epiphyseal line is seen to be of primary importance. They are to be used as osseous ligaments, and should retain sites of implantation corresponding with ligamentous attachments. In the neighbourhood of growing epiphyses due regard must be paid to the laws of growth. This case may therefore be looked upon as an instance of the extraneous fixation of the epiphysis to the diaphysis (by a graft), which the late Sir William Macewen showed would interfere with or prevent normal linear growth.

A CASE OF ARTIFICIAL PNEUMOTHORAX.

(With Special Plate.)

BY

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A MAN, aged 26, was under treatment for eighteen months (1922-23) for pulmonary tuberculosis affecting the upper lobe of the right lung. Recovery was excellent, and, by the sanction and advice of his doctors, he went to Kenya Colony in September, 1924, and invested in a farm there. The place suited him, and all went well until some months ago, when he became very ill, apparently (as far as can be made out from the history) with an acute exacerbation, which spread rapidly through the right lung, but chiefly affected the base. He saw a doctor, who advised him to get away as quickly as possible, and go straight to Davos-Platz. He arrived here under my care on February 22nd, 1926. He was exceedingly ill on arrival, the daily temperature varying from about 99° in the morning to 102° and over at 7 p.m. (taken by the mouth). He had a racking cough, and was bringing up a large quantity of sputum loaded with tubercle bacilli; he had lost about 2 st. in weight, and was looking a typical picture of what is known as "galloping consumption."

On examination the whole of the right lung was dull, and the lower half absolutely so; the whole lung was full of moist râles, and at the base there was loud bronchial breathing, increased vocal resonance, and increased vocal vibrations. Some moist crackling râles were heard in the upper lobe of the left lung, and the disease apparently had well started in this lung.

The radiographic appearance (Fig. 1) showed extensive trouble in the right lung, cavitation at the apex, and a dense black shadow in the lower part. It will be seen that the heart is drawn well over to the right side; the left lung shows commencing tubercle in the upper lobe. The appearance of this radiograph made me consider the possibility of an effusion at the right base, and I accordingly explored with a large-bore needle, but got nothing out. As the patient was obviously going downhill, and showed no signs of any improvement, I thought it worth while to see if it would be possible to establish an artificial pneumothorax on the right side, although there seemed very little hope of being able to do so, because of the probable presence of strong adhesions. However, on March 13th an attempt was made, and, to my great astonishment, a free space was found at once, the manometer swinging well, showing a strong negative pressure; 150 c.cm. of air only was introduced and a small initial pocket made. This amount of air sufficed to raise the pressure from a negative one to a strongly positive one, the pressures being as follows:

Induction	...	...	-2 -6	...	150 c.cm.	...	+2 -4
March 16th	...	...	-2 -6	...	200 c.cm.	...	0 +3
March 21st	...	...	-2 -7	...	300 c.cm.	...	+1 -4

A radiograph taken shortly afterwards showed the production of a small pocket (Fig. 2). Two more insufflations were made, the results being as follows:

March 31st	...	...	-2 -7	...	300 c.cm.	...	0 -3
April 10th	...	...	-3 -8	...	500 c.cm.	...	0 -1.5

The fillings were continued at intervals of a fortnight, about 600 c.cm. being introduced each time, and the radiograms (Figs. 3 and 4) show the development of a fair-

sized artificial pneumothorax in the lower part of the right lung, many adhesions having given way, but leaving two or three powerful bands, which are very plainly seen in the illustrations.

An interesting point is that after the third insufflation the patient remarked that he felt his heart once more beating on the left side instead of on the right. On inspection of Figs. 3 and 4 it will be seen that the heart, which was formerly drawn over to the right side by adhesions, has returned to its proper position on the left.

July, 1926.—The pneumothorax, although only a partial one, caused an undoubted and pronounced improvement in the patient's condition. The cough and expectoration have very much diminished, the pulse rate, instead of being 120 to 130, is now running at about 80, the breathing is easier and quieter, and the temperature has come down. The patient is now getting up for a short period each day without any ill effects. The signs in the left lung are diminishing in extent and intensity.

February 1st, 1927.—The further progress of this case is as follows: The patient kept very well all through the summer, and was able to take moderate exercise, the temperature being always quite normal, and the cough and the sputum diminished. The general condition improved considerably, and he gained weight. Fillings were continued every three weeks, the pneumothorax cavity gradually increasing in size, and the adhesions thinning and stretching. On January 17th the patient's temperature began to rise again, and he developed pain on the side of the pneumothorax; this was shortly followed by the appearance of a small serous effusion, which is following the ordinary course of such effusions; and the patient is already improving daily. Incidentally it is of interest to note that with the establishment of this effusion the adhesions have given way, the pneumothorax now being nearly "complete"; the other lung is holding up in a very satisfactory manner.

I am indebted to Mr. P. G. Sutton, M.S.R., of the X-Ray Institute, Davos-Platz, for the radiographs.

PARAPLEGIA (MEGALOCYTIC) CURED BY HYDROCHLORIC ACID.

BY

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DIAGNOSIS in the following case was possible by measuring the average diameter of the red cells, and by that alone. Haematology, and all its complexities, gave no light. How forcibly this illustrates my favourite doctrine that simple recorded measurements in clinical medicine are richly rewarded, yet greatly neglected.

A florid, healthy, active young man of 37, a cargo superintendent, decent and clean living—noticed tingling in both legs up to the groins in January, 1925; later his hands tingled, he was drowsy, and had sacral pains, worse on walking. Next his ankles gave way, micturition became difficult, and the pavement felt like cotton-wool.

He was much worried sexually at this time by the exactions of his second wife, to whom he had been married a few months. In July he could no longer walk, and in August I saw him in consultation with Drs. Eddie and Robertson. I diagnosed posterior combined sclerosis, and he was admitted into the Royal Infirmary under my care. There he lay on the balcony for five months, and then went to the seaside under Dr. Sproule. The plantar reflexes were extensor, knee-jerks absent, and he could not move his feet. Hydrochloric acid was not present in the test-meal secretions, and x rays were suggestive at first of pyloric new growth, but became normal after belladonna. Haemoglobin was 75 per cent., and the pathologist reported more than once that there was no evidence of pernicious anaemia. As he had had sore tongue before admission I still felt incredulous.

In view of the recent illuminating work of Dr. A. F. Hurst on this subject I ventured to send him a blood film and an outline of the case. At his instance, Dr. Hampson kindly carried out the measurements of

the red cells shown in the curve. Dr. Hurst wrote (February 18th, 1926):

"The average size of the red cells is increased, so that there is the megalocytosis which is characteristic of Addison's anaemia.

We find not infrequently that in the early stages this is the only evidence of Addison's anaemia—a general examination pointing to quite normal blood or slight anaemia of a secondary type, but I believe the megalocytosis is conclusive evidence."

Presumably the interpretation of the case is that, owing to the absence of hydrochloric acid, his intestines became infected with some germ which is capable either of producing the haemolysis of pernicious anaemia or of causing the degenerative changes in the spinal cord. Probably the sexual exhaustion was a factor in deciding the incidence on the spinal cord; for doubtless our medical forebears had good reasons for attributing tabes to sexual excess before its syphilitic nature had been ascertained.

Treatment.

He had four teeth extracted, and massage. He drank half a pint of hydrochloric acid three times a day after food, and must continue to do so all his life, as the deficiency is doubtless congenital. Its strength is 5 drachms of dilute hydrochloric acid to the pint of sweetened water. He had twenty-four hours' fresh air every day for four months; besides sunshine, he had two hours a week of ultra-violet rays from three carbon arc lamps running at 30 per cent. over pressure, according to my system.¹ To the latter he himself largely attributed his cure. I find that they nearly always make a medical patient feel better—which is half the battle won. Hence they are a very useful addition to a general medical ward.

After a month or so in hospital he gradually improved, and walked after fifteen months' illness. His gait is now brisk, with only a hint of spasticity. He looks well, can run, and has been at work for three months clambering about ships. His legs and finger-tips still tingle. Haemoglobin is 100 per cent., sensation is normal, and the knee-jerks have returned, but the extensor plantar reflex persists.

"When once these cases are bedridden improvement is unusual"; so that his recovery is remarkable, and is due, I think, to the hydrochloric acid. Hitherto a case of this kind would be foredoomed to Addison's anaemia. It will be interesting to see if the hydrochloric acid habit will save him from this fate—of which he has been warned.

REFERENCE.

¹ BRITISH MEDICAL JOURNAL, October 3rd, 1925, p. 613.

HABIT FORMATION IN THE BLOOD VESSELS OF THE SKIN.

BY

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SUPERFICIAL blood vessels appear to possess a property of retaining for a variable period an altered sensibility to stimuli, whether internal, external, chemical, thermal, mechanical, or nervous. A vessel by the constant use of its power of contraction or dilatation may acquire the habit of so responding to the same degree when the stimulus is lessened or when another form of stimulus is supplied. Hypersensitivity may remain in a skin vessel for a considerable period after the application of the original stimuli. Certain phenomena demonstrate these peculiar properties, but in mentioning them it should be realized that the alteration of reaction is not always specific and that there may be an altered response to other forms of stimuli.

A. Mechanical Stimulation.—When an area of skin is subjected to a pressure of about 2 lb. by stroking with a round bobbin of wood the vascular changes, active and passive, which follow will disappear within a few minutes. If the skin be now immersed in hot water it will be found that the line of the stroke reappears as an area of more marked erythema than the surrounding skin. The line represents an area of hypersensitivity. The line shows also a much slower return to normal.

B. Thermal Stimulation.—Prolonged exposure of the skin to heat will often leave vessels very responsive to stimulation. A stoker who had been accustomed to wear a singlet which covered the lower chest and abdomen showed a very marked response to dry and moist heat; the response was especially deep over the exposed areas. Similar excessive vascular dilatation is to be found in many other persons who make a continual demand on the skin for heat excretion power. Hyperthyroidic individuals flush up very freely in heat. One of the "excuses" generally given for the morning cold bath is that by exposure of the body to a sudden cold medium the arterioles and capillaries of the skin are taught to react quickly and actively. By the phrase "acclimatization" is meant the adjustment of the superficial blood vessels to changed surroundings and changed metabolic level.

C. Chemical Stimulation.—When an area of skin has been chemically irritated there may remain for a considerable period an oversensitiveness of that area even though all trace of lesion has gone.

A woman who had had a severe fur dermatitis on the neck returned in three weeks with severe irritative dermatitis over the same area of skin; apparently it had followed the exposure of the neck to very cold winds. After this had settled down she again had a severe relapse over the original areas due to the use of carbolic soap. In each case the relapse had followed the exposure of the whole face and neck, and yet the only portions of skin affected were those which had been left in a hypersensitive condition by the original fur dermatitis.

D. Infective Stimulation.—The skin around areas of mild inflammation (acne follicles, pustules, etc.) shows a more marked response when subjected to mechanical irritation than do the intervening areas. For example, in a case where there had been a bromide eruption the areas where there had been lesions developed an urticarial response when they occurred in the path of a heavy flat stroke stimulus. When the whole body was immersed in warm water the areas of injury stood out as points of deeper erythema. Patients suffering from acne rosacea will often volunteer the information that a heated room causes the sites of disease to reappear after their apparent cure. This apparent manifestation of "habit" cannot altogether be explained as due to the fact that areas of infection are of higher temperature (Lewis), since they are found when all traces of disease have disappeared. The temperature change may, however, explain the development of wheals over patches of acute seborrhoea when the whole skin is rubbed or heated. A simple experiment to show that after the subsidence of infection there is some change in vessels is found in the warming of the skin of a person who has just recovered from impetigo: the areas are shown up as of deeper erythema mapped out on the unaffected skin.

E. Nervous Stimulation.—After the complete disappearance of all signs of the eruption of herpes zoster in a young man, areas where lesions had been present were found to remain excessively active in their response to heat stimulation. Urticarial papules may reappear frequently at one point of the body, and the mildest of external or internal stimulation may be sufficient to cause whealing—for example, a mosquito bite on the hand of a middle-aged medical man left such a sensibility for at least eight years; the least provocation, such as temporary ill health or overwork, will cause the lesion to become irritable and raised. Darwin has noticed that blushing will occur in areas which are the subject of constant thought. He quotes the example of a pianist with rather ungainly hands who blushed from the mid-forearm downwards whenever hands were mentioned or even when he thought of them. Blushing can certainly become a vascular habit.