not severely disabled. The iodized oil was not removed at operation, and a further film taken before his discharge from hospital showed that the notched filling defect remained in the same position as before.

Case III

A housewife aged 44. First seen July 20, 1944. Had had recurrent left sciatic pain for four years. Pain increased by coughing. Lasègue's sign present and left ankle-jerk diminished. No sensory loss or muscular wasting. C.S.F.: No cells; protein, 40 mg. per 100 c.cm.; W.R. negative. Myelography of the lumbar region showed a slight asymmetry of filling of the first sacral "axillary pouches," with less filling on the left side. No bony abnormality was seen and there was no narrowing of the disk spaces.

Operation.—Sept. 22. Laminectomy of L 4 and L 5. No evidence of disk protrusion on careful exploration of both disk spaces. No softening of disks found. Fine adhesions clearly seen on left first sacral root within the spinal canal. These were freed and the root mobilized. The patient made a rather slow recovery from her pain over three weeks and has remained free from pain since.

Comment

In the first case the swelling of the root was so gross that we were satisfied that it must have been due to a local tumour or very severe oedema. As there was no evidence of any disk protrusion or other cause of external pressure a longitudinal incision was made into the nerve root, which was found to be pale, homogeneous, and oedematous. The enlargement was more than sufficient to cause the defect seen in the myelograms. The prolonged and severe pain after operation is quite unusual in disk cases, but might well be expected with an inflammatory lesion.

In the second case the swelling was less marked, and we might not have felt so confident of the diagnosis but for the similarity to the first, especially in the post-operative course. In this case the iodized oil was left in the theca and, as would be expected, the filling defect persisted in a post-operative skiagram in spite of the decompressive effect of the operation.

The diagnosis of "neuritis" or "radiculitis" at operation is obviously very difficult unless gross enlargement of the root is present, and as these cases have occurred recently we think we may have missed a similar but less marked condition in some of our earlier and hitherto unexplained cases of root pain in which we found no lesion at operation.

It is impossible at this stage to arrive at any definite conclusion as to the cause of the oedema of the nerve roots which we have observed. We could find no evidence to suggest that it was due to the spread of inflammation from arthritis of the intervertebral joints. The mechanical explanation afforded by Dandy's conception of the "concealed" disk causing intermittent compression of the nerve root could perhaps be invoked to explain the oedema and even adhesions in these cases, but, as we have said, we could find no evidence of any abnormality of the disk, and we have not yet encountered any cases conforming to Dandy's description. Mechanical compression of a nerve root from narrowing of the intervertebral foramen or encroachment of posterior osteophytic outgrowths could conceivably cause the oedema we have observed, but one would expect radiological evidence of this to be visible, which it was not in our cases. Magnuson (1944) has discussed these aspects of the diagnostic problem.

If the lesions are inflammatory and no mechanical factor is concerned in their causation it is difficult to think of any condition which would affect isolated spinal nerve roots, apart from herpes zoster. There is some evidence that zoster can occur without a cutaneous eruption, but it is highly improbable that oedema of the affected nerve root would continue for many months even in those cases in which neuralgia persists. In this connexion we have recently seen a case of herpes zoster of the fifth lumbar nerve root after the removal of a fragment of a ruptured fourth lumbar disk. The patient was entirely free from pain on discharge from hospital, but returned a week later with a severe recurrence of his sciatic pain. It was at first thought that a further rupture of the disk had occurred, but within two days a herpetic eruption developed in the fifth lumbar area on the right leg. The severe pain lasted for about a week, but then subsided gradually and has not recurred.

We must leave the problem for further elucidation by observation of the "pathology of the living," as it is improbable that morbid anatomical studies will be available to provide the answer. At present we cannot differentiate these cases of

"neuritis" from those with a ruptured disk before operation. We must for the moment be content with having seen a lesion which Symonds considers "has not yet been granted to human eyes."

REFERENCES

- Bankart, A. S. B. (1943). *Proc. roy. Soc. Med.*, **36**, 329.
Dandy, W. E. (1943). *Ann. Surg.*, **118**, 639.
Magnuson, P. B. (1944). *Ibid.*, **119**, 878.
Pennybacker, J. (1942). *Proc. roy. Soc. Med.*, **35**, 510.
Symonds, C. P. (1943). *Med. Annu.*, p. 312.

FOOD CONSUMPTION OF WORKING-CLASS AND LOWER-MIDDLE-CLASS FAMILIES IN BRUSSELS DURING JANUARY, 1945

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Great concern has been shown regarding the feeding of the peoples in the occupied countries both during the German occupation and since their liberation. There have been many conflicting reports, and little reliable information has been published concerning the feeding position even in those countries which were liberated many months ago. This article gives an account of the feeding of a number of working-class and lower-middle-class families in Brussels during Jan., 1945, some four months after their liberation. It is felt that this description might assist in forming some general opinion concerning the feeding in other localities.

The rations supplied during the period chosen for this study were much the same as had been available for the whole of the period from the liberation in Sept., 1944, to Jan., 1945. They were, in fact, not greatly different from those allowed during the latter part of the German occupation, although during the first two winters of the occupation food had been in such short supply that famine oedema and other evidence of serious malnutrition were encountered in Brussels and other large cities (Bastenie *et al.*, 1944). Thus the data give a fair indication of what the people of medium economic status in Brussels have had to eat during the past two or three years. Wealthier families, by buying on the black market, have had more to eat, and others, through poverty, have had less.

Methods and Results

The information was obtained from records specially kept by 19 clerks or workers at a factory in Brussels, who noted all the purchases of food by their families during a period of one week from Jan. 8 to 14, 1945. The subjects also indicated whether the various items were bought legally or on the black market. The men were given a light midday meal at their place of work, for which they surrendered food coupons, and this was taken into account when assessing the diet of the families. No other source of food was available. Details of the composition of each family and of the income were also obtained. The excellent co-operation given by the men and by the social workers at the factory ensured that the information was reasonably reliable.

The families chosen for this investigation were those of 10 clerks and 9 workmen employed by a gas and electric company. Only men who were willing to co-operate were selected, but there was no reason, on this account, to suspect any bias whereby their diet was not generally representative of that of their economic groups as a whole. There was little difference between the incomes of the clerks and the workmen, the extreme limits being 2,066 and 4,100, with an average of 2,850, francs per month. (176 francs=£1.) The 19 families were composed of 70 individuals of both sexes and various ages.

(private communication) for British middle-class families in the few years before the war. It is apparent that the chief deficiencies are in calorific value, animal protein, fats, calcium, and riboflavin. It is noteworthy that except for riboflavin there is no obvious deficiency of vitamins. Although the Brussels diet is not deficient in total protein the proportion derived from animal sources (29%) is unusually low: this might affect the biological value of the total protein. Moreover, some 40% of the animal protein was derived from milk, which was allocated almost entirely to children, so that the adults must have received an even smaller amount of animal protein than would appear from the tables. Similarly, since 60% of the calcium in the diet was derived from milk, the adult intake of this mineral must have been strikingly low. The deficiency of riboflavin is brought about by the shortage of dairy products, meat, and eggs, which, for example, in the United Kingdom in 1943 supplied 60% of the total riboflavin of the diet (*Food Consumption Levels*, 1944).

No attempt has been made to assess the intake of vitamin D, but the diet obviously contained little of this nutrient. However, most children received supplements of calciferol from benevolent sources.

It should be stressed that the rationing system gave high priority to young children. In fact, their allowances were more than they could possibly have eaten (Bastenie *et al.*, 1944). Thus the food position of the families with young children was usually satisfactory, whereas families without children or with children of 12 to 18, whose requirements were high but for whom no extra rations were available, had much less adequate diets.

Comment should be made on the fact that apparently about 92% of the earnings of the families studied was spent on food. Five factors accounted for this. (1) Past savings were drawn upon with monotonous regularity. (2) When they had all been spent, debts were piled up. (3) As has been pointed out by Ellis (1945), rationed foodstuffs were bought and then sold on the black market to provide money for the purchase of other foods; great nutritional bargains were sometimes made in this way. (4) The coupons for rationed items which were not available were sold at a high price to people who lived in districts where these foodstuffs could be obtained. (5) Many took an active, though small, part in black-market activities; for example, they might go at the week-end to the country, purchase food from a farmer, and bring it back to town, there to sell the greater part at black-market prices.

Summary and Conclusions

By means of household budgets a dietary survey has been made on the families of 19 Brussels workers during Jan., 1945.

The amounts of meat products, dairy products, and fats available to the families in Brussels were low. This is strikingly apparent when comparison is made with the amounts of these foodstuffs available in the United States, Canada, and the United Kingdom during the war. Cereal products and potatoes formed an unusually high proportion of the diet in Brussels.

The nutritive value of the diet in Brussels has been compared with that of the diet in the United States, Canada, and the United Kingdom during 1943, with that of the diet in the United Kingdom before the war as found by McCance and Widdowson, and with the National Research Council Recommended Dietary Allowances. The comparison shows that the diet in Brussels was deficient in calorific value, calcium, riboflavin, animal protein, and fats. There was no obvious deficiency in other nutrients, but vitamin D may also have been inadequate in the diet of adults.

We wish to thank Air Marshal Sir H. E. Whittingham for enabling us to carry out this work and for his encouragement. We would also thank the Director of the Electro-Gaz works, Brussels, and the subjects and their families for their co-operation. We also record our gratitude to the social workers at the Electro-Gaz works, who gave us much assistance in obtaining the data.

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REFERENCES

- Bastenie, P., Durieux, H., Friart, G., Gregoire, P. E., Jacquemyns, Lederer, J., Requie, S., Slosse, J., and Van der Hoeden (1944). *Rapport sur l'Etat Sanitaire de la Population Bruxelloise pendant les Périodes de Restrictions Alimentaires* (1940-4).
- Ellis, R. W. B. (1945). *Arch. Dis. Childh.* (in press).
- Food Consumption Levels in the United States, Canada, and the United Kingdom* (1944). H.M.S.O., London.
- Nutrition and Relief Work* (1945). Oxford University Press, London

A CASE OF LOCAL TETANUS

BY

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The term "local tetanus" is used to denote those cases of infection by *Cl. tetani* in which muscular spasms and contractures are limited to one region of the body throughout the course of the disease. It is often extended to cases in which the tetanic manifestations are predominantly rather than exclusively local and to those with a prolonged local phase before a terminal generalization. Though referred to by earlier writers, the modern study of local tetanus started with a paper by Courtellemont in 1915. The diagnosis was made with increasing frequency, and by 1918 accounted for 19.2% of all cases of tetanus among casualties treated in the United Kingdom (*Official History of the War*, 1922). The most frequent form was the monoplegic, affecting an arm or a leg, but paraplegic, cephalic, and (rarely) abdomino-thoracic types were recorded. Splanchnic tetanus, so called because it follows a visceral infection, is "local" only inasmuch as the patient dies of asphyxia before generalization can occur.

The features of local tetanus were widely appreciated by the end of the last war, but all forms of the disease have become less common, and there is a risk that the rarer types may escape recognition for a longer period than is desirable in the interests of the patient. It is therefore thought justifiable to record a case, recently studied by Major A. G. Emslie, R.A.M.C., and me. The patient was seen four months after wounding and two months after the onset of what was taken to be a spastic paralysis of the right leg.

History of Case

The patient, a man aged 22, had received no tetanus toxoid or other prophylactic measure before he was wounded on Aug. 21, 1944. The injuries occurred in the chest, left shoulder, abdomen, and anterior aspect of the right thigh in its upper third. He was given 1,500 units of A.T.S. within 12 hours. Débridement of all wounds was carried out within 24 hours, and he was then given 9,000 units of anti-gas-gangrene serum on account of the dirty condition of the wound in the thigh. He made a good recovery, and was discharged from hospital on Oct. 11, 51 days after injury. He remained fit for a further three weeks, after which he noticed a dull pain with stiffness in the region of the right hip. This gradually became worse, and he reported sick on Dec. 22. Until then he had been up and about, and throughout his illness he preferred to stay out of bed, as walking relieved the ache in his thigh. Examination on Dec. 29 revealed a cheerful healthy-looking man. Temperature and pulse were normal. All wounds were healed. The cranial nerves were normal. There was no trismus. Power, tone, sensation, and reflexes were normal in the arms and left leg. The right leg was held in an attitude of semiflexion at the hip and full extension at the knee. There was a slight increase of the lumbar lordosis. The lumbar muscles on the right were somewhat tense as compared with those on the left. The tensor fasciae latae, quadriceps, and adductors on the right were hard, tender, and could not be made to relax, but the hamstrings and muscles below the knee were normal. The right knee-jerk could not be elicited owing to the rigidity of the knee. The ankle-jerk was somewhat accentuated. The plantar responses were vigorously flexor. Sensation was normal throughout. The rigidity above the knee was such that the hip-joint seemed ankylosed. No spasms were seen. Radiographs showed a small metal foreign body lying to the inner side of the femur in its upper third. Blood count and sedimentation rate were normal.

A tentative diagnosis of local tetanus was made; this was supported by the observation that the contracture persisted in sleep and under pentothal anaesthesia—a fact which excluded the possibility of a hysterical condition. The consultant physician, Brig. Stevenson, considered the clinical indications definite enough to justify immediate treatment. The patient was given 40,000 units of A.T.S. intramuscularly daily for two days, followed by 100,000 units intravenously in saline on the third day. On the fourth day the wound in the thigh was explored and the foreign body removed. He received 80,000 units on the day of operation, followed by 40,000 units daily for three days. He thus had a total of 380,000 units of serum in 7 days. Despite the operative intervention no trismus or other evidence of generalization occurred.

Cultures taken from the foreign body gave a growth of *Cl. tetani* and *Cl. welchii*—an association often met with in tetanus. In order to control any remaining organisms left in the wound he was given a four-day course of penicillin, amounting in all to 400,000 units,