had ulcerated, and had considerably diminished in size, commenced to grow again.

In one instance—Dog B—recurrence took place even after the growth had apparently disappeared. A fortnight after we had noted the complete disappearance of the growth, a recurrence was observed at the site of the old tumour. A fortnight later it had reached the size of a walnut; it then became flabby, and 17 days later, when the dog was killed, it was represented by a small fibrous mass.

In one case—Dog C—the growth persisted till the death of the dog, which took place apparently as the direct result of the tumour and its secondary deposits in the viscera. The animal was thin and weakly before the inoculation, and to this is probably to be attributed its want of resistance.

Microscopical examination of the tumours in the subcutaneous tissue produced by inoculation and of the secondary deposits in the organs showed that they had a structure identical with that of the primary growth on the genitals. They were composed of small round cells, sometimes loosely packed, preserving their round form, sometimes more closely packed, assuming a polyhedral shape. There was a delicate stroma enclosing the cells in spaces of variable size. Numerous thin-walled blood vessels were to be seen not only in the supporting framework, but also between the cells. The growths presented the characteristics of a round-celled sarcoma. Nothing of an inflammatory character was to be made out in the actively-growing tumours, and it was only when ulcerated or diminishing in size that an infiltration of the growth with inflammatory products was to be seen.

Dog showing subcutaneous tumours the result of inoculation.

ACQUIRED IMMUNITY.

An animal which has once recovered is immune, and we have never been successful with subsequent inoculations.

1. An old black and tan terrier was successfully inoculated in the flank. The resulting tumour, which in 6 weeks formed a lobulated mass $1\frac{1}{2}$ by $1\frac{1}{2}$ in., completely disappeared in 10 weeks. A month after the disappearance of the tumour the dog was unsuccessfully inoculated in both flanks from a vaginal tumour. A second dog was successfully inoculated from the same tumour at the same time. Seven weeks later it was again unsuccessfully inoculated from a vaginal tumour. Another dog was successfully inoculated from the same tumour at the same time.

2. A young fawn bitch was successfully inoculated in one flank. The resulting tumour reached the size of a filbert. It was removed, and was used successfully to inoculate another dog. A month after the disappearance of the tumour the dog was unsuccessfully inoculated from a vaginal growth. Another dog was successfully inoculated from the same growth at the same time.

3. A white wire-haired puppy was successfully inoculated in both flanks. The resulting tumours, which reached the size of $1\frac{1}{2}$ in. in diameter, had completely disappeared in 3 months. The dog was then unsuccessfully inoculated from a growth in the subcutaneous tissue. Two other dogs were successfully inoculated from the same growth at the same time. Five weeks later the dog was again unsuccessfully inoculated from a subcutaneous tumour. Another dog was successfully inoculated from the same tumour at the same time.

4. A black and white terrier puppy was successfully inoculated from a vaginal growth in both flanks. The resulting tumours reached the size of about 2 inches in diameter and then ulcerated, and completely disappeared in 6 months. The dog was then unsuccessfully inoculated from a subcutaneous tumour. Another dog was successfully inoculated from the same tumour at the same time.

CONCLUSIONS.

1. The tumours in question are infective round-celled sarcoma occurring in dogs.

2. The tumours can be transplanted from the genitals, where they naturally occur, to the subcutaneous tissue of other dogs.

3. The tumours can be transplanted from subcutaneous tissue to subcutaneous tissue through a series of dogs.

4. The tumours after reaching the maximum of growth may disappear spontaneously with or without ulceration.

5. The tumours may continue to increase, and may cause death by secondary deposits forming in the viscera.

6. If the tumour should disappear the animal is then immune to subsequent inoculation.

REFERENCE.

1 *Journal of Pathology and Bacteriology*, January, 1898.

THE COLD-BATH TREATMENT OF TYPHOID.

By F. E. HARE, M.D.,

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I HAVE read the able paper by Dr. Sidney Phillips on the treatment of typhoid fever with much interest and instruction. Some of his arguments however, more especially such as apply to the treatment by systematic cold bathing, call for comment.

Though pyrexia may not now be regarded as one of the chief dangers of enteric fever, this does not in any way weaken the case for cold bathing. While I am personally of opinion that the mere reduction of temperature is in itself of considerable importance, yet cold bathing has been repeatedly shown to act in many other ways, all more or less conducive to the welfare of the typhoid patient. So well recognised is this, that both in the Brisbane Hospital and in the German Hospital, Philadelphia, bathing is frequently continued during defervescence; that is, after the rectal temperature has ceased to attain the bathing point, 102.2° F. J. C. Wilson,¹ of the latter institution, states:

Every now and then a patient whose temperature no longer rose to 101.4° F. (in the axilla) would ask to have the bath repeated, saying that it made him feel so much more comfortable. In consequence of this we have adopted the rule of giving one or two plunges a day during the defervescence..... The result has been entirely satisfactory, and has seemed to us to hasten the convalescence.

At Brisbane² bathing is frequently continued after the temperature has ceased to demand it, to dispel such symptoms as slight delirium, insomnia, thirst, dryness of the mouth and tongue, etc., and almost invariably with success.

Dr. Phillips says that "The chances of recovery of a person contracting typhoid to-day are little or no better than they were fifty years ago, notwithstanding the advances in medical knowledge and improved nursing and hygienic conditions." Although he does not say so, it is to be presumed that he intends this statement to be restricted to the British Isles, and those countries in which systematic bathing is not resorted to. Otherwise it is difficult to reconcile it with the following:

"The claim made for it"—the cold bath—"that it reduces the mortality from 17 or 18 to 8 or 9 per cent., has not been disproved." I would go further, and submit that the claim has been proved as thoroughly as it is possible to prove the success of any therapeutic measure. The many thousands of consecutive cases recorded on the Continent, in the United States, Canada, and Australia, and treated without selection, show an average mortality well below 8 per cent.

Dr. Phillips advances one rather unusual argument in defence of the omission to practise systematic cold bathing in this country. Taking 100 cases, it may be admitted that on the average 82 would recover even without cold bathing, while 9 would die even with the bath. Therefore he concludes that "9 of every 100 patients are subjected to repeated bathings unnecessarily, and that the 9 who die have these repeated bathings added to their sufferings." This line of argument might be applied to any form of treatment that is not invariably successful. Supposing it to be admissible, however, it does not seem an exorbitant price to pay for the saving of 9 lives in every 100 cases; for the reduction of the case mortality of typhoid by 50 per cent., especially as "the fatality of the disease.....has little altered" under other methods of treatment. But such an admission cannot be permitted to pass. For the advantages of cold-bathing are by no means exhausted in reducing the death-rate. The objects of treatment may be summed up as follows: (1) To save life if possible, (2) to prolong it if 1 prove to be impossible, and (3) to obviate suffering and promote comfort in any case, even when 1 and 2 prove to be impossible.

I have shown in *The Cold-bath Treatment of Typhoid* that (1) the case mortality of the disease is reduced by 50 per cent., (2) that nearly all the distressing symptoms connected with the pyrexial state, and many of those depending on the intestinal lesion, are alleviated to an extent not attainable by any other therapeutic measure, (3) that nutrition is maintained and convalescence greatly accelerated; and (4) that even in cases which terminate fatally, life is prolonged on the average by several days.

The possibility of selection of cases has naturally been entertained by all who have worked at the subject. To me it has seemed that any selection to be successful would require an almost complete foreknowledge of the course and duration of the disease in each individual case, and this at so early a stage that as yet no threatening symptoms are present. Personally I have found this quite impossible.

Dr. Phillips is of opinion that "if the temperature is not very high, is accompanied by remissions, is not very irregular in its rises and falls, if the pulse is not very rapid or feeble, and if the patient does not seem greatly affected by toxæmia.....he might be spared the cold bath for a time at any rate." I admit that if it were possible to foresee with any approach to certainty a short duration in such a case, the omission might be occasionally made without grave risk. But there is nothing in the above description of symptoms to show that the fever will not last for many weeks, in which case much ground will have been lost irrecoverably. The omission will then appear especially regrettable, since it is in the early stage that severe refrigeration is well supported, and that most advantage is to be derived therefrom.

All who have practical experience of cold bathing are struck with the great relief to all pyrexial symptoms, the increased comfort and deep refreshing sleep which rapidly follow each immersion. None of them, therefore, could have been responsible for the statement that "the 9 who die have these repeated bathings added to their sufferings."

Dr. Phillips says of the treatment:—"Its infrequent use.....is due not so much to a doubt of its virtue as to its impracticability." This admission is most important, for it may be taken to mean that the long-standing prejudices as to the dangers of inducing shock, collapse, internal congestions, hæmorrhages, pulmonary, and other complications, are at length beginning to yield to the pressure of authentically recorded facts. It will now be chiefly necessary to deal with the mechanical difficulties of the system; and these have now been overcome at so many hospitals for so many years in different parts of the world that it can hardly be maintained that the metropolis of Great Britain is incompetent for the task. As a matter of fact, when once the system has been fairly started, the practical difficulties in hospitals, at any

rate, are found to be altogether imaginary. The only conditions in which this is not so, are in the homes of the poor and ignorant, and it is a question whether typhoid should ever be treated in such surroundings. In the houses of the well-to-do the treatment is of course perfectly easy and quite satisfactory.

REFERENCES.

¹ Observations on the Treatment of Enteric Fever by Systematic Cold Bathing in the German Hospital, Philadelphia. J. C. Wilson, p. 10. ² *The Cold-bath Treatment of Typhoid*, pp. 63, 108.

SPINDLE-CELLED SARCOMA OF RECTUM.

EXCISION OF RECTUM, WITH PRESERVATION OF THE SPHINCTER,
BY SUPERIOSTEAL RESECTION OF THE COCCYX
AND PART OF THE SACRUM.

By THOMAS CARWARDINE, M.S.LOND., F.R.C.S.ENG.,
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SARCOMA of the rectum is rare. Cases of lympho-sarcoma and melano-sarcoma have been described by Ball¹ and by Nepveu, and Cooper and Edwards² record a case of mixed-celled sarcoma of the anus. I have not met with any published record of a spindle-celled sarcoma of the rectum in Great Britain, and Mr. Harrison Cripps, whose experience in rectal pathology is great, has not himself come across any sarcomatous growths.³ Mr. Ball (Dublin) describes two specimens of spindle-celled sarcoma of the anus and rectum respectively,⁴ and Cooper and Edwards refer to a rectal case under Dr. R. J. Lewis (Pennsylvania).⁵ In the museum of the Bristol Royal Infirmary I have come across a specimen removed by Mr. F. R. Cross described as a spindle-celled sarcoma of the rectum, and an examination of a microscopical section confirms that diagnosis.⁶

History.—J. B., a miner, aged 41, was sent to me in July last by a medical friend for what appeared to be undoubtedly cancer of the rectum. Three months previously the patient began to experience pain, difficulty, and bleeding on defæcation. The finger in the rectum detected a bleeding, fungating, rosette-like mass, about 2½ inches long and 2 inches broad, extending over the anterior and left lateral wall, everted and thickened at the edges, ulcerated in the centre, with its lower margin about 2½ inches from the anus, and its upper beyond the reach of the finger. It was hard and craggy, but freely movable with the mucous membrane.

Structure of Growth.—A naked-eye section of the growth is represented in Fig. 1, which shows the probable origin in the submucous tissue, its direction of growth, and its circumscribed character. The tumour was composed of glistening interlacing bundles of tissue. For a microphotograph I am

Fig. 1.—Naked eye section through edge of tumour.

indebted to my friend Dr. Jas. Taylor (Fig. 2, see p. 1812). The growth consists almost entirely of long spindle cells with a variety of oat-shaped nuclei, but here and there a large round cell or a large multinucleated cell is found.

Operation.—The method of operation presents some features of interest, and I venture to give the details on account of its facility and the excellence of its results. On July 29th left inguinal colotomy was performed in a few minutes without stitches by the method of Reclus, using a glass rod, and the gut was opened without anæsthesia a few days afterwards. This enabled the whole rectum to be flushed twice a day into a bedpan by means of a 4-pint douche of iodised water; so that at the date of operation (August 9th) the bowel was as clean and sweet as possible to be, and the area was neither obscured nor fouled by fæces.