

seventy members in attendance. Symposia were devoted to "The Training of Psychological Counselors" and "The Work of the School Psychologist." Addresses were given by Dr. F. H. Allport on "Methods of Personality Study"; by Dr. Ethel Waring on "Generalizing Abilities of Preschool Children"; and by Dr. W. V. Bingham, president of the association, on "Vocational Guidance in New York State." Fordham University was selected as the place of the next annual meeting.

THE Royal Society, London, is preparing for the Ministry of Labor a register of scientific research workers whose services could be used for the nation in the event of war. Professor Archibald V. Hill, Foulerton research professor and joint honorary secretary, is chairman of a subcommittee for scientific research attached to the Central Register Advisory Council of the Ministry of Labor. Sir Walter Moberley, chairman of the Advisory Council, is reported to have stated that "The general scheme includes the registration of technicians, engineers, architects, and others. This work is being dealt with by their appropriate professional institutions. So far as the scientists are concerned, we felt that the Royal Society was the natural body to undertake the work and that Professor Hill, as one of its secretaries, was the right man to act as chairman."

THE spring meeting of the Indiana Academy of

Science was held on May 12 and 13 at New Harmony, which was an early center of science in the West, being the home at one time of William Maclure, Charles Alexander LeSueur, Thomas Say, David Dale Owen, Robert Dale Owen and Richard Owen, and being visited once by Sir Charles Lyell. The program was devoted in part to lectures on the early scientific history of New Harmony as well as to the more recent studies in the geology, flora and fauna of the area. There were also conducted tours among the sites of historic and scientific interest.

THE twenty-eighth annual report of the Brooklyn Botanic Garden for the year 1938 records a total attendance for the year of more than 1,628,000, with a record week-end attendance from noon, April 30, to 5 P.M., Sunday, May 1, of 56,145, or at the rate of about 155 every two minutes. Two new gates were constructed during the year, financed by a bequest of \$10,000, and a beautiful memorial approach, consisting of stone seats, water basins, fountain and monumental columns, just inside the main entrance, was made possible by a gift of \$32,000. Private funds contributed, in addition to income from endowment, were in excess of \$54,000. About 56 per cent. of the total maintenance budget was met from private funds, and about 43 per cent. from the tax budget of New York City. A new garden of medicinal and culinary herbs was opened to the public in September. About twenty pages of the report are devoted to summaries of the research work in progress during the year.

DISCUSSION

WILL IODINE COME TO BE CONSIDERED AN ESSENTIAL PLANT NUTRIENT?

INFLUENCE of iodine has been studied in water and soil cultures at Oregon Agricultural Experiment Station beginning in 1929. Crop indicators used in experiments include alfalfa, clover, peas, corn, lettuce, tomatoes and sunflowers.

Mathematically significant increases in yield have been obtained, especially with alfalfa, clover and lettuce, while germination has been stimulated with corn. Iodine seems to promote development of chlorophyll or green pigment in plants. Soil micro-organisms appear to be affected, particularly nitrogen-fixing legume root bacteria. Yeasts are known to be stimulated by iodine.

Favorable concentration in flowing culture solutions is found to be one fourth to one half part per million. Flowing solutions were connected in series by Waldo Carlson, graduate assistant, who found the age of solutions affected stimulation and older solutions were more beneficial. The iodine may change to organic

form before it is effective. With alfalfa in "sterile" culture this concentration was inhibitive, an indirect effect is indicated. James C. Lewis, graduate assistant, found stimulation from iodine in soil cultures using a soil well supplied as to total iodine. Two to four pounds of iodine as potassium iodide were found to be significantly stimulating in soil cultures with Aiken and Deschutes soil series. Other soils have given negative results. Even where increase in yield was small the iodine content of the plants has been increased many-fold according to analyses by Mr. Lewis.

Comparison of methods for iodine determination has been made in the laboratory of Dr. J. R. Haag, nutrition chemist. Some improvement has been made in adapting the Harvey procedure for analysis of soils and plant materials.

Oregon soils, waters and plants are frequently low in iodine, yet certain deep wells, lakes and soils are found to be well supplied. Iodine in Oregon soils may run from $\frac{1}{2}$ part to 15 parts per million. The iodine content of Oregon waters is from .01 to 20 parts per

million. The relation seems sharpest between iodine content of water and goiter. Soil iodine seems to accumulate some with organic matter and to be higher in soils of sea-bed origin. Baumann in 1895 found absence of iodine in plants affects thyroid. Also in 1903 recommended seaweed as fertilizer, due to its iodine content.

According to a map of the United States prepared by Dr. J. F. McClendon there is a high incidence of goiter in certain areas, including much of the Pacific Northwest. Head lettuce and spinach are among the plants that contain relatively more iodine. Marine by-product fertilizers afford a source of iodine. Small-scale field trials are being made this season. If successful, potassium iodide might be added in irrigation water or large seed may absorb sufficient amounts for plant needs.

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RANGE PLANT NEWLY FOUND TO BE POISONOUS

WHILE searching for the cause of death of cattle in a small herd in northeastern Colorado, several native plants suspected of causing poisoning were fed. One of these plants, *Picradeniopsis oppositifolia* (Nutt.) Rydb. or *Bahia oppositifolia* A. Gray, was found to have poisonous properties, though hitherto unsuspected. The plant is a low-growing, gray-green perennial three to six inches tall with opposite, three to five divided leaves. It belongs to the thistle family and has small tight heads of yellow flowers.

Feeding experiments were conducted to determine its actual toxicity for cattle and sheep. Approximately six quarts of the finely ground plant was force-fed to a 650-pound steer by means of a stomach tube. Typical symptoms of HCN poisoning were produced, starting in about 30 minutes. Although the animal showed the accelerated respiration, trembling and muscular incoordination which are characteristic in HCN poisoning, these symptoms lasted for only about 30 minutes. Following this, although the animal had apparently recovered from the effects of the HCN, a marked depression was observed, which endured for more than three hours, but the eventual recovery was complete. Identical results were obtained when fed to guinea pigs.

A mature ewe was also force-fed, using $1\frac{1}{2}$ quarts of the chopped-up plant. The chain of symptoms was very similar to those produced in the steer, but more severe. Again a period of depression was followed by complete recovery.

Bahia oppositifolia is not readily eaten by stock except when forage is scarce, and it is questionable if they ever eat enough to prove injurious.

However, since quantitative chemical analyses of the plant indicate an average HCN content of .03 per cent.

it may be considered potentially dangerous to live stock.

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THE TRANSPORT OF WATER TO ANODE OR CATHODE THROUGH NON-AQUEOUS LIQUIDS

EXPERIMENTS have been reported recently by W. J. V. Osterhout and J. W. Murray in the May 13, 1938, issue of SCIENCE, page 430, and by H. E. Bent in the December 2, 1938, issue of SCIENCE, page 525, concerning the "Movement of Water from Concentrated to Dilute Solutions through Liquid Membranes."

The author has conducted experiments with non-aqueous liquid membranes, separating two equal portions of the same salt solution in water and has found that in some cases water is transported to the cathode solution, while in other cases water is transported to the anode solution, when platinum electrodes are dipped in the two salt solutions and connected to a source of direct current of 110 volts or more. With 110 volts the transport of water through an intervening membrane of benzaldehyde or of carbon tetrachloride is very slow, requiring several days or weeks before showing an appreciable change in the two volumes of aqueous solution. At voltages around 450 to 500 the transport of water is much more rapid, and a considerable difference in the two volumes may be observed within two days.

The apparatus in each experiment consisted of a U-tube with benzaldehyde or carbon tetrachloride filling the curved part of the tube with an equal volume of the saturated aqueous solution of the salt introduced into each arm of the tube above the liquid membrane simultaneously and carefully so that the solution would lie on top of the liquid membrane, with platinum wire electrodes dipping into the aqueous solutions and connecting to the direct current source, at first a 110 volt d.c. supply line, later a transformer-vacuum tube rectifier, which would furnish up to 500 volts and was designed to produce continuously up to 100 milliamperes. Much lower currents than this passed through the solutions separated by the liquid membranes.

When the electrolyte was ammonium oxalate, water was transported to the cathode side through benzaldehyde or through carbon tetrachloride. Likewise, when the electrolyte was sodium oxalate, water was transported to the cathode through benzaldehyde or through carbon tetrachloride. When the electrolyte was cupric nitrate, water was transported to the anode side through benzaldehyde and through carbon tetrachloride. These phenomena I have interpreted as indi-