These being the facts, why should an expedition "be dispatched with qualified scientific observers to study the bionomics of the two species involved . . . and to make recommendations regarding a Sanctuary and possibly some protection for immature animals"?

Where, except on the Arctic ice fields where they whelp their young, could an expedition go to find either Harps or Hoods? And where could a sanctuary be established except on floating ice—ice that is melting and soon disappears in the wide ocean?

Had the author looked into the natural history of the American seals or the literature of the seal fishery, he would not have said: "It appears probable that the coast of Labrador is the breeding region and that the herds thence migrate south and southeast to the western and northern coasts of Newfoundland"—for he would have learned that these seals (Harps and Hoods) breed on the ice floes and—unless wounded by terrestrial or aquatic sharks—rarely visit the land at any time.

C. HART MERRIAM

LAGUNITAS, CALIF.

SPECIAL CORRESPONDENCE

EXPEDITIONS OF THE PHILADELPHIA ACADEMY OF NATURAL SCIENCES

WITH twelve expeditions in the field, ranging east and west from Tibet and Siam to Africa, and north and south from the Arctic to Bolivia, the Academy of Natural Sciences of Philadelphia is sponsoring one of the most extensive exploring and collecting programs undertaken since its establishment 122 years ago.

George Vanderbilt, of New York, is leading an expedition which has left Nairobi, British East Africa, for a five-month journey through central Africa to Timbuctoo, thence across the Sahara desert by tractor-truck to Algiers. With Mr. Vanderbilt are James A. G. Rehn, curator of the department of entomology, and Harold T. Green, curator of museum exhibits, and Baron von Blixen, the well-known African explorer. Among the animals sought are the bongo, a large antelope with most spectacular markings; the okapi, of which no museum has a mounted group; the giant eland, addax, scimitar-horned oryx and dwarf buffalo.

Brooke Dolan, II, of Philadelphia, will spend more than a year in the wilds of western China and the Tibetan borderland, collecting birds, mammals, fishes and plants. In 1931 Mr. Dolan made a similar expedition. He is now forming his caravan of yaks and coolies at Chungking, some 1,200 miles up the Yangste River from Shanghai, preparing for the 500-mile overland journey to Batang. The party includes Ernst Schaefer, zoologist, who accompanied Mr. Dolan on his first expedition and helped to secure the unique giant panda group now on display in the museum, and Marion H. Duncan, for many years a resident in Batang.

Through the courtesy of the Chinese government, this expedition will explore regions seldom, if ever before, visited by white men. Among the high peaks of the northeastern Himalayan range it will be necessary to reduce the packs to a minimum weight, hence the members of the party will depend for food largely on native game and yak's milk, with limited allowance of chocolate, coffee, sugar and cheese for variety. As gifts for a Chinese mandarin who aided his former expedition, Mr. Dolan is taking along two magnificent great danes from near Philadelphia, with the hope that they may be successfully crossed with the large and powerful Tibetan dogs which abound among the nomad tribes.

After four years of intensive work in Peru, making a study of the distribution, sources and relationships of the birds, M. A. Carriker, Jr., of the department of vertebrate zoology, now is extending his work into Bolivia, under a grant from the American Philosophical Society. His activities during the next six months will be confined to the northern part of Bolivia, covering a range from snow-line in the Andes to the level of the Rio Beni. Mr. Carriker is accompanied by his son, Melbourne R. Carriker.

To secure specimens of wapiti (American elk) and pronghorn antelope for habitat groups in the North American Hall, two trustees of the academy, Prentiss N. Gray, of New York, with his son, Sherman, and R. R. M. Carpenter, of Wilmington, Delaware, with his son, R. R. M. Carpenter, Jr., will spend six weeks in Wyoming, making their base at Mr. Gray's cattle ranch in the historic Jackson's Hole. They will be accompanied by C. Clarke Rosenkranz, artist of the staff, who will make color sketches of the group backgrounds, and collect plants, grasses and other natural accessories for the foregrounds.

These two animals, now reduced to mere remnants of the former vast herds, are among the most striking of North America's original game resources. The wapiti, which once ranged from Connecticut westward to California and northward from Tennessee and Texas to Ontario and British Columbia, is the largest member of the deer family, the bulls sometimes standing more than 5 feet at the shoulder, with magnificent antlers sometimes more than 5 feet long, with a spread up to 70 inches. As late as the early part of the last century there were large herds of elk in parts of Pennsylvania and New York, being so numerous in the Keystone state that Elk County was named for

them. The pronghorn antelope, first described in 1818 by George Ord, an early president of the academy, formerly ranged the entire country west of the Mississippi, their total number being placed at 40,000,000; now dwindled to perhaps 15,000.

In Siam, the permanent field staff, organized in 1928 by Rodolphe M. deSchauensee, a trustee of the academy and associate curator in the department of vertebrate zoology, is continuing the work of three earlier expeditions. With headquarters in Bangkok this collecting of birds, fishes, reptiles, insects and mammals extends into every part of Siam. To date the specimens received include some 4,500 birds, 6,000 fishes, 300 reptiles, 400 butterflies, 500 insects and 100 mammals. Among these are a number of new species.

Frank B. Foster, a trustee of the academy, planned to leave Philadelphia early in August for the Kenai Peninsula, Alaska, where he hopes to secure a bull moose of unusual size for a striking one-animal "group" in the North American Hall.

Dr. W. M. Benner, research associate in the department of botany, is collecting a general series of plants found in the more remote mountain regions of Texas, Arizona, New Mexico, California and Colorado. Among the objectives of his expedition will be the dwarf willow tree, only four to five inches high, which completes its seasonal activity in a few weeks; Alpine timothy a few inches high, which heads in an equally brief period and other plants that spring up as soon as the snow line recedes.

In the high plateau of central Mexico, Dr. Henry A. Pilsbry, curator of mollusks, and Dr. Francis W. Pennell, curator of botany, accompanied by Cyril H. Harvey, of Atlantic City, are collecting mollusks and plants, under a grant from the American Philosophical Society. The work of this expedition will aid in completing a chart of the route taken by mammals, mollusks, insects and plants which, over a period of some 3,000,000 years, moved northward from South America when the Isthmus of Panama was lifted above the waters 20,000,000 years ago.

For a three-months exploring and collecting trip along the west coast of Greenland, and as far north as Ellesmere Land, an expedition sponsored by R. R. M. Carpenter, of Wilmington, Delaware, a trustee, is now skirting the coast of Labrador in Captain Bob Bartlett's schooner *Morrissey*. The party is led by William K. duPont Carpenter, and includes Harry J. Lance, Jr., of the staff, Robert F. Dove and a representative of the Canadian government.

The object of this expedition is to secure specimens of birds and animals, and to collect fishes and other sea animals. It also is hoped that some definite information may be obtained as to the nesting and breeding habits of the greater snow goose and the common brant, two birds which summer in Arctic lands and in the autumn migrate southward to North Carolina, and even as far as Cuba. Thus far little is known about the summer life of these birds. The expedition will visit Cape York to inspect the Peary monument erected there last summer, then proceed to Ellesmere Land, where it is hoped specimens of Peary's caribou, a rare and striking white species, may be photographed or secured.

To continue the excavations near Clovis and Carlsbad, New Mexico, which last year revealed impressive indications that man lived in North America perhaps 15,000 years ago, the joint expedition for the academy and the University Museum of Philadelphia is working under the direction of Edgar B. Howard, research associate in the department of vertebrate zoology, who will be joined later by Ernst Antevs, geologist of the Carnegie Institution of Washington. Thus far the facts represent the association of the bones of extinct animals with human artifacts, and the search now is being intensified with the hope of finding human bones.

James Bond, research associate in the department of vertebrate zoology, on his eighth expedition to the West Indies, for a representative collection of birds, has added a number of species to the already extensive collection he has secured for the academy.

On a recent expedition to Louisiana, Edward Woolman, accompanied by Wharton Huber, associate curator of the department of vertebrate zoology, collected small mammals and birds, and secured moving pictures of the large numbers of blue geese that winter in that part of the United States.

SCIENTIFIC APPARATUS AND LABORATORY METHODS

PHOTO-ELECTRIC TECHNIQUE FOR THE COUNTING OF MICROSCOPICAL CELLS

THE technique of progressive dilutions used by early bacteriologists to isolate species and to estimate the probable number of cells is still applied in the determination of quanta of viruses, bacteriophages and enzymes.

The isolation and counting of bacterial and fungic species have been so simplified by the introduction of solid culture media, differential stains and micromanipulation that the dilution technique, which in part is embodied in the standard plate count method, is no longer carried to its final point: *e.g.*, one organism per dilution bottle.

The following is a brief description of an attempt to