level of this substance in the blood, the effect of the former being more marked. The sparing action on protein metabolism by these factors is of special interest in this connection.

These findings support the suggestion which we made in a previous publication,[4] namely, that the depression of the level of the amino acids in the blood during insulin hypoglycemia may be due in part to its effect upon some point in the mechanism of the enzymatic activity of glutaminase.

The administration of certain amino acids such as (dl) α-alanine increased the level of this substance in the blood. Glycine, on the other hand, produced no effect in some animals and a variable increase in others. The reason for this variability is not clear at present but may be of importance regarding the question as to whether glycine undergoes deamination. Other amino acids are being investigated.

The findings of Krebs[5] that brain, liver, kidney and retina are rich in glutaminase activity and also the work of McIlwain[6] in which he isolated glutamine from horse meat lend added support to the probability that the glutamine-like substance is glutamine.

Our studies are still in progress and some of the clinical and experimental data will soon be published.[7]

I am indebted to Roslyn T. Roth and Ruth S. Harris for their technical assistance.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A PROMISING NEW SOIL AMENDMENT AND DISINFECTANT[1]

THE serious crop losses suffered by growers as a result of injuries to plants by specific organisms in the soil indicate the need for a low-cost disinfectant which could be applied as an insurance measure in soils suspected of harboring such organisms. This need is particularly great where prediction of damage can not be made prior to planting or in areas where the incidence of such damage is spotty or where the economics of the crop preclude the use of expensive materials.

Preliminary results obtained by the use of a mixture of 1–3 dichloropropylene and 1–2 dichloropropane indicate that this material promises to fill this need. The material used in these experiments was obtained from the Shell Development Company at Emeryville, California, from whom it is available in two grades, one an approximately 50–50 mixture of the two compounds, and the other a crude form containing about 75 per cent. of the mixture, the balance being impurities of various kinds. It is low-priced compared with any competing product and, compared with chloropicrin, is extremely simple to handle. It is shipped in ordinary 55-gallon drums and can be handled without the use of a gas mask in the open air. In common with similar compounds, breathing of the fumes should be avoided and the precaution taken of promptly washing off with water any of the mixture which might be spilled on the hands or skin. No other commercial use for the material has thus far been found and no priorities are currently involved in its manufacture.

Tests with rapidly maturing vegetable crops grown in soil heavily infested with the root-knot nematode (*Heterodera marioni*) have shown that a very real measure of control has been obtained, not only in the plot which was covered with asphalt impregnated paper used as a mulch paper before treatment, but also in a parallel plot which received no seal of any kind either prior to or after the treatment. This is particularly important when the needs of the small grower are considered. In these tests, injections were made at intervals 1 foot apart, the amount per acre being approximately 200 pounds. Furthermore, in these tests, the crude form of the mixture was used. This crude form contains some impurities, but its manufacture involves fewer processes and it is therefore cheaper.

Experiments in pineapple fields have been conducted since the spring of 1940. In these experiments, a dosage of 150 pounds of the mixture in pure form per acre was used and injections were made through the mulch paper. The results thus far have shown that in all the locations in which the treatments were applied, definite and favorable response in growth has been obtained. The results are particularly striking in an area where a complex, including at least *Anomala* beetle larvae (*A. orientalis*), nematodes and pythiaceous fungi, has resulted in serious plant failure. In all cases, the results can be compared with those from equivalent applications of chloropicrin and, without exception, the new treatment is at least equal to that material in its benefits.

[4] M. M. Harris, J. R. Blalock and W. A. Horwitz, *Arch. Neurol. and Psychiat.*, 40: 116, 1938.

[5] H. A. Krebs, *Biochem. Jour.*, 29: 1951, 1935.

[6] H. McIlwain, P. Fildes, G. P. Gladstone, and B. C. J. G. Knight, *Biochem. Jour.*, 33: 223, 1939.

[7] M. M. Harris, *Jour. Clin. Investigation* (in press). July, 1943.

[1] Published with the approval of the acting director as Technical Paper No. 145 of the Pineapple Research Institute, University of Hawaii.

Results in pineapple fields did not make themselves evident for over a year after treatment, indicating that the soil disinfection, apart from its immediate effect in reducing populations of harmful organisms, had also affected the soil complex in such a way as to permit the plant to gradually show increasing improvement over the untreated checks. This was in direct contrast to the results with chloropicrin which, as usual, manifested themselves earlier with a dark-green growth typical of pineapple plants grown in chloropicrin-treated soil.

It is probaly true that the broad function of treatments such as these is to amend the biological complex of the soil so that the end result expressed in terms of plant health and plant yield is favorable. Biological complexes in the soil may be radically changed through the elimination of some specific organism and the suppression or stimulation of others. Such changes may be as significant for the end result as the initial effect on the specific organism, particularly if the crop in question is slow in maturing.

Much experimental work remains to be done on the effect of the treatment on specific organisms, the range of practical dosages for varying soils and weather conditions and the possibilities of treating soil around growing plants. When the pineapple plant is used as the test plant in such experiments the final results are slow to accrue, but since the material (called D–D mixture for short) has such great potential usefulness for other more rapidly maturing crops in a great many agricultural areas, it seems advisable to present the preliminary results at this time so that these potentialities can be fully explored.

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A SIMPLE BIRD HOLDER FOR USE IN AVIAN MALARIA STUDIES

WE wish to describe briefly here the canary holder which has superseded in our laboratory the one described a few years ago (SCIENCE, 88: 114, 1938). The new holder (see sketch), which has the great advantage of not injuring a bird, consists essentially of a thin brass tube of a size that a canary can be snugly fitted into, altered as indicated below.

In what is to be the hind end a notch is made about five eighth inch wide and one quarter inch deep with holes so placed in each corner that a straight wire can be passed through both of them. Just above each of these holes a slight perpendicular groove is filed on the outer surface of the tube to serve as a lock for the handle of the key which is made of half-hard brass wire.

Thin galvanized iron sheet metal is soldered across the other end and a portion bent forward to form the headrest.

The bird is inserted slowly into the holder until its head protrudes from the opening in the front end and it is then held in position by inserting the key above

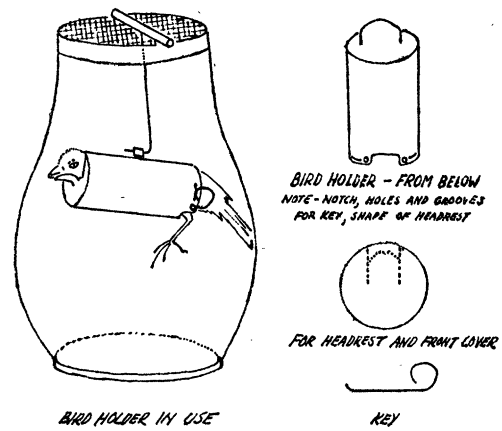

FIG. 1.

the legs dangling from the hind end and locking it in place. The holder and its contained bird are then suspended in a globe with mosquitoes.

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DULL, CHARLES E. and MICHAEL N. IDELSON. *Fundamentals of Electricity.* Illustrated. Pp. xx + 456. Henry Holt and Company. $2.00.

DULL, CHARLES E. and IRA G. NEWLIN. *Fundamentals of Machines.* Illustrated. Pp. xvi + 547. Henry Holt and Company. $2.00.

BARKER, ROGER G., JACOB S. KOUNIN and HERBERT F. WRIGHT. *Child Behavior and Development.* Illustrated. Pp. viii + 652. McGraw-Hill Book Company. $4.00.

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LINDSAY, ALEXANDER D. *Religion, Science and Society in the Modern World.* Pp. 73. Yale University Press. $1.50.

NEEDHAM, JOSEPH. *The Teacher of Nations. Addresses and Essays in Commemoration of the Visit to England of the Great Czech Educationalist Comenius, 1641.* Pp. 99. Cambridge University Press. The Macmillan Co. $1.75.

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