On account of the prolonged stay in hospital and the enforced recumbency, a stern but kind discipline has to be maintained to ensure the happiness of the children, and in this the three and a half hours per day school tuition which is given has been of great help. In giving exercise to their minds and an occupation to their hands it proves a powerful aid to cure.

The details and technique of the local treatment are beyond the scope of this paper. It is carried out on conservative lines, and its aims are the preservation and restoration of the diseased parts. All cases of tuberculosis other than pulmonary are admitted, the majority being those with bony, articular, or glandular foci. With the exception of peritoneal cases no experience of visceral lesions has been gained.

Eighty per cent. of the cases admitted are discharged under the heading of "Disease arrested," but the degree of cure of necessity varies with the type of case. In the bony and articular types the convalescent stage of the treatment is prolonged as long as possible in order that the disability may be overcome. In cases where the deformities are severe corrective operations are performed.

It must be recorded that the type of case admitted has improved during the five years that the hospital has been opened, and that cases with marked deformity and long-standing sinus formation are not so common as formerly. The result of this is that the average duration of stay has been shortened, and the degree of cure has improved. With the spread of knowledge of surgical tuberculosis a still further improvement is hoped for.

The following statistics are deduced from the cases discharged during 1918:

Discharged, disease having been arrested—			
Tuberculous spine	Average stay, 617 days	19	122
Tuberculous hip	" " 729 "	25	9
Tuberculous knee	" " 438 "	6	9
Tuberculous osteitis	" " 319 "	22	10
Tuberculous glands	" " 209 "	25	17
Tuberculous peritonitis	" " 162 "	25	
Discharged as improved			122
Discharged as incurable			9
Discharged with infectious disease (subsequently readmitted)			10
Died			17
Total			167

It is impossible, however, to draw any conclusion from these figures as to the length of stay in hospital necessary to bring about cure or cicatrization, as many of these cases had been under treatment for some time before admission. The time which must elapse before a diagnosis of incurability can be made is in many cases a long one, and in view of the almost certain prospect of cure in early cases must be regarded as valuable time lost. By discharging all cases as soon as a diagnosis of incurability is made, and by giving preference to all cases of early disease over those which exhibit complications, the greatest good is done to the greatest number.

The hospital at Leasowe is linked to the Liverpool Health Committee's scheme for the extermination of tuberculosis, through the Liverpool Child's Welfare Association, which has access, through the courtesy of the Medical Officer of Health, to all cases of surgical tuberculosis reported, and which, through the channels of its Almoner work in the out-patient departments of the Liverpool hospitals, is in possession of valuable information about the home conditions of these children.

From the offices of this association in Liverpool the cases are selected according to urgency, priority being given to cases of early disease. Again, through this executive body, the cases are followed to their homes after discharge from hospital, and much valuable information is gained by this after-care work and supervision, in confirming the diagnosis of cure and in watching the progress of these cases in after-life.

Although 80 per cent. of the beds at Leasowe are allocated to the Liverpool Health Authority, beds have been allotted by the council of the hospital to other health authorities, and thus the hospital serves a wider field.

An additional twelve acres of land has been acquired adjoining the hospital, thus providing for future extension.

Mr. Telford in his letter pleads for the erection of large hospitals, such as that at Berck-sur-Mer, in the best

climatic situations we have, and proves, to his own satisfaction, that these cases do not do well during the winter months in the neighbourhood of Manchester. It would therefore appear to be advisable that a concentration of the national effort against surgical tuberculosis be made and larger hospitals be built in those areas where it has been proved that these cases do well.

SUPERIMPOSITION OF A RETROGRADE UPON A DIRECT INTUSSUSCEPTION.

BY

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The following example of a rare form of intussusception still seems worthy of record, even though its presentation for publication has been unavoidably delayed:

In November, 1914, I was asked to see in consultation a male child aged 2 years. The mother stated the child had been ailing for five or six weeks. During the earlier part of this period he had been fretful and sickly, with occasional vomiting and diarrhoea; latterly, and especially for the last twenty-four hours, he had been unable to retain any food. She added that he had passed faeces recently, and that no blood or slime had ever been seen in his stools.

The child was very emaciated and the muscles were so weak that his head fell helplessly backwards or forwards, to the right or to the left, as gravity dictated, according to the position in which he was carried. The abdomen was very distended; the child did not vomit while under my observation. He was obviously in an exhausted state and allowed abdominal palpation without much resistance and without appearing to suffer much pain. The temperature was 97° F. and the pulse 140.

Abdominal palpation revealed what appeared to be an isolated, firm rounded mass in the left upper quadrant of the abdomen, and a soft, less well defined mass in the lower abdomen, mainly in the left lower quadrant, but also to a less extent palpable in the right lower quadrant. (Fig. 1.) This soft mass could be more definitely detected by bimanual examination, one finger in the rectum and the other hand on the abdominal wall. The rectum itself, as far as the forefinger could reach, was empty.

I was unwilling to make a dogmatic diagnosis in my own mind as to the cause of the obstruction, looking upon the length of history as being against a diagnosis of intussusception, as was also the absence of blood in the stools, and being inclined to regard the apparently isolated, firm rounded mass as being an enlargement of mesenteric lymphatic glands. The child was admitted to the Manchester Royal Infirmary and I operated as soon as possible after admission.

Operation.

An incision was made through the left rectus muscle. The first piece of viscus which presented in the wound was a Meckel's diverticulum about 2½ in. long, quite free and unattached at its distal extremity, blown out like a glove finger, and obviously having no causative connexion with the intestinal obstruction. The small intestine was much distended. Further examination showed that the trouble was an intussusception of a very peculiar type (Figs. 2 and 3). The total length of the intussusception *en masse* before reduction was, as nearly as I can estimate it, between 10 and 12 in. long. The proximal 3 in. of the mass was firm and distally limited by a cuff-like edge from the remainder of the intussusception. It was this portion which could be so distinctly felt in the left upper abdominal quadrant by palpation. The distal 7 to 9 in. of the intussusception represented the soft swelling which could be felt in the lower abdomen.

It was at once evident that there was a retrograde intussusception superimposed upon the proximal 3 in. of a direct intussusception 10 to 12 in. long. The retrograde cuff gripped the proximal portion of the direct intussusception so tightly that it was apparent that before the latter could be "milked" back the former would have to be reduced. This was no easy matter. The "milking" manoeuvre was useless in order to effect the reduction of the retrograde portion, and reduction was effected by squeezing the forefinger between the free edge of the retrograde cuff and the ensheathing layer of the direct intussusception, and exerting a gentle and carefully graduated "shoehorn" lever manoeuvre. By this means the retrograde cuff, which was tightly gripping the main direct intussusception, was successfully reduced, and as soon as this had been effected the direct intussusception was "milked" back with ease.

FIG. 1.—A. Hard rounded tumour.
B. Soft indefinite tumour.

There was very little oedema of or haemorrhage into the submucous connective tissue layer at the apex of the direct intussusception, and only very weak fibrinous exudate between the apposed peritoneal coats of the entering and returning layers of the intussusceptum. From a marked dimple present after reduction at the caput caecum it appeared probable that the direct intussusception had commenced as a caeco-colic

FIG. 2.—A, Small intestine. B, Tight cuff of retrograde intussusception. C, Direct intussusception.

FIG. 3.—A, Dilated small intestine. B, Retrograde intussusception. C, Intussusciptions of direct intussusception. D, Returning layer of direct intussusception. E, Entering layer of direct intussusception. F, Appendix. H, Ileo-caecal valve. J, Caput caecum.

intussusception. There was no gangrene of the bowel. The caecum, ascending, transverse, and descending colon had a well marked, broad, and continuous mesentery, so that after reduction it was possible to place, without undue tension, the caecum in any part of the abdominal cavity. Time being valuable, no attempt was made to fix the caecum to prevent recurrence. The wound was closed by two layers of continuous catgut sutures and a layer of interrupted silk worm-gut sutures.

The reaction of the child was wonderful; he made rapid progress to recovery, almost at once displaying a voracious appetite, and was discharged from hospital fifteen days after the operation. The temperature kept alongside the normal line throughout, reaching its maximum (99° F.) on the third and fourth evenings after the operation.

This type of intussusception was quite new to me, namely, the superimposition of a retrograde upon a direct intussusception, but as a result of some slight search I have found a very similar case reported by D'Arcy Power. He describes his specimen as follows:

"The primary invagination was ileo-caecal, of the ordinary descending type, the apex of the invagination, consisting of the congested and thickened ileo-caecal valve, with the openings of the ileum and vermiform appendix. The primary invagination was enveloped in a second intussusception passing in the reverse direction, that is to say of the retrograde variety, and this retrograde intussusception was itself complicated by a third intussusception also of the retrograde kind. The primary intussusception and the first retrograde invagination had occurred during life, for their apposed surfaces were glued together with inflammatory exudation. The third invagination was much smaller and was formed after death by a wrinkling of the bowel."

The direct intussusception in this case measured 3½ in. and the retrograde 2½ in. D'Arcy Power gives a semi-diagrammatic drawing of the specimen. He adds: "... I believe it to be an example of an intussusception which is by no means uncommon. It is a particularly deadly variety, first, because distension of the colon has no effect upon it, and secondly, because after a laparotomy, any attempt to reduce the intussusception tends to increase the retrograde invagination and so makes matters worse."

Clubbe, in his excellent work *The Diagnosis and Treatment of Intussusception*,² very briefly mentions what appears to be a similar case, as follows:

"The intussusception was of the ileo-caecal variety, but the mass, after reaching the descending colon, appeared to form a retrograde movement *en masse* and to be invaginated into the colon higher up the bowel. So, in reduction, pressure first in one direction, then in the opposite was necessary. ... The child made a rapid recovery."

Before passing on to the consideration of some interesting features of my case, I wish to allude to another case reported by D'Arcy Power.³ He describes the specimen as follows:

"It consists of a piece of intestine in which there are two intussusceptions, one ascending, the other descending. The first intussusception is at the usual seat—namely, the ileo-caecal valve. ... In the large intestine, three inches above the

end of the intussusception just described, is a second invagination about an inch in length." He mentions two similar cases having been previously reported.

I note that in the description of the former of the two cases reported by D'Arcy Power he refers to the direct portion of the intussusception as being the "primary invagination." This seems to assume that the direct invagination occurred first, and that the retrograde intussusception formed later by a retrograde swallowing of the direct intussusception by the colon. I have spent a good deal of thought on my case, and I am in great doubt whether this is a correct assumption. In my case the retrograde portion of the intussusception gripped the underlying direct intussusception so tightly that it seemed to me a physical impossibility that such a condition of affairs could have been brought about by the retrograde swallowing of a primary intussusception.

In considering this question let us commence by drawing for ourselves a diagram of a simple direct intussusception. The process of a further direct intussusception of the first intussusception *en masse* is a simple matter and easy to understand, but if the primary intussusception is going to be intussuscepted *en masse* in a retrograde direction one naturally asks oneself by what portion of the bowel is it going to be swallowed. If the condition seen in Figs. 2 and 3 is to be reproduced, then the primary intussusception must be swallowed by its own ensheathing and returning layers. I have said above—in reference to my own case, and bearing in mind the extreme tightness of the retrograde cuff—that this seems to be physically impossible. If a direct intussusception itself is going to be swallowed again *en masse* in a retrograde direction, a glance at a diagram would make it appear that the natural swallowing agent should be the dilated small intestine above the intussusception; but if this occurred it would not reproduce the conditions found in my own case and in the other cases I have quoted.

In reference to Mr. Clubbe's case I wish I had amplification by a diagram of the statement "invaginated into the colon higher up the bowel."

I make the suggestion that it is much more probable that such an intussusception as I have described is formed as follows: A preliminary condition exists of a descending or direct intussusception of the ordinary type, together with an ascending or retrograde intussusception further along the bowel as described by D'Arcy Power in the second case of his to which I have alluded (Fig. 4 A). The apex of the direct intussusception eventually reaches the proximal end of the retrograde intussusception, and the former commences to be swallowed by the latter

FIG. 4.—A, Direct intussusception approaches retrograde. B, Direct intussusception reaches retrograde. C, Swallowing of direct by retrograde complete.

(Fig. 4 B). This swallowing can go on until the retrograde intussusception forms a tight cuff surrounding the proximal end of the descending intussusception (Fig. 4 C), which would exactly represent the condition which I found in my case.

One has read of, heard of, and seen oneself cases where the direct and the retrograde invaginations are met with apart from one another in the same case. This combination cannot, therefore, be described as very rare. It might, therefore, quite fairly be asked, if my explanation is the correct one, Why is the superimposition of the one upon the other so very rare?—as I believe it is. The natural thing to happen, when the apex of the direct intussusception reaches the retrograde intussusception, is that the direct shall reduce the retrograde intussusception in front of it as it increases in size. When this does not occur, and instead the retrograde swallows the direct one must

look upon it as an accident, and a rare accident, either due to rather stronger than usual adhesions between the peritoneal coats of the retrograde intussusception or due to a ballooning of the gut at the site of the retrograde intussusception as the direct one approaches it. I have given as my reason for thinking that the condition was produced by a swallowing process of direct by retrograde rather than by a secondary retrograde intussuscepting process of a primary direct invagination that the retrograde cuff was so tight that it was impossible for it to have been formed in this latter way. In my experience, one does not get this condition of extreme tightness in the case of the superimposition of a direct upon a direct intussusception, which condition is definitely recognized as the secondary intussusception of a primary direct intussusception *en masse*.

I have noted that the mother said the child had been ailing for five or six weeks; the greater part of this period no doubt represented a period of acute enteritis, which was the most important causative factor in the development of the intussusception.

In this case one cannot but be struck by the fact that, in spite of the size of the intussusception and the tightness of the cuff at its proximal end, the pathological changes which had taken place were only very slight. One can only attempt to explain this by surmising that the swallowing of the direct intussusception by the retrograde occurred very rapidly and recently, and that the tightness of the retrograde cuff became at once sufficient to completely obstruct both arterial supply and venous return, instead of, as in simple types of intussusceptions, the venous return becoming obliterated before the pressure was sufficient to obstruct arterial flow.

After the operation the child almost at once gave evidence of great hunger; considering that he had not retained much food for some time, this is not to be wondered at, but the fact that he called most loudly for tomatoes was certainly a clue to the cause of the original enteritis.

Regarding differential diagnosis I shall always bear in mind in the future the peculiarity of the tumour to be felt—namely, the upper firm rounded portion, representing the site of the retrograde superimposition, which was quite distinct from the larger, softer, and less defined lower portion, representing the portion which was purely the direct descending intussusception.

REFERENCES.

- ¹ D'Arcy Power: *Trans. of Path. Soc. of Lond.*, vol. 1, 1899, p. 121.
² Charles P. B. Clubbe: *The Diagnosis and Treatment of Intussusception*, p. 66. ³ D'Arcy Power: *Trans. of Path. Soc. of Lond.*, vol. xxxvii, p. 240.

KALA-AZAR IN MESOPOTAMIA AND ITS INCUBATION PERIOD.

BY

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AN interesting discussion has been taking place in the pages of this JOURNAL as to the indigenous existence of kala-azar in Mesopotamia. It started with Major Low's article on June 7th, 1919, and was continued by Dr. Hamill on July 5th, and by Lieut.-Colonel Ledingham on July 19th. To this last letter Major Low and Captain Billing replied on July 26th. That my contribution is so late is due to my continued presence in the country under discussion.

The most important point in settling the question of the presence of kala-azar in Mesopotamia is the maximum length of the incubation period of that disease.

Major Low and Dr. Hamill both consider the question of the existence of kala-azar in this country settled in the affirmative. Colonel Ledingham expresses doubts on the subject, and I am quite with him in this attitude, although I have met cases of kala-azar here where the interval between the commencement of an unbroken period of residence in Mesopotamia and first evidence of illness is much longer than in Major Low's and Dr. Hamill's cases. In Major Low's case, taking his own reading of the date of onset, the incubation period might be eight months.

The patient had been in Bangalore, a place from which I have met other cases of this disease.

Dr. Hamill's case I was acquainted with, and I think I am right in saying that repeated spleen and liver puncture by very competent observers failed to find the Leishman-Donovan body in this patient. Even, however, if the diagnosis of kala-azar were correct there was here also an interval of only eight months between the patient leaving India and the onset of his illness in Mesopotamia. In Colonel Ledingham's first case the interval appears to be the same; in his other cases the dates are uncertain.

I have met with several cases of kala-azar in Mesopotamia, and I have selected from my records of these cases five examples—four Indians and one British—where the interval between leaving India and the onset of the disease in Mesopotamia was more than double that mentioned above.

In each of these cases the diagnosis was confirmed by finding the *Leishmania donovani* in the spleen during life, and the man's movements were confirmed by reference to his service book.

1. *Follower A.* Nearly two years in Mesopotamia before admission to hospital in October, 1917.

2. *Bearer D.* Had been in Mesopotamia for seventeen months continuously previous to the first onset of the fever on August 31st, 1918.

3. *Private G.*, a British soldier. Had been in Mesopotamia (near Baghdad) for seventeen months continuously before onset of the fever on January 8th, 1919. Came to Mesopotamia from Bangalore.

4. *Follower M. M.* Had been in Mesopotamia continuously from September, 1917, up to the date of his admission to hospital for kala-azar on March 2nd, 1919—an interval of just over seventeen months. Came from Noakhale in East Bengal.

5. *Follower G.* Came from Dacca in East Bengal. Left Dacca in March, 1917, arrived in Mesopotamia, April 10th, 1917, and has not left the country since. Arrived in Baghdad in May, 1917, and remained in Northern Mesopotamia. Was in hospital for a month in the autumn of 1918 for some febrile disease (nature unknown), and was discharged as fit. Came to Basra apparently well on April 22nd, and was admitted to hospital for kala-azar on April 30th, 1919. There is here an interval of over two years between arrival in Mesopotamia and admission for the disease.

Long as these intervals are, I do not regard them as conclusive proof of the endemicity of kala-azar in Mesopotamia, though certainly they are weighty evidence. But with equal force it may be held that the disease in these cases was contracted in India and that the many months of health in Mesopotamia are evidence of a long incubation period in some cases of kala-azar. Moreover, each of the Indian cases I have seen in Mesopotamia has come from a known infested area in India.

Previous experience in India has led me to believe that kala-azar is not always the malignant disease we used to think it was, and that, independently of active treatment and independently of the occasional beneficial effects of such dangerous complications as cancerum oris, cure may sometimes spontaneously occur. I think the resemblance to malaria may perhaps go further, and that the parasite may in some cases long remain quiescent in internal organs and only begin to evince its malignant toxicity when some other factor has lowered resistance.

As Colonel Ledingham says, proof of the existence of kala-azar in Mesopotamia must come from its occurrence amongst the native population, and such civil surgeons as I have asked have not seen a case here; neither have I in a limited experience of local Arabs and Persians; nor has any native practitioner that I have met. Dr. Ramy, a Syrian physician of extensive practice, who spent three years in Khanqin and has practised for many years in Basra, and who is, moreover, familiar with kala-azar from his Syrian experience, tells me that he has never seen a case in Mesopotamia.

With regard to Dr. Hamill's reference to Arab belief in a generalized disease following Baghdad boil no more reliance can be placed on their ideas than on other oriental stories, and no such pilgrimage from Baghdad to Basra for inoculation purposes ever took place. It is true the Arabs call some boils "male," and others "female," but the distinction is fanciful and devoid of scientific support. The only connexion known between Baghdad boil and kala-azar is in the morphological resemblance of their respective parasites, and that is a matter beyond the Arab ken.

In conclusion, therefore, the evidence as to the existence