

**ON CARBOHYDRATE METABOLISM (A
COURSE OF ADVANCED LECTURES IN
PHYSIOLOGY DELIVERED AT THE UNIVERSITY
OF LONDON, MAY, 1905): FOLLOWED BY THE
FUNDAMENTAL PRINCIPLES, AND THE
TREATMENT, OF DIABETES DIALECTICALLY
DISCUSSED**

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On Carbohydrate Metabolism (a Course of Advanced Lectures in Physiology Delivered at the University of London, May, 1905); Followed by the Fundamental Principles, and the Treatment, of Diabetes Dialectically Discussed by F. W. Pavy

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F. W. PAVY

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Royal College of Physicians of Edinburgh

PUBLICATIONS

The following publications will appear in the spring of 1955.

2. ADAM PATRICK, M.A., M.D., LL.D., F.R.C.P.(Edin. & Lond.): *The Enteric Fevers, 1800-1920*. 46 pp., frontispiece, 3 charts, Bibliography, stiff paper covers. 3s. 6d.

An expanded version of the Sydney Watson Smith Lecture delivered in November 1954. This volume gives a critical review of contemporary opinion on the enteric fevers over this period.

3. JAMES M. MACKINTOSH, M.D., LL.D., F.R.C.P.(Edin. & Lond.): *Research in General Practice*. 56 pp., Bibliography, stiff paper covers. 3s. 6d.

An expanded version of the John Matheson Shaw Lecture delivered in November 1954. Professor Mackintosh, a member of the Steering Committee of the College of General Practitioners surveys the history, present-day facilities and potentialities of research in general practice.

4. SIR DAVID KENNEDY HENDERSON, M.D., F.R.C.P.(Edin. & Lond.): *Society and Criminal Conduct*. 44 pp., frontispiece, 3 charts, stiff paper covers. 3s. 6d.

An expanded version of the Morison Lecture delivered in December 1954. A survey of criminal conduct, its origin as a psycho-biological phenomenon and a discussion of the possibility of its treatment and prevention.

*D. David Ferrier F.R.S.
With the kind regards of the author*

ON

CARBOHYDRATE METABOLISM

*(A Course of Advanced Lectures in Physiology delivered at
the University of London, May, 1906)*

WITH AN

APPENDIX ON THE ASSIMILATION OF CARBOHYDRATE
INTO PROTEID AND FAT

FOLLOWED BY

THE FUNDAMENTAL PRINCIPLES, AND THE TREATMENT,
OF DIABETES DIALECTICALLY DISCUSSED

BY

F. W. PAVY, M.D., LL.D., F.R.S.,

HONORARY PHYSICIAN TO KING EDWARD VII HOSPITAL; CONSULTING
PHYSICIAN TO GUY'S HOSPITAL

LONDON

J. & A. CHURCHILL

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PREFACE.

CARBOHYDRATE is viewed in this volume from a twofold aspect—physiological and pathological. When physiological procedure is in operation, the carbohydrate principles of our food are dealt with in the system in a manner to be rendered applicable to utilisation, and, in passing to utilisation, they become lost sight of after being ingested. When, on the other hand, pathological instead of physiological procedure confronts us, carbohydrate matter fails to be placed in the requisite position to proceed to utilisation, and, in consequence thereof, simply traverses the system in the form of sugar to become discharged as such with the urinary water, the issue being diabetes. Pathology steps in on account of default in the fulfilment of the part that ought to have been carried out as a physiological proceeding. The two points of consideration being thus related, a knowledge of the physiological operations involved in carbohydrate metabolism constitutes a necessary preliminary to a right comprehension of the pathology of diabetes. Physiology is truly regarded as the handmaid of medicine, and nowhere does this position more strongly hold good than in connection with the matter before us.

This leads to an inquiry into the position in which the glyco-genic doctrine stands being called for. Under this doctrine it is taught that our carbohydrate supply is transported in the form of free sugar through the circulatory system to the seat of utilisation in the tissues. Such a procedure in reality implies the production of glycosuria; for sugar, with its small molecular constitution, if allowed to reach the circulation, cannot be prevented from running off in a *pari passu* measure

with the urine. To be kept out of the urine, sugar must be kept out of the general circulation, and this, under natural circumstances, is effected by the occurrence of carbohydrate assimilation in accordance with the principles enunciated in this work.

As an outcome of the teaching of the glycogenic doctrine it is suggested that the transport of sugar through the circulatory system to the systemic capillaries for oxidation and force production constitutes a necessary phenomenon of life, and upon these premises it is argued that a supply of carbohydrate food is needed by the diabetic. In spite of the circulatory system being charged with a redundancy of sugar from which pernicious effects are being produced, the supply of carbohydrate, with the attendant abnormal condition arising therefrom, is to be maintained. With the greatest confidence it can be affirmed that, as a matter of fact, no principle of action could be productive of more sinister results.

The glycogenic doctrine, then, stands far otherwise than in the position of a mere question of abstract science. No less an important matter than the principle of action to be put into force in the dietetic treatment of diabetes is at stake in connection with it. If physiology is to hold its right position, and to act as a guiding instead of a misleading factor in relation to medicine, the interests of medicine demand that the glycogenic doctrine should be abandoned. To satisfy the requirements of the case I consider it must be said that nothing short of a clean page is needed upon which the subject must be treated upon different lines from those hitherto adopted.

To Dr. Selous and Dr. Leslie Eastes I desire to tender my thanks for the assistance rendered by them in the preparation of the sections of the villi depicted in this work, and to Messrs. W. Watson & Sons for the care bestowed upon the production of the photomicrographic illustrations. To Dr. H. W. Bywaters I am indebted for the preparation of the index, and for much aid in carrying the work through the press.

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