fittest in the vesiculæ seminales, and a protective provision of Nature? The most marked degenerative changes in the spermatozoa were found in dementia præcox.

9. Whereas in 66 successive cases of general paralysis spirochaetes were found in an emulsion of the brain, spirochaetes were not once found in 50 cases in which an emulsion of the testis was examined microscopically by dark-ground illumination. This fact may be correlated with the fact that general paralytics, unless the wives are infected, have healthy children.

10. The testes of a large number of general paralytics, including four of the juvenile form, were examined. In not one of these cases was there a complete arrest of spermatogenesis. In many there was very active spermatogenesis and normal staining spermatozoa in the seminal fluid. A considerable proportion of the testes, however, showed strands and islands of completely atrophied tubules amidst normal tubules. Seeing that where this atrophy occurred islands of normal Leydig cells are seen, it must be concluded that the atrophy of the tubules was due to local obstruction of the vasa efferentia by gonorrhoea or syphilitic inflammation. In one case of juvenile general paralysis in which the secondary sexual characters had not developed the testes were infantile in development.

11. The testes of 22 cases of dementia præcox were examined. Three stages of regressive atrophy are described for convenience and brevity, but they all gradually merge from the earliest change in the biochemical reaction of the heads of the spermatozoa to a complete regressive atrophy of all the seminiferous tubules, so that the appearances of the organ as regards capacity for function in an adolescent was less than that observed in the decrepit dement of 86. Indeed, the testis of an old dement of 80 showed more microscopic evidences of virility than any one, even of the earliest cases, of dementia præcox. In one-half at least of the cases there was complete regressive atrophy. It is possible that this regressive atrophy of the testes may be correlated with a deficient vital resistance to infective disease, especially tuberculosis, from which the vast majority of these cases die.

12. The testes of 6 cases of imbecility and idiocy were examined; 5 of the 6 showed complete absence of spermatogenesis. Various other forms of mental and bodily disease at varying ages showed active spermatogenesis, in spite of the most advanced and active tuberculosis, dysentery, bronchopneumonia, and gangrene of lung.

13. A full account of the microscopic and biochemical changes in the reproductive organs and the central nervous system in dementia præcox will form the subject of a future communication.

14. There is abundant evidence to show that whereas, on the one hand, the degenerative changes in general paralysis obvious to the naked eye in the brain are due to a chronic inflammatory reaction occasioned by spirochaetal poison; on the other hand, dementia præcox is a primary nuclear degenerative process with no inflammatory reaction and no obvious naked-eye changes of the brain. An attempt will be made later to correlate the morbid biochemical changes observed in the reproductive organs with those in the brain in this disease.

Note.—In referring (JOURNAL, November 29th, p. 699) to Marshall's work, *The Physiology of the Reproductive Organs*, I should have stated that the article in this work from which the quotation was made was written by Dr. Cramer; and that it was his experiments that led to the conclusion that the lipid granules serve as oxygen carriers.

MUMPS IN ADULTS:

AN ANALYSIS OF 694 CASES.

BY

GEORGE MACLEOD, M.A., M.B., CH.B., D.P.H.

THE only plea for the publication of these clinical notes on what is usually regarded as a mild contagious disease of childhood is the circumstance that the war has afforded opportunities for the study of its manifestations in adults. Of the 694 cases, 78 per cent. occurred amongst Australian troops, who offered peculiar facilities for the spread of the disease in a virgin soil, as very few of them had previously been exposed to this infection, which consequently overran entire units in a short space of time.

Parotitis.—The onset, usually abrupt, was characterized, as usual, by general malaise, stiffness in the lower jaws, pain on mastication, with rise of temperature (99° to 101° F.), followed by swelling of the salivary glands, which subsided in three to nine days. In many cases there was no fever, and the temperature usually subsided by the fifth day, though the glandular swelling had by no means subsided by that time. The parotid glands were usually first affected, and in 64 per cent. of the cases the left parotid was the first to be involved; in 17 per cent. the disease was confined to the left side, in 20 per cent. the right side was alone affected, while in the remainder the glands on both sides were ultimately implicated. In two cases the disease first appeared in the submaxillary glands, and spread to the parotids later. In nine cases orchitis was the first manifestation; four of these had no glandular involvement, two others had pain only in the lower jaws, and the remaining three developed parotitis three to four days after the onset of the orchitis. In several cases redness and oedema or a whitish exudate was observed around the orifice of Stenson's duct, but no causal organism has been recovered.

Orchitis.—This has been the most frequent complication, occurring in 140, or 20 per cent. of the cases. It usually begins about the seventh day of the disease, but sixteen cases developed this complication after the tenth day, the latest recorded being on the twenty-second, thirty-fourth, and forty-fourth days respectively; while in fifteen cases orchitis set in on the first day of illness with or without swelling of the salivary glands. The orchitis is usually heralded by general malaise, sudden rise of temperature to 103° or frequently to 105° F., with, as a rule, severe pain and tenderness in the affected testicle, which soon becomes swollen, sometimes to a great size, with signs of fluctuation. It is accompanied by swelling of the cord and of the hydrocele of Morgagni, and oedema of the scrotum. In 16 per cent. of the cases of orchitis both testicles were affected, while the remaining one-sided affections were divided almost equally between the right and the left sides. The temperature is frequently maintained at 104° or 105° F. for three or four days, is accompanied by delirium and vomiting, and falls by crisis. In order to prevent or forestall this complication the patient, if an adult male, should be kept in bed for ten days from the commencement of his illness; once it is established, orchitis should be treated by rest in bed, restriction of the patient to a bland fluid dietary, and regulation of his bowels by mercurial and saline purgatives; local support and the application of belladonna ointment help to soothe the inflamed gland. When the patient has recovered from the orchitis and is allowed up, he should be advised to continue wearing a suitable suspensory bandage for some weeks. A relapse of orchitis has been met with twenty-three days after its original appearance; in none of these cases has there been any evidence of atrophy of the gland, and in no case did suppuration occur in an inflamed testicle.

Other Complications.—Symptoms suggestive of pancreatitis—namely, fever, headache, vomiting, pain and tenderness around the umbilicus, with a small rapid pulse—have been observed in 6 cases, all of whom made a good recovery in seven to ten days, the vomiting being the most troublesome symptom. There was considerable rigidity of the left rectus abdominis muscle, but no tumour could be felt and there was no evidence of undigested fats in the stools, while the subsequent history of these cases gave no indication of impairment in function of the pancreatic gland. In 48 cases which, after a primary attack of ordinary severity, had already entered on convalescence, the temperature rose abruptly on the seventh to tenth day to 100° or even 104° F., with a pulse rate of 80 to 120. Apart from a feeling of general malaise, there were no local manifestations to indicate the seat of this complication, which is apparently toxic in nature; the temperature fell by crisis in two to five days, and thereafter convalescence was uninterrupted. Other complications include bronchitis, tonsillitis, rheumatism, and conjunctivitis; laryngitis and aphonia occurred in 8 cases, earache and deafness in 3, otorrhoea in 2, while in 2 cases suppuration of the parotid occurred. In 2 cases death occurred from intercurrent disease.

Relapses.—These are not uncommon and were met with in 17 cases. In 8 of these the parotid was involved, in 8

the submaxillary, and in the remaining one the sublingual gland. The relapses occurred from the tenth to the thirtieth day and always at a distinct interval after subsidence of the primary swelling. In one case a chronic recurring soft swelling of the parotids persisted for over eleven weeks.

All the above cases were in adult males of 18 to 40 years of age; seventeen were second attacks and one claimed to have celebrated his third attack.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

TREATMENT OF DELIRIUM TREMENS.

YEARS ago, while in practice in South America, where I had considerable experience of it, I found the treatment of delirium tremens most unsatisfactory. I tried everything then recommended, including potassium bromide in half-ounce doses by the rectum every four hours, without much effect. The war having called me back out of retirement, I chose asylum work, and learned much about hypnotics; first, perhaps, that hyoscine in pharmacopoeial doses is useless. I confirmed the late Charles Mercier's statement that it is harmless at any rate up to doses of one thirty-third of a grain; that its effect, even then, is very transient, and that this dose may be repeated at frequent intervals, say every four hours, if necessary. In sudden emergencies, and for immediate effect, I look upon it as the best hypnotic. In adequate doses it has never failed me, and it has never given a moment's anxiety. A colleague, who suffered from "heart disease" with anasarca, orthopnoea, and insomnia, found it the most satisfactory of all the hypnotics in his case until, after fourteen doses of one seventy-fifth of a grain each, it completely lost its effect. For prolonged use, sulphonal would, but for its high price, supplant all other hypnotics except hyoscine. I often give thirty grains night and morning, and I have never had any cause to repent doing so. Owing to its slowness in action I prefer not to give it three times a day, lest the doses should overtake one another. I have never met any one who has seen a case of haematoporphyria. In addition to its hypnotic effect, sulphonal appears to me to be the only mental sedative we have for prolonged use.

On taking charge of this institution I was instructed that the guardians objected to the use of alcohol. This was somewhat of a disappointment, for I had been looking forward to testing Dr. Francis Hare's recommendation to treat the delirium with alcohol. Failing that, I fell back on hypnotics. Here are short notes of the first case:

A publican, aged 40, was admitted on December 20th, 1918, in an excited and violent state, suffering from delusions of persecution. The heart and lungs were normal. At 4 p.m. he was given hyoscine hydrobromide (gr. $\frac{1}{3}$), and was ordered sulphonal (gr. 30) night and morning. At 8 p.m., as he was still very agitated and restless and had had no sleep, he was given a hypodermic injection of hyoscine hydrobromide (gr. $\frac{1}{3}$), and calomel (gr. 5) was ordered. He slept for two hours, but then became unmanageable. At 1 a.m. the hypodermic injection (gr. $\frac{1}{3}$) was repeated, and 1 oz. of white mixture ordered. He slept for an hour and a half, but again became unmanageable, and was given another hypodermic injection. In the evening he again became unmanageable, and the injection was repeated; he slept for a few hours, but next morning he was noisy and violent, though he seemed stronger. The pulse was 100, and the skin cool and dry. The hyoscine was not repeated, but the sulphonal was continued. On the morning of December 23rd it was reported that he had slept well, and in the evening the dose of sulphonal was reduced to 20 grains. On December 24th he looked well, and the pulse was 76. On the next day the sulphonal was given up.

It will be noticed that the first efficient dose of hyoscine broke his sleeplessness. The others carried on until the sulphonal could act, and between them I think we may safely claim that they cured in three days what threatened to be a severe attack. This man was in good physical condition, and scarcely caused anxiety. Not so the next—fat, bloated, and a soaker all his life. He was a bad subject for any disease, and most unpromising as a case of delirium tremens.

A man, aged 52, was admitted as an epileptic on August 26th, 1919. It was reported that he had always been a heavy drinker and had been strange for more than a year. His first epileptic seizure occurred nine months ago, and he was a patient in the infirmary in a strait-jacket in May, 1919. His memory had

often been a blank of late, and on the morning of his admission he was found on the floor covered with bruises. He was at first treated with paraldehyde; he did not sleep, and became very excited, restless, and hallucinated. On the evening of August 29th it was obvious that he was suffering from delirium tremens. At 7.30 p.m. he was given hyoscine hydrobromide (gr. $\frac{1}{3}$). He slept for over four hours, but as he was very restless when he woke he was given gr. $\frac{1}{3}$. On August 30th it was reported that he had slept well; he was ordered sulphonal (gr. 30) night and morning. He slept well that night, and woke rational in the morning. On September 1st the dose of sulphonal was reduced to gr. 20 night and morning, and on the following day it was stopped. On September 5th he had recovered.

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Reports of Societies.

TREATMENT OF MALARIA IN ENGLAND.

Incidence in England: Importance of Efficient Treatment.

At a meeting of the Medical Society of London, held on November 24th, the President, Mr. V. WARREN LOW, being in the chair, Lieutenant-Colonel S. P. JAMES opened a discussion on the treatment of malaria in England. He said that since March 1st of this year medical practitioners had been obliged to notify all cases in which a patient upon whom they were in professional attendance was suffering from malaria, and since the order came into force nearly 14,000 patients had been so notified, and the weekly number of notifications showed no signs of diminution. The number of official notifications had increased from 598 in March to 1,172 in October, together with 405 additional cases reported by the Ministry of Pensions; for the first three weeks of November there were 918 official notifications, and 1,247 additional cases reported by the Ministry of Pensions. A map was exhibited showing that cases of malaria were now distributed almost everywhere in England and Wales, so that a thorough knowledge of the diagnosis and treatment of the disease must be communicated as widely as possible to medical practitioners throughout the country. From the point of view of treatment the most important cases were those in which the treatment of an acute relapse had not been successful in preventing a fatal issue. The number of deaths registered as due to malaria was usually, in this country, between 50 and 60 per annum, but in 1917 the number rose to 86, in 1918 to 108, and in the present year, if the rate of mortality now prevailing continued, the number would be 280. During the first three months of 1919 there were 70 deaths, and a most disquieting feature was that most of them were of young men and men in the prime of life; the same was true of the deaths in 1918. Another serious feature was that there was evidence that in at least some instances death might have been prevented if all medical practitioners in England had had a sufficient knowledge of diagnosis and treatment of the disease. In the hope of preventing some avoidable deaths the Ministry of Health issued a note which was published in the leading medical journals of August 16th this year. With a view to early inquiry into the deaths which might occur, it had since been arranged that registrars throughout the country should send immediately to the Ministry a certified copy of the registration of a death attributed to malaria.

The total number of cases of malaria contracted in England which had been discovered and notified since September, 1917, now amounted to 414. Among these cases occurring in the civil population the great majority (75 per cent.) had been in children under 15 years of age. In these indigenous cases, as in a fatal case of exotico malaria which was described, some of the patients received quite inadequate quinine treatment even after a definite diagnosis of malaria had been made. Serious cases of malaria occurred in great numbers during the war on ships returning home from Dakar, Sierra Leone, and other West African ports, and in these also quinine treatment was inadequate.

Having in view that in present circumstances a practicable method of treatment must be a simple and inexpensive routine, Colonel James said that he believed that