The economist, the statesman, and the strategist will search these seemingly dry tables to learn from them many important lessons as to the structure of a modern war effort and as to the possibilities inherent in the magnificent machinery of a modern industrial economy. But the layman will scan them as well for the great human story which they convey—a story of devotion, steadfastness, and labour under peril that can well stand as an example to other nations."

Citing many of the figures of the Report, the *Herald Tribune* said that many interesting evidences of the impact of total war on British life could be drawn from them. "But all of them," it declared, "add up to an inspiring picture of a great people mobilised for every sacrifice, pulling its full weight and more in the common struggle, in which it has never flinched nor failed."

DIPHTHERITIC POLYNEURITIS.

By MAJOR J. E. CAUGHEY, *Physician, No. 2 N.Z.G.H., N.Z.M.C.*

As in the last war, diphtheritic polyneuritis has been one of the most common neurological disorders encountered in the Middle East. In the past three and a half years epidemics of diphtheria have occurred both in the field and among base units. The most common type of lesion is the ordinary faucial diphtheria, but in addition, diphtheric skin lesions are quite often encountered. These latter usually occur as so-called desert sores which become infected with the diphtheria bacillus. Diphtheric infection of burns or wounds is another type of lesion seen occasionally. There is doubt and discussion as to the source of the diphtheritic infection in these cases. Many consider the infection is secondary and probably has occurred by droplet infection from the patient or another person who has active diphtheria or who is a carrier. This point is still undecided but from a nurse's point of view it is sufficient to appreciate that diphtheritic polyneuritis may follow either a local faucial diphtheria or cutaneous diphtheria.

Incidence.—The incidence of nervous complications cannot be predicted. Sir Humphrey Rolleston reported 477 cases in a series of 2,300 cases (20.7 per cent.). In a small epidemic in the Western Desert 17 cases were admitted to 2 N.Z.G.H. and of these two developed polyneuritis. I have records of 20 other cases which have come under my care in three and a half years in the Middle East.

Onset of Polyneuritis.—This usually occurs two or three weeks after the onset, by which time the throat or skin lesion has usually healed. In faucial diphtheria the first sign is a paralysis of the palate, which may be unilateral or involve both sides. The patient complains that on drinking, fluids come back down the nose. Next or at the same time there is paralysis of accommodation which manifests itself by blurring the vision. The peripheral neuritis of the arms and legs usually occurs between the fourth to sixth week after the initial infection. In cases of cutaneous diphtheria the onset of paresis is first evident in the muscles near the local lesion.

The Effect of Anti-diphtheritic Serum Treatment on the Incidence of Polyneuritis.—It is an established fact that the earlier in the disease that anti-diphtheritic serum is given, the less likely is the occurence of polyneuritis. In one series of cases reported by Rolleston when the serum was given on the first day of the disease, the number developing paralysis was only 3 per cent. Those who received serum in the fourth day after the onset of the disease showed 26.9 per cent. with polyneuritis. These figures indicate the importance of early administration of anti-diphtheric serum and where the diagnosis of a throat lesion is in doubt serum should be given promptly rather than wait the result of the examination of a throat swab.

Symptoms.—The first evidence of paresis appears at the site of the primary infection. In faucial diphtheria one or both sides of the palate are affected and the patient complains that fluids come down the nose when drinking. In cutaneous diphtheria the muscles and skin at the site of the lesion is first affected by numbness and weakness. It is then usual for paresis of accommodation to develop, causing blurring of vision. It almost suggests that these eye muscles are specifically affected by the toxins of the diphtheria bacillus.

The first evidence of involvement of the limbs is usually pins and needles and numbness in the fingers and toes. The limbs are weak and foot drop may develop; walking becomes unsteady; there may be paresis of the muscles of the face.

Examination.—By the time the nervous symptoms have developed the primary lesion of the throat or skin has usually cleared up. The scars of healed desert sores may be small or large, irregular, reddish purple or pinkish and surrounded by an area of brown pigmentation. In some of these, over the scar and over an area surrounding the sore, the skin may be anæsthetic to pinprick or touch.

In the nervous system, in faucial cases, it is usual to find paresis of one or both sides of the palate. This is rarely complete but causes difficulty in swallowing. In spite of the blurring of vision it is the exception to be able to demonstrate weakness of accommodation. The facial muscles and the oculomotor muscles may be weak.

In the limbs it is usual to find weakness of muscles and deep tenderness on pressure. The deep reflexes may not be impaired in the early stages of the illness but soon are lost completely. Appreciation of touch, heat, cold and pain are impaired or lost over a glove and stocking area of the four limbs and there is loss of the sense of position in the fingers and toes which causes very marked unsteadiness on walking and on standing. With the eyes closed the patient tends to fall.

Disorders of the heart must be given a prominent place in any discussion on diphtheria. It is doubtful what is the origin of this trouble. By some it is ascribed to neuritis affecting the vagus nerve in the same way as the other nerves are affected. Others believe it is due to accumulating toxins from the diphtheria bacillus affecting the heart muscle directly. The effect on the heart is a disturbance of rhythm of some kind. The usual finding is tachycardia—at other times bradycardia, auricular fibrillation or heart block occur.

The course of the disease is variable and is dependent upon the severity of the nervous affection. If antitoxin is adminstered early and in large doses the course is liable to be short. Death rarely occurs from involvement of the heart. In other cases the prognosis is uniformly good, although in severe cases it may be twelve to eighteen months before recovery is complete. In mild

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