

field for systematic clinical research, but it is unlikely that we shall arrive at a satisfactory understanding of them until more is known concerning the influence of the sympathetic system upon the joints and upon the mechanism of visceral pain.

### Conclusion

I am conscious that these remarks have raised various problems and have done little to solve them, but it is perhaps well that we should realize what gaps still remain in our knowledge of this most fascinating disease. On the question of operative treatment, with which I have not attempted to deal, it would be unwise to assume that we have reached finality. Although the surgical treatment of toxic goitre can at present claim such results that it is regarded as the method of choice for all save the mildest cases, I never do a subtotal thyroidectomy without feel-

ing what a crude and imperfect method it is. Who can doubt that before many years have passed the biochemist will place some weapon in the physician's hand that will enable him to break the vicious circle of toxic goitre as certainly as the surgeon can, and without any of the risk which we cannot, try as we may, altogether eliminate from these anxious and delicate operations.

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## DIAGNOSIS OF PHYSICAL DISORDERS IN THE INSANE

BY

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(With Special Plate)

The well-recognized fact that psychotic patients may suffer from serious organic disease without uttering a word of complaint by no means constitutes the chief difficulty in the diagnosis of physical disease in the insane. As Hall<sup>1</sup> has pointed out, physical signs may be few, or even absent, in grave medical or surgical conditions which in the mentally normal give rise to unmistakable clinical pictures. If this be true in such common disorders as appendicitis and gastric ulcer, to take only two examples, it is unlikely that rare diseases will be diagnosed in the insane during life, especially as the use of accessory methods of investigation may not be possible owing to lack of co-operation or active resistance of the patient, and even a complete physical examination may have to be abandoned.

During the past year four patients came under observation at this hospital in whom the physical diagnosis was doubtful. As the conditions revealed at necropsy were somewhat unusual these cases were considered of sufficient interest to record.

### Case I

A man aged 82 had been insane since 1888. He was transferred to this hospital in 1929 in a state of secondary dementia. He then had arterial and myocardial degeneration, but there were no signs of active heart disease. For the last two years of his life he had been bed-ridden and so demented that he was unable to notice any change in his physical well-being. The terminal illness began on July 15th, 1934, with a rigor, which was followed by high fever. The heart sounds became almost inaudible, and crepitations appeared at the bases of the lungs. He gradually became unconscious, and died on July 20th without developing any further signs. There was, however, some diminution in the quantity of urine passed during the last few days of life. Examination of the urine the day before death showed a large amount of albumin, many granular casts, a few pus cells, and many coliform bacilli.

A necropsy was performed on the day of death, when it was found that the heart was enlarged, weighing 14 oz. The muscle was red and firm, and the left ventricle was hyper-

trophied. On the left cusp of the aortic valve there was a mass of vegetations about the size of a sixpence. This mass was reddish in colour, and, though not easily friable, neither was it hard and fibrotic. It ulcerated the margin of the valve. No other vegetations were present. There was only slight atheroma of the cusps of the aortic and mitral valves and of the proximal part of the thoracic aorta. The coronary arteries were patent throughout.

Both kidneys presented a "flea-bitten" appearance, due to multiple petechial haemorrhages scattered over their surfaces. On section many more tiny haemorrhages were seen in the cortex. In the centre of some of these were tiny white spots which exuded pus on pressure. The cortex of both kidneys was greatly diminished, and the cortical markings were indistinct. In the right lung many alveoli were dilated, giving a bullous appearance. On section a little clear, frothy fluid was expressed. The left lung was well aerated throughout. The brain and spinal cord were normal to naked-eye examination, and nothing abnormal was noted in the other organs, except in the spleen, which was unduly soft and friable. No infective focus other than the vegetation on the aortic valve could be traced.

Microscopical examination revealed an area of acute inflammation in this vegetation, in which polymorphonuclear leucocytes and diplococci could be seen. Miliary abscesses, also of recent origin, were present in the cortex of both kidneys. During routine examination of sections of the brain many miliary abscesses were found around the vessels in the cerebral cortex, both in the grey and in the white matter (Fig. 1 on Special Plate).

The unusual features of this case were the age of the patient, the absence of signs of active pre-existing heart disease, and the short duration of the terminal illness. It is probable that the endocarditis was due to a pneumococcal infection, since this form of bacterial endocarditis is more common in later adult life, is very rapidly fatal, and, according to Thayer,<sup>2</sup> in only 37.5 per cent. of cases is there a history of pre-existing heart disease. Focal areas of suppuration, such as we found, are common in pneumococcal endocarditis—Thayer found them in 72 per cent. of his cases—while they are rare in any other form.

### Case II

A man aged 74 was admitted on December 5th, 1934, in a condition of arteriopathic dementia. He had advanced generalized arteriosclerosis. His blood pressure was 180/122. The urine contained a trace of albumin but no casts, while the blood urea was 85 mg. per cent. He had incontinence of urine, not suggestive of retention overflow, but attributable to his mental state. There was a constant purulent nasal discharge, which on examination was found to be due to large nasal polypi. An operation for their removal was considered necessary in spite of his poor physical state, and this was performed on December 20th under sodium evipan anaes-

thesia. The only difficulty experienced during the operation was the customary free haemorrhage associated with this operation. This was readily controlled by nasal plugging. The patient began to rally after operation, but he never fully regained consciousness, and died twelve hours later in a condition strongly suggestive of uraemia.

A post-mortem was carried out on the day of death. The site of operation was clean except for a small amount of blood clot. The trachea and bronchi contained a little blood-stained frothy mucus. The lungs were somewhat congested, and on the left side there were old adhesions between the pleura and the chest wall. The heart was enlarged, weighing 15 oz., and the left ventricle was hypertrophied. There was slight atheroma of the thoracic aorta and intense atheroma of the abdominal aorta, where numerous calcified plaques, spreading into the common iliac arteries, were noted. The liver was slightly pale, but otherwise appeared normal.

In place of the kidneys we found two thin-walled sacs, each containing a large quantity of clear, uninfected urine (Fig. 2). On the right side there was no trace whatever of kidney tissue; on the left side a small amount of recognizable kidney substance was present at the upper pole. The right ureter was greatly dilated at its origin, and the muscular coat was hypertrophied throughout its length. The left ureter was less hypertrophied. Both were patent. The bladder was sacculated, stretched, and thinned; in several places its wall appeared to consist of epithelial and peritoneal coats only. It was greatly distended with urine. No obstruction could be found distal to the bladder. There was no stricture, and no evidence of previous obstruction. The prostate was normal in size and consistency. The other viscera appeared healthy.

The arteries of the brain were grossly atheromatous and of "pipe stem" consistency. In the brain several small recent softenings were present in the anterior part of the right thalamus, and two older ones were seen in the white matter of the right lateral lobe of the cerebellum. In microscopic sections of the remaining kidney tissue the majority of the glomeruli were found to be completely sclerosed, being represented by knots of fibrous tissue. The walls of the renal vessels were also fibrotic and their lumina narrowed.

The necropsy in this case raised two problems: the first, why the patient had lived so long, in fair physical health, and presenting no signs of renal failure, with only a trace of kidney tissue; the second, the cause of the bilateral hydronephrosis. We were unable to solve either.

### Case III

A woman, aged 58 years, was admitted on October 26th, 1934. Her mental illness had commenced on September 27th, two days after the death of her husband. The first symptoms of mental trouble were amnesia and loss of appetite. Her mental illness progressed rapidly to a state of acute confusional insanity. Pyrexia was absent until shortly before admission.

When examined on admission she was delirious, with a temperature of 101°, a pulse rate of 104, and a respiratory rate of 26 per minute. There was much wasting of recent onset, a high colour, and sweating. A blood count showed 11,700 leucocytes per c.mm., with 80 per cent. of polymorphonuclears. She was obviously very ill, yet physical signs were few. The chest showed two or three small patches of consolidation of the lungs. The heart was normal. There was a certain amount of rigidity of the upper recti abdominis, and deep pressure here caused flinching, but the signs were no more than those often met with in pneumonia. The liver was not palpable, and the abdomen was otherwise normal. The lower abdominal muscles were flaccid, and moved normally.

During the next week her condition rapidly deteriorated. She ran a temperature varying from 100° in the morning to 102° in the evening. The pulse rate remained just over 100, and the respiratory rate rose to between 60 and 70. The physical signs in the chest became less evident and no further signs appeared in the abdomen or elsewhere. Frequent blood counts did not show an increasing leucocytosis, the total leucocyte count remaining at about 11,000 per c.mm., and

the polymorphonuclears ranging from 69 to 79 per cent. The sputum was negative for tubercle bacilli and did not show a preponderance of any particular organism.

The only possible diagnosis was bronchopneumonia, in spite of the paucity of signs in the chest. The temperature rose rapidly to 105° just before death, which occurred on the evening of October 22nd.

A post-mortem was performed on October 23rd, and only slight pulmonary lesions were found. Although partial consolidation of the lungs had taken place portions from all parts floated in water. Small beads of pus were expressed from the lower lobes.

On opening the abdominal cavity several small yellow protuberances, each about the size of a cherry, were seen on the surface of the liver. On incising these yellow pus poured out. Further incisions into the liver disclosed an organ riddled with pus-containing cavities. Pus was collected with sterile precautions from one of the abscesses, and stained smears of this showed a short-chained streptococcus. Cultures produced a diplococcus and a staphylococcus, the latter probably a contaminant. The portal vein was found to contain pure pus, which was traced backwards to the small tributaries of the vein. The appendix was normal on naked-eye examination and on microscopy. Dissection of the rectum revealed a number of piles, which were excised for section. The other organs did not present any abnormalities other than those associated with prolonged pyrexia.

Microscopically the cause of the portal pyaemia was demonstrable in one of the piles. This had thrombosed, and in it evidence of recent inflammatory changes was found, there being numerous polymorphonuclear leucocytes amid the thrombosed veins and newly formed fibrous tissue.

In this case a woman aged 58 died following symptoms of bronchopneumonia. At the necropsy an unexpected finding was an extensive portal pyaemia, which had originated in a thrombosed pile and had produced very large coalescent abscesses in the liver. Careful subsequent questioning of the relatives disclosed the fact that the patient had had an "attack of piles" several months previously, but none since. A history of an illness two months before admission described as "gall-bladder trouble" was also obtained.

### Case IV

A man, 49 years old, was admitted on July 7th, 1935, as a case of mental confusion, due possibly to cerebral arteriosclerosis. The history of his illness was vague. There was no history of previous mental or physical illness, except that following an attack of influenza in March, 1934, he had had a succession of "chills" and colds, with progressive loss of weight and weakness. About a month before admission he had complained of headache and depression. A week before admission he became mentally confused and actively resistive to all attention.

On admission the patient was in a state of complete physical prostration with advanced cachexia, and in low muttering delirium. His temperature was 96°, his pulse rate 78, and his respiratory rate 18. His mouth was septic. The heart was dilated, with a diffuse apex beat outside the mid-clavicular line. The blood pressure was 108/78. The radial arteries were sclerotic. So far as could be ascertained there was no gross pulmonary lesion. There were basal crepitations in both lungs, and scattered crepitations with harsh broncho-vesicular sounds were heard all over the right lung. Percussion of both lungs gave a hyper-resonant note. Any attempt to turn the patient on to either side produced acute dyspnoea, whilst x-ray examination was impossible.

A neurological examination was negative; the optic disks could not be examined owing to lack of co-operation on the part of the patient. Abdominal examination was negative. The urine showed a trace of albumin and 0.83 per cent. of sugar. A blood sugar estimation two hours after a meal was 87 mg. per cent. A blood count gave the following result: red blood cells, 3,648,000 per c.mm.; haemoglobin, 72.2 per cent.; colour index, 1; white blood cells, 8,300 per c.mm.; polymorphonuclears, 67 per cent.; large lymphocytes, 11 per cent.; small lymphocytes, 17.5 per cent.; and monocytes,

4 per cent. There was very slight anisocytosis and poikilocytosis.

During the remainder of his life there was some decrease in the patient's delirium. He was able to understand what was said to him, but was incapable of reply beyond a hoarse whisper of "Yes" or "No." He was free from headache whilst in hospital. There was persistent incontinence of urine and faeces. The temperature remained subnormal, and the pulse rate did not rise above 80 beats per minute. No further physical signs were elicited until July 13th, when the patient developed oedema of the right lung. The temperature rose to 99.8°, the pulse rate increased to 120, and the respiratory rate to 40. Oedema of the left lung ensued, and proved fatal on July 15th. A tentative diagnosis of pulmonary tuberculosis with cerebral metastasis was made.

A post-mortem examination was made on the day of death. On opening the thoracic cavity a soft mass about the size of a chestnut was found lying on the pleural surface of the fourth rib on the left side, close to the vertebral column. Incision of this mass yielded a yellow, semi-fluid material, some of which was collected for microscopy. The incision divided the whole thickness of the rib very easily, the growth having involved both surfaces as well as the marrow cavity. No other ribs were affected and the vertebral column appeared normal. The upper lobe of the right lung was occupied by a large tumour, the centre of which was necrotic. Other miliary foci were scattered throughout the middle and lower lobes of this lung. The glands at the hilum were not enlarged and the main bronchi were free from growth. The left lung was oedematous, particularly in the lower lobe, but did not contain any tumour tissue.

The heart was slightly enlarged, weighing 12 oz. The heart muscle was pale and flabby; the pericardium was normal. Patchy atheroma was present on the mitral and aortic valves. The peritoneum, stomach, liver, gall-bladder, spleen, and suprarenals appeared healthy on naked-eye examination. The right kidney contained two small white tumour masses, each about the size of a cherry, which projected above the surface. These masses, unlike the growth in the lung, were firm to the touch. The left kidney contained two similar tumours, although these were situated deep in the cortex, and were only found on section. Apart from the presence of these tumours both kidneys appeared healthy. There was no oedema round the tumours.

The brain was oedematous, and the convolutions were flattened as a result of increased intracranial pressure. The cisterna basalis and the ventricles contained an excess of cerebro-spinal fluid. No other abnormalities were detected on naked-eye examination and section of the cerebral hemispheres, but in the left lateral lobe of the cerebellum there was a soft whitish tumour mass, not sharply demarcated from the surrounding brain tissue, which was grossly oedematous. After fixation it was seen that the tumour had invaded most of the left lateral lobe. The pons, medulla, and cervical portions of the spinal cord appeared normal.

Microscopical examination of smears taken from the necrotic material in the rib rendered it possible to differentiate large malignant cells from the cells of the bone marrow. Sections of the primary growth in the lung showed carcinoma cells arranged in solid trabeculae. The cells varied in shape and size; some were large and columnar, others were small and cubical. The nuclei were large and vesicular, and in many mitotic figures were visible. In some parts of the section tall columnar cells were grouped round a central blood vessel, with their long axes at right angles to the vessel wall. This arrangement was much more evident in the metastases in the brain and kidney, where also a greater variation in the size and shape of the cells was seen than in the primary tumour.

The absence of symptoms and signs referable to the chest is noteworthy in this case, although it is not very uncommon for the first symptoms of cancer of the lung to be due to metastatic deposits in the brain, as in the series reported by Ferguson and Rees.<sup>3</sup> What was more remarkable in this case was the complete absence of any symptom or sign suggesting the presence of a cerebellar tumour. From the situation of the tumour in the cerebellum and the oedema of the adjacent brain tissue,

as well as from the greatly increased intracranial pressure, localizing signs of a subtentorial tumour and the general symptoms and signs of high intracranial pressure would certainly have been expected.

It is regretted that an ophthalmoscopic examination which would have revealed papilloedema could not be made owing to lack of co-operation of the patient, and also that an x-ray examination which would have enabled us to diagnose the growth in the lung could not be undertaken, as the patient was at no time well enough to be moved. In view of the impossibility of making these two examinations, and the absence of signs and symptoms, it is difficult to see how the diagnosis could have been made ante mortem.

### Summary

Four cases are presented which exemplify a few of the difficulties besetting the diagnosis of physical diseases in the insane.

In one of these, a patient with extensive bilateral hydronephrosis, the disease was latent, and had it not been for an operation which enforced extra work on the kidneys, the patient might have continued to enjoy fairly good physical health in spite of the minute amount of kidney tissue he possessed. This case was a good illustration of the only recently appreciated fact that a very small number of functioning glomeruli suffice to maintain renal efficiency.

Another case was remarkable for the occurrence of acute bacterial endocarditis in a man aged 82, whose fatal illness ended within a week of the appearance of the first signs. The virulence of the infecting organism was such that miliary embolic abscesses were present in the brain and kidneys.

The third case was one of portal pyaemia resulting from infected haemorrhoids. As Hurst says<sup>4</sup> "portal pyaemia is rarely diagnosed" we were not unduly depressed at our failure to recognize the condition, and we record the case as an instance of a rare complication of haemorrhoids.

In the last case a correct diagnosis could have been made in spite of the remarkable absence of symptoms and signs had the patient been well enough to permit of an x-ray examination, or co-operative enough to allow the use of an ophthalmoscope. This case illustrates the paramount importance of making a complete examination by every available means in a mental patient suspected of an organic lesion.

We wish to thank Dr. D. F. Rambaut, medical superintendent of St. Andrew's Hospital, for permission to publish these cases. The photographs were taken by Mr. E. Tranmer, to whom we are greatly obliged.

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The annual national training camp for the Women's Voluntary Aid Detachments of the British Red Cross Society will again be held this year at Northwood Park, near Winchester. Between May 15th and June 9th it is expected that some 700 officers and members will attend for one or more weeks of intensive training in first aid, defence against chemical warfare, infant welfare or hygiene, and sanitation. For many the period in camp will constitute their annual "holiday," since the personnel of the detachments is largely drawn from the ranks of business and professional women.

JULIUS H. KRETZMAR AND R. A. ROBERTS: ALBERS-SCHÖNBERG'S DISEASE



FIG. 1.—Female, aged 21 years. Note the wide separation of the eyes, indicating some degree of hypertelorism, the prominence of the nasal bone, the left-sided facial paralysis, and the massive lower jaw.

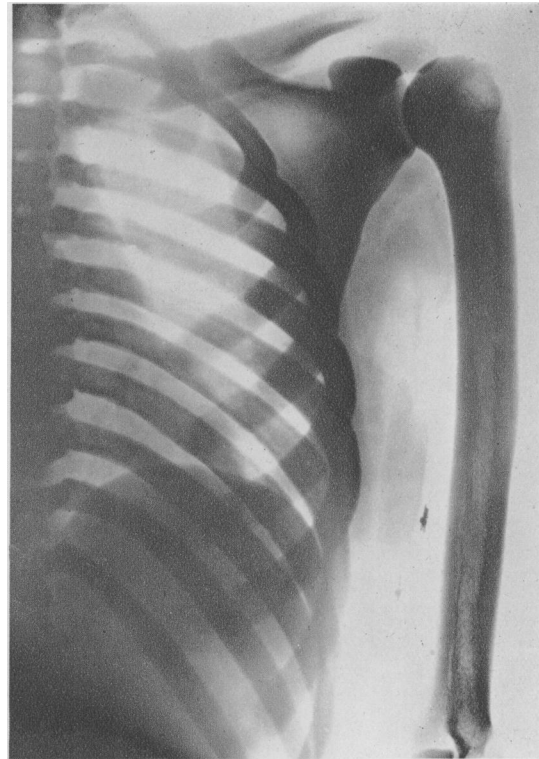


FIG. 2.—Female, aged 21 years. Radiograph of left chest and left humerus. The structure of the humerus illustrates the thickening of the cortex and the relatively small size of the medullary canal.



FIG. 3.—Female, aged 21 years. Radiograph of hand. There are appreciable alterations in the outlines of the metacarpals as the result of the cortical thickening.

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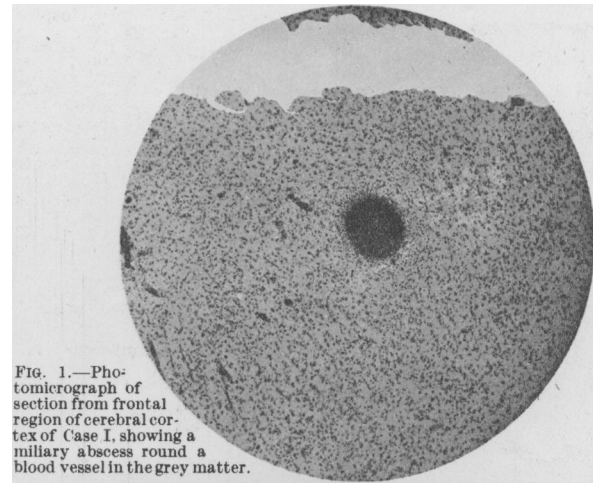


FIG. 1.—Photomicrograph of section from frontal region of cerebral cortex of Case I, showing a miliary abscess round a blood vessel in the grey matter.

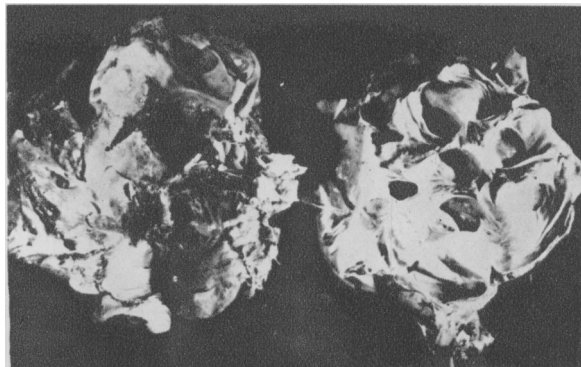


FIG. 2.—Photograph of kidneys from Case II. The small amount of kidney tissue present at the upper pole of left kidney was the only recognizable kidney substance in the two organs.