

aware of the deficiencies in their buildings and equipments. They report that they have repeatedly asked for additional funds to rectify conditions, but in most instances with little result.

Laboratory equipment, both clinical and X-Ray, absolutely essential for a modern sanatorium, is likewise deficient. At present not a single sanatorium has an adequate clinical laboratory or an X-Ray outfit installed, but some provision is now being made for the purchase of X-Ray outfits. The occasional X-Ray examinations now made are done at outside laboratories. At Phoenix, these examinations cost seven dollars each. The clinical laboratory at Fort Lapwai was designed to be in connection with the drug room, a room without outside windows. At this sanatorium, space was provided for an X-Ray outfit in the basement of the hospital. The patients would have had to walk, or to be carried down a long stairway. Only the most insistent protest from a visiting officer against the recommendations of the Indian Office architect and the agency officers changed this location to the first floor. A large room on the first floor intended for dispensary purposes has been divided to accommodate this equipment when it arrives.

Approximately two thousand dollars has been allowed for an X-Ray outfit for this institution. This sum will purchase only a portable machine, better than nothing, but inadequate for the demands made upon such equipment in the modern sanatorium.

The Indian Service will have this year funds amounting to \$3100 to secure X-Ray equipment for the Fort Lapwai sanatorium. This is intended to purchase one unit.²⁴

Actinotherapy in the form of quartz lights has been provided in the Chippewa, Fort Lapwai, Sac and Fox, and Talihina sanatoria. This method of treatment has been long accepted as of value, especially in extra-pulmonary forms of tuberculosis.

Occupational therapy equipment is not provided, and dental equipment is usually supplied by the traveling dentist.

Grade schools are operated in connection with all these institutions. The personnel in charge is of no higher standard than that found in the boarding schools.

²⁴ Hospitals at Forts Browning, Peck, and Lapwai are receiving X-ray equipment from savings and not by special appropriation. The budget for 1929 is asking for five portable units at \$1600 each, and five standard with fluoroscope at \$3000 each.

Drolet, of the New York Tuberculosis and Health Association, in 1926, reports a questionnaire survey of tuberculosis hospitalization in the United States.²⁵ In this report, he states that in 177 institutions studied, the average cost of establishing a tuberculosis bed was \$3761. In the Indian Service the cost per bed at Talihina was \$766.66. Fort Lapwai and the Phoenix infirmary unit building costs in the Indian Service are lower than on the outside partly because labor and oftentimes materials are cheaper. This, however, does not account for all of the discrepancy. A casual comparison of Indian Service sanatoria with the average state, county or city sanatorium will reveal at once the very poor construction and equipment provided.

The expenditures made for maintenance of sanatoria and the average per diem costs are listed in the accompanying table.

Drolet, in the study mentioned above, furnishes information on this point for 198 institutions representing 32,073 beds. The average cost of maintenance per patient was \$21.60 per week for beds used, or \$3.08 per day. With this figure of \$3.08 may be contrasted the Indian Service figures of \$1.36 for sanatoria and \$1.95 for sanatorium schools.

Indian Service statistics showing per diem costs in sanatoria, 1926 and 1925

	Per diem 1926	Per diem 1925
Average	\$1.36	\$1.73
1. Fort Spokane	1.47	1.64
2. Laguna	1.36	2.48
3. Navajo	1.25	1.07

Indian Service statistics showing per diem costs in sanatorium schools, 1926 and 1925

	Per diem 1926	Per diem 1925
Average	\$1.95	\$2.26
1. Phoenix	1.82	1.31
2. Shawnee	3.12	5.75
3. Fort Lapwai	1.43	1.28
4. Sac and Fox.....	1.63	1.54
5. Carson	"	1.76
6. Choctaw-Chickasaw	1.77	1.97

^a This hospital ran only three months in 1925.

²⁵ *American Review of Tuberculosis*, December, 1926, XIV, No. 6.

The low cost of maintenance in Indian Service sanatoria can be accounted for in the following manner:

1. Salaries paid the superintendent and employees are lower than the average in other institutions. This is especially true in relation to other federal sanatoria.

2. The staff is always less per unit of patient population. This makes it necessary to have much of the service done by patients. The lack of order and cleanliness in institutions is doubtless a reflection of this same situation.

3. The lack of equipment to render reasonable service saves much money, but at the same time it results in inferior treatment. This fact, combined with that of limited personnel, is definitely reflected in the impermanence of results obtained with discharged patients. In the State of Washington, frequent comments were heard from tuberculosis workers not in the Indian Service, as well as from Indians, that the discharged patient from Indian Service sanatoria did not remain in an arrested condition of health as long as those from state and county institutions.

4. A difficulty that has existed in the past, but is not so prevalent now, is the authority the agency superintendents have exercised over administrative policies of the institution. Not appreciating the needs and requirements, they have ignored the pleas of the physician for additional employees, and insisted that sick children able to be up and around should devote their activities to some occupation or service about the building.

In connection with these figures it should be said that the many elements of cost, such as food, technical service, heating, repairs, special activities, and depreciation, should be higher in Indian Service sanatoria because of their location than in institutions more favorably situated. These items caused a wide variation in cost in the institutions studied by Drolet. He found the highest maintenance cost in federal institutions.

The physicians in charge of the Phoenix, Fort Lapwai, Sac and Fox, and Talihina institutions have all had some special training in tuberculosis work. The superintendent at Chippewa is taking a special course in tuberculosis this summer at Colorado Springs. The other superintendents have had no special training. For the most part, all these employees have been fairly permanent. The marked exception is at Pyramid Lake, where in eleven months of

operation, there have been seven physicians, and, as far as could be learned, only one of them was qualified for the position. Except at Phoenix, Sac and Fox, and Talihina, the superintendent is supposed to perform some reservation duties in addition to his hospital work.

The nursing personnel for all sanatorium patients is far below the accepted ratio of one to seven for bed and one to thirty for ambulant cases. Matrons not trained and frequently unsympathetic are often depended upon for nursing service. At Fort Lapwai a matron was punishing three tubercular boys by requiring them to take their afternoon rest on the floor in a draughty hall instead of in bed.

That the staff of employees as a whole is below that requisite to render approved service will be seen from the accompanying table:

Indian Service statistics showing employees in sanatoria and sanatorium schools, April, 1927

Class of institution	Bed capacity ^a	Total employees	Doctors	Contract doctors	Nurses	Others	Ratio per bed	Percentage deficiency (basis 1:2)
Totals ...	814	166	10	1	21	134	1: 4.9	59.23
Sanatoria	241	42	3	...	9	30	1: 5.7	65.14
Sanatorium schools	573	124	7	1	12	104	1: 4.5	56.71
Ratio per bed capacity	1: 4.9	1: 81.4	1: 81.4	1: 38.8	1: 6.1

^a Bed capacity is as of November, 1926.

If it is assumed that the actual use of these beds approximates 79 per cent in any one year, there was still a deficiency in all employees. The same factors must be considered in these figures as were outlined under Hospitals.²⁶

The conditions described above are sure to react on the results obtained with patients. All cases hospitalized are supposed to have some form of active tuberculosis, and the fact alone demands that the greatest care and precision characterize the treatment accorded

²⁶ See page 284.

them in the hospital. The inadequate care of the patients may be summarized as follows:

1. Patients often travel long distances by day coach and over land by auto to reach a sanatorium, a trip that in itself is inadvisable.

2. On entrance to the sanatorium, the patient is not given a complete and careful examination because the physician claims that he is usually so overworked that he does not have the time. Possibly in some instances initiative is also lacking. The available records in sanatoria do not indicate that complete examinations have been made. The physician in charge is further handicapped because of lack of X-Ray and laboratory facilities. The intelligent handling of tuberculosis cases depends, it should be added, upon the accuracy and completeness of diagnoses at the outset.

3. Frequent re-examinations are not uniformly a part of the routine in Indian Service sanatoria. The admittance examination is only a beginning. It is customary to make frequent re-examinations, depending upon the condition of the case in question.

4. Indian Service sanatoria have no segregation of bed space, nor sufficient personnel with which to assure the observation of cases in bed on admittance. On an average, from 40 to 50 per cent of patients admitted to sanatoria are in need of definite bed care for periods of time varying from a few weeks to months. Only the desperately ill Indians are accorded such care.

5. Insufficient personnel necessitates relying upon the patients to do a certain amount of manual labor. Although this practice is permissible in some cases no scientific selection is made in the Indian Service, and doubtless many patients are required to work who would be far better off in bed.

6. A large proportion of patients in these sanatoria are suffering from extra-pulmonary forms of tuberculosis that could be definitely benefited by actinotherapy, either by exposure to natural irradiation or the artificial quartz light therapy. Practically none of the former is being done, and not enough of the latter.

7. Artificial pneumothorax, an approved method of treating selected cases of pulmonary tuberculosis, is not being used in a single Indian Service sanatorium. The explanation usually offered is that the Indian will not remain once he feels his strength returning, and that no facilities exist for continuing the treatment when

he is discharged. Although there is doubtless an element of truth in both statements, this method has not been given a real trial. The Sac and Fox Sanatorium has been able to keep its patients on an average of 385 days. Much could be accomplished in that time, and it is not improbable that a longer length of stay could be secured if other facilities were available, such, for instance, as an up-to-date occupational therapy department. No well developed program of occupational therapy is being carried out in these sanatoria, important as it is, considering the economic condition of the Indians.

8. Treatment through exercise is not scientifically applied in the Indian Service sanatoria, for it requires an intimate knowledge of the case. Exercise properly administered has an important place in the treatment of tuberculosis, because it prepares the patient nearing an arrest of the disease to withstand the strain of returning to his ordinary life.

The medical records kept of patients reflect the general conditions described above. A careful examination of available records in Indian Service sanatoria shows that the forms on which to chart clinical data are meagre. Not a single institution maintains a complete case record of its patients. A beginning could be made by completing the present meagre forms but better ones are necessary for good work.

The very minimum standard record requirements include forms providing for the following data:

1. Social report
2. Medical history
3. Physical examination
4. Chest examination
5. Re-examination
6. Laboratory report
7. X-Ray report
8. Special reports (eye, ear, nose and throat, dental, etc.)
9. Temperature chart—graphic
10. Weight chart—graphic
11. Nurse's progress report
12. Physician's progress report
13. Physician's orders
14. Record of daily activities
15. Report to agency

In addition, a well ordered sanatorium keeps the following forms:

1. Statistical record of cases
2. Case summary
3. Pneumothorax record
4. Tuberculin record
5. Heliotherapy record
6. Occupational therapy record

Such records as were found in the Indian Service were generally on small cards, or often on a single form. The superintendent at Leech Lake was attempting to make use of form No. 5-353 used by the Indian Service. This form is defective because of its awkward size and arrangement. At Phoenix, the most complete assortment of record forms was found. The forms included:

1. Entrance examination
2. Monthly examination chart
3. History chart
4. Report of patient's condition

At the outset of this discussion, it was stated that the Indian Service was not making a clear distinction between the use of its sanatoria proper and its sanatorium schools. The sanatorium is an institution designed for the open case of tuberculosis. The sanatorium school, if it is supposed to fill the place of the preventorium, should take only the incipient and contact cases of tuberculosis. These are children who have been "contacts" in a home with tuberculosis or who are malnourished and in all probability are likely to develop tuberculosis if not given systematic care.

The prevalence of tuberculosis among Indians, their seriously defective dietetic habits, and their low economic standards would indicate that there are large numbers of children of this type who would be benefited by preventorium care. Unquestionably a fair percentage of children in the government schools would fall within this classification. At Tualip, for example, out of a population of 250 children, forty were found with evidence of latent or quiescent tuberculosis. The children at this school came from homes in which the disease was widely disseminated. The very poorly balanced ration served at these schools plays no small part in increasing their susceptibility.

No effort has been made to rehabilitate the Indian once he leaves the sanatorium. A person who has had tuberculosis, even though he may have achieved a quiescence of his disease while in the sanatorium, is not necessarily in a condition to be returned to his old life. In the white population nearly fifty per cent of discharged sanatorium cases relapse within two years. The Indian's inherently low resistance and lack of immunity and the deplorable home he often returns to would seem to require that he be carried under supervision for a longer period than the white to assure the permanency of the arrest of his disease.

Institutions of colonies established to meet this need in the general population make provision for teaching the patient some vocation that he can follow with safety. They include selected types of agriculture, poultry raising, certain building trades, clerical work, and other occupations found suitable. Indian handicrafts open a very wide field of activity for the Indian patient. These combined with other established occupations would make it relatively easy to meet the needs of the Indian patients.

The institutions used for this purpose are not of the sanatorium type. As the idea is to adjust the patient gradually to the conditions he must face at home, dormitories are used as a measure of economy. Cottages, however, would undoubtedly serve better, especially for the man or woman with a family, for thus the patient could live under more nearly natural conditions while carrying out the hardening up process.

In this type of work it is frequently necessary and desirable to provide for the family of the patient in which case a percentage of his earnings goes to cover the cost of family maintenance. This type of service is of course intended for the adult and does not apply to children who are in need of further schooling.

In time it is conceivable that small colonies will be built up somewhat similar to the colony at Coolidge, New Mexico, where for commercial purposes Indians are producing a very high grade of weaving and silver handicraft that has a ready market. It is assured and understood that such a project for the tuberculous should be under the direction of medical authority.

A discussion of sanatorium facilities in the Indian Service would not be complete without reference to their relative size and ability

to meet the needs in the Indian Service and the needs of the various reservations.

The accepted formula for estimating these needs is one bed for each annual death, averaged over a ten-year period. The most accurate figure obtainable for the Indians is an annual average of 1076 deaths for the period 1916-25. The sanatoria and sanatorium schools in 1926 provided a total of 814 beds, or 75.6 per cent of the number of deaths reported. On the average about 74 per cent of these beds have been used which indicates that approximately 55 per cent of the minimum needs were served.

The number of Indians admitted to state, county, and city sanatoria is unknown. Conferences with a few superintendents in these institutions would indicate that the number is small, although such service is available in many instances. The exact causes for non-use of such facilities is not known accurately, but it is believed that lack of funds plays no small part. Another cause may be the hesitation of the Indians to accept hospitalization in an institution in which there are no other Indians. Again, in the majority of states, the existing facilities are inadequate for the white population, and therefore little effort is made to encourage the Indians to accept hospitalization. This is well illustrated in Montana, with a total of 434 deaths from tuberculosis in 1924 and with 150 civilian beds, and 211 beds for veterans of the Army and Navy, including Indians. This latter group of beds serves many out-of-state cases. If all beds were used for Montana residents, a shortage of seventy-three would still exist.

Within the past year or so many requests have come from the various agencies to establish beds for the tuberculous on their reservations, either separately or in connection with their hospitals. Invariably they ask for small units of from ten to fifteen beds, hoping to care for all stages of the disease. They offer three arguments in support of this request. First, a serious need for isolation of the open case to prevent the further spread of the disease; second, the reluctance of the Indians to accept hospitalization off the reservation; and third, the belief that small units are more economical than large ones, which opinion apparently is based on their difficulty in obtaining appropriations in the past. The Indian Office apparently has a similar belief in this matter.

Such a solution of the problem is not deemed to be sound, and it is out of harmony with present methods of handling the tuberculous.

Tuberculous patients may be easily grouped into two general classes; the curable and the incurable. The curable case may be in the early or in a more advanced stage of the disease, but in either case it is believed that the patient will respond to proper treatment in a variable period of time and therefore will require a very different course of treatment from the incurable or terminal case. This latter type of case is hopeless, and consequently the most to be done is to make the patient comfortable and keep him from infecting others.

The sanatorium is first and last a curative institution, and requires many special facilities for the treatment of its cases, as well as especially trained personnel, whereas the terminal case can be cared for by the regular hospital service.

All the national health and medical agencies have for years recognized the advisability of hospitalizing the terminal case at the general hospital, rather than at the sanatorium. If the two types of case are placed in the same institution, difficulties at once arise. Frequent deaths in an institution will discourage the curable patients and in a short time cast a shadow over the institution, thus affecting other cases that should come in. This has been the history of practically every institution attempting to hospitalize all stages of tuberculosis. The accepted plan, therefore, has been a sanatorium for the curable case and isolation beds in general hospitals for the incurable. Of course, any sanatorium, no matter how carefully it selects cases will get some that are terminal, but the practice is not to take such cases if it can be avoided.

Sanatoria cannot be operated economically in units of less than forty or fifty beds. From this minimum up to 150 and 200 bed institutions, is found the greatest economy. Institutions of this size warrant the employment of a trained physician and the adoption of acceptable standards of operation.

The general belief that Indians cannot be induced to leave their reservation for sanatorium care has not been borne out by the experience at the Phoenix and Sac and Fox sanatoria. Both of these institutions draw patients representing various tribes from

long distances. At Sac and Fox the average length of stay has been somewhat over 385 days, and the superintendent reports that he has no particular difficulty in keeping patients as long as he wishes them to stay. With the Indians' appreciation of good treatment and a sympathetic understanding on the part of the hospital authorities, no valid reason seems to exist for contending that they would not accept treatment at a well operated sanatorium off their reservation.

To build small units would mean poor equipment and operation, a restricted service, and in the end, false economy. If, however, the small units proposed for general hospitals are to be used for advanced cases and for isolating terminal cases, the plan is good. A few general hospitals in the Service, such as Rosebud and Cheyenne River, could with a small amount of alteration or addition readily care for this type of case.

As the need for sanatoria is obvious, it will be well to illustrate the problem by a definite situation. An analysis of the deaths from tuberculosis on the reservations in Montana indicates that there are not fewer than one hundred per year; thus an equal number of beds is required. If these beds were divided among the six reservations, it would mean a number of small units each receiving a part-time service from the regular agency physician who is not trained in tuberculosis work. It would result in a mere repetition of the ineffectively operated hospital now in existence and little if any really constructive help could be rendered to the curable patient. It would not be as economical to employ six specialists for these units as it would be to provide two for a single institution.

On the other hand, allowing an average of five beds for isolation purposes at each reservation, need still exists for an institution of seventy beds, manned by trained personnel and properly equipped. A thoroughly modern service could be rendered in an institution of this size.

The idea of economy in building small units is erroneous. The prevention and cure of tuberculosis is not measured by the money spent in buildings, but rather by the results obtained with individual cases. Thus a multitude of small inefficient units in the end would result in greater loss of life and a questionable degree of isolation of cases.

Hiawatha Hospital for Insane Indians. One hospital for the insane is operated by the Indian Service. It is located at Canton,

South Dakota. It has the highest average use of available beds of any hospital in the Indian Service. For some time it has averaged approximately 100 per cent. In 1926 the average was 102 per cent.

The prevalence of insanity among Indians is not known, though the general impression is that such cases are proportionately less numerous among Indians than among the average white population. It is reported that some cases are hospitalized in state institutions. The constant demands made on the Hiawatha Hospital would indicate that there are many more than are receiving care.

At Hiawatha are two hospital buildings with several additional service buildings. The central portion of the main building contains the administrative quarters and the culinary section on the first floor, and the employees' living quarters on the second floor. The patients' quarters are in laterals extending from either side of the central portion, on the first and second floors. The basement contains the bakery and ample storage space.

The kitchen and dining room have tiled floors and are ample in size. At the time of the visit of the survey staff the range was out of order and the supply of kitchen utensils and of hot water was limited. A refrigeration outfit supplies ample refrigeration.

The bakery, located in the basement, was in disorder and the oven was in a bad state of repair.

The patients' quarters provide for males on one side and females on the other. The arrangement of these sections in all four wards is identical. There is one twelve-bed ward for adults and children; one eight-bed ward; and two one-bed rooms. The sanitary facilities for the twenty-two patients in each ward consist of two lavatories, two water closets, not enclosed, one slop sink, and one drinking fountain. Windows are screened with a fairly light weight iron screening attached and not built in. Equipment is confined almost entirely to iron beds.

The hospital building is located about fifty yards from the main building. On the first floor is a good sized dining room in great disorder. The club dining room for employees is located in the central section and to the rear. The patients' quarters on this floor consist of one five-bed ward with a porch and one fourteen-bed dormitory. On the second floor is the operating room;

its only equipment was two lavatories and a slop sink. On this floor are also located one five-bed porch, one four-bed room, and one twelve-bed ward. In addition, there were three employees' rooms. In one of the patients' rooms, two patients were sleeping on the springs of a bed placed on the floor. The sanitary facilities for each floor consist of one water closet, one lavatory, and one tub.

In this building males are hospitalized on the second floor and females on the first. Children were housed with adults, as in the main building.

The institution operates a farm of approximately 325 acres. The produce consists of the usual garden vegetables and feed for the dairy herd, which at the time of the visit consisted of eighteen certified milk cows. The milk supply is reported to be adequate for patients and employees. The dairy barn was very disorderly, due to the dependence on patient labor.

Water is obtained from two deep wells, the second of which has just been completed. Sewage is discharged directly into the Canton City disposal plant. The power plant and laundry are located in a separate building to the rear of the main unit. Both were in disorder.

The superintendent has a very attractive cottage near the main building.

Unfortunately the superintendent was away on leave at the time of the survey visit and the nurse in charge had arrived only a few weeks previously, so that it was impossible to obtain much information relative to patients. Later correspondence showed the following types of patients present in June, 1927, about one month after the visit:

Epilepsy	16
Dementia præcox	31
Imbecility	17
Constitutional inferiority	3
Idiocy	8
Senile dementia	7
Paranoia	1
Intox. psychoses	4
Manic-depressive	3
Undiagnosed	2

The length of residence was high, as is indicated by the following table:

One year or less.....	6
One to two years.....	5
Two to three years.....	2
Three to four years.....	1
Four to five years.....	15
Five or more years.....	65

Deaths for five years past were reported as follows:

1923	14
1924	2
1925	2
1926	5
1927	4

One birth occurred in 1926, the result of co-habitation between patients.

As stated previously adults and children are housed in the same quarters; only the more violent cases are segregated in single rooms. Cases of tuberculosis were reported in the hospital building, but no precautions were being taken to protect the other patients from them, nor were their dishes sterilized.

It was impossible to study the diet served patients, as no file of menus was available. On the day of the visit, it consisted of a stew of meat and carrots, with more fat and bones than anything else, thin apple sauce, bread, and coffee. Proper facilities, such as tables in ward dining rooms, and personnel to supervise the patients at their meals, were lacking. Several patients were eating from the floor.

Since the personnel in attendance is untrained and limited in number, the patients receive but a minimum of care. The first trained nurse for this institution was engaged in April, 1927. She received her training at St. Elizabeth's Hospital in Washington, D. C., and appeared to be very capable but bewildered at the responsibilities thrust upon her. This institution had twenty-four employees, including farmers, day laborers, and those engaged in caring for patients.

As in all institutions of this character, much of the manual labor about the place is done by patients who are able to work. Clinical records of cases in this institution are inadequate. It was impossible to obtain a complete picture of the case from the available notes. A monthly statement of the physical condition of each patient is sent to the superintendents of the agencies from which they came.

One case in particular was studied; a young boy sent there from Arizona. The facts in the case as presented in clinical notes and correspondence would indicate that the reservation superintendent was determined to have this boy hospitalized, despite the fact that the superintendent of the hospital reported repeatedly that he was not a case for this institution, as he had been unable, after several months of observation to determine any sufficient cause for hospitalization. At the time of the survey visit, correspondence was still in progress between the two superintendents and the Indian Office. It seemed obvious, however, that the agency superintendent was determined to be rid of this boy. This conclusion was strengthened after comparing notes with a member of the survey staff who had studied the facts of the case on the reservation from which the boy came. He was subsequently sent home.

Recommendations. 1. In the future far more study and planning should be done before hospitals are constructed.

The first point to be determined is the real need for a hospital in the general community. The established hospitals in communities adjacent to the Indian reservations should first be given thorough consideration. As eventually the Indian is expected to amalgamate with the local community, wherever possible he should use established hospitals. Such a procedure will prevent overbuilding and assure the patient the services of a well equipped hospital and good diagnostic treatment and consultation service. If no established hospitals are available, steps should be taken to ascertain whether the local white community and the Indian Service can cooperate in a plan to develop a hospital which will be of general service to the community, providing both the Indians and the whites with a service superior to that which either could secure if acting alone.

The second point to be determined is the proper location of the hospital with due regard to the community which it is to serve. How are patients, doctors, and nurses to get to it? How is it to get its supplies? These questions, if frankly faced, will generally avoid utilizing some isolated old buildings, improperly located for use as a hospital.

The third question is the size and design of the hospital. The size should depend on the facts obtained by the survey to show need and probable use. The design should be worked out by experts in hospital planning or by the utilization of the work of ex-

perts. Numerous sets of plans are available emphasizing interior arrangement and equipment. The Hospital Library Bureau, Chicago, Illinois, will lend such material without charge. The following basic requirements should be met in all new hospitals constructed and in those reconstructed: (a) Isolation rooms, (b) maternity wards separate from other wards with necessary sanitary facilities, (c) an operating unit providing separate room or rooms, depending on size of the hospital, for sterilizer and service equipment, (d) one or more rooms, depending on the size of the hospital, for laboratory equipment, X-Ray, and special treatment facilities, (e) one or more rooms to serve as physicians' and nurses' offices, and (f) preferably a separate examining room. Living quarters for the employees should be outside the hospital.

The fixed equipment in hospitals should be located to promote efficiency in its use and should be designed with a capacity equal to the demands to be made upon it. The ratio of fixed equipment to patients should approximate for lavatories one to six, for water closets one to eight, and for tubs one to ten.

X-Ray equipment, preferably stationary, should be installed in every well equipped hospital.

The rooms should be equipped with comfortable beds and mattresses and with suitable lockers and bedside facilities.

The fourth and final question to be considered in planning the hospital is the cost. If due consideration is given to the needs of the community as a whole the buildings should be permanent structures to meet a lasting community need. The material used should be reasonably fire-resisting and should insure a low maintenance cost. The cost should be accurately figured and the estimates presented to Congress. If the plan is to build a part at once and subsequently to develop the institution further the original plans should give enough detail to present the ultimate scheme. It is to be hoped that Congress will give careful consideration to the plan as a whole and will appropriate in accordance with it so that the facilities provided will meet community needs. The recommended Division of Planning and Development should insofar as possible work out arrangements for cooperation between the Indian Service and the state and local governments for a division of the cost in constructing and operating hospitals which will meet all local needs.

2. The personnel in hospitals should be materially improved. In hospitals of sixty beds or more the physician should be on a full-time basis and should be specially selected on the basis of his qualifications for this type of work. A graduate nurse should be in charge of the nursing activities in each hospital. The ratio of graduate nurses to patients should be one to ten. The number of assistants and other employees should be sufficient to bring the ratio at least to three employees to five patients. A competent cook, capable of preparing special diets, should be employed.

3. The per diem allowance for hospital maintenance should approximate that in other well administered hospitals. The figure in the Public Health Service hospitals is approximately \$3.71 and in general hospitals approximately \$4 per day. This increased expenditure should result in the serving of better food specially adapted to the requirements of the individual patients.

4. Some hospitals at present in use can be arranged to accommodate cases of tuberculosis by making available space now used by employees, by installing heating equipment and by increasing the hospital staff.

5. The Indian Service should adopt for its hospitals the standards established by the American College of Surgeons for accredited hospitals. These standards cannot be met immediately but they should be achieved in the course of a reasonable time, say three to five years.

6. As is the case in hospitals, the first sanatorium need is for a careful detailed study to determine the number of beds needed for the tuberculous. The basis for the computation should be the minimum formula of one bed for each annual death. The number of deaths should be averaged for a considerable period, preferably ten years.

7. Before the Indian Service itself undertakes to construct and operate new sanatoria it should determine the possibility of co-operative relationships with state or local institutions. Wherever possible it should utilize such institutions, even if it is necessary to use federal appropriations to pay the cost of having the Indians hospitalized in their sanatoria. The use of federal funds to assist in the expansion of their institutions would in some instances be justified if a fair coöperative agreement could be reached.

8. The existing figures indicate the need for a minimum of 250 sanatorium beds for Indians. A more careful survey would tend to raise rather than lower this figure, since it is based on incomplete reports of deaths from tuberculosis. Exactly where these beds should be provided should be determined by the detailed survey, but certain suggestions can be offered at this time.

At selected reservation hospitals provision should be made for incurable cases of tuberculosis. The number of beds required at the hospitals selected will probably be found to be from five to twenty. Space not now available should be made so by installing necessary equipment, by supplying employees with living quarters outside the hospital, or by other necessary action. In some cases small additions should be built.

For the care of cases believed curable, sanatoria of fifty beds or more, depending on the needs, should be constructed at those points in the several districts that will serve the greatest number most economically. The State of Washington, east of the Cascades, the State of Montana, and the Navajo country are three locations that, according to present data, seem desirable. The exact location should be determined with due consideration of accessibility to transportation centers, supplies, and medical consultants.

The needs of the Navajos require the construction of a thoroughly modern sanatorium of from fifty to seventy-five beds to be a unit in the proposed hospital center for that territory.

New infirmary units should be constructed for Sac and Fox, Talihina, and Chippewa.

9. In planning new sanatoria and in adding to existing ones the advisory services of specialized national organizations should be sought and plans should be carefully developed with due regard to needs. The plans should be carefully worked out to show costs and the data presented to Congress. As sanatorium planning and construction lends itself well to the expansion idea, funds may be sought first for the administrative and infirmary sections and later for the ambulant and semi-ambulant sections. It is hoped that Congress will insist upon the submission of detailed plans and statements for needs and that the practice of providing insufficient data will be discontinued.

10. The practice of salvaging old buildings and converting them into sanatoria should likewise be discontinued. In this connection

it is specifically recommended that the institution at Pyramid Lake be entirely abandoned because it is too remote for efficient administration and because most of the plant is not adapted for use as a sanatorium. The proposal to convert old Fort Simcoe into a sanatorium should be abandoned for like reasons. A sanatorium is needed in this district, but it should be at an accessible point and have buildings suited to the requirements. The present plan to provide an infirmary at Shawnee is also bad. An entirely new unit is needed and should be built in accordance with approved plans.

11. The equipment of all sanatoria in the Indian Service should be brought up to the standards of the American Sanatorium Association. All sanatoria should be equipped with X-Ray, clinical laboratory appliances, quartz light, pneumothorax, and material for occupational therapy. Indian handicrafts, such as bead work, basketry, and weaving, offer great possibilities for occupational therapy.

12. The personnel at the sanatoria should be materially improved. The medical director in charge should have had special training in the care and treatment of tuberculosis. If sanatoria have more than sixty patients an additional full-time medical assistant should be provided for each additional sixty patients or major fraction thereof. Each sanatorium should have as superintendent of nurses a graduate of a recognized sanatorium training school or at least of a general hospital. For the care of bed patients the ratio of nurses to patients should be one to seven, and for the care of ambulant cases one to thirty. At least 10 per cent of the bedside nurses should be graduates. A sufficient number of employees should be available to do the necessary work about the sanatorium. Patient labor should only be used when the physician certifies that the work required will be in no way injurious to the patient. The amount of such labor will be negligible.

13. The medical service at these sanatoria should embrace the following points:

- (a) Complete records on suitable forms
- (b) Complete history, X-Ray examination, and sputum, urine and Wassermann tests, within twenty-four hours after arrival
- (c) Re-examination every two months if patient is doing well, and at least every two weeks if doing badly
- (d) Visit to bed patients by physicians once daily

- (e) Visits to ambulant patients by doctor or nurse daily
- (f) Weekly weighing
- (g) Proper disposal of infectious material
- (h) Adequate consultation service
- (i) Careful regulation of activities in accordance with physical condition
- (j) Use of actinotherapy in suitable cases
- (k) Use of artificial pneumothorax in suitable cases
- (l) Provision for recreation, religious, and instructional needs

14. Appropriations for administration and maintenance of sanatoria should be raised to a point comparable with accepted practice. The average cost is approximately three dollars a day. The exact figure will depend in part on the degree of isolation.

15. The water supply at each sanatorium should be approximately two hundred gallons per day per capita. This supply will insure adequate fire protection but fire escapes should be installed on all buildings of two stories or more not yet so equipped. All chemical extinguishers should be recharged once a year and properly labelled. The water supply should be analyzed twice a year.

16. The sanatorium school of the preventorium type is recommended for the Indian Service. This type of school takes not the open cases of tuberculosis, but the "contacts" and the undernourished. The thorough medical examination recommended for boarding schools should indicate the need in these institutions. A thorough survey should be made of Indian children in public schools and in day schools, and provision should be made in accordance with ascertained needs. The educational facilities for children in sanatorium schools should be of as high a standard as is recommended for Indian schools in general.

17. The personnel at Hiawatha Hospital should be materially increased. A graduate nurse should be in charge of each building in which patients are housed. A sufficient subordinate personnel should be employed so that some one will always be on duty day and night in all wards or buildings. Additional laborers should be employed to supervise the operation of the institution farm and dairy and to keep them in reasonable condition.

18. Arrangements should be made at this institution for the segregation of (a) epileptics, (b) children, and (c) the tuberculous.

19. Material improvement should be made in equipment of this hospital. The kitchen and the bakery should be given special atten-

tion. A plentiful supply of hot water should be always available. For the less violent patients, tables and chairs should be provided.

20. A system of records conforming to accepted psychiatric practice in hospitals for the insane should be installed.

Health Conditions in the Boarding Schools. Of the seventy-eight government boarding schools and fifty-two mission boarding schools, sixty-four and thirty, respectively, were visited by one or more members of the survey staff. Certain fundamental data have been carefully compared and the following discussion is based on what may be considered the average conditions to be found in them, although, as has frequently been pointed out, variations between the best and the worst are wide and the best frequently have some weak points and the worst some good ones. For convenience of discussion, the subject will be treated under several headings.

Design and Capacity of Dormitories. Large dormitories are found almost invariably. Some have sleeping porches added to increase their capacity, usually at the expense of the light and ventilation of the inner rooms. Occasional dormitories have been built with some rooms for from four to eight pupils and a few have a number of small rooms for two. Some changes have been made in the design of these buildings since the first ones were built. The newer units show evidence of a more advanced knowledge of school construction.

The desirable cubage per child for dormitory construction is usually estimated at at least six hundred cubic feet. Indian schools in most instances fall far below that figure. The percentage of window space to wall space is low in Indian schools, and hence ventilation is often unsatisfactory. In some instances this is aggravated by the practice of nailing down windows in girls' dormitories.²⁷ The only sections assured of adequate ventilation are the porches, and generally they are not ideal, as several sides of the porch are exposed.

Heating facilities are often limited. Either the radiation surface is inadequate or the capacity of the power plant is insufficient. This applies especially to sanitary sections and dressing rooms and frequently to sleeping quarters.

²⁷ The Indian Office has taken steps to eradicate this practice.

The Washington office has requested all schools to install ventilators. They are boards inserted in the window frame to divert the current of air. In some instances they are adequate but in many they are not, because the arrangement of windows and the orientation of the buildings cause a direct and often strong draft directly over the child.

A few buildings are in use the safety of which is open to question. The outstanding illustration is the boys' dormitory at Santa Fé, which has been condemned for some time because of serious cracks in the main walls, but regardless of that fact the number of children housed in it has been increased. The steam boilers at this school are buckled, making it unsafe to carry a head of steam really sufficient to heat the radiators.

It was not possible in all instances to make detailed measurements of the dormitories to compute the cubage allowed per pupil. In one or two instances, fairly representative of conditions in the great majority of dormitories, the cubage was found to be very low. A series of such computations was made in schools in the northwest by the district United States Public Health Service officer. His report is in the Indian Office and reveals the same overcrowding. Viewing these dormitories at first hand, it was hardly necessary actually to compute this factor when in dormitory after dormitory beds were found very close together, often even touching each other.

This problem of housing is so serious that a few of the numerous instances should be mentioned. The Pipestone School has a new porch on the boys' dormitory which is said to give adequate space. This porch in itself is adequate, but in building it, a large dormitory was deprived of three windows, leaving only a single outside window for about thirty-five beds, which were separated from one another by only a few inches. The three windows between the new porch and the old dormitory are still in place, thus allowing at best the window space of one and a half windows. The inner rooms were very poorly lighted, and the air was greatly vitiated. At the Carson School the same porch idea was recommended for the boys' dormitory over the protest of the superintendent. In practically every instance observed where the capacity of a building was increased by sleeping porches, it was at the expense of the

inner rooms.²⁸ The building at the Carson School was in such a bad state of repair and was so poorly arranged that the greatest real economy would have been effected by replacing it entirely. Furnishing a sharp contrast to this dormitory were the very modern horse and dairy barns. Such contrasts are not uncommon in the Indian Service. The farm buildings are often of recent construction and of most modern design. At Santa Fé, twenty-five thousand dollars was put into a gymnasium, although as has been pointed out the boys were housed in a building that had been condemned.

The overcrowding of rooms with beds is not the only problem. In a few instances, two children were in a single bed, not because they preferred it to keep warm during the cold nights, but because no room was left to place additional beds. A single instance might have been excused but in one case as many as thirty children were accommodated two in a bed.

Every available space that will accommodate beds is often pressed into service. Thus children are frequently quartered on attic floors, in closely placed beds, with the same lack of light and air. Not infrequently in these attic dormitories the fire hazard is serious. In a school recently renovated, for example, approximately seventy girls were quartered on the third floor of a building of temporary construction. The only fire escape for this floor was located off a store room at the rear of the building. The entrance to this escape was securely locked and the matron kept the key. In case of a fire coming up the stairway, it would be impossible for these girls to escape through the windows onto the roof. Locked fire escapes and nailed windows were sometimes found in girls' dormitories. The explanation offered was that such measures are necessary to keep the sexes separated. At some schools this is not done, and the matrons, who are usually of a higher type, do not report any particular difficulties in controlling the situation.

The state of repair of these schools has rapidly deteriorated yearly, due to their inferior type of construction and the fact that sufficient funds for upkeep have not been available. At present several of them are apparently beyond the state where a reasonable expenditure could restore them.

²⁸ Porches have, of course, been built as an economy measure. The cost of construction is much lower than in the case of dormitories.

The question of fire protection is a serious matter in these buildings because practically none are of fire resisting construction. Stone or brick outer walls offer very little protection to wooden roofs and interiors of frame. The condition is made more serious when stoves are used for heating purposes and when the buildings are of more than one story.

Fire fighting facilities are frequently inferior. Not all schools have an adequate water supply or water storage facilities. Fire hose outlets with hose on reels are not available in all buildings. The chemical extinguishers provided are not always sufficient in number, and infrequently they are not tagged to show the date of last recharging. Several were tested and a few were found dead. While fire drills are required of all schools, in some they are not routine.

The main sanitary sections are usually located in the basement of the dormitories, making it necessary for the pupil to go down from one to three flights of stairs at night as well as in the day time.

Many dormitories, especially those occupied by boys, are not provided with night toilets on the upper floors. These facilities on the upper floors are generally locked during the day. The Indian Office reports that the present plans will provide more toilet facilities on upper floors.

The main sanitary sections in the basement are as a rule poorly lighted and ventilated and are rarely sufficiently heated. The floors are usually made of cement frequently not so laid as to insure quick drainage. The conditions are often unsatisfactory, though girls' sections were almost universally in better condition than the boys'.

The equipment found in many of them is old, and rarely is each piece of equipment in working order. Leaky faucets and water closets are common, causing great waste. In an extreme instance only two water closets were found in order for eighty girls. All other equipment was clogged and in some instances overflowing onto the floors. The explanation was that the engineer was also the athletic coach and the team activities were always given preference. This situation was the worst seen, but in practically all dormitories one or more toilets were out of order. This constant trouble is caused partly by carelessness on the part of the pupils but much more by the nature and age of the equipment, which is diffi-

cult to keep in repair. The flushing device in the boys' building at Haskell could only be operated by the use of some strength, a fact which probably explains the conditions found there.

About half of the sections visited were without toilet paper. Much toilet paper is wasted, especially by the boys, and frequently it is used in lieu of towels.

Facilities for washing face and hands are often of the trough type. In some places the water is obtained through spigots and in some through a perforated pipe controlled by a master valve. The faucets were often leaky and in a few instances entirely out of order. The perforated pipe method is often unsatisfactory, as water is sprayed over the floor as well as in the trough. In some instances, the hot and cold water faucets alternate, but this makes it difficult for any single individual to obtain the right mixture. The children frequently overcome this difficulty by plugging up the waste pipe and then all washing together in the same trough, despite the prevalence of trachoma and impetigo.

Shower baths are far more numerous than tubs. The latter are seen most frequently in the girls' sections. They are generally in rooms adjoining the regular lavatory section. The floors are of cement and hence cold, except in warm weather. These sections are often kept locked and are opened for use on specified occasions. Thus where the ratio per unit of population is low, the child has but one or two baths at the most during the week. At Sherman these quarters are open practically all the time and they are used freely. As a result, the children are cleaner, and this is reflected in the clean bed linen seen.

The bath sections often have no dressing room facilities. In some cases a long bench is provided, but rarely ever hooks on which to hang clothing. These are essential.

Hot water for washing and bathing purposes is in most instances supplied by an individual heater adjoining the bathroom. These units are as a rule small for the demands made on them, and that fact has something to do with the personal cleanliness of the children, especially of the boys working in the shops and needing warm water and soap to remove grease and grime.

Soap was rarely immediately accessible. In only a few instances was liquid or powdered soap seen, and the supply of ordinary hand soap, if any, often consisted of but a few thin pieces. The Indian

Office reports that it is negotiating for liquid or powdered soap and containers. This form of soap is the most sanitary and is highly desirable.

The Pullman towel system has been installed in nearly all schools, but its effectiveness varies. Apparently about as many towels are used improperly as are used properly. The explanation of misuse is generally the limited supply of towels, necessitating the issue of one to each child either daily or at the designated wash periods. If a child wishes to wash between periods he must make a special request for a towel, which involves the problem of locating the matron, or use available soiled towels, or toilet paper, or nothing. The laundry may be so crowded with work that the soiled linen cannot be laundered properly, thus causing a shortage. In a few wash rooms piles of soiled towels were seen which had been there for boys. Practically all towels supplied, except the bath towels, are too small, being little larger than a man's pocket handkerchief. The containers are frequently not locked, thus permitting the child to take a soiled towel if clean ones are not at hand.

The reason usually given for not having clean towels available at all times is that the children resort to towel fights and in other ways abuse the privilege. To control the children, especially the boys, in the use of towels, is admittedly an educational problem of considerable difficulty, but it is not to be solved properly by keeping towels away from them. Since hardly any Indian school is without cases of trachoma and impetigo, both contagious, the use of towels has an important bearing on the transmission of disease.

Tooth brushes are supplied usually by the school, though in some cases the pupil is required to purchase his own brush, if possible. This is a responsibility rightly belonging to the child, but if he cannot purchase a brush, the school should. Apparently the same brush serves for a long time, as the majority appeared much used. A tooth powder is supplied in one can for all children, unless the pupils can purchase individual tubes. This practice is unsanitary because many brushes come in contact with the top of the can. In some schools, the children keep their tooth brushes in their individual lockers, a plan much better in principle than the hanging of dozens of brushes according to numbers on a rack, even though the rack is screened and the rows are staggered to prevent contamination by dripping.

In the smaller schools the lockers provided for the personal effects of the child are generally extremely small.²⁹ In fact they ordinarily afford only space for one change of clothing and a few odds and ends. Suits are frequently hung on the walls in the rooms. The uniform rooms provide long racks for the regulation school regalia used on dress occasions. In most small schools the locker space is in the basement, poorly lighted and ventilated. The small lockers are generally constructed of wood and many do not have ventilation, an important matter especially for the boys who do fairly heavy manual labor in the shops or on the farm.

In the larger schools the arrangements, especially for the higher class students, are generally much better. Many times in rooms for two boys a small closet space is provided. The new boys' dormitory at Chemawa makes excellent provision for two boys to a room, with ample locker space.

The Indian is often criticized for not accumulating possessions. His lack of this trait is cited as an indication of his general improvidence, and unquestionably his lack of desire for possessions is one of the factors in making him content with a very low standard of living. Certainly the boarding school is making no attempt to change this condition. The Indian boy in a typical boarding school could not possess much more than the clothes on his back, because there is no place to keep other things.

The pupils sleeping in large dormitory rooms and porches either dress at their beds or use a community dressing room. These dressing rooms are usually situated in the basement and are rarely sufficiently heated. As a rule the furniture consists of long low benches and lockers.

Recreation rooms are generally in the basement and contain the very simplest equipment, such as benches around the walls. A few, especially in the larger schools, have some equipment. Some of these rooms have chairs, tables, pianos, games, and phonographs, but they are not the rule. The well equipped rooms are sometimes set apart as "parlors" and not freely used by the children. The rooms at the boarding school at Keams Canyon are a noteworthy

²⁹ The Bloomfield School in Oklahoma is a notable exception. There ingenious provision has been made to give each girl some space and equipment which she can regard as her own. The new dormitory for older girls at the Sequoyah Orphan Training School in Oklahoma offers another sharp contrast to the typical small school.

exception. The Santee mission school and the Bloomfield school make much better provision for the housing of these children than is generally found in Indian schools. At Santee, though the buildings are old, there is considerable privacy for the individual.

Quarters for matrons, usually small and very simply furnished, are generally provided in the dormitories.

Kitchens are located either in a section of the dormitory building or, as in larger schools, in separate buildings. They are usually of adequate size, although in some instances, such as Tulalip, Sherman, and Warm Springs, they are very small and crowded. In many places not enough attention has been paid to lighting and ventilation. A new dining hall and kitchen has recently been built at Chemawa. The plan is good, but the arrangement of the equipment in the kitchen might have been improved by placing the steam cookers and canopy against a dead wall rather than against the few available windows. Storage space for a day's or week's supplies is often insufficient or is located at a distance. Refrigeration is secured principally from natural ice in large chests or from a brine machine. Leupp and Warm Springs have no such facilities. Garbage is put in containers and then fed to the hogs. More thorough provision for screening should generally be made, and the cans and the immediate vicinity more carefully cleaned.

Kitchen equipment is rarely good. The ranges supplied are almost always of sufficient capacity, but time and again they were found in a poor state of repair, making it difficult to prepare food properly. Wash tubs, wash boilers, lard pails, and such makeshifts are utilized when steam cookers are not available.

Soiled clothing is often worn by the employees and school children in the kitchen. No regulation uniforms are supplied for or required of these employees.

Several large schools are still using hand methods for dish washing. The mechanical equipment in some schools is old, and in many instances where such equipment is found the supply of hot water is limited. Boiling water is rarely available in sufficient quantity and the efficiency of the work is questionable.

The dining rooms usually accommodate the entire pupil population, often with considerable crowding. The lighting and ventilation factors vary, but on the whole may be said to be fair. The tables are generally of wood, some finished and some unfinished.

Some have linoleum tops, some metal, and some are covered with table cloths which are often unreasonably soiled. Stools or benches are generally used for seats. Food is served either in china dishes, enamel ware, or aluminum. The former is of the heaviest hotel type and the second frequently chipped. As a rule all food served is eaten from a single plate. Serving dishes are provided. Cups or glasses are generally provided for the coffee, cocoa, or milk.

The bakeries are usually in rooms separate from the main kitchen. At Keshena the bakery is in the basement. The equipment ordinarily is a large rotating oven or ovens of the army or navy type. Electric ovens are used at Carson City and Keshena. The oven at Rice School was purchased as a matter of economy. Bids on a good brick oven were only fifty dollars higher than the cost of the discarded navy oven the Indian Office authorized the school to purchase. Within two months the fire bricks collapsed, destroying the efficiency of the oven. The bread from this oven was burned, top and bottom, and soggy in the center. Poorly baked bread, however, is a distinct exception. At practically every other school visited the bread was examined and found well baked.

The clothing worn by the workers in the bakery is open to the same criticism as has been made of that worn by employees in the kitchen.

The permanent employees in the kitchens and bakeries are not required to take a physical examination. Some of the pupils working in these places were observed to have impetigo or other skin disorders.

Other Buildings. Next to the dormitory, the student perhaps uses the school building more than any other. As a rule, the school rooms and buildings have not been planned in accordance with the best practices in white communities. In only a few could the lighting and ventilating be given a high score. A large number of schools still have non-adjustable seats. In the few schools where adjustable seats were found, no effort was made to adjust them because adjustment is regarded as impracticable under the half-day plan of instruction. Two or more groups of children must use the same classrooms, and therefore some seats would have to be adjusted twice daily.

The majority of the classroom buildings are not provided with sanitary facilities. The Indian Office reports that it is now setting

standards on classroom orientation, paints, light, and ventilation that will conform to the accepted standards.

The work shops are usually old buildings, not well lighted and ventilated. The one thing in favor of the children is the fact that large classes are not the rule.

The laundry is an important feature of every government school. It is one of the chief sources of labor for the pupils. With approved machinery, adequate space, and a capable laundry operator, a much greater volume of work could be handled in less time. The space allotted to the laundry is often small. At one large school this fact is capitalized. The superintendent reported that he can get much more work out of the children if he keeps large piles of laundry before them. An inspection of the plant verified his statement. A number of small children were literally hidden behind great piles of wet laundry in a greatly overcrowded room filled with steam.

The equipment in laundries is often old and in poor repair. The mangles are generally single-roll affairs, requiring three to four times the necessary labor in doing flat work, and requiring hand ironing for the very simple dresses and skirts worn by the girls. This work could be more easily and rapidly done by machines, thus freeing the children for other activities of greater educational value. The seriousness of the situation is increased by the antiquated methods used in applying power. Big drive-shafts and belts are fairly common. The machines are by no means universally safeguarded and, as a consequence, reports of accidents are fairly frequent, although fortunately most of them are minor.

The only really modern laundry equipment seen in operation was at the Phoenix School, but modern equipment has been purchased for the new Burke School at Fort Wingate. Practically all machines at Phoenix were of late design, operated by individual electric motors, thoroughly incased, thus rendering accidents practically impossible. This outfit could have been improved had a greater space been provided, making it possible to arrange the equipment in the most efficient order, but if every school had a similar outfit adapted to its size, a great improvement would be achieved.

One other building at boarding schools has a direct bearing on the health of the child; the dairy. Usually dairies are the most

modern buildings on the place and are well kept. Occasionally this is not the case. At Sherman, the dairy barn and its surroundings are old and very poorly kept.

Several dairies have milking machines, but the bulk of this work is done by hand, and in some instances the same detail of boys is kept on for the entire school year, although this work requires very early rising. Almost all dairy details include a few very small boys.

The milk rooms are usually screened and kept clean. An adequate supply of live steam or boiling water is not always available to sterilize pails and cans. No pasteurization or bottling plants were found in any of the schools. Milk is conveyed in large cans and served from pitchers to children at the tables.

The size of the dairy herd varies. As a rule the number of fresh milk cows is insufficient to supply an average of a pint of milk a day per child for cooking and drinking purposes, though in a few exceptional instances the supply averages a quart a day. Several herds are accredited and in only a few instances was a dairy herd found which had not been tuberculin tested or was not reported to be tested regularly. In no instance was chemical or bacteriological examination of milk reported. A good herd and large production were always found where school and agency officers were thoroughly interested in this most important need of the Indian children. The conclusion is drawn that all schools might have had better milk supplies had the local officers been more keenly interested in the problem.

Some schools, Tulalip, for example, were operating their dairies very efficiently. When the children are away during the summer vacation, the excess milk is sold to local commercial dairies and credit taken for butter to be used during the coming school year. This procedure is most commendable, though not possible in schools at long distances from commercial centers. Butter or cheese, however, could be made during the summer months to be served during the coming school year.

Water Supplies. The source of water depends upon the locality. Springs, rivers, and deep or shallow wells are used. In many instances, the least expensive method has been resorted to, not always after due consideration to the potability of the water. Practically every school has a large steel storage tank for surplus supplies. The pumping plants are ordinarily not automatic. The volume of

water needed is perhaps greater in these schools than in similar institutions outside the Service, because of the serious fire hazard combined with the personal needs. Some schools report a shortage at certain seasons which could be obviated in some cases by increased storage facilities and in others by larger production. The minimum average needs are not less than seventeen gallons per capita per day.

The Public Health Service is now rendering the Indian Office a splendid service at nominal cost by surveying many of its school water supplies and submitting reports and recommendations for their improvement. Contamination was found in several instances.

The local state boards of health analyze water supplies gratis. In some places complete files of such examinations are kept, in others not. It is exceptional to find a school having such analyses made at regular intervals each year. The methods of treating polluted water supplies are, on the whole, inefficient. The best plant was seen at Fort Belknap, Montana. At the Orphans' Training School at Tahlequah, Oklahoma, the water is at present taken from a shallow well which is lower than the point of discharge for effluent from the sewage disposal plant. The analyses of this water supply have always shown *B. coli*. An appropriation for a new well was included in one of the urgent deficiency bills which failed at the last session of Congress. The work of providing a new water supply for that school should be rushed as the present methods of treating the water are bad.

Sewage Disposal Systems. In a few instances sewers are connected with local city plants, but at most schools a septic tank is provided. Several of them are defective for one or more of the following reasons: (1) The size is inadequate, as they were built for a much smaller population than is now cared for and have never been enlarged to meet present day demands; (2) the type of construction is not always good; (3) some are not cleaned frequently enough; (4) their efficiency is in many cases reduced by the large volume of laundry water passing through them; (5) the effluent is often emptied directly into streams or on the surface, as at Chemawa.

This most vital problem is also receiving the attention of the Public Health Service engineers, and there is promise of considerable improvement in the future if the Indian Service is allowed sufficient funds to make the necessary corrections.

Recreational Facilities. Playgrounds and their related activities are not given their due place in the programs of the school children. Some agency officers believe that the child's surplus energy should be expended in some productive labor. Consequently the playground area and equipment is often curtailed. Greater stress is placed on teams than on individual pupils, and as a result the provisions for individual play and recreation in Indian schools are far below the standards in our public schools.

A thoroughly trained physical education director is rarely found at any of these schools. The efforts of the few persons really interested are devoted chiefly to the few eligible for teams without proper cooperation with the medical officer. A few instances were encountered where boys had been advised by the physician not to go in for strenuous athletics, and the doctor's advice had been ignored.

Gymnasiums have been built at many of the schools. Several schools located in cold climates or where rainfall is excessive, remain in need of such facilities. Several of the gymnasiums can be rated very high; for example, the new unit just completed at Genoa. The most recently completed gymnasiums are ample in size, but more consideration should be given to the provision of sanitary facilities and shower baths.

The large non-reservation boarding schools have some form of athletic field. The one at Haskell is the most pretentious of all. A vast amount of money was put into it, so that it presents a marked contrast with the living and working quarters provided for the children. A far more splendid memorial and contribution could have been made to this school if the same amount of money had been used to reconstruct the living quarters.

Care of the Child. Thus far an attempt has been made to picture in a very sketchy manner the multitude of difficulties inherent in the average Indian boarding school from the standpoint of the child's environment, not including personnel. The most important factor, however, is the care of the child. With intelligent administration and supervision of a school, it is often possible to overcome to a degree very inferior accommodations and equipment, though in many Indian boarding schools it could not be accomplished under present conditions. For example, nothing will correct overcrowding except providing additional space or restricting

the number of pupils. Adequate sanitary facilities are dependent upon good equipment. A proper balance in recreational, school, and labor activities is dependent upon space, equipment, intelligent personnel, and a proper apportionment of the child's time.

Obviously one of the most important items in the care of the child in these schools is the food supplied, and yet in many if not most schools it was found to be limited, not only in variety but also in amount.

The average allowance for food per capita is approximately eleven cents a day, exclusive of the value of food secured from the school farm. The amount from the farm varies greatly. It permits a few schools, a very few, to approach a reasonable standard.

Generally speaking, however, the children are not given a balanced ration, and in some instances the food supplied is actually insufficient in quantity. At Rice School, to cite an extreme example, the average amount spent for food was nine cents a day. The dietary was examined at first hand for three successive days, and it was obvious that the children were not receiving an adequate amount of food even of the very limited variety supplied. Malnutrition was evident. They were indolent and when they had the chance to play, they merely sat about on the ground, showing no exuberance of healthy youth.

Sherman Institute gave the greatest variety and spent more for food than any other school studied. The daily expenditure at this school was eighteen cents per capita, which included the annual estimate allowance and a fair market value for all fruit produce and milk taken from the school farm. Even with the facilities they possess for raising early crops, their dietary was still faulty.

As a specified appropriation is made for all schools on a per capita basis, regardless of the location of the school or the difficulty encountered in supplementing the supplies furnished on annual estimate by local production, it is easy to visualize the state of affairs that exists at schools in the far north, or on the desert. A matter of this sort cannot be handled by a standardized per capita cost.

At several boarding schools visited the officers in charge would offer the explanation that Indian children do not like vegetables, milk, eggs, and other articles of diet, because they never have them at home. A child quite naturally does not like a thing he never has

had. Tastes for certain foods must be developed. It is just as much a responsibility of the boarding school to teach the child to appreciate a proper dietary as it is to teach him reading, writing, and arithmetic. It is true that dietary facts are generally taught in the school room, but this effort at formal instruction is more than counteracted by the daily meals placed before the child. What is the use of telling a child he should eat fruit, vegetables, and milk, when some of them are never available, and teaching him that he should never drink coffee when coffee is regularly served in the dining room? It is gratifying to note that in the few instances where a more abundant supply of milk was available, the children for the most part drank it freely. At Sacaton, the supply of butter is more abundant than at any other school, and the children used it in large quantities.

Considering the extremely small allowance made for food, it seems unnecessary to go into an elaborate analysis of the various food elements now served. It is enough to say that in general the dietary is excessively high in starch and meat, stews, and gravies. In the majority of schools milk, milk fats (butter, cream), fresh vegetables, and fruits are served either not at all or in very small quantities. Where fresh vegetables and fruits are served, they are generally limited in amount and are available only during the seasonal periods.

A small allowance is made each school for the purchase of food in the open market. This allowance is so small that purchases often must be confined to the needs of the hospital. At Tulalip the fund was exhausted at the end of four months, although forty children reported as having tuberculosis were in need of a better diet than that served in the regular dining room.

Supplies are generally purchased on the lowest bid and often a very poor grade of foodstuffs is secured. Unroasted coffees are supplied, and at most of the schools the only means of roasting is the ordinary oven or the top of the stove.

The milk supply has already been discussed, and little need be added here, except to say that the dairy herd is frequently too small to furnish an adequate supply of milk. Production figures for the dairy herd are unsafe indices, but they furnish the only information as to the amount of milk provided. In only a few schools are the dairy herds large enough to raise the average above a pint

a day, and in many instances the supply is much lower. The dried milk powders are rarely used. Where the fresh supply is limited they could materially improve the present diet. The Indian Office reports that it is extending the use of this product.

The preparation and service of the food supply often leaves much to be desired. The qualifications for cooks are so low that almost any one capable of the simplest operation can meet them, although the work requires mass production. Hot foods are seldom eaten when hot. At nearly all schools the food is placed on the tables before the pupils enter the dining hall. The children march in. Each one stands at his place. A bell or triangle rings for absolute quiet. A blessing is repeated. The children then sit down and at last the bell is struck that permits them to begin their meal. By the time these formalities are over, the food has been standing dished up and waiting in serving dishes on the table not less than five minutes and frequently fifteen. Several minutes are taken to serve it to the individual children, which is usually done by one boy or girl seated at the end of the table, although at some schools several serve, or the service dishes are passed. By the time the child gets food it is luke warm or sometimes even cold. The additional food supplies have usually been emptied into wash tubs or other large containers and are hurried to the tables by boys or girls detailed for the purpose.

In some schools the child must maintain a pathetic degree of quietness. In fact, several matrons and disciplinarians said that they did not allow the children to talk. The loud laughter and incessant din of young voices heard three floors above the dining room at the St. Francis Catholic School on the Rosebud Reservation was in attractive contrast. At Chemawa the children are seated in what are termed "family groups." At each table are boys and girls of different ages, with a big boy at one end and a big girl at the other. If brother and sisters are in the school they sit together. Here the children talk freely, although the bell is sounded as a caution if the matron thinks the noise too great. This arrangement seemed to the survey staff far better than that usually found. In some schools the segregation by sex and age is carried out so meticulously that one table in the boys' half of the dining room contains the smallest boys in the school, and a corresponding table on the girls' side contains the smallest girls. Frequently these little

ones can scarcely manage the heavy pitchers and serving dishes. The youngsters charged with the duty of serving the others struggle manfully and get through this task after a fashion, though sometimes a six or seven year old child cannot make a satisfactory distribution of the food. Many school authorities have recognized this fact, and although in the main they adhere in the dining room to a fairly strict classification by age and sex, they have placed one or two older children at the ends of the tables for the little folks to attend to the service, always with due precautions in the separation of the sexes. The older girls at these tables take a very motherly interest in the little girls. For the older boys it may be said that they serve the little boys with far more accuracy and dispatch than is the case where the little ones serve themselves, although sometimes a complaint is heard that the big boys reserve the best for themselves. The dining room employees so far as could be observed gave no close or particular attention to service of the smaller children.

Recently an attempt has been made to analyze the dietary provided these children. As a result, the Service has asked for an increase in food allowance to bring the average to about thirty-five cents per capita per day. No attempt should be made to establish a uniform standard figure. Thirty-five cents a day will probably suffice, however, at the more favorably located schools, but will be inadequate at those less favorably situated. This problem can be handled successfully only by providing to meet the needs that exist in each school.

Some may contend that the poor diet served the Indian children is adequate because so many of them are at or above the normal weight, as computed on the standard height-age tables. To the student of nutrition the weight of a child is but one of the many factors to be taken into consideration in evaluating his nutrition. The Indian child, long subjected to a diet with an excess of starchy foods, frequently has a flabby, unhealthy fat that is sometimes mistakenly assumed to indicate good health. On stripping the child the body is mute evidence of the fallacy of such an idea. The winged scapulæ, pot-belly, stooped shoulders, and the general lack of tone and healthy color in the skin give unmistakable evidence of malnutrition. The Indian child frequently suffers from diseases

influenced by a deficient diet, notably tuberculosis and possibly trachoma.

At this point mention should be made of a most commendable effort made at the Nespelem public school. The agency superintendent constructed a small lunch room on the public school grounds. The equipment was just sufficient to meet the needs. A capable cook was engaged to prepare a luncheon each school day for an average of forty-seven Indian children. A well balanced meal was being served at an average of about thirteen cents per capita, more, by the way, than the average daily allowance for three meals at the boarding school. The noticeable thing in this school was the marked difference in the physical appearance of the Indian and white children. The latter were very definitely malnourished.

Daily Activities. It is commonly reported by Indian school authorities that the children come to them at the beginning of the school year in an emaciated and run-down condition and that it requires weeks and sometimes months for them to "pick-up." Unfortunately, many do not "pick-up," as is indicated by the malnutrition and tuberculosis seen late in the school year.

The part that diet plays in this situation has been discussed, but other conditions are of equal magnitude; these are the daily activity of the child and his physical defects. It is an accepted fact that over-activity will not only produce a state of malnutrition, but it will counteract any attempt to correct such a condition by feeding. In order of importance, the chief causes of malnutrition may be considered as follows:

1. Physical defects
2. Over-activity
3. Insufficient and improper diet

Over-activity resulting from the half day of school and the half day of labor is found among almost all children in Indian boarding schools excepting the very youngest. The physical condition of the child is too frequently ignored. The idea of adjusting the child's duty to his physical ability is practically unknown in the Indian school. The amount of work to be done is almost unlimited and the children must do it. It is often true that the child does not actually accomplish a great amount of work in the prescribed time,

as he learns to loaf on the job, but he does work under pressure in many instances.

Generally speaking, the Indian child's day begins at 6 a. m. and continues for the smaller children in some schools until 7 p. m., and for the older children until 9 or 10 p. m. Theoretically one-fourth of the older child's time is devoted to industrial activities, supposedly educational, and not connected with the routine labor of the school. In practice much of the industrial work is undertaken for production and not for education. In Haskell Institute, for example, a boy detailed to the print shop to be taught printing may be required to fold papers for all the hours of his detail and to work under pressure to get a commercial job out on time. Most of the industrial teachers admit that great consideration has to be given to production to the detriment of education.

The laundries are perhaps open to the most serious criticism. As has been pointed out, the amount of labor spent is far greater than necessary, a waste due to the old, inefficient equipment. Practically all this work requires the child to stand. The monotonous ironing of simple dresses and shirts for hours is frankly production work, and is not necessary to teach the child the simple processes involved.

The methods practiced in disciplining children are often unwise. More than once members of the survey staff have seen small children standing in corners for long periods as a punishment for minor offenses.

In this connection, it is well to mention the methods employed in incarcerating obstreperous children, although the Indian Service has recently directed that the jail at Albuquerque be torn down, and it has under consideration a general order discontinuing the use of jail punishments at boarding schools. At the time of the visit from the survey staff nearly all schools had some such facility, either a simple room securely locked, or perhaps an isolated building actually designated as the "jail." At Albuquerque attention was drawn to a structure closely resembling a Mexican hut. Closer observation revealed a solid concrete, box-like building, with a door and one small window. It was barely large enough to accommodate two iron beds and a small stove. Otherwise it was devoid of furnishings. It was surrounded by a barricade of heavy wire and miscellaneous boards woven into a high fence. The grounds surrounding this unit were untidy and the interior was dirty. There were

no toilet facilities or running water. Perhaps this was the worst example seen, but the principle of the "lock up" prevails in many other schools.

Clothing. Practically all children were found to have sufficient clothing to protect them from the cold. In several schools located in rainy climates, the children do not have raincoats and rubbers, and wet clothing and feet are common. This is due in some instances to their having to stand in line or march through the rain to their classes or meals as well as to their work.

The supply of shoes averages about four pairs per year. They are bought on the lowest bid and are usually of poor quality, not able to stand the wear put upon them, especially where there is considerable wet weather. Another most serious factor is the fitting of shoes to the individual child. In some instances accurate measurements are not taken. The child is given a size according to his age, or if he is among the first he may be able to secure a reasonably good fit. In the smaller schools where an extensive assortment is not possible, the child is frequently given shoes too large or too small. Complaint was made by children of corns and other discomforts due to improperly fitting shoes.

*Medical Care of the Child.*³⁰ As physical defects are one of the most serious causes of malnutrition they should be given first importance in the consideration of the school child. The routine examinations are rushed through so rapidly that it is impossible to make careful diagnoses and therefore many physical defects are missed at the outset and the child must labor under a remediable handicap the remainder of his time in school unless a sufficiently acute examination forces him to go to the hospital, and even then he may be discharged before improvement in his condition warrants.

The most extreme instance of neglect in respect to physical examination was found at one of the day schools. Approximately ninety children were enrolled there at the time of the visit. The teachers and the public health nurse reported that the physician examining these children spent not more than two hours and that he never used a stethoscope or counted a pulse or took a temperature. The records of these examinations revealed a charting of

³⁰ See also pages 30, 236, 237, 240.

pulse, a recording of temperature, and a check indicating that the lungs had been auscultated and palpated. A method seen time and again of examining a chest was to place the stethoscope twice anteriorly and twice posteriorly without leaving it long enough for a complete inhalation or exhalation to be heard, and without requiring the child to cough to elicit rales. One physician in examining for trachoma repeatedly examined the left eye, never reverting the right lid. These cases are exceptional, but after observing the routine school examination at first hand in a number of instances, it became clear that in many cases the findings entered on the child's record were not accurately determined.

In a few schools vision charts were available, but with the exception of those places where a trained public health nurse was employed, no records of the results of such examinations were seen. At various schools these nurses have examined the vision of children, and their records show a large percentage of visual defects requiring corrective glasses, but it is a rarity to see Indian children wearing glasses. The excuse offered is that they break them. Observation of children in classrooms and while reading indicated that a considerable proportion need glasses.

Not only are innumerable defects overlooked, but there is not enough specialized personnel to make the necessary corrections. On a few reservations where more intensive work has been done, such as, for example, Rosebud, a larger number of defects have been corrected than is the general rule.

When a child is acutely ill, he is usually sent to the hospital for care. He may not remain until convalescence is complete, and in the case of tuberculosis, the child is frequently sent home, even though the conditions in the home may be the worst possible for the child. The Indian Office is now making an effort to hospitalize such cases at the school hospital or send them to a sanatorium school. To make this really effective will require far greater facilities than it now possesses or is likely to have on the present low appropriations.

It has been reported that special nutrition classes are provided for the undernourished. The extent of this practice at best is to attempt to give these children extra food and not to analyze their particular problem as individuals. This plan is of questionable merit, because in many schools there is nothing much additional

to offer at a special table. In some instances, as at Chemawa, the underweight report at the hospital twice daily and receive extra milk. At Pipestone mid-morning and mid-afternoon milk was furnished the underweights in the classrooms.

Recommendations. 1. Immediate steps should be taken materially to improve the quantity, quality, and variety of food served Indian children in boarding schools. Under most favorable conditions an average per diem expenditure of not less than thirty-five cents per capita apparently will be required. In schools with inferior farms, in the smaller schools, or in schools remote from supply centers, a larger allowance is necessary. If it does not seem practicable to consider each school separately, they should be classified according to their requirements and an adequate per diem per capita rate established for each class of schools.

2. The production of milk should be increased so that the average daily supply will be at least one quart per capita. Until this standard can be reached through the production of the school dairy farm, milk should be purchased; fresh, if an adequate supply of clean fresh milk is procurable; dried, if fresh milk cannot be secured. The practice of regular tuberculin testing of cows should be extended to all schools without exception, and as rapidly as possible the standard of an accredited herd should be attained at every school. Regular bacteriological examinations should be made of all milk supplies, and records of such tests and examinations should be kept on permanent file. In the few instances where dairy barns are not of modern design, these should be reconstructed or replaced on a basis comparable with the barns at Carson School, Tulalip, Bloomfield, and Pipestone.

3. The definitely malnourished child should be provided with a fuller and more specialized diet than that furnished others. The nutrition class method, so extensively used in public schools but not generally practiced in Indian schools, is one method for bringing a large number of undernourished Indian children up to standard.

4. Material improvement should be made in the preparation and serving of food, both for the children in normal health and those below standard. All persons handling and preparing food should have a physical examination at least once a year, and they should be supplied with clean uniforms. A sufficient supply of

steam or hot water should always be available to sterilize dishes thoroughly. Mechanical dish washers that will permit of sterilization should be installed. Those schools not now equipped with ranges, bake ovens, steam kettles, and cooking utensils of good design and in good condition should promptly have their equipment brought up to a reasonable standard.

5. The over-crowding at present found in many boarding schools should be corrected promptly, preferably by providing for more Indian children in schools near their homes, either Indian Service day schools or public schools. The Indian Service day schools, maintained where public schools are not available, should carry children at least through the first six grades, so that the necessity for providing for young children in boarding schools may be reduced to a minimum. Definite standards of capacity should be established and children should not be admitted beyond that capacity. A minimum of six hundred cubic feet per pupil in dormitories is recommended. Beds should be at least four feet apart. Not more than one child should sleep in the single thirty-six or forty-inch beds provided. At least ten square feet of floor space per capita without furniture should be provided for "rough house" games.

6. Much more adequate medical care should be given the children. Since so many Indian children are below normal, thorough physical examinations should be made of all children at least twice a year and more frequently for those found below standard. A well-trained teacher or nurse can inspect for sight, hearing, weight, and physical measurements, and can record the results. The child can then be examined by the physician. When examined by the physician the child should be without clothing or at least stripped to the waist. The rate of examination by the physician should not average more than six to eight an hour. The physician should be required to fill out and certify a complete record of findings on a prescribed form. The present record system is inadequate, but the one in use at Tulalip perhaps more nearly meets the requirements. Laboratory methods of diagnosis, such as serological, sputums, X-Ray, and urine should be utilized wherever indicated, either at the school hospital or at outside laboratories either public or private.

Those children found to be malnourished or suspected of infection from tuberculosis, trachoma, or other diseases should at once

be segregated and put on such special treatment as the case demands. When possible the children in need of hospital or sanatorium care should be transferred at once. If places are not available for them and there are vacancies in the school hospital, they should be cared for there until provision can be made for them in an institution especially adapted to their needs. The practice of sending open cases of tuberculosis and other infectious diseases to the home of the patient where no care is available should be stopped.

The dispensary methods for the treatment of children should be radically revised. More thorough examinations and diagnoses should be made, and where treatments are required lists should be prepared and each treatment recorded.

Much more attention should be given to control communicable diseases. Careful examination and prompt isolation will greatly reduce the high incidence of infectious diseases in Indian schools. Immunization for smallpox and diphtheria should be routine practice for each pupil not showing satisfactory scar, or history of antitoxin injections, on admission to school. If instructions in the new circular prepared for doctors are carried out it will greatly facilitate this practice in the future.

Better provision should immediately be made for the correction of defects of vision and hearing, tonsils, adenoids, and teeth. In some cases this service can be secured through contracts with local specialists. If this method is impracticable the field personnel should be increased to meet the situation.

Eneuresis should be recognized by all workers as a medical problem to be handled by the physician himself or under his orders. All punishment should be immediately discontinued. The sufferers should be supplied with rubber sheets and clean linen and be made as comfortable as possible.

7. The physician in charge, and not the principal, the disciplinarian, or the matron, should be the authority on all matters directly relating to health. The diet provided at the schools should be approved by him, and he should have definite authority to regulate and control the work of the children and their participation in athletics.

8. The question of the amount and the nature of the work required of boarding school children should be given serious consideration. At several schools both the amount of work required

and its nature appear to be an important factor in explaining the low general health condition. Modern labor saving machinery should be generally provided for production, and if the children are below par additional adult employees should be employed to operate it. The laundries in particular need attention in this respect, and especially should attention be given to equipment to prevent accidents.

9. At many of the schools, particularly the smaller ones, more attention should be given the clothing of children. Shoes are especially important. Great care should be exercised to see that they really fit, even if this necessitates carrying more sizes in stock than has been the practice in the past. At schools where a long rainy wet season is normal, rain-proof outer garments and rubbers or overshoes should be supplied and the children should not be required to form in lines and stand in the open. Each child should have space to keep his own clothes, preferably near his sleeping space. If locker rooms are necessary they should be well ventilated and lighted.

10. Material improvement should be effected both in the toilet facilities themselves and in their use. The equipment should be at least sufficiently modern in design to be effective, and it should be kept in practically perfect order. The minimum standards should approximate: lavatories one to four pupils; waterclosets one to six; showers one to ten; baths one to six where showers are not used; where both baths and showers are used one to ten. Hot water should be available throughout the day. Liquid or powdered soap should be provided at all lavatories. A sufficient supply of individual towels should be available at all times. If possible tooth brushes should be kept in the child's own individual locker. If racks are used, they should not hold more than twenty-five brushes. The toilet rooms should be well ventilated and lighted and should be kept reasonably warm. Provision should be made for night toilets on each floor of dormitories.

11. Facilities for recreation and the supervision of recreation need much more attention. A trained physical director should replace the present disciplinarians, and he should work in close harmony with the physician. Suitable leadership should also be supplied for girls. Schools in northern climates or in places where rainy seasons are long should be provided with gymnasiums, notably

Tulalip, Fort Peck, and Cheyenne River. Recreation rooms should uniformly be provided and should have proper ventilation, light, and heat. They should have reasonable equipment, consisting of comfortable chairs, tables, games, and some musical instruments, such as a phonograph or radio. Special attention should be given to the needs of the smallest children if in some places it proves necessary to keep them in boarding schools.

12. At many schools improvement is needed in the water supply and in the sewage disposal plant. Improvement in many instances will require building larger facilities unless the number of pupils is reduced. The water supply should be analyzed regularly and reports filed. If a contaminated supply must be used, thorough treatment should invariably be given. Unless sewage can be discharged into a regular system, a thoroughly modern treating plant should be built of sufficient size so that the effluent on discharge will be innocuous.

13. In the future much more attention should be given to all remodelling of old buildings and all new construction. The first question asked with respect to an old building should be: after it has been remodelled and re-equipped, will it comply with reasonable standards for a building designed originally to serve the particular purpose to which it is to be put? If that question cannot be answered positively and unreservedly in the affirmative, it is poor economy to spend money remodelling, for the building will always be a sub-standard makeshift. Sleeping porches are of course desirable and should be provided wherever possible, but they should not be built on where they will make the inner rooms materially below standard in light and ventilation.

In all new dormitory construction the following questions should be given special attention: Is the design as effective as possible in overcoming the drawbacks inherent in institutions; are big congregate dormitories reduced to a minimum and is maximum provision made for reasonable privacy through small rooms for three or four pupils? Are the sanitary sections subdivided in small units on the several floors, are they properly lighted and ventilated, and are they sufficient in number? Is the material of which the building is made reasonably permanent and fire resisting so that maintenance will be low and fire hazard slight? Is adequate provision made for fire escapes and fire fighting? Is electric wiring and the heating

adequate and safe? It would be worth while in new construction to give careful consideration to the use of the cottage system.

Nursing Education in Non-Reservation Schools. The Indian Office has been interested for some time in training Indian girls as nurses. It is believed the Indian girl's temperament is particularly adapted to that line of work, and at the same time the profession of nursing opens a new field to her.

The non-reservation schools have been selected for pre-nursing training for the following reasons: they provide secondary education, a hospital is operated in connection with each, and the step from high school to a regular nurse's training course would not be so great, especially if part of that course could be given at these schools, thus permitting the teacher and the graduate nurse in charge of the hospital to weed out undesirable pupils and stimulate and encourage the more promising.

The idea of coöperation between the Indian schools and the training schools for nurses was suggested by officers of the State Department of Health of Minnesota. In pursuance of this suggestion the Indian school authorities consulted with certain training schools for nurses of recognized standing and the nursing authorities of the states in which such schools are located in order to decide upon the minimum requirements necessary to admit their Indian pupils. As a result, Haskell Institute has an understanding with the Minnesota State Board of Nursing and an affiliation with the Anker Hospital in St. Paul. The essence of this agreement is that Haskell will teach certain subjects, such as anatomy, physiology, hygiene, history of nursing, nursing ethics, etc., during the last two years of the high school course, and assign all girls taking this course to hospital detail rather than other routine duties about the school. In return, the Anker Hospital in some instances waives the customary probationary period of three months for these pupils. After finishing the full prescribed course, they are eligible for diplomas in nursing.

The plan at Chemawa was identical in outline, with the exception that for their two years of work in the school hospital the Oregon State Board of Nursing Examiners allowed one year's credit in any recognized training school in that state, but it is reported that

this arrangement did not prove satisfactory and it has now been abandoned.

It is planned to develop the same nursing course in Sherman, Albuquerque, Phoenix, and Chilocco, but as yet these schools have been unable to reach a satisfactory agreement with their respective state boards.

The teaching facilities at Haskell and Chemawa should be considered in some detail. The civil service positions now open to instructors are identical with all other nursing positions. They pay a gross of \$1500 per annum.³¹ Thus it is obvious that they cannot attract the highly trained nurse desirable for such work, although attendance at classes indicated that Chemawa was much in advance of Haskell in nurse training work.

The practical training given in the school hospitals was of a like character. At Haskell there was a hospital nurse in addition to the instructor, but a clash of personalities prevented the close coöperation desirable, and as a consequence the efforts of the two lacked unity. In the hospital the girls assisted in the routine hospital and dispensary work. It seemed to be more of a routine than an educational enterprise. At Chemawa the instructor of nurses was also the hospital superintendent and therefore a more unified course was assured. But, at its best, the limited hospital personnel required much overwork on the part of graduate nurses, and thereby less guidance to the pupil nurse.

Haskell has sent its third class of nurses to the Anker Hospital, St. Paul, and this summer, Chemawa sent its first to the Immanuel Hospital in Portland.

The project is very new, and under the handicaps still existing it has not had a fair chance to prove its value.

As the Anker Hospital was the only training school in which these students had been accepted over any appreciable period of time, a conference was obtained with the superintendent of nurses to determine the results obtained. Sixteen Indian pupil nurses were enrolled. The following statement, furnished by the superintendent of nurses, will give an idea of their work while at this hospital. This table shows that for the most part these girls have been doing acceptable work. The superintendent of nurses reported that the

³¹ This salary has now been raised to \$1860.

Indian pupils coming under her supervision over a period of several years had given very satisfactory service, also that those who had not had the preliminary pre-nursing course did better than those who had. This may be accounted for in part by the fact that a girl who would make the attempt at nursing unaided most likely possesses initiative lacking in the girl who had perhaps been urged to enter the pre-nursing class. As a matter of fact, the Indian school endeavors to eliminate all girls from their nursing classes who they believe will not be a credit to the school, and this is another argument they offer in favor of it.

Graduate Indian nurses are scattered throughout the country. It has been impossible to make a close study of their training and the character of work accomplished on the outside. But from several hospital physicians and others who have come in contact with these workers the general impression is gained that they make splendid nurses and that they probably accomplish the best results in bed side nursing.

The field of public health nursing is new to these girls and but few have gone into this more specialized type of work. At Anker Hospital, however, it is reported that a few of the girls now finishing possess suitable qualifications for such work, and the hospital has arranged for them to secure, as part of their training, practical experience in public health work under the auspices of an instructive visiting nursing group in Minneapolis. One has been granted a scholarship by the Federation of Women's Clubs to take a course in public health nursing in the state university, and she plans to work upon an Indian reservation when she completes her course.

This attempt on the part of the Indian Office to encourage nursing as a profession among Indian girls is a very worthy step in the right direction. The openings for nurses should be many, especially in the Indian field service, both in hospitals and as public health nurses. It is believed that an Indian public health nurse could accomplish as much, if not more, than any other nurse in the Indian homes. She would have a better understanding of the Indian psychology, customs and traditions, and, in some cases the language, and would therefore have a tremendous advantage at the outset. These girls would naturally be attracted to the Indian field service if the inducements in salary and living conditions were comparable with similar situations in the average community.

The question arises whether these girls should be given a year's credit for their two years' work in the boarding school. The

Data on Indian pupil nurses at the Anker Hospital at St. Paul, Minnesota

No.	Age	Preliminary	Entered Anker	Remarks
1	23	Grad. Haskell June 1926	9-1-26	A good student
2	23	Grad. Haskell June 1926	9-1-26	A good student
3	25	Haskell 4 yrs. 15 credits. Pre-nursing 3 mo. credit	2-1-26	Quiet, slow, gives the impression of being stoical
4	23	Grad. Haskell June 1926	9-1-26	A good student, a little slow
5	21	Flandreau 2 yrs. H. S.	3-2-25	A splendid worker, well liked by patients. Slow. Poor class work
6	20	4 yrs. Neelsville H. S. Wis.	9-1-26	A fine student, dependable
7	23	Grad. Haskell June 1926	9-1-26	Rather slow to think and act, but I think she will make good
8	24	Grad. Haskell January 1925	1-24-25	A fine young woman, good stu- dent, reliable, musical
9	20	2 yrs. H. S. Pierre Ft. Yates Flandreau	3-2-25	Neat, thorough worker. Imma- ture. Not strong on class work
10	20	1½ yrs. H. S. Flandreau	9-2-24	Very dependable, neat. Fair stu- dent
11	25	Grad. Haskell June 1924 Pre-nursing	9-2-24	A fine young woman. Good stu- dent, very reliable, ambitious. A good example for her fellow workers
12	20	3 yrs. H. S. Haskell No pre-nursing	9-1-25	Timid manners. Has improved very much. Very ladylike. Good work.
13	25	2 yrs. Carlisle	3-1-26	An able woman. A fine student. Gives promise of a good nurse
14	23	Grad. Haskell June 1926	2-1-27	Not stated
15	21	Grad. Haskell June 1926	2-1-27	Not stated
16	25	10 grades Haskell Some work in Sanatorium, Toledo, Ohio	2-1-27	Not stated

strongest argument in its favor is that many more girls might be induced to take nursing if they received this additional credit. Such a course is not desirable for the following reasons.

The national nursing organizations have for many years been endeavoring to raise the standards for nursing, and as a consequence, the following standards of entrance have been adopted:²²

1. Four years of high school (accredited)
2. Age minimum, 19; maximum, 35
3. Physical status must be good
4. Pre-nursing subjects during high school if possible—Latin, science, English, voice culture, etc.
5. Graduates having A. B. or B. S. allowed credit in time amounting to one academic year. Students from normal schools not expected to repeat but required to pass examinations on courses already studied
6. Character and experience

The soundness of these requirements can hardly be questioned. A nurse should certainly possess a sound background in fundamental knowledge before adding her more specialized nursing course. Although so much preliminary education may not be necessary for the strictly bed side nurse, it is of great importance in the training of public health nurses where considerably more initiative and self-reliance are necessary. It is believed that the success of this major undertaking on the part of the Indian boarding schools will be more definitely assured if the highest standards are adopted at the outset. Although the adoption of the lower standards may increase the number of student nurses, it may also increase the proportion of failures among those handled under such a plan. As in all other educational activities, the Indian girl who wishes to become a nurse should be so equipped that she may be given an equal chance with the white.

Recommendations. 1. All Indian schools giving pre-nursing courses should first attain the standards of accredited high schools.

2. Pre-nursing courses should be designed to meet the requirements of the Committee on Education of the National League of Nursing Education.

3. A definite course in theoretical and practical nursing covering somewhat the same ground as is now outlined in these schools is of the utmost importance.

4. The nurses selected for teaching purposes in the class room and the hospital should be selected on the basis of their teaching

²² Committee on Education of the National League of Nursing Education.

ability, and they should be supplied with the necessary equipment to do their work. A sufficient number of employees should be provided to do the work of the hospital so that the pupil may receive the necessary instruction and guidance.

5. The character of the course given should be such that the graduates would be eligible for any accredited nurses' training school, and an effort should be made to place these girls in the best schools.

6. These girls should be encouraged where possible to prepare themselves for the field of public health nursing.

7. A reimbursable plan should be adopted for financing promising nurses who desire special training in the field of public health.

8. The Indian Office should encourage these graduates to qualify for Indian Service hospitals and public health nursing positions.

9. The salaries paid and the living quarters provided should conform to the suggestions outlined in the section devoted to Organization of the Medical Service.²³

²³ See page 224.