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HARVEY (WILLIAMS[1]) CUSHING

April 8, 1869–October 7, 1939

By Dr. ELLIOTT C. CUTLER

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Honour a physician with the honour due unto him for the uses which ye may have of him: for the Lord hath created him. For of the most High cometh healing, and he shall receive honour of the king. The skill of the physician shall lift up his head: and in the sight of great men he shall be in admiration.—*Book of Ecclesiasticus, Chapter 38, Verses 1–3. Being the First Lesson for St. Luke's Day.*

No other individual in modern medicine has revealed such a variety of accomplishments as Harvey Cushing: master-surgeon, neurologist, physician, critical investigator, medical bibliophile, inspiring teacher, litterateur, artist! His craftsmanship and technical performance in surgery were superb; his precise exploration of the nervous system made him an eminent neurologist; his care of and interest in his patients were an example for the most devoted family physician and brought to him the faith and love of patients above what is accorded most physicians; his curiosity led him to an interest in original sources and a love of books which resulted in his amassing a great medical library and becoming one of the leading medical historians of his day; his scientific medical contributions form an important background in neurophysiology and endo-

[1] The Williams, his maternal ancestor's name, was finally dropped after his settling in Boston in 1912, where his mail often became confused with that of a surgical colleague, Dr. Hayward Warren Cushing. But an even earlier episode had warned him of this difficulty, for in 1895 when he had taken the examination for house-pupil at the Massachusetts General Hospital, he failed to hear the result for a long time after the other candidates had been notified. Investigation revealed that his notice of successful application, which seemed all-important to him at that time, had been forwarded to the same Dr. Hayward Warren Cushing, one of the most promising younger surgeons of Boston. This first incident was probably a major influence in his dropping the use of his middle name in his publications as early as 1900.

This seemed a desirable plant in which to study the factors influencing HCN formation. The chemical composition of *Suckleya suckleyana* and its relation to the toxic properties of the plant is an important physiological problem.[2]

Preliminary studies of the carbohydrate and nitrogen content of poison Suckleya showed the soluble carbohydrates to be chiefly reducing sugars which varied from one per cent. in seedlings to 2.5 per cent. in three-months-old plants. The sucrose content never exceeded 0.25 per cent. at any stage of development studied.

The starch content showed only moderate variation from early June to August.

Close relationship was found between the HCN and reducing sugar content. The HCN varied from a minimum of 0.018 per cent. at the time of minimum sugar content to a maximum of 0.240 per cent. when the sugar was highest.

Young plants contained a higher percentage of protein or colloidal nitrogen than old plants, but the older plants were higher in soluble nitrogen.

The marked reduction of protein nitrogen with advance of the season, accompanied by an equally rapid formation of HCN, is a behavior worthy of further investigation which may help to clarify some of the problems of nitrogen metabolism in plants. It is probable that following the exhaustion of available nitrates from the soil, synthesized proteins may be digested and the nitrogen constituent of the molecule then used in the formation of glucosides which yield HCN upon hydrolysis.

The data showed no accumulation of starch during the period of protein nitrogen diminution but rapid increase of reducing sugars. This relationship between the hexose sugars, colloidal nitrogen, soluble nitrogen and HCN suggests that the presence of available carbohydrates may stimulate the synthesis of the HCN—containing glucoside. The above relationship also suggests that this synthesis probably is not checked by limited nitrates, providing factors have been favorable for liberal protein formation in the early part of the season.

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EXPERIMENTAL CHRONIC CADMIUM POISONING[1]

CONTINUED feeding of albino rats with an adequate diet to which cadmium as the chloride had been added has been conducted in this laboratory for the purpose of studying the toxicity of chronically ingested cadmium. The details of this study will be reported elsewhere, but three symptoms of toxicity are so striking and of such importance as to justify a preliminary announcement in addition to the report presented at the twenty-third annual meeting of the Pacific Division of the American Association for the Advancement of Science.

The concentrations of cadmium added to the basic diet were 0.0031, 0.0062, 0.0125, 0.025 and 0.05 per cent. The symptoms of toxicity observed were bleaching of the enamel of the incisor teeth, anemia, and cardiac hypertrophy. The bleaching of the teeth is similar to, if not identical with, that produced by fluorides, and occurred on all dosage levels of cadmium. The degree of bleaching was proportional to the dosage. The anemia was likewise present on all dosage levels of cadmium, the severity increasing with the percentage of cadmium added to the diet. The cardiac hypertrophy was most evident on cadmium concentrations of 0.0062, 0.0125, and 0.025, and less evident on a concentration of 0.05 because the rats died before the hypertrophy could fully develop. Since the cardiac hypertrophy was not limited to the left ventricle, it is believed that the anemia rather than hypertension resulting from kidney damage was the causative factor.

ROBERT H. WILSON
FLOYD DEEDS

BUREAU OF AGRICULTURAL CHEMISTRY AND ENGINEERING, U. S. DEPARTMENT OF AGRICULTURE, AT THE DEPARTMENT OF PHARMACOLOGY, STANFORD UNIVERSITY SCHOOL OF MEDICINE

[1] Food Research Division Contribution No. 455.

[2] A paper presented at the Virginia meeting of the American Society of Plant Physiologists.

BOOKS RECEIVED

HENDRICK, IVES. *Facts and Theories of Psychoanalysis.* Second edition, revised. Pp. xiv + 369 + xv. Knopf. $3.00.

HERZBERG, GERHARD. *Molecular Spectra and Molecular Structure; I, Diatomic Molecules.* Pp. xxviii + 592. 181 figures. Prentice-Hall. $6.50.

Palao Tropical Biological Station Studies, No. 4; A List of the Fishes of the Palao Islands, and Other Papers. Pp. 523–694. Illustrated. Japan Society for the Promotion of Scientific Research, Tokyo.

Texas Agricultural Experiment Station: Fifty-first Annual Report, 1938. Pp. 281. Agricultural and Mechanical College of Texas.

University of Illinois Bulletin; Papers Presented at the Fifth Short Course in Coal Utilization, Held at the University of Illinois, May, 1939. Pp. 173. Illustrated. The University. $0.50.

Vitamin E. A Symposium Held Under the Auspices of the Food Group (Nutrition Panel) of the Society of Chemical Industry, April, 1939, at the School of Hygiene and Tropical Medicine, London. Pp. viii + 88. The Society. 5/–.

Zoologica; Scientific Contributions of the New York Zoological Society. Pp. 265–384. Illustrated. The Society.