England granite says that it is the very symbol of solidity. But New England granites have been stripped by glaciers of every trace of decayed rock. They are solid because they are freshly exposed. That is not the case with granites in this western country.

For instance there is granite in the immediate vicinity of Salt Lake City. It seems solid. It is used in building. It will take a polish. But I am told it will not hold a polish more than three or four years, because the crystals have begun to decay. Professor Pack tells me that he has examined granite in this vicinity from the surface to a depth of 800 feet below it and found even at that depth that decomposition was in progress, as shown by the clouded appearance of certain crystals, the feldspars, under the microscope.

The granite of Boulder Canyon is decomposed on the surface. No one knows, as yet, to what depth. But the geologist has reason to suspect its solidity and must add his objection to those of conservative engineers against the suggestion that the dam be built by blowing the cliffs into the canyon.

The other type of dam proposed is to be built of reinforced concrete. Concrete may be described as a rock composed of minerals which are permanent under surface conditions because they form in that environment. Moisture promotes the consolidation of concrete. Age increases its strength. So far as the superstructure is concerned, a geologist must reason that a concrete dam will outlive a rock fill dam. The engineering problem in building a concrete dam is that of excavating to solid foundations. It is, in the judgment of conservative and experienced engineers, reasonably practicable to do so. But, if the conditions of jointing and decay of the rocks are considered as they should be, it will be the geologist rather than the engineer who shall determine whether they are solid or not.

The foundations are now being explored by drilling. It is not enough. A drill may bore out a core within a foot of a weak seam and not betray its existence. The preliminary examination will, no doubt, be followed by more thorough investigation and it may be suggested that a method of shafts and tunnel be employed. Shafts sunk, one on each side of the river, and connected by a tunnel at a depth of a hundred feet below the bottom of the channel, would enable a complete examination of the rock, inch by inch. Weaknesses could be excavated and filled. If they should prove too numerous at one hundred feet, the shafts could go deeper to a deeper tunnel. Eventually when solid rock was found, the rock above the tunnel could be cut away to the surface, stoped, as miners say, and the stope filled with concrete would form an impervious curtain wall. Working from the bottom up, the bed of the river would be approached and the deeper foundations would be laid without exposure to the risk of floods. It is not the province of the geologist to instruct engineers and I would not presume to, but the suggestion may stand to illustrate the problem of a deep and secure foundation, that the geologic conditions demand.

The Garden of Eden was created some five thousand or more years ago by the building of huge dams of earth to control the Tigris and Euphrates, and so well did those ancient engineers execute their task that the beauty of the garden became a tradition of all Eurasian races. The garden endured until the state fell. Subtle forces weakened the quality of its citizens as moisture attacks the minerals of the granite. Our engineers can build a dam to endure for thousands of years. What is the endurance of our state? What concrete foundations of national character are we laying to cut off the underground activities that would destroy it?

STANFORD UNIVERSITY BAILEY WILLIS

EXPEDITIONS OF THE MUSEUM OF NATURAL HISTORY

IN one of the corridors of the American Museum of Natural History the officials of that institution have hung a map of the world to which labels are attached showing the distribution of its exploring parties and field workers. During the present year a larger number of expeditions have been sent out than ever before. Intensive work is being pursued by each department.

In the department of geology, Dr. Edmund O. Hovey is at present on a trip through Cali-

fornia, Oregon, Washington and British Columbia, securing data and photographs for the purpose of the construction of a number of relief models, showing most interesting geological formation in these states. Associate Curator Reeds is working in the vicinity of New York, collecting data for a museum exhibit to show the "Climates Past and Present," and Mr. Foyles is continuing his studies in northwestern Vermont on the Fort Cassein terrain.

For the department of vertebrate paleontology, an expedition in charge of Albert Thomson is at work in western Nebraska, seeking fossil mammals from the Snake Creek beds of the Pliocene age. Working in the same vicinity is Curator Matthew, who will shortly be joined by Mr. Olsen. Mr. Barnum Brown, who is well known from his success in securing most of the Brontosaurian material now on exhibition in the museum, is at work in the Siwalik Hills of India, obtaining fossil mammals and other invertebrates from a famous fossil bearing formation. In the late autumn, it is the intention of President Henry Fairfield Osborn to join the Third Asiatic Expedition, which has connected with it, in charge of paleontology, Mr. Walter Granger. Working with Mr. Granger at the present time are Professors Charles P. Berkey and Frederick K. Morris. Already extensive shipments have been made by this expedition. Mr. Childs Frick, one of the trustees of the institution, will continue fossil collecting in southern California, where he has already obtained an extensive collection from the Pliocene.

Dr. Frank M. Chapman, curator of the department of birds, accompanied by Mr. George K. Cherrie and Captain O'Connell, are in Ecuador continuing their studies on the distribution of bird life in the Andes. They will first investigate southern and southeastern Ecuador and will then conclude their work by a boat trip from Guayaquil along the coast to Paita, Peru. Assisting in the investigations in bird life in Ecuador, Henry Watkins is now engaged in the mountains of Peru. His latest shipment comes from the humid regions northeast of Lake Junin. Ernest Holt, formerly of the United States Biological Survey, is engaged in collecting birds and mammals for the museum in the mountains of eastern Brazil. A collection was recently received from him which was secured around Mt. Itatiaya. Later Mr. Holt will explore still higher peaks. The museum's representation of bird life from this important region has until now been confined entirely to specimens in the old Prince Maximilian Collection. José G. Correia is undertaking the collection of birds at the Cape Verde Islands, and Rollo H. Beck, who is working under the auspices of the Whitney South Sea Expedition, is collecting in the Society Islands. Mr. Beck is accompanied by Mrs. Beck and Mr. Quayle. Mr. Griscom is doing work in New Foundland, while other members of the department are engaged in the local field.

The department of mammals has G. H. Tate in Ecuador. He will later be joined by an assistant in order that more intensive investigations of the life of mammals in this region may be studied. H. C. Raven, who accompanied Dr. W. K. Gregory to Australia last year, has nearly completed a systematic collection in Queensland and will next go to the great Nullaboa Plain in South Australia. He has already obtained for exhibition and study a series of the marsupial mammals.

In September, Herbert Lang, assistant curator of African mammals, will leave for British Guiana for a three months' trip. At Georgetown he will join William La Varre and will go up the Essequibo River through the diamond mining district along the Mazaruni. He hopes to go through the savannah country and Mt. Koraima. By studies of the conditions in this section at first hand, Mr. Lang has an opportunity to compare the ecological conditions in the great South American forests and savannahs with those of equatorial Africa, a comparison which has long been needed in connection with the preparation of his reports on his Congo expeditions.

Dr. F. E. Lutz, of the department of entomology, is engaged in work in the vicinity of Boulder, Colo. F. E. Watson, of this department, recently returned from a four months' trip to Haiti where he secured approximately eleven thousand specimens of the lower invertebrates, chiefly insects, and about three hun-

dred miscellaneous specimens of fishes and reptiles. He is now carrying on local field work, having in view the collection of material for several butterfly groups.

R. W. Miner, of the department of invertebrate zoology, is continuing field studies in southern New Jersey in connection with the construction of a new rotifer group. Assisting him is Research Associate Frank J. Myers, whose well equipped laboratory at Ventnor, New Jersey, is the basis of operations.

Dr. Russell J. Coles is collecting material for the department of ichthyology off the coast of North Carolina. Mr. Louis L. Mowbrey has sent in some important material for this department from the Florida waters.

Dr. G. K. Noble, of the department of herpetology, accompanied by Mrs. Noble, has left for the Dominican Republic. The chief object of this expedition is to secure data, photographs and material toward the construction of the two habitat groups for the new Hall of Reptiles in the museum. The West Indian region is rich in reptilian and amphibian life. Perhaps the two most striking creatures in this locality are the rhinoceros iguana and the giant tree frog. Both these forms are confined to the island of Santo Domingo. The expedition will travel over a large part of the island in the course of its investigations. The rhinoceros iguana is found to-day chiefly in the arid southwestern portion of the island in the vicinity of a dead sea, the surface of which is more than a hundred feet below sea-level. The giant tree frog has been taken only in the Central Cordillera and on the Quita Espuala, a range of mountains in the northeastern part of the island. It will be necessary for the expedition to carry on its work during the height of the rainy season in order to secure information in regard to the life history of the giant tree frog. Although this species is the largest and most spectacular tree frog in the world, its life history is entirely unknown, and the expedition hopes to secure valuable scientific data as well as exhibition material.

While field work in the department of anthropology is necessarily restricted for the present year, nevertheless, Mr. Nelson, of the Division of Archeology, is in Europe, engaged in a study of the paleolithic and neolithic collections in the museums abroad, and will endeavor to secure specimens to round out the exhibition series in this museum. During his trip Mr. Nelson will visit Norway, Sweden, Spain and Belgium.

Earl H. Morris, who for a number of years has been engaged on the Huntington Expedition work at Aztec, New Mexico, in company with Charles L. Parnheimer, of this city, is now busy making a general reconnaissance of the Navajo mountain region of New Mexico. Dr. P. E. Goddard, of this department, accompanied by Lieutenant G. T. Emmons of Princeton, left early in June for a trip to the Northwest Coast. It is the intention of this party to secure specimens and authentic data which will make possible an early completion of the North Pacific Coast Hall.

PROPOSED FEDERATION OF AMERICAN BIOLOGICAL SOCIETIES

THE second conference called to consider the question of cooperation or federation among biological societies met in Washington in the rooms of the National Research Council, on April 23, 1922. This meeting was held in pursuance of a resolution adopted at an informal conference in Toronto, December 27, 1921, and approved by the societies there in session. The conference organized under the chairmanship of Professor L. R. Jones, who had also presided over the Toronto gathering.

Plans for the 1922 meeting, in so far as they could be arranged by agreement among the officers of the several societies, were entrusted to a committee consisting of the secretaries of the American Society of Naturalists, Botanical Society of America, and American Society of Zoologists, in cooperation with the permanent secretary of the American Association for the Advancement of Science.

The view was generally expressed that the conference should, if it decided to recommend any form of federation, present a definite plan of organization. A committee was accordingly raised to formulate such a plan. This committee, of which Professor F. R. Lillie was chairman, reported to the conference the fol-