A NEW seismograph station began operation at the Utah State Agricultural College, Logan, on January 26. The equipment of the station consists of a 12-inch acceleragraph of the Montana type which has been installed by the U. S. Coast and Geodetic Survey, and a two-component Wood-Anderson seismograph with a six-second period. Funds for the purchase of the Wood-Anderson instruments were bequeathed to the college by the late Thomas P. Oldham and the station will be known as the Oldham Seismograph Station in his honor. The instruments are installed in the basement of the south wing of the Administration Building. The pier rests on well-cemented gravels deposited as a delta by the Logan River in Pleistocene Lake Bonneville. The approximate geographic location of the station is longitude 111° 49′ west and latitude 41° 45′ north. The station will be conducted by the staff and students of the department of geology.

THE Alaskan Branch of the U. S. Geological Survey has recently started the office compilation of multiple-lens airplane photographs covering an area of about 5,000 square miles in the broad valley of the Tanana River in the interior of Alaska. The area, which was photographed by the Geological Survey in 1938, lies between Fairbanks on the west and the international boundary on the east. The pictures were taken from an elevation of about 15,000 feet, so that one inch on the photographs is equal to about 2,500 feet on the ground. From the photographs there will be constructed a planimetric map that will be published on a scale of 4 miles to the inch. The work, which is under the direction of Gerald FitzGerald, will probably take until the end of the current government fiscal year.

A PRELIMINARY statement recently prepared by the Alaskan Branch of the Geological Survey reports the estimated value of minerals produced in 1939 from Alaska mines as $24,888,000. This brings the total mineral production of the Territory to over $800,000,000. Of the production in 1939, gold accounted for $22,900,000. The value of the platinum metals recovered from its mines in that year is estimated at $936,000, which places Alaska among the half-dozen largest platinum-producing countries of the world.

LIMITED facilities and a limited budget have again restricted the number of students who could be received at the College of Natural Sciences at Yenching University for the present academic year. More than half of the thousand applicants for entrance to the university applied to enter the College of Natural Sciences. The enrolment figures in natural sciences for the fall semester of 1939 show graduate students, 27; seniors, 23; juniors, 54; sophomores, 144, and freshmen, 107. The undergraduate enrolment in the college (excluding freshmen) classified according to departments is as follows: biology, 7; chemistry, 46; home economics, 20; mathematics, 13; physics, 39; pre-medicine, 53; pre-engineering, 12; pre-nursing, 5, and unclassified, 26. The registration for the entire university is 982.

DISCUSSION

THE SMALLER ANIMALS OF THE GREAT PLAINS

THE rodents of the grassland, particularly ground squirrels, prairie dogs, kangaroo rats and jack-rabbits, have long constituted a problem in grazing areas as competitors with live stock. Their increases on the plains are well described by Merriam in the Year Book of the United States Department of Agriculture for 1901. He states that on many parts of the plains prairie dogs were more abundant in 1900 than formerly and their colonies had overspread extensive areas previously unoccupied. This is due to the aid of the settlers, (1) by decreasing the animal's natural enemies, and (2) by increasing the food supply. The settler wages warfare against the coyotes, kit foxes, badgers, ferrets, weasels, hawks, owls, snakes and other predatory animals which had previously held the prairie dogs in check. "The prairie dogs have multiplied until they have become a pernicious enemy to agriculture.

"For example, one South Dakota settler states that about fifteen years ago his children noticed two or three burrows about a mile from his house, and now they have spread over and occupied a full quarter section (160 acres), having surrounded his house and taken possession of all the land near it." Merriam cites many examples of losses, among others, that of a cattle ranch which had its carrying capacity cut from 1,000 cattle to 500 by an increase of prairie dogs, which extended to cover 300 square miles, causing a decrease in population and the abandonment of a post office.

The natural enemies of the plains rodents have been decimated through prejudices and the use of poisons. Also, flesh-eating animals usually have good coats and are trapped for fur. This applies to the black-footed ferret, the present status of which appears to be very much in doubt. Merriam states that this animal alone was capable of holding plains rodents in check. The only report of specimens in recent years comes to the writer from Hamilton County, Kansas, which is near the Colorado line. Merriam also described the method of attack of the kit fox. Of this animal, Seton says, "Harmless as a rabbit, he is harmless to man and man's interests . . . readily takes the poison bait used now-

adays for killing coyotes." The writer has seen only one of these in recent years, and the status is difficult to determine. The badger is somewhat disliked by cowboys because horses may step into its holes with serious results. The prairie dog is nearly equally dangerous, and this rodent increases when the badger is absent. It has been practically extirpated over most of the plains area, in part due to the value of its fur. Similar processes have reduced the hawks and owls of the Great Plains along with all the other flesh-eaters. Many are likely to disappear completely unless some special means is taken to preserve them. When one reads Sweetman's book on "Biological Control of Insects," he wonders why this idea was not extended to control of rodents in grassland areas. A large undisturbed area would afford opportunity for the study of natural biological control of rodent outbreaks and would quite possibly eliminate the constantly recurring exhaustive and dangerous application of poison. For this purpose, an area of natural plains grassland not overgrazed by large animals is essential.

The life histories, water relations and competition of grasses is also in need of extended investigations. The facts of the origin and original habitat of the species occurring as pests under agricultural conditions often throw much light on causes of outbreaks. For example, the pale western cutworm, a pest of cultivated grain, originally lived about the dust wallows of the bison and spread to plowed fields, where similar conditions occurred. This fact was discovered by the Canadian entomologists, who had opportunities to observe natural conditions superior to those afforded in the United States. All these problems require long-time observation on lands where wildlife is managed on a hands-off basis.

V. E. SHELFORD
UNIVERSITY OF ILLINOIS

ANAPLASMOSIS AMONG DEER IN THE NATURAL STATE

OVER a period of years, sporadic outbreaks of anaplasmosis have been reported from various cattle ranches in the foothill areas near Mt. Hamilton, California. The source of the infection was never definitely established, but at one ranch, particularly, the suspicion arose on more than one occasion that the disease was transmitted mechanically through the bleeding and vaccination of the herd, although the aseptic precautions with which these procedures were carried out would seem to preclude that possibility.

Since no hunting was allowed on the above-mentioned ranch, the deer roaming the vicinity increased to the point of becoming a nuisance, and permission for their destruction was requested of the State Division of Fish and Game. The request granted, Mr. Gordon True, Jr., of the Fish and Game Division, inquired whether the writers would be interested in investigating the possibility of carriers among these deer and kindly obtained ticks and samples of blood from them at the time the animals were killed. He also reported the deer to be *Odocoileus hemionus columbianus* (Richardson), commonly spoken of as Columbian blacktail or coast deer. Professor W. B. Herms and Dr. D. E. Howell, of the Division of Entomology and Parasitology at the University of California, identified the ticks from the deer as *Dermacentor occidentalis*.

On July 25, 1939, 10 cubic centimeters of pooled blood from five deer were inoculated into a young cow, 217. Three days later, 5 cubic centimeters of pooled blood from two other deer were inoculated into the same cow. Smears prepared from the blood before it was pooled showed a very few typical-looking marginal bodies or Anaplasma in three deer.

Beginning on the seventeenth day following the second injection, the blood of 217 was examined at weekly intervals. The examination on the forty-second day after the second inoculation revealed a few bodies, and from this time on, the blood picture progressed in the manner characteristic of anaplasmosis; that is, the marginal bodies became increasingly plentiful, anisocytosis appeared, followed by regenerative red cell changes; namely, polychromatophilia, punctate basophilia and nucleated red corpuscles. Typical symptoms developed, such as emaciation, quickened pulse and respiration, some drooling from the mouth and slight discharge from the nose. Recovery was fairly rapid.

Neitz and du Toit's report of 1932[1] on the transmission of anaplasmosis to antelopes was supplemented by that of the writers[2] the following year, proving that deer become carriers following inoculation of infective blood and suggesting that, in the natural state, they afforded a potential reservoir of the infection. The experiment here described establishes this possibility as a conclusive fact.

Since *D. occidentalis*, the tick infesting the deer used in this experiment, has already been incriminated[3] as a biological agent responsible for the spread of anaplasmosis, the logical assumption is, therefore, that ticks probably were the sole means of contact between the cattle on the ranch previously mentioned and the deer inhabiting that area.

WILLIAM HUTCHINS BOYNTON
GLADYS M. WOODS
UNIVERSITY OF CALIFORNIA, BERKELEY

[1] P. J. du Toit, Twelfth International Veterinary Congress, III: 325, 1934.

[2] William Hutchins Boynton and Gladys M. Woods, SCIENCE, 78: 559–560, 1933.

[3] William Hutchins Boynton, William B. Herms, D. E. Howell and Gladys M. Woods, *Jour. Amer. Vet. Med. Asn.*, 88, n.s., 41: 500, 1936.