

occurrence. It is not true that the discovery of the spirochætes has shed a clearer light on the cell changes. Their diversity is no more intelligible now than before the spirochætes were found. A similar diversity can be demonstrated in non-paralytic brains. The discovery of the spirochætes does not alter Alzheimer's histopathological findings or "justify another conception of the relations between inflammation and degeneration in the paralytic process." Jahnel, whose authority Raecke so often cites, regards Alzheimer's conception as quite harmonious with his spirochæte findings. But suppose it is wrong; suppose it to be founded on inaccurate observations; only by histopathological investigation could this be proved. Or suppose it is to be shown experimentally that, in the central nervous organs of animals, spirochætes from paralytic brains produce changes exclusively inflammatory; here again it is only by the anatomist that the last decisive word can be spoken. Nissl does not himself see why spirochætes may not produce non-inflammatory changes as well as inflammatory. The mechanism of the action of the spirochætes on the brain tissue in paralysis is still entirely unknown. As regards the inflammatory changes, though we know that parasites are apt to cause inflammation, the occurrence of massive inflammatory infiltrations is no evidence that the inflammatory changes have necessarily always a parasitic origin. The anatomical characters that distinguish the paralytic affection from ordinary syphilitic inflammation remain, even if the metasyphilitic hypothesis is rejected.

SYDNEY J. COLE.

The Sachs-Georgi Precipitation Test in Syphilis, with Special Reference to its Employment on the Spinal Fluid [Die Sachs-Georgische Ausflockungsreaktion bei Syphilis, mit besonderer Berücksichtigung ihrer Anwendung am Liquor]. (Arb. für Psychiat., München, Bd. i, December, 1919.) Plaut, F.

This test, though not without difficulties of its own, is far simpler than the Wassermann, and, giving mostly concordant results, may prove a useful substitute for it. One c.c. of the patient's blood-serum, inactivated by heating at 56° C. for half an hour, is diluted with 0.85 per cent. saline to 10 c.c., and is then mixed with 0.5 c.c. of cholesterinised alcoholic heart-extract diluted with saline to 3 c.c.; after two hours in the incubator and ten to twelve hours at room temperature the result is read in the agglutinoscope. In spinal-fluid tests series of increasing doses are used. The paper contains a long discussion of technique and precautions.

Prof. Plaut has made parallel tests (Wassermann and Sachs-Georgi) of 500 sera. Some interesting discrepancies were observed. Of the 500 sera, 222 were from cases of known or suspected syphilis. In 116 of these both tests were positive; in 67, including 31 known to have been syphilitic, both were negative. Cases in which one or other reaction was doubtful being excluded, there remained 16 with a flat disagreement—10 with only the Wassermann positive, 6 with only the Sachs-Georgi. The 10 that gave Wassermann only were all of them cases of long-standing syphilis, and included 3 juvenile paralytics and 3 other congenital syphilitics; on the other hand, among the 6 giving Sachs-Georgi only, there were 3 cases of secondary syphilis and 1 of

primary. Plaut's material does not suffice to show whether after syphilitic infection the Sachs-Georgi reaction appears earlier than the Wassermann, but it shows that in cases of recent syphilis undergoing treatment the Sachs-Georgi may often remain after the Wassermann has disappeared. The series included 49 paralytics, and in only 3 of them was the Sachs-Georgi negative—the juveniles already mentioned; in 3 other juvenile paralytics it was positive.

The 278 remaining of the 500 were cases in which there was no suspicion of syphilis. In 267 of these both tests were negative; 5 gave a positive Sachs-Georgi and 6 a doubtful; none a positive Wassermann. The 11 were of so miscellaneous a character as not to throw serious doubt on the specificity of the test; such findings may perhaps become fewer when the technique is perfected, but it is well known that the Wassermann also not rarely gives similar unexpectedly positive results in cases with no history or clinical evidence of syphilis.

Plaut has also made parallel tests of 158 spinal fluids. In 62 of these, including 60 paralytics, both tests were positive; in 73, including 30 known syphilitics, both were negative. There were 15 in which minor divergences were observed, or in which one or other reaction was doubtful. In 8 cases there was a flat disagreement, and in all of these (who were all of them paralytics) it was the Sachs-Georgi that was negative. The total number of paralytics was 80, of whom 76 gave a strongly positive Wassermann. They included 8 juvenile paralytics; all of these gave a strongly positive Wassermann, but 5 gave only a weak Sachs-Georgi and 3 a negative. It is interesting to compare these last results with the above-mentioned observations on juvenile paralytic sera.

It is known that in non-syphilitic meningitis in a person whose blood gives a positive Wassermann, the spinal fluid may give a positive Wassermann. Plaut finds that it may similarly give a positive Sachs-Georgi, as he has observed in a meningococcus meningitis in a congenitally syphilitic child. Apart from such complication with acute meningitis, a positive Sachs-Georgi reaction in the spinal fluid is evidence of the syphilitic nature of an organic nervous affection.

SYDNEY J. COLE.

- (1) *The Density of the Cerebro-spinal Fluid in Cases of Mental Disease*;
 (2) *Indigo-forming Substances in Urine (Urinary "Indican")*;
 (3) *Indigo-producing Substances in Urine (Urinary "Indican")*.
 II. *New Qualitative Tests. (Reports from the Chemical Laboratory, Cardiff City Mental Hospital, Nos. 1, 4 and 5, 1920.)*
 Stanford, R. V.

(1) The density of the cerebro-spinal fluid was determined by the pycnometer, as the quantity of fluid to be examined was too small for the specific gravity to be measured with an hydrometer. The results are expressed as densities at 25° C. relative to water at 4° and are tabulated under four headings: (1) General paralysis; (2) epilepsy, (3) various types of mental disorder excepting 1 and 2, and (4) secondary and senile dementia. The conclusions arrived at from these examinations are that the density of the cerebro-spinal fluid in general paralysis is higher than in other mental diseases except epilepsy; it is