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DUTIES OF THE STATE IN RELATION TO THE NATION'S FOOD SUPPLY.

RESEARCH ON NUTRITIONAL PROBLEMS.*

BY

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SOME of those interested in this discussion must have wondered what exactly the officers of this Section of Preventive Medicine had in their minds when they used the words "What duties has the State?" Did they mean by "duties" obligations imposed at the present time by Act of Parliament? If so, the discussion resolves itself more or less into a recital of those official activities which bear on the subject of nutrition and feeding. It must be assumed that this is not wanted, but rather the consideration of the problem as to what an ideal State should do in regard to carrying out research in nutritional matters, in the instruction of parents, in maintaining food supplies, and providing cooking facilities.

In the first place it may be worth while to consider whether feeding problems are a profitable field for Government activity. Nobody would deny that State and local government interference in matters of health, especially as it is affected by sanitation and drainage, water supply, and limitation of spread of infectious disease, has been of untold benefit to the community. Is it likely that a similar interest in feeding will be followed by beneficial results of a commensurate order? Some may think not, but for myself, and speaking probably for all those in touch with modern work on nutrition, I should say that the outcome of a sane and forceful effort on the part of imperial and local governing bodies in this field would lead to as revolutionary a change in the general health of the community as has followed their work on matters of public hygiene.

In a sense the problem of correct feeding is even of a more fundamental nature than that of general hygiene, for

* A paper read in the Section of Preventive Medicine at the Annual Meeting of the British Medical Association at Edinburgh in introducing a discussion entitled "What duties has the State in relation to the nation's food supply regarding research, instruction of parents, maintenance of supplies, and cooking facilities?"

whereas it is possible to bring about good health and perfect development under bad hygienic conditions so long as the food eaten is very good, when the diet is defective the most perfect hygiene as we know it will not prevent bad physical development, ill health, and early death. Good hygienic conditions may for the moment be described as those conditions which reduce the chance of infection by micro-organisms, but nothing has been more prominent in recent work on feeding problems than the part played by correct feeding in increasing the individual resistance to infection. It is true that our knowledge of this problem is of an elementary nature, but the subject is one of active interest at the moment, and further facts of great importance will no doubt come to light very soon. I need only allude to the recent accumulation of facts showing the importance of vitamin A in increasing the resistance of the animal to inflammatory conditions of the respiratory passages and lungs as a forerunner of knowledge on the relationship between diet and resistance to infection. But apart from this large question of the relation of feeding to infection, there remain the purely metabolic disorders which are brought about by incorrect diet; among these may be instanced the bone deformities and the defective dental structure and growth of jaws which follow deficient vitamin D intake, the symptoms of scurvy due to deficient vitamin C, the nervous symptoms due to deficient vitamin B, the goitre due to deficient intake of iodine, the stunted growth due to deficient intake of biologically good proteins, and the ill effects of excessive and unbalanced cereals. These are some of the more recently established facts, and, even if they are not greatly extended in the near future, they are sufficiently important in themselves to justify the belief that it is certainly a most profitable line along which the activities of the State should be directed and hastened. The question now arises as to the methods to be adopted for the acquisition and diffusion of new facts concerning nutrition, and the relation of these facts to the public weal.

With regard to research on nutritional problems, the machinery, or at least a skeleton of the machinery, is present in the Medical Research Council. Since this body was set up a large part of its activities have been directed to the solution of nutritional problems. It was a most happy occurrence for the progress of nutritional studies that the Medical Research Committee was appointed soon after the enunciation of the vitamin problem, and that Sir Frederick Gowland Hopkins, one of the original and present members, should have played the leading part in this work. It is true that at that time nobody could foresee what an extraordinary part the vitamins were playing in the production of disease common in this country, but at least the field was set and all the circumstances were propitious for the rapid accumulation of facts which followed.

The Medical Research Council has always been ready to support work on nutritional problems to the limit of its meagre resources. Unfortunately its limited income is not the only drawback to rapid progress in this part of its work, for the field of workers upon which it can draw is very small. Work of this type does not attract young men, and even those who have found themselves in this field have often arrived there by accident. There are many reasons for the lack of popularity of this kind of investigation, but probably the greatest of these is the spirit of scepticism and even hostility which has surrounded the subject of feeding, especially as it concerns vitamins. Many of the established physiologists and pathologists of this country have not only failed to see the scientific and practical significance of the new dietetics, but have been sceptical and often even hostile as to the existence of these substances. The popularity of the subject among the general population and the uncritical way in which vitamins have been discussed have only made the atmosphere which surrounds nutritional investigation worse.

It is possible to foresee the end of this period of unpopularity, as even the scientist with the longest latent period cannot fail to be aroused by recent work on the antirachitic vitamin and its photosynthetic production by the action of ultra-violet radiations on ergosterol. These recently discovered facts must tend also to focus the attention on particular problems and prevent the loose thinking and talking that is so widespread in matters dietetic. The facilities for nutritional investigation, or at least financial facilities, have been recently greatly extended by the formation of the Empire Marketing Board. The liaison between this body and the Medical Research Council is to be highly commended, and it is to be hoped that attention will not only be given to technical problems connected with storage and transmission of food, but that an eye will be given to the more academic problems of diet which form the fundamental basis for all future advances in knowledge as to the relation of feeding and health.

Interwoven with the advances in knowledge of nutrition is the problem of animal feeding, attention to which is being given by the Board of Agriculture, whose financial resources as compared with those of the Medical Research Council are very great. Speaking as one whose time has been largely occupied in investigating problems which are certainly as important from an agricultural as from the human aspect, I have a strong feeling that the inter-relationship between nutritional research as carried on in the university laboratories of this country not primarily devoted to agriculture and that of the Board of Agriculture is not so close as it ought to be.

On the whole, so far as matters of research in nutritional problems are concerned, it is probably safe to say that the official machinery of this country is well established and

likely to grow from strength to strength. Care must be taken that, as it grows, co-ordination of the work grows with it, so that not only should there be a rapid diffusion of new facts as they come to light and a limitation of unnecessary overlapping, but, what is of supreme importance, individual workers should be able to take up quickly the newer and often better point of view as it becomes established. Better co-ordination and more intimate knowledge of each other's work would not only result in more rapid progress, but would greatly reduce the hostility, too often encountered, where one group of workers decries the results of another group. The antagonism to Lister's teaching of antiseptics is only one instance of what is far too common in this country.

So far as the acquisition of new facts on nutritional matters is concerned, things are, on the whole, well; but what about the mechanism for the dissemination of this knowledge and for making full use of it? Here again the mechanism is at hand in the form of the Ministry of Health and the Board of Education. The first of these bodies has its nutritional advisers among its officers, and in recent years has undertaken a large number of tasks which involve advice in feeding and the dissemination of knowledge of dietetics. I need only mention the establishment by local health authorities of maternity and child welfare centres. The Ministry of Health also has its Research Department, whose activities are, however, more concerned with the investigation of technical points concerning foodstuffs than with the acquisition of more fundamental facts.

It is evident that the State has some machinery for directing the dissemination of knowledge of nutrition as it is acquired, and the question must now be faced as to whether this mechanism is satisfactory, and, if not, how it can be improved. It is an easy matter for an outsider to criticize and suggest improvements, but before venturing to do so I should like to pay tribute to the excellent work now being carried out by the Ministry of Health and educational authorities along these lines. Nobody has a greater admiration for the civil servant of this country than I have, and this admiration extends as much to the Ministry of Health as to other governing bodies. At the same time it is perfectly certain that knowledge of dietetics is greatly in advance of the application of this knowledge and the adoption of its teachings by official authorities. The reason for this is easily understood. Government officials must play for safety, and the greatest crime in their eyes is to make a statement one day which has to be retracted at a later period. However valuable their teaching might be in other respects, a mistake is unforgivable, so that their advice must be limited to what is considered as generally accepted. This means a latent period of many years as regards most discoveries. Their task is not lessened, so far as dietetics is concerned, by

the multitudinous teachings of experts and so-called experts. What, for instance, is an official to do when faced with the many suggestions as to the dietetic means of saving the race which fill our daily papers? These suggestions are not only multitudinous but are often contradictory. They represent the views of a few who know, more who half know, and many who are entirely ignorant of the subject. The average intelligent reader smiles and rejects the lot.

Nothing is more clear than that any system must be inefficient which leaves discussion as to active policy in matters of dietetics to one or more officials whose time is largely taken up with administrative work. How to improve the situation is difficult to suggest. One obvious and essential method would be to appoint a Board of Nutrition to make recommendations to the executive officers of the Ministry of Health. This Board should consist largely of active workers on nutrition with experience of both animal experiments and the feeding of human beings. They should be chosen on the basis of their work only, and no question of representation of learned societies or of particular parts of the kingdom ought to receive consideration. It should be the duty of those members not only to sift the evidence as they read it, but to keep in touch with all those actively engaged on nutritional investigations. Speaking as a laboratory worker I am sure that a good welcome will be given to any official body whose object it is to find out the latest trend of experimental results. As it is, practically the only officials concerned with nutrition who ever visit my laboratory are those from other countries than my own, and I expect my colleagues engaged in this type of work have the same experience. In their active experimental work many investigators are years ahead of their publications, and I consider the direct personal contact with research in progress is a most important function of any official body engaged in advising a Government department. It is at least as important, to my mind, that the Ministry of Health should have a strong and representative body of nutritional experts as it is for the Treasury to have its financial experts, or for the War Office to have its Army Council.

Assuming that we had an efficient method of acquiring new knowledge on nutritional matters, and one by which the Ministry of Health received the best and the latest advice as to the relative importance of new discoveries, the question now arises as to how such information should be dealt with so that the average citizen could profit thereby. For some people an official announcement of the facts is sufficient, especially if the pronouncement is given with adequate authority. What a boon it would be at the present time, for instance, if out of all the multitudinous teachings presented to us as regards feeding a really authoritative body issued a reasoned statement declaring the

relative importance of all the points raised. While such a statement would influence many people, we must not delude ourselves into thinking that it would convince any large section of the population. I can speak with feeling on this point. It is now five years or more since I published the fact that cereals, and especially oatmeal, will, in the absence of sufficient vitamin D, interfere most potently with calcification processes and the general health, but those who realize this are very few in number, in spite of the fact that the evidence is open to anybody to examine. Prejudice and ignorance—both absolute ignorance and ignorance of the value of the scientific method—can only be overcome by time.

Another method by which the Ministry of Health could, if given the necessary authority, greatly increase its effectiveness would be to assume greater control over the feeding arrangements in all institutions run by State aid. I refer particularly to Poor Law institutions, prisons, welfare centres, and similar bodies. Sometimes the sole controlling factor in the minds of the governing bodies is the question of cost of the food, although this is by no means always the case. I do not think any local authority need fear a great increase in cost if the feeding were controlled by a wise body of experts representing the Ministry of Health. At the same time I am convinced that the results of the improved health and physique which would follow the adoption of the latest facts of nutritional science would amply repay both any possible increase in cost and any interference of the central dietetic authority.

I can imagine many medical men being alarmed at the suggestion that the Ministry of Health should advise in the feeding of children at welfare centres, but I am sure from my own observations that this would be highly efficacious in many cases—again not in all, for medical attendants at welfare centres are often very alert to new facts regarding nutrition, sometimes even too alert and uncritical, especially where patent foods are concerned.

One other suggestion can be made which would greatly facilitate the working of an authoritative body dealing with nutrition. I refer to the necessity of some scheme for standardizing foods and other preparations for their vitamin content. I am aware that this has recently been boldly tackled—much to their credit—by the Pharmaceutical Society of Great Britain in their new standardizing laboratories. This attempt should be officially encouraged to the utmost extent, and, if the methods which are developed prove satisfactory, it should be as much the duty of the Ministry of Health to adopt these by legislation as it is their present duty to test foods for their purity. It ought to be impossible in the near future for people to put on the market preparations about which claims as to their vitamin content are made unless these have been officially tested.

To sum up, I suggest that the following steps should be taken by the State in order to strengthen the control and executive power of the Ministry of Health in matters of nutrition:

1. That the Ministry of Health should set up a Board of Nutrition consisting largely of experts actively engaged in nutritional research, whose main duties would be: (a) to examine the results of the investigations carried out by those researching for the Medical Research Council, the Board of Agriculture, the Empire Marketing Board, and all others engaged in this field, both by studying their published work and, as far as possible, by personal contact with the actual investigations; (b) to advise the Ministry of Health to take action along lines which appeared to them advisable; (c) to recommend, or even to initiate, research on practical points where there is any obvious hiatus of evidence.

2. That the necessary authority be given to the Ministry of Health, acting on the recommendation of its Board of Nutrition, (a) to control the feeding of Poor Law institutions and prisons, and to advise in others, such as welfare centres or wherever public grants are made; (b) to publish authoritative statements, and, if necessary, give the evidence for such, on feeding matters to the general public; (c) to set up or control a food analysis department which includes not only the testing of food as at present carried out, but the standardizing of foods and other preparations for their vitamin content.

None of these suggestions is revolutionary, and they are only developments of practices at present in use. They would raise the status of nutritional matters to a level compatible with its importance to the nation. They would hasten the adoption of the teachings of dietetics discovered during the past twenty years. They would lead to untold benefits to the health of the community.

The Instruction of Parents.

This, I imagine, would be part of the duties of the Ministry of Health, acting on the advice of its Board of Nutrition. It is probable that official statements made to the press would be the most important method of teaching the facts to the average parent. At the present time this work is being attempted by several well meaning health societies, whose members have a strong conviction that diet is a very important subject, but whose knowledge of the facts is often lamentable. These societies would no doubt continue their well intentioned efforts, but their knowledge of the subject would be greatly enhanced and their teachings correspondingly influenced by the official statements of the Ministry of Health. All the numerous

public lectures on diet at present given throughout the country would be similarly influenced. The teachings would be unified and the wheat of the subject separated from the chaff. The present method, which seems to be growing in popularity, of issuing manifestos to the press on dietetic subjects, is altogether wrong. These statements are often partisan in their origin and are frequently signed by men who, however distinguished they may be in their own lines, cannot possibly have any real knowledge of dietetics. The Board of Nutrition must supersede these well meaning efforts by better methods.

Maintenance of Supplies.

If by this is meant the maintenance of sufficient food in the country to supply the necessary amount of energy and protein for each individual in a position to buy it, then it would not appear desirable for the State to take any action except in times of national emergency, as in war, especially war accompanied by blockade. On the other hand, if it means the maintenance, and increased facilities for obtaining special foods and the limitation of others, it is probably a line of action that may prove useful.

The trend of scientific work on nutrition is to divide foods roughly, from the point of view of disease, into three classes: (1) "protective" or disease-preventing foods; (2) harmful or disease-producing, or, probably better, "protection-demanding" foods; and (3) neutral foods. Among the first, or protective foods, would be placed milk, eggs, green and other vegetables, fruit, cheese, meat, and fat fish. In the second, or disease-producing foods, are cereals and cereal products, including bread of all kinds (white flour or wholemeal flour), maize, oatmeal, rye, rice. The third, or neutral group of foods, would probably include sugar, pulses (peas and beans), pork and bacon, and white fish. These are tentatively arranged, and it might be desirable with further knowledge to redistribute the members of group (3) among groups (1) and (2). For instance, the way in which sugar seems to upset experimentally fed dogs suggests that under some conditions it is a harmful food, and if there were any lack of vitamin B in the diet pulses would then pass into group (1) among the protective foods. It may be necessary to point out that the inclusion of cereals and cereal products among the harmful foods does not mean that these substances are devoid of nutritional properties. They have many excellent qualities in this respect, and their harmful effects can be readily antagonized by some of the members of group (1), or protective foods. At the present time, however, a sufficiency of "protective" foods is often not eaten, and poor physical development and bad health result in many individuals.

In view of these facts it would be desirable for our hypothetical Board of Nutrition to consider whether it was necessary for the Ministry of Health to take steps to

make the "protective" foods—milk, cheese, butter, eggs, fat, fish, etc.—more easily procurable by increasing the supplies. It would probably be undesirable at the present time to limit the quantities of the "harmful" group—that is, cereals—available, for these are the cheapest procurable foods and form the basis of the average diet in the country, and especially in view of the fact, as stated above, that they can be made innocuous.

In one other respect—namely, the maintenance of pure food, both as regards micro-organism contamination and admixture with chemicals as preservatives—the State is already active. All of us commend this work and would like to see it strengthened, especially as regards the supply of pure milk. The widespread sale of milk contaminated with tubercle bacilli is a moral and economic disgrace to the country. I think it is time the community faced the probability that the sale of milk bacteriologically clean will be an uneconomic proposition, and it only remains to be determined whether the improvement in health and physique accompanied by some monetary loss is more desirable than widespread tuberculous infection and large monetary profit. A time may come when knowledge of the factors controlling resistance to infection will be sufficiently definite to make it a matter of indifference whether milk is infected with tubercle bacilli or not. Or it may be that an adequate substitute for milk, cheaper and more easily controlled, will be discovered. This time, however, is not yet, and it is important that one of the best "protective" foods in the dietary should be so controlled as to lead to the larger consumption of a purer and better product. It would be a bold and excellent thing if some city or town would purchase and run its own herd of cows with the object of supplying its citizens with good, clean milk. Any small financial loss would be amply repaid by the improved health and increased feeling of security of the community.

Whereas the economic side of food supplies must obviously always be one of vast importance, the question of personal profit plays far too great a part in feeding arrangements. This is beginning to be recognized by the setting up of the Food Council to investigate the relation of cost of food to wholesale and retail profits. As time goes on the importance of the question of private profit and food wangling will be more and more recognized, and State schemes for meeting the situation will undoubtedly be developed. It is neither desirable that any particular food should be reduced in or eliminated from the diet under the influence of private individuals and companies, nor that it should be foisted on to the public by other individuals for similar reasons. Both of these actions are possible. An example of the first of these is seen in the gradual reduction of an excellent food in the dietary of this country in the case of fish, apparently as the result of methods of sale employed by fish retailers. An example

of the second type can be seen in the tremendous consumption of pig products and veal in Germany, as the result of the discovery by a strong agrarian movement that the production of these foods is a sounder economic proposition than the production of beef and mutton. If big dietetic changes are desirable they should be controlled by the State, each case on its own merits, after the best advice has been taken from both a nutritional and a financial standpoint.

Cooking Facilities.

This part of the problem involves a discussion as to whether it is desirable for the State (*a*) to play a greater part in the teaching of cookery, and (*b*) to provide means of cooking food for public consumption. I imagine that greater facilities for the teaching of cookery will be provided by local authorities as the demand for such by the public increases. Better education and greater realization of the importance of proper feeding will no doubt hasten this demand.

The second point—namely, the provision of means of cooking food by the State—seems to me of greater interest. It would certainly be a method by which many individuals would obtain not only better cooked food, but also one by which they would have the chance of getting a greater variety of more wholesome food. The modern practice of consuming great quantities of preserved foods, the large trade carried on by cookshops in poorer areas, the increasing opportunities afforded for the purchase of expensive cooked foods, seem to indicate the desirability of the setting up of public and official organizations whereby people can obtain food already prepared for consumption either at home or on the premises where cooked. Experience of this type of organization was obtained during the war, and no doubt others will be in a better position for expressing an opinion as to the desirability or not of the State taking up this matter.

Summary.

1. Increased interest of the State in nutritional matters is very desirable, and would lead to untold benefit to the community even if only the knowledge of dietetics already established were utilized.

2. The mechanism for State research on nutrition is already well established in the Medical Research Council, the Empire Marketing Board, and the Board of Agriculture, but greater activity and closer co-ordination of the investigators is necessary.

3. The present interest and powers of the Ministry of Health should be greatly extended, and the first step in this direction ought to be the setting up of a Board of Nutrition consisting largely of people actively engaged in nutritional research with knowledge and experience of the scientific feeding of human beings and animals.

4. The Ministry of Health, acting on the advice of its Board of Nutrition, should (a) control the feeding of Poor Law institutions, prisons, welfare centres, and other organizations where public money is spent; (b) issue dietetic instructions to the public, and, where necessary, give the evidence upon which these instructions are based; (c) consider the advisability of controlling food supplies, and especially of increasing the availability of the "protective" foods to the public.

