

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

also high in acute confusional insanity. A repeated high density will confirm a diagnosis of general paralysis. The author suggests that the course of all mental disease is accompanied by metabolic disturbances of the brain tissue, leading finally to a loss of brain substance in general paralysis and terminal dementias, whereas in acute and recoverable mental disease the increased katabolism is temporary or periodic, and is compensated by an increased supply of nutriment to the brain, no changes being detected in this organ *post mortem*.

(2) The indigo-forming substances in the urine are very unstable, and their decomposition cannot be attributed to the influence of a moderate acid or alkaline reaction, light, temperature, bacteria, or atmospheric oxidation. Possibly decomposition is connected with an auto-oxidation. The indigo-forming substances have not yet been isolated from the urine. The Hoppe-Seyler and precipitation methods were tried without success, but by salting out from the urine and simultaneously extracting with ether and alcohol, products of a very unstable constitution were obtained which gave the indigo reaction, but which could not be solidified. It is unlikely that these products consist of potassium indoxylsulphate as generally held, as this substance is only unstable in acid solution, and resists decomposition after many hours' heating at 160°-170° C. in caustic potash, and is completely decomposed in neutral solution only after heating at 120°-130° C., whereas "indican" of human urine disappears at room temperature in acid, neutral or alkaline solution. It is more probable that indigo-producing substances of the urine are not always the same, but are a mixture of nearly related compounds of the indigo group. This would explain their varying behaviour in different urines.

(3) The usual tests for indican in the urine (treatment with an acid, an oxidiser and extraction with chloroform) are unsatisfactory. They do not give concordant results in duplicated experiments, and the indigo solutions are all colours between red and blue, decolorising spontaneously in many cases. Decolorisation may be due to oxidising impurities in the chloroform used for the extraction of the indican, or to "over-oxidation" due to secondary reactions from the presence of air.

The author has devised an improved indigo test termed the "carbon dioxide process," in which the urine is treated with hydrochloric acid, chloroform and hydrogen peroxide, the whole process being carried out in the absence of air by means of a stream of carbon dioxide gas. By this method pure blue solutions and concordant results in duplicate analysis are always obtained. The isatin test can also be improved by the exclusion of air.

F. E. STOKES.

5. Sociology.

Applicability of the Findings of the Neuro-psychiatric Examinations in the Army to Civil Problems. (Ment. Hyg., April, 1920.)
Bailey, P.

The American Army mobilisation has furnished the first national health survey. The completed results of the Neuro-psychiatric Service are presented. Facts of pathological significance were obtained by

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