We must not be content merely with trying to maintain the national dietary as near as possible to what it was in peacetime. It is as important to apply all our scientific knowledge to the improvement of the diet of the nation as to apply scientific knowledge to the improvement of weapons of war. The objective of war food policy should be, first, to supply sufficient of the protective foods for health, and then sufficient of the energy-yielding foods.

To meet national requirements on this basis we need to increase the supply of protective foods and also the total amount of food. The food requirements of the men who go into the fighting Services are increased by from 25 to 30 per cent. The same is true of the unemployed taken into the heavy industries. The total food requirements of the nation must therefore be increased by between 5 and 10 per cent.

Wartime Food Policy

This increase in supplies has to be met at a time when it is necessary to economize in shipping space and in foreign credits. In peacetime we produced at home what could not be imported cheaply, our imports amounting to about two-thirds of our total supply and requiring about 20 million tons of shipping per annum. In wartime our food policy must be based on home production. Our imports, apart from what we purchase for economic reasons or to keep the food out of the hands of the enemy, must be limited to what cannot conveniently be produced at home. Under these conditions we must be prepared for some change in the national dietary. We shall be fortunate if in the war and post-war period we can provide sufficient food to maintain the whole population in health, even though some of our likes and dislikes have to go by the board.

Fortunately it is possible to obtain all the nutrients which the body needs from a few foodstuffs. We should choose for increased home production those which are of the greatest value for health and, at the same time, yield the maximum amount of food per acre. In this category would come vegetables and potatoes. Of animal products the most important for health is milk. With a shortage of feeding-stuffs the dairy cow should have priority. If we had sufficient vegetables, potatoes, milk, and oatmeal we could meet national requirements for the protective foods. These, taken together in large amounts, would supply all the protein, vitamins, and minerals which the body needs.

Sufficient milk is being produced to provide 0.6 pint per head per day if it were all used in liquid form. The production of vegetables is being increased by allotment schemes, and could be increased sufficiently to bring consumption up to 6 oz. per head per day, the level among the wealthiest part of the population. Owing to the ease with which potatoes can be produced consumption might profitably be increased to 16 oz. per head per day. There is sufficient oats at peacetime level to provide 2 oz. per head per day, and still leave a considerable surplus for use as an animal feeding-stuff. The consumption of sugar might be reduced from its present level of 2.7 oz. per head per day to, say, 1 oz.

The following table shows the kind of diet which could be made up from the amounts of home-produced foodstuffs stated above and the peacetime average consumption of wheat and fats (butter, margarine, and cooking fats), the consumption of sugar being reduced to 2 oz. per head. In addition to the foodstuffs named there would always be home-produced beef, mutton, some eggs and bacon, and some imports of other foods, especially cheese and dried fruits.

	Calories	Proteins	Calcium	Iron	Vitamins (International Units)		
					A	B ₁	C
Protective : Milk .. 0.6 pt. Vegetables .. 6 oz. Potatoes .. 16 oz. Oatmeal .. 2 oz.	800	27	0.56	6	2,890	479	1,713
Energy-yielding : Bread .. 11.8 oz. Fats .. 1.8 oz. Sugar .. 1 oz.							
Total nutrients ..	2,100	50	0.67	13	3,500	646	1,713
Pre-war diet of poorest 10 per cent. ..	2,000	56	0.48	10	2,000	310	680

The above hypothetical diet is given not as a model which might be used as a basis for rationing but merely as an illustration of the fact that it is possible to make up a fairly satisfactory diet from a small number of foods, the most important of which can be produced at home in sufficient amounts. The difficulty is to ensure the equitable distribution of the food. We cannot get this by rationing unless the rationed amount is within the purchasing power of every family. The Government has allocated 50 million pounds a year to keep down food prices. But it is important to subsidize the right foods. A short list of home-produced and easily imported foods, such as that given above, from which a diet nearly adequate for health could be made up, would form a suitable iron ration which Mr. Keynes, for economic reasons, has suggested. If we had sufficient of these to meet the needs of the whole population, and at a price within the purchasing power of every family, the food position would be secure.

TREATMENT OF HEAD INJURIES IN WAR

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The time is opportune to review the experiences of the belligerent nations in the treatment of head injuries of modern warfare. From both sides there come reports of operations which indicate that the principles of treatment are not sufficiently understood by all the civilian and Service doctors who are now called upon to care for head wounds of a type not encountered in civil life.

Wounds of the Brain

In the first stage of the war the open head wounds have been like those of the war of 1914-18, but both French and German authors^{1 2 3 4} have found that operation may be delayed longer than was previously thought safe, even up to forty-eight hours after the injury. In their view there is no call to operate before shock has been adequately treated, and, if the conditions of war are favourable, wounded may be transferred before operation to the C.C.S. or even the Base, as in the Polish campaign, where the Germans evacuated their wounded by air.⁵

All writers stress the importance of avoiding hasty and incomplete operations. Brain tissue resists and localizes bacterial infection as well as, if not better than, other tissues; it is the ventricular cavities and large basal cisterns that are so vulnerable to the spread of infection. In brain wounds, as in wounds of the limbs, it is desirable to remove necrotic tissue, bone splinters, and foreign bodies, with the object of preventing or restricting the spread of infection in the form of purulent encephalitis, abscess, purulent ventriculitis, and meningitis. The aim is to

obtain a clean, smooth-walled cavity which, with the aid of light packing, will heal by granulation. This is the ideal, but there are weighty limiting factors. The operation must be done without encroaching on important nervous pathways that are known to be intact, and without opening the ventricular cavities or basal cisterns. Preparations for treatment therefore include thorough clinical examination and radiographic survey of the foreign bodies. Missiles deep in the brain should usually be left alone, and superficial wounds over such important areas as the pre- and post-central gyri should be interfered with as little as possible. How is the balance to be struck between conservative methods so essential in some cases and the bold operation so necessary in other cases if fatal infection is to be prevented? Inadequacy of surgical facilities will in some instances decide this question for the time being, but in most doubtful cases the only sure guide to treatment is the clinical state of the patient, observed from day to day. In a patient with a deep penetrating wound of the brain with small aperture, intervention may at times be postponed until the physical signs or increase of protein in the cerebrospinal fluid indicate that the brain lesion is extending instead of healing.

In large open wounds of the brain the removal of necrotic tissue is easy if suction apparatus is available. This apparatus is essential in all brain operations. After careful haemostasis the wound is lightly packed and the condition of the resulting brain fungus is subsequently controlled by lumbar punctures at frequent intervals.

In penetrating and tangential wounds of small aperture opinions differ as to the best method of approach to the damaged area of the brain. The orthodox method, which is favoured by Tönnis,³ is to nibble away the bony edges of the wound until the opening is large enough to enable the surgeon to deal with the brain wound under direct vision. French surgeons,¹ on the other hand, advocate access by means of an osteoplastic flap on the grounds that with the better exposure they can clear the damaged area more thoroughly and thus reduce the subsequent incidence of abscess formation. The resulting skull defect is much smaller, and the risk of meningitis in wounds of the convexity of the brain is, they claim, not increased. This policy is the logical outcome of Clovis Vincent's work⁵ on the treatment of the brain abscess of civil life by means of osteoplastic flaps. The idea that any brain wound should be treated by an osteoplastic flap is a new one, but it will not be lightly rejected by those who have seen the great improvement in the results of brain abscess approached by osteoplastic flap.

All these elaborations of treatment prompt the question—How can we hope, in a war of movement in which segregation is rarely possible, to have our wounded treated in a way that requires special equipment and to some extent special experience? The War Office has made a promising approach to this large problem in establishing mobile neurosurgical units⁶; and the provision of the necessary equipment and training of the young surgeon to do this, along with other varieties of war surgery, are by no means beyond its powers.

THE CRUCIAL DECISION

Improvements will also follow with clearer recognition of the limitations of the surgical method in all forms of head injury, and of the dangers of some types of incomplete operation in brain wounds. It is obvious that all scalp wounds should be surgically cleaned as soon as possible, and in most cases the fractured skull should be dealt with. With the steel helmet, of which in modern warfare some types are probably more effective than

others, there are fortunately many head wounds in which the dura is intact and the underlying brain damage slight and temporary. In each operation the crucial decision comes when the outer surface of the dura is reached. The dura is a natural barrier not only against injury and infection from without, but also in protecting the brain from fungation and from invasion by connective tissue. It is disastrous in open head wounds to extend a dural wound with the idea of obtaining a useful decompressive effect. The sequel is a damaging or fatal brain fungus. The rule to be aimed at should therefore be that the opening in the dura should not be enlarged unless the surgeon is adequately equipped and prepared to go on and remove the necrotic brain tissue and clot to an extent that will leave the brain at the conclusion of the operation free from undue tension and from potentially infected material.

Primary suture of the scalp over brain wounds is looked on with disfavour by most authors. The formation of brain fungus is not unfavourable provided the necrotic tissue has been thoroughly cleaned out and the dural defect is not large. However, if the wound is recent and the condition of the scalp permits it, primary suture may be done in certain cases. It does not prevent invasion of the exposed brain by connective tissue. Primary repair of the dural defect cannot yet be regarded as a safe procedure in gunshot wounds.

Antiseptics

While there is as yet no conclusive proof of the prophylactic value of the sulphonamides the preliminary impression of their use by mouth and subcutaneously is in all quarters favourable, and they are probably responsible, in part at least, for extension of the waiting period before operation. Tönnis has also used protosil packs in large open wounds of the brain with good results. Falconer and Dorothy Russell⁷ and Manifold⁸ have conducted experiments on rabbits to determine the damaging effect of antiseptics on the brain substance, as judged by histological and metabolic criteria. They have found that the least harmful of a large series of the recognized surgical antiseptics are proflavine sulphate (1/1,000) and another member of the flavine series, 2:7-diaminoacridine (1/1,000). Soluseptasine in 3 per cent. solution is relatively harmless. They showed that with all antiseptics least damage was done when the antiseptic was applied in isotonic and approximately neutral solution.

Closed Head Injuries

In all countries, it seems, some surgeons are still performing decompressive operations in cases of closed head injury. This method of treatment, as Ferey² points out, is usually unnecessary and may even be harmful. It was shown some years ago, by Ritchie Russell,⁹ that the unconscious state after closed head injury is not directly related to rise of intracranial pressure. As a result the operation of subtemporal decompression, which had never yielded convincingly good results in closed head injury, began to fall into disuse, and there has been a growing body of opinion that operation in the acute state is rarely called for except in cases of subdural and extradural haematoma.

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