

suffering from an old empyema. She was greatly wasted by suppuration and amyloid disease, with albuminuria, 238 grains of urea being eliminated per diem by the kidneys. She had clubbed fingers, and she appeared to be in an evil case. But the cryoscopy of the blood showed -0.57° , or only $\frac{1}{100}^{\circ}$ below normal, and an extensive operation was successfully ventured upon on the faith of that observation.

CASE 11.—A patient under the care of Dr. W. Hector of Tarland had prostatic hypertrophy and violent cystitis as the result of many years of disease. Irrigation and catheterism answered for a time, but hæmaturia of an obstinate nature set in. Double vasectomy cured the hæmorrhage and greatly diminished the enormous prostate. But the pain and cystitis recurred, and the patient's sufferings became so violent that bladder drainage through the perineum was inevitable, whatever the consequences might be. Albuminuria, with urine of a specific gravity of 1010, left the renal condition uncertain; but cryoscopy of the blood showed -0.61° , or $\frac{1}{100}^{\circ}$ below normal. Still the operation was absolutely necessary to relieve the pain, which narcotics and all other measures entirely failed to do. It was followed in a few days by uræmia and death.

CASE 12.—The patient, who was under the care of Dr. C. Adam of Elgin, had suffered from phlegmasia dolens for some years and had recovered, but lately the swelling had recommenced. No phlebitis or lymphadenitis was found, but a mere trace of albumin and a low specific gravity (1002) of the urine threw suspicion on the kidneys. This was confirmed by cryoscopy of the blood, which showed its freezing-point to be lowered to -0.59° , a condition due, almost certainly, to defective elimination by both kidneys.

These 12 cases, to which I might add more, illustrate the services which cryoscopy of the blood is in a position to render under circumstances in which we have hitherto had little more than conjecture to aid us and they justify the expectation that the method will soon be universally adopted. In Cases 1, 4, 6, and 7 it will be noted that the blood froze from $\frac{1}{100}^{\circ}$ to $\frac{7}{100}^{\circ}$ above its normal point. Cases 6 and 7 were hydræmic, but Cases 1 and 4 showed no signs of either that or anæmia. Possibly a condition of unusual purity of the blood may exist, with a higher freezing-point than normal, but what is the significance of such an elevation of its freezing-point in these cases I am unable to say. It will, I suspect, prove to be a symptom of disease. In Cases 2 and 9 the lowering of the freezing-point was clearly owing to hepatic, not renal disease, and I am of opinion that not the least valuable import of cryoscopy will be its power of indicating otherwise undetectable disease of the liver, at least in the practice of the operating surgeon.

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Aberdeen.

THE SANATORIUM IN THE TREATMENT OF PHTHISIS.¹

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MY interest in this subject was first aroused by Dr. Archibald Smith, of Lima, with whom I had some acquaintance in the "eighteen-sixties." He spoke, for the first time in my experience, with confidence of the curability of the disease, especially as treated in the mountains of Peru. These new hopes were fortified by Henry Bennet, with whose methods and results I became familiar, both in his writings and in personal association with him at home and in the Riviera. The first records, of any considerable

value, of the effects of various methods of treatment of the disease were published by Dr. C. J. Williams and Dr. Theodore Williams in 1871, records which did much to instruct and to encourage us. Bennet's influence drew me away for a time from the High Alps as a climate for phthisis, but in 1878 I, after occasional observation of a few cases treated in the Swiss Alps, made the acquaintance at Davos of Dr. Unger and Dr. Ruedi, and I then formed great anticipations of the value of Alpine climate—anticipations which 25 subsequent years have strengthened and formulated.

At that time climate seemed to us to be the paramount factor in the cure; so our admiration was the greater as the remarkable results obtained by Brehmer at Görbersdorf rose into repute, results in which climate played but a secondary part. Brehmer's method, to which nothing important has been added by later physicians, brought the cure of phthisis from a remote and costly achievement, attainable only by wealthy and leisurely patients, near the doors, I had almost said into the homes, of poorer sufferers given up to death. We did not realise the facts which the computations of Birch-Hirschfeld and others have placed beyond question, that then, as now, many persons were recovering from pulmonary phthisis under our eyes; our eyes were not open to see it.

By the modern method we are not only curing the individual, but we are also laying the chief stone of the edifice of prevention. This modern method we may call the method of Brehmer; but it is called more commonly the sanatorium method. To this name some objection has been made; it is said that the method may be carried out independently of the sanatorium. We cannot be guided by the etymology of names—no name can indicate all the connotations of its subject; but I think that this objection is a shallow one. The method was worked out in a sanatorium created for the purpose, it has been tested and perfected in sanatoriums, and if now it can be carried on outside a sanatorium, which is not too readily to be admitted, this is so only by bringing the skill and the conditions of the sanatorium into the home. I should look with little confidence on the home treatment of a phthisical patient by a physician unversed in the practice of the sanatorium, and by a patient who had not had at least a month's training within its precincts. It is, as it were, to tell a boy at home to read his Cæsar and his Xenophon, a little Euclid and algebra, to pat him on the head, bid him be good and industrious, and promise to call in a week or ten days to see how he has got on.

It is no paradox to say that in the congregations of the sanatorium we have learnt individual treatment; that from institutions which may well sink into the thralldom of routine, or lend themselves to the grosser temptations of the hotel-keeper, has issued the doctrine that for the individual sufferer no vigilance is fastidious, no skilled control vexatious. From a highly specialised system we have learnt that for phthisis there is no specific—not even climate; that to speak of the best climate for phthisis, of the best mode of feeding, or again of the best disposal of rest and exercise, is to speak vainly. For scrofulous children, as a rule, the best climate is the sea; for the adult in the third or fourth decade of life the climate of the high Alps, less windy than the sea, even more tonic and perhaps having some virtue in its dryness and rarity, is often the best; the elderly must be content with a milder and more equable resort, which indeed is to be preferred also for many younger patients whose stomachs are unequal to large demands, and whose heat production is slow. On the robust folk full feeding may be pressed quickly; with the enfeebled, whose stomachs are often relaxed, large and rich meals best agree when they are vomited. To the febrile and overwrought again that prolonged rest, which in vigorous and apyretic persons would be lost time, is precious.

The sanatorium, if on the block system, should stand south-east, on a dry upland site sheltered by pine woods, 200 yards at least away from the building. The front should be slightly crescentic. Most of the rooms should be single, a few may be double for special needs. All must be on the front, the back being given to the service, and to the accommodation of an occasional visitor. The smaller the bedroom, within limits, the better, lest it be used as a sitting-room, whereas it is but a shelter for the bed and for dressing and undressing. There should be no general sitting-rooms, which encourage indoor gossip, except, of course, a dining-room and a spacious and airy entrance-hall on the south front. Every room should have its covered

¹ A paper read before the British Congress on Tuberculosis, Section II., Medical, including Climatology and the Sanatorium.

balcony, wide enough to take the long chair (or bed) and a table, separated by glazed screens from those next to it, and supplied with convenient electric light. The balcony is the living room of the patient. Airing galleries may be provided for the few who may like them, but they have social and other disadvantages. The balcony, if raised a step or two above the bedroom floor, will not shut out much light from the window below, at any rate not in winter, when the sun is low. Of walls and furniture I will only say that the doors should be double and the walls and floors without angles and well pugged; that wardrobes should be built in the walls, flush with them and the ceiling; that linoleum, with felt under it, makes the most comfortable and the cleanest carpet. The window must occupy the greater part of the south wall, and sliding shutters with louvres must be provided to darken the room for light sleepers, and against stormy weather. Heating is a great difficulty. Open fires, if practicable, are by far the best means of heating. If impracticable the walls should be heated by flues. To heat the air to be respired is wrong, both in principle and in practice. If so-called "radiators" must be used, the radiator must be set against an opening in the outer wall, and the air led over it into the room so as to enter the room at the bottom. Hot air rises, and, do as we may, the inmate of a room so heated is hot in the head and cold in the legs and feet. The roof must be warm in winter and cool in summer. If all passages and corridors be well and equally warmed the heating of the chambers will need less attention.

It is undesirable that patients should take their principal meals in the private room and a dining-hall must be provided; but I have received a bad impression of the dining-rooms of most of the sanatoriums which I have visited. Either they are a whirlpool of draughts, wherein the poor patients can scarcely keep their hair on, or they reek with foul odours. The director of a sanatorium, in many ways admirable, lately ushered me with pride into a handsome dining-hall whose close atmosphere was so thick with the reek of departed dinners that I sickened on the threshold and, muttering some excuse, made my escape. Most of these halls are much too high and not thoroughly air-swept; others are ordinary apartments with the windows taken out, so that the patient must dine in a hurricane, bolting his food and surrendering whatsoever charm dinner might yet have for him. Saloons should give place to sheds or bungalows with sliding walls of louvred shutters which can be adapted to the wind of the day, and afterwards quickly thrown open for coffee and cigarettes, when each patient can sit where he pleases.

If, in obedience to the needs of municipal or other public bodies, such sanatoriums must be built to receive more than 50 patients a physician must be engaged for every multiple of 50—the largest number of patients to which any man can do well. Let us not tolerate again the farce of so-called medical attendance which still persists in many asylums for the insane, to the grievous loss of science and to the detriment of the sick. But in my opinion sanatoriums are designed so large and costly as to deter the benevolent and to encumber the treatment. A hut or villa system in the grounds about a central administrative block is cheaper, more homely, and more efficient. The Japanese house is a good model. The difficulty of ventilating large blocks is insuperable; they will beget the secretary-director, and lead to a barrack or hotel system. Tents are useful, but for temporary purposes only. Ordinary dwelling-houses converted into sanatoriums are makeshifts at best, and unsatisfactory at that.

I repeat that it is vain to talk of a "best climate" for phthisis, even for those who can go where they please. Sun is an amenity and a cordial, but does not directly contribute much to the cure. At Davos the patients do as well in the darker as in brighter winters. Gabrilowitch, at Halila, compared the reports for the winter six months with those of the summer six months, and found that the winter patients did considerably better than the summer patients, the bracing air of winter, in spite of less light, being more restorative. For the most general terms in which climatic conditions can be put is that the coldest air which the individual can tolerate, if it be dry, clear, and still, is the best, as it calls for more food and thus stimulates the appetite. But in an air so cold as to be very stimulating to a patient of 35 years of age, a patient of 55 years of age would shrivel up. Thus it is for the younger patients of fair vigour that the high Alpine airs are the best; say for vigorous persons under 40 or 45 years of age without much bronchial irritation. At Davos it is wonderful to

see a wan listless youth for the first few days picking daintily at his half-eaten meals, and 10 days later devouring all before him. At lower altitudes some urgent feeding may be needed, but in any fresh open air a naturally good feeder soon regains appetite; and to force him before nature calls is too often to lose a week or two in an attack of indigestion. In England, Norfolk, Suffolk, and Kent offer the best climates for the phthisical. A poor eater does badly in any climate and under any stuffing. Appetite again much depends upon the preparation of the food, especially among the wealthier classes. The meals, even in the more luxurious sanatoriums, are too often badly cooked and badly served, good as the raw materials usually are. The dishes and plates are cold, the meats are tepid, and the coffee and tea are scarcely fit to drink. All bread, rolls, and cakes should be baked in the house. A variety of dishes, again, as city diners know, tempts to repletion; yet sanatorium cooks do not stand alone in their contentment with a narrow round of menus, which, attractive enough at first, begin, perhaps after a week or two, to pall upon the palate. The physician of a sanatorium should be something of a cook and much of a gourmet.

For the encouragement of scientific work in sanatoriums, which in the nature of the case are far from the advantages of large towns, there should be central committees. Such a committee in England—let us say a branch of the National Association for the Prevention of Consumption and other Forms of Tuberculosis—would organise the methods of reporting, would suggest the kind of information needed, would circulate scientific results among these institutions, and would point out the many directions in which investigation is needed. Excellent work of this kind is now done in a few sanatoriums, but there is a fear lest the medical officers should fall into the supine routine of too many of the asylums for the insane. Or, again, work may be active but ill-directed. Every sanatorium deserving the name has its laboratory; but how much valuable time is wasted in the counting of bacilli? Such computations are necessary from time to time, no doubt; but daily or even weekly fluctuations are too dependent on temporary contingencies to be worth much, and there are more important things to be done. For instance, I may suggest examinations of the blood, the comparison of its cells, and of the fluctuations of its specific gravity; the study of its sera for agglutination, toxins and antidotes, and their relation to the tuberculin; the attenuations of virus by inoculation and other methods; the estimation of the virulence rather than of the number of bacilli in the sputa; the evidences of mixed infections such as cocci in the blood; the investigation of the possible harm of re-infection by tubercle, as, for example, by soiled fingers, tooth-brush, or swallowed sputum; the secretions of the stomach at various phases of digestion; examinations of the urine for toxins, for the comparison of ingestion and excretion, for the influence of fever and of exercise on metabolism; and so forth, *ad infinitum*. Many a worker on such subjects in a remote sanatorium would feel the moral tonic of the help and association of a central scientific committee. Again, in all public or semi-public institutions there should be a bench in the laboratory where any pathologist, neighbour or visitor, could avail himself of the material either for research or for self-improvement. I attach importance also to the establishment of some connexion between the district medical officers of health and the sanatoriums; but this is a long story.

I am guilty of no extravagance when I suggest that one-third of you who hear me, wittingly or unwittingly, are, or have been, infected with tubercle. Some of us, ailing indefinitely, may have been the innocent means of infection to others, so secretly stalks infection in our midst. Every trustworthy report from sanatoriums—and herein I must compliment our colleagues of Germany on such reports, the last in my hands, and this not the least, being that from the sanatoriums of the Hanse Towns—every such report, I say, emphasises anew the remarkable success of Brehmer's system, on one condition—namely, that the patient be caught at the outset of his disease. Happily for me, it is not within the sphere of this paper to ask what provision is to be made for advanced cases, whether for their own comfort or for the safety of the public, this is a matter of State Medicine; but it is my duty to reinforce your demand that advanced cases, save in a few overwhelming infections, shall cease to occur. There has been much supineness in the matter of early diagnosis—a supineness bred of pessimism, of despair; let us bring the inspiring message of optimism, of

enthusiasm. Let every physician, however modest his sphere, remember that upon his alertness depend the lives of the infected and the stamping-out of infection. The incipient case of to-day is the advanced case of to-morrow. On former occasions I have said that a case presenting the ordinary first stage symptoms of the out-patient room, if for our fathers an incipient case, is in our eyes an advanced case; yet too often still the family practitioner waits till the physical signs are evident to a second year's student. What consultant has not felt his heart sink as, in the so-called incipient case, the "consonating r le" fell upon his ear? Medical men who have no ear for music ought to distrust themselves a little in auscultation. Not long ago a physician, as honest as he is accomplished, told me that he could not perceive a difference of percussion which I estimated at quite a quarter of a note; he lamented his lack of an ear for music. Early diagnosis depends, however, less upon this detail or that, more upon the cumulative evidence of many indications which the family physician is in the best position to appreciate. The features of the individual do not carry much weight with me, excepting, of course, such acquired features as scars in the neck, or the thick nostrils and upper lip due to the catarrhs of childhood. Many persons of so-called tuberculous aspect never fall victims to the bacillus; many of robust appearance are attacked. Never let muscular strength, ruddy cheeks, or a well-formed chest blind us to canker within.

Whosoever complains of being overwrought, of being "off colour," as the phrase goes, in him suspect phthisis, cough or no cough. Let no h moptysis, however slight, be set down to a "blood-vessel in the throat"; let no pleurisy, however long ago, be forgotten. In examining the sputum, if any there be, we shall not take the absence of bacilli as an assurance of safety. In young children we may find some occasion of examining vomit for bacilli. If there be no fever, a high mean pulse-rate with low arterial pressure will keep us on the watch, especially if therewith there be some loss of weight, an unusual tendency to sweat and languor after exertion. Indeed, we shall not admit the absence of fever until we have taken the temperature in the rectum every two hours of the 12 of the day, and particularly after exercise. To an mia, to dyspepsia, to vague pains in the chest, if we shall not give more than their due weight, we must not give anything less. Percussion, which must be made on the bare chest of the patient, sitting on a wooden chair without cushion, must be made with a light finger, and the notes must be estimated not so much by absolute pitch as by an attentive comparison of the two sides. Even if both apices be affected the notes of the two are never identical. I would ask you if comparison of the percussion notes in respiration and in expiration is of importance? The larynx should always be examined, if only for loss of colour. The Roentgen rays, so anxiously tested by Dr. Walsham and others, have not yet proved to be of use in doubtful cases. The spirometer, valuable for comparative records in the various stages of a patient under treatment, is of no use in early diagnosis. Attempts to plot out curves of fever characteristic of tubercle or mixed infections seem not yet to have met with much clinical success. Of tuberculin in diagnosis I have had little experience; in one case, however, it was a great help to me; yet tubercle sleeping in many of us, if not by its use awakened for mischief, might give some ominous answer in its dreams.

The next question I would submit for consideration is that of the mean duration of residence in the sanatorium. The degrees of cure are three—namely, arrest, obsolescence, and *restitutio ad integrum*. To consider this last is to be too curious. Nay, even if we make obsolescence our term for discharge we shall nip sanatorium treatment in the bud, at any rate for the poorer classes. To bring about obsolescence of phthisis, even of the first stage, we need, in my opinion, two winters and one summer at least—say, 18 months—and in saying this I am astonished at my own moderation. In many cases three winters and two summers will be needed. But how many, even in the easier classes, can sacrifice this time without breaking up their careers and abandoning the ties of home? Such, nevertheless, is the advice which for many years I have had to offer to those who have consulted me; and this opinion I must still give if we are to be satisfied with nothing short of obsolescence. But during the last few years, during which time statistics, such as those of Dr. Turban and of Dr. Trudeau, have been given to the world, since we have had to reckon with what is practically possible in the provision of sanatorium accommodation, and

to consider if it be worth while to spend money on a vast scale for cures beyond our compass, my own views have undergone a change. Herein I have been much impressed by the distinction which our German colleagues have drawn between "*wirtschaftliche Heilung und wissenschaftliche Heilung*";—as we may express it in English, between a pathological cure and an economical cure. What is meant by a pathological cure we know, as we know also that the means of such cures are unattainable save by persons of wealth and leisure, and not by all even of these. Keeping our minds fixed upon the first stage—for we will not admit that physicians will continue to let cases drift into the second without sanatorium treatment—it appears that after a certain time patients may be allowed to return to clean homes and wholesome occupations so far improved, and, what is quite as important, so deeply imbued with sanatorium methods, that most of them will hold their ground for some years, and many will ultimately recover. To fix a term for the individual case is, of course, impossible; but, now that large numbers have been dealt with, a mean term may fairly be demanded of us by the paymasters of these resorts. Some sanatoriums put the mean term at three months, which seems to me too sanguine; others put it at six months.

When we try to apply some general rule to the individual case, to estimate for the patient and his friends how far he will fall within the mean or without it, we must be guided by certain individual features. For instance, if fever continue after the first 10 or 14 days the mean duration of residence will be exceeded. How long may fever continue, and yet the patient do well? In view even of an extreme term, is it any use keeping a patient in the occupation of a bed if the fever has not subsided, say, in four or six months?—for we may have 6 or 8 per cent. of such cases. Rapidity and instability of pulse are adverse symptoms. Sugar or albumin in the urine is, of course, of bad omen. Poor feeders do badly. Topers do badly. Young patients not out of their teens do badly on the whole; and so, again, do patients in the later decades of life. A steady gain of weight is, of course, hopeful, but patients may gain weight while retrogressing in respect of local disease. I have expressed the opinion that tuberculous pedigree does not tell against the case prognosis; but herein Sir William Broadbent differs from me. Pregnancy is, of course, a very unfavourable complication. Gout I regard as a very favourable one. An obedient patient of tranquil temperament has a much better chance than the wayward or fretful. As to physical signs—I have not worked in a sanatorium; but on my fragmentary experience I think that if on admission there were crepitations at one apex these ought to have dried up in a month or six weeks if the patient is to be discharged in three months; at which term the physical signs should have become fairly negative. As to bacilli, these pests seem to persist indefinitely in many patients discharged and otherwise doing well. In bronchiectatic cases, on the other hand, they may not be found. I attach more importance to a diminution of the quantity of the sputum. Upon such data as these I think the chances of the individual case in respect of the mean stay may be calculated, say, after the first month's residence? That the presence of tubercle in other organs is a very grave factor in the prognosis I need not say; cases of slow scrofula with pulmonary complication often indeed do remarkably well, but in most other cases of multiple diseased organs I have had disastrous experience. Multiple deposits in the lungs themselves also in their degree forbid the more sanguine hopes. However, if sometimes we are disappointed by the ill results of a case in which we had looked for better things, on the other hand, it happens, more frequently, I think, that cases in which we had not dared to hope much gratify us by revealing an unexpected power of recovery. Thus the cruel face of Nature may break into a smile.

It is only by means of the kind reception that many sanatorium physicians have given me, and of the free and generous manner in which they have allowed me to share their thoughts, that I shall dare to-day to discuss treatment in sanatoriums. I will begin by quoting the words of him to whom my debt is the greatest—viz., Henry Bennet. In 1866 he wrote of the physicians of his time: "They dare not apply to their patients the ordinary rules of hygiene; they dare not give plenty of animal food; they dare not give fresh cool air day and night; they dare not keep the skin clear and cool by cold or tepid sponging. Their patients when they go to health resorts think they ought to take exercise, and they do so. They think it did them good

when well, and will do so now when they are ill; but they merely walk themselves into the grave." If I quote no more than this, does not that which I have read tell us how enlightened a forerunner was Bennet in the treatment of phthisis? And now we are tending to drop into the opposite routine of idleness and stuffing. So hard is discrimination. Whatever our treatment, let us first take such order with ourselves that it shall not be treatment of the abstraction Phthisis, but of the individual victim of tubercle bacilli, of which victims no two are identical. Such discrimination means well-paid physicians, and many of them. I repeat, let us not fall into the routine of asylums for the insane, wherein the public authority has always been seeking how far it can reduce the salary for which it can get medical men to apply, and, having got them cheaply, how many patients it can make them attend to. Let not the public act in sanatoriums, as it acts in asylums and hospitals, as if, that is, the public had itself found out how to cure diseases and had engaged a few medical men to carry out its own ideas.

As in other diseases, so in phthisis, the first task in undertaking a cure is to clear up arrears. When the patient comes under care, in most cases at any rate, he has drifted into physiological debt. He has mortgaged his estate, has overdrawn his banking account, has bought raw material at forced prices and paid for it with bills renewable at heavy fines. Our first duty, then, is to straighten the account; and it is astonishing how much is to be done by reducing expenditure, by husbanding profits, and by clearing off arrears. Every patient, febrile or not, should rest for ten days or so until the physician can reckon up the balances. And let it not be forgotten that the stomach, indispensable as it is, indeed, because of its indispensability, needs rest too—that is to say, it must be nursed. To thrust a heap of food into the stomach of a worn or exhausted human machine is to court failure; fortunately, such is the tolerance of the human body the patient is often quit of such an error for 10 days' indigestion and "biliousness," when the food has to be moderated after all. Now I do not often read in the reports of cases, amid their long lists of physical examinations, records of the dimensions of the stomach before and after meals, which I regard as one of the most important of these examinations. In weak and febrile patients the walls of the stomach are almost always lax, so that the food is delayed in the viscus, and tends to ferment there; especially if the secretions of the peptic glands are attenuated; under the internal pressure the organ gives way more and more, and may not recover itself in the hours of emptiness, or indeed, if feeding by frequent snacks is advised, may never become empty. Not long ago I saw such a patient, stuffed on the most modern principles; his medical attendant was annoyed that he positively declined to eat, that he was nauseated, and was losing ground rapidly. On examination of the emaciated body we were able not only to map out but even to grasp a large pendant stomach as full of food as a haggis. How long it had been full I do not know. For the first few days let rest be rest all round, stomach included; then, after the varying dimensions of the organ are known, the food may be increased according to the energy of the individual. Another warning I would give is to watch carbohydrates with care. Feeble stomachs digest these materials with less activity, and they tend to generate flatulence. Man at bottom is carnivorous. I think milk is given too profusely. The bulk of liquid has two dangers: first, it impedes digestion by diluting the gastric juice and distending the stomach—at any rate, in non-febrile cases where liquid is not so quickly disposed of; and, secondly, it adds to the mass of the blood which the heart, often ill-nourished, has to lift. For my part, I rarely find the need of forced feeding—now and then a patient is fastidious, but the secret of forcing the food is to put the patient into open air as cool as he can bear it, and if the cook is a good one the appetite in hopeful cases will come back of itself. On my first visit to Davos, when I found myself at table with 30 weather-beaten people eating like wolves, I exclaimed to Ruedi, "But where are your patients?"

Food has two ends to fulfil: to compensate fever, if, that is, fever be present, and to nourish the body. Feverish patients will dispose of more liquid than the non-febrile; and as in them the stomach is usually relaxed the food must be in frequent small quantities. Gabrilowitch, in a series of careful experiments, has shown that in the phthisical, and not in the febrile only, the weight falls with

surprising rapidity between meals if these are at too long intervals. This fall he finds best marked at nights between supper and breakfast. It would seem, then, that so long a fast, however wholesome for the sound, is not desirable for the sick. As he epigrammatically puts it, "Irritability and sleeplessness are the hunger of the phthisical." When fever has disappeared, and the patient has regained his normal weight, the physician, by close watching of the scales, will be able to return to ordinary meals at the usual intervals. There are now no more arrears to make up, only the balance of waste to repair.

Of alcohol Bennet well said, "Even when it is prescribed medicinally there is always the risk of abuse. It is a double-edged sword." For a few days, occasionally, when the patient flags, when his skin is cool and damp, when his pulse is feeble, when his digestion is slow, and when after meals he is depressed in spirits, it is helpful; as a rule it is not needed. It is our duty, then, as pathologists, knowing that liquorish habits favour tuberculosis, to discourage the still prevalent notion that without alcohol a sick person can never regain strength. There are many lives to throttle out of this cat yet. All patients, without exception, must rest both before and after meals; the latter they remember, the former, which is at least as important, they are apt to forget. Patients liable to vomit food must take their meals in bed. Exercise may be insufficient; indolence may lead to padding with fat rather than to hard condition. Stalled fat cattle are more subject to tuberculosis than the leaner kine on the hillside. The restoration of the heart degenerated by toxins is to be brought about by regulated exercise, and in no part of the treatment is the discrimination of the sanatorium physician more indispensable. On massage I would invite opinions: in former years when more patients remained under home treatment I thought it very beneficial; since the departure of our patients for the sanatorium I have had little further experience of it. I would ask particularly whether massage is inadmissible during moderate fever?

In the earlier days of Davos hydropathy had some vogue, especially the douche. On these means also I would invite discussion. I have found much good in the wet sheet, and the wet pack may be helpful in fever.

The use of gymnastics in the treatment of phthisis is little understood. That in certain phases of disease of the lungs gymnastics must be inappropriate needs no insistence. For instance, he would be a brave man who ordered lung gymnastics in a case of softening or recent hæmorrhage. In phases of softening, again, the risk of suction of septic matters from one part of a lung into another would forbid all exertion likely to cause forcible inspiration. At high altitudes it would seem that the larger volume of the inspirations promotes insensibly an expansion of the lungs too gradual to bring about this peril. In healing stages, when softening has ceased and the lung is drying and laying down protective fibre, may not gymnastics, under supervision as skilled as for cardiac disease, do much to expand and thus to call into healthy function the parts which the tubercle has spared? I seek the answer from those who are dealing daily with these problems.

To admit that there is no drug endowed with specific virtue in phthisis is not to admit that drugs are never useful. For the most part the open air will reduce fever, will prevent sweats—whether due to fever or debility—will promote appetite, and will calm and fortify the circulation. But it is not to be forgotten that during liberal feeding gentle laxatives, and especially an occasional mild mercurial alterative, prove valuable; that a drop of an arsenical solution may settle an irritable stomach, a few drops of strychnine may brace up a slack one, and so on; but I have no faith in courses of drugs, whether antidotal, tonic, or topical, save, of course, in laryngeal cases, which, as the part can be got at, are to be treated locally from the first.

Finally, I must protest against the emptiness of mind which certain reformers would enforce upon their patients. I feel sure that a lack of tranquil occupations and amusements conduces to introspection, and, moreover, is not without grave peril to the moral life. Most of the patients we have to treat depend for their livelihood upon habits of industry; young folks may be sent to a sanatorium at the very time when the habits of life are forming, and it is deeply to be regretted if to the calamity of tuberculous infection must be added a dissipation of those virtues of energy and method upon which our happiness depends. During phases of bodily incapacity submission to the inevitable takes the form of a duty, unfortunate as the loss

of time may be; but vapid hours and aimless days may break up the hardly won discipline of a careful education, if it do not abandon the thoughts to wantonness. The vacuous looks and aimless wanderings of the patients hanging about the precincts of some sanatoriums have impressed me painfully. Vigorous games are rarely suitable; but surely there are occupations, such as gardening, the fine arts, literature, natural history, and quiet handicrafts, which to those free from fever would be beneficial. Perhaps even the visits of teachers in the arts and sciences would not prove so wildly exciting as to throw the population into a fever.

I will sum up the chief questions which I have propounded.

1. Can mixed infections be recognised from fever curves?
2. Can we distinguish between economical (*wirtschaftliche*) healing and complete (*wissenschaftliche*) healing? if so, what is the mean term of residence for the economical healing of early cases?
3. How long in certain active cases, say from 6 to 8 per cent., is a febrile patient to be kept to bed in the reasonable hope of recovery? For instance, in a public sanatorium are we justified in retaining patients who have been confined to bed for six months, five months, or even for four months?
4. What estimates of improvement and what rules of prognosis can be based upon physical signs alone?
5. Is multiple tuberculosis, for instance, in lung and testicle too hopeless a condition for a public sanatorium? How far is it comparable with an equal extent of mischief in one organ?
6. Of what use, if any, is massage?
7. Of what use, if any, is hydrotherapy?
8. Are special pulmonary exercises appropriate at certain stages of progress? and if so, when, and under what conditions?
9. Must we repair the body at the expense of the life of the mind? Can we not give even some educational value to the sanatorium besides the medical drill of it?

A FURTHER CONTRIBUTION ON ACUTE DILATATION OF THE STOMACH,

WITH AN ACCOUNT OF TWO ADDITIONAL CASES.

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WE have been led by the perusal of a paper on this subject by Dr. Campbell Thomson¹ and the discussions and letters which have recently appeared on the subject to make this addition to a paper published by us in the Transactions of the Clinical Society of London in 1898. In this paper we tabulated and briefly abstracted 16 cases of this rare and fatal condition and reported two new cases, one by the courtesy of Mr. Walter Edmunds and one which had come under our own observation. Since the paper was published other cases with quite typical symptoms and running fatal courses have been recorded by W. H. Brown,² Kirsch,³ and T. B. Appel.⁴ Abstracts of these cases may be found in the *Medical Review* of the same year, with a reference to a case published by Fenger.⁵ These and additional cases are also given in Mayo Robson and Moynihan's work on Diseases of the Stomach. An attempt was also made to collect cases of the same disease which did not prove fatal. This was difficult, but we found and abstracted the accounts of five cases which appeared to be instances of the disease in question. Care was taken to exclude all cases in which mechanical obstruction at the pylorus was present. Although it appeared to us at the time that the same train of symptoms might follow in cases of this kind, yet we felt that in discussing the cause, symptoms, and diagnosis of the disease it was better to deal with uncomplicated cases only. The two additional cases which we wish to record are as follows.

CASE 1. *Lacerated wound of the knee-joint; cellulitis of the leg and thigh; ultimate amputation of the limb; acute dilatation of the stomach and of part of the duodenum.*—The patient, a male, aged 29 years, came under observation in 1900 with a lacerated wound of the left knee, opening the joint. A large amount of grit was ground into the wound. The injury was the result of a railway crush, the patient attempting to enter a train in motion and his leg being dragged between the footboard and the platform. The joint wound gave considerable trouble, pockets of pus forming both above and below the joint. Later an arthrectomy was performed and ultimately, on account of severe and repeated hæmorrhage, it became necessary to amputate the thigh. This was about a month after the accident. The patient at the time was extremely collapsed and hardly responded to intravenous infusion of saline fluid, or to brandy or strychnine injections. The bowels were not confined but there was no marked diarrhœa. Unfortunately, no note was made as to the presence or absence of vomiting.

The post-mortem examination was made 17½ hours after death. The only marked visceral abnormality was the condition of the stomach and duodenum. The stomach was dilated and was very prominent. Its upper border was not displaced. Its lower border extended well below the umbilicus. The dilatation was *not* confined to the stomach, for the first part of the duodenum was dilated to twice its normal size. The dilatation extended to the place where the duodenum came in front of the lumbar spine. The stomach contained a little fluid and some odourless gas.

CASE 2. *Pleuro-pneumonia with severe toxic symptoms; acute dilatation of the stomach and duodenum.*—The patient, a man, aged 24 years, had previously had no serious illness and came of a healthy family. On May 27th, 1901, after playing cricket, he shivered and shortly afterwards noticed a pain in his left side which caused a "catch" on breathing. On the third day of the illness he was admitted to St. Thomas's Hospital, evidently very ill and with a temperature of 104° F. Over the lower lobe of the left lung percussion resonance and vocal fremitus were diminished, the breath sounds were very feeble, and a few crepitant sounds were audible. The abdomen was not distended, the abdominal respiratory movements were present, and the abdominal viscera were apparently normal. On the fourth day of the illness the temperature suddenly fell to 96°, but it rose again the same evening to 102°, and steadily mounted from that time until death when it reached 104°. In addition to the signs mentioned at the base of the left lung, a patch of faint tubular breathing developed in the left scapular region and rhonchi and moist sounds were present over the other parts of the lungs. Profuse and uncontrollable diarrhœa now set in, the bowels acting 15 times on the eighth, five times on the ninth, and 11 times on the tenth day of the disease. The patient was sleepless, complained of severe epigastric pain, and commenced to vomit. He was so collapsed that saline fluid was injected into the subcutaneous tissues, brandy being administered freely and strychnine being injected. Death occurred 11 days from the commencement of the disease. Up to the day before death the urine contained no albumin. No urine measurement was made.

At the post-mortem examination the body was found to be emaciated, the trachea and bronchi contained a large quantity of tenacious mucus, the bronchial glands were swollen, and the left lung was completely pneumonic, the lower lobe being grey and œdematous whilst the upper was still red. The visceral pleura was covered with a thick fibrinous pellicle. The lower lobe of the right lung showed patchy grey hepatisation; the other lobes were congested and œdematous. There was a fibrinous pellicle on the pleural surface of the lower lobe of this side. The heart was not dilated; the cavities of the right side contained tough fibrinous clot, which extended from the auricle to the commencement of the pulmonary artery. There was no endocarditis and no excess of pericardial fluid. The parietal pericardium, however, was thickened and adherent to the superjacent pleura of the left side. The adhesions were recent and "buttery." Inflammation had not spread to the interior of the pericardial sac. The stomach was greatly distended. It lay with its long axis directed downwards and to the right. The lowest part of the viscus was within a few inches of the pylorus and reached the level of a line joining the anterior superior iliac spines. The lesser curvature, after emerging from beneath the liver, ran almost vertically downwards to a point on the right of the mid-line on

¹ THE LANCET, Oct. 26th, 1901, p. 1115.

² THE LANCET, Oct. 14th, 1899, p. 1017.

³ Deutsche Medicinische Wochenschrift, August 17th, 1899.

⁴ Philadelphia Medical Journal, August 12th, 1899.

⁵ Clinical Review, 1898.