and proceeded up the Delaware Valley to the Water Gap, thence to Stroudsburg, crossed to the Lehigh River, and thence traveled south to Bethlehem. The trip included visits to exposures of most of the formations from the Pre-Cambrian through the Upper Devonian beside Pleistocene deposits and various economic features such as cement, slate and metallic paint ore. The excursion was successively led by Professor Freeman Ward, of Lafayette, Dr. Bradford Willard, of the State Survey, Professor Frank Swartz, of Pennsylvania State College, and Dr. B. L. Miller, of Lehigh University. At Bethlehem dinner was served at the Hotel Bethlehem and was followed by a welcome from President C. R. Richards, of Lehigh, after which Professor H. Ries, of Cornell, spoke briefly.

On the thirtieth the conference ended in the members and guests selecting one of three trips. The first under Dr. B. L. Miller, of Lehigh, was largely devoted to metallic economic geology in that visits were made to abandoned iron pits and the old zinc mines of the Saucon Valley south of Bethlehem. The second trip, conducted by Professor Freeman Ward, of Lafayette, was devoted to a study of the glacial deposits, chiefly with a view of observing the differences between and the interrelations of the Illinoian and Wisconsin drifts. Those who selected the third trip were led by Dr. Lawrence Whitcomb, of Lehigh, to Spitzenberg, a conical hill near Lenhartsville, some thirty miles west of Bethlehem. The purpose of this visit was to inspect the peculiar limestone conglomerate which rests upon the Ordovician shale near the crest of the hill.

It is planned to hold the annual meeting of the conference for 1933 at Harrisburg as guests of the Pennsylvania Topographic and Geologic Survey. This is scheduled tentatively for the last week-end in May and will cover the Silurian-Devonian-Mississippian sections of the Susquehanna and Juniata Valleys, the Triassic and pre-Silurian Paleozoics between Harrisburg and York, including a visit to the Cornwall Iron Mines, and the river terraces, the peneplanes, and other physiographic features of the neighborhood.

BRADFORD WILLARD,
Secretary-Treasurer

THE NEANDERTAL RACE IN PALESTINE

THE discovery during the first two weeks in May of seven skeletons of the Neandertal race is destined to throw a flood of light on that particular species of fossil man. The specimens hitherto found in Europe have been so few and fragmentary that there was little evidence to suggest that the race or species might include a number of varieties. The first intimation of marked variation came with the discovery of the skull at Broken Hill, Rhodesia, some ten years ago. In 1925 Turville-Petre found a portion of the cranial cap of a Neandertal skull in the Cave of the Robbers near the Sea of Galilee. But the fragment being small (frontal and one cheek bone) gave no indication of variation from the European type.

The seven individuals just found in the Cave of the Kids near Haifa by Theodore D. McCown, field representative of the American School of Prehistoric Research and in charge of the joint excavations of the American and British Schools, will, on account of their relative completeness, throw new light not only on the species as a whole, but also point to a Palestinian variety of the Neandertal species. A tracing just received of one of the best preserved adult skulls shows that the latter agrees with the European type in the marks of a powerful musculature, massive brow ridges, taurodont dentition and prognathism. But the prognathism is confined largely to the upper jaw and the dentition. The chin can scarcely be called receding and the frontal and parietal portions of the skull are more highly developed than in the known European examples.

It is especially fortunate that these seven skeletons, as well as that of a Neandertal child found (also by McCown) in the same cave one year ago, were all *in situ* and associated with industrial remains of the Mousterian Epoch. McCown states that one of the adult skeletons was found clasping to his breast a huge jaw of the wild boar.

The skeletons were lying near the bedrock and in a stony matrix. McCown is bending every effort to remove them safely from the deposit and ship them to London in time for exhibition at the International Congress of Prehistoric and Protohistoric Sciences which meets from August 1 to 6.

GEORGE GRANT MACCURDY

SCIENTIFIC NOTES AND NEWS

THE preliminary program of the meeting of the American Association for the Advancement of Science, to be held at Syracuse, New York, from June 20 to 25, was published in the issue of SCIENCE for May 27. Some seventeen associated scientific societies will meet with the association. The first general session, followed by a reception, will be held on the evening of Monday, June 20, under the presidency of Dr. John J. Abel, professor of pharmacology, emeritus, at the Johns Hopkins University. Dr. Edward L. Thorndike, professor of educational psychology at Teachers College, Columbia University, will make the address.

The first meeting of the council will be held at 9 o'clock on Tuesday morning. As has been noted in the preliminary announcement, there will be a full program of symposia and general addresses with special opportunities for excursions and field trips.

NEW YORK UNIVERSITY conferred at its graduation exercises the doctorate of science on Dr. William H. Welch, professor emeritus of the history of medicine at the Johns Hopkins University, who was from 1879 to 1884 professor of pathological anatomy and general pathology in the New York University and Bellevue Hospital Medical College.

THE University of Würzburg, at the three hundred and fiftieth anniversary of its foundation on May 2, conferred the degree of doctor of medicine *honoris causa* on Dr. Francis G. Benedict, director of the Nutrition Laboratory of the Carnegie Institution of Washington.

THE honorary degree of doctor of science was conferred on June 16 by George Washington University on Dr. Frederick Parker Gay, head of the department of bacteriology in the College of Physicians and Surgeons of Columbia University; on Dr. George Canby Robinson, director of the New York Hospital and Cornell Medical Association, and on Dr. Alan Mason Chesney, dean of the Johns Hopkins University School of Medicine.

THE degree of doctor of science will be conferred on Dr. Walter C. Mendenhall, director of the U. S. Geological Survey, by the University of Wisconsin, on June 20.

AT the seventy-seventh annual commencement of the Polytechnic Institute of Brooklyn the honorary doctorate in science was conferred upon Dr. Moses Gomberg, chairman of the department of chemistry at the University of Michigan, and on Professor Irving Wetherbee Fay, of the institute, who becomes professor emeritus of chemistry after thirty-five years of service at the college.

THE staffs of the College of Engineering and the Engineering Experiment Station of the University of Illinois gave a dinner on May 25 in celebration of a decade of progress of the College of Engineering under the guidance of Dr. Milo S. Ketchum as dean of the College of Engineering and director of the Engineering Experiment Station. Short addresses were made by Dr. A. N. Talbot, Assistant Dean H. H. Jordan and Professor W. C. Huntington. Professor A. C. Willard presented an illuminated parchment to Dean Ketchum on behalf of the members of the staffs of the College of Engineering and the Engineering Experiment Station. Dean Ketchum made a brief response. The parchment contained the following note of appreciation: "The staffs of the College of Engineering and the Engineering Experiment Station of the University of Illinois upon the completion of a decade of service by Milo Smith Ketchum as dean and director unite in expressing to him their appreciation of his able guidance and leadership in the affairs of the college and station during the ten years and in wishing him every success in the years that are to come."

THE Society for Experimental Biology and Medicine at its recent annual meeting elected the following officers: *President,* A. R. Dochez; *Vice-president,* E. L. Opie; *Secretary-Treasurer,* A. J. Goldforb; *Council,* W. B. Cannon, A. E. Cohn, L. J. Cole, W. O. Fenn, M. S. Fleisher, W. H. Harris, W. J. MacNeal, W. Ophüls, W. J. V. Osterhout, W. W. Palmer, S. W. Ranson, F. R. Sabin, F. H. Scott, R. W. Scott, C. M. Van Allen and E. Witschi.

DR. GEORGE W. BACHMAN has been appointed director of the School of Tropical Medicine, San Juan, Puerto Rico. The school is under the auspices of Columbia University. Dr. Bachman, who has been acting director of the school for the last year, succeeds Dr. Earl B. McKinley, who resigned to become dean of the George Washington University School of Medicine. Dr. Bachman was also promoted from associate professor to be full professor of parasitology.

DR. JAMES W. GLOVER, who has been on leave of absence from the University of Michigan, and who has been president of the Teachers Insurance and Annuity Association of America, has resigned from his position in the association and will resume his professorship of mathematics at the University of Michigan beginning with the coming academic year.

PROFESSOR R. S. SETON, head of the department of agriculture of the University of Leeds, retires at the end of the academic year.

THE Committee on Scientific Research of the American Medical Association has given to Dr. Daniel A. McGinty, of the department of physiology, Emory University Medical School, a grant for the continuation of studies on the coronary circulation. Two previous grants for similar work have been given to Dr. McGinty by the committee.

THE Barnard Free Skin and Cancer Hospital, St. Louis, has been awarded a grant by the American Medical Association, for a study of the problem "The Potential Infiltrative Nature of the Virus of Warts" to be carried out under the direction of Dr. M. G. Seelig.

CURATOR FRANK C. BAKER, of the Museum of Natural History, University of Illinois, will continue his studies of the pulmonate fauna of the state of Illinois,

begun last summer, for the State Natural History Survey of Illinois. He will be assisted by Mr. Dale Foster, graduate student in zoology of the university. Particular attention will be given to the valley of the Mississippi River, which will be surveyed from Jo Davies County to southern Illinois.

MR. SEIDO ENDO, instructor in geology at Tohoku Imperial University, Sendai, Japan, is spending the next two years in paleobotanical studies with Professor E. W. Berry at the Johns Hopkins University.

DR. W. MCKIM MARRIOTT, dean and professor of pediatrics, Washington University School of Medicine, St. Louis, will be the lecturer at the University of California Medical School for the year 1932–1933. Dr. Marriott, who will be at the medical school early in the fall of this year, will conduct lectures and clinics.

DR. RUDOLPH MATAS, emeritus professor of surgery, Tulane University of Louisiana School of Medicine, New Orleans, delivered the sixth annual Donald C. Balfour Lecture at the University of Toronto Faculty of Medicine, on "The Story of Postoperative Pulmonary Embolism before and after Lister." The date was the one hundred and fifth anniversary of the birth of Lord Lister.

THE Herbert Spencer lecturer for this year was Dr. Ronald Aylmer Fisher. The lecture was given on June 8 under the title of "The Social Selection of Human Fertility."

PROFESSOR C. U. ARIËNS KAPPERS delivered the David Ferrier Lecture at the Royal Society on June 2, taking as his subject "Some Correlations between the Brain and the Skull."

PROFESSOR WERNER HEISENBERG, of Leipzig, Professor George Gamow, of Leningrad, and Professors Samuel A. Goudsmit and David M. Dennison, of the University of Michigan, will participate in the fifth Symposium on Theoretical Physics to be given at the University of Michigan during the summer session, June 27 to August 19. The lectures by Professors Gamow, Goudsmit and Dennison will begin on the opening day of the session, June 27. Due to the fact that Professor Heisenberg will be detained in Leipzig on account of official duties at the university his lectures will not begin until Monday, July 11.

THE thirty-fifth annual meeting of the American Society for Testing Materials will be held in Atlantic City from June 20 to 24. On Tuesday, June 21, symposia will be held on "Textile Materials" and on "Steel Castings." On Wednesday sessions will be devoted to steel, magnetics and insulating materials. The seventh Edgar Marburg Lecture, "Fundamentals in the Problem of Resistance to Deterioration," will be given on Wednesday afternoon by Professor Hugh S. Taylor, of Princeton University. Sessions will be held on Thursday for discussion of the effects of temperature on metals, timber, coal, paving and waterproofing materials and corrosion and fatigue of metals. On Friday programs will be held devoted to cement, lime, gypsum, ceramics, non-ferrous metals, concrete and building stones.

SIGMA PI SIGMA, the honorary physics fraternity, installed its twenty-fourth chapter at Miami University, Oxford, Ohio, on June 4. The chapter is designated the Omega chapter. The charter group was composed of about twenty undergraduates, graduate students and faculty members, including Dr. R. L. Edwards, head of the department of physics. Dr. Marsh W. White, of the department of physics at the Pennsylvania State College and executive secretary of the fraternity, was the installing officer. At an open meeting of the chapter following the installation dinner Dr. White gave an address on "Nuclear Physics."

THE section of geology of the Ohio Academy of Science held its annual spring field excursion on May 28 and 29, in southern Ohio, devoting attention exclusively to the physiography of the region, especially the drainage changes since preglacial time. The Teays Valley and its tributaries were examined in the area between Portsmouth and Athens, and the relations between the Teays, Deep and present stages were observed. Twenty members, guided by Wilber Stout, state geologist of Ohio, constituted the party.

THE one hundredth anniversary of the founding of the British Medical Association will be celebrated at the annual session in London from July 21 to 30. The annual representative meeting will be held on July 21 and the three following week days, while the scientific sections will meet on July 27, 28 and 29. The annual general meeting will be held on July 23, at the British Medical Association House in London.

IN opening the new reading rooms at the Institute of Physics, London, on May 24, Lord Rutherford, the president, explained that they were provided to give greater opportunities to the members of the institute and its participating societies. Through the cooperation of the Physical and Optical Societies and the other participating societies, a large number of books and periodicals had been provided. The intention was to gather together a small library of text-books and reference books, and the nucleus of such a library already existed. At the annual general meeting held afterwards, Lord Rutherford said that remarkable progress had been made in the short time

since the foundation of the institute. He considered that the institute could justly claim some of the credit for the growing recognition of the value of applied physics, and he urged physicists of every type to regard it as a duty to join the institute. Lord Rutherford was reelected president, Sir Frank Dyson and Sir William Bragg were elected honorary fellows.

WILLIAM H. DONNER, of Villanova, retired steel manufacturer of Pittsburgh, has been elected president of the newly established International Cancer Research Foundation. Mr. Donner, it is understood, has placed at the disposal of the foundation cash and securities on the basis of present values amounting to $2,000,000. This was set aside by Mr. Donner as a trust in 1929 on the death of his son, Joseph W. Donner. Arthur Morton, president of the Pennsylvania Hospital, Philadelphia, is the vice-president of the foundation. The directors are: Thomas S. Gates, president of the University of Pennsylvania; Edward R. Weidlein, of the Mellon Institute for Industrial Research, Pittsburgh, and former United States Senator George Wharton Pepper. In addition to the directors who will administer the foundation, there will be a board of advisory trustees to be selected from among distinguished citizens and scientific men in all parts of the world. They will advise on the selection of the most promising research problems and investigators and decide where the foundation's money can be expended most efficiently. The foundation, it was stated, is interested primarily in securing results by assisting qualified investigators, and money will not be spent on buildings. The foundation stipulates that not more than 35 per cent. of its income shall be allotted to one institution, not more than 50 to 65 per cent. within the United States, and not less than 35 nor more than 50 per cent. outside the United States.

ONE of Audubon's three largest and finest canvases, an oil painting of "Black Cocks" on a grouse moor, has been presented to the Harvard Museum by John Eliot Thayer. Mr. Thayer has recently given the museum his collection of birds' eggs and nests. The painting was done by Audubon in 1827 while he was on a visit to Scotland. It was painted for a Scottish nobleman whose family sold it some years ago to Mr. Thayer. The canvas is about six by nine feet and has the qualities of an eighteenth century landscape.

THE Carnegie Corporation has made an appropriation of $10,000 toward the maintenance of the library of the Medical College of Virginia, which will this summer be housed in a new building. Adjoining the new library of the college the Richmond Academy of Medicine has built its home and library. This will contain the Joseph L. Miller collection of rare first editions, engravings, silhouettes, medical curios, etc. The headquarters of the Medical Society of Virginia will also be in the Academy of Medicine building.

AN offer to pay at the rate of £5,000 a year from July 31, 1932, to July 31, 1933, for the maintenance of an Imperial Forestry Institute in Oxford has been made by the Forestry Commission and the Secretary of State for the Colonies. The only condition is that the university shall make a contribution to the Department of Forestry for the same period at a rate not exceeding £288 a year, in addition to the contribution which was current on March 18, 1924.

THE annual report of the Royal Society for the Protection of Birds, according to the London *Times*, refers to the need for protection for insectivorous migratory birds, in their nesting homes, in lands where they winter, and on passage. The report says that the dramatic rescue of migrating swallows and martins by Austrian and Hungarian animal-protection societies during the sudden snows in the autumn of 1931, and their transportation by aeroplane to warmer lands, threw for a few weeks a floodlight on the subject of migration, and should suggest a sequel more practical than an ephemeral story and photograph. It should spur on investigation into the value of migratory birds and stimulate rational protection. Reported greetings accorded the swallows in Venice contrast oddly, however, with familiar accounts of migrants netted by the *roccoli* and dished up at restaurants, swallows taken at their roosts for millinery, martins' nests knocked down to inculcate tidiness in paper-littered streets. It is stated that the most notable protection afforded migrating birds at present lies in the bird-nests and perches at six lighthouses on migration routes, provided by the society in cooperation with Trinity House. With regard to oil pollution, it is urged that international action can alone remedy an evil for which ships of all nations are responsible.

The Geographical Journal, London, has received through the agency of the High Commissioner for Canada the final figures of population by provinces arrived at through the census taken on 31 May–1 June 1931 by the Dominion Bureau of Statistics. A comparison with the figures for 1921 shows that the total population is 10,374,196, an increase of over 1,500,000 over 1921; and all the provinces, except four, show percentage increases varying from 5 to 30 per cent. The very small population of Yukon Territory has grown by seventy-three persons, but Prince Edward Island, Nova Scotia and the North-West Territories all register a decrease, in the last case of more than 10 per cent. Quebec has the largest numerical increase (513,056), closely followed by On-

tario with 498,021; a drop of about 11,000 is recorded by Nova Scotia.

THE Alliance nationale pour l'accroissement de la population française, in a study it has recently published on the vital statistics of France for 1931, points out, according to the Paris correspondent of the *Journal* of the American Medical Association, that the birth rate fell off sharply toward the close of the year. A comparison of the birth rate for the corresponding quarters of 1930 and 1931 shows the following differences: first quarter, increase 937; second quarter, decrease 3,537; third quarter, decrease 4,907; fourth quarter, decrease 11,155; for the entire year, decrease 18,662. The number of marriages, furthermore, having diminished by more than 16,000 it is to be feared that the reduction in the number of births may be still greater in 1932. If one notes that, of the 730,000 births in 1931, 55,000 were of children of foreigners, whereas, of the 680,000 deaths, there were only 30,000 deaths of foreigners, it will be seen that the French excess of births over deaths in 1931 was only 25,000. This small excess runs the risk of being transformed next year into a permanent deficit unless something energetic is done to promote a better birth rate. Finally, since the number of emigrants in 1931 exceeded the number of immigrants by more than 25,000, the population of France has in reality diminished, the first time that that has happened since the war.

A 6,000-ACRE experimental forest, to be used as a "laboratory" for forestry experiments and research, has been established in the Lassen National Forest in California. The tract contains over 3,000 acres of red and white fir timberland on which both mature and small trees are available for future experiments in forestry methods of timber cutting, logging and slash disposal. One fifth of the area is covered with brush fields, the result of repeated fires. Here reforestation will be undertaken by the planting of stock grown at the Forest Service nursery at Susanville, in order to convert those brush fields into commercial forest. Later, one or more portions of the experimental forest will be selected and designated as "natural forests" and will be left unmolested for the purposes of scientific study. The Swayne Mountain Experimental Forest, the first to be established in California, will be under the supervision of the California Experiment Station of the Forest.

DISCUSSION

PHYSIOGRAPHY AND THE DYNAMIC CYCLE

INTRODUCTION

IN an article in SCIENCE and in other recent papers Waldo S. Glock[1] has presented theoretical discussions of several aspects of the physiography of the lands. Contributions to the theory of a relatively new subject are especially welcome, for whether or not they lead to definitive conclusions they incite students to more careful reflection on fundamental principles of their science.

Glock suggests the division of physiography into two phases, an active or dynamic phase which he would call geodynamics, and a static or passive phase, called geomorphology. "Physiography may be approached from a purely dynamic view-point." Accordingly he discusses a "dynamic cycle" supposed to be measurably independent of and in any case different from the "geographic cycle."

The "dynamic cycle of stream systems" is contrasted with the "geographic cycle" of landforms. "A stream is never young, never mature, and never old in a strictly dynamic sense, for the processes, although they vary in intensity, vary little if at all in quality." In the dynamic cycle streams first pass through a phase of extension, "a time of conquest and minute invasion"; later through a phase of integration, "a time of withdrawal and consolidation," in which tributaries are eliminated "until merely a skeletonized framework remains to care for drainage." These two phases are not necessarily distinct but may overlap, at least locally.

Geomorphology is regarded as static or passive, and "is concerned with the details of surface configuration expressed first by the origin of that form and second by the influence of lithology and rock structure. The method of origin has interest only because it explains and rationalizes important lineaments in the composition of the landscape." The geographic cycle "stands out as the quintessence of geomorphological description."

WHAT IS PHYSIOGRAPHY?

In 1869 Huxley delivered a series of twelve lectures on natural phenomena under the auspices of the London Institution. To distinguish his subject from the elementary works on physical geography of his day he borrowed the term "physiography" which had long been applied, in a different sense, to a department of mineralogy. The lectures were published in 1878 under the title "Physiography, an Introduction to the

[1] Waldo S. Glock, "Dual Nature of Physiography," SCIENCE, n. s. 72, pp. 3–5, 1930; "The Development of Drainage Systems and the Dynamic Cycle," *Ohio Jour. Sci.* 31, pp. 309–334, 1931; "The Development of Drainage Systems: A Synoptic View," *The Geogr. Rev.*, 21, pp. 475–482, 1931.