(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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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,

by intramuscular injection at three-hourly intervals. The contractions slowly declined, and tone was normal in the affected muscles 7 weeks after operation. He has remained well since then.

Comment

The long incubation period of two months is not unusual in local tetanus, though in many cases—notably in Bruce's 1918 series (*Official History of the War*, 1922)—it has obviously been an artifact due to the giving of repeated doses of antiserum at weekly intervals after wounding.

As a rule local tetanus arises in subjects who have had antiserum, but this is not always the case. Claude and Lhermitte (1915) have described a case in which no antiserum was given, and have further drawn attention to the existence of an attenuated form of generalized tetanus in which spasms do not occur, symptoms being confined to painful contractures which interfere but little with the patient's activities. Clearly the varying balance between the patient's passive immunity and the strength of the infection will provide a wide choice of clinical pictures.

This case illustrates the manner in which the toxin, ascending along peripheral nerves, involves a sharply demarcated zone of grey matter. The muscles involved were those supplied by the upper lumbar segments on one side only. If contracture was present in muscles above and below this level it was not clinically apparent.

As regards treatment, the large quantities of antiserum given were designed to prevent the generalization which has sometimes occurred after surgical intervention in this type of case. Penicillin was used to control any organism still left; but the happy outcome cannot be attributed to that drug, since many cases of local tetanus have been known to recover after removal of a foreign body and the use of serum alone. Nevertheless, it would seem to be a useful insurance in such cases.

My thanks are due to Lieut.-Col. P. A. Stewart, R.A.M.C., for permission to publish this case.

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Medical Memoranda

Congenital Recurrent Dislocation of Head of Radius

One feels that this case is worthy of report not only on account of the rarity of the condition but also because of the unique features presented in this particular instance. Twenty-two cases of congenital dislocation of the head of the radius, unaccompanied by other lesions, have been recorded, but in only one (Mauck and Butterworth, 1938) was the dislocation recurrent and completely reducible, and in that case the condition was bilateral, with reduction occurring in full extension.

CASE REPORT

On Jan. 16, 1945, a girl aged 9 was brought to the orthopaedic out-patient clinic of Durham County Hospital with the complaint that exactly one week previously, while attempting to loosen a button on the left shoulder with her right hand, she suddenly felt pain in

the right elbow, and noticed that a "lump" appeared in front of the elbow, which disappeared on manipulation. The pain was momentary, and not severe. No history of any previous injury to the elbow was offered. Her birth was by Caesarean section at seven months' gestation, and the birth weight was only 4½ lb.

Examination showed that the patient was a well-developed, intelligent child. The left elbow was normal. Inspection of the right elbow revealed no swelling or bruising. Flexion, pronation, and supination were full. Very slight limitation of extension was present, and the tendon of the biceps with its aponeurosis was unduly prominent in the last few degrees of extension. When the patient extended the elbow past 90°, in supination, the head of the radius dislocated forwards, without pain. It could be reduced with ease by simple thumb pressure. Dislocation was not possible in pronation or in flexion beyond the right-angle.

Radiographs showed that the head of the radius was shallow and poorly formed. There were no additional zones of ossification about the elbow. The ulna had no tendency to anterior curve of the upper aspect of its anterior and posterior borders, as described by McFarland (1936). The radius was not longer than normal.

COMMENT

The absence of any history of trauma and the x-ray appearance of the head of the radius strongly suggested that the condition was of congenital origin. The complete absence of disability rendered any immediate radical treatment, such as orbicular ligament reconstruction, unjustifiable. Excision of the head of the radius was particularly contraindicated by the age of the child.

It was explained to the mother, however, that as the radius grew, dislocation for appreciable periods would permit of undue lengthening of the bone, with the probable result that dislocation would become permanent, and limitation of movement ensue. In that event excision of the head of the radius would be considered.

My thanks are due to Mr. A. H. G. Munro, hon. orthopaedic surgeon Durham County Hospital, for permission to publish this case, and for his help and advice.

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Operation for Recurrent Subluxation of the Temporo-mandibular Joint

In the *Journal* of Sept. 23, 1944 (p. 423), there appeared a letter on the subject of "clicking mandibles." This, and the reply given, prompt me to send the following case record.

An airman in the R.A.F. Regiment was first seen in Feb., 1944. He complained that when he opened his mouth there was a loud click on the right side. When eating, the click would often be associated with a sharp pain in the region of the right temporo-mandibular joint, severe enough to cause him frequently to abandon his meals. He gave a history of having been an amateur boxer, but he had never had his jaw dislocated or fractured.

In Jan., 1943, he had undergone a dental clearance, and had been fitted with dentures. Six months later he noticed the clicking of the jaw. On examination the click was obviously associated with a partial subluxation of the right temporo-mandibular joint. When he closed his mouth the subluxation was spontaneously reduced. A radiograph of the joint failed to show evidence of osteoarthritis. He maintained that his condition caused him much disability, and he agreed to submit to operation even after the uncertainty of a cure and the relative certainty of a frontal paralysis had been explained to him.

At operation the right temporo-mandibular capsule was exposed through a curved incision. The capsule was found to be lax. A vertical incision was made in the capsule, and the cut edges were then overlapped and sutured so as to tighten it in an antero-posterior plane. Two sutures were also inserted to draw a very small "pleat" of capsule up to the root of the zygomatic process, and by this means tighten it in a vertical plane. The mandible was then "immobilized" in a jaw splint for seven days. Right frontal paralysis followed the operation. On removal of the jaw splint the patient was able to open his mouth, insert his dentures and eat, without his jaw clicking, and without his old pain. He was seen again in June, 1944, when the right frontal paralysis had completely recovered. According to the patient's statement, recovery had occurred suddenly ten weeks after the operation. He could open his mouth widely without any recurrence of his symptoms, although there was still slight deviation of the point of the jaw to the left. The scar of the operation is inconspicuous.

He was last seen on March 3, 1945, and was then still symptom-free.

For permission to publish these case notes I am indebted to Sir Harold Whittingham, Director-General of Medical Services, Royal Air Force, and to Wing Cmdr. H. F. Harvey, officer commanding our Mobile Field Hospital. I wish to thank Air Cdre. Stanford Cade, Consultant in Surgery to the Royal Air Force, for much help and encouragement.

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