In pyonephrosis a pyelogram materially assists in prognosis.

CASE XIV.

A woman of 36 suffered pain in the left loin, pyuria, and irregular fever for six months. There was definite enlargement of the left kidney. X rays showed a small calculus (Fig. 23). No urine could be obtained by catheterization of the left kidney. Catheterization of the right kidney after 15 grams of urea gave a urea concentration of 1.8 per cent. A pyelogram showed cavities occupying the greater part of the renal region (Fig. 24). At operation these cavities were found filled with pus, and the kidney shown in Fig. D was removed. It consisted merely of fibrous loculi and contained a small stone.

It was possible to say prior to operation that nothing short of nephrectomy would relieve such extensive suppuration and disorganization.

NOTE ON "DEFATTING" OF THE ACID-FAST BACILLI OF LEPROSY AND TUBERCLE BY INJECTIONS OF CHAULMOOGRADES AND MORRHUATES.

BY

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IN 1916 I recorded favourable effects in leprosy from the subcutaneous and intravenous injection of soluble sodium salts of the unsaturated fatty acids of chaulmoogra oil, sodium gynocardate, and hydnocarpates¹; in 1917 I pointed out² that even small doses given intravenously may produce softening of the nodules, accompanied by breaking up and absorption of the lepra bacilli; these changes were illustrated by coloured plates. In 1919 I recorded similar results from sodium morrhuate, prepared on similar lines from cod-liver oil,³ and a year later with sodium soyate from soya-bean oil (to which Dr. E. Muir has since added ethyl esters of linseed and olive oils), and I showed that prolonged treatment by these methods may produce disappearance of the lepra bacilli from the tissues with apparent cures, which have now lasted in some cases for from five to eight years. I showed also that occasionally severe cases of leprosy cleared up in the course of some months following a prolonged febrile reaction, with great destruction of the bacilli, after a small intravenous dose without any further treatment, indicating that the dissolved bacilli have acted as an antigen in producing active immunity. In 1920 I reported some favourable results in the treatment of tuberculosis, mostly of the surgical form, with sodium morrhuate. In 1921 I summarized the results of my six years' researches,⁴ and discussed the probable mode of action of these preparations, pointing out that the direct action theory of E. L. Walker and Marion Sweeney⁵ (based on their demonstration of a specific action of gynocardates and hydnocarpates on acid-fast bacilli as a class) would not explain the efficacy of sodium morrhuate and soyate nor the prolonged improvement after a single febrile reaction, and I concluded:

"Such cases appear to be best explained on the theory that, during the extensive breaking down of the bacilli, antigens are formed, which bring about the subsequent prolonged improvement. I have for long considered that the action of the soluble salts of the fatty acids of the several oils I have shown to be effective in leprosy must, in some way, be due to a chemical reaction with the fatty acids in the coating of the acid-fast bacilli, so weakening their protective envelopes as to allow the body-cells to deal with them, while the extensive breaking down of the bacilli in the body may lead to immunizing antigen formation in the system. Whatever the precise explanation may be, it is now abundantly clear that my discovery, that injections of soluble preparations of the fatty acids of chaulmoogra, cod-liver, and soya bean oils lead to breaking down of leprosy bacilli in the human body, is of great interest and importance, and one which demands much further research."

The precise manner in which the dissolution of lepra bacilli in the tissues is brought about remained to be elucidated, but in 1920 Dr. J. A. Shaw-Mackenzie⁶ recorded experiments showing that the addition of sodium

gynocardate, sodium morrhuate, and sodium oleate to a pancreatic extract doubled the fat-splitting effect of pancreatic lipase on an emulsion of olive oil *in vitro*, and he suggested "a direct stimulating action of tissue lipolysis in, at any rate, partial explanation of the therapeutic effect of sodium morrhuate and of sodium gynocardate" on acid-fast bacilli. It then occurred to me to investigate the possible effect of these preparations on the blood lipase in both leprosy and tuberculosis, for it is known that this ferment is deficient in many tuberculous cases, and during the past year I have been working at this point in the biochemical laboratory at St. Bartholomew's Hospital, with the kind permission and help of Dr. Mackenzie Wallis, the preliminary results of which appear to be worth mentioning in view of the interest aroused by Professor Dreyer's important researches on "defatting" of tubercle bacilli *in vitro*.

Thanks to the kindness of Dr. E. Muir, Leprosy Research Worker, Calcutta School of Tropical Medicine, in sending home to me in ice a considerable number of serums of treated and untreated lepers, I was able to find that in three untreated nodular lepers the blood lipases averaged only an equivalent of 0.033 decinormal sodium hydrate, while the average of nine treated cases was 0.22, or about the normal figure; one of them, who had just had a severe febrile reaction with extensive destruction of the bacilli, however, showed a low lipase content, as if the ferment had been used up in dissolving the organisms. Dr. Muir has since made a large number of lipase estimations in lepers in Calcutta, and he has recently reported to me that "we are finding almost invariably a very low lipase content in severe reactions, and we are finding a good prognosis justified when there is a high lipase content."

I have also been making lipase estimations in a number of serums from surgical cases of tuberculosis kindly sent to me by Dr. Pugh and Dr. Mawson from the Carshalton Children's Hospital, and Dr. Mawson has recently sent me records which indicate that patients with low lipase content are usually those who are not doing well. I am also testing serums before and after treatment by chaulmoogrades and morrhuates at Carshalton, and also, through the kindness of Dr. Rundle, at the Fazakerley Sanatorium of Liverpool, to see if the lipases are raised by these drugs. It is too early to report the results, but those already obtained in leprosy appear to support the view that this class of preparation acts by increasing the blood lipase, which in turn dissolves the fatty coating of the acid-fast bacilli of leprosy, and probably also of tubercle, setting free the antigens, with resulting production of immunity in the system in leprosy, and possibly also in tuberculosis. In the latter disease, however, it is more difficult to control the process with sufficient accuracy to prevent too great liberation of toxins, in pulmonary affections at any rate. In other words, I appear to have obtained in leprosy, and possibly in surgical tuberculosis, "defatting" of the causative bacteria *in vivo*.

REFERENCES.

- ¹ *Lancet*, February 5th, 1916. ² *BRITISH MEDICAL JOURNAL*, October 21st, 1916. ³ *Indian Journ. Med. Research*, vol. v, No. 2, October, 1917. ⁴ *Indian Med. Gaz.*, May, 1919. ⁵ *Practitioner*, August, 1921. ⁶ *Journ. Infect. Dis.*, 1920, 26, p. 238. ⁷ *Medical Press*, August 18th, 1920.

A PAN-RUSSIAN Odontological Congress will be held at Moscow from September 4th to 11th, when the subjects of discussion will include the chemistry and surgery of the buccal cavity, single and compound prosthesis, caries as a social disease, industrial diseases of the teeth and buccal cavity and the means of combating them, provision of dental treatment, statistics of diseases of the teeth and buccal cavity, and post-graduate courses.

THE fifth Italian Congress of Medical Radiology will be held at Palermo, under the presidency of Professor Gioacchino, from October 18th to 21st, when the following subjects will be discussed: X-ray treatment of skin diseases, by Professor Rossi of Parma; pneumo-radiography, by Professor Gortan of Trieste; radio-diagnosis of the urinary system, by Professor Boidi Trotti of Turin. An excursion will be made to Taormina and Syracuse. The subscription, 25 lire, should be sent to Dr. Sgroi Salvatore or Professor G. Scaduto, via Alloro 58, Palermo, before September 1st.