tasks. They are invariably quartered in the hospital and in some instances have to share the sanitary facilities provided for patients.

Conditions such as these tend to discourage the nurses and account for the rapid turn-over and the difficulty the Indian Office experiences in getting additional nurses to enter and remain in the Service. They are also responsible for the unsympathetic type of nurse seen on a few occasions, women who because of their personalities have difficulty in securing permanent positions on the outside.

Practical nurses have been utilized far more in the past than they are at present. Their employment has been largely a matter of expediency, resorted to because of the difficulty in securing trained nurses, a difficulty resulting from the low salaries offered, the heavy duties imposed, and the isolation and hardship involved. The approximate number now in the service has been mentioned in the discussion of graduate nurses.

The most serious phase of this situation apparently lies in the fact that practical nurses are given positions requiring graduate nurses. This may be well illustrated by a description of conditions seen on one reservation. The hospital there had two nurse positions, each filled by a practical nurse. The head practical nurse for some time had been away on account of illness and all duties fell on the second nurse and such assistants as were provided. The physician had arranged to perform several tonsillectomies on the day of the visit and had given notice twenty-four hours in advance, but at the time set to start the operation, he himself had to stop and prepare the operating room, the instruments, and the dressings. This preliminary work required at least two hours, and by that time everybody was in a state of nervous excitement. It was finally discovered that enough sterile dressings had not been prepared. The one nurse on duty was doing her utmost, but in a way that showed plainly her lack of training.

The Indian Office reports that it is no longer employing practical nurses. It is a sound policy to discontinue giving this type of nurse administrative duties or work requiring training. The practical nurse could, however, be used to advantage in the hospitals under the direction of a trained nurse more nearly to adjust the ratio between nurses and the unit of patient population.

A Supervisor of Nurses entered the Indian Service in August, 1924. Her duties were outlined at that time as having the direction of field nursing service. The following table will show the gradual change in trained public health nurses in the field:

Indian Service statistics, Field Nurse positions (Public Health Nurses), 1924-1927

Year	Field nurse positions available	Positions filled
1924	5	4
1925	10	5
1926	13	9
1927	[a]16	12

[a] One of these positions is filled by a nurse attached to the Oklahoma State Board of Health. She visits Oklahoma Indian boarding schools, conducting classes in infant and maternity hygiene.

Two of the above field positions (1927) are filled by qualified graduate nurses who have not taken the civil service examination and are rated as "temporary." Two others are practical nurses with some nursing experience, rated as "temporary."

During the fiscal year 1928 it is planned to add from six to ten more field nurse positions. Of these, four have now been authorized and one is filled by a qualified civil service nurse.

In addition to these government nurses, four public health nurses work exclusively among Indians under the direction of state boards of health, two in Minnesota and two in Wisconsin. Four other public health nurses are working under the direction of other agencies, one under the Montana State Tuberculosis Association and three under the Eastern Association on Indian Affairs in New Mexico.

In several other states, some public health nursing is done for Indians living in certain white communities supporting their own public activities. This is found chiefly in urban settlements.

The reservation Indians at large, however, are receiving almost no public health nursing service. Where a full-time service now exists, the field is so large from the standpoints of area and population that effective work is difficult. At Rice Station the nurse who is assigned to one of the largest Indian reservations in the country, in addition to reservation work also has to travel a distance of thirty miles to see Indians living at Globe and Miami. The nurse

at Albuquerque has three pueblos in her district, one thirteen miles in one direction from Albuquerque, and one fifteen miles in another direction.

The qualifications of these nurses are on a whole much higher than those of any other group of employees in the Indian medical service. All have had special public health training in addition to their regular nursing courses, in conformity with civil service requirements.

The public health nurses are making a very definite contribution to the health of the Indians. Due to their training and experience they are able to handle the perplexing problems that have been neglected for so long by the field matrons generally who have no training and have little conception of the health problems in the Indian homes on the reservations and in the camps.

The public health nurses' work has been greatly handicapped by the following factors: The extensive territory to be covered; the poor transportation facilities available; inability to speak or understand the Indian language; lack of equipment with which to work; and the difficulties encountered in working with the present agency personnel, especially physicians. As a matter of fact, the first attempts of the nurses have been in some instances quite like those of many agency physicians, namely, to dispense some form of medicine. It has been different, however, in that drug dispensing is used only to gain the confidence of the Indians and very rapidly thereafter more constructive work was started in the homes. This establishment of confidence was admirably illustrated at one pueblo upon visiting homes with the public health nurse. The cordiality extended to her by Indian men and women in their homes after only a few months' acquaintance, and the type of service she rendered demonstrated that a capable trained person could accomplish marvelous results in a comparatively short time in creating health habits for the prevention of illness and in raising living standards, provided her territory was not too extensive.

In view of the instances observed, it is believed that if a similar service could have been substituted years ago in place of the field matron service, the health situation among Indians would be far different today.

One of the most serious difficulties encountered by these nurses in the field is their relationship with the existing agency physician.

Their training has been of a specialized character, sometimes considerably in advance of the physician's training in his field. Their viewpoints are at times widely divergent. Under these circumstances it is difficult if not impossible for the nurse to abandon her own standards. As a consequence, if she is to function at all effectively, she must work more or less independently. This procedure she believes is forced upon her though it is in direct violation of all public health nursing ethics, and it greatly curtails her work.

The generally accepted ratio to population is a minimum of one trained public health nurse per 3000 population for general public health work, and one per 1000 for school nursing. The Indian Service presents a problem vastly different from the average American community, and therefore these ratios would not necessarily apply on all reservations. Where the reservation covers a large geographical area, and the population is widely scattered, obviously one nurse could not begin to care for the same number as in cases where all are concentrated in one community, as, for example, in a Pueblo. The acute health situation among all Indians renders them a serious liability to the Service as well as to the state in which they reside, and consequently there is not a single tribe or group of Indians that does not need some public health nursing service. To make such effort effective, enough nurses must be available to cover any specified area adequately, which means follow-up service for her original contacts with great enough frequency to accomplish the desired results.

In various health demonstrations and in numerous experiences in community and rural health work, it has been found that a nurse working in a territory with a population of 3000 averages 1540 visits per year and budgets her time somewhat as follows:

21 per cent in travel
43 per cent in homes
27.6 per cent in offices completing her rceords

To apply these factors to the various Indian reservations would require much time and thought in light of the marked variation in the different jurisdictions. Based on a minimum of one public health nurse for each Indian reservation, 100 nurses are needed, or 76 per cent more than are now provided for, and this ratio by

no means could be considered sufficient for the Indian population at large.

In some instances the local state, county, or city public health nursing service could care for the Indians within its jurisdiction. For example, in some sections of California many Indians are receiving the same care as the whites. Consideration might well be given to the economy of the practice of some large life insurance companies, which utilize existing public health nursing services on a fee basis with a view to prolonging the lives of policy holders.

Four positions have been authorized for California by the Service. They will be placed with due consideration for the existing facilities. It could doubtless receive additional service at several points by coöperation with the state and local health boards.

The housing facilities provided for the public health nurse are usually very poor. At one jurisdiction the nurse is located at some distance from both the boarding school and the agency headquarters. Another nurse was for a considerable time quartered in a small house on the edge of an Indian village at the extreme edge of her jurisdiction, whereas she should have been stationed near the center of the district. Not enough consideration has been given this important factor of location.

Thirteen positions have been established for traveling nurses, but only nine of them have been utilized, as they were created primarily to have nursing service available for special physicians. Four of these positions are thus in reserve for epidemics and similar emergencies. Six of these nurses are trained and have civil service certification; one is a practical nurse under civil service rating; one is a "temporary" practical nurse, and one position is vacant.

Their duties are to assist the traveling specialists in their trachoma work. They usually remain after a clinic to supervise the immediate follow-up on recent operative cases.

Field matrons have been employed for a long period of time. They are mentioned here only because a certain amount of health service is assigned to them. Their duties, as outlined from time to time, have been broad and all-inclusive. The type of service outlined for them would, in fact, tax the most modern public health nurse, social case worker, and farm demonstration agent combined. The very meager salaries offered and the low educational standards

established for this almost superhuman effort and skill have resulted on the whole in an untrained personnel.[15]

Much may be said to the credit of these workers, although a few have been uninterested and perfunctory. In many instances, they have been most self-sacrificing and within the limits of their understanding have done everything in their power to render a service to the Indians. One field matron was encountered who had a real grasp of her duties. She had had about three years of nursing training and experience and was rendering a service worthy of special commendation. Regardless of the conscientiousness and long hours of toil of many of these workers, constructive work resulting from their endeavors is rarely found. They should not be blamed for lacking qualifications which were not required by the government when they entered the service. The present administration is to be commended for its decision to abandon the long established policy of using this type of worker and to substitute for them trained public health nurses. The change cannot be effected too rapidly. The investment in this service has been a great loss when compared with what might have been accomplished had the same amount been expended for trained personnel.

Medical Supplies. The drug supplies on the shelves of practically all reservation dispensaries and hospitals are of a doubtful character, and are far in excess of the present needs.

Much of this stock is of a perishable nature, long since deteriorated, and of uncommon drugs, seldom if ever used. At Zuni, for example, ten pints of fluid extract of ergot were found, enough to supply the entire service.

This situation is due chiefly to the policy of purchasing supplies in advance, the unsystematic method of ordering, and the shipping of army surplus supplies without an order from the agency.

The estimates for the purchase of such supplies are made in November for the fiscal year beginning the following July. With the possible exception of the more staple supplies, such as cathartics and cod liver oil, the tendency has been to overload with certain perishable drugs. At the time of the visit from the survey staff some agency physicians did not understand that they were allowed

[15] For a more detailed discussion of the field matron service see the chapter on Family and Community Life and the Activities of Women, pages 591 to 599.

to purchase perishable drugs in the open market although the Indian Office reports that this practice has long been permissible. These doctors therefore deemed it wise to put in an ample supply of all listed drugs, in case they might need them.

Some agencies do not keep an inventory of their drugs and consequently order without consideration of existing supplies. In the absence of an agency physician, the chief clerk frequently duplicates the order for the previous year, thus overstocking with perishable drugs and others that perhaps only one physician will care to use.

Surplus army and navy supplies have from time to time been offered other federal bureaus. Some of this material is good and some worthless. In the past it has been shipped to agencies without an order and consequently they are overstocked on supplies for which they have little use. This has been true especially of narcotics. In several places large quantities of powdered morphine were found. In this form it is practically useless on a reservation. Within the past year this practice has been remedied. All such supplies are now carefully checked for their potency and suitability before being received by the Service.

The district medical officers with the agency physicians are now going over the agency supply with the view to eliminating deteriorated stock and transferring surplus supplies.

The annual estimate lists the drug supplies that can be ordered without special request, and the physician is supposed to keep within this limitation. If sufficient cause is shown for the purchase of drugs not listed, they can be supplied by special order from the Chief Medical Director. These lists are being revised to give the physician the widest possible range in the selection of his medicaments.

The Service maintains large warehouses in St. Louis and Chicago, from which drugs and supplies are distributed to the various agencies. They are being carefully checked at this time to eliminate surplus and inferior drugs.

In several instances the funds available at present are not sufficient to provide the necessary medication. In some instances the fund amounts to less than ten cents per capita.

The quality of drugs supplied in the past has not always been good. Acetyl-salicylic acid tablets (aspirin) are so friable that they

are frequently found in a semi-powdered state. Other drugs have been purchased at the lowest bid from pharmaceutical houses not manufacturing the highest grade of product. This practice is receiving attention at the present time. It is reported that in the future only bids from reliable houses will be considered.

Biologics are now contracted for at the leading laboratories. Previously the agency was required to order all such supplies at specified distributing centers. In the case of diphtheria, this arrangement caused unnecessary delay in administering anti-toxin and the difference between the cost and the purchase price in the local market was negligible. The Indian Office has now issued orders permitting the purchase of such supplies locally in emergencies. Large supplies for immunization purposes are purchased directly from the main supply depots.

The agencies are now supplied with catalogues of the more reputable houses and their requisitions are carefully checked in the Washington office before being finally approved. Thus a better quality is assured, unnecessary supplies are eliminated, and additional ones are added where the chief medical director determines that the need exists. The specifications for medical supplies are being revised to conform to existing standards in other federal bureaus.

Large quantities of army cotton in small packages is being supplied to the agencies. It is not suitable for refined operating room use, but can be used in small dressings.

Recommendations. The more necessary organization changes are summarized in the following recommendations:

1. The Headquarters Staff: The Chief Medical Officer of the Indian Service, under the general direction of the Commissioner of Indian Affairs, should determine the policies to be followed in respect to strictly medical affairs. Policies in matters which involve medical affairs and economic and social conditions or general education should be formulated jointly by the Chief Medical Officer and the specialists in other branches of the Service. The Chief Medical Officer should prepare and present the sections of the budget directly relating to medical activities and he should be present when other sections that involve health are presented. In making appropriations for health work more use should be made of lump sums not designated for specific institutions or for detailed

particular purposes so that the Chief Medical Officer, under the general direction of the Commissioner, will have a freer hand for effective administration.

The Chief Medical Officer should be supplied with a small staff of specialists to aid him in developing and perfecting the specialized medical services which must be rendered. The position of epidemiologist at present authorized should be filled. New positions should be created for specialists representing the fields of tuberculosis, trachoma, child hygiene, venereal disease, and hospital administration. Their duties should be primarily consultive rather than directly administrative. Additional trained clerical assistance should be provided to permit of the compilation and analysis of the medical data necessary for the efficient planning and control of the medical activities of the Service.

To provide more adequately for the development and supervision of the public health nursing work, the present supervisor of public health nursing should be given not fewer than four trained assistants, each to be assigned to a district in the field. The public health nursing work should be under the general direction of the Chief Medical Officer.

A system of medical cost accounting should be installed.

A thorough study of existing law relating to health work among the Indians should be made and a report submitted to Congress through appropriate channels, including a draft of a bill or bills to bring the law on this subject abreast of present developments in the field of public health.

2. District Medical Directors: The Indian medical service should as soon as possible take over full responsibility for the district medical directors.

Need for the cooperative service rendered by the specialized field personnel of the Public Health Service will always exist. An extension into more of the Indian communities should be sought. Consultation and coöperation with private national health services should be further developed.

Subdivision of the territory embraced in the three districts numbered four, five, and six into five districts, should be made, on the basis of existing population and transportation facilities.

Adequate trained clerical assistance should be provided for each of the district medical directors, without depletion of the clerical forces of other branches of the service.

3. Special Physicians: In selecting special physicians, due consideration should be given to their fundamental background in general medical work and to their general adaptability for their work.

Appointees should receive special training at trachoma clinics where cases are being handled under the various methods, but which are not connected with the Indian Office, and they should be allowed subsistence and transportation in connection therewith. This is important because of the present uncertain knowledge of the causative factors in trachoma and the fact that all specialists in the field of ophthalmology do not agree on the methods of its control.

The future activities of special physicians should include only the number of cases that it will be possible for them to follow-up at regular periods of three months.

A complete medical file should be kept of every case treated containing all data relative to general physical as well as eye conditions. This is absolutely essential if a reliable and constructive method is to be evolved for the care of trachoma.

4. School, Agency, and Hospital Physicians: The medical personnel in the Indian Service should be brought to as high a standard as that maintained by the Public Health Service, the Army, the Navy, and the Veterans' Bureau. To achieve this object it will be necessary to raise the general level of salaries and to adopt a salary scale comparable to that used for the Public Health Service. When salaries are raised, higher entrance qualifications can be set and an effort made to draw into the service promising younger men well trained for the work.

New physicians entering the Service should be given an apprentice assignment to a well organized field service hospital and reservation to prepare them for the special conditions they will meet in the Indian Service.

When higher salaries and higher qualifications make available a supply of well qualified candidates, the Indian Service will be in a position to deal effectively with its existing personnel. This problem would, however, be simplified if Congress would amend the retirement act so that Indian service physicians could be retired as early as age 60 at a reasonable retirement allowance. The Service should promptly establish high standards for the medical service and require compliance with these standards. Those of the existing

staff who prove unable to meet these standards should be allowed to resign. The practice of transferring a physician who has failed at his station will be rendered unnecessary if a sufficient number of well qualified candidates can be secured.

Definite steps should be taken to afford the existing personnel an opportunity to improve their work and to fit themselves to meet higher standards. They should be expected to register in the state where they practice, to become members of the state and local medical societies, and, insofar as possible, to attend meetings. From time to time they should be sent to local and in some cases national meetings and to district conferences of Indian Service physicians. Special arrangements should be made to have them visit stations where particularly good work is being done either generally or in some special field such as trachoma or tuberculosis. Leave of absence for special study and advancement should be granted whenever possible.

Both the salaries and the living and working conditions should be raised so that the physician can maintain a reasonable standard of professional life. His house should be the equal of that of a moderately successful country doctor both in professional equipment and in domestic furniture. Unless the government itself provides the domestic furniture, the doctor should be given an adequate allowance for meeting costs of moving when he is transferred from one station to another.

The Service should require all physicians to comply with reasonable minimum standards in their practice. They should be required to keep the essential records and to submit proper reports, a matter which will be considered in detail under the practice of preventive medicine.[16] The indiscriminate doling out of medicine should be stopped and examination, diagnosis and complete case records should be required. The agency physicians should make greater effort to encourage the Indian women to have physicians in attendance at child-birth. Although the existing evidence suggests that either men or women physicians who show real interest can achieve equally good results, it is suggested that an experiment be tried in detailing well trained women physicians to some of the more primitive tribes.

[16] See pages 266 to 268.

To permit of the maintenance of higher standards of practice it will be necessary materially to increase the number of physicians. The number to be employed should be determined after a careful study of the field with due consideration to the factors of distance and accessibility. A rough estimate would be that at least twice the number now employed will be needed. Every hospital of fifty beds or more should have a full time physician selected with special reference to the type of service to be rendered by that hospital. Physicians at hospitals for fifty or more patients should not be expected to do reservation work. All boarding schools of three hundred pupils or more should have a resident physician specially qualified for the type of work in such institutions. These physicians should have general oversight of all activities of the school which affect health and should give or supplement instruction in health.

5. Contract Physicians: The contract plan should be replaced as rapidly as possible with a fulltime personnel, except for certain specialized services, such as surgery.

Permission to utilize contract physicians should be granted, however, when it is necessary to fill positions which would otherwise be vacant. The maximum patient population should not exceed four hundred.

A careful inquiry into the qualification and standing of physicians to be given contracts should be made, and contracts awarded only to those of the highest standing.

6. Dentists: Much more adequate dental service should be rendered the Indians, both in schools and on the reservations. The dental service in schools should be comparable with that in the best public school systems.

The number of dentists should be materially increased to render this service. Effective use can, however, be made of dental hygienists, especially at schools, thereby reducing somewhat the need for dentists. One full-time dentist and one full-time dental hygienist can together probably take care of the needs of two of the largest schools or even more of the smaller ones.

7. Nursing Service: The number of trained graduate nurses in the hospitals in the Indian Service should be materially increased. Every hospital should have a minimum of not less than two graduate nurses so that one may be always on duty for day service and one on call, at least, for night duty. Where the amount of surgery

warrants it, a special nurse should be placed in charge of surgical work and cases. The ratio of trained nurses per unit of hospital population should be increased one to ten, and practical nurses or other suitable assistants should be secured to bring the ratio to one to five. This will require 262 trained nurses and 243 practical nurses, or assistants suitable to assume bedside care of patients. In male wards, an orderly service is desirable.

All practical nurses or those not holding certificates of graduation from approved training schools should be replaced with trained nurses graduated from grade A hospital training schools, unless they can be assigned to positions under the direction of trained graduate nurses.

All hospital nurses should be assured the following hours off duty, based on a twelve-hour day:

Two hours per day
Two and one-half week days per month
Two and one-half Sundays per month
One month's vacation per year

The night and day duty nurses should arrange an alternate schedule.

A careful survey should be made to determine the number of public health nurses needed on each reservation. The immediate goal should be one nurse to each reservation. The ultimate goal should be a ratio of one to each thousand population, or 262 based on the 262,293 Indians[17] now under the Indian Office on the reservations. If impossible to place so large a number immediately, there should be assigned at least one public health nurse to each reservation at the outset. Each existing field matron position should be replaced by a public health nurse as rapidly as possible.

The latest civil service requirements for "Graduate Nurse Visiting Duty," issued December 30, 1927, are to be commended.[18] If

[17] See Schmeckebier, The Office of Indian Affairs.

[18] These standards require (1) Completion of at least two years of a standard high school course, (2) graduation from a recognized school of nursing requiring a residence of at least two years in (a) a hospital having a daily average of fifty bed patients or more or (b) a hospital having a daily average of not less than thirty bed patients where the course includes not less than six months' resident affiliation with a general hospital having a daily average of not less than seventy-five bed patients or where the graduate has completed a resident post graduate course of not less than six months' duration in general nursing in a hospital having a daily average of not less than seventy-five bed patients; (3) not less than one year's institutional or two years' private duty postgraduate experience in nursing; (4) evidence of state registration, and (5) at least four months' postgraduate training in public health or visiting nursing at a school of recognized standing, or in lieu of such training, one year of full-time paid experience under supervision in public health or visiting nursing. This special training or experience under (5) may be included as part of the periods called for under (3).

the Indian Service can pay salaries sufficiently high to keep all its public health nursing positions filled with persons who have met these standards and who show in the probationary period that they possess the character and personality for work with Indians, it will have made a marked advance. The Service should resist the temptation to reduce these standards because of difficulties in securing and keeping persons who can meet them at the salaries paid. The new entrance salary of $1860 should prove satisfactory if arrangements can be made to advance the salary of the successful nurses fairly systematically until they reach a reasonable maximum.

Whenever possible, the Indian Service should coöperate with local, state, county, and city health authorities in utilizing their public health nurses by sharing a reasonable proportion of the expense attached thereto. In all such instances, the ratio of nurses to unit of population should be such that efficient work could be done.

The housing facilities made available for nurses should be comfortable and reasonably well furnished, and located at a point convenient to their activities. Hospital nurses should have quarters outside the hospital.

The Practice of Preventive Medicine and Public Health in the Indian Service. The medical and health service of the Indian Service in its operation has as a rule been curative and not, as has been asserted to be the case for some years past, educational and preventive. In fact, it has to a great extent been merely palliative in practice. The major single exception of a general character has been the widespread campaign for vaccination against smallpox.

Lack of Preventive Program. The findings that substantiate this statement are as follows:

1. Until the past year or so trained public health personnel has not been permanently employed by the Indian Service. This personnel embraces physicians, epidemiologists, and nurses, with adequate clerical assistance for each.

2. The permanent clinic, the back bone of case finding and follow-up machinery of public health practice seems not to have been established until recently[19] and then only at Crow agency, Montana; Cass Lake, Minnesota; and Keshena, Wisconsin. These attempts are commendable, but at this stage cannot be said to constitute a well developed project. This does not refer to the dispensary service rendered in boarding schools. The clinic should carry out preventive as well as curative measures, have access to family case records, and be so organized that it supplements all other preventive and curative health procedures. The manner in which permanent clinics are conducted is in most instances unsatisfactory.

3. The compilation and analysis of accurate vital statistics has never been a general practice in the Indian Service. Without these essential data it is absolutely impossible effectively to plan or direct a constructive health program. This subject is so important that it will be further discussed later.

4. Tuberculosis, the most serious disease problem among the Indians, has not been effectively attacked. The sanatoria and reservation schools have been operated far below acceptable standards.

5. The preventive work in the trachoma campaign has consisted mainly in providing separate towels in boarding schools, displaying posters in Indian communities, and in a small amount of rather ineffective segregating of cases in schools. The really worth while activity is at Fort Defiance, and that is of a curative nature, although it does segregate cases. A more limited, though commendable, activity is at the Reno Colony, where a permanent clinic is being operated jointly by the local field matron and the county public health nurse. As has been pointed out more at length in the section on trachoma the existing knowledge of the disease is limited; and it may doubtless prove true in trachoma, as it has in tuberculosis, that emphasis must be placed on diet and a hygienic regimen. As the Indian diet both in schools and on reservations is obviously markedly deficient, the tendency to put almost the entire emphasis on local curative measures is open to serious question.

[19] This statement it should be noted refers to permanent clinics. Special and temporary clinics have been held from time to time in the past.

6. Child welfare and hygiene have been neglected. Scientific effort is made in prenatal and preschool work only in a few instances. The school child has had the most cursory of physical examinations and wholly inadequate correction of defects. This statement is borne out by the reported prevalence of tuberculosis among children in the schools and by the epidemic of acute infectious diseases that spread almost unchecked. Adequate facilities for isolation are lacking.

The teaching of health education in boarding schools has to a great extent been rendered ineffective by two factors: the inability of teachers untrained in this subject to handle it effectively, and the negative practices in the every day life of the child in school. As examples may be cited, stressing in formal instruction the drinking of milk, but at the same time not providing it, and advocating regular bathing and yet making only limited provision for it.

7. Provision for potable water supplies and for adequate sewage disposal arrangements have been neglected. In only a few places has a concerted effort been made to meet these needs. Many years ago, a sewage disposal plant was installed for the Warm Springs Indians at Pala, California. Equipment was provided and installed in the agency quarters, but never in the Indians' homes, and the surplus equipment has long since been moved off the reservation. In boarding schools where this matter should be of the first importance from an educational standpoint, a poorly functioning system is sometimes found.

At some jurisdictions reports have been made for years of a contaminated water supply, yet corrective steps have been taken but slowly. The first really broad and systematic effort to change this situation has been made during the present year through surveys of water and sewage disposal systems by the Public Health Service.

8. Inadequate provision has been made for coöperation with other organizations, federal, state, and philanthropic.

These eight points cited appear abundantly to justify the conclusion that as a rule the medical work of the Indian Service has been curative or even palliative rather than educational and preventive.

The important matters of coöperation with other agencies and adequate statistics and records require further discussion.

Coöperation with Other Organizations. Various national and local health agencies have asked permission of the Bureau to carry out on Indian reservations certain activities in their particular fields. The permission has been granted. The private agency has been permitted to send workers to the reservation and a degree of courtesy has been assured them by Indian Service employees. Their studies were made with a certain amount of independence. In the case of public health nursing, where the most constructive results could be obtained only by a close coöperation with the reservation employees, it was found that the relationships were often strained, even to the breaking point, as the work progressed, although they had been cordial at the outset. This was due to the fact that the outside workers had no definite responsibility to the Indian Service. With salaries that were much in advance of those paid within legislative limits by the Indian Service and training of a more specialized character than that of the reservation employees a definite clash in personalities resulted.

The most serious fault, however, lies in the fact that generally the work attempted by these workers was not done with any idea of its ultimate incorporation into the Indian medical service. If this idea was ever advanced, it was theoretical, because, by and large, this goal has not materialized. In practice, most of these endeavors have vanished as abruptly as they started, leaving little that was constructive.

The Office of Indian Affairs has also failed to assume leadership in these matters, largely because it has not had a trained personnel in close contact with, and able to evaluate, the activities of these private agencies. It has seldom taken the initiative and requested service from outside agencies, and therefore has not assumed responsibility in such endeavors. One exception to this is found in the Red Cross Survey of 1924. The Indian Office requested the American Red Cross to make a survey to determine the public health nursing needs on certain Indian reservations. A study was made and a report with recommendations submitted. As a result, the Office has attempted to carry out some of these recommendations, although in a limited way, due largely to the lack of funds with which to bring about the changes suggested. It may be said in passing that the findings of the Red Cross report correspond

very closely to those of the present survey insofar as they relate to the same reservations.

In August, 1912, Congress authorized the Public Health Service to make an investigation into the prevalence of contagious and infectious diseases among the Indians of the United States. A report was submitted in 1913, containing findings, conclusions, and recommendations. Viewing the situation of this problem in the Indian Service today, it would seem that the Service has lacked the technical staff necessary to correct the preventable mistakes outlined in that report. It has of course been seriously handicapped for funds with which to prosecute such a program, but, more important, it has lacked a well equipped technical staff adequately to present its technical requirements to Congress and the Budget Bureau.

The American Red Cross, the American Child Health Association, and the Metropolitan Life Insurance Company have coöperated with the Service by preparing, and in some cases even by providing, brief pamphlets on various subjects pertaining to health. As this literature has been published in English, it is useful chiefly in the schools and among the more advanced better educated Indians. Obviously it can be of little service to the Indians who do not easily use English. Religious literature has been printed in the Dakota language for the Sioux tribes, and in the Five-year Program at Pine Ridge mimeographed folders have been prepared in that language. The fact that this has been done shows that it could be done in health literature. Little use has thus far been made of moving pictures. Home surveys have been made on several occasions. They are too often filed instead of being used as the basis for an active cumulative index of the health situation inherent in the Indian home.

It should be noted that from time to time various other voluntary agencies have carried on health activities among certain Indian tribes. These activities have generally dealt with a specific problem and not with the situation as a whole.

To the activities of the Red Cross in providing public health nurses can doubtless be traced in no small measure the recent development of this service by the Indian Office itself. The Eastern Association on Indian Affairs is making a similar demonstration by providing field nurses in New Mexico. The survey made by the

Red Cross, although never published, served a valuable purpose in stimulating the Service to review its work and undertake new and improved efforts. The Junior Red Cross activities in the schools have undoubtedly been helpful although possibly not sufficiently adapted or related to Indian conditions. The hospital maintained for eye cases by the Episcopal Church at Fort Defiance should also be specifically mentioned, and also the recent health survey at Klamath made by the Oregon Tuberculosis Association and the National Tuberculosis Association. Mention has been made of the coöperation of a committee from the American Medical Association in the trachoma campaign and of the work of Noguchi under the auspices of the International Health Board in the study of trachoma. The catalogue of such activities, however, is comparatively brief, especially if the age of the Indian health problem is considered. Unquestionably enough has not been done through close coöperation between the Indian Service and private agencies in perfecting well developed programs.

In some states, such as California, Washington, Oregon, and Minnesota, the Indian has benefited by the state traveling tuberculosis clinics, and the activities of the local county public health units. This service, like that of the voluntary activities mentioned above, has been independent of the Indian Office, and has received no subsidy from it.

The Indian Office is engaged in no coöperative full-time public health services. In the Northwest, such a point has been selected, but details have not been worked out.

The general lack of coöperation and exchange of ideas between the Office of Indian Affairs and state boards of health is a matter of frequent comment and is to be deplored. The Office has had no technical personnel to arrange such coöperation, and the state boards of health have interpreted lack of definite action as a suggestion to stay off the Indian reservations. In point of fact, the courts have upheld this isolation policy on the part of the Indian Office. Legislation today, technically speaking, would hold the Indian reservation inviolate by outside agencies.

Several national voluntary health agencies devote their time to the various specialized fields of preventive medicine and public health. Their executive staffs are composed of trained specialists, qualified to speak with authority on health activities lying within

their respective fields. These organizations are supported by private or public contributions, and their purpose is to make available to established health agencies the fruits of their studies, experimentation, and demonstrations. They have conducted certain important health demonstrations to test the practicability of their studies, demonstrations that federal agencies were unable to make because of restrictive legislation, lack of funds, and, too frequently, lack of initiative. The results of their investigations have been accepted as standards in many phases of the field of public health.

In sanatorium planning and construction, a very highly specialized field, the Indian Office has not until within the last few months consulted those agencies to which the entire country looks for guidance and standards. The service offered by these organizations is available merely for the asking. The Indian Service hospitals and sanatoria are much below the minimum standards in planning, construction, and administration.

Although the Indian Office has from time to time permitted outside agencies to make valuable studies on the reservations, it has taken more of a passive than an active interest. It has not viewed the situation from the standpoint of possible incorporation into its own program of a demonstrated method. Further, it has not often in the past assumed the initiative in requesting expert opinion from the outside.

The Secretary of the Interior, however, took a commendable step to correct this state of affairs when he requested the Public Health Service in 1926 to detail a member of that organization to the Office of Indian Affairs to assist in the reorganization of the Indian medical service.

In 1924 the Office collaborated with the American Child Health Association in the preparation of health education material for the boarding schools. The American Junior Red Cross prepared material on first aid and accident prevention.

Since that time, there has been a decided favorable change in the attitude of the Office of Indian Affairs toward federal, national, state, and local, official, and voluntary health agencies. Several worth while examples are:

1. The sanitary inspectorial service rendered by the Public Health Service.

2. The Montana Tuberculosis Association offered the services of a tuberculosis nurse for any reservation in Montana. The Blackfeet Reservation was selected. The Indian Office stipulated the conditions of the contract which, in general, were that this worker should do a generalized rather than a specialized nursing service. The Montana Tuberculosis Association would provide salary, and the Indian Service would furnish a car and its upkeep as well as living quarters. The activities of this worker would be under the direction of the Indian Service, and the report would be made both to the Montana Association and the Indian Service.

3. In Montana a plan has been under consideration for the establishment of a full-time health unit at Hardin. The territory embraced by this unit will include the majority of the Indians at the Crow Agency. Plans have not materialized as yet, but there is a definite interest on the part of the Indian Office in coöperating with the Montana State Board of Health and other interests in this plan by providing a part of the cost.

4. At the present time negotiations are under consideration to bring about a coöperative working arrangement between state health authorities in the states of Minnesota, Wisconsin, and California.

Vital Statistics and Records. It is a generally accepted axiom today that the quality of a service is accurately reflected in the completeness and accuracy of its records. In this respect the Indian Service has been weak. Vital statistics and records of medical activities at present are incomplete and as a rule unreliable. Wide variations are found between figures obtained at the reservation and those at the Indian Office in Washington. The Office has depended too much upon the initiative and interest of its field personnel, not recognizing that such personnel were not selected for fitness in the technical field of statistics, and has not itself demanded and used accurate original basic records. Physicians who have not been in the habit of keeping careful records in their private practice cannot be expected to make accurate and complete returns when they enter the Indian Service unless they are required to do so and are given definite instructions regarding details. General circulars issued by the Indian Office on this matter as far back as 1916 have urged and insisted on more accuracy, but a casual glance at the present day reports makes it evident that comparatively little has been accomplished, because of the failure to prescribe suitable definite forms, give precise instructions, and carefully check the results through actual use of the records. To be fair, certain inherent difficulties in the Indian field service should be considered:

1. The Scarcity of Physicians: The number of physicians on the reservations has always been much too small, a fact which increases the difficulty in collecting data. If a physician with far more before him than he can do makes an attempt to keep complete records of births, deaths, and disease, he must neglect his care of the patient. At the reservations where complete vital statistics records were found, some of the Indians criticized the physician for devoting more time to the collection of data than he did to the care of the sick. They particularly resented the fact that he came only after the Indian had died to inquire about the cause of death.

2. Tribal Customs: Some tribes are averse to reporting births and deaths because of prejudices and tribal custom. Many are merely indifferent because of their ignorance of the importance of prompt reporting.

3. Confusion in Names: The Indians in some tribes have more than one name, which makes it impossible to keep accurate records unless there is an adequate field personnel.

4. Indians Living off their Reservations: An Indian who dies on some reservation other than the one in which he is enrolled may be counted twice. Many Indians living in urban communities are carried on their tribal roll, but births and deaths among them are frequently not reported to the reservation, or only after a period of time. Again, private practitioners do not always make the proper returns to the agency.

Definite recognition must be given the fact that under existing conditions not all the returns can be equally complete and reliable. For certain jurisdictions the Washington office can reasonably demand approximately perfect figures. For others, notably the Navajo jurisdiction, the difficulties are so great that considerable time will have to be spent in developing an adequate statistical system before reasonably complete figures can be expected. Some jurisdictions have districts from which practically complete figures can be easily obtained, but in others the problem is more like that

in the Navajo country. In the preparation and analysis of the statistics the Indian Office must recognize these facts and separate its accurate reliable figures from the less accurate. To combine accurate and inaccurate figures in inseparable totals may lead to erroneous conclusions. Accurate facts are diluted with inaccurate. Separate figures should be given even if this course necessitates dividing jurisdictions into districts according to the reliability of the data for them. The Office is now beginning to recognize this principle and is asking that the distinction be made.

Factors Affecting Health Statistics. Other factors that affect the accuracy and completeness of health statistics which must be considered are:

1. Returns made by Field Personnel other than the Physician: The various field workers on the reservations have been instructed to report all births and deaths coming to their attention. Frequently such reports are made to the agency office and not to the physician. Such records relating to deaths are almost certain to be incomplete and inaccurate because at best the diagnosis as to cause of death is a guess. Often no report at all as to cause is given. Several such instances were found. At Fort Peck in the past five years, 53.2 per cent of the deaths recorded in the office were reported without a statement of the cause. At Pine Ridge in the past eighteen months 31.2 per cent had no statement of cause of death. At Cheyenne River in a period of four years and three months 37 per cent were reported without cause of death. On the other hand at Crow Agency where three physicians and three field matrons serve an Indian population of approximately 1800, during a period of three years a definite cause of death was reported for all but 2.8 per cent of the deaths. The Consolidated Chippewa Agency in Minnesota had a record of the cause of death in all but 10.8 per cent in a four-year period. The Rosebud Reservation, comprising approximately 5700 Indians scattered over an area of forty by sixty miles, with two full time and two contract physicians and a public health nurse, reported a definite cause of death in all but 13.5 per cent of the cases.

2. Lack of Accurate Case Records: Indian Service physicians have never kept accurate case records of disease and illness in Indian families. Thus the transferred physician must learn his new field from contact with cases, a thing which would require an enormous amount of time. At present apparently physicians rarely make the attempt. The rapid turn-over of the medical personnel prevents the physicians from learning the local fields and discourages them from attempting to compile case records. The fundamental records from which reliable data could be taken are therefore almost totally lacking.

3. Inaccuracies in Diagnoses: The diagnoses made by physicians are frequently little more than guesses. Some guesses are made in all vital statistics, but in the Indian Service figures the percentage of preventable inaccuracies is undoubtedly far above normal. At one agency, a list of thirty-six deaths was examined, regarding which the physician admitted that he knew one-third were incorrect. He had made no effort to rectify the errors. The annual report on disease at this agency was admittedly compiled at the close of the year by paging through Osler's *Practice of Medicine,* and tabulating largely from memory the number of cases of this or that illness seen. Colds and influenza were excepted.

Little effort is being made at this time to analyze existing facts. In some instances much valuable information could be compiled from existing data if an attempt were made. In the work of this survey it was possible on several occasions to use such data to determine certain trends in mortality.

Since January, 1919, the Indian Office has requested its physicians and agencies to make all vital statistics records in triplicate, retaining one copy at the agency, sending one to the state department of health, and one to Washington. In the past eighteen months the Indian Office has attempted to take off the data contained on the census forms, and then forward them to the United States Census Bureau for checking and tabulation. The copies retained at the agency are often not filed in any logical order.

The Census Bureau compiles its vital statistics of Indians from the various census areas, irrespective of agency or tribe. Thus a comparison of statistics from the two sources is sure to reveal wide variations. Navajo reservations spread over the corners of four states.

The same difficulty in obtaining accurate vital statistics exists in most of the states. By and large, the state boards of health could not supply data that they considered really accurate. As a rule they either did not segregate Indian deaths from those of the total popu-

lation, or else they classified Indians under the general headings including negro, Japanese and Chinese.

No systematic effort is made at this time to report morbidity. In a few instances the acute infectious diseases have been reported to the state health officers. Such reports, however, are rare. No epidemiological case record has generally been kept of infectious and contagious diseases, although possibly this may be done in some school or hospital.

The dispensary records examined on reservations were as a whole unsatisfactory. They lack detail. Frequently entries are made according to symptoms, and in one instance a record was found of "supplies." The present book used for recording such data would be acceptable if the entries were more accurate and complete.

Medical reports made by the agencies to the Washington office have been unreliable for the following reasons:

1. Inaccuracy of the basic source of most figures.
2. Use of figures previously reported without making a careful check-up.
3. Preparation of reports from memory.
4. The editing of the physicians' reports to conform to the superintendent's opinion as to the facts. The possibility of this practice will in the future be largely eliminated because physicians may now report directly to the Chief Medical Officer.
5. Changes of forms and character of information desired. In the past ten years, such changes have been frequent. This has caused confusion and too frequently a multiplicity of reports.

Recommendations. 1. The Indian Service should adopt a well-rounded, effective program of preventive medicine and public health service. The outstanding features of this program should be: (1) An adequate directing force of well trained public health physicians; (2) a greatly increased staff of public health nurses; (3) well organized and administered public health clinics on all reservations; (4) special emphasis on the prevention of the three outstanding diseases among Indians, tuberculosis, trachoma, and diseases of infancy; (5) general efforts to interest the Indians in hygiene and to instruct them in it; (6) the collection, tabulation, and use of reliable vital statistics; and (7) full coöperation with state and local government health agencies and with private national and state health organizations.

2. The specific recommendations regarding the physicians and public health nurses have been already made and need not be repeated here.

3. The object of the clinic should be to encourage all Indians on the reservations to consult physicians freely regarding their general physical condition without waiting the onset of serious diseases. Through this agency it should be possible to detect incipient cases of tuberculosis, trachoma, and other serious diseases or susceptibility to such diseases and to arrange for preventive treatment while the chances for complete arrest and cure of the disease are good. It should also serve as an agency for the follow-up and after treatment of Indians who have been to hospitals and sanatoria because of serious conditions, especially tuberculosis and trachoma. It should give especial attention to expectant mothers and to mothers with young infants. In this work it would encourage women to come to hospitals for confinement or at least to have skilled attendants.

The location of the clinic, its days and hours for patients, and other similar details will depend on local conditions. In general, stress should be laid on holding clinics at times and places convenient for the Indians.

The facilities should be adequate, and reasonably attractive waiting rooms should be available for the Indians. The personnel should place special emphasis on maintaining friendly relations with the Indians and on winning and keeping their confidence. At regular intervals the traveling specialists of the Service should visit the clinics and give special attention to the Indians found to require their services.

4. Through the clinics, the public health nurses, and the school physicians, a determined effort should be made to locate all Indians in contact with cases of tuberculosis, trachoma, and other communicable diseases. If these persons show evidence of the disease or susceptibility to it, appropriate measures should be taken for their protection. In any case educational work should be done to instruct them in respect to hygiene and especially diet. Recommendations with respect to hospitals, sanatoria, sanatorium schools, and boarding schools are given in detail in the respective sections dealing with these subjects.

5. Special attention should be given on the reservations to child welfare and hygiene, so that correctable defects may be detected

and remedied at an early age before the child is sent to school. Recommendations regarding the care of boarding school children are contained in the section of this chapter dealing with that special subject.[20] The local Indian medical service should make complete and careful examinations of all Indian children attending public schools or Indian Service day schools and should arrange for the care and treatment of all found in need of attention. Local officers should give special attention to the sanitation and hygiene of local schools for Indians. This service should be extended to Indian children in public schools unless the public school authorities are found to be making adequate provision.

6. The routine practice of the reservation public health organization should include vaccination against small pox, immunization of preschool children and school children against diphtheria, the prompt reporting and isolation of cases of communicable disease, and as far as possible general testing for the discovery of venereal diseases, as is now being done at the Consolidated Chippewa Agency. Provision should be made for treatment of cases of venereal diseases thus located.

7. The local health organization should also give special attention to water supply and sewage disposal. In many Indian village communities regular water and sewer systems are practicable and the program should look to their ultimate development. Tribal funds or reimbursable funds might well be used in such a program. Where the installation of such systems is impracticable a privy campaign, such as has been successful in many white communities, should be inaugurated. Working models of acceptable simple plans for these buildings should be available on every reservation, and Indians should be aided in building sanitary privies on their own places.

Further steps should be taken toward providing a safe water supply. This matter is discussed under hospitals, sanatoria, and schools so that here reference is made particularly to water supplies on the reservations. The use of tribal well-boring machines is suggested. Arrangements can be made for having water tested periodically by the laboratories of state health departments or by the Public Health Service.

[20] See pages 392 to 396.

8. Popular health instruction should receive more emphasis than heretofore. Motion pictures dealing with health should be shown to reservation Indians as well as to school children. Lectures and conferences with Indians on health could well be used more. Where the Indians have a written language, health pamphlets in these languages could well be distributed. Special baby clinics could be more generally held.

9. The policy of the Indian Service should be to attain maximum possible coöperation with the public health authorities of the states and counties in which Indian jurisdictions are located. Insofar as practicable the state and local organizations should be utilized even if this arrangement requires some payment to the state or local authority from national or tribal funds, but where this payment is made the national government should exercise at least some supervisory authority to see that service to the Indians is adequate.

10. The Indian Service, through the recommended Division of Planning and Development, should enlist the coöperation of private national and state health organizations and of national societies of the various classes of public health workers. Among the first group may be mentioned national and state organizations interested especially in tuberculosis, infant care, trachoma, and venereal diseases; among the second, the associations of public health nursing, general nursing, and social service. Wherever private organizations are willing to coöperate with the Indian Service in demonstrating the practicability of a program, or in experimenting to determine the practicability of a program believed sound, maximum coöperation should be extended.

11. An adequate system for the collection, tabulation, and use of vital statistics should be immediately installed. The first step in this direction should be a reasonably liberal appropriation for a competent statistician and a small corps of experienced statistical clerks. The second step should be the preparation of suitable forms and instructions. In devising forms the effort should be made to use the forms of the state in which the jurisdiction is located insofar as they are applicable or at least to make them supply all information required by the state. The third step should be to arrange for the examination of the returns, their tabulation, and their use as a device for controlling and directing the public health work.

The records and statistics should include: (1) Mortality statistics, (2) morbidity statistics for reportable diseases, (3) family case records, (4) dispensary records, (5) hospitals and sanatorium records, (6) school medical examination records, and (7) records of work done by the various medical workers.

No attempt will here be made to indicate precisely what each of these records should contain or how they should be tabulated and presented. To attempt such a presentation would open up the whole field of vital statistics. If the Indian Service can get an adequate appropriation for this work it will have no difficulty in securing competent experts who in coöperation with public and private agencies can work out the details.

Hospital Facilities in the Indian Service. The hospital and sanatorium facilities offered in the Indian Service do not meet the minimum requirements according to accepted standards in this and other countries.

Hospital and sanatorium standards and practices vary enough to necessitate a separate discussion of each type of institution, such as school and agency hospitals, sanatoria and sanatorium schools, and hospitals for the insane.

In the main, this problem will be discussed in its broadest aspects with reference to specific instances that best illustrate the point in question.

Hospitals. The Office of Indian Affairs has classified its hospitals under the following headings: (1) School, (2) agency, (3) school and agency, and (4) hospitals for the insane. With the exception of the last named, the demands made upon the three types of hospitals are much the same. They are supposed to offer facilities for general surgery, confinements, and acute and chronic diseases, and, in some instances, for such acute infectious diseases as tuberculosis, trachoma, and for other communicable diseases.

In order to get a fair cross section of the character of the work done in Indian Service hospitals, statistics were compiled from Indian Office reports relating to seventeen hospitals in as many states. The following tabulation summarizes the data. The figures are only totals, as it was impossible to determine the exact nature of the individual cases from the reports submitted. They give, however, a general idea of the types of service rendered in the average hospital.

Indian Service statistics on character of work done in seventeen selected hospitals in the period January 1 to June 30, 1926

Type of treatment given	Cases treated in 17 selected hospitals		Average number of cases per hospital
	Number	Per cent distribution	
All treatments	6,326	100.0	372.11
Surgical	1,911	30.2	112.41
Trachoma	438	6.9	25.76
Other	1,473	23.3	86.64
Medical	4,415	69.8	259.69
Trachoma	129	2.0	7.58
Tuberculosis	295	4.7	17.35
Other	3,991	63.1	234.76

The Indian Service reported that it operated during the fiscal year ending June 30, 1926, sixty-two school, agency, and school and agency hospitals. These hospitals represented a total capacity of 1672 beds, with a total of 264,714 days of hospital treatment rendered. The available hospital days of treatment would equal tht total number of beds (1672) multiplied by 365, or 610,280. It is obvious, then, that approximately 43 per cent of available bed capacity was utilized. These data may be conveniently subdivided for each class of hospital, as follows:

Indian Service statistics on use of hospital beds in Indian Service hospitals, 1926

Type of hospital	Bed capacity	Available bed days	Bed days used	Per cent used
Total	1,672	610,280	264,714	43.3
School hospitals	670	244,550	76,632	31.3
Agency hospitals	68	24,820	11,212	45.1
School and agency	934	340,910	176,870	51.9

This table shows that the school hospitals had the lowest use of beds, the agency hospitals next, and the school and agency hospitals the greatest.

No adequate scientific study of hospital needs has been made by the Indian Office upon which to base the type and number of beds required for individual reservations.

In well organized hospitals in the average American community, the average use of beds approximates 85 per cent of the available bed capacity. Hence the Indian Service hospitals are using less than half the bed capacity ordinarily used. The question at once arises, are there too many hospital beds in the Indian Service? The answer must be in the negative, for although no accurate figures are available on the sickness rate among Indians, the most superficial observation in the field will impress the observer that scores of Indians are not receiving the hospital attention they need. The cause of this situation as observed at approximately forty-three of these institutions resolves itself into the following:

1. The Indians have to be educated to accept medical treatment and hospital care. This fact makes it imperative that the Service should be of reasonably high grade and that the personnel should be qualified to win the confidence and friendship of the Indians.

2. The medical personnel in charge is not of sufficiently high grade. Physicians are frequently placed in charge who are not experienced in or qualified for hospital administration. The result is lack of interest and poor service.

3. The hospital staff has been so small that reasonably adequate service could not be rendered.

4. The percentage of public health nurses in the service is low. One of their values lies in their ability to discover cases and urge hospitalization.

5. Such case-finding facilities as clinics are lacking.

6. A combination of the above conditions over a period of years has inculcated a distrust in the hospital on the part of the Indians. This distrust combined with their natural reticence has caused them to accept hospitalization very slowly unless in dire straits. But when they have confidence in the quality of the service, it is remarkable to find how readily the Indians accept good hospital service. With the possible exception of a few of the old Indians and some of the less civilized tribes, if they have confidence in the physician

and receive kindness and sympathy from the nurses, they are in general quick to accept such care and will travel a long distance for it. A case was observed in the Navajo country in which an old woman came voluntarily from nobody knew where to the hospital to have her eyes treated for trachoma. Such voluntary action is not uncommon; many other instances could be cited. How else can the fact be accounted for that 57.6 per cent of all births on the Oneida Reservation in Wisconsin between August, 1926, and May, 1927, took place in the agency hospital? And that 29 per cent of all births from July, 1926, to May, 1927, at the Crow Agency, Montana, occurred in the hospital? Where such splendid work is being done, the evidence discloses a sympathetic personnel. On the other hand, one often hears complaints of neglect and even maltreatment.

7. The physical plant of the hospital has been responsible for a certain amount of this difficulty. The construction has not been good and the arrangement is generally inconvenient. The basic plan in most of these institutions is two large wards, an arrangement that does not permit of meeting the shifting needs of surgery, confinements, and acute infectious diseases.

A policy in the past has been to salvage abandoned forts and other buildings and to convert them into hospitals, regardless of their location and the suitability of construction. These buildings are frequently located at long distances from convenient transportation centers, where the minimum amount of contact with the outside world is possible. Sometimes the old buildings are entirely unsuited to hospital use. In the name of economy money and paint are poured into old buildings resulting in the end in the same old building, still unsuited to the needs for which it was intended.

The government has recently seen the short-sightedness of the policy in the matter of the location and construction of hospitals, and the Indian Office has formulated a plan whereby a hospital center is to be situated at Fort Defiance, Arizona. This decision is wise, as a hospital there can very adequately administer to the needs in the Navajo country. If the building plan will conform to accepted standards in hospital planning, equipment, and administration, it will be a commendable step in the right direction. To accomplish these results, however, a much larger appropriation will have to be made than is now planned.

Where the needs are obvious, the Service has been definitely handicapped by low appropriations in building institutions that will meet modern requirements. Lack of funds results in a limited cubage per patient, prevents any considerable subdivision of the hospital space, and further requires the constant building of new institutions according to old inconvenient plans.

As a general rule, an allowance of from 7000 to 8000 cubic feet per bed should be provided for the full requirements of an average general hospital, exclusive of nurses' quarters, which require an additional allowance of 4000 cubic feet per bed.[21] General hospitals of about one hundred bed capacity, situated at a distance from large centers and supplies with the minimum of laboratory, operating, and plumbing equipment, average in cost forty-eight cents per cubic foot.

The architect in the Indian Office was asked to supply the information contained in the following table to permit of showing in more detail the actual conditions in Indian Service hospitals, especially those of more recent construction. This table shows that the Indian Service hospitals have not been planned on an adequate cubage basis, and that the average cost is greatly below the standard cited:

Cost, cubage and capacity of selected hospitals in the Indian Service

Hospital	Date of completion	Cost of construction	Cubage	Cubage cost	Bed capacity	Cubic feet per bed
Total	....	$275,140	1,464,858	....	407	.....
Average	....	27,514	146,487	0.187	40.7	3,599.4
Chilocco	1926	22,640	107,736	0.21	18	5,985.3
Choctaw-Chickasaw	1916	46,000	224,357	0.21	60	3,739.3
Cloquet	1916	22,560	101,931	0.22	20	5,096.6
Ft. Lapwai	1927	29,000	185,440	0.16	110	1,685.8
Ft. Peck	1926	24,000	106,759	0.22	12	8,896.6
Kiowa	1915	42,000	286,022	0.15	42	6,810.0
Klamath	1927	25,000	127,868	0.20	30	4,262.2
Laguna	1914	17,000	89,904	0.19	66	1,362.2
Leupp	1927	27,800	132,910	0.21	24	5,537.9
Red Lake	1916	19,140	101,931	0.19	25	4,077.2

Hospital building costs in the average American community have shown a steady rise in the past twenty-five years. This is due in part to the rising costs of materials and labor, and partly to the fact that the hospital of today is a much more refined institution than it was twenty-five years ago. Certain conveniences are now regarded as essential that were unknown years ago. In this matter, the Indian Service has not been able to keep abreast of the times.

[21] *Architectural Forum,* XXXVII, No. 6, December, 1922. Note that the figures refer to all the requirements, not merely to the ward rooms or separate rooms in which the beds are located.

Unfortunately in making appropriations for Indian hospitals, a tendency has been apparent to consider not what is requisite to meet reasonable minimum standards for the effective treatment of medical and surgical cases among the Indians, but rather what the Indians are accustomed to in their own homes. That the hospital facilities now supplied are in many instances superior to what the Indians have in their own homes is at once admitted, but it must be remembered that not infrequently the disease which the hospital is called upon to combat had its origin in the bad living conditions to which the Indians are accustomed. In many cases an important function of the hospital is to educate the Indians to higher standards so that when they return to their own homes they will know from experience what they should have. This educational work is especially important in the treatment of tuberculosis and trachoma and in maternity cases, in which the mothers should be given sound instruction in infant care. The survey staff holds no brief for ornate elaborate hospitals where patients are given luxuries, but on the other hand it does not regard the Indian's standards of living as any criterion as to what a hospital should supply. The question is not what the Indians are used to, but what is necessary for the economical and efficient treatment of the diseases which the hospital is created to combat. It is false economy to hold down the capital investment in hospitals, if by so doing they are prevented from rendering effective treatment.

It seems hardly necessary to say that many states, counties, and cities supply as modern and effective hospital care for the indigent case as is supplied for the patients coming from the better homes. The chief differences are that the indigent cases are cared for in wards and the pay cases in semi-private or private rooms according to their ability to pay, and that the pay patients may be furnished some luxuries not regarded as essential for effective treatment. This modern type of hospital service is both humanitarian and economical. The American Indians are entitled to hospitals as modern as those available for the indigent whites in this country.

The general plan and arrangement of the Indian Service hospital space has been poor. Usually no isolation rooms are available for patients. The separate rooms provided are as a rule occupied by the hospital staff.

The appropriations for hospital upkeep have been so restricted that the older buildings especially have deteriorated to a point where large sums would be necessary to restore them even to their original inferior condition, much less to remodel them. In fact many of them should be replaced with new structures embracing modern planning and arrangement. The lack of permanency in building materials causes an unavoidable deterioration that costs heavily in the end. In planning new structures and in considering the replacement of the old, consideration should be given the possibility of their future use for the community as a whole, both white and Indian. In many instances it may prove feasible to coöperate with state, county, or other local agencies in perfecting plans whereby joint hospital facilities may be provided. If such coöperation can be arranged superior hospital facilities may be made available for the entire neighborhood, giving both to whites and to Indians advantages they could hardly secure if each should have an independent hospital.

As many of these hospitals are of frame materials and none of them are of completely fire resisting construction, the fire hazard is great, especially as they are often far removed from organized fire fighting apparatus and are not provided with adequate apparatus on the ground. In addition to the insufficiency of fire fighting apparatus, water supplies are often inadequate. The number of chemical extinguishers, their distribution, and the frequency with which they are recharged, have often been found faulty. Fortunately most of the buildings are of one-story construction so that patients could be taken out if the occasion demanded it.

The fixed equipment such as plumbing, lighting fixtures, and radiators, is often inadequate, in some instances in respect to numbers, and in others, in respect to capacity, and is frequently in poor repair. The hospital at Cheyenne River, South Dakota, is of two-story construction. On the second floor are two glassed-in wards that would be suitable for the housing of tuberculosis cases. It is reported that radiators were provided, but that some time ago they were removed and placed in the children's dormitories at the reservation school. These wards, which would accommodate approximately from sixteen to twenty more patients, are thereby rendered useless, especially during the winter months. The Indian Office is now planning to correct this situation and to open this space for patients. In some hospitals the heating plant is of limited capacity, and it is with difficulty that the buildings are kept warm. When the head nurse in one of the hospitals became ill, she had to be removed to a hospital in a nearby city because she could not endure the low temperature of her own hospital.

Utility room facilities, such as slop sinks and other equipment for aids in nursing, are generally either of a poor design, in a bad state of repair, poorly placed, or absent.

Frequently the laundry equipment in general and agency hospitals is of an old inefficient design, such for example as a single-roll mangle. At the school hospitals the laundry work is frequently done at the regular school laundry. As these units usually have old equipment of limited capacity, difficulty is often experienced in getting prompt service.

Movable equipment, such as beds, mattresses, hospital furniture, dishes, and culinary equipment, is of poor quality, is frequently limited in amount and is often in bad condition. The beds and mattresses especially are of inferior quality. Many of the springs sag and the mattresses are lumpy, a combination which does not assure the patient the needed rest and relaxation. Much of the difficulty is due to the fact that such equipment in the past has been purchased at the lowest bid with little apparent regard for quality, wearing power, or hospital needs. The medical service is now endeavoring to raise the standards of specifications for such equipment so as to compare more favorably with those approved for other federal hospitals. It is assumed that the future will show a marked improvement in this respect.

Operating room equipment is of a varied character. In many hospitals the amount is adequate, but it has almost invariably been crowded into too small a space. The usual rule is to have all equipment, such as the regular operating room pieces, scrub-up sinks, sterilizers, sterile linen closets, in fact, practically everything connected with an operating suite, placed in one room. This results in serious congestion, in many instances leaving barely enough space for the operator and his assistants to walk. At the Laguna

hospital the operating room is situated between the men's ward and the dining room. As the ward has no outside exit, the men patients must pass through the operating room. The nurses' quarters, too, are located off the operating room. Similar evidence of crowding can be found in practically every Indian Service hospital. Often the objectionable condition is due to poor planning, because in place after place a re-arrangement of space with slight additions would correct the difficulties.

Sterilizing equipment is often inadequate. At the Rosebud Agency a high pressure sterilizer has been installed for years, with no possibility whatever of supplying high pressure steam to operate it. Plumbers' blow torches were utilized instead. No imagination is required to understand the difficulties under which the operator must work with such an arrangement in the operating room. This equipment is to be replaced by a type meeting the needs of the hospital.

Special hospital equipment, such as X-ray, clinical laboratory, and special treatment facilities is generally lacking. At the present time no hospital has an X-ray unit. Requests have been made for several portable units, and undoubtedly some of them will be installed in the near future. Clinical laboratory equipment, an essential of any well organized hospital, is not provided. In some few instances, one may find a microscope that is usable and a few test tubes and reagents, but ordinarily their appearance indicates infrequent use. This observation is further substantiated by the universal lack of records of such work on the meagre clinical sheets. The Indian Office has recently purchased from the Veterans' Bureau forty microscopes, which are being put in excellent condition and will be distributed to several of the hospitals. Others will be required in the near future. Special treatment equipment, such as diathermy and quartz light, is not found in this class of hospital.

The American College of Surgeons' standards for clinical laboratory work include chemical, bacteriological, serological, and pathological examinations. All tissues removed must be examined pathologically and the gross and microscopic findings recorded. Such service is not rendered in Indian Service hospitals. The serological work would be done gratis at most state board of health laboratories, but it was reported in those state laboratories visited that this service was seldom requested. The State Board of Health

of Montana reports the following laboratory service rendered Indian Service physicians for the years 1925 and 1926:

Agency	Typhoid	Wassermanns	G. C.	Diphtheria	Tuberculosis	Urine
Fort Browning ...	..	9	3	1	..	..
Crow	4	16	15	..	25	..
Lame Deer	..	..	..	..	..	..
Fort Belknap	..	..	..	..	..	..
Fort Peck	7	2	..	1	..	1

This service was rendered only partly in connection with hospital service; some was undoubtedly done in connection with routine reservation practice.

Facilities for confinements are in most instances the same as for any other case. Delivery is made either in a ward or in the operating room.

The organization of the hospital administration staff has been defective. In the past, authority and responsibility were frequently divided. Usually the physician had no control over hospital employees. At one agency the superintendent was arranging with physicians in a neighboring city to locate a hospital nurse, when the physician in charge could have secured a capable nurse whom he knew and could undoubtedly have worked with to advantage. This situation has been remedied by a recent order, placing all hospital employees under the direction of the physician. As a rule, this order is being carried out, although at one agency the physician in charge of the general hospital had to get authorization from the superintendent before he could change his nurse from night to day duty.

In all agencies the hospital physician is expected to do a certain amount of reservation work. Often on reservations where there is more than one position for physicians, and some are vacant, the physician at the hospital must assume full responsibility for the outside work in addition to his hospital duties. Under such circumstances the hospital work must obviously be neglected to a considerable degree.

Outside consultant service is usually available only at those stations situated near an urban community, except for rather infrequent visits by special field personnel.

The nursing staffs in these hospitals, as has been pointed out in more detail in the discussion of the nursing service, are almost invariably far below the standards for such practice. The accepted ratio of nurses to patients in general hospitals is an average of one to every five patients in open wards, exclusive of the employees required to do the manual labor.

It may be well to consider in more detail the ratio of total employees per unit of population in these hospitals. The commonly accepted ratio in the average general hospital is one and one-third to one and one-half employees per patient. The Public Health Service hospital authorities report a ratio of three employees to five patients, and at the same time assert that they are considerably understaffed on account of insufficient appropriations.

The most recent figures procurable from the Indian Service regarding hospital employees are based on a check made in April, 1927. They are presented in the following table, which indicates the very serious understaffing of these hospitals. In considering these figures, it must be remembered that practically all physicians listed were devoting only part time service to the hospital, that only about fifty of the nurses listed were graduate nurses on a permanent basis, the remainder being either on temporary service or practical nurses with training and experience insufficient to comply with civil service standards; and that the total employees includes farmers, dairymen, day laborers, and hospital assistants, only a few of whom gave any so-called nursing service to the patient. It was impossible to obtain figures making an accurate division of this latter class.

Indian Service statistics showing employees in hospitals as of April, 1927

Class of institution	Bed capacity	Total employees	Physicians	Contract physicians	Nurses	Other employees	Ratio of employees to beds	Percentage deficiency on basis 1:1
Total	1,764	290	51	13	82	144	1: 6.1	83.56
Ratio per bed capacity	....	1: 6.1	1: 34.6	1: 135.7	1: 21.5	1: 12.2	....	....
Hospital for insane	92	24	1	....	1	22	1: 3.8	73.91
School and agency	934	182	34	3	49	96	1: 5.1	80.51
Agency	68	17	3	....	3	11	1: 4.0	75.00
School	670	67	13	10	29	15	1: 10.0	90.00

On the assumption that only about 46 per cent of bed space is used in these hospitals in the ratio of one employee to one bed, the degree of understaffing still remains about 64 per cent.

The shortage in hospital staff indicated in the above table results in inadequate supervision and care of patients. Sometimes the patient has to perform many of the routine duties, as well as to wait on himself. It is not uncommon to find patients literally dragging themselves to the lavatory sections; sometimes patients too ill to be out of bed are seen doing work about the hospitals.

A rule is in force that certain specified assistant positions must be filled by Indian employees. This works a serious handicap to the already over-worked staff, because frequently Indians are not available. The positions could be filled by capable whites, but they must remain vacant until an Indian is found. The Indian Office is now changing the nomenclature for assistant positions to conform to hospital practice, and it is assumed that much of this difficulty will be overcome.

The management of the hospital staff is difficult, due to the type of employee, the low salaries paid, the poor housing facilities provided, and the isolation from contact with the outside world. These factors cause a high turnover in personnel and a consequent lack of continuity in effort.

Appropriations for new buildings and repairs to present buildings and equipment as well as funds for maintenance are far below the average. The average per diem costs in the Indian Service are around $1.80. The Public Health Service hospitals,[22] "without pride of achievement," point to their average per diem costs in 1926 of $3.71. They have suffered a gradual reduction in such costs since 1923, as follows:

1923	$4.08
1924	3.89
1925	3.80
1926	3.71

The service rendered by Indian hospitals has been in keeping with the low appropriation made for hospital maintenance. Not alone has the staff been inadequate; the food supply has often been deplorable. A well balanced ration for invalids cannot be supplied

[22] United States Public Health Service, Annual Report, 1926.

on the present allowances. Not infrequently the hospital lacks a competent cook capable of preparing special diets.

The administrative records and practices in these hospitals have been poor. In many places this defect is recognized by the Indian Office and attempts are being made to remedy it.

Occasionally an entire Indian family is at the hospital, although only one member is ill. To induce the family to send the sick member it was necessary to take them all. It would seem that for the time being there is excuse for this practice, but it is believed that with the development of the medical and public health nursing service, it can gradually be discontinued. Contrary to statements made by some Service employees, it is not believed that this factor works a serious handicap in " tying-up " the hospital beds. It does, however, give a false picture as to the use of hospital beds and administratively is unsound.

It is desirable to consider at this point the use made of non-reservation hospitals in a fairly close proximity to some of the reservations. At Carson City, Nevada, the medical service is rendered by a contract physician who does not attempt major surgery. Indians in need of such service are sent to Reno, about thirty miles distant by hard surface road or railroad. The hospitals used are thoroughly modern and are equipped to give expert service. The patient has the additional advantage of the available consultation service the average city hospital affords. When his case has reached the point of convalescence he is discharged and allowed to complete that phase of his cure at the reservation hospital. This seems to be a very happy solution in the city hospital, and it precludes the necessity of trying to maintain a completely equipped hospital at an isolated point.

Most of the surgical treatment rendered the Oneida Indians at Keshena, Wisconsin, is obtained at Green Bay, Wisconsin. The same benefits result as at Carson City Hospital. A similar service is to be found occasionally on other reservations.

A somewhat different plan has been started at Cloquet, Minnesota, under the Consolidated Chippewa Agency. Under this jurisdiction are four general hospitals and one sanatorium. Cloquet is to be made the surgical hospital and is to receive all such cases from the various points on the reservation, excepting perhaps those too

acute to warrant travel. A capable surgeon at Cloquet has been engaged to do the surgical work, but unfortunately the agency officers are expecting him to do the general reservation work in that vicinity as well. If this surgeon, who is a busy man and not at all likely to have time to concern himself seriously with reservation work, were required to do the surgical work only, and another physician were supplied for general duty, the plan would be acceptable. The time available for the present survey did not permit of determining to what extent it is practicable for the Indian Service to make coöperative arrangements with existing local general or special hospitals, or to join with local white communities in providing new hospitals. The practice has so much to commend it on the ground of both economy and efficiency that the recommended Division of Planning and Development ought to work out plans for coöperation wherever it is practicable.

Sanatoria. No sanatorium in the Indian Service meets the minimum requirements of the American Sanatorium Association.

The administration of Indian Service sanatoria differs from that of its hospitals in that usually the sanatoria have a better qualified physician in charge.

The sanatorium facilities offered by the Indian Service are divided into two classes: sanatoria proper, or institutions taking active cases of tuberculosis, both children and adults; and sanatorium schools or institutions designed for cases of latent tuberculosis in children. These latter institutions correspond to the preventorium in principle, but differ in that they are not wholly confined to latent tuberculosis. They accommodate some cases of active tuberculosis.

Institutions classified as sanatoria or as sanatorium schools are located at eleven places. At seven are the so-called sanatorium schools, with a total bed capacity of 510 beds. At four are sanatoria proper with a total of 241 beds.

For convenience of discussion, they will be listed with their bed capacity, total days of treatment available, and the total days of care actually given during the fiscal years 1925 and 1926. It should be noted that the figures for the Laguna and the Chippewa institutions include also the data for general beds at these institutions.

At the appropriations hearings in 1926,[23] the Indian Office reported 83,306 Indians examined for tuberculosis (1925), with positive findings in 5142 cases. This is 6.2 per cent of the number examined. During the same year, 1695 Indian cases, or 33 per cent of those found were hospitalized for tuberculosis in sanatoria. Quite a large number of additional cases were hospitalized in agency and school hospitals. As this service was only of a temporary character and designed to care for cases awaiting transfer to

Indian Service statistics showing use of sanatoria beds in the Indian Service, 1926 and 1925

Institution	Bed capacity		Available days of treatment		Actual days of treatment		Percentage use of beds	
	1926	1925	1926	1925	1926	1925	1926	1925
All sanatoria	241	206	87,965	64,848	52,661	30,381	59.9	46.8
1. Laguna [a]	66	66	24,090	24,090	14,710	7,596	61.0	31.5
2. Navajo	30	30	10,950	10,950	9,227	8,726	84.2	79.6
3. Chippewa [a b] ..	120	85	43,800	20,683	22,516	6,730	51.4	32.5
4. Fort Spokane..	25	25	9,125	9,125	6,208	7,329	68.0	80.3
All sanatorium schools	510	535	186,150	173,375	148,847	135,458	79.9	78.1
1. Phoenix	120	120	43,800	43,800	31,117	34,030	74.0	77.7
2. Shawnee [c]	80	80	29,200	7,300	12,246	1,674	41.9	22.8
3. Fort Lapwai...	110	110	40,150	40,150	32,421	35,625	80.7	88.7
4. Sac and Fox...	80	80	29,200	29,200	28,663	29,429	98.1	100.7
5. Jicarilla	60	60	21,900	21,900	26,280	11,451	120.0	52.2
6. Choctaw-Chickasaw	60	60	21,900	21,900	18,120	17,157	82.7	78.3
7. Carson	..	25	....	....	....	6,092	....	66.7

[a] The Laguna Hospital and the Chippewa Hospital provide both for tuberculosis and for general cases. The figures here given include both classes of cases, because data distinguishing between the two classes are not available at the Indian Office. At Laguna 36 of the 66 beds are for tubercular patients and at Chippewa 97 of the 120 beds are for this use.
[b] In operation only eight months in 1925.
[c] In operation only three months in 1925.

sanatoria or their homes, it need not be considered in the present discussion.

The only information available on the medical activities of these sanatoria was obtained from the monthly hospital reports on file in the Indian Office. They are very incomplete and do not give a clear picture of the situation. For example, it was impossible to obtain from each of these institutions a classification of cases on admittance according to the stage of disease, or a classification according to the condition on discharge, whether quiescent, improved, or progressive, excepting deaths. As there is no method of follow-up for cases, nothing is known as to what becomes of them once they leave the hospital. Thus a measurement of the results obtained is impossible.

[23] House Hearings on Interior Department appropriations bill, 1928, p. 313.

The scanty information available is given in the accompanying table which indicates the type of service rendered:

Service rendered in sanatoria and sanatorium schools January 1 to June 30, 1926

Institution	Medical service					Surgical service		Termination of case through	
	Tuberculosis				Other diseases				
	Pulmonary	Bone	Gland	Not specified or other		Trachoma	Other operations	Death	Discharge
Laguna	130	4	...	...	65	180	80	6	192
Navajo	95	21	26	...	...	...	8	2	19
Chippewa	...	...	...	[a]366	93	3	11	10	122
Fort Spokane.	13	...	1	...	1	...	...	2	10
Phoenix	...	...	...	[a]486	1	...	...	8	73
Shawnee	22	5	6	1	5	18	...	2	43
Fort Lapwai..	507	...	73	[a] 57	271	...	14	2	76
Sac and Fox..	275	67	174	2	47	...	...	10	28
Jicarilla [b]	...	...	...	[a]216	[c]54	...	...	...	...
Choctaw-Chickasaw ..	134	4	6	1	225	...	...	7	65
Carson	32	26	26	1	69	10	20	4	37

[a] Character of tuberculosis not specified.
[b] Jicarilla report is for only three months.
[c] Influenza epidemic.

These figures obviously are open to question from several angles. At most they can be assumed to represent the number of cases treated.

As the two types of institutions are used for practically the same type of case, they can be discussed as a whole. With the exception of Fort Spokane and Jicarilla all were visited during the course of the survey. For convenience they will be considered from the standpoint of location, equipment, and administration.

The salvaging of abandoned forts and other discarded buildings has been resorted to in the sanatorium as well as in the hospital program. Laguna, Fort Lapwai, Phœnix, and Talihina are the only sanatoria that have been built for sanatorium purposes. All others are converted from old buildings originally designed for other purposes. One of the most recent sanatorium schools is located at Pyramid Lake, Nevada, in what was once a reform school.

At the time of its construction isolation was considered of prime importance. A branch line railroad runs within a mile of the institution, but it is of use only as a method of bringing in supplies, for its course does not make it convenient for passenger traffic. The nearest railroad point convenient for passengers is Wadsworth, Nevada, about eighteen miles distant over a primitive desert road, very difficult of passage during bad weather. Practically all patients coming from the states of Washington, Oregon, California, and points south, are transported overland from Reno, a distance of fifty miles, thirty-eight miles of which is improved highway. This means that patients sent from points in Washington and Oregon must travel approximately forty-eight hours to reach Reno, usually in a day coach, and then must travel by car overland. Obviously such a trip is beyond all reason for a case of active tuberculosis. The nearest city of any importance where consultation could be had is Reno. The location of this institution may be briefly characterized as impossible.

A plan has been under consideration, and funds have been appropriated, to rebuild the old Fort Simcoe property on the Yakima Reservation in the state of Washington as a sanatorium. It is located about ten miles from the nearest small town, and thirty miles from Yakima. The present buildings are those customarily found at an old fort. They are of frame construction and in a very bad state of repair. This property was used in years past as a boarding school, and at that time considerable difficulty was experienced in obtaining sufficient water. The buildings proposed for sanatorium use were gone over carefully, and they were found to be totally unsuited for this purpose. The amount of money necessary to convert them into an approved hospital would more than build an entirely new and modern unit, although this does not mean that such a unit could be obtained with the present appropriation of $50,000.

The location of other sanatoria visited is not subject to serious criticism.

The materials used in the construction of new sanatoria have not always been of a fire-resisting character. This is the case at Talihina, Phœnix, and Laguna. The fire hazard in all the institutions is great. None is entirely fire-resisting. This is due not alone to the material from which they are constructed, but also to the

limited water supply as at Fort Lapwai, the poor water storage facilities as at Sac and Fox, and the absence of fire escapes as at Shawnee. Modern sanatoria are as substantially built as hospitals and are permanent buildings. In the end the greatest economy is found in concrete, stone, or brick materials. The old system of cottages, as used at Phœnix, and of large wards as used in all other Indian Service sanatoria, has been obsolete for years. The American Sanatorium Association for the past ten years or more has recommended a definite division of bed capacity according to the type of patient, as follows: Infirmary cases, or those confined to their beds, 40 per cent; semi-ambulant cases, or those who are in bed the majority of the time, about 35 per cent; ambulant cases, or those who are up most of the time, 25 per cent of the bed space.

These figures are based on the average use of sanatorium beds as observed in dozens of sanatoria all over the country. In other words, the average sanatorium, taking average cases of tuberculosis finds that 40 per cent or more of its cases are in need of infirmary treatment for a variable period of time. No evidence is available to indicate that the Indians would not require the same provision.

The infirmary space more than any other demands the most modern arrangement and equipment. The patients are bedfast and require the same bedside care as the acutely ill hospital cases receive. This type of case requires a large proportion of single rooms but some rooms should be provided for two and a few rooms for four, the exact ratio depending upon the size of the institution.

In the Indian Service it is rare to find a single isolation room for the terminal cases. Screens are used to segregate the patient from the others in the ward.

This faulty construction might be expected in the case of a converted boarding school, but it is also found in the newer buildings, such as Talihina, Laguna, Phœnix, and Fort Lapwai. Phœnix and Fort Lapwai are the only sanatoria said at this time to have infirmary buildings. At Phœnix a new frame unit has just been completed. It accommodates fifteen boys and the same number of girls in two wards. The only single rooms are for the employees. Other major faults in the planning of this unit were the presence of cross ventilation and the absence of sheltered porches, advisable in that climate. Four water closets and the same number of shower

baths are provided. A bed patient is seldom able to use a shower bath.

At Shawnee, Oklahoma, a sanatorium school has been established in a plant formerly used as a reservation school, and consequently not adapted to the present needs. A plan is under consideration to convert an old frame building on the place into an infirmary for bed cases. This unit is the poorest on the grounds. It is a fire trap, and is in no sense suited to the demands of a hospital.

At Fort Lapwai old reservation school buildings were utilized up until the past year or so. They have been replaced by three new units, two dormitory buildings, and a hospital. The dormitory buildings are identical in arrangement. They are built in the form of a quadrangle inclosing a court which has no outside entrance. The patients' quarters are divided into three ten-bed and two nineteen-bed wards, with no isolation facilities whatever in these buildings.

The hospital building, which is supposed to accommodate reservation patients as well as tuberculosis cases, has a total bed capacity of thirty-four. Only two of the beds are in single rooms and four are in double rooms. Without question the amount of money spent in rebuilding this institution, differently expended, would have produced a far more effective arrangement. This building is entirely lacking in scientific planning and arrangement. As it stands, it represents the practices of twenty years ago.

The patient's comfort in the modern sanatorium is further planned for in providing locker space for his clothing as well as dressing rooms, recreation rooms, and an assembly room. These facilities are lacking in all Indian Service sanatoria.

Though the patient's comfort in a sanatorium should be the first consideration, the space provided for medical and administrative purposes is almost as important. Such space in these sanatoria is usually limited. The doctor's office, record room, examining room, and laboratory are crowded into a single room.

Arrangements for artificial light and ventilation are little better in the new institutions than in the converted schools. Sun decks for heliotherapy are absent, as are most other modern arrangements for such treatment. At Onigum, quartz light therapy must be given in the doctor's office and examining room, the ventilation of which is poor. Much of the good from the ultra-violet lamp is probably

offset by the stuffy vitiated air the patient must breathe while taking the treatment.

The sewage disposal plants operated in connection with many of these institutions are inadequate. Steps are now being taken to determine the efficiency of such facilities by Public Health Service sanitarians.

The medical superintendents of all these sanatoria are provided with a residence. In some instances the quarters are quite acceptable as is the case at Sac and Fox, Talihina, and Fort Lapwai. In others, notably Navajo and Laguna, the quarters are inferior. The housing facilities for other employees are generally poor. Space is provided either in the institution or in poorly equipped quarters outside. Those housed in the institution must use bed space that is needed by patients.

Fixed equipment, such as sanitary facilities, is frequently inadequate, both in number and in arrangement. In converted schools and buildings, Shawnee, for example, this equipment may be found entirely in the basement, a most unfortunate location when many patients are semi-bedfast. The bathing facilities provided are often showers instead of tubs. The abandoned school converted to serve as a sanatorium with the least possible re-arrangement, is almost invariably an inefficient institution.

The same unwise economy and lack of understanding of sanatorium requirements are reflected in the movable equipment. Sanatorium employees often complain that Indian children refuse to remain in bed, a refusal which is readily explainable when some of the beds are found to have sagging springs and lumpy mattresses. Bad beds are not universal but they are found too frequently. This condition is due in the main to the poor quality of equipment salvaged from other buildings, and the low grade of new equipment bought in the past. The Indian Office reports that from this time on, all such equipment will be purchased on specifications meeting the standards of other federal sanatoria. Properly treated, the tuberculosis case is required to spend longer periods in bed than the general hospital case, and the least the sanatorium can offer is a comfortable bed that will be conducive to the rest and relaxation the patient needs.

Other equipment, such as kitchen utensils, dishes, and food conveyors, is limited. Some of the sanatorium superintendents are