediate vicinity out from Baton Rouge showed even a heavier mortality. Immediately north of Baton Rouge in the suburb Istrouma in an open area, approximately five acres in size, one man collected 26 bob-whites which had been killed by the storm. These were spotted by pointer dogs, so it is likely that this represents the major portion of the birds killed in this area.

Meadow larks, sparrows, mocking-birds, Virginia cardinals and other birds were found by students on the campus and could be seen killed along the highways leading to the city. The number of birds actually killed on the highways would probably average one bird to each half mile, but a highway represents a very narrow strip of territory and one not containing many birds. It does, however, give a little idea of the mortality which must have taken place in the surrounding neighborhood. From this it can be seen that the total destruction of the birds over the entire area visited by hail must have been enormous.

An interesting item in this connection is also the fact that apparently a large flock of scarlet tanagers must have been passing through this vicinity on the night of this storm. Aside from the bob-whites which were spotted by dogs, there were more scarlet tanagers reported as having been killed than any other one species of bird. The total number of tanagers reported to the zoology department, excluding all possibilities of duplication, was twenty-seven. This number merely represents the number of males killed and seen. The female with her dull color is not identified by the laymen. It was only the scarlet-colored males that were noticeable. It is probably safe to say that an equal number of females in the same area were killed. Three of these scarlet tanagers were captured alive with merely a broken wing. One of them was kept alive in the department for nearly two weeks. One of the other two is still living at the present writing.

This mortality represents simply the birds killed within territory frequented by persons and does not include a large amount of wooded, swampy or other territory not frequented by people. It is probable that of scarlet tanagers alone, including the entire