much hospital service during the war and is an efficient house physician; further, he can communicate by telephone with Dr. Hyla Greves. There is little sickness, and practically no time is lost on this account. The arrangements at the colony are proving the success anticipated. The progress of the patients, as evidenced by gain of strength, the clearing up of symptoms and physical signs of disease, and the disappearance of sputum, is uniformly satisfactory.

Subject to the somewhat exacting nature of farm work, the colonists enjoy a large measure of liberty. There are no bounds, and such amenities and social life as the countryside offers are open to the men. On Saturday afternoons and Sundays, with the exception of the weekly rota of men who carry out essential duties, such as feeding stock, &c., the colonists can go further afield. It is encouraging to note that the men tend more and more to spend their free hours in the country rather than in the neighbouring towns. The colony recreation-room is provided with two small billiard tables, a piano, a gramophone, and other amusements, also the daily papers and farming journals. Without exception the men express their marked preference for the life at Kinson to that at a sanatorium.

Several months' running of the colony on the lines just described revealed some unanticipated difficulties. It was impossible so to divide the farm as to secure land of equal quality for the three holdings. After consultation with the men, whose opinion was almost evenly divided, the three-holding system was, not without reluctance, abandoned in favour of a scheme whereby all the land is worked as a small farm. As now constituted the farm consists of 9 acres of grass and pasture, inclusive of 2 acres devoted to poultry, and 25 acres of arable land, the latter of which includes $1\frac{1}{2}$ acres of orchard, 4 acres under four-course rotation, $2\frac{1}{2}$ acres of market garden, and $1\frac{1}{2}$ acres of permanent catch-crop. The stock consists of 9 cows, several calves, 2 horses, 3 breeding sows, with their litters, and 300 head of pure-bred poultry.

The 21 colonists are divided into four parties which in rotation are appointed to: (1) stock—care of all animals, dairy work, &c.; (2) carting, ploughing; (3) general farm work—all operations save ploughing and horse work; (4) market gardening and marketing; and (5) poultry. Approximately, a squad is engaged under skilled supervision for a week at a time in each department.

A Provisional Estimate of the Prospects of the Colonists.

Briefly, the record up to Dec. 20th, 1918, is as follows: 8 patients have left the colony, 1 on account of disinclination for the life, 3 for breaches of discipline, and 4 owing to physical incapacity. Thus, only 4 men have shown themselves definitely unequal to the work which, day in and day out, is somewhat strenuous and extends from seven to eight hours.

With respect of the adaptability of the men and their prospects, the opinion of Mr. Hunt as practical farmer is of interest. Of the 21 men now in residence, four, in his opinion, are not physically capable of the full training and are unlikely to make independent smallholders. For these men a simple training is indicated such as will enable them to supplement their pension; for example, the care of pigs, fowls, and goats, and some knowledge of vegetable growing and bee-keeping. The remaining 17 men, granted favourable conditions of settlement, all promise to make good; several of them, men of education, would do well to study at an agricultural college with a view to farming on a larger scale.

Taking the men collectively the training has to begin with the veriest A B C of country life. Again, the men, although working for from some seven to eight hours daily, cannot by a considerable margin compass the output of a normal person. Education is slow, and Mr. Hunt states that 12 months' training will not be sufficient save in exceptional cases with previous experience. It is his opinion, also, that to judge by their present standards of knowledge and physical endurance, a small number of the men only on completion of their training in September, 1919, will, if single-handed, be able to earn their living on the land. This renders the settlement of the men a matter for serious consideration. He suggests that on completion of the 12 months' training the most efficient men be found positions as paid assistants upon established holdings in the neighbourhood of Kinson with a view to gaining

further experience. But the men are all impatient to start for themselves when their year is up. Another proposal is that the picked men be settled on holdings and that the less proficient be allotted to them as assistants. It is evident that special provision must be made for settling the colonists. To allow them to leave the colony and to trust to their own resources would in many instances spell failure. The conditions of settlement cannot be too favourable; good land, easily worked, markets of easy access, generous landlords, and opportunities for obtaining skilled advice are essential. It is to be noticed that the experience of Kinson supports the view that the vocational re-education of the consumptive, to be of use, must be associated with a scheme for the provision of employment subsequently.

The plan which seems best to meet the requirements of men trained on farm colonies is their settlement as they become sufficiently skilled upon holdings within easy access of the colony, for preference, as tenants of the colony management. This would permit of the coöperation of the several holders and the continued supervision and direction by the expert farmer in charge of the colony; another material advantage would be that when, as will certainly happen, a tenant has need of rest for some days, assistance upon which may depend the success or failure of a season, could be provided by the pupils at the colony.

The ideal that should be kept in view is to enable a tuberculous man, after proving himself on a small holding, to pass in turn to progressively larger holdings, and eventually to become a large farmer employing his own labour. In view of the youth of the general run of the Kinson colonists, this ideal is quite possible. The whole question of the future of the trained colonist and the best means of providing for his settlement is now under consideration by the council of the Y.M.C.A.

RAT-BITE FEVER:

TWO CASES TREATED WITH APPARENT SUCCESS BY A SINGLE DOSE OF NOVARSENO BENZOL INTRAVENOUSLY.

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THE two cases here described were undoubtedly examples of rat-bite fever.

Notes of Cases.

CASE 1.—Patient aged 20. Had suffered from pulmonary tuberculosis for last four or five years. Previous to the present attack his lung trouble was quiescent; appetite good; temperature normal; some dullness at right apex in front; no crepitations or signs of activity. Nine weeks before admission to nursing home he was bitten on the left little finger by a rat. Wound not washed for about one and a half hours. Three weeks later the present attack began. Every two or three days the temperature rose to about 104° F. and

Periodic rises of temperature in Case 1.

sometimes 105°. He had severe aching in back and legs; felt cold and shivered; no actual rigor; no rash; skin felt itchy during attack. He occasionally felt sick; latterly mouth was very dry. The lymphatic glands above left elbow and in axilla became enlarged, but now can hardly be felt. The wound healed in a few days.

Blood culture, aerobically and anaerobically, was negative. White cells, 17,000 per c.mm.; polymorphs 90.5; lymphocytes, 7.5; large mononuclears, 2 per cent.; no

eosinophiles. No spirochaetes or other parasites seen in stained films. On dark-ground illumination of citrated blood no definite spirochaetes were found. One peculiar body was seen—a round body rather smaller than a red blood cell with two long narrow processes which exhibited a wavy motion. I cannot say whether it was an artefact.

At the height of temperature, on June 27th, 0.45 g. novarsenobenzol was given intravenously. The temperature fell and was down for a month. Then for about a week it rose at night; also some swelling of left arm. Since then, up to October, he has been quite well; no rise of temperature.

This case was complicated by the patient having suffered from pulmonary tuberculosis, but previous to the rat-bite this was quiescent. I did not see him in the attack a month after the novarsenobenzol injection, but the attack seemed to have had no resemblance to the former ones.

CASE 2.—Pte. C. H., aged 30, a patient in a war hospital, Exeter. On Jan. 7th, 1918, he was bitten on the finger by a rat. He reported sick in February, and since has had rises of temperature lasting about 24 hours, generally with intervals of four days. During the attacks he lost his appetite, felt sleepy, and had maddening headache. Distinct skin eruption; large raised erythematous patches all over the body; itching severe. He generally vomited during the attack. The temperature rapidly rose (103° or 105° F.), rarely lasting more than 24 hours. The wound healed in three or four days; apparently no enlargement of lymphatic glands.

At Exeter it was discovered that he had been bitten by a rat. On July 12th, 1918, an injection of 0.45 g. novarsenobenzol. Temperature remained normal for a month, then went up to 101.8°. No treatment was applied; since quite well except for a slight attack of influenza.

A differential blood count showed a polymorph percentage of 80. No malarial or other parasites seen in stained films, or by dark-ground illumination of citrated blood. On blood culture in one tube a Gram-negative bacillus was obtained slightly motile, forming indol, no liquefaction of gelatin, forming acid and gas with glucose, lactose, and mannite, and negative with sucrose; litmus milk, acid and clot. Evidently a coliform bacillus.

In this case the pyrexia occurred about every five days for over five months. There were no signs of the disease wearing itself out till the intravenous injection.

Causation.

In THE LANCET of Sept. 8th, 1917, I reported a case of "periodic attacks of pyrexia"; a single dose of galyl given intravenously was followed by complete recovery. Professor Tanner Hewlett¹ said how much it resembled rat-bite fever, but there was certainly no history of a rat bite. In THE LANCET of Feb. 16th, 1918, Captain S. R. Douglas, Dr. L. Colebrook, and Mr. A. Fleming report a case of rat-bite fever. A streptococcus having the characters of *Streptococcus pyogenes* was isolated on anaerobic culture from the enlarged glands of axilla. After vaccine treatment complete recovery took place; there seemed every reason to suppose that this organism was the cause of the pyrexia.

In my cases I could not find any spirochaetes, unless the peculiar body described might have been a couple of these adhering to a red cell. Its appearance is somewhat suggestive of the *Spirocheta icterohæmorrhagiae*, found by Dr. Alfred C. Coles in the blood of the common rat.² In my second case, on blood culture, in one tube a bacillus having the cultural characters of *B. coli communis* was obtained, but I think this must have been a contamination.

In these cases of rat-bite fever so many different kinds of organisms have been found on blood culture, sporozoa, streptothrix, *Micrococcus tetragenus*, &c., that one cannot help feeling suspicious, considering the fallacies of blood cultures. Spirochaetes have, no doubt, been found in blood and fluid from enlarged glands, by Japanese observers, in cases of rat-bite fever. Cases have consequently been treated by salvarsan, which is advised by Professor William Osler.³ Whether this disease is caused by spirochaetes or other unknown protozoon, or is a bacterial infection due to a streptococcus or other organism, is certainly not settled. The marked leucocytosis of polymorph type is perhaps in favour of the latter view.

It would be interesting if in a case of rat-bite fever a definite organism such as a streptococcus could be obtained

from blood or gland juice, and then a cure produced by salvarsan. There is, I suppose, no doubt that salvarsan is of great benefit in many cases of pernicious anæmia, supposed by Dr. W. Hunter to be due to a streptococcus. Dr. G. Stopford Taylor⁴ describes the benefit of intravenous injections of neokharsivan in cases of tuberculous skin ulcers, lupus, sycosis and eczema, and blepharitis. Many diseases other than syphilis might be successfully treated by salvarsan or its substitutes.

PROPHYLACTIC TREATMENT OF CONSTIPATION IN CHILDREN.

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THE frequent occurrence of constipation in children is a fact which soon obtrudes itself upon the notice of any doctor conducting an infant welfare consultation. And considering the bearing this condition has on the health of the child in later years, an endeavour is made here to give a few suggestions which may prove helpful to those in charge of a welfare clinic.

Definition of the Term.

First of all the exact meaning of the term "constipation" must be clearly understood. Inquiry often elicits the information that a child's bowels move every day. But this is not enough. A sufficient motion should occur each time. A child may pass a small stool each day and still have a loaded rectum. If the stool consists of small dry pieces it is almost certain that the rectum is not being emptied thoroughly. Constipation means that, for some reason, the rate of propulsion of the bowel contents and the amount expelled are below normal.

Before constipation—threatened or present—can be diagnosed, a knowledge of the characters of a normal stool is necessary. For the first few days the infant's bowels may move two to six times per day. The stool consists of meconium—a viscid, tarry-looking substance, almost odourless or only possessing a faint inoffensive smell. The colour gradually changes to an orange-yellow. In bottle-fed babies the colour may be lighter at first owing to dilution of the feeds, but the colour becomes darker as the feeds become stronger and contain more fat. The number of stools per day is not so important as their character. If the colour is good, smell inoffensive, consistence soft, and no straining, one motion per day is satisfactory.

Care of the Child: Cultivation of Regular Habits.

In the prevention of constipation, satisfactory hygiene in the home is of paramount importance. Too often a child is given a purge without any inquiry into the home conditions or as to how it is cared for, with the result that its bowels are only temporarily relieved. The child should have abundant fresh air and sunlight during the day and should sleep alone in a fresh airy room protected from draughts. No fire is necessary. The position of the child in the cot should be changed at intervals. The child will be healthier, and consequently the bowel will share the benefit in tone given to the whole system.

Exercise should play a prominent part in the daily routine. Regular periods should be reserved for this, the time and amount being regulated according to the child's age. At first freedom in kicking its legs about at intervals during the day is sufficient, and as age advances it should be allowed to crawl about in a little pen.

The importance of cultivating regular habits as early as possible cannot be exaggerated. Feeding times should be at definite hours, the child being awakened if necessary. The longer the interval between the feeds the better. Almost any child can begin right away with 3-hourly feeds, receiving six feeds per day. Others do well on 3½- or 4-hourly feeds, receiving five feeds per day. The writer has found that in a large number of cases even four feeds per day, with 4-hourly intervals, produce satisfactory results. But the essential point is that, whatever periods are chosen, strict regularity must be adhered to, and in no case should the child be fed during the night.

¹ THE LANCET, 1917, ii., 552.

² THE LANCET, March 30th, 1918.

³ Principles of Medicine, 1918.

⁴ Brit. Med. Jour., Oct. 19th, 1918.