geomorphology. The last half day of the last session was devoted to papers on geomorphology. In this group should be included the address of the retiring president, Dr. François E. Matthes, of the U. S. Geological Survey, who spoke on "Our Greatest Mountain Range, the Sierra Nevada of California."

Six papers were devoted to urban geography. This interest in the geographical aspects of cities illustrates a feature of modern geographical field studies.

On Tuesday afternoon, December 26, one session was devoted to the general subject—"Conventionalizing Geographic Investigation and Presentation." Professor P. E. James, University of Michigan, presented a paper on "The Terminology of Regional Description." Professor W. D. Jones discussed "Procedures in Regional Investigation." The final paper of the group was given by Professor V. C. Finch, University of Wisconsin, on "Written Structures for Presenting the Geography of Regions."

Ten papers at least were strictly in the field of regional geography or chorography. In these there was evidence of the use of the techniques and terminology discussed in the symposium mentioned above.

A feature of the meeting was an address by Dr. L. Dudley Stamp, of the London School of Economics, who was an invited guest of the association. He spoke on the subject "One Hundred Years of Change in Land Utilization in the British Isles—the Work of the Land Utilization Survey of Britain." In this paper Dr. Stamp discussed not only the results of the survey but the method by which they are gradually completing a land use map of Britain on the scale of six inches to the mile.

For the forthcoming year the officers elected are: *President,* Dr. W. W. Atwood, president of Clark University; *Vice-president,* Professor V. C. Finch, University of Wisconsin; *Treasurer,* Professor R. S. Platt, University of Chicago; *Secretary,* Professor Frank E. Williams, University of Pennsylvania, and *Counselor,* Professor P. E. James, of the University of Michigan.

SCIENTIFIC NOTES AND NEWS

IN conferring the degree of doctor *honoris causa* on Dr. Harvey Cushing in connection with the ceremonies marking the formal reopening of the University of Paris on November 4, Dr. A. Roussy, professor of morbid anatomy and dean of the faculty of medicine, said in part: "I render public homage not only to one of the greatest surgeons of the United States of America but also to the man whose work in anatomy, physiology and clinical surgery has brought great progress to modern neurology and to the ingenious inventor whose new forms of technique have made it possible, during the past thirty years or more, to save thousands of lives."

FOR the first time in 121 years the Connecticut State Medical Society on January 5 exercised its charter right to confer the honorary degree of doctor of medicine. The recipient was Dr. Russell H. Chittenden, professor emeritus of physiological chemistry and emeritus director of the Sheffield Scientific School of Yale University. The ceremony was a feature of the one hundred and fiftieth anniversary of the founding of the New Haven Medical Association. In conferring the degree, Dr. Ralph A. McDonnell, president of the state society, said: "This honor, now held by no living man, is about to be conferred upon you in recognition of your valuable contributions to our knowledge of the human body and because of the inspiration derived from your instruction by many who later achieved marked success in the practise of medicine."

AT the meeting of the American Astronomical Society held at Cambridge from December 28 to 30, Dr. Albert Einstein was elected to honorary membership. There are seven other living honorary members.

ON the occasion of the annual meeting of the National Council of Geography Teachers, the Distinguished Service Award was presented to Professor R. H. Whitbeck, of the department of geography in the University of Wisconsin. The award was established only a year ago and the first recipient was Dr. William M. Davis, professor of physiography, emeritus, at Harvard University. At the end of the present academic year Professor Whitbeck will complete twenty-five years of service at the University of Wisconsin.

AT a ceremony in New Orleans on December 4, Dr. Rudolph Matas, since 1928 emeritus professor of surgery, Tulane University of Louisiana School of Medicine, New Orleans, was presented with the medal of the Order of Isabella the Catholic, the only Spanish decoration retained by the republic from the late monarchy; the presentation was made by the consul of Spain. The honorary degree of doctor of medicine and surgery was also conferred on Dr. Matas on this occasion, the consul-general of Guatemala making the presentation on behalf of the University of Guatemala. The mayor of New Orleans presided at the ceremony.

ON January 23 the first Matas Award in Vascular Surgery will be presented in New Orleans to Dr. Mont R. Reid, from 1895 to 1927 professor of surgery at Tulane University, now professor of surgery at the University of Cincinnati.

DR. WILLIAM HALLOCK PARK, director of laboratories of the New York City Department of Health, celebrated his seventieth birthday on December 30. Among the gifts received was a bronze *bas relief* plaque. This was presented on behalf of the workers in Dr. Park's laboratory at a brief ceremony in the auditorium of Willard Parker Hospital by the retiring commissioner of health, Dr. Shirley W. Wynne, as his last official act. The plaque is the work of the sculptor Alexander Finta.

DR. J. MCKEEN CATTELL, editor of SCIENCE, was given a dinner at the University Club, Boston, at the time of the meeting of the American Association for the Advancement of Science. Dr. Karl T. Compton, president of the Massachusetts Institute of Technology, presided, and Dr. John Dewey, emeritus professor of philosophy, Columbia University, made the principal address.

DR. WILLIAM E. PRAEGER, since 1905 head of the department of biology at Kalamazoo College, Michigan, has recently celebrated his seventieth birthday anniversary. Next June he will have terminated twenty-nine years of active service at Kalamazoo, primarily in the teaching of botany.

DR. LECOMTE DU NOÜY, head of the biophysical department of the Pasteur Institute, Paris, has been elected a member of the German Academy of Sciences at Halle, in recognition of his scientific work and in particular of his work on the physical and physicochemical manifestations of immunity. Dr. Royal Whitman, of New York City, has been elected to membership in recognition of his work in orthopedic surgery.

E. F. REID has been awarded the Coopers Hill War Memorial Prize of the British Institution of Civil Engineers for 1932 for his paper on "Failures in Steel and Cast-Iron Mains and Provision for their Protection."

DR. R. ST. A. HEATHCOTE, lecturer in the University of Wales, has been decorated with the Third Class of the Order of the Nile, conferred upon him by the King of Egypt, in recognition of valuable services rendered by him as professor of pharmacology in the Egyptian Faculty of Medicine.

THE *Journal* of the American Medical Association states that special ceremonies in the School of Tropical Medicine of the University of Puerto Rico, San Juan, on December 16, marked the unveiling of a bronze bust of Dr. Bailey K. Ashford, who recently retired as a colonel of the medical corps, U. S. Army. The Honorable Benjamin J. Horton, acting governor of Puerto Rico, presented the bust to the School of Medicine, and Dr. George W. Bachman, director, made the speech of acceptance. Other speakers were Carlos Chardón, chancellor of the University of Puerto Rico, and Dr. Rafael Bernabe, president of the Medical Association of Puerto Rico. The casting of the bronze bust was unanimously approved by the legislature in recognition of the work of Dr. Ashford as founder of the School of Tropical Medicine and as initiator of the first campaign against hookworm disease in America.

DR. FRIEDRICH PASCHEN, Berlin, formerly president of the Physikalisch Technische Reichanstalt, and Dr. Arnold Sommerfeld, professor of theoretical physics at Munich, have been elected honorary members of the Physical Society, London.

DR. REGINALD RUGGLES GATES, professor of botany at Kings College, University of London, has been appointed a fellow of the college.

THE title of emeritus professor of eugenics has been conferred by the University of London on Dr. Karl Pearson on his retirement from the Galton chair of eugenics at University College, and that of emeritus professor of Egyptology on Sir Flinders Petrie on his retirement from the Edwards chair of Egyptology.

DR. CLARENCE KING has been appointed professor and head of the department of ophthalmology at the University of Cincinnati College of Medicine, to succeed Dr. Victor Ray, who has been made professor emeritus.

PROFESSOR RICHARD SIEBECK, of the University of Heidelberg, has been appointed to succeed Professor Wilhelm His in the chair of internal medicine and the directorship of the first University Medical Clinic.

The British Medical Journal states that the following German professors have resigned their appointments: Professor P. Wohlwill, professor of surgery at Hamburg; and Professor F. Janssen, professor of surgery, and Professor P. Neukirch, professor of internal medicine, at Düsseldorf.

OFFICERS of the American Society of Parasitologists have been elected as follows: *President,* E. E. Tyzzer, of Harvard Medical School; *Vice-president,* J. E. Ackert, Kansas State College; *Secretary,* H. W. Stunkard, New York University; *Treasurer,* J. Andrews, Johns Hopkins School of Hygiene. New council members elected at Boston are Dr. E. B. Cram, of the U. S. Department of Agriculture, and Dr. W. A. Sawyer, of the Rockefeller Foundation. The next meeting of the society will be held at Pittsburgh.

OFFICERS of the Entomological Society of America elected for 1934 are: *President,* C. L. Metcalf; *First vice-president,* E. P. Van Duzee; *Second vice-president,* J. H. McDunnough; *Secretary-treasurer,* H. B. Hungerford.

AT the annual meeting of the American Society of

Agronomy held in Chicago, Illinois, on November 16 and 17, the following officers were elected for the ensuing year: Professor R. I. Throckmorton, Kansas State College, *president;* Dr. H. K. Hayes, University of Minnesota, *vice-president;* Professor J. D. Luckett, New York State Agricultural Experiment Station, *editor,* and Dr. P. E. Brown, Iowa State College, *secretary-treasurer.* Professor Charles F. Shaw, of the University of California, was elected chairman of the soils section and Professor H. L. Westover, of the Bureau of Plant Industry, was elected chairman of the crops section. Professor R. M. Salter, of the Ohio State University, and Dr. J. G. Dickson, of the University of Wisconsin, were elected to the council of the American Association for the Advancement of Science, as representatives of the society.

AT the Philadelphia meeting of the American Association of University Professors the following officers were elected: *President,* Professor S. A. Mitchell, director of the Leander McCormick Observatory of the University of Virginia; *Vice-presidents,* Dr. H. W. Tyler, emeritus professor of mathematics at the Massachusetts Institute of Technology, consultant in science to the Library of Congress and general secretary of the association, and Dr. Yandell Henderson, professor of applied physiology at Yale University. Dr. W. W. Cook, professor of law at the Johns Hopkins University, was elected to succeed Dr. Tyler as general secretary.

OFFICERS for 1934 of the Royal Society of South Africa have been elected as follows: *President,* Dr. A. W. Rogers; *Treasurer,* Dr. L. Crawford; *General Secretary,* A. J. S. Goodwin; *Editor,* Professor R. S. Adamson; *Librarian,* Professor E. Newbery.

DR. CHESTER K. WENTWORTH, associate professor of geology at Washington University, St. Louis, has been granted an indefinite leave of absence to accept appointment as geologic engineer to the Honolulu Board of Water Supply. He will reach Honolulu early in February to undertake detailed geologic studies relating to the development of potential water supplies for the city of Honolulu.

DR. JEAN R. OLIVER, professor of pathology at the Long Island College of Medicine, has been assigned an additional grant of $1,000 by the Josiah Macy, Jr. Foundation for continued studies on the pathology of Bright's disease.

THE Committee on Scientific Research of the American Medical Association has made the following grants: to Dr. Harry B. Friedgood, for work on the therapeutic effects of various iodide compounds on experimental exophthalmic goiter in the guinea pig; to Dr. Carroll L. Birch, of the College of Medicine of the University of Illinois, for assaying urine of hemophiliacs and normals for the sex hormone of the anterior pituitary gland; to Dr. John L. Ulrich, to continue investigations on reciprocal action in the cat's nervous system. This work is being carried out in the department of zoology of the Johns Hopkins University.

AT the annual dinner of the Explorers Club, New York City, on January 6, F. Trubee Davison, president of the American Museum of Natural History, spoke on "Modern Exploration." Dr. Roy Chapman Andrews was toastmaster. Air Commodore P. F. M. Fellowes, leader of the Houston-Mt. Everest expedition last year, showed films taken on the flight over the summit. Bradford Washburn and Julien Bryan showed motion pictures on exploration subjects.

THE 1933 Marburg Lecture of the American Society for Testing Materials, which was delivered at the last annual meeting by Dr. H. J. Gough, superintendent, Engineering Department, National Physical Laboratory, England, on "Crystalline Structure in Relation to Failure of Metals—especially by Fatigue," has been published, and copies in separate form are now available. Dr. Gough, for over ten years, has carried out extensive experimental studies of metallic single crystals and he discusses in this lecture that section of the work concerned principally with the characteristics of deformation and fracture under mechanical forces.

THE Centennial Commission of the First and Second District Dental Societies of the State of New York announces the following to be awarded for suitable essays, at the discretion of the Prize Committee: A series of suitably engraved Centennial medals to each individual submitting the most acceptable paper, which paper embodies the result of original research or study not previously published, and must be between 2,000 and 5,000 words in length. In addition to the medals, the papers are eligible for: (1) The 1934 "Morris L. Chaim Prize" of the First District Dental Society of $250.00 offered for the most acceptable essay not previously published on research in dentistry or any of its specialties. The essay may also deal with the fundamental sciences, provided the work has a definite bearing on some dental problem. (2) The 1934 "Benjamin Lord Prize" of the First District Dental Society of $150.00 in the field of clinical dentistry, having an immediate and direct value to practical needs. (3) The "Frank T. Van Woert Prize" of the Second District Dental Society, of $100.00 for the best paper on "Dental History." (4) The "Thaddeus P. Hyatt Prize" of the Second District Dental Society of $100.00 for the best paper on "Preventive Dentistry." Further information may be obtained by addressing: The Centennial Dental Commission, Academy of Medicine, 2 East 103rd Street, New York City.

A NEW building which will serve as a laboratory for research in agricultural by-products will be built on the Iowa State College campus as soon as plans now in preparation are completed and bids for construction can be requested. Official word of the appropriation of $70,000 for the building by the Public Works Administration has been received from the U. S. Department of Agriculture at Washington, D. C., by T. R. Agg, dean of engineering, and P. Burke Jacobs, chief of the Ames Field Station. The money was allotted with the understanding that the building be placed under construction within the shortest possible time to provide immediate employment for about 50 men for approximately 6 months. Preliminary plans call for a structure about 35 feet high and containing about 60,000 square feet of floor space.

IN the furtherance of the oceanographic studies to which he has dedicated his steel cruiser, the *Velero III,* Captain G. Allan Hancock, of Los Angeles and Santa Maria, California, is undertaking his fourth cruise along the Pacific shores of North, South and Central America, and to a number of the adjacent islands. Among others, the Galapagos Islands are to be revisited to fill in certain gaps in the collecting of the previous cruises by Captain Hancock in those waters. The expeditionary staff comprises Captain G. Allan Hancock, director and captain; Mr. W. Charles Swett, executive officer and cinematographer; Dr. E. O. Palmer, physician; Dr. C. McLean Fraser, of the University of British Columbia, hydroids and other coelenterates; Dr. Harold W. Manter, of the University of Nebraska, representing the Carnegie Institution of Washington, trematode parasites of fishes; Dr. Wm. Randolph Taylor, of the University of Michigan, marine algae; Dr. Waldo L. Schmitt, of the Smithsonian Institution, crustacea, and Mr. John S. Garth, of the University of Southern California, ornithology and entomology. It was expected the expedition would sail from Los Angeles about December 30, and would be in the field for a period of two months or more.

DISCUSSION

ARE THERE GRANITIC AND BASALTIC SHELLS IN THE EARTH?

GEOLOGISTS at the present time seem to be gradually accepting the theory that the surface materials of the earth consist, in general, of a thin and incomplete layer of sediments over a thicker, but also incomplete, shell of granitic and gneissic material, which in turn overlies a probably thicker and continuous shell of basaltic (and peridotitic?) material. The incomplete shell of granitic material has been named the Sial, and the complete shell of basaltic material has been called the Sima.

It seems worth while to call attention to the fact that data now available suggest an explanation of this arrangement of the earth's near-surface materials (Sial and Sima), and, in fact, seem to require such an arrangement. The significant data are the following:

First: It has long been known that basaltic rocks are heavier than granitic rocks, and it is now well established that this is true at all temperatures and pressures found within the earth-zone in question, whether the substances are solid or liquid.

Second: Granitic rocks contain about twice as much radium as basaltic rocks. Considerable variations exist in different regions, but comparable measures nearly always disclose more radium in granitic rocks than in basaltic rocks of the same region, and, in general, the granites and rhyolites contain at least twice as much radium as the gabbros and basalts.

Third: Under normal conditions in the earth rhyolitic magmas crystallize at lower temperatures than basaltic magmas; in fact, after a careful study of all the data, Larsen[1] concluded that most rhyolitic magmas crystallize between 600° and 700° C., while most basaltic magmas crystallize between 800° and 900° C. Therefore, there is a difference of 200° C. between the average temperatures of crystallization of these two types of magmas.

Fourth: The measured geothermal gradient indicates that temperatures increase steadily (though not at a uniform rate) with increasing depth, and it is reasonable to infer that near-fusion temperatures exist in the earth at moderate depths. The existence of volcanoes proves that fusion temperatures exist, at least locally.

Fifth: The study of igneous rocks in the field and in the laboratory proves that differentiation is an important process affecting all kinds of magmas. There is much difference of opinion regarding the explanation of the process, but its existence and importance are no longer questioned.

Sixth: There are numerous minor and peculiar products of differentiation, but the two normal and abundant end-products of the process are rocks of the granitic and basaltic types.

The relation between these facts and the existence of a (partial) shell of Sial above the shell of Sima deserves careful attention. The facts seem not only to explain, but also to require, such an arrangement of earth materials. Perhaps the simplest way to

[1] *Am. Mineral.,* xiv: p. 81, 1929.