practices more effectively and more profitably and that after the soundness of these practices has been demonstrated by scientific experiment the rest of the world will receive from China important contributions to knowledge.

At any Chinese restaurant in America one may obtain, by asking for it with sufficient diligence, a cheese made not from the animal protein of milk but from the vegetable protein of the soybean. Persistence in the asking is usually required, because the Chinese manager of the restaurant keeps this food on hand for his own use. It is only in rare instances that his American customers know of it or ask for it.

Soybean cheese is highly salted and its use by the Chinese corresponds very closely to our use of Roquefort cheese. The Chinese do not serve salt on their own tables, but they salt and at the same time season their food by the addition of one of two substances, soybean cheese and soybean sauce. The latter is a brown, salty liquid, also prepared from the soybean. Soybean cheese is excellent when served with salad, meats, vegetables or bread.

Protein is extracted from the soybean in the form of a milky liquid by a process of grinding, boiling and straining. From the soybean milk prepared in this manner the protein is coagulated or precipitated in the form of a white curd by the addition of brine made from impure salt containing as impurities magnesium chloride and calcium chloride, just as cheese curd is precipitated from cow's milk by the addition of rennet. From the soybean curd soybean cheese is made through the process of fermentation described in a forthcoming paper on "A New Species of Mono-Mucor, *Mucor sufu,* on Chinese Soybean Cheese." The author of the paper, Mr. Nganshou Wai, chief chemist of the National Hygienic Laboratory, Shanghai, is a native of Chekiang Province, China, and was graduated in 1924 from the Japanese Imperial University, Kyoto, where he became specially interested in biochemistry. He then worked for two years in the laboratory of Professor Genitzu Kita, at Kyoto, whose studies of fermentation are well known.

Mr. Wai has isolated from soybean cheese a mold which uniformly accompanies the proper fermentation of this cheese, has grown the mold in pure culture, and by inoculating fresh soybean curd with it has produced soybean cheese of characteristic flavor and texture. The original account of the experiments was published in Chinese, with illustrations, in December, 1928, in the Agricultural Journal of the Agricultural College, National Central University, Nanking. Mr. Wai's present paper, an abstract of the original, is the first presentation in English.

FREDERICK V. COVILLE

MANGANESE TOXICITY IN TOBACCO

DURING the season of 1928 peculiar abnormal physiological symptoms appeared on tobacco plants grown in soil in the greenhouse at the Connecticut Agricultural Experiment Station at New Haven. The symptoms were compared with similar symptoms occurring on tobacco plants grown in water and sand cultures at the Tobacco Substation in Windsor, Connecticut. At this latter station a study was made on the effect of manganese on the growth of tobacco. It was found that injury to the plants occurred in water cultures at a concentration of 1 p.p.m. of manganous sulphate, while in sand cultures the injury first occurred at 80 p.p.m. In comparing the symptoms of the injury on plants from the two stations they appeared to be fully identical. Complete analyses were made of the soils used in the New Haven experiment and they were found to be normal except for a high content of soluble manganese and also a high acidity. Later analyses were made of the soils under different fertilizer treatments and also of respective plant material grown on them. A definite correlation was established between reaction of the soil and manganese content of the plant material, *viz.*, the higher the acidity, the greater the percentage of manganese found in the plant material.

In order to determine more definitely that manganese was causing the toxicity a soil of very low content of soluble manganese was placed in a greenhouse flat and planted to tobacco. The plants were watered with a weak (0.5 per cent.) solution of manganous sulphate. The resulting growth was fairly normal and showed only slight evidences of the peculiar symptoms previously noted on plants in the greenhouse pots. Analyses of the soil and the plant material showed considerable amounts of manganese in both cases. The acidity of the soil, however, was not high. More plants were set in the same soil and watering with weak manganous sulphate solution was continued. In this case the growth was identical to that observed on the plants in the greenhouse pots. On analysis both the soil and the plant material contained very high amounts of manganese and the acidity of the soil was higher than in previous tests.

The manganese injury in tobacco may be described as follows: The leaves are sometimes normal in shape and size but are often distorted and dwarfed. The top leaves at first have a yellow-green color. When the leaves are fully developed the yellowish color is minutely distributed in the interspaces of the finest ramifications of the leaf veins, which long remain green. The color grows paler toward the tip. In later stages the entire leaves take on a more yellow color, but the "pattern" remains the same. In still

later stages the leaves may crinkle and brown irregular spots are distributed over the leaf surface.

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EVIDENCES OF AQUATIC LIFE FROM THE GLENWOOD STAGE OF LAKE CHICAGO

RECORDS of aquatic life during the various stages of Lake Chicago have been lacking for the earliest or Glenwood stage, whose waters stood about fifty-five feet above the present level of Lake Michigan. F. C. Baker points out that the withdrawal or Bowmanville stage of the lake, immediately following the Glenwood, witnessed abundant life in the waters of Wilmette Bay.[1] In the latter part of November, 1928, the junior author discovered minute molluscan shells in the well-stratified silts and clays of the Glenwood stage of Lake Chicago. Later, additional species were collected from the same locality, by D. F. Higgins and the senior author.

The locality where the discovery was made is in the western part of the village of Wilmette, Illinois, in the $SE\frac{1}{4}$ of the $SE\frac{1}{4}$ of Sec. 29, T. 42 N., R. 13 E., Cook County. The area lies in the fields north of Lake Avenue and east of Reinwald Avenue, Wilmette. A master's thesis, written by Miss Marie Devou, of Northwestern University, presents a further description of this region. The surface of the fields is between 625 and 630 feet A. T., or about fifty feet above the level of Lake Michigan. The shells were found about four feet below the surface in that part of the lake plain that was covered by the waters of Skokie Bay during the Glenwood stage of Lake Chicago.

The sediments were screened and washed, and a few more specimens have been found. These were sent to Mr. Baker, who kindly identified them and who lists the following species:

Gyraulus circumstriatus walkeri (Vanatta)
Gyraulus umbilicatellus (Ckll.)
Menetus exacuous (Say)
Helisoma trivolvis (Say)
Stagnicola caperata (Say)
Stagnicola reflexa (Say)
Physa gyrina hildrethiana Lea
Sphaerium occidentale Prime
Strobilops virgo (Pilsbry)[2]
Planorbula n. sp.

The last named is a species soon to be described by Mr. Baker. All the species, with one exception, are fresh-water shells. Mr. Baker states that these species are known in the older deposits of middle Illinois. Doubtless they migrated to the vicinity of the Glenwood beach, where, as Mr. Baker points out, they occupied the warmer waters of the shallow pools behind the beach barriers.[3]

The specimens identified by Mr. Baker have been placed in the Pleistocene collections at the University of Illinois Museum of Natural History. They will become a part of the Chicago Pleistocene collection.

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THE CAPTURE OF YOUNG WHITEFISH IN THE BAY OF QUINTE

THE young of the common whitefish (*Coregonus clupeaformis* [Mitchill]) have been taken but rarely in scientific collections, and, so far as the writer has been able to ascertain, the only reference to current year fry in the literature is that of Hankinson (1914). The capture of a considerable number of young whitefish in the Bay of Quinte is therefore of interest. These fry were taken close to shore in water of a depth of three feet or less on numerous occasions between April 12 and June 4, 1928. The capture and observation of these fry over a period of some seven weeks provide material which yields valuable information on the early growth, food and habits of this important commercial species. Full details of the early life history of the whitefish will be published at an early date.

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SCIENTIFIC BOOKS

Comparative Neurology, A Manual and Text for the Study of the Nervous System of Vertebrates. By JAMES W. PAPEZ. Thomas Y. Crowell Company, 1929. xxi + 518 pp., 315 figs. 8vo.

THE author has undertaken the difficult task of producing a combined laboratory guide and text-book on the anatomy of the nervous system. The comparative point of view is introduced in the first chapter with a discussion of the cerebral cortex of some of the lower mammals in relation to their sense-organ equipment. In the following chapters an account of gyri and sulci of the cortex in some of the

[1] F. C. Baker, "The Life of the Pleistocene or Glacial Epoch, as Recorded in the Deposits Laid down by the Great Ice Sheets," Univ. of Illinois Bull., XVII, 41, 1920, pp. 71–73.

[2] A land shell.

[3] F. C. Baker, personal communication.