experiment or use to induce some pleasurable gratification. It is not known to whom the shoe and stocking belonged. These were not the property of anyone living in the house, nor to the young woman with whom he was "walking out." So far as could be ascertained, the man's habits were in every way regular, and socially satisfactory. The bedroom was not in general occupation and the bed-clothes were not disturbed.

Though the verdict returned at the inquest was "suicide during temporary insanity," if the above surmise is correct, it is open to question whether death may not have been due to misadventure rather than to an impulse to self-destruction.

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*A Case of Pellagra.** By E. BARTON WHITE, M.R.C.S.Eng., L.R.C.P. Lond., Medical Superintendent, Bristol Mental Hospital, and GEOFFREY HADFIELD, M.D., M.R.C.P.Lond., Pathologist, Bristol General Hospital, and Bristol Mental Hospital.

ALTHOUGH still a rare disease in this country, there is little doubt that the incidence of pellagra amongst mental patients is considerably higher than in the rest of the population, and the opportunities for its study have been largely in the hands of the medical officers of mental hospitals. That these opportunities have been utilized is fully borne out by many careful and scientific records published from our mental hospitals since Prof. G. M. Robertson, of the Royal Hospital, Morningside, recognized the first case—a Shetland girl—in this country, in 1909, which case was published by Brown and Cranston Low in the same year. The foundations of our knowledge of the spinal cord changes were laid by the late Sir Frederick Mott, and following this pioneer work, reports of cases from mental hospitals in many parts of the country have been published, culminating in the well-known investigations of Watson, of Rainhill Mental Hospital, who has studied with great care 54 cases occurring in that institution over a period of twelve years. In spite of the fact that the exact cause of the disease is still hotly disputed, the mass of published detail and accumulated experience supports a few legitimate generalizations. Kimber emphasizes a growing belief that pellagra, especially a mild type, is more common amongst the population of mental hospitals than has hitherto been supposed. Most observers have previously been unwilling to diagnose the condition until the skin rash became manifest. Several of Kimber's cases were diagnosed before this sign appeared, its appearance at a later date clinching the diagnosis. The importance

* A paper read at a meeting of the South-Western Division held at Fishponds on April 29, 1926.

of observations such as these cannot be over-emphasized; furthermore, in our opinion, they throw some light on the ætiology of the disease, for the signs in the pre-eruptive stage are mild diarrhœa combined with a sore tongue. These signs are precisely those which, in so many cases, dominate the early clinical picture of Addisonian anæmia, in which recent research suggests that achlorhydria plays a *rôle* of considerable importance in pellagra.

It is uncommon to read the *post-mortem* records of pellagra without finding some mention of gastro-intestinal atrophy, especially of the small intestine. McCarrison regards this as a sign of avitaminosis, and Cramer reproduced it experimentally in animals deprived of vitamin B, and demonstrated that it was associated with diminished fat absorption and invasion of the superficial layers of the bowel by bacteria. We have found this change in the case we report, and in another reported elsewhere a detailed examination of the small bowel revealed a definite, almost selective atrophy of its lymphoid elements.

There is much to support Watson's view that pellagra should not be regarded as a definite disease entity always produced by the same cause. Our small experience is in accord with his—that in mental hospital patients the disease tends to be of the acute and fatal type and does not respond to treatment, such cases being in sharp contrast to those in which the manifestations are mild and curable.

Case Report.

A married woman, æt. 28. Admitted April, 1925.

Family history.—One of twelve children. Three brothers died in childhood, cause not known; four sisters have died, two of tuberculosis at the ages of 3 and 17 years. Five sisters are alive and well. Father died of tubercular laryngitis, aged 53. Mother alive and alcoholic, aged 65. None of the family have been out of the west of England.

Personal history.—Married eight years—husband a labourer. First child premature and died. Daughter aged 7 years healthy. Son aged 5 years healthy but backward. No miscarriages. Menstruation had been scanty and irregular for two or three years.

She had had no previous illness, but had been getting thin, pale and irritable for several months. There has been no history of mental disorder in the family.

Her certificate was to the effect that she was restless, excitable and confused, and did not know where she was.

Physical state on admission.—She showed signs of recent wasting. Height, 5 ft. 4 in., weight, 7 st. 9 lb. Head and features well shaped and symmetrical. *Complexion:* Hair dark brown and luxuriant growth. Eyes blue and clear. Skin clear, but pale. Temperature was subnormal. *Chest:* Heart and lungs normal. Pulse 90 and regular in force and rhythm. Abdomen was normal; area of stomach resonance normal. Urine: Sp. gr. 1020, acid, no albumen, but a trace of sugar.

Nervous system.—This was difficult to test owing to the mental state.

The knee-jerks were normal, plantar reflex normal, abdominal reflex only slight. Sensation tests could not be relied on, but there was no movement or muscular resistance to pin-pricks on the limbs, but on the trunk and neck these were resented. Muscles generally were flabby and there were signs of general wasting.

The pupils were dilated and slightly irregular in outline. There was a fine tremor of the hands.

Mental state on admission.—She was in a state of confusion, with ideational inertia, and she was quite lost to her surroundings.

She would rouse herself at intervals, when she would mutter, "My mind is gone," and appeared to have hallucinations, seeing her children by her bed. In these clear intervals she showed illusions of identity. Her memory was poor and confused, and with this, accompanied by lack of attention power, she was unable to account for her recent movements. She was emotional on the depressed side. Instinctive action was uncontrolled, and she was inclined to be destructive to her clothing and bedding.

There was periodic motor restlessness and she had to have a room to herself. She resisted all nursing attention and had to be fed with all her food. She slept poorly.

Diagnosis.—A diagnosis of confusional insanity of the depressed form was made, and as such there was a fair possibility of recovery. In two months it was possible to nurse her in a bed on a verandah facing south-west. Though not exposed to excessive heat, she became acutely sunburned about the exposed parts, unlike the other patients on the verandah.

Skin-eruption.—The face, neck and dorsum of hands were affected by an erythematous dusky rash, which in fourteen days became a dry pigmented and scaly eczema with spreading edges on the face and neck. She was removed indoors and the skin was treated with soothing ointments. These had no effect; pigmentation became deeper and the skin was raised and thickened. There was no pain or irritation.

Cracks appeared in the skin chiefly on the forehead, along the naso-labial fold, the anterior border of the sterno-mastoid and over the joints on the dorsum of the hands. Large scales came away, leaving septic surfaces of the hands, containing much pus. Blisters appeared on the finger-tips, containing blood. Owing to septic absorption the temperature rose to 101° F. and abscesses appeared on the chest-wall, back and front. There was also a large abscess immediately above the umbilicus.

Gastro-intestinal disturbances appeared as intermittent diarrhœa. Each attack would last from seven to ten days, the stools being offensive and containing undigested particles of food. The tongue was swollen and red, and there was a large ulcer on the margin. The gums bled readily on cleaning, and there was general stomatitis with ulceration on the buccal mucous membrane.

Progress of Case.

The patient lost weight and the mental state remained the same. The skin condition, however, improved in the autumn, and by December showed a reddish-brown pigmentation over the face areas affected, with a dry, pigmented thickening of the skin. The bullæ dried up and the abscesses healed. The hands were left in a dry, scaly and pigmented state—the condition described as dermotogra. The hæmorrhagic blisters on the flexor tips of the fingers dried up, leaving a contracted wrinkling of the skin.

Urine.—About this time it was found that the sugar had disappeared from the urine, but there was a trace of albumin present, which persisted.

Fæces.—Bacteriological examination revealed no dysenteric or other pathological organism and the loose stools continued to contain much undigested food.

Diet.—Consisted of raw eggs and milk, beef-tea, milk pudding and custard. Orange-juice was given at intervals after the mouth had been cleaned.

Drugs.—Small but increasing doses of arsenic and nux vomica were given throughout.

Disinclination for food persisted, and though there was some nausea, there was no vomiting. In February, 1926, her condition was one of extreme emaciation with established diarrhœa. Septic cracks formed in the dried pigmented patches on the face and hands, and small abscesses re-appeared on the back. The temperature, which had fallen to subnormal for two months rose from the septic absorption and she died early in March.

Pathological notes.—During September, 1925, the blood-count was 4,000,000 red blood-cells and 8,000 white blood cells, with hæmoglobin 30%. The fasting blood-sugar was 0·118% and the blood-urea was 36 mgrm. per 100 c.c. urine.

POST-MORTEM EXAMINATION.

There was practically no mesenteric or other abdominal fat. The spleen was enlarged, bright red, and the substance soft and diffluent. The heart and lungs were healthy. The stomach was slightly dilated and the mucous membrane was thin and pale. The mucous membrane of the small intestine was thin and appeared to be atrophied, and there were a few injected patches, but no ulceration. The mucous membrane of the large intestine appeared to be thin and glistening, otherwise normal.

No naked-eye abnormality was found in the endocrine glands, nor in the central nervous system. The pancreas, thyroid, supra-renal and pituitary were examined microscopically. No changes were found which could not quite well be accounted for by the terminal septicæmia. The first two segments of the cervical cord were examined, and in all sections stained by the Weigert-Pal method a considerable amount of marginal and pseudo-systematized demyelinization was found (see figure).

Sections of the skin showed very extensive surface keratinization, underlying which there were acute recent inflammatory changes with much polynuclear exudation and multiple thromboses in the smaller vessels.

The small bowel showed marked thinning of its walls, but a detailed examination of the mucous membrane was impossible owing to *post-mortem* desquamation. An impression was gained that this atrophy affected its lymphoid elements. (In subsequent investigation on another case this impression proved to be correct.)

A Case of Pellagra with Recurring Attacks.

By W. J. T. KIMBER, M.R.C.S., L.R.C.P., D.P.M., Medical Superintendent, Hill End Mental Hospital, St. Albans.

THE progress of a case of pellagra under observation for a period of five years, during which time many exacerbations of the pellagrous symptoms were noted, should be of considerable interest.

The ætiology of this condition remains obscure in spite of painstaking efforts by various observers on different lines, and, while a certain amount of hypothesis has been advanced, there is lacking that knowledge which should enable us to eliminate the spurious and co-ordinate the remainder into an intelligible and comprehensive whole.

A brief survey of the main theories as to causation will serve as an introduction to a study of the case-report.

Deficiency in biological value of protein.—According to this theory, the condition is due, not to an absolute deficiency of protein in the diet, which may in fact be present in quantities greater than are necessary to maintain normal health, but to a deficiency of those proteins which contain certain specific side-chains in their molecular composition, particularly tryptophane. This is present in a comparatively large amount in the protein of meat, eggs, peas, beans, etc., and, on addition of these to the diet, early cases of pellagra rapidly improve. Maize protein, consisting largely of zein, is deficient in tryptophane; hence the origin of the now generally abandoned maize theory. In this connection it must be remembered that it is only the amount of protein absorbed that can be