yet been decided. The annual award of the Academy's grant-in-aid was made to Dr. E. R. Eller, of the Carnegie Museum, Pittsburgh, to finance his further search for Scolecodonts. The following officers were elected:

President, W. H. Thurston, Jr., Pennsylvania State College; *President-elect,* E. A. Vuilleumier, Dickinson College; *Vice-president* (western Pennsylvania), Anna A. Conn, Uniontown, (eastern Pennsylvania), Walter S. Lapp, Lansdale; *Secretary-Treasurer,* V. Earl Light, Lebanon Valley College; *Press Secretary,* Bradford Willard, Lehigh University; *Editor,* Robert T. Hance, Pittsburgh; *Junior Academy,* Karl F. Oerlein, California State Teachers College.

BRADFORD WILLARD,
Press-Secretary

SPECIAL ARTICLES

BISULFITE BINDING SUBSTANCES (B.B.S.) AND THIAMIN DEFICIENCY

THIAMIN plays an important role in the metabolism of pyruvic acid. Keto-acids and aldehydes, including pyruvic acid, react with bisulfite (and hence are termed bisulfite binding substances—B.B.S.) affording a basis for their determination.[1] Thompson and Johnson[2] found a marked increase in the quantity of B.B.S. in the blood of thiamin-deficient rats and pigeons. Estimations of pyruvic acid in the latter showed that the rise in B.B.S. was due almost entirely to this substance. Lu[3] found a marked increase of pyruvic acid in the blood of thiamin-deficient rats.

Adapting the technic of Clift and Cook[1] to urine we have investigated further the relationship of B.B.S. and thiamin deficiency with the view to working out a method of appraising the status of thiamin nutrition in humans and as a means of estimating the content of thiamin in foodstuffs and biological materials.

It was early found in working with rats that the quantity of food intake is an important factor in the results obtained. Consequently, the amount of food must be limited to an arbitrary level during urine collection periods. The addition of considerable NaCl to the diet during collection periods assures sufficient urine so that animals can be studied individually. The salt has no vitiating effects on the results.

There is a rapid and progressive rise in the urinary B.B.S. of young adult rats on a thiamin-deficient diet. Frequently in as little as one week, after restriction to the diet, the increase is 200 to 400 per cent., confirming the findings of Banerji and Harris[4] published while this study was in progress. In advanced deficiencies the increase is as much as 600 to 900 per cent. When the food intake is limited at a constant level and thiamin is given, the B.B.S. of deficient rats drops to normal within 24 hours. This effect is partially masked when food is given *ad libitum,* since thiamin quickly stimulates the appetite. In animals receiving the standardized level of the deficient diet, adequately supplemented with thiamin, consecutive daily B.B.S. values are within a narrow range, 3–8 ml (expressed as ml of 0.005 N iodine) per 24 hours.

It is generally recognized that high fat diets can prevent or cure polyneuritis in rats.[5,6] We have made some observations on this relationship, in connection with the effect of diet on B.B.S. values. When fat (autoclaved lard) is substituted isocalorically for sucrose in the thiamin-deficient diet, there is some immediate decrease in B.B.S., but the values remain high (300 to 400 per cent. above normal) with no further change even after feeding the fat for two weeks. During this interval the growth rate and appearance markedly improve. Thiamin administration causes a B.B.S. drop to normal within 24 hours. Control animals on the same schedule receiving adequate thiamin showed no change in B.B.S. It is hoped that our studies now in progress will contribute to a satisfactory interpretation of these results.

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A NEW METHOD FOR STUDYING THE PROPERTIES OF LUBRICATING OILS BASED ON THE USE OF A NEW INSTRUMENT

WE have recently succeeded in making an automatic recording tensiometer. This instrument takes one measurement every two minutes, and being equipped with synchronous motors (of the electric clock type) will record the value of the surface tension practically indefinitely on a roll of paper. The recording box is connected to the tensiometer through an electric cable, so that the tensiometer itself can be placed in a separate room, an ice box, an incubator or even in a tightly closed chamber submitted to high pressure or vacuum.

[1] F. P. Clift and R. R. Cook, *Biochem. Jour.,* 26: 1788, 1932.
[2] R. H. S. Thompson and R. E. Johnson, *Biochem. Jour.,* 29: 694, 1935.
[3] G. D. Lu, *Biochem. Jour.,* 33: 774, 1939.
[4] G. G. Banerji and L. J. Harris, *Biochem. Jour.,* 33: 1346, 1939.
[5] W. D. Salmon and J. G. Goodman, *Jour. Nutrition,* 13: 477, 1939.
[6] F. E. Stirn, A. Arnold and C. A. Elvehjem, *Jour. Nutrition,* 17: 485, 1939.