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By

W. R. AYKROYD

M.D.

DIRECTOR OF NUTRITION RESEARCH, INDIAN RESEARCH FUND
ASSOCIATION : LATE MEMBER OF HEALTH SECTION,
LEAGUE OF NATIONS (1931-5)



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INTRODUCTION

ON Diet and Regimen in Sickness and Health, by Horace Dobell, M.D., was a popular text-book during the seventies and eighties of last century. The seventh edition was published in 1882. It is of interest to note what the author has to say about the dietary requirements of human beings :

“ Practical experience in the dieting of large numbers of men, and other means, have enabled us to establish the fact, that an average man, as above described (weight 150 lb.), requires for the maintenance of health, a diet which shall contain about 4 oz. of plastic materials, 3 oz. of fat, and 10 oz. of carbohydrates ; and on careful analysis of the diet, we find that it can supply the required 10,000 British units of heat.”

Converting ounces into grammes and using Rubner's figures for the calorie values of 1 gramme of protein, carbohydrate, and fat respectively, we arrive at the following standard dietary :

Protein.	Fat.	Carbohydrate.	Calories.
113 gm.	85 gm.	283 gm.	2,417

(Actually, 10,000 British units of heat = 2,500 calories, but Dobell was using less accurate conversion factors than Rubner's.)

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Dobell proceeds to lay down the following rules :

“ A healthy adult man requires daily from 900 to 1,130 grammes of dry nutritious food of which $\frac{1}{200}$ must be mineral matter ; 3 or 4 oz. of plastic matter may be combined with 3 or 4 times that quantity of heat-giving material. The heat-giving constituents must contain a mixture of fats with saccharine materials (carbohydrates) in the proportion of about 1 of the former to 3 of the latter. Every complete diet must include some vegetable and fruit which contains potassium, and the total amount of water taken in 24 hours, including that contained in the dry food, must not be less than 2 litres.”

There will be plenty to say in later chapters about heat units (calories), plastic materials (protein), mineral matter, and so on. We are not specially concerned here with the accuracy of Dobell's estimate of calorie, protein, fat, carbohydrate and mineral requirements. The point to be stressed is that in Dobell's day, and until very recent times, very little was, so to speak, demanded of a diet, and moreover it was difficult to put forward a very clear case in support of unexact-ing text-book standards. The result was that the majority of human diets were found, on investigation, to fulfil the requirements de-

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manded by science ; for practical purposes dietary needs were satisfied as long as there was no hunger ; and there seemed nothing further to be said about the matter. A lecture or two on nutrition had to be given to medical students, but they soon forgot all about a subject which seemed to have no close relation to the problems of medicine and public health. Dietetics was, in fact, a "dismal science" which repelled and bored the student, as the reader can discover for himself by questioning a few elderly doctors of his acquaintance. The writers of text-books on dietetics would insert a chapter or two about calories and proteins and hurry on to more entertaining questions such as the digestibility of oysters and the alcoholic content of port and sherry.

The essence of the change in outlook which has taken place in recent years can be described in a sentence : modern dietary standards are much more exacting than those which preceded them. The problem of adequate nutrition can no longer be regarded as a simple one, instinctively solved by uninstructed humanity. A child may have plenty to eat, may even consume protein and fat in the quantities recommended by Voit in 1870, and yet be in a state of grievous malnutrition ; to put it in text-book style, quantitative suffi-

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ciency may co-exist with a whole series of qualitative defects, any one of which may produce the most serious physical consequences. A great mass of evidence has been collected which proves that there is a close relation between general health, both bodily and mental, and diet, between physical development and diet, and that dietary deficiency is responsible for some of the commonest and most serious diseases from which humanity suffers. The modern student of dietetics casts his net wide; he looks for dietary deficiency in unexpected places. He has little respect for the traditional dietary habits of mankind, or for the idea that because millions of people seem to rub along fairly well on a particular diet, that diet is perfectly adapted to their needs. As a result of this change in view, the science of dietetics is now passing through an active and progressive phase.

Modern nutritional science has been built on a foundation of observation and experiment for which a great variety of workers in many countries have been responsible. Clinicians, epidemiologists, public health workers, laboratory workers, animal husbandry experts and practical animal breeders have all contributed; observation and experiment on man have run side by side with observation and

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experiment on animals, the one confirming the other. The development of the science has been hastened by two catastrophes: the Great War and its privations, and the economic *débâcle* of recent years which brought unemployment, poverty and the dangers of malnutrition to millions in the wealthiest countries of the world. Considered separately, many of the observations which have gone to build up what McCollum calls the newer knowledge of nutrition might seem unimportant. It is when they are considered as a whole that their full weight becomes manifest. The author hopes that this book will not only supply the reader with a brief statement of modern ideas on dietary questions, but also, by means of suitable selection and presentation, convince him of the importance of recent discoveries in this field in relation to the whole structure of our civilization. In its broader aspects dietetics is a common-sense subject, demanding no great effort of comprehension on the part of the student. Courageous men attempt to teach the layman, entirely without tears, the elements of physics or astronomy. The present writer has a simpler task.

The literature of the science of nutrition is extensive. The 5th volume of *Nutrition Abstracts and Reviews* (1935-6) published 4,762 abstracts of scientific papers and books

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on various aspects of the subject, and the flood appears to be increasing rather than diminishing. Without such admirable publications, the modern scientific worker would either lose touch with the work of his colleagues or spend a large part of his time in seeking out and reading original articles. There are now a considerable number of journals devoted entirely to diet and nutrition. In the circumstances it is impossible to supply a comprehensive bibliography, and that given on p. 248, though it includes many of the better-known text-books, is rather a random selection.

A number of references are made in the book to work carried out by the author under the Indian Research Fund Association, for which grateful acknowledgement is due to the Association.

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