Administration of Picrotoxin.—That night anacardone was discontinued and picrotoxin was given, after a further lumbar puncture in which 8 c.cm. of blood-stained fluid (traumatic) was withdrawn. Slowly every twenty minutes $1\frac{1}{2}$ c.cm. of a 0.3 per cent. solution was administered intravenously. After four of these injections the coma seemed less, the conjunctival reflexes were restored slightly, and the patient winced when her ear was pinched hard. The picrotoxin was kept up intramuscularly during the night, and the next morning 2 c.cm. of the solution was again injected intravenously. The drip saline was going all the time. The patient was in a much lighter coma that morning. She grunted and moved when pricked or disturbed. Later in the day, after two more intramuscular injections of picrotoxin, she woke up. Her lungs were dry and, beyond some dimness of vision, which passed off gradually, and some pain in her back, she seemed on the road to recovery. She had some earache later and the tongue was sore. This cleared up rapidly, and recovery is now complete. Coma lasted between sixty and seventy hours.

Commentary

In treating this case intratracheal oxygen apparatus and an iron lung were in readiness in the event of respiratory failure. The steps that have seemed to me to be important are:

1. Immediate emptying of the stomach with a pump.
2. Instillation of hot coffee in the stomach.
3. Emptying the bowel with an adequate enema.
4. The administration of a glucose-saline drip. This may help excretion by the kidneys, which are often damaged, as the haemoglobinuria shows. This also keeps up the blood pressure.
5. Judicious lumbar puncture.
6. The continued administration of a cardiac stimulant such as coramine, cardiazol, or anacardone.
7. Picrotoxin seems very helpful: the antipathy between picrotoxin and the barbiturates has been shown by Rovenstine and others. It is a powerful respiratory stimulant, and must be given repeatedly and, best of all, intravenously. Up to 10 mg. can be administered with safety.
8. It is most important to keep the patient warm with hot-water bottles, care being taken not to burn the unconscious patient; to change posture to prevent congestion; and to insert an airway to prevent the tongue being swallowed. The mouth should also be frequently swabbed with glycothymol or some similar preparation.

The value of picrotoxin has been more widely recognized in America than in England. Several papers have appeared in American journals describing its merits. In the present case, though the convulsive stage was not reached with the dosage used, I have no doubt from the clinical results that picrotoxin was of the greatest value. Respiration improved rapidly after each injection, and the conjunctival reflexes also improved.

The prognosis, as judged by the depth of the coma, shallow respiration, low blood pressure, and very feeble pulse, seemed as grave as possible. The results in this case would show that hope must never be abandoned and that vigorous treatment must be pursued by all routes.

I am grateful to Dr. Greig of Hove, with whom I saw the patient and who initiated the treatment in the early stages, and to the medical department of Messrs. May and Baker for help in the pharmacology of soneryl and some of the references to the American literature of barbiturate poisoning.

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A CASE OF TUBERCULOSIS

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The following case of tuberculosis, showing several manifestations of the disease in the same subject, may be considered of interest in that the clinical, laboratory, and post-mortem findings give an unusually clear picture of the sequence of events which culminated in the patient's death.

Clinical History

The patient, a stoker aged 34, first came to our notice on January 8, 1940, when we were approached by one of his messmates, who said that his friend's speech and behaviour were strange and that since joining the ship he had never seemed well, had always been too tired to go ashore, and had complained frequently of headaches. When examined in the sick-bay the man said he had been feeling ill for several weeks and that three days previously he had suddenly felt giddy, and since then had had difficulty in talking, writing, and remembering certain words. He had had frequent frontal headaches for many weeks but had never vomited. He had a slight cough with scanty sputum; this had been present for about a year, but had not worried him much. While giving this history he appeared dazed, spoke and moved slowly, but laughed readily. He was unable to pronounce certain words and completely forgot others, although he remembered them immediately and was able to continue when they were suggested to him. He fully appreciated his difficulty, and his answers, though slow in forthcoming, were quite rational. He named various objects without difficulty.

On examination the temperature was 101° and the pulse 90. The tongue was heavily furred and the breath foul, the throat being clear. The absence of superficial abdominal reflexes and rather brisk knee-jerks were the only abnormal physical signs in the central nervous system. Cranial nerves, motor and sensory spinal nerves, and all the remaining reflexes were normal. The plantar response was flexor. There was no loss of co-ordination, no static or intention tremors, no astereognosis, and no grasp reflex. The fundi appeared normal. There were signs of a pleural effusion on the left side reaching almost to the apex. The right lung appeared normal and no abnormalities were present in the abdomen.

Further points in the history were obtained partly from his medical history sheet and partly from his wife. His records showed that between September, 1938, and December, 1939, he had lost nearly 3 stone in weight, while previous to this he had been gaining. His wife stated that on returning from a spring cruise in 1939 he looked ill and appeared to be getting thin, and, although strongly disinclined at all other times to see a doctor, he remained sick on shore from April 10 to May 9 with a diagnosis of "bronchial catarrh." His cough almost disappeared during the summer, but he was still feeling far from well when he joined this ship in September. There was no history of respiratory disease previous to 1939 and he had never had venereal disease. There was no family history of tuberculosis.

He was admitted to hospital on January 9 with a provisional diagnosis of cerebral abscess in the left frontal region and pleural effusion. His condition deteriorated without remission until his death thirteen days later. During this period the temperature ranged irregularly between 99.6° and 102.2° , with a pulse of 72 to 108. On admission slight patellar clonus on the right side and faint pallor of the temporal halves of both disks were found in addition to the signs already noted. There was a moderate hypochromic anaemia and a leucocyte count of 10,300—polymorphs 82 per cent. Sputum became

more profuse, but repeated examinations for tubercle bacilli always proved negative. No fluid was obtained on exploratory puncture of the pleura, and unfortunately it proved impossible to obtain a radiograph of the chest. The cerebrospinal fluid, which was clear and not under pressure throughout, showed a trace only of glucose and 690 mg. chlorides per 100 c.cm. On January 12 there were 85 cells per c.mm., all polymorphs, whereas two days later there were 100 cells per c.mm.—49 polymorphs and 51 lymphocytes. The Wassermann reaction was negative in both blood and cerebrospinal fluid.

By January 16 the patient had become somnolent, lying on his side turned away from the light. He answered "Yes" to all questions, although apparently understanding them. There was stiffness of the neck and a positive Kernig sign, more marked on the right side. On January 18 crepitations appeared over both lungs, and during the final two days he became delirious with incontinence of urine and faeces.

Post-mortem Examination

At necropsy the following conditions were found. There was an excess of slightly turbid cerebrospinal fluid. No tubercles were seen on the meninges. A tumour, the size of a large marble and showing punctiform haemorrhages in its substance, was present in the left temporal lobe, and a similar tumour, half the size, was found just anterior to the third left frontal convolution in the region of Broca's area. The left pleural cavity was the seat of a chronic inflammation, with little fluid but large masses of fibrin. The upper halves of both lungs were studded with miliary tubercles, but there was no obvious chronic tuberculous focus in the substance of either lung. The other organs showed the usual changes resulting from chronic toxæmia, and no miliary tubercles were discovered. On section the cerebral tumours were shown to be tuberculomata, and tubercle bacilli were found on direct examination of the cerebrospinal fluid and basal meninges.

Commentary

During the patient's lifetime the diagnostic difficulties were not particularly great, the dysarthria, pleural effusion, pyrexia, and loss of weight being valuable pointers. The laboratory gave little assistance to the clinician except in the examination of the cerebrospinal fluid. On January 12 to 14 a swing from polymorphs to lymphocytes was seen in the cerebrospinal fluid cell count, and as this has been observed frequently in the initial stages of tuberculous meningitis we may deduce that the meninges were invaded shortly before this time. It would appear that the tuberculous activity started in the winter of 1938-9 in a focus adjacent to the left pleura. It is probable that the so-called "bronchial catarrh" in April, 1939, marked an increase of the activity in the pleura, which, under the influence of rest in bed and warmer weather, subsided sufficiently to allow the patient to perform his duties for the next six months. Knowing that his behaviour was normal on joining the ship and that there was no complaint of headache, we suggest that tuberculomata developed towards the end of 1939 and that with crumbling of the body's defences the disease extended more rapidly, meningitis starting about January 12 and the blood stream being flooded during the last few days of life. It is reasonable to expect that the lungs would be the first organs to be affected in miliary tuberculosis from a non-pulmonary focus. The findings in this case suggest that this is so, and that the pulmonary capillaries act at least temporarily as a filter for the organisms, the systemic circulation only being invaded when the lung is overwhelmed by the infection.

J. Paraf and H. Orestin (*Bull. Mém. Soc. méd. Hôp. Paris*, 1940, 56, 93) record a typical case of bilateral mumps in a man aged 80, complicated by transient right hemiplegia and aphasia as the disease was subsiding.

Clinical Memoranda

Rubella at Sea

The following account of an outbreak of German measles on board one of H.M. ships at sea is recorded in view of the unusual circumstances determining its course. A certain amount of overcrowding on board was unavoidable owing to the ship having its wartime complement. Added to the difficulties of properly ventilating a darkened ship there was the impossibility of segregating known contacts, and the absence of such isolation accommodation as would be provided in hospital. Again, ship's routine had to be maintained at full pressure, despite the absence of many ratings on the sick list. The outbreak of rubella occurred simultaneously with a large number of severe colds, influenzal in type; these were of the short, acute variety, with initial pyrexia, and varying degrees of bronchitis and loss of voice, necessitating rest in bed for a few days.

The first case of German measles developed nine days after the first contact with the shore population, following several weeks at sea. This first case did not actually go ashore himself, and must therefore have contracted the disease by indirect infection. No previous cases had occurred on board. There were twelve further cases in the next month, mostly in young adults.

The clinical type of rubella was normal, with a well-marked eruption starting on the neck, upper chest, and face. The average duration of the rash was three days. Small red spots were constantly noticed, at the onset of each case, on both the hard and soft palate. General constitutional symptoms were absent, and there were no complications. Treatment consisted simply of rest in bed during the acute stage of the rash.

CONTROL OF INFECTION ON BOARD

Individual.—All cases with pyrexia were at once put to bed. For the purpose of isolating rubella part of the sick bay was screened off by a curtain. As the numbers of acute colds increased it became necessary to isolate patients with German measles in a separate mess, where they were slung in hammocks which were of necessity some twelve inches apart.

General.—(1) Daily inspection of all throats in messes concerned was first carried out. The small red spots on the palate, constantly seen, did not appear before the general eruption. As there were no premonitory signs of any value this daily inspection was discontinued. (2) Facilities for gargling with salt and water were provided and used throughout the ship. (3) After due consideration the ship's cinema was allowed to continue.

Cases were considered non-infectious from rubella, on the average, six days from the date of the first appearance of the rash. Faint staining which sometimes persisted at the end of the six days was not considered as evidence of infectivity. Desquamation was negligible in amount in all cases. Patients were discharged as fit for duty after a further two days' convalescence. Cases of acute colds were considered non-infectious and fit for duty within six days, except in a few with laryngitis and loss of voice. Subsequently there have been no relapses. The rubella outbreak has now almost subsided. The acute colds, however, are still prevalent.

GENERAL OBSERVATIONS

(1) In a ship whose complement consists of a large proportion of ratings below the age of 20 the incidence of rubella was much smaller than one would expect in