

that one of the chief reasons for improved endurance was a reduction in proteid.

Mental tests were taken consisting of the addition of numbers, these showing slight increase in mental quickness.

A complete account of the experiments will be published shortly. It was undertaken by Professor Fisher in connection with a series of statistics which he is collecting on the subject of labor-power, especially in relation to diet, somewhat similar to the series of statistics collected by the economist Nitti some ten years ago. In communicating to the editor of SCIENCE the foregoing outline of his experiment, he has asked that any readers of SCIENCE who may be able to supply data on this subject from personal experience or other sources will put themselves in correspondence with him.

FIELD WORK OF THE SCIENCE DIVISION OF THE STATE OF NEW YORK.

GEOLOGICAL SURVEY.

Correlation Work.—The director and assistants continued the field investigations necessary to the comparative study of the New York Devonian faunas in their extension eastward. Explorations, resulting in considerable and exhaustive collections, were carried on in northern New Hampshire and Vermont, eastern Maine and in the Gaspé Peninsula, Canada. These field investigations, now completed, have brought to light a very large amount of instructive paleontological and stratigraphical data.

Areal Surveys.—The survey of the crystalline region of the Highlands of the Hudson has been continued. In the Adirondacks, a portion of the iron region of Essex County has been resurveyed and the Theresa quadrangle in Jefferson County well covered. In the area of exclusively sedimentary rocks, surveys have been made in the Lake Champlain Valley, and the following quadrangles in central and western New York have been advanced or brought to completion: Chittenango, Cazenovia, Syracuse, Geneva, Auburn, Nunda, Portage, Skaneateles and Phelps.

Surficial Geology.—Though somewhat interrupted by the absence of the geologists in

charge, some advance has been made in the interpretation of the northern Hudson and lower Mohawk Pleistocene phenomena and in the survey of the morainal deposits of western New York.

Paleontology.—A discovery of singular interest is the occurrence of Eurypterid-bearing shales with a novel and extensive fauna in the Shawangunk Mountains of eastern New York. The age of the Shawangunk grit, commonly regarded as equivalent to the Oneida conglomerate (lowest Upper Silurian) of central New York has but recently been demonstrated on purely stratigraphic data, to be the probable equivalent of part or all of the Salina formations. Subsequent to this demonstration the Eurypterid fauna was found in the grit, confirming the stratigraphic deduction, as its species are in some measure those of the Pittsford shale which lies at the base of the Salina series in western New York. The fauna is distributed through nearly 700 feet of the grit deposits. The museum has been enriched by very extensive collections of these fossils. Large acquisitions have also been made from the Eurypterid localities of Herkimer County from the Chazy and Beekmantown limestones of Lake Champlain with some remarkable slabs of Cystideans and other fossils from the Trenton limestone of southern Ontario.

Economic Geology.—A careful reexamination of the iron regions and their ore bodies has been made with the definite purpose of indicating possibilities of future development. These operations have met with a result altogether unanticipated and have determined the presence of undeveloped ore deposits so extensive as to put the state in the first rank of iron-bearing regions of the country. Indeed it is now probable that no equal area contains more available undeveloped iron ore, now to be reckoned by some hundreds of millions of tons of fair to high grade ore representing a vast increase in the potential wealth of New York state.

Other metallic ore industries have also been exploited, an interesting example being the newly developed zinc deposits of St. Lawrence County. Special examination of the sand-

stones of the state have been continued and completed.

Mineralogy.—A discovery of notable interest is the location of a series of vein caverns lined with perfectly developed calcite crystals of extraordinary size. A single crystal of remarkable crystallographic completeness and of a fine amethystine tint weighs nearly 1,000 pounds and innumerable others from 50 to 500 pounds each. In habit these crystals are highly modified rhombohedra with basal pinacoids and scalenohedral faces, frequently twinned but exemplifying a common form without great modification. Probably no such development of calcites so gigantic in size and at the same time so uncomplicated, clear and well built has before been seen in this country. An extensive series of these crystals has been removed for the museum and measures have been taken to control the entire supply for the state's collections.

Caverns.—Careful exploration has been made of the caverns of the Helderberg limestone plateau for the purpose of ascertaining their relations to the existing topography and drainage. It has been possible to determine that this network of underground passages represents successive stages of work not dependent wholly on the joint systems of the region and that, as lines of drainage, these passages are to-day in a decadent stage.

ARCHEOLOGY.

For two years past options have been taken on various lands believed to carry sites of Indian villages or burial grounds, and these are excavated as opportunity affords. This year the archeologist opened a village and burial site near Ripley on the shore of Lake Erie. The encroachment of Lake Erie on this site has been so great as to destroy some part of it, this of itself aside from internal evidence indicating its considerable antiquity. One hundred and fifty graves and refuse pits were opened and from them were obtained an amazing number of all sorts of relics and utensils of this early Erie culture, stone implements and ornaments in great variety, fabrics, skin clothing, seventy pots, about half of which were unbroken, skeletons with

ornaments attached and even parts of skin and flesh preserved. No site ever opened in New York has proved so instructive and so prolific in the vestigia of Indian life. The additions thus made to the archeological collections are extensive and important.

BOTANY.

Reexamination of species of *Crataegus* and the search for additions to fungous flora have been the chief objects of the past field season.

ENTOMOLOGY.

Protective and control measures against the San José scale, the grape root worm, tussock moth and elm leaf beetle and other insect enemies of the fruit and shade trees have been actively carried out. Special investigations upon the Caddis flies and gall midges have also been continued.

INTERCOLLEGIATE GEOLOGICAL EXCURSION.

THE annual New England intercollegiate geological excursion was held on Saturday, November 3. This excursion, organized in 1900 by Yale and Harvard, has met at Holyoke, Worcester, Boston, Salem and Meriden, and has annually brought together students from all the New England colleges and many of the normal schools and high schools, participation being limited to teachers of geology and certain advanced students. The expeditions have done much to improve teaching on the subject and to develop friendly relations between the geological departments of the different institutions.

Last Saturday the excursion was conducted at Meriden, Conn., by Professor Gregory, of Yale, and was preceded by a meeting on Friday evening at which the geology of the Meriden region was described. The object of the trip this year was to study the sandstones and interbedded lavas of the Triassic formation, and special attention was given to an important 'fault line,' on which the displacement amounts to 2,000 feet. Professor W. M. Davis, who worked out the structure of the region, pointed out the topographic features which were the result of the faulting; Pro-