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In February 1902 and March 1904 I brought before the Medico-Chirurgical Society of Edinburgh a case of infantilism associated with chronic diarrhoea in which the condition was due to defective or arrested pancreatic secretion, and in which the diarrhoea was cured and the infantilism removed by the administration of pancreatic extract and by that means alone. I claimed that the condition—pancreatic infantilism as I termed it—is a distinct clinical entity—a disease which had not hitherto been recognised and described.

The characters of pancreatic infantilism are:—Arrested bodily and arrested sexual development; intelligence good, no mental defect; no deformity or structural defect of the bones; no visceral disease or derangement except chronic diarrhoea, flatulent distension of the abdomen, and defective or arrested pancreatic secretion. The defective or arrested pancreatic secretion is probably due to chronic pancreatitis. In some cases the condition (chronic diarrhoea and infantilism) is completely cured by the administration of pancreatic extract and by that treatment alone.

In this communication I propose to detail the after-history of that case and to refer to other cases which have been recorded since I directed attention to the condition. The disease appears to be extremely rare. Cases of arrested development associated with, and apparently due to, chronic diarrhoea are not very uncommon, but in most of these cases there is not, so far as our present information enables us to judge, defective pancreatic secretion.

The details of the case are as follows:

Case of Pancreatic Infantilism Cured by the Administration of Pancreatic Extract.

Clinical History.—D. B., aged 18½, came under my observation at the end of the year 1901. Although 18½ years of age, he looked like a
boy aged 10 or 11; he was only 4 ft. 4½ ins. in height, and he weighed only 4 st. 7½ lbs. The bodily development had apparently been arrested at the age of 10.

He was perfectly formed; the different parts of the body were all proportionate. Skiagrams showed that the epiphyseal lines—which should close between the sixteenth and eighteenth years (Gray)—were unclosed; consequently the bones were capable of further growth. This was a good point for prognosis.

He was mentally bright and intelligent. He presented none of the physical or mental alterations suggestive of sporadic cretinism, he was not the subject of inherited syphilis, and there was no suspicion of rickets and no evidence of tubercle.

The sexual organs were infantile; there were no pubic or axillary hairs. His voice was high-pitched and childlike in tone.

For nine years before he came under my observation he had been the subject of chronic diarrhoea; the average number of stools, before the pancreatic treatment was commenced, was five or six in the twenty-four hours; the motions were copious, liquid, and somewhat light in colour (yellowish-brown). The abdomen was somewhat swollen and tympanitic. The appetite was good. He suffered a good deal from abdominal pains—cramps as he termed them—apparently due to flatulence. The stomach appeared to be quite normal; examination of the stomach contents after a test-meal showed that the normal digestive principles were present. The urine was free from sugar.

Family History.—His father, aged 53, was alive and well; his mother died at the age of 37 of pleurisy. Two brothers were dead—one at the age of 22 of phthisis, one in infancy. Four brothers and three sisters were alive and well; all were normal in size except the youngest, aged 9 years, who was undersized. This brother was admitted to the Edinburgh Royal Infirmary under my care seven months later (22nd April 1902). He was then 10 years of age, well formed, sharp mentally, but very small and light (3 ft. 10 ins. in height, and 3 st. 8½ lbs. in weight). He had for some time suffered from diarrhoea—four motions on an average daily. After his admission to the Infirmary there was no diarrhoea and the stools were normal; there was no defective pancreatic secretion. He was discharged a fortnight later (6th May 1902) quite well, having gained 1½ lbs. in weight. He is now quite well, and of normal height (5 ft. 6 ins.).

Diagnosis.—After carefully studying the case I came to the conclusion that the diarrhoea was due to defective metabolism in the upper part of the gastro-intestinal tract, and I suggested that it was probably due to disease or defective action of the pancreas. I had
seen several cases in which diarrhoea, apparently similar in character, was due to pancreatic disease.

The pancreatic secretion was shown to be defective or completely absent by three separate methods of research (see footnote, p. 326). Consequently I came to the conclusion that the diarrhoea was due to defective or arrested action of the pancreas; and, as there was no other apparent cause for the arrested bodily and sexual development, I thought it probable that the infantilism, like the diarrhoea, was the result of defective or abolished pancreatic secretion. The correctness of this conclusion was proved by the results of treatment.
Treatment.—One drachm of pancreatic extract (Armour's liquor pancreaticus) and one drachm of a glycerine extract of steapsin, specially prepared in the laboratory of the Infirmary, three times daily, were prescribed. This, and for three months a milk diet, was the only treatment.

The treatment was commenced on 27th December 1901. During the years 1902, 1903, and 1904 the patient took the medicine regularly (except during the autumn of 1902), three times daily; during the years 1905 and 1906, twice daily. For the past eight years, 1907 to 1914 inclusive, he has been quite well and has not taken it at all.

An interesting point is that during the autumn of 1902 the patient omitted to take the pancreatic extract, that in consequence of this omission the diarrhoea returned, and that after the treatment was resumed the diarrhoea again disappeared.

After the first three months the milk diet was discontinued. For the past twelve years he has been having the ordinary diet used by persons in his position in life.

Condition on 6th March 1915.—The patient stated that for the past ten years he has enjoyed excellent health (with the exception of an attack of dyspepsia, due to errors in diet, during March and April 1914), and has been regularly at work as a tailor from 7 A.M. to 6.30 P.M., with one break of an hour. He is fortunate inasmuch as the workshop in which he is employed is an ideal place as regards sanitary arrangements. His present height is 5 ft. 3 ins., and his weight when stripped is 7 st. 13 lbs. During the past nine years his bowels have been very regular; he has, as a rule, one motion a day, seldom two; the motions are always formed and natural.*

* The pancreatic secretion was shown to be defective or completely absent by three separate methods of research, viz.:—

1. The stools contained a considerable quantity of undigested fat; this undigested fat became very much less after the administration of pancreatic extract.

2. When the patient was taking a milk diet the amount of phosphoric acid in the urine was greatly below the normal; after the administration of pancreatic extract the amount of phosphoric acid was markedly increased.

My house-physician, Dr. David Young, who suggested and conducted this part of the inquiry, stated that when a patient is having a milk diet, caseinogen is the source of phosphorus in the urine. This caseinogen is broken up in the stomach into paranuclein and a proteid. Paranuclein, which contains 4 per cent. of phosphorus, is insoluble; but when paranuclein comes in contact with the pancreatic juice, it is split into paranucleic acid and an albumose, which is soluble. This is the source of the phosphorus (phosphoric acid) in the urine.

Dr. Young found that the amount of phosphoric acid in the urine in this case, when the patient was taking a milk diet, was extremely small; but that
Results of the Treatment.—The result was remarkable improvement both as regards the diarrhoea, the bodily development and growth, and the sexual development.

1. Before the pancreatic treatment was commenced there were, on an average, 5 or 6 loose motions daily. As the result of the treatment the diarrhoea was arrested. During the first eighteen months after the treatment was commenced there were two motions on an average daily, one of which was formed; since that time there has been only one motion daily, formed and perfectly normal.

2. Before the treatment the patient had not grown at all for eight years. After the treatment he gradually commenced to grow. He now measures 5 ft. 3 ins., and weighs 7 st. 13 lbs., an increase of $10\frac{3}{4}$ inches in height and 3 st. 5¼ lbs. in weight.

3. The sexual development, which when the patient came under observation was quite infantile, gradually became complete.

4. The patient lost his child-like appearance; his voice, which was high-pitched and childish, became low-toned and rough.

The condition of the patient before treatment (December 1901) and after treatment (May 1904) is shown in Figs. 1 and 2, which are photographed exactly to scale.

during the administration of the pancreatic extract the amount of phosphoric acid in the urine underwent a very marked and rapid increase.

3. By Professor Sahli’s test. This consists in the administration of capsules (invented by Professor Sahli of Berne) containing iodoform surrounded by a glutoid substance, which is insoluble in the gastric and intestinal secretions, but which is soluble in the pancreatic secretion. If the pancreatic secretion is active, the glutoid wall of the capsule is dissolved and the iodoform is set free; iodine, in the form of iodides and iodates, can then be demonstrated in the saliva by testing with chloroform and nitric acid; the nitric acid sets free the iodine, which gives a pink colour to the chloroform. The test is a beautiful means of demonstrating, firstly, the length of time that food (i.e. the capsule) remains in the stomach, and, secondly, whether the pancreatic secretion is active or not. If no iodine reaction is obtained in the saliva after the administration of the capsule, it may be concluded either that the capsule has not passed from the stomach, or that the pancreatic secretion is in abeyance.

In this case, after the administration of a test capsule, iodine could not be detected in the saliva. That the capsule had passed from the stomach was proved by the fact that it was found undigested in the stools. This experiment was repeated more than once. When, however, a test capsule was given along with food, and a dose (2 drachms) of pancreatic extract was given two hours afterwards, it was found that the saliva contained iodine an hour after the pancreatic extract had been administered. The activity of the capsules was also tested by a control experiment. Capsules were given to two patients who had no stomachic or intestinal disease; in both cases iodine was detected in the saliva an hour and a half after the capsules were swallowed.

These three methods of investigation showed that the pancreatic secretion was deficient or entirely absent.
The following table shows the differences in height and weight, etc., at different dates:

**Table showing the Age, Height, Weight, etc., in the Case of Pancreatic Infantilism Described in the Text at Different Dates Before and After Treatment.**

| Date       | Age     | Height       | Increase in Height | Weight | Increase in Weight | Sexual Development | Number of Motions per Diem |
|------------|---------|--------------|--------------------|--------|--------------------|---------------------|-----------------------------|
| Dec. 27, 1901* | 18½    | 4 ft. 4½ ins.| ...                | 4 st. 7½ lbs. | ...                | Infantile            | 4, 5, or 6                  |
| Feb. 2, 1902   | 19      | 4 ft. 4½ ins. | 1½ in.          | 5 lb. 6½ | 7 lb.              | Commencing           | 2 or 3                      |
| Oct. 22, 1902† | 19½    | 4 ft. 6 ins.  | 1¾ ins.          | 5 lb. 2 | 8½ lb.            | Considerably developed | 3, 4, or 5                  |
| May 20, 1903   | 20      | 4 ft. 8½ ins. | 4½ in.          | 5 lb. 7 | 13½ lb.           |                     | 2 (1 formed)                |
| Mar. 2, 1904   | 20½     | 4 ft. 9½ ins. | 5½ in.          | 6 lb. 1½ | 22 lb.            |                     | 2 (1 formed)                |
| May 10, 1904   | 21      | 4 ft. 10 ins. | 5¼ in.          | 6 lb. 3½ | 23½ lb.          | Complete             | 2 (1 formed)                |
| Jan. 26, 1906  | 22½     | 5 ft. 1½ ins. | 9½ in.          | 7 lb. 5½ | 40½ lb.          |                     | 1 (formed)                  |
| June 12, 1908  | 25½     | 5 ft. 2½ ins. | 10½ in.         | 7 lb. 11½ | 46½ lb.          |                     | 1 (formed)                  |
| Mar. 6, 1915   | 31½     | 5 ft. 3 ins.  | 10½ in.         | 7 lb. 13 | 47½ lb.          |                     | 1 (formed)                  |

* Treatment commenced at this date.
† For the past two months has omitted to take the pancreatic extract.

**Notes of Other Cases of Pancreatic Infantilism.**

**Dr. J. L. Rentoul's Case of "Pancreatic Infantilism"**

(Brit. Med. Journ., 24th December 1904, p. 1695).

R. K., female, aged 18, came under observation in May 1904. She looked quite childish—about 9 years of age. Her height was 4 ft. 2½ ins., and her weight 4 st. ½ lb. There was no sexual development; the breasts were represented by small nipples; there was no hair on the pubes nor in the axillae. She had never menstruated. She was bright in appearance and intellect. Her appetite was good, but she never thrrove. She was always considered a pretty child, and was well formed, save for enlargement of the abdomen. She had grown steadily till about the age of 11; after that age she had not grown at all.

The only abnormality detected was enlargement of the abdomen, due entirely to flatus. Since infancy she had been troubled with diarrhoea; the motions averaged 9 per diem; the stools were frothy and oily in character, and very large. The skin was healthy looking. Her bones and joints were quite healthy, and showed no evidence of rickets. The urine was normal.

**Family History.**—Father living and healthy; all his people are healthy. Mother died of "galloping consumption"; had one mis-
carriage and two full-term children, of which one is the patient; the other, a boy, is well-grown, and enjoys good health.

**Diagnosis.**—Infantilism with a pancreatic lesion.

**Treatment.**—Pancreatic extract, ten grains, three times daily.

**Result.**—In two weeks there was great improvement; the diarrhoea had ceased, the stools were healthy and more natural looking, the abdomen was not swollen. At the end of a month she had gained three-quarters of an inch in height and two and a half pounds in weight. The medicine (pancreatic extract) was now stopped for two weeks; at the end of that time she had gone back to her original condition, and lost half a pound in weight. The pancreatic extract was again given, but in the liquid form. In the course of four months she gained 2 inches in height and 9 1/2 lbs. in weight. This improvement was gratifying, but more so was the improvement in her general condition—the breasts were now developing and are a fair size; hair had started to grow on the pubes and in the axillae; she was bright, happy, and willing for work.

On 8th March 1915 Dr. Rentoul wrote me: “R. K. is now quite well; she has remained so since 1905. In 1906 I put her on to the pancreatic extract again for one month. She is working every day, menstruates regularly, and is in all respects in good health. Height, 4 ft. 6 ins.; weight, 6 st. 8 lbs.”

The following table shows the alterations in height and weight at different dates:

| Date                  | Height.      | Weight.    |
|-----------------------|--------------|------------|
| 16th May 1902.        | 4 ft. 2 1/2 ins. | 4 st. 1 1/2 lb. |
| 17th June             | 4 ft. 3 ins.  | 4 st. 3 lbs. |
| 4th July              | 4 ft. 3 ins.  | 4 st. 2 1/2 lbs. |
| 4th Aug.              | 4 ft. 3 1/2 ins. | 4 st. 8 ins.  |
| 12th Sept.            | 4 ft. 4 1/2 ins. | 4 st. 10 ins. |
| 4th Oct.              | 4 ft. 6 ins.  | 6 st. 8 ins.  |

* No medicine between these dates.

DR. JOHN THOMSON’S CASE OF “PANCREATIC INFANTILISM” (*Transactions of the Medico-Chirurgical Society of Edinburgh*, 1904, vol. xxiii. p. 165).

T. R., aged 24 1/2; height, 5 ft. 1 1/2 ins.—that of a boy of 9 or 10. He was very intelligent, having passed the sixth standard at school when 13 years old. His hands and feet were slender and well formed, the genital organs infantile in appearance. He looked exactly the same as Dr. Bramwell’s case had done two years ago before treatment with pancreas. He had the same yellowish pallor of complexion, the same
proportions of body, the same weak muscles and tumid abdomen, the same high-pitched childish voice.

He was the sixth child of healthy, well-conditioned parents, and had been regarded as healthy until about 11 ½ years ago (October 1892), when he had a very severe attack of "influenza." After this he suffered from very intractable diarrhoea. The motions were numerous (4 to 7 in the day), pale, and extremely offensive, and often contained fat. There was great abdominal distension, sickness, loss of appetite, and frequent severe pains. In the earlier years of his illness he was an in-patient in the Children's Hospital and in the Royal Infirmary. In both he was regarded as a case of pancreatic disease. No treatment tried had any permanent effect on his symptoms, and when first seen by Dr. Thomson in November 1894 there had been little, if any, improvement. Dr. Sloan and Dr. Thomson tried a variety of treatment—acids, alkalies, sedatives, antiseptics, and arsenic. He was also given thyroid and pancreas, but not regularly, nor for a long time. Between the ages of 15 and 17 ½ he grew 2 ½ inches. During the next 5 years he gained 3 inches in height. During the last two years he had grown a quarter of an inch. The severe diarrhoea had ceased for two or three years, but the motions were still very unhealthy in character, abdominal pains were frequent, and the belly much distended. As the patient would not in recent years submit to hospital treatment, it had not been possible to investigate his case thoroughly. A skiagram showed that the epiphyses were in the state of development of those of a boy of 7 or 9 years old.

Subsequent Progress of the Case.—Dr. John Thomson has kindly given me the following report regarding the future progress of this case:—"Between April 1904 and March 1905, while under my observation, T. R. gained 1½ inches in height but he lost none of his infantile characteristics. He had, as you will remember, an extreme dislike to all medical examination, and I lost sight of him for years.

"On 17th April 1913 (when he was 32½ years old) I was asked to see him again in consultation. I was told that he had remained about the same off and on till six months before, when he began to complain of increasing debility, with abdominal pain and occasional foetid diarrhoea. One month before I saw him he was found by his medical man extremely emaciated and feeble, with no appetite, and his voice almost inaudible. The urine contained a considerable amount of sugar.

"I found him in a state of great exhaustion and much emaciated. His heart and lung sounds were normal. The abdomen was somewhat distended and showed some greatly enlarged veins on the surface. A hard swelling was present in the neighbourhood of the pancreas; its exact size and form could not be made out, owing to the tense con-
dition of the recti, although there was no complaint of tenderness on pressure. There was much sugar in the urine. His conformation was just as infantile as when you saw him. As he was much too weak to stand, I was not able to measure his height. His mother said she thought he had grown another inch since I had seen him in 1905. He went steadily downhill, and died on 25th May 1913. Before he died the abdominal tumour became more prominent to the right of the middle line.

"We diagnosed malignant tumour of the pancreas. Permission for a post-mortem examination was refused."

Note by B. B.—Curiously enough this patient was a great friend of my patient (D. B.), who informs me that notwithstanding the remarkable improvement which occurred in his (D. B.'s) case, T. R. absolutely refused to be admitted to the Royal Infirmary, and would not take the medicine (pancreatic extract) prescribed by Dr. John Thomson, except very irregularly.

Dr. Conrad de L. Carey's Case.—The following case, for which I am indebted to Dr. Conrad de L. Carey of Guernsey, is suggestive and interesting in connection with disease of the pancreas and infantilism:

"Having recently read a lecture on 'Infantilism' in vol. i. of your Clinical Studies, I thought that an account of the following case might interest you:

"A few days ago a girl was found lying in the road dead, and I was ordered by the Court to make an autopsy. In appearance the body was that of a girl about fourteen years old. There was no sign of any pubic hair, though at the inquest the birth certificate was produced, proving her to have been twenty years of age. The top of the scalp was quite bald, but there was no other evidence of syphilis, and there was certainly no cretinism about the case. Post mortem it was found that death was due to dilatation of the right ventricle, secondary to advanced endocarditis of the mitral valve. The uterus was about one inch in length—not more; no ovaries could be found. The kidneys were fused together at their bases, forming a single horse-shoe-shaped organ. The bowels were extremely small with thickened muscle coats, otherwise healthy.

"There was no sign of tubercle, but the pancreas was large and extremely hard, cutting just like fibrous tissue.

"I have been unable to get a history of any illness from the parents, which can be accounted for by their desire to shield themselves from any responsibility for not having called in a doctor. In view of your suggestion in the Clinical Studies that in such cases the pancreas was at fault, I thought that the account might interest you. It was stated at the inquest that the girl was quite bright and intelligent, though
she would not play with other children, and was extremely sensitive about her baldness.

"I take it that the condition of the pancreas was one of chronic pancreatitis, though one is at a loss for a cause. The teeth showed no signs of being peg-shaped; the corneæ were clear, palate normal; and tibîæ and other bones quite normal and well formed."

DR. R. G. FREEMAN'S CASE OF "INFANTILISM TREATED WITH PANCREATIC EXTRACT" (American Journal of Diseases of Children, November 1911, vol. ii. pp. 332-339).

Dr. R. G. Freeman of New York reported four cases of arrested development associated with chronic diarrhœa, in one of which (No. I.) marked improvement resulted from the use of pancreatic extract. Dr. Freeman wrote me on 31st March 1915, saying that another case (No. IV.) "was put on pancreatic extract, but no marked improvement took place in this child until she was taken to Dr. Combe at Lausanne, where, without very much modification in her treatment and with no medicine, she made a marked improvement during one summer."

"Case I.—The first case, a child now 4½ years old, has been under my care for twenty months. She had a history of never having done well. She had had repeated attacks of bowel trouble, from which she would convalesce, only to be debilitated by a fresh attack. When first seen in August 1909 she was suffering from intense general lassitude, and would not willingly lift her head from the pillow. She would lie for hours without moving or speaking. Her mental development was very good.

"Her tongue was heavily coated; her abdomen was distended; she was markedly emaciated and somewhat anæmic. She was having one or two very large, soft, grey, curdy movements. Her appetite was very poor. She was put on a diet of peptonised milk with wheat flour gruel after an initial dose of castor oil. Bismuth was administered at each feeding.

"The examinations of the faeces and urine were made by Dr. Herter and corresponded to the findings in his cases.

"During twenty months she showed practically no gain in weight, although at the time of the present report she weighed 2 pounds more than she did three months previously.

"No food had been found that appeared to increase her weight, although the gelatin advised by Dr. Herter was tried. The character of her stools improved, the greatest improvement having followed the administration of buttermilk, of which she took a pint a day. The stools became of good colour, slightly curdy, and but one of moderate size each day.
"The administration of intestinal antiseptics had no influence on the bacteria of the intestines. Under the administration of pancreatic extract she seemed to improve more than under other medication."

On 31st March 1915 Dr. Freeman wrote me saying:—"Case No. I. was put on pancreatic extract, and has been on it most of the time. She improved very much as soon as the pancreatic extract was started. It was first given about five years ago; at that time she weighed 17 lbs.; last autumn, when she was eight years old, she weighed 35½ lbs. and measured 41½ ins."

Dr. A. A. Mumford's Cases of "Arrested Growth and Chronic Diarrhoea" (Manchester Medical Chronicle, June 1908).

Dr. A. A. Mumford has recorded some cases in children in which protracted ill-health, severe anaemia, and defective growth were associated with a faulty metabolism of fat. The stools were copious, frequent, and loose, evil-smelling, and clay-coloured or very light brown. There was occasionally a small trace of glycosuria, but no jaundice. The abdomen was distended; general nutrition was often so seriously impaired that growth was not only materially interfered with but absolutely arrested, so that a state of infantilism resulted, extending over many years. When once the assimilation of fat is secured and the accompanying catarrh diminished or cured, the symptoms may entirely pass off, and in some of the cases which he had been able to follow after a prolonged course of special treatment the disease was arrested, and the ordinary physiological processes were found sufficient to maintain the health of the child. A diagnosis of chronic interstitial pancreatitis was suggested.

In Case I. various forms of pancreatic extract were tried. The best results were obtained by small pilules, each containing one grain of pancreatin, two after each meal. Within a few days a change was brought about; the motions became less frequent in number, firmer in consistency, and of a normal colour; the general appearance of the child completely altered; the patient became lively, bright, and energetic; the pains in the joints entirely disappeared; the muscles of the legs began to fill out; the abdomen lost its swollen condition. The increase in weight, which was at first very slow, afterwards became marked.

In July 1905 the weight was 28½ lbs.; September 1905, 25½ lbs.; December 1905, 30 lbs.; March 1906, 31 lbs.; normal weight would be 43 lbs. Pancreatic treatment was then begun. By September 1906, the weight had increased to 34 lbs.; February 1907, 36½ lbs.; July 1907, 39½ lbs.; March 1908, 43½ lbs.; normal, 52 lbs. Before pancreatic treatment the child was only 70 per cent. of its normal weight. After 18 months' treatment it had grown to 83 per cent. of the normal weight.
March 1915.—Dr. Mumford tells me that the child is in good health, fully grown, though spare; all the symptoms have disappeared.

I append the notes of two cases of infantilism associated with diarrhoea. At first sight they were thought to be cases of pancreatic infantilism, but this was not so. These cases seem similar to some cases described by Dr. Christian A. Herter at the annual meeting of the Association of American Physicians, under the term "intestinal" infantilism. A more appropriate term would, I think, be "gastro-intestinal" infantilism, for in Case II., related below, the defect seems to have been chiefly in the stomach.

Case I.—Infantilism with Chronic Diarrhoea and Anaemia.—The patient (J. M'L.), a boy of 18, did not look more than 9 years of age. He was only 4 ft. 2\(\frac{1}{2}\) ins. in height and 4 st. 10\(\frac{1}{2}\) lbs. in weight. He stated that he had not grown since he was 8 years of age. His sexual organs were completely undeveloped. Mentally he was quite bright and sharp. He was employed on a farm, and was able to partly keep himself. His face was broad, full, and puffy-looking; his abdomen large, skin somewhat dry, but there were no symptoms of sporadic cretinism; he did not feel the cold; he sweated naturally on exertion; his hair was luxuriant and natural in texture. There was no umbilical hernia; the anterior fontanelle was closed; and, as already stated, he was mentally quite active and bright.

When he came into hospital he was markedly anaemic, and the spleen was somewhat enlarged; its lower edge could be distinctly felt in the abdomen. The anaemia was of the chlorotic type; the red corpuscles numbered 4,000,000 per cubic millimetre, and the haemoglobin equalled 28 per cent.; the colour index (corrected) was therefore 0.38; the white corpuscles numbered 3200 per cubic millimetre; a differential count showed that the different forms of white corpuscles were present in normal proportions.

For the past eight years he had been troubled at intervals, about six times every year, with diarrhoea. The attacks of diarrhoea came on without obvious cause, and usually lasted for four, five, or six days. During the attacks he had six or seven copious light-coloured motions, mixed with slime, in the course of the twenty-four hours. Dr. John Thomson, who kindly sent the patient into the Infirmary under my care, thought that this was perhaps another case of pancreatic infantilism. But observation showed that this was not so.

As the result of treatment—milk diet and the administration of large doses of iron, in the form of Robertson's Blaud's pill capsules—the bowels became quite regular, and the anaemia disappeared. On 24th May the red corpuscles numbered 4,500,000 per cubic millimetre,
and the haemoglobin equalled 65 per cent. But notwithstanding the disappearance of the diarrhoea and the anaemia, the patient did not grow while he was under observation in the Infirmary (he was discharged on 20th May 1904). This was no doubt due to want of time, for during the next two years this patient, who had not grown for ten years, increased five inches in height.

The condition of the patient when he came under observation is seen in Fig. 3.

On 6th March 1906 the patient wrote my house-physician as follows:—“I may say I am pretty well, only I have very sore legs; I think it is rheumatism that is causing the trouble. I am growing in-kneed. Well, doctor, I may let you know that I have grown five inches since I left the Infirmary, and I am so glad to let you know, and also glad that Dr. Byrom Bramwell did so much good. I would be so much pleased if Dr. Bramwell could give me a remedy for my legs, they are so sore.”
CASE II.—Infantilism with Chronic Diarrhoea, Dilatation of the Stomach, Recurring Attacks of Severe Gastric Tetany, Absence of Free Hydrochloric Acid in the Stomach Contents; Cured by Diet, Hydrochloric Acid, Pepsin, Massage, Faradic Stimulation of the Dilated Stomach, etc.—A. J., aged 20, was admitted to the Edinburgh Royal Infirmary on 1st November 1904. Though 20 years of age, he looked like a boy of 10 or 11. His height was 4 ft. $3\frac{1}{4}$ ins., and his weight 4 st. $12\frac{1}{2}$ lbs. His face looked much older than his body. His mental condition was in no way affected; he was, in fact, extremely sharp and intelligent. His body was perfectly formed except that his abdomen was large. His sexual organs were completely undeveloped (see Fig. 4).

The motions, which numbered on an average 4 per diem, were copious, frothy, like pea-soup, and contained a large excess of fat.
Analysis of the stomach contents showed an entire absence of free hydrochloric acid. The stomach was markedly dilated. Analysis of the stomach contents by Dr. Noël Paton gave the following result:

"Acid, a trace; total acidity, 0.01825; free acid, none; free HCl, none; butyric and lactic acids, none."

The condition of the teeth was peculiar and interesting. In the lower jaw the central incisors were extremely long, owing to the fact that the gums had receded from the teeth—the sort of thing that one sees in old people* (see Fig. 5).

* Mr. Guy, Dental Surgeon to the Royal Infirmary, kindly examined the patient and gave me the following full report regarding the condition of the teeth:

"The teeth are well developed; there is no departure from the typical in form; all have erupted except the wisdom teeth. They are fairly regular, but the lower canines are slightly rotated, so that their labial surfaces are labiodistal, and the right upper canine is slightly inside the arch.

"The first lower molar, left, is missing; it was extracted three years ago.

"The first upper incisor, right, has a pit on the labial surface of the enamel.

"As regards caries—

"1st lower molar, right, has a small cavity on the occlusal surface.

"2nd lower molar, right, has a cavity on the occlusal, also one on the buccal surface.

"2nd upper molar, right, has a small cavity on the occlusal surface.

"1st upper premolar, right, has a mesial cavity."
History.—Thirteen years ago he had what he says was an attack of Asiatic cholera; up to that time he was quite well. For the past 10 years he had suffered from chronic diarrhoea, and had not grown at all; during this time he had had several attacks of pain and spasm in the abdomen, hands, feet, and limbs (typical gastric tetany). He had been under treatment in various hospitals without any effect.

Diagnosis.—At first sight this case looked exactly like my previous case of pancreatic infantilism, but observation showed that this was not so, though the motions contained an excess of fat, the pancreatic secretion, as tested by Sahli's capsules, was found to be quite active, and the long administration of pancreatic extract did not produce any benefit.

Treatment.—Milk diet, hydrochloric acid and pepsin, massage, faradic current to the stomach.

Result of Treatment.—Under this treatment the diarrhoea was markedly improved, and the patient gained in weight. He was discharged from the Infirmary on 27th March 1905.

On 4th October 1907 and 11th April 1908 he was readmitted suffering from severe attacks of gastric tetany—cramps in the stomach, hands, and feet.

His general condition had markedly improved. His height was now 4 ft. 6½ ins. and his weight 5 st. 2 lbs. The sexual organs, which, when first seen, were completely infantile, were now developing; pubic hair was beginning to grow.

Since his discharge from the Infirmary in March 1905 he had been employed as a laboratory assistant. During this time he had had frequent attacks of gastric tetany, but not severe enough to keep him from his work until the attack in October 1907 commenced.

The tetany was treated with chloral hydrate and bromide of potassium, thyroid extract, quinine, gastric lavage, massage, and the faradic current to the abdomen. The question of gastro-enterostomy was on several occasions carefully considered, but negatived.

He complained of great weakness in the knees and back. He

"In the upper jaw from the first premolar right to the first premolar left, inclusive, there is present chronic suppurative periodontitis (pyorrhoea alveolaris), the two central incisors the worst, with patulous sockets; all four incisors are loose and partly extruded.

"In the lower jaw from canine to canine inclusive, the same condition is present; the roots of the incisors are exposed, the centrals for half an inch, the laterals for a quarter of an inch; all four incisors are thickly coated on the lingual aspect with tartar, which is also present on the labial surface of the exposed roots; they are very loose.

"There is a patch of leukoplakia on the dorsum of the tongue.

"The teeth are to be carefully scaled and cleaned, and the pyorrhoea treated; the cavities of decay are to be filled."
found great advantage from elastic knee-caps, together with arsenic, strychnine, and phosphoric acid.

Subsequent Progress of the Case.—After his discharge from the Infirmary in May 1908 he continued to enjoy good health, and has since been regularly employed as a laboratory assistant.

Remarks.—This is a most interesting case, not only because of the infantilism and its removal by gastric treatment, but because of the long-continued and very severe attacks of gastric tetany—a condition which is so often fatal.

THE NEW PSYCHIATRY.*

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LECTURE II.

PSYCHO-ANALYSIS.

In to-day's lecture I hope to give a description of psycho-analysis, its aims, objects, uses and technique.

Psycho-analysis is a method of obtaining a complete history of the patient's illness and an insight into his modes of thought, such as can be obtained in no other way. A detailed history of a mental disorder includes an account, not only of the manifest disturbances of conduct, but also of the patient's thoughts in association therewith, and of the various experiences and events which led up to it, together with their bearings on one another from the patient's point of view.

When all this has been ascertained it becomes necessary to trace the patient's particular habits of thought back to their origin. Psycho-analysis achieves this result by reviving his memory for numerous incidents and events which he had forgotten, and by unearthing his hidden, repressed, and therefore unconscious complexes, such as were considered in the first lecture, especially those having relationship with his present illness.

The true relationship is then discussed in such a way as to place these complexes in their true light. This is in reality a kind of re-education whereby the patient acquires self-realisation and develops his character and personality.

When all this is accomplished, the recovery of the patient, which is the chief aim of psycho-analysis, results as a matter of course.

* The Morison Lectures, delivered in the Royal College of Physicians, 8th, 10th, and 12th March 1915. (Abridged.)