There at present on duty seven female nurses, two of whom are employed as dietists, one hospital steward, two acting stewards, and sixteen privates of the hospital corps. In addition, a number of civilians are employed as cooks, baker, dairyman, watchman, teamsters and laborers.

I trust that after the hospital has been in existence for a sufficient length of time it will furnish interesting and perhaps instructive results.

THE ADVANTAGES OF THE SANITARIUM TREATMENT OF TUBERCULOSIS WHEN CHANGE OF CLIMATE IS NOT POSSIBLE.*

E. S. OLIVER (JOHNS HOPKINS.)

SARANAC LAKE, N. Y.

The writer has for two years past been living at Saranac Lake, N. Y., as a patient and physician, studying the problem of tuberculosis in his own person, in the Saranac laboratory for the study of tuberculosis, and as a member of the staff of the Adirondack Cottage Sanitarium. The views he is about to express are the results of two years' study and observation, and are to be regarded solely as the expression of his own opinion and not in any sense to represent officially the institution with which he is connected.

As may be inferred from the title, it is accepted as a foregone conclusion that sanitarium treatment is the only solution of the many problems presented in this protean disease. The conclusion reached by the Berlin Congress and International Medical Congress in Paris leaves no room to doubt that the sanitarium treatment accomplishes what no "specific"—whether serums or drugs—can alone accomplish, and is capable of achieving, unassisted, all the beneficial results that can be claimed for either serum or drugs. Let us examine for a moment what may be regarded as the essential principle of the sanitarium treatment. First, unquestionably, comes the giving up of former habits of life, and the change from the old surroundings combined with the change to a more favorable climate. We, in Saranac Lake, are convinced that there is much of healing in the climate alone, and those of us who have suffered personally from the asthmatic breathing that so affects the tuberculous patient can testify to the vast difference in the quality of the air in the Adirondacks, as compared with that at our homes, and many of us go so far as to detect fine shades of difference between the air at Paul Smith's, that at Lake Placid—nay, even that at the Sanitarium, as compared with that at the village one mile away and 300 feet lower. We may as well admit that there is nothing essential in the altitude to which the patient resorts. The isolation of the patient from his family and community is of the utmost importance in combating the spread of disease. On the other hand, the segregation of persons more or less affected with the disease, especially of those in the same stage of progression, does away with the sensation of being an object of repulsion and danger—of being an outcast—which overwhelms the modern leper so long as he is in the company of sound and healthy individuals. This association with other patients supplies to him the social intercourse for which he longs in his enforced isolation and serves to combat homesickness, the pangs of which lead many hopeful cases to throw

away their chance of recovery—for the mere sake of seeing familiar faces and hearing familiar voices. The sanitary precautions insisted on in the Sanitarium completely removes the danger of further infection and makes association with those recognizedly consumptive fraught with less risk than the average individual encounters in the street cars and stores which are the scenes of his daily labors. Moreover, the education which the sanitarium imparts as to the dangers of carelessness in disposing of the sputum is full of object lessons in themselves sufficiently valuable to justify the maintenance of such institutions. But it is the regulated out-of-door life amidst hygienic surroundings, with diet selected according to the individual's needs as carefully as his medicines are prescribed for his symptoms, and in the application of the best tried and most rational methods of medical treatment, that we find the vital essence of the sanitarium treatment.

The question of exercise is one on which Dr. E. L. Trudeau takes perhaps the most advanced position of all those who have successfully treated tuberculosis by the hygienic method. Exercise further than that necessary to go and return three times a day from the patient's cottage to the central dining hall is forbidden in the Adirondack Sanitarium to all those patients who reach a maximum temperature daily of 99.4 F. (37.5 C.). In cases maintaining for a considerable period a

Figure 1.

temperature of 100.5 F. all exercise is forbidden, and the patient remains at his cottage, lying in his cot on the veranda, where his meals are served by an orderly, from a diet selected according to the prescription of the physician in charge.

RESULTS OF SANITARIUM TREATMENT.

To an observer who has studied tuberculosis in the wards of the public hospitals and sees for the first time the patients in the Adirondack Sanitarium, the first impression is one of absolute skepticism that these people, who present all the features of robust health, can be suffering from the dread destroyer with which he became familiar in his student days. The visitor finds that he is almost the only one on the grounds who coughs. He is conscious that he looks anemic and emaciated by the side of the consumptive, and he is apt to hurry away lest some other visitor will take him for the consumptive; nor is he unwilling after his visit to believe that of all patients, including those entering the sanitarium in all stages of the disease and remaining at least nine months under treatment, 34.5 per cent. go away apparently cured, while of those actually in the incipient stage 73.4 per cent. are apparently cured.¹ Not only the apparently cured, but many of those in

* Presented in a Symposium on Tuberculosis, to the Section on Hygiene and Sanitary Science, at the Fifty-first Annual Meeting of the American Medical Association, held at Atlantic City, N. J., June 5-8, 1900.

1. Vide the excellent paper entitled: *The Result of Sanatoria and Social Hospital Treatment in Pulmonary Tuberculosis*, by H. McL. Kinghorn, M.D., Saranac Lake, printed in the *Montreal Medical Journal*, July, 1899.

whom the disease is merely "arrested," have been able to return to their vocations and live a practically normal life for a period ranging from one to fifteen years. To give a concrete idea of the results from our practical everyday experience among the Sanitarium patients, let me cite the instance of two patients whom I have just encountered on the street and asked for the record of their weights.

W. H. B. entered Sanitarium June 30, weighing 134 pounds; July 7, weighed 139 pounds; July 14, weighed 146 pounds; July 21, weighed 149 pounds; July 28, weighed 153 pounds; August 11, weighed 158 pounds; August 18, weighed 161 pounds; August 25, weighed 164½ pounds.

H. P. D. entered the Sanitarium June 23, weighing 130 pounds; July 14, weighed 138 pounds; July 28, weighed 146 pounds; August 11, weighed 151 pounds; August 25, weighed 154 pounds.

A study of the official weight-book will show a score of such phenomenal gains in weights.

The accompanying charts taken at random furnish the most convincing evidence that pyrexia can most successfully be treated simply by the rigid observance of rest and outdoor life.

Cough as a symptom has much more significance for the patient than for the physician. I have repeatedly seen patients enter the sanitarium with a cough that

Figure 2.

kept them in paroxysms night and day, who could not walk from their cottage to the dining hall without pausing three times to expectorate in the receptacles provided on the ground. I have seen them lose their cough in a week or ten days, save for a single more or less violent paroxysm on retiring and on rising, and have heard them report the expectoration diminished in three weeks from three or four ounces on admission to half an ounce daily, when they were subjected to no treatment other than the hygienic routine of outdoor life in all sorts of weather.

The amount of food consumed at table three times daily by the patients, and between meals when so prescribed, is such as would surprise the hardest-working day-laborer of your acquaintance and give you reason to fear that some acute dilatation of the stomach must inevitably follow, until you had become accustomed to the appetite whetted by the tonic breezes of the Adirondack region.

As Dr. Trudeau has shown in the all too few articles he has written for the instruction of the profession, the early diagnosis is the cardinal factor in the cure of the disease, and not alone in the cure, but in the sanitary prevention of its extension. Early diagnosis becomes thus the keystone in the arch on which we are to build the structure of our barrier against the "white plague."

The average family practitioner recognizes the disease only when the symptoms are so prominent and the physical signs so unmistakable that the patient is already too far gone to stay his downward course.

The plan I propose is that where a general practitioner, or a specialist in pulmonary disease, has under observation and advice two or more cases really incipient, he should have sent them to a cottage, rented or built for the purpose, in some favorable situation in the suburbs of his city or town, say ten miles from its limits, where the air is uncontaminated by dust or smoke and the surroundings rural and attractive; a trained nurse should put the patients through, under the physician's close supervision, the regular sanitarium life as it is pursued in the Adirondack Cottage Sanitarium and the Muskoka Sanitarium on this continent, and in similar institutions in Europe, notably in Brehmer's Sanitarium at Gerbersdorf, in Detweiler's at Falkenstein, and in Walther's at Nordrach.

Figure 3.

Figure 4.

In choosing a site for the miniature sanitarium, let a slight elevation be selected for the cottage, the exposure of the main verandas and bedrooms for patients to be on the south. The chosen location should be far removed from the din and bustle of the town, but near enough to some railway or tramway to give to the patient's family and business associates the opportunity of calling on him at such times as may be prescribed by the physician. If the roads in the neighborhood are suitable for driving, great pleasure and a considerable aid in the treatment is provided for. Of how little real moment the change of climate is, provided a rigid sanitarium treatment is pursued, is shown by the cures achieved in the Hôpital Boncecaut, located within gunshot of the fortifications surrounding Paris. Often a cottage may be found already built which may be adapted to the treatment proposed, but probably it will in most instances be found advisable to build a structure especially contrived to meet the needs of so unique a routine of daily life.

I append to this paper plans for such a building, drawn by a competent architect, Mr. W. H. Scopes, of

Saranac Lake, which will be found to embrace all the essential features of the sanitarium on the "cottage plan" rendered famous by Dr. Trudeau's work. It provides for a cellar, with plants for hot water, heat, coal-bins, pantries, and water closet for servants. The first floor (Fig. 7) offers a general sitting-room, dining-room, kitchen, bathroom with all the necessary appliances, two bedrooms, the nurse's bedroom and her office and consulting-room. Open fireplaces are provided, both for the sake of ventilation and for their cheerfulness.

The second-floor plan (Fig. 8) shows a scheme for four additional bedrooms for patients, and in the third floor, as shown by the side elevation, are rooms for the cook and chambermaid (Fig. 9).

The covered veranda around the southern and western sides on the first floor, and the open veranda on the second-floor, offer the best possible opportunities for that life of repose in the open air which is the essential

Figure 5.

point in the treatment, according to the open air plan. Lounges, reclining chairs, hammocks or camp beds are furnished to suit the tastes of the patients. The rooms should be wainscoted to a height of six feet and finished in plaster, and "moresco" for the rest of the walls and ceiling. The floors are best made of hardwood, oiled and polished, or else covered with linoleum, with a rug or two of some washable stuff. Electric light is the only form of artificial lighting permissible. The windows should be of ample size, and of the fashion that permits them to be raised and lowered, and in the same frame revolved on an axis, all of which movements are accomplished by the device known as Bolles' patent. The same revolving principle should be applied to the transoms, which occupy the upper three feet of the wall separating the two first-floor bedrooms from the central sitting-room. This scheme of ventilation permits the air to be changed constantly through the night, so that the same air is never breathed twice while the patient occupies the room, and it continues the fresh-air treatment even throughout the time the patient spends indoors—a most important consideration. No draperies or carpets are to be permitted except a small rug in the sitting-room. The sitting-room can be as handsomely furnished as may be desired. How homelike and cheerful such quarters can be made, even when complying

with the sanitary requirements mentioned, may be judged from Figs. 5, 10 and 11, which are amateur photographs of the sitting-rooms and bedrooms in several of the Adirondack Cottages. The daily routine of life must be ordered according to the precepts of experience.

I present the daily program of a patient in the Adirondack Cottage Sanitarium:

7:00 a. m., temperature taken while patient is in bed.

7:30, patient rises; sponge bath—cold or tepid.

8:00, breakfast.

8:30, patient reports at pharmacy or physician's office; while waiting can write letter and send it off in the 9:30 mail.

9:30, a stroll if permitted to exercise; or a drive, if not.

10:30, a glass of milk or an egg, or both; reads, studies or works until 12 m.

12 to 1, rest in a hammock or on a couch in the open air until dinner.

Dinner. After dinner, rest until 3:30, temperature taken and then extra nourishment given.

3:30, milk or egg, or both.

3:30 to 5:30, patient reads, studies, works, strolls or drives, according to strength and the doctor's advice.

5:30 to 6, patient lies in the hammock or on a couch in the open air.

Figure 6.

6:00, supper.

6:30, patient reports, if necessary, at the physician's office; sits or lies on veranda, or attends some form of amusement provided in the parlor or pavilion.

8:00, temperature taken.

9:00, extra nourishment, milk or egg, and retires.

Letter-writing is limited to the bare necessities of correspondence and is done only in the morning hours.

All forms of mental and physical exertion are forbidden so long as there is active disease, with elevation of temperature above 99.4 F., or other constitutional symptoms. The reading is selected to divert the patient's mind from his afflictions to more cheerful topics, and games are allowed, provided they do not involve any harmful exertion of mind or body. The social life in the Adirondack Cottage Sanitarium is a feature which strikes every visitor as unique. Knopf remarks especially on the gay spirit which prevailed when he visited the Sanitarium in 1896.

The food provided at the Adirondack Cottages is selected by the superintendent, Mrs. Julia A. Miller, from a long experience in such work. For breakfast: fruit, oatmeal, wheatena, "Pettijohn," beefsteak, lamb chops, bacon, eggs cooked in a great variety of ways—soft-boiled, scrambled, fried, poached, made into omelettes, etc.—brown bread, wheat bread, corn bread, muffins,

griddle cakes, etc. For dinner: a simple but appetizing soup, fish, roast or boiled beef, roast lamb, fowls prepared in various ways, cornbeef, vegetables, cabbage, tomatoes, potatoes cooked in an infinite variety of ways, beets, peas, beans, rice, lettuce, squash, asparagus; for desserts, ice cream, nuts, pies, puddings, custards, jellies, fruits. For supper: one hot meat, cold meats, white

Figure 7.

and brown bread, toast, some hot cereal food, baked beans, potatoes, eggs, preserved fruits, jellies, jams. Milk is furnished at the table at every meal, and is provided for each patient to take with him to his cottage for the between-meal nourishments.

Figure 8.

With the special symptoms that present themselves for treatment, I do not purpose dealing at this time. Suffice it to say that they are all treated with as little resort to drugs and from the most common-sense point of view that can well be imagined. Dr. Trudeau

Figure 9.

and his assistants practice medicine not by rule of thumb, but according to the dictates of a large experience, based upon a profound knowledge of the broad principles underlying all disease and its treatment.

Let me point out briefly what are the chief advantages of the plan proposed, 1, to the physician; 2, to the pa-

tient; 3, to the nurse; 4, to the family of the patient and to the community in which he has been infected.

The physician is enabled to keep his patient under his own supervision instead of intrusting him to a stranger. His patient remains a source of revenue to him, instead of dropping out of his practice, a consideration which has more or less force for every family practitioner. He is guaranteed by the presence of a trained nurse that each of his patients will get the best treatment possible, and that every rule laid down will be rigidly followed. This can not be said for any scheme which leaves the patient in the hands of his family. The family physician, moreover, gets the credit for the recoveries, which his early diagnosis, watchful interest and skill as a therapist have brought about. This contributes to his influence and future usefulness in the community and puts on him the necessity of keeping himself familiar with all the practical details of sanitarium treatment by which the best results can be obtained.

The trained nurse is freed from all those trammels which hamper her when she is trying to carry out the instructions of the physician in the face of the preju-

Figure 10.

dices and sympathies of the patient's family. Those under her care are placed in the situations most convenient for her manipulation, and the plans presented enable her to move a patient from any room, through a window cut down to the floor, out to the veranda, thus saving strength and facilitating work. The plan provides for the easy enforcement of every sanitary regulation, preserving the nurse and the fellow-patients from risk of infection. She, with the physician, has the most favorable conditions for herself and her patients. She shares in the just credit due for their recovery and wins that repute as a successful practitioner of her profession which is as dear to the nurse's as to the physician's heart. The patient reaps every advantage that could be gained at the expense of a long trip to some health resort, a trip which, in his weakened condition, may prove most unfavorable to his prospect of recovery.

The sufferer is under the daily supervision of the man he trusts most in the world, not of a busy stranger, whose few interviews with him are at best brief and con-

fined to professional detail. He is attended by a careful nurse, who gives him every care that her varied experience can dictate. He has gained everything, and practically lost nothing, by undertaking the course of treatment.

The patient's family and community are saved the danger of infection, are given an object-lesson of incalculable value in the curability of tuberculosis and in the sanitary precautions which are effectual in preventing its spread. They have preserved to them the presence and influence among them of one who is a bearer of the heavy burdens and responsibilities of family, business and social life—for it is just such leaders among men and pillars of the social structure who are most often seized by the jealous dragon Tuberculosis.

What would be the cost entailed upon each patient who takes advantage of my plan? To completely build and furnish such a home as that shown would, at this period of high prices for lumber, plumbing, fixtures and furniture, cost \$6000. The running expenses of the sanitarium must cover at least the interest on this. The

The objection has been made by persons with whom I have discussed this plan that, without the shock that comes to a man from the complete breaking off of all his business and social relations, and without the enforced separation from them entailed by a change of climate, few persons really in the incipient stage of the disease can be persuaded to place themselves under a rigid routine of treatment. This does not seem to me a valid objection, for even in those cases which come hundreds of miles to such a resort as Saranac Lake, the ties of home and business life remain practically unbroken, and the sense of anxiety and the worry are just as great, or even greater, than if the patient were nearer home and had daily reports from his family and business associates. And it happens only too frequently here that patients coming from other more or less distant points soon tire of the routine, and are without sufficient will-power to persist in the rigid treatment without the example of fellow-patients and the discipline of a nurse, and after a few weeks or months of futile and desultory effort, or of days and nights spent in saloons or poolrooms, return to their homes discouraged, and before long meet the unfortunate consequences of their ill-advised action.

Every hope of success in this plan, as in every plan for the treatment of tuberculosis, depends on the iron will and the consummate tact of the physician and the nurse

Figure 11.

following estimate for six months, based on actual experience, will represent fairly well the other features:

ESTIMATE FOR SIX MONTHS.

Interest at 6 per cent on \$6000.....	\$180
Services of trained nurse at \$50 a month.....	300
Coal for cooking, 6 tons at \$6 a ton (12 to 15 tons must be added for heating if the months be winter months)	36
Wood for open fireplaces, 10 cords at \$3.....	30
Electric light, \$5 a month	30
Hire of cook and maid, each \$15	180
Table supplies, at \$100 per month	600
Total for 6 months	\$1356
Total for 1 month	226

The plan provides for the accommodation of six patients. Thus the cost to each of the six patients per month is less than \$40. That is to say, at a cost of about \$40 a month, apart from the physician's fees, an individual can have all the opportunities offered by the sanitarium treatment for the complete cure—in 75 to 90 per cent. of really incipient cases—of pulmonary tuberculosis, without severing the ties binding him to his domestic, business and social life.

Cottage of Resident Physician, Adirondack Cottage Sanitarium, Saranac Lake, N. Y.

who have undertaken the task. Both of them will be obliged to study closely and deeply the methods pursued in the most successful sanatoria.

This leads me to a matter which has always been a source of wonder and dismay to me, namely, to find in my two years' stay here how few general practitioners ever come to Saranac Lake—in very truth, the fountain head of the rational theories of treatment in this country—to make a profound personal study of the methods actually in use here. These methods, as I have shown above, are daily offering, even to the untrained eye, the most striking illustrations of what can be done to combat tuberculosis, not merely in its earliest, but also in its middle and even later stages. I can point out any day on the streets of Saranac Lake a dozen—nay, a score—of cases who have come here in the last five or six years, and received the prognosis from even the most optimistic of physicians that death must inevitably ensue in four to six months, but who have in the face of his advice persisted in remaining here, and have been to all practical intents and purposes cured, and are now supporting themselves or their families by their daily exertions.

It is to me of profound significance that the one who hopes most in all these cases, and who is most loth to give up a patient, is Dr. Trudeau himself. He, more than any man in this country, has studied the possibilities of treatment and of cure in every form of pulmonary tuberculosis, and does not hesitate to-day to say that the more cases he sees, the less capable he feels of predicting what cases may recover.

THE SANITARIUM FOR CONSUMPTIVE SAILORS ESTABLISHED BY THE U. S. MARINE-HOSPITAL SERVICE AT FORT STANTON, N. M.*

J. O. COBB, M.D.

Passed Assistant-Surgeon U. S. Marine-Hospital Service.

There is a prevalent belief that the sailor does not have tuberculosis. Just because he is at sea breathing the purest air, we naturally think of him as having the greatest chance of escaping that dread infection. The public mind loses sight of the fact that the average sailor spends a great part of his life ashore, participating in drunken brawls, gambling in the vile holes underground in New York, San Francisco, Baltimore and all the large maritime commercial centers. The little time he spends in sleep when ashore is in sailors' boarding houses, usually filthy dives. In lieu of beds, there are rough bunks built in like a set of shelves clear up to the ceiling. Into these a little straw is thrown, and this is the bed of one man one night, and another the next, and so on. The straw is rarely, if ever, changed, and this is the only bed these poor fellows can get in these gruesome places. They need no covering, for the room is heated by the red-hot stove, around which some sit and smoke and play and drink the long night through. Such a place is awful to think about, and it is small wonder these men get sick; it is the greater wonder that every man so exposed is not rapidly infected with tuberculosis, for it is only reasonable to believe that all such places become infected in time. Then, too, it is easy to understand that one case may infect an entire crew at sea, on a long voyage, when the men are packed together like animals. The sailor breathes pure air only when he is on watch, but when he "turns in," his sleeping quarters are exceedingly bad—so bad that it is impossible to describe them adequately without subjecting one to the accusation of exaggeration.

We of the Service know that there are hundreds of consumptive sailors and our annual reports show that we have been losing on the average more than one hundred a year. Our experience has also shown us that all the cases that remain, eventually die; they drift in and out of the different hospitals, better to-day and worse to-morrow, and sooner or later serve as a necropsy study.

So it has gone for years. No movement which is purely humanitarian can be brought about without much talk and some sober writing. Officers talked and thought, but unfortunately this is usually what a non-political government officer is compelled to do—take it out in talking or writing, if he is so inclined. It is to the credit of the officers of this Service that they have ever been alert to the prevention, spread and proper control of the disease. The present surgeon-general, Dr. Walter Wyman, was the first in the Service to undertake to bring about the establishment of a sanitarium

for consumptive sailors. This was many years ago, when he was a junior officer, and his efforts met with little encouragement, and although unsuccessful he can properly lay claim to being a pioneer. He did not forget his early ambitions after he became surgeon-general, and it fell to his lot to be the instrument to consummate the establishment of a sanitarium for consumptive sailors.

In December, 1898, I was sent on an inspection tour through Arizona and New Mexico for the purpose of recommending a site for the contemplated sanitarium. It was thought that as the Army had been first in the arid region—and of course had selected the most desirable site—abandoned posts would best serve our purpose as fulfilling the requirements of large tracts of land, good water-supplies, and that the data published by the officers of weather and other conditions would be very valuable as a guide.

After careful examination in both territories, Fort Stanton was decided on as best suited for our purposes, specifically and generally. The weather reckonings made by the Army, together with special reports by its officers serving here in early times, showed mild winters with delightfully cool summers. It was necessary to have a station combine these two features or else have two stations, one at a low level for winter and one higher for summer, for otherwise patients at low levels would lose in summer all that had been gained in winter. With its undoubted advantage of climate, a generous water-supply, a large reservation, and with substantial stone buildings, it is an ideal site.

Fort Stanton is situated in Lincoln county, N. M., about six miles from Capitan, the terminus of the El Paso and North Eastern railroad. The elevation is 6126 feet. There are 38 buildings of various sizes, most of them being of native rubble stone. There is room for 200 patients, besides quarters for officers and attendants. Repairs are going on, and new machinery is to be introduced shortly. A modern steam laundry and a one-ton ice plant are now contracted for, and the plans and specifications are being prepared for an electric-light plant and extensive repairs, which will be commenced this fall. All the buildings will be made modern, and the appointments will equal any in the country. The laboratory will be conducted especially in the study of the disease. The apparatus for the purpose is already on the ground and is temporarily set up in an old building awaiting the repairs on the executive building, where there is to be a room set apart for this purpose.

There is a large farm and garden attached to the station. On the farm is being raised all the forage and most of the grain for the horses, milk cows, cattle and chickens. In the garden we have a source of pleasure not often found at such institutions. We have all the fresh vegetables needed and such vegetables as can not be bought in this vicinity.

Our herd of Jersey milk cows supply all the milk used at the station. While speaking of the cows it may be of interest to describe the method of dealing with the milk. We try to have all the patients follow as nearly as possible the method of taking milk described by Dr. Bulkley. To make this a little more perfect, it is necessary that the milk should always have a given percentage of fat, and to obtain this our milk is cooled immediately after milking and run through a separator. The cream will turn out about 20 per cent. (volume), and then this is added to skim milk to make it 20 or 25 or 30 per cent. of cream, as is prescribed by

* Presented in a Symposium on Tuberculosis, to the Section on Hygiene and Sanitary Science, at the Fifty-first Annual Meeting of the American Medical Association, held at Atlantic City, N. J., June 5-8, 1900.