Washington State Department of Health

ANNUAL REPORTS

1939--1940

To His Excellency
Arthur B. Langlie
Governor of Washington

Sir:

I have the honor of submitting the Annual Report of the State Department of Health and the minutes of the meeting of the State Board of Health, for the calendar years 1939 and 1940, in accordance with Section 6007, Remington's Revised Statutes, State of Washington.

The period covered by this report includes that period preceding the national emergency and that period in which the national emergency became a reality. Inspection of the report will show the demands made upon and met by the State Department of Health in the interest of national defense, reference being made specifically to demands made upon our laboratory, upon our Division of Vital Statistics, upon the Division of Public Health Engineering and upon the Division of Epidemiology.

Inspection of the report will further indicate certain increased activities of the Department during the period prior to the national emergency. Specific reference is made to the demands made upon the laboratory, as result of enactment of a prenatal bill requiring serological tests upon expectant mothers. This law is found in Chapter 165 of the Laws of 1939. During this same period the Department inaugurated its program of tuberculosis control on a more active basis than in former years. Rules and Regulations of the State Board of Health were changed concerning health certificates for school employees. This accounted for the large demand upon the Division of Epidemiology.

The above are but a few of the highlights set forth in the report.

Respectfully submitted,

Donald G. Evans, M. D.
State Director of Health

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ADMINISTRATION

The most serious problem which faced the State Department of Health during the year 1938 was that of securing a sound and stable system of financing local health work. Financed as they were by the three mill social security levy under a system of county health department so-called memorandum budgets, the budgets could be, and sometimes were, changed at the will of the county commissioners. When the demands of the several public assistance programs became pressing funds were often diverted from the health department in order to meet them. This practice became so serious during the month of April 1938 that it became apparent that a drastic revision of our system of financing local health work was needed. The health officer should be as reasonably sure of the budget under which he operates as the auditor or the sheriff.

For these reasons the State Department of Health, after many consultations and considerable deliberation, drew up and proposed the principles of financing local public health work which were subsequently enacted into law as Chapter 191, Session Laws, 1939. This law provided that .4 of a mill or 30 cents per capita be budgeted for public health, and that the money might not be spent for any other purpose. As this law did not go into effect until April 1, 1939 it was necessary to persuade certain counties to set up interim budgets in order to keep the local health departments functioning, and to persuade others to budget monies other than those required under the .4 of a mill law. In both of these projects the State Department of Health received encouraging cooperation.

While by and large county finances are now in a stable condition, the law should be considered as merely forming a base line below which a county should not sink in providing funds for the preventive health services which modern living requires. Much effort was directed during the year toward effecting an increase in local public health funds above the mandatory budget law level. Cooperation on this point was likewise encouraging.

For some time men of considered judgment have expressed the belief that tuberculosis control was the weak point in our state health program. In order to correct this condition a tuberculosis control officer was appointed to the division of epidemiology, and later in the year a consulting x-ray technician was added to supplement this program. The services of these specialists are being made available to local health departments and physicians. Plans are completed for the routine examination of teachers for the presence of significant tuberculosis. It is

felt by many that the present physical examination which they are required to take serves little purpose, and that an examination for tuberculosis would not only be of private but public benefit. The peculiar age distribution among teachers, and the conditions under which they work make them unusually effective spreaders of the disease when they have it, and indicates from statistical experience that they are more likely than the average run of the population to be susceptible to the disease.

Under the new national venereal disease act, increased funds were made available in this state for our control program. Free anti-syphilitic drugs are now being made available to physicians on request, the only stipulation being the confidential reporting of the case. Plans were drafted for increasing clinic facilities for treating syphilis in several areas of the state and a venereal disease public health nursing consultant was added to the State Department of Health staff. She will help to improve the effectiveness of the public health nurse in the venereal disease control program.

Much emphasis was given during the year toward bringing into a more desirable relationship the ratio of public health nurses to population. As indicated in the 1938 annual report, even upon the basis of our standard of one nurse to every 5,000 of the population, which is nearly twice the American Public Health Association standard of one nurse to 2,500 population, some of our counties are markedly out of line. In this field our progress has been satisfactory, but slow.

During the year the orthopedic nursing consultant of the crippled children's program was detailed from the State Department of Social Security to the State Department of Health, and the work has become more effective as a result of this arrangement. The crippled children's program aims at the prevention and the treatment of crippling conditions. The alternate objective is that the child may be restored, in so far as possible, to normal and that he may take his place in society as an independent, self-reliant citizen. This public health nursing work, under the director of the department, is in charge of a special nursing consultant.

Demands for increased statistical analysis of our birth and death experience not only by official but private agencies as well, has led to the addition to the staff of the division of vital statistics, a statistician. A series of general statistical studies are now in progress. The output of these studies will be increased during the coming year.

The department of health cooperated with the state departments of fisheries and game in the work of the stream pollution commission.

As we look forward to the new year several points of concentration seem clearly indicated. We must intensify our activities and increase the effectiveness of our tuberculosis work and our venereal disease program. At the same time we must not overlook the health of our mothers and infants. Here we will have to concentrate on the finding of prenatal clinics and the establishment of improvements in the delivery service of the needy and medically indigent. We will have to take steps to see that facilities for meeting the needs of the premature are made available at least on a district basis, for those of the state's areas which now lack such equipment. We must also develop at least an educational program for the degenerative diseases, particularly cancer, and last but not least we must see what may be done toward extending full time preventive public health services to certain of the state's areas which now lack them.

DIVISION OF EPIDEMIOLOGY

L. A. Dewey, M. D., Dr. P.H.

There were more cases of communicable disease reported to the department in 1939 than have ever before been reported in a single year. A grand total of 44,298 cases were reported as compared to 31,864 cases in 1938, an increase of 12,434. In spite of this, there was a decrease in the incidence of nearly all diseases, for one disease - measles - was more than responsible for the entire increase.

MEASLES:

The incidence of measles has been quite low in the state for the last eight years. During this time there have been only two epidemics, and both of these were small. As a consequence, a very large number of susceptibles had accumulated who were almost certain to contract measles if subjected to exposure. Under such conditions, a major epidemic of the disease is inevitable and this began in 1939.

While only 1,709 cases had been reported in 1938, reports of 22,439 cases were received in 1939. Ordinarily, when such an increase occurs in the incidence of measles, the case fatality rate rises sharply, but this failed to occur in 1939. Only 15 deaths resulted from 22,439 cases which is a lower fatality than in 1938 when three deaths resulted from the 1,709 cases. This record is very satisfactory when compared to that of 1924, when the last measles epidemic of comparable size occurred. In that year 21,372 cases were reported and these resulted in 183 deaths.

SMALLPOX:

Smallpox incidence in 1939 was the lowest in the history of the state. Only 89 cases were reported, as compared to 966 in 1938. The lowest previous year was 1933, with 238 cases. Intensive vaccination campaigns throughout the state are doubtless largely responsible for this substantial decrease.

TYPHOID FEVER:

An increase in the incidence of typhoid, 260 cases as compared to 167 in 1938, was due to an epidemic of 119 cases which occurred in Clallam County in May and June. The source of this epidemic was found to be in the school lunch room. Only one of the 119 cases resulted in death, an unusually low fatality rate, and no secondary cases occurred.

A minor epidemic involving twelve cases occurred during September in Yakima County and was traced to a raw milk dairy as the source.

DIPHTHERIA:

The 84 reported cases of diphtheria during 1939 were 22 less than were reported during the preceding year. This decrease cannot be considered of importance, however, as both rates are so low that the difference is insignificant. The reports do indicate that the diphtheria control procedures are meeting with success.

SCARLET FEVER:

The incidence of scarlet fever in 1939 on the basis of case reports was almost identical with that in 1938. Reports of 1,818 cases were received in 1939 as compared to 1,803 cases in 1938. Eight deaths resulted in 1939 and nine deaths in 1938. Case reports of scarlet fever are very unreliable due to the mildness of the disease. Many cases are not seen by a physician and consequently are never diagnosed.

ENCEPHALITIS:

Encephalitis is a relatively rare disease, although a few cases are reported every year in the state. The term really includes several diseases caused by related, although distinct organisms. In 1938 there were 54, or more than double the usual number of cases reported. This unusual incidence was due to a small epidemic in Yakima and Kittitas counties which occurred in July, August, and September. In all, there were 33 cases reported from Yakima County and 5 from Kittitas, resulting in ten deaths. The epidemic in humans was preceded by an extensive epidemic of encephalitis among horses, which was said to have affected more than 500 animals. Studies made on the blood of some of the human cases indicated that the infection was due to the western strain of equine encephalomyelitis virus which was also the cause of the equine outbreak.

This is the first known outbreak in Washington due to this virus, although outbreaks have occurred in other western states during recent years. Further outbreaks may be expected in other parts of the state unless extensive immunization of horses is carried out.

TUBERCULOSIS:

Tuberculosis continues to be a problem in this state as in most others with 693 deaths for 1939, the lowest number ever recorded, less than in 1938, the previous low year. The death rate is comparable to the national average, being slightly less. But still it is more than most states predominantly populated by white people. The fact that the

death rate continues to fall in spite of reduced economic resources of the state for caring for needy cases seems to speak well of the good work done in years gone by; for, during these past few years, little has been done toward adding facilities for the care and treatment of those sick over and above what existed five years ago in this state. This would indicate that the work in the past was aimed in the right direction. Those affiliated with voluntary and official health agencies who put their energies to this task may well be proud of their work and at the same time wonder what would have been their reward had not the continued economic adversities caused a halt to their activities.

Some gleam of hope arose in 1937 and 1938 for increasing the bed capacity for tuberculosis cases in this state toward the optimum figure of two beds per annual death. Hope in 1939 was mingled with pessimism caused by apparent loss of anticipated state and county building funds and because of this factor no actual construction occurred. However, considerable thinking upon these lines was productive of evaluating the true needs of a county or district, and by the end of 1939 the needs, cost of construction, maintenance cost and size requirements the state over were correlated to the point that the one remaining deterrent to a building program was the lack of money. In arriving at the final conclusions of these plans, the State Department of Health made thorough active local studies and did research in the department's statistical filed. Concomitant with these pieces of study and research, voluntary tuberculosis agencies have made studies of a similar nature useful in this planning. The work was strengthened materially by the generous cooperative support given by the tuberculosis specialists practicing in the state of Washington. Their advice as specialists and heads of existent sanatoria crystallized the final adoption of what constitutes minimum standards for the state of Washington's future public tuberculosis hospital construction.

At the present time there are 1,019 beds available in the state for tuberculosis, both public and private. Of these, 66 are for children, leaving a total of 953 beds for adults. Based on a study of the average number of annual deaths for the past five years in which two adult beds per death is the desirable number needed, we find a deficiency of 525 beds. When this deficiency is met the state will have adequate hospital service for its tuberculosis cases. It is now felt among the specialists in tuberculosis work that beds for children in sanatoria are a diminishing necessity. Tuberculosis children's problems are primarily those of isolation from continued environmental tuberculous contact and the building up of a good state of personal health through proper nutrition and modified and regulated activity. These objectives can be met in other places than in tuberculosis hospitals, and just as efficiently.

Thus, we have not encouraged the expenditure of tuberculosis money to be allocated for the creation of children's beds.

During 1939 an idea was conceived by the department to develop in certain actively functioning full-time health departments a tuberculosis consultation service to the physicians in their community. It has been realized that in areas remote from the larger cities wherein may be found tuberculosis specialists, the physicians have at time difficult problems of diagnosis regarding their chest disease cases. There is no one available locally who is trained in the art of tuberculosis diagnosis and detailed study of x-rays of the lungs to whom they may turn for help. To send a possibly early tuberculosis case one hundred miles to the nearest tuberculosis specialist is more than likely impractical, if not actually impossible. So it was felt that if the local health officer could bring to the doctor and his patients such service at regular intervals, a very worthwhile service could be rendered to his local communities.

Such consultation clinics were instituted in three county units on a trial basis. The willingness of the private practitioners to cooperate was splendid and their encouragement to continue this work as a regular program gives to the State Department of Health the necessary proof that such a program will succeed. In this service no attempt has been or will be made to substitute for specialists already in the vicinity of these health departments.

The reporting of tuberculosis cases to the jurisdictional health officer by the diagnosing physician is far from complete. It is felt that this failure to report is due to forgetfulness on the part of the physician in practically all instances. However, the fact he forgets to report his case causes a huge burden to be placed upon the official health agencies in their attempt to first evaluate and then institute measures to control their tuberculosis problems. There is, however, encouragement to be gained from the fact that in 1929 only 33 per cent of all tuberculosis deaths had previously been reported, whereas ten years later, in 1939, 56 per cent of all deaths had previously been reported as cases. These figures are the nearest index we have as to the exact number of cases reported and unreported still alive. By December 31, there were 1,586 cases of active tuberculosis reported for the year 1939. Basing our conclusions upon those deaths never reported as cases, we might say that there must be 44 per cent more diagnosed cases as yet unreported; or that the figure 1,586, is but 56 per cent of the cases developing in 1939. This means, if statistically true, that the health departments have a handicap of 44 points out of a possible 100 in their attempt to reach the goal of complete tuberculosis control service. A case cannot be properly serviced and control work carried out if it is

unknown to the official health agency. Effort is being made to bring home to the state's physicians and it is certain that when they realize the importance of this, there will be a steady increase in the reporting of diagnosed cases.

SYPHILIS AND GONORRHEA:

The decline in reported venereal disease cases which began in 1938 continued in 1939. Reports of cases in the past three years are as follows;

	Syphilis	Gonorrhea
1937	3,512	4,585
1938	3,191	3,496
1939	2,925	3,220

This shows a steady drop in reports of both syphilis and gonorrhea, the latter showing the greatest drop. This decline cannot be considered as due to a decreased prevalence of the two diseases, as the case reports are not a reliable index of incidence or prevalence. Both diseases are very incompletely reported, particularly gonorrhea, and the decline may be due in part at least to poorer reporting of cases. The greatest factor involved in poor reporting is the failure of patients to consult a physician for diagnosis and to rely on self-treatment. It is felt that self-treatment of gonorrhea may have increased greatly during the last three years, as it is during this time that the new chemotherapeutic agents have become available and this may be largely responsible for the great drop in gonorrhea reports. No such explanation is applicable to syphilis, however, as it seems certain that constant lay education in regard to this disease has resulted in a greater percentage of patients consulting physicians for diagnosis, as evidenced by the increasing number of serological tests done in the laboratories of the state. The 1937 reports of syphilis represented a tremendous increase over preceding years and may have been due in part to the discovery of many cases of long duration. The exhaustion of the supply of old cases may be the explanation of the drop in the two succeeding years.

The chief objectives of the venereal disease program in the state are the discovery and treatment of early cases in order to control their infectiousness and limit the spread of the diseases. Early infectious cases, particularly of syphilis, are found chiefly through the investigation of contacts of cases already known. To obtain best results in contact investigation it is necessary that the investigator have special training and experience in the work and it is the goal of the department to have a public health nurse with special training in this work connected with every local health department. Two clinics are now capable

of giving this training in connection with the School of Public Health Nursing of the University of Washington and field nurses will be brought in for training as rapidly as possible.

Treatment is available to patients through two sources, private physicians and public clinics. Antisyphilitic drugs are furnished by the State Department of Health free to private physicians for the treatment of all cases which have been reported to the department. In the public clinics treatment is provided free to all patients who cannot obtain treatment elsewhere. There are eighteen such clinics in the state and these are so located that they are accessible to approximately 70 per cent of the population. All but one are operated in connection with local health departments.

No new clinics were established in 1939 as efforts were chiefly directed at improving the efficiency of those already in operation. A nurse with special venereal disease training was added to each of two local health department staffs in order to increase contact investigation and delinquent follow-up work in connection with the local clinics. One city venereal disease clinic was completely remodeled during the year and a full time physician with special training in venereal disease work was placed in charge. Diagnostic facilities in clinics were improved by the provision of darkfield microscopes for their use. A new serological laboratory was established in connection with one clinic and three serological laboratories already in operation were aided by the provision of additional equipment.

Consultation and advice on local venereal disease problems were offered to local health departments and physicians by the State Venereal Disease Control Officer and the Nursing Consultant in Venereal Diseases.

A summary of services rendered through this department to venereal disease patients by public clinics and private physicians follows:

	Syphilis	Gonorrhea
New cases admitted to free clinics in 1939	1,381	1,074
Average number of cases registered in clinics	1,758	183
Cases discharged from clinics as arrested or cured in 1939	1,268	962
Total treatments administered in clinics	70,572	13,067
New cases registered under care of private phys.	1,544	2,146
Doses of antisyphilitic drugs supplied to private physicians	32,541	

DIVISION OF PUBLIC HEALTH ENGINEERING

Roy M. Harris, M.S., C.E., Chief

INTRODUCTION

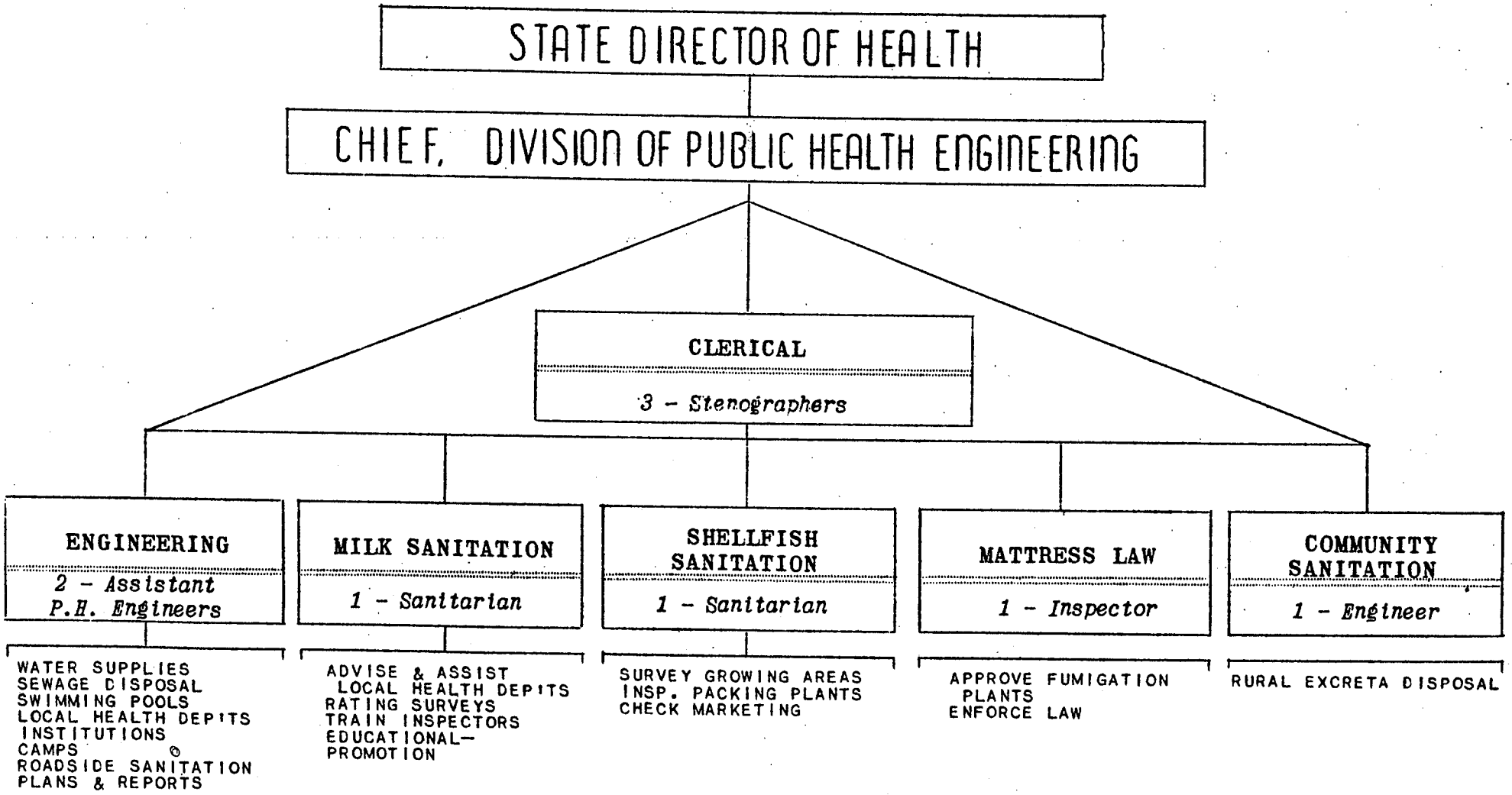
The activities of the division, although definitely interrelated, are subdivided into five general classifications as indicated on the Organization and Functional Chart, Figure 1. The 1939 Annual Report will therefore be broken down into the five subdivisions as indicated by this figure.

Advisory assistance to local county and city health departments is, of course, one of the major responsibilities of the division, and in this respect all personnel engaged in field activities devotes considerable time to work with local health departments. The distribution of local sanitation personnel in full-time county health units remained practically the same for 1939 as indicated in the 1938 Annual Report. Five sanitary engineers, 12 sanitarians, and 7 milk inspectors are assigned to 14 full-time local health units and 2 part-time local health departments serving a total of 19 out of the 39 counties in the state of Washington.

COOPERATION WITH OTHER AGENCIES

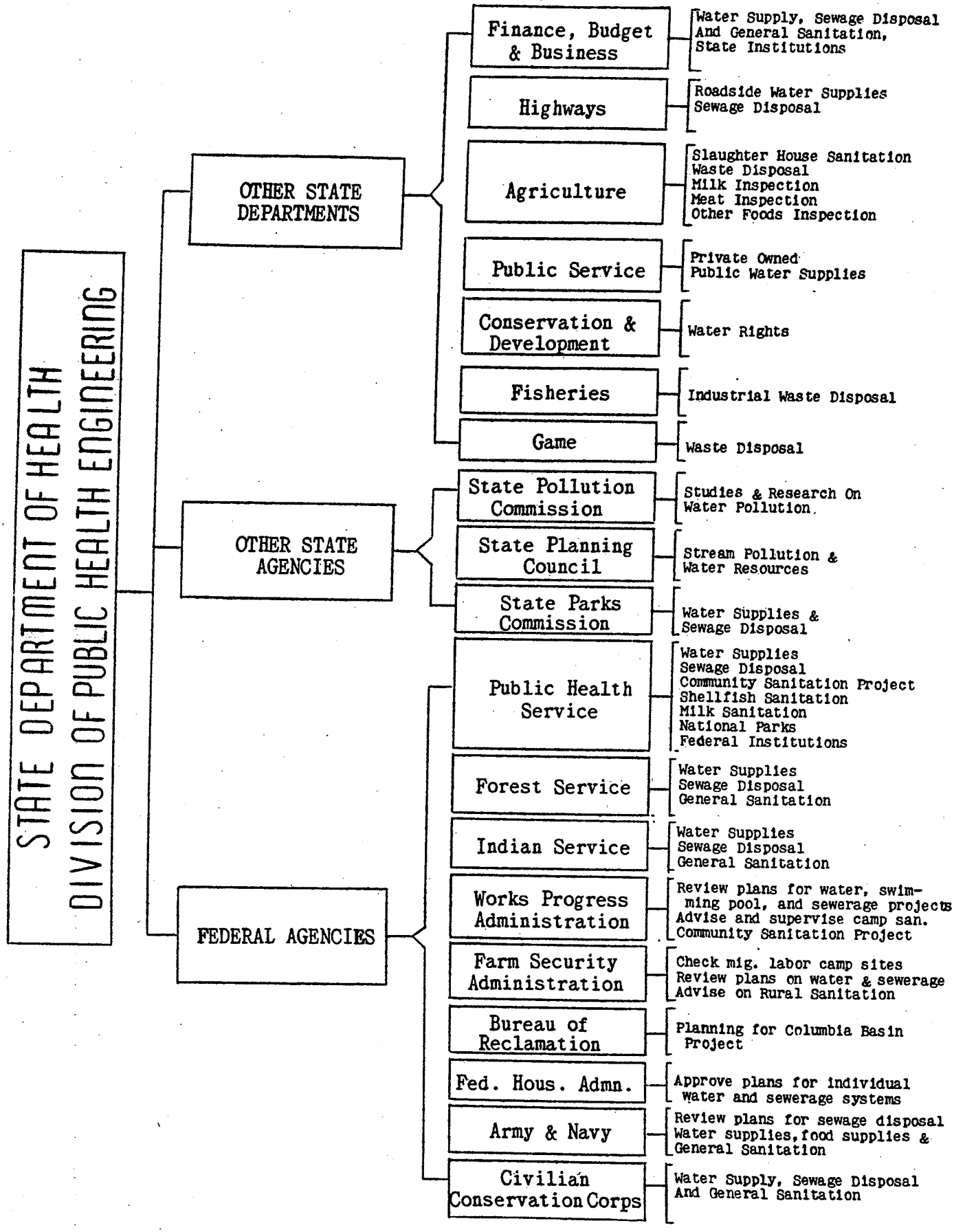
In addition to the ordinary activities, the division spends considerable time in rendering service to a large number of both official and nonofficial agencies. The various state and federal agencies with which the division cooperates are listed on Figure II. Some of the work involved in this cooperative program is of a supervisory nature but the majority of the activities indicated are purely advisory. They do, however, fit in definitely with the public health program in the state of Washington and are quite necessary to secure unification of sanitation activities.

In addition to the official agencies indicated by Figure II, there are a number of nonofficial agencies with which the division cooperates. These are as follows: The Association of Washington Cities, the Pacific Northwest Section of the American Water Works Association, the Pacific Northwest Sewage Works Association, the American Society of Civil Engineers, the University of Washington, Washington State College, and many other educational and nonofficial agencies.



Organization & Functional Chart for Division of Public Health Engineering

FIGURE 1



COOPERATION WITH VARIOUS STATE FEDERAL AGENCIES

FIGURE 2

PUBLIC HEALTH ENGINEERING ACTIVITIES

An accurate accounting of both field and office time for the two assistant public health engineers and the chief of the division was made during the year, and it is interesting to note from Figures III and IV the various proportions of time spent on the several engineering activities.

WATER SUPPLY SANITATION:

In connection with this activity, plans for 79 projects were reviewed and approved by this department as shown in Table 1.

Three water supply emergencies were met during the year; at Bingen, White Salmon, and Olympia. The problems encountered in connection with studies and measures taken at these three cities are shown in some detail as follows:

BINGEN WATER SUPPLY:

During the early part of 1939, this department noted that the reports on the bacterial analyses of the Bingen water supply indicated high contamination. Contact was made with the local health department and an engineer from this department was dispatched to Bingen with a portable chlorinator. This portable chlorinator was installed and the entire distribution system was disinfected. From the sanitary survey and examination of the history of the deep well which furnished the town with its source of water, it was deduced that pollution might enter the well due to the faulty construction of the well itself and the possibilities of crevices and channels in the faulted basalt in which the well was drilled. The use of fluorescein in the immediate vicinity of the well resulted in the production of the characteristic color reaction in a very short period of time, which indicated that the well was subject to surface contamination. The city officials were notified of this fact, and it was recommended that either the present supply be rehabilitated in order to prevent any possibility of surface contamination, or that the city secure its water supply from White Salmon, which had an abundant supply of surface water. This latter step was followed out. It was, indeed, very fortunate when considering the high contamination of the water supply that there were no reported cases of intestinal disturbance.

WHITE SALMON WATER SUPPLY:

In August a forest fire on the watershed from which the town of White Salmon obtains its water supply created an emergency which

FIGURE III

TIME DISTRIBUTION

Public Health Engineers

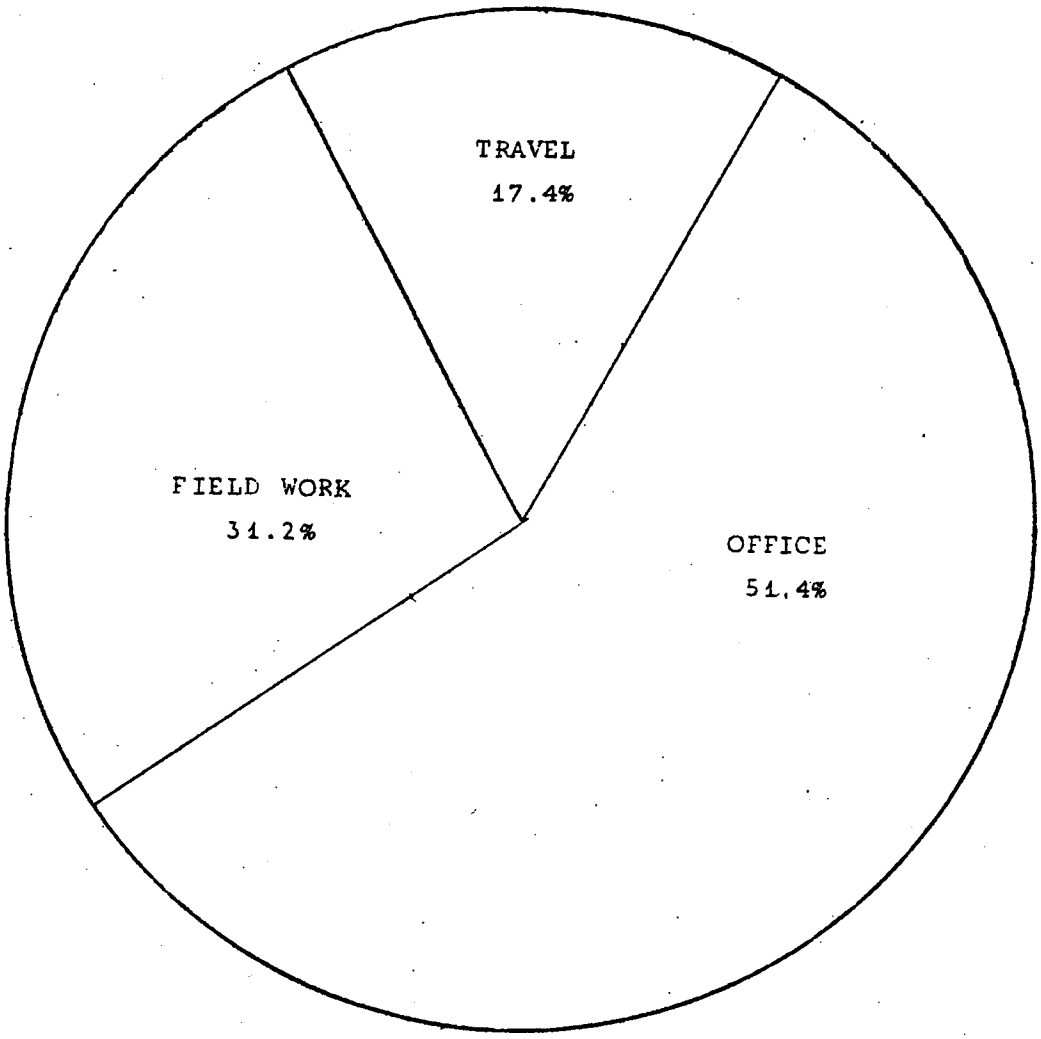


FIGURE IV.

DISTRIBUTION OF FIELD WORK

Public Health Engineers.

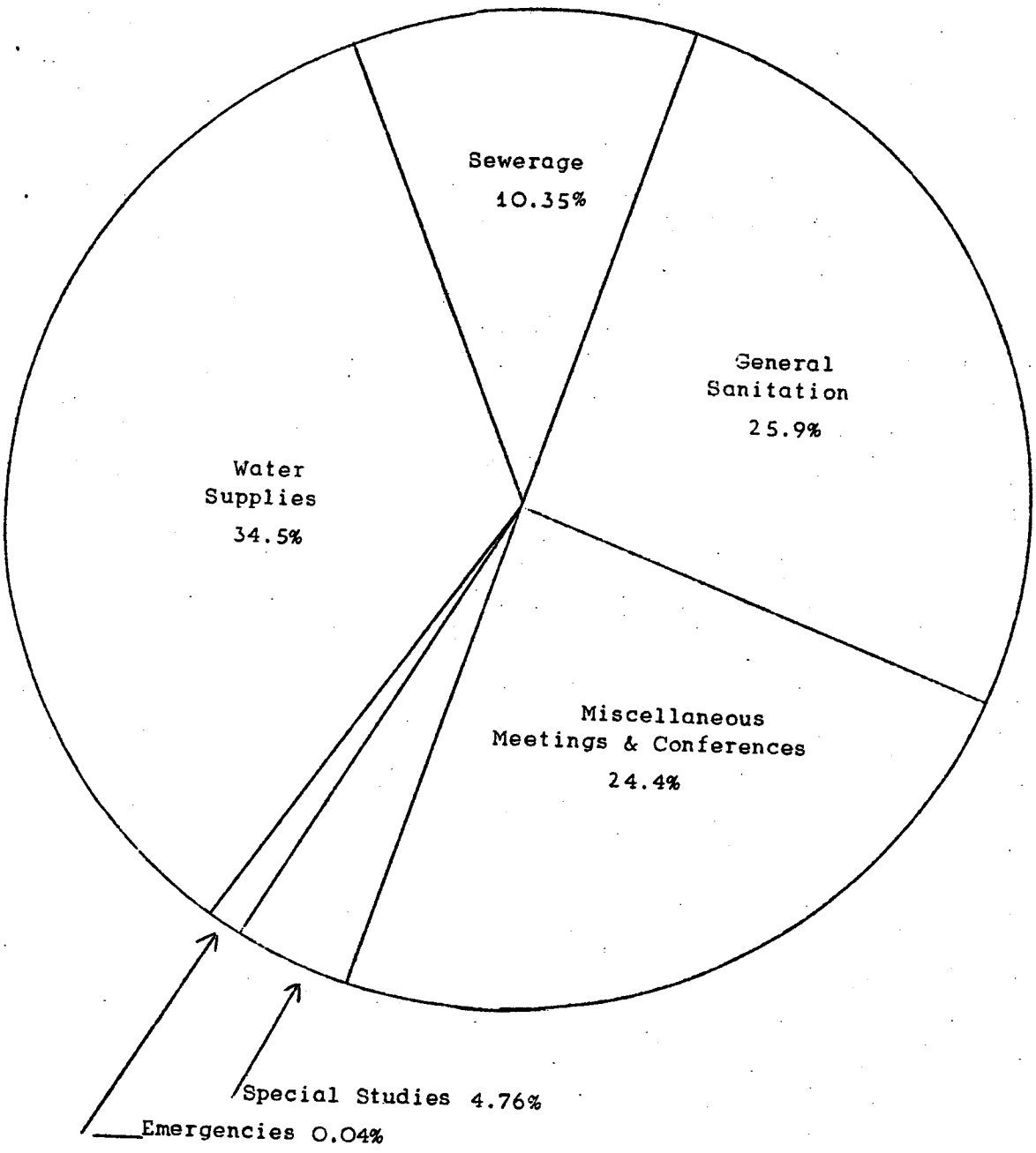


TABLE I.

WATER SUPPLY PLANS REVIEWED AND APPROVED, 1939

Alderwood	Water system
Auburn	Water supply improvement
Auburn	Water main extensions
Battle Ground	Water system
Bellingham	Installation on Twelfth Street
Bellingham	Extension McLeod Road to Guide Meridian
Bellingham	Replacement on Van Horne Street
Bellingham	Replacement between 14th and 15th Sts.
Bellingham	Replacement on Ivy Street
Bellingham	Extension 32d St., Underhill & Park Ridge
Bellingham	Replacement Iowa to Alabama Street
Bellingham	Several water main extensions
Bellingham	Improvement Racine St. and Meador Ave.
Bellingham	Installation on Alabama Street
Bellingham	Installation on Chuckanut Drive
Bellingham	Replacement Yew Street and Iron Street
Bellingham	Replacement on Erie St., extension on 26th
Bellingham	Installation Iowa to Kentucky Street
Bellingham	Chlorination plant alteration
Bellingham	Water supply tunnel construction
Bellingham	Water supply intake
Bellingham	Location of intake
Bellingham	Sprinkling system, City Hall Park
Bingen	Water extension and improvements
Bingen	Reservoir
Blaine	Water main replacements
Bremerton	Anderson Creek booster pump house
Carrolls	Water system
Cathlamet	200,000 gallon steel water tank
Cle Elum	Replacements and improvements
Cle Elum	Location of pipe line
Coulee City	Water distribution system
Dayton	Reservoir
Elma	Water main replacement
Everett	Water system improvements
F.S.A. - Yakima Unit	Water supply
Fort Steilacoom	Water supply
Goldendale	Water distribution system
Goldendale	Water main improvement
Kennewick Irrigation District	Water main replacements
Kent	Water main improvement
King County, Park View Tracts	Water main installation
King County Water Dist. #17	Filter and distribution system(Hunt's Point)
King County Water Dist. #49	Water mains (Lake Burien)
King County Water Dist. #56	Water system (Redondo Beach)
King County Water Dist. #58	Water system (South of Renton)

Water Supply Projects - Continued

Kirkland	Water main replacement
Island Lake (Kitsap County)	Water supply
LaCrosse	Water supply
Leavenworth	Water supply
Lyle	Reservoir
Mansfield	Replacement and Extension
Marysville	Water supply
Mason County, Sch. Dist. #306.	Water supply
Oakesdale	Water works
Olympia	Replacements and Extensions
Opportunity	Water main installation
Othello	Pump setting
Parkland	Water main installation
Port Angeles	Replacements and Extensions
Port Orchard	Water main extension
Port Townsend	Water system replacements
Puyallup	Water supply betterment
Quincy	Water distribution system
Ridgefield	Installation of booster pump
Riverside	Water supply
Sequim	Water main replacement
Soap Lake	Water main extension
Soap Lake	Water main extensions
South Bend	Water main replacements
S. Wenatchee, Sch. Dist. #120	Water supply
Sunnyside	Water supply
Tacoma	Wells 6A, 7A, & So. Tacoma Pump Station
Tulalip Indian Reservation	Water supply
Vancouver	Water supply
Waitsburg	Continuation of project approved in 1938
Washougal	Well site
Wilbur	Water supply
Yakima	Extensions and replacements

demanded the immediate attention of the division of public health engineering.

White Salmon is served by gravity supply line having the intake located on Buck Creek, the watershed of which is uninhabited. No provision was made for continuous disinfection of the supply. During the course of the fire which swept the entire watershed, the United States Forest Service found it necessary to locate two fire fighting camps on the city's watershed. The total number of men on the watershed operating from these two camps and engaged in cutting fire trails across the watershed and generally combatting the conflagration, was in excess of 375. The necessity of placing this large number of men directly on the city's watershed practically overnight created an emergency and necessitated immediate chlorination of the water supply in order that the consumers might be protected from the hazards of waterborne disease.

The first camp was located on the watershed on August 11. On August 12 one of the State Department of Health emergency chlorinators was installed on the gravity supply line from Buck Creek, and the second camp was located on the watershed on that same day. During the entire period the fire raged on the watershed and until August 18, when the fire fighters were removed from the area, an engineer from the division of public health engineering remained constantly with the chlorination equipment in order to assure continuous and efficient operation of the disinfection process. During that period an above normal dose of chlorine was used because of the extensive contamination occurring on the watershed during the course of the fire. On August 18 the chlorine application was reduced to a normal amount and the chlorinator left on the supply line to provide continuous disinfection until after the fall rains had flushed the watershed.

In spite of the fact that 375 men were working and living on the watershed during the entire period of the fire, not one single case of waterborne disease was reported in the White Salmon area.

ROADSIDE WATER SUPPLIES:

As a continuation of the plan jointly worked out between the State Highway Department and this department, the division during 1939 continued to examine and reexamine certain roadside water supplies that are being developed by the highway department for public use. The State Department of Health insignia, which denotes approval of the water supply, was issued to the State Highway Department to be displayed at seven separate roadside water supplies. These are located as follows: one on Primary State Highway 2, one on Primary State Highway 12, four on Primary State Highway 8, and one on Primary State Highway 3. The public reaction to this procedure of marking and establishing safe roadside water supplies has been exceptionally gratifying, and it is hoped that this program may be extended to include a number of water supplies located at strategic points throughout the state.

SEWAGE DISPOSAL AND TREATMENT:

During the year 42 sewerage projects were reviewed and approved by the department as indicated by Table 2.

Four new sewage treatment plants were completed and placed in operation and three other plants were under construction during the year. The plants that have been completed are as follows:

DAYTON: - This plant is designed to treat sewage from a population of 3,000 plus wastes from a large pea and asparagus cannery. The essential features of the design are as follows: prescreenings of wastes at the cannery and addition of lime at this point during the canning season, comminution of the sewage by means of a mechanical shredding device, chemical treatment at the sewage treatment plant, mechanical flocculators, two mechanically equipped circular primary clarifiers, circular trickling filter designed for a maximum application rate of 15,000,000 gallons per acre per day, mechanically cleaned secondary sedimentation basin, chlorination at three separate points throughout the plant, and provision for recirculation of the waste through the various units including the trickling filter.

ELLENSBURG: - The Ellensburg plant is designed for a population of 6,000 but because of the high infiltration during irrigation season, the capacity of the plant is rated at 10,000,000 gallons daily. The essential features of the plant consist of a detritor for the removal of grit, mechanically equipped flocculators, two circular, mechanically equipped primary clarifiers, multi-stage, heated digesters, flash mixer for securing adequate mixing of chlorine, a chlorine contact chamber, and chlorination at two points.

SEATTLE: - This plant was designed for a population of 35,000, but because of the combined sewer system it is designed for a maximum flow of 8,000,000 gallons daily. The plant consists of a sewage lift station, a mechanical detritor for grit removal, two comminutors, two mechanically equipped circular primary clarifiers, multi-stage, heated digesters, glass-covered sludge drying beds, and provision for both post- and pre-chlorination.

WESTERN STATE CUSTODIAL SCHOOL, BUCKLEY: - Sewage disposal facilities at this institution are being built in units to provide ultimately for a population of 3,000. The plant design consists primarily of an Imhoff tank followed by slow sand filters.

The following treatment plants were placed under construction during 1939 and should be completed during 1940: Orting (two Imhoff tanks), Issaquah (separate sludge digestion, complete treatment), and Farm Security Administration, Yakima (this plant designed for migratory population of 1,750 and consists of complete treatment with Imhoff tank, trickling filter, secondary settling, and chlorination.)

TABLE II.

SEWERAGE PLANS REVIEWED AND APPROVED, 1939

Aberdeen	City-wide sewer project
Bellingham	Master sewer project
Bellingham	Sewer, Illinois & Elizabeth Sts.
Bingen-White Salmon	Sewage treatment (preliminary)
Cle Elum	Sewage treatment (Preliminary)
Cowlitz County Hospital	Sewage treatment
Coupeville	Sewerage system
Edmonds	Sewer improvement
Edmonds	Sewer improvement Block 77
Ellensburg	Sewage treatment plant (final approval)
Ephrata	Sewage treatment plant (final approval)
F.S.A. - Yakima Unit	Sewage disposal
Ferndale	Sewer extensions
Green Mound School for Girls	Sewage disposal
Issaquah	Sewage treatment plant (final approval)
Issaquah	Trunk sewer No. 1
King County	Sewers, 30th Ave. N.E.
King County	Sewers, 32d Ave. N.E.
King County	Airport Way sewer
Leavenworth	Sewage treatment plant (preliminary)
Mount Vernon	Sewer extension, Millett's Addition
Mount Vernon	Sewer from Park Street to Hazel
Mount Vernon	Sewer Extension
Monroe - Union High School	Sewer connection
North Beach	Sewage treatment (preliminary)
Oak Harbor	Septic tank
Richmond Beach	Sewerage system and sewage treatment
Seattle	Sewer, Calhoun Street
Seattle	Sewer, E. 57th St. 35 et. al.
Seattle	Sewer, 34th Ave. West
Seattle	Sewer, 24th Ave. West
Seattle	Sewer, 32d Ave. West
Seattle	Sewer, 11th Ave. S.W., et al.
Seattle	Sewer, West Spokane Street
Spokane	Intercepting sewer
Tacoma	Sewers, L.I.D. No. 1742
Tacoma	Sewers, L. I. D. No. 1746
Tacoma	Sewers, Hosmer St., So. 23d to S. 19th
Thurston County - Highway Department Headquarters	Sewage disposal
Yakima	Additional sludge drying beds
Yakima	Sewers
Zillah	Sewers

Field visits were made to practically all sewage treatment plants and the operators were assisted in running control tests and in evaluating the meaning of these tests with the objective of increasing plant efficiencies. Not as many efficiency tests on sewage treatment plants were made during 1939 as during the previous year, but it is anticipated that a number of plants will be tested for efficiency during the 1940 season.

INDUSTRIAL WASTE TREATMENT PLANT STUDIES:

The study of industrial waste treatment continues to be an important problem, as these wastes may, if treated in combination with domestic sewage, in certain instances have a tendency to upset the sewage treatment process. Where independent industrial waste treatment units are employed it is important that the characteristics of the wastes be known in order that proper treatment may be employed.

Considerable advisory assistance was given to the Utah-Idaho Sugar Company plant at Toppenish in connection with the treatment of beet sugar wastes. Previous studies of the pollutional effects of these wastes on the Yakima River led this department to recommend that chlorination, at least, be employed in addition to the previous screening process that was utilized in past years. Complete studies were made by the plant chemist on B.O.D., chlorine demand, and other characteristics of the raw waste, as well as studies to determine the effect of these wastes on the Yakima River itself. Considerable data were secured from this plant and it is anticipated that this material will be available for inclusion in either the 1940 Annual Report or in a separate report dealing with this particular problem.

At Kirkland the division assisted in an advisory capacity in laying out proper methods for disposing of wastes from one of the state canneries.

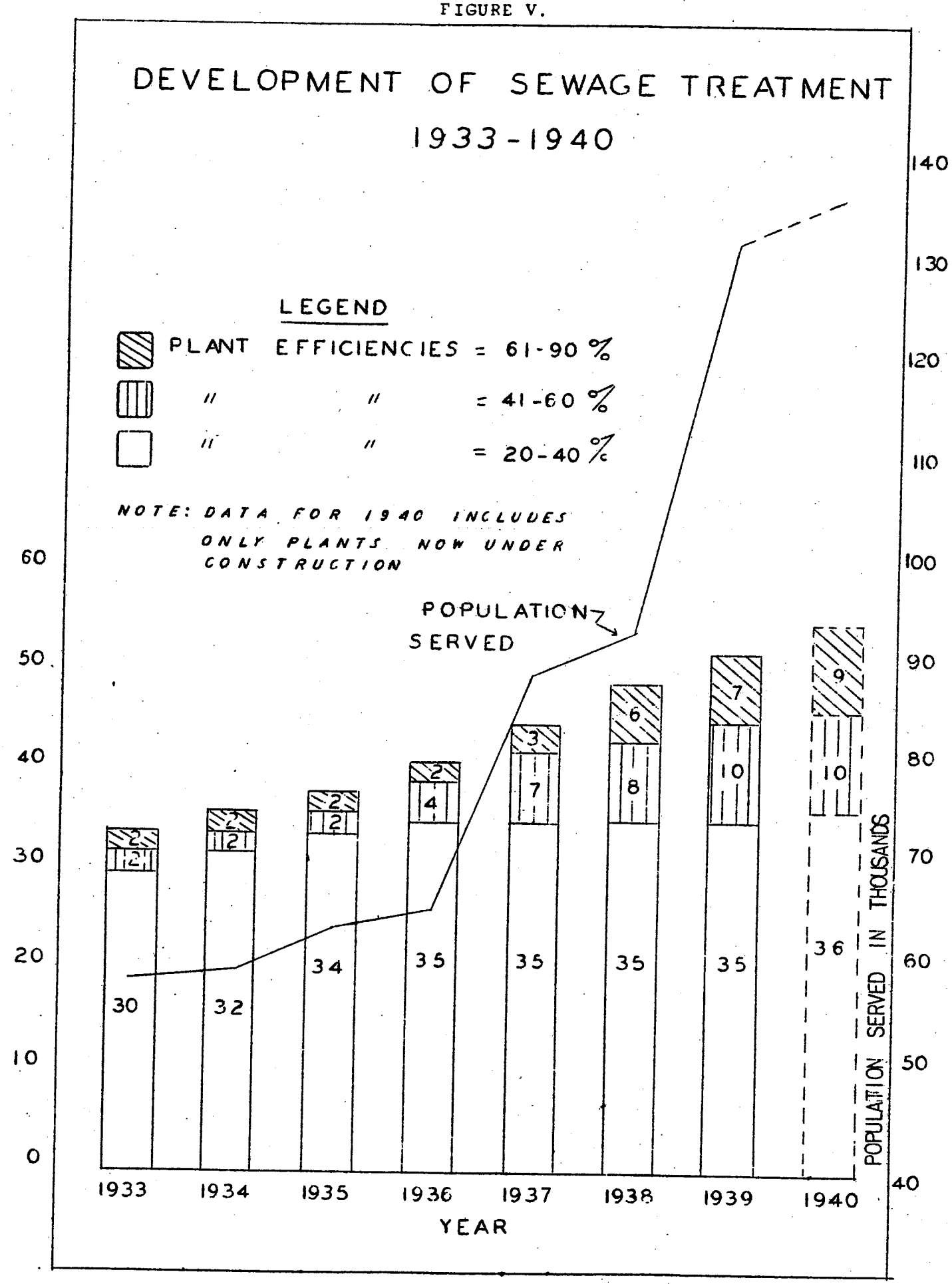
At Issaquah it was necessary to study the milk plant wastes in order to determine what effect these would have on the proposed new sewage treatment plant.

A considerable amount of the chief's time was given over to advisory assistance to the State Pollution Commission in conjunction with the study of Grays Harbor and other problems.

DEVELOPMENT OF SEWAGE TREATMENT:

Figure V illustrates the increase in municipal sewage treatment facilities during 1939. The number of plants added was only three but the population served was increased to 133,400 or approximately 13% of the urban sewered population.

FIGURE V.


DEVELOPMENT OF SEWAGE TREATMENT
1933-1940
LEGEND
PLANT EFFICIENCIES = 61-90 %
" " = 41-60 %
" " = 20-40 %
NOTE: DATA FOR 1940 INCLUDES ONLY PLANTS NOW UNDER CONSTRUCTION
POPULATION SERVED
60
50
40
30
20
10
0
140
130
120
110
100
90
80
70
60
50
40
POPULATION SERVED IN THOUSANDS
2
2
30
2
2
32
2
2
34
2
4
35
3
7
35
6
8
35
7
10
35
9
10
36
1933
1934
1935
1936
1937
1938
1939
1940
YEAR

TRAINING OF WATER AND SEWAGE WORKS OPERATORS:

The department, in accordance with its usual policy of assisting water superintendents and sewage treatment plant operators in raising the standards of their profession, was cosponsor of the Second Annual Short-Course of the Pacific Northwest Section American Water Works Association at the University of Idaho. The department devoted considerable time to the schedule of study and also to the work of this school. Notable interest was manifested throughout the state in the short-course and a large number of water superintendents, sewage treatment plant operators, and city engineers from all parts of Washington attended the school. There were 110 registrants, and 69 certificates of attendance were awarded to the personnel of water and sewerage departments.

WORK PROJECTS ADMINISTRATION CLEARING CAMPS:

During the year the department spent considerable time in supervising the sanitation of the WPA clearing camps. These camps are located in two general areas of the state; namely, in the Columbia Basin, and on the right-of-way of the Bonneville transmission line. The setup of these camps and the number of men involved indicated that this department should exercise strict supervision over all the sanitary features of these camps.

These camps are nine in number, of which six, having a combined capacity of 3,000 are located on the Grant Coulee Clearing Project, and three, with a capacity of 720, are located on the Bonneville right-of-way. The men at these camps were drawn from all portions of the state and are in the habit of leaving the camps over the weekends and at the end of pay periods. Prior to July 1, 1939, it was customary for a man to spend two weeks in camp and then two weeks at home before another tenure of duty. From a consideration of the above, it becomes very apparent that if any communicable disease breaks out in the camps the possibilities of transmission to the four corners of the state would be magnified.

Increased vigilance was occasioned by the outbreak of a small typhoid epidemic in the Columbia Basin which, fortunately, did not effect any of the men on the project. However, on the Bonneville project there was an outbreak of dysentery which very patently resulted from an insanitary practice which this department had condemned on a previous inspection.

Supervision of the camps consisted of sanitary inspections from time to time throughout the year of all the features of the camps, and also advising the WPA officials upon the requirements of camp sites, construction, and operation. In all instances the source of water supply was selected and the method of sewage disposal designed by this department.

SWIMMING POOLS:

Table 3 below indicates swimming pool plans reviewed and approved. In addition, a number of plans were reviewed and not approved, and a number of inspections were made of existing pools. In general, however, the supervision of swimming pool operation is a responsibility of local health departments.

TABLE 3

SWIMMING POOL PLANS REVIEWED AND APPROVED
1939

Blockhouse Mineral Springs Resort (Klickitat County) - Improvements
Connell School District No, 51 - Preliminary and final approval
Longview (R.A. Long Swimming Pool) Preliminary and final approval
Oakesdale - Preliminary and final approval
Spokane Y.M.C.A. - Installation of recirculation and filtration
Tolt Recreational Center - Preliminary approval

MISCELLANEOUS ACTIVITIES:

Special reports, based upon field investigations were written on the following:

1. CLOVER CREEK SURVEY: this study was made to establish the practicability of discharging completely treated sewage effluent from McChord Field into the main tributary to Lake Steilacoom.

2. LEWIS COUNTY SCHOOL SURVEY: all schools were surveyed and individual recommendations made on necessary improvements.

3. STATE INSTITUTIONS: a survey of all state institutions was made by the Acting State Director of Health and the Chief of the division.

4. HOSPITALS AND NURSING HOMES: a number of these were surveyed during the year and special reports prepared.

5. OLYMPIA GASTRO-ENTERITIS OUTBREAK: An abstract of the complete report is included under Appendix A.

6. SEQUIM TYPHOID FEVER EPIDEMIC: A brief review of this epidemic which involved 114 cases is included under Appendix B.

7. SEPTIC TANK ORDINANCE: During the year the division of public health engineering prepared a "Recommended Septic Tank and Privy Ordinance" designed for adoption by municipal and city governments. The ordinance was recommended for adoption in order that cities and counties might bring their ordinances and laws relative to the sanitary disposal of human excreta up to date and in accordance with well defined practice. The ordinance is so written that it serves as a complete guide for the construction of septic tanks and the absorption fields necessary for the final disposal of septic tank effluents and for construction of a sanitary pit privy.

These ordinances are available for distribution through either the State Health Department, Division of Public Health Engineering, or local full-time county health departments.

MILK SANITATION

The milk sanitation program of the State Department of Health has been designed to increase the quality of milk; first, by placing qualified inspectors in counties and cities, and second, by giving the inspectors an ordinance that will enable them to obtain the best results. This program in most localities was carried out in conjunction with local health departments, and in some instances through the dairy industry and consuming public by educational methods.

Experience has shown that men in the production field become somewhat self-satisfied, and when a milk shed, taken as a whole, is surveyed it is found that all dairymen on that milk shed are not in the same class of progressiveness. Therefore, in order to provide consumers with the means of knowing which supply of milk they should buy it is advocated to local health departments that they adopt a system of grading the milk. This, in turn, calls for education of the consuming public who are reached by lectures, moving pictures, and even field trips to other milk sheds where greater achievements of sanitation have been reached than on their own. Also, surveys were made of various milk sheds and the data turned over to the local health officer.

The public as a whole is prone to believe that its milk supply is properly protected and therefore of no further concern, but as long as we have milkborne diseases and epidemics, and conditions existing on dairy farms and pasteurization plants that are potentially hazardous, it cannot afford to lose interest. It is generally conceded that it is the responsibility of a local government to supervise its own milk sanitation program as it does its water, sewage, police or fire programs. It is shown on the following graphs and maps that there are only 9 towns and 6 counties that see fit to do this. In some of these the inspection is inadequate. It is considered by the United States Public Health Service that under ideal conditions one inspector should have not more than 300 dairies to inspect. Yet, when the 7 state inspectors and 19 county and city inspectors are totaled, it leaves somewhere near 2,300 dairies per inspector for the whole state, and some of these are so scattered and the conditions are so unfavorable that one inspector is unable to take proper care of his theoretical allotment. Of course, what actually occurs is that most of the dairies receive only the inspections that can be given by state inspectors, which is far from ample, and those cities and towns that have inspectors concentrate on their smaller territory. The great bulk of the dairies are therefore inspected only once a year, if that often.

Milk inspection is a highly specialized job and, as such, requires men who are trained in milk sanitation and have the viewpoint of assisting the dairyman to produce a high grade of milk. The inspector must keep ahead of a fast moving industry and in so doing must take advantage of all the training that is available. For this reason the State Department of Health has invited the United States Public Health Service to hold a milk seminar in Seattle during the spring of 1940, at which time all phases of milk inspection will be discussed. Also, at each Dairy Institute held by the State College of Washington there are sections in which milk sanitation is discussed.

It is the duty of the Milk Sanitarian of the State Department of Health to continually advise with the local milk sanitarians and assist them in any program that is deemed advisable. This function is not of a supervisory nature, but purely advisory. This service has a tendency to relieve the pressure on local men and makes the problem a joint responsibility. Another service rendered to local health departments is that at least annually the milk laboratories are inspected and approved by the chief of laboratories, or if they or the technicians are unable to be approved, steps are taken to make them fit for approval.

Dr. F. A. Clark, Milk Specialist of the United States Public Health Service, made a survey of the Seattle and Tacoma milk sheds and, as a result, Seattle doubled its milk sanitation staff by the addition of 3 inspectors, 1 sample collector, and 1 laboratory technician. Tacoma made preparations to add one more inspector, making two for this city.

Yakima went on the grading system under the Standard Milk Ordinance and received a very high rating, while Ellensburg and Garfield adopted the Standard Milk Ordinance but will not start grading until 1940. No new county or city inspectors were placed, other than for Seattle, due to lack of funds for public health work, but several counties and cities signified their interest provided funds could be made available. Spokane adopted a compulsory pasteurization ordinance to become effective July, 1940. Several plants throughout the state requested this department to make inspection of their plants in order that any improvement made would comply with the Standard Ordinance. Assistance was given the faculty of the State College of Washington in collecting material and preparing for a separate course in milk sanitation which will begin in February, 1940. As usual, assistance was given in the dairy branch of the Western Washington Fair. Assistance was also given at Sequim to control the typhoid epidemic spread through the school. Inspections were made of the dairies supplying the Indian schools at Inchelium, Nespelem, and Wellpinit at the request of the Indian Service.

Rating surveys were made for: Vancouver, Camas, Walla Walla, Yakima, Seattle, Tacoma, Pierce County, and Ellensburg.

FIGURE VI

GRAPH SHOWING DISTRIBUTION OF TOTAL
TIME SPENT ON MILK SANITATION ACTIVITIES

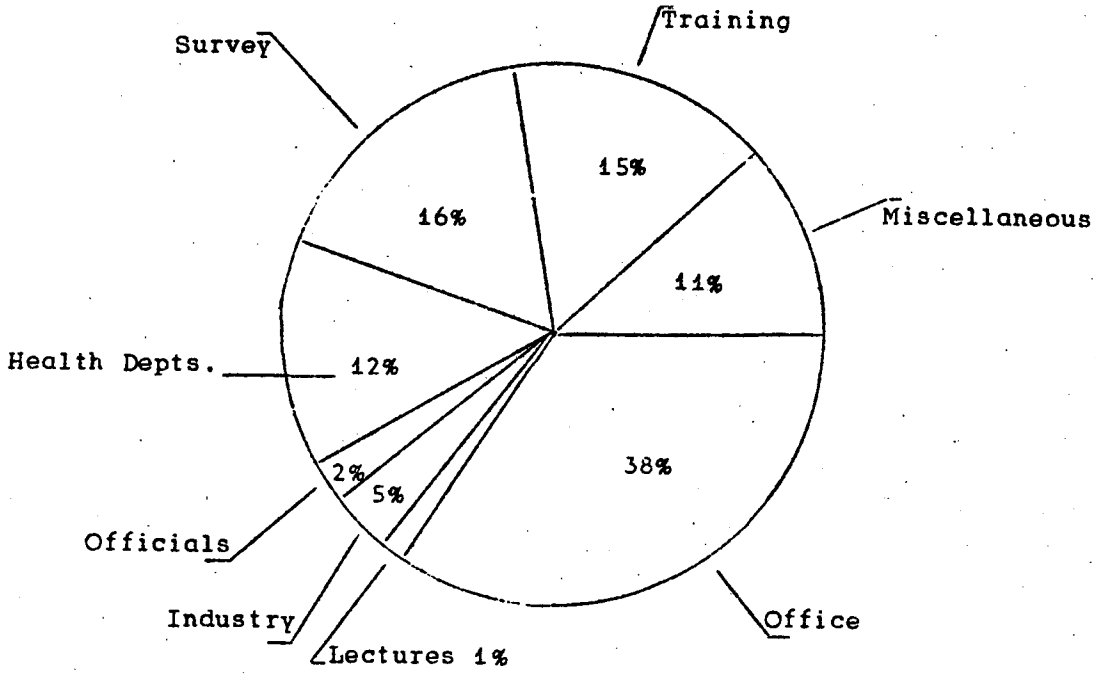


FIGURE VII

DISTRIBUTION OF LOCAL MILK INSPECTION WORK

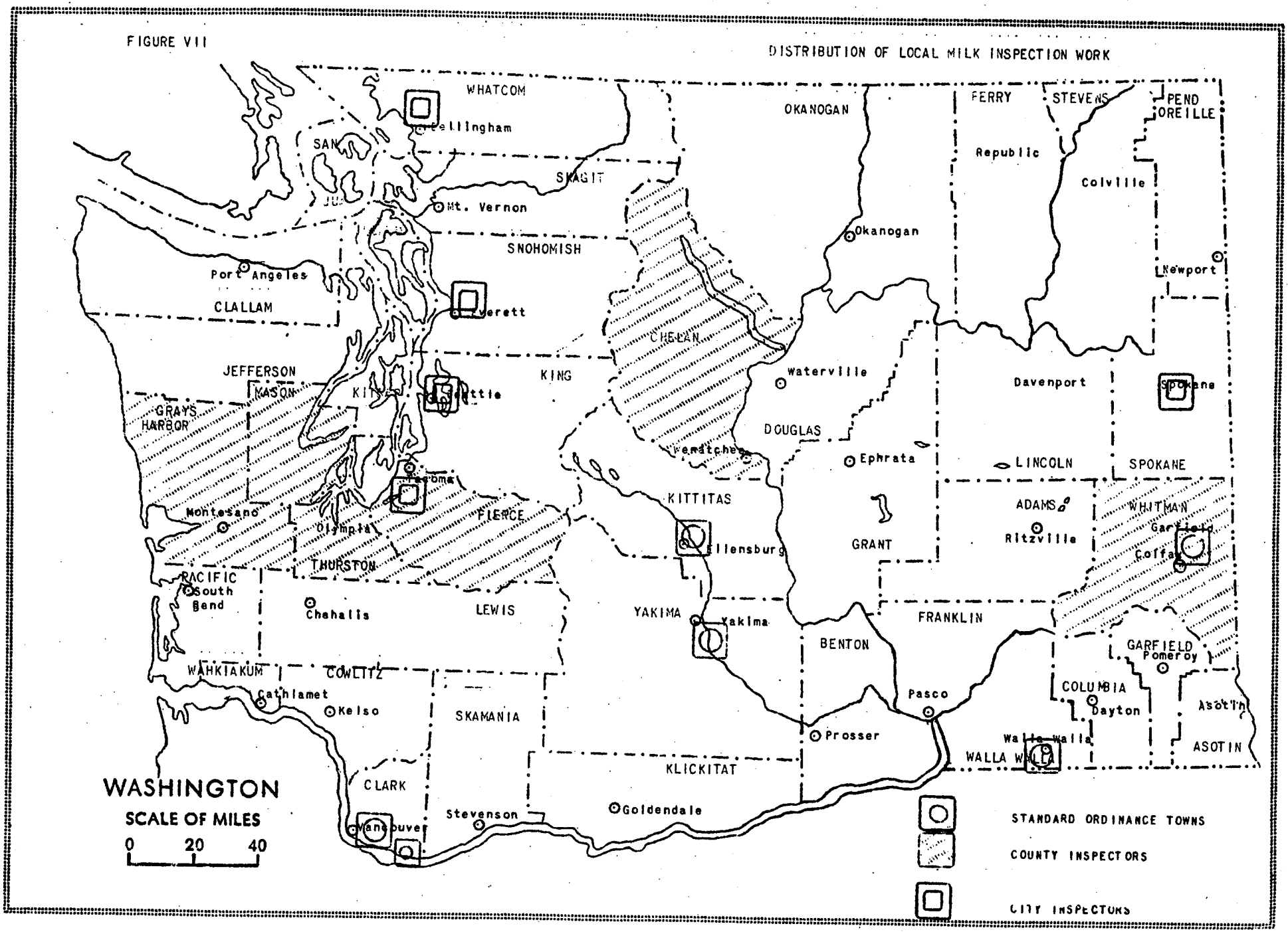


TABLE IV.

MILK SANITATION ACTIVITIES

	NUMBER
Dairies Inspected - Training Inspectors	315
Dairies Inspected - Survey	538
Conferences with Health Dept. Personnel	107
Conferences with City Officials	14
Conferences with Industry	48
Lectures, etc.	11
Meetings	5
Rating Surveys	8

TABLE V.

DISTRIBUTION OF MILK INSPECTORS

State	7	
County	5	
Standard Ordinance Cities	5	
Other Cities		
Other Cities -		
Bellingham	1	
Everett	1	
Seattle	6	
Spokane	1	
Tacoma	1	
Total Inspectors for the State		27
Estimated Number of Dairies in the State		60,000
Average Number of Dairies per Inspector		2,220
Estimated Number of Dairies that should be allotted to each Inspector		300

SHELLFISH SANITATION

INSPECTIONS:

The 1939 shellfish inspections and reinspections totaled 1,685: 566 inspections were made of shucking plants; 297 inspections were made of culling houses and floats; 211 shoreline inspections were made; 189 growing area inspections were made, and 210 inspections were made of loading and shipping docks, and 212 sanitary inspections were made of retail markets and fish dealers in the principal cities of the state to determine the method of handling, the kind of containers in which the shucked stock were packed, the proper refrigeration, and the identification of the merchandise offered for sale.

CERTIFICATIONS:

161 shellfish producers and shippers were approved: 106 approved for shellstock only and 55 for shucking, packing, and repacking plants. 66 certificates of approval were issued for interstate shippers and were duly approved by the United States Public Health Service for interstate shipment of shellfish.

LABORATORY ANALYSES:

87 samples for bacteriological test of shellfish and seawater were collected from growing areas and shucking plants and examined in the State Department of Health laboratory: 66 were seawater, 3 fresh water, 11 oysters, 5 mussels, and 2 crabmeat.

HEALTH DATA CARDS:

Health data cards were issued by the State Department of Health to 210 shellfish handlers employed in shucking, packing, and repacking plants as well as those employed on the growing areas. In addition, health data cards were issued to shellfish handlers employed in the cities of Seattle, Tacoma, Vancouver, and Spokane by the city health departments.

SURVEYS:

In April a preliminary survey was made of Fidalgo Bay for the purpose of planting seed oysters shipped from Japan. Due to the probable shoreline pollution and some sewage entering this area from the City of Anacortes, it was found inadvisable.

TABLE VI.

LABORATORY RESULTS - SEA WATER SAMPLES

Date	Lab. No.	Location	Station No.	Plate Count 37° C	Plate Count 20° C	Score
1/26	1	Grays Harbor, Mid Stream, No. Channel	54	60	1400	23.0
	2	" " " " " "	53	250	5300	41.0
	3	" " " " " "	55	3000	5800	50.0
	4	" " " " " "	103	80	1000	32.0
	5	" " " " " "	102	8	1100	23.0
	6	" " " " " "	101	20	1400	2.3
	7	" " " " " "	58	200	3000	50.0
	8	" " " " " "	51	500	10000	23.0
2/6	9	" " " " " "	101	20	10000	1.4
	10	" " " " " "	102	45	3200	1.4
	11	" " " " " "	103	24	2400	0.3
	12	" " " " " "	55	20	2600	23.0
	13	" " " " " "	54	50	1000	0.5
	14	" " " " " "	58	10000	10000	32.0
2/16	15	" " " " " "	103	250	6700	5.0
	16	" " " " " "	55	300	6000	32.0
	17	" " " " " "	54	100	7100	23.0
	18	" " " " " "	58	400	7000	32.0
	19	" " " " " "	53	500	10000	23.0
3/6	20	" " " " " "	58	500	2400	4.1
	21	" " " " " "	58	20	10000	3.2
	22	" " " " " "	58	50	10000	32.0
	23	" " " " " "	58	90	5400	50.0
	24	" " " " " "	58	1400	7500	5.0
	25	" " " " " "	58	50	10000	14.0
3/7	26	" " " " " "	58	12	1800	0.3
	27	" " " " " "	58	15	10000	5.0
	28	" " " " " "	58	30	10000	2.3
	29	" " " " " "	58	80	10000	41.0
	30	" " " " " "	58	150	5400	14.0
	31	" " " " " "	58	2000	4200	50.0
	32	" " " " " "	58	100	1300	5.0
	33	" " " " " "	58	20	10000	3.2
3/8	34	" " " " " "	101	20	9000	0.1
	35	" " " " " "	102	20	1000	0.1
	36	" " " " " "	103	25	4200	0.4
	37	" " " " " "	55	30	10000	0.5
	38	" " " " " "	58	10	5400	3.2
3/29	39	" " " " " "	103	10	10000	0.5
4/18	40	Fidalgo Bay, Channel Near Crandall Spit		0	3	0.0
	41	" " " " Railway Bridge		1	8	0.0
	42	" " " " Head of Bay		0	1	0.0
4/27	43	Grays Harbor	101	10	10000	0.2
	44	" "	102	8	10000	0.5
	45	" "	103	12	10000	4.1
	46	" "	55	14	10000	4.1
	47	" "	54	25	6000	5.0
5/18	48	" "	101	8	10000	0.3

TABLE VI.
(Continued)

Date	Lab. No.	Location	Station No.	Plate Count 37° C.	Plate Count 20° C	Score
5/18	49	Grays Harbor	102	102	4200	2.3
	50	" "	103	8	10000	5.0
	51	" "	55	10	10000	2.3
	52	" "	54	12	10000	4.1
5/23	53	West Side Humptulips River		4	10000	0.0
5/24	54	" "	101	40	10000	0.1
	55	" "	102	16	10000	0.5
	56	" "	103	20	10000	3.2
6/20	57	" "	101	7	10000	0.1
	58	" "	103	40	10000	23.0
	59	" "	102	14	3000	3.2
	60	" "	55	50	1500	14.0
	61	" "	101	18	700	0.2
	62	" "	102	50	2000	5.1
	63	" "	103	5200	6000	41.0
7/11	64	" "	54	300	3700	14.0
	65	" "	55	60	7500	3.2
12/13	66	Samish Bay, Rock Point Oyster Float		40	4200	5.0

TABLE VII.

LABORATORY REPORT ON SAMPLES OF OYSTERS

Date	Lab. No.	Location	Type of Stock	Score
1/3	1	Tasteeful Food Products Co., Blaine	Packed	3.0
3/6	2	Northwest Cold Storage, Gortons Forsted Sea-foods, New England Oyster Growers Exchange, Certificate R. I. #4	Frozen	0.0
4/25	3	Growing Area, W. Ortley, Samish Bay	Shellstock	0.0
5/18	4	Hoods Canal, S. R. Moffett Area	Shellstock	0.0
9/19	5	New Washington Oyster Company, Willapa Harbor	Packed	0.0
10/25	6	Market at Yakima, Washington; Marush Fish and Oyster Company	Packed	3.0
11/1	7	National Fish & Oyster Company Plant, Samish Bay	Shellstock	1.0
11/1	8	National Fish & Oyster Company Plant, Tacoma	Packed	32.0
11/1	9	Marush Fish & Oyster Company Plant, Tacoma	Packed	2.0
12/13	10	Chuckanut Oyster Company, Samish Bay	Shellstock	1.0

In May a sanitary survey was made of an oyster growing area at the mouth of the Lilliwaup River, a portion of Hood Canal, for the purpose of certifying this area. As a result of the survey it was found that raw sewage at points along the shoreline from dwellings and also from recreational camp and tavern discharged into the tidal waters adjacent to the growing area. It was necessary to restrict this area from the sale of shellfish for the protection of the public health.

VIOLATIONS:

As in the past, the most common violation was the possession and offering for sale of unidentified shellfish from areas not approved or plants not certified by the State Department of Health. The following stock was confiscated: 500 gallons were destroyed by the Oregon health authorities at our request, that were shipped from a nonapproved plant; 200 bushels of shellstock were seized in Tacoma for the reasons that the stock had been out of water too long and not held at the proper temperature, resulting in open shells and dead oysters.

MUSSEL POISONING:

In 1927 an outbreak of mussel poisoning occurred on the Pacific Coast where 102 cases were involved with 6 deaths from eating this shellfish. Most of these cases occurred along the California Coast. Immediately after the outbreak, scientific investigation and research studies were undertaken by the George Williams Hooper Foundation for Medical Research in San Francisco, a department of the University of California. This investigation has been carried on during each year which followed and is still in progress. Based upon information gained from tests of this shellfish that have been made each year, a fairly definite idea has been gained as to the time when mussels may be expected to become poisonous. Every year between the first part of June and the middle of September the toxicity of the mussels reached a peak. It is not of the same intensity every year. The studies show the poison season lasts usually about one month; after that the toxic content of the mussel drops rapidly and by late fall the shellfish are again practically free of poison. Because of the toxic condition of the mussels during the summer, a seasonal quarantine is placed upon the taking of this shellfish from June to October.

In cooperation with the Foundation, each year during the summer months samples of mussels are collected from the rocks in False Bay,

San Juan Island, and the livers are extracted and forwarded to the Foundation in San Francisco for examination as to their toxicity.

The following tabulation shows results of mussels collected during the summer of 1939:

July 13	6.0	mgr.	per	mouse	unit
August 2	3.3	"	"	"	"
August 8	4.5	"	"	"	"
August 21	2.7	"	"	"	"
August 30	2.7	"	"	"	"

In spite of intensive investigations made from every possible angle knowledge relative to the causes of this temporary strong poison in this Pacific Coast shellfish is still incomplete. It is certain that mussels and clams are an important and valuable food, especially to people who live along the Coast. There should be no fear in the eating of these shellfish, provided that the general public is well informed relative to certain dangers connected with these shellfish at certain seasons of the year. The public should always respect a quarantine measure which may be established with full assurance that it is a necessity for the protection of human life.

There is no record of any cases or deaths caused by mussel poisoning in the state of Washington. However, the following Table indicates there is a possible danger from this shellfish during certain seasons of the year:

NUMBER OF CASES AND DEATHS FROM
MUSSEL POISONING ON THE PACIFIC COAST
1927 - 1939

AREA	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Central California	102 (6)	-	62 (4)	2	-	40 (1)	7	-	-	-	21	-	76* (8)*
Northern California	-	-	-	-	-	-	15 (1)	-	-	3 (2)	-	-	-
Oregon													
Alaska	-	-	-	-	-	-	-	12 (2)	-	-	-	-	-
TOTAL	102 (6)	0	62 (4)	2	0	40 (1)	22 (1)	12 (2)	0	3 (2)	21	0	76 (8)

* 12 cases and two deaths attributed to clams.
Number of deaths in parenthesis

COMMUNITY SANITATION

The Community Sanitation Project which has been operating continuously since 1934 operated in 20 counties during 1939. The purpose of the program is to assist in the elimination of infection from fly-borne diseases by the construction and installation of sanitary fly-tight privies in rural and unsewered areas, and also the removal and destruction of the old insanitary open pit privies.

Under this project a sanitary pit privy, of the type approved by the United States Public Health Service, may be obtained for the cost of the material only. All labor necessary in the construction, installation, and elimination of old privy is furnished by the WPA. The operation of the Community Sanitation Project makes it possible for people with small incomes to solve some of their serious sanitation problems, thereby helping to protect the community against fly-borne diseases.

During the year there were 1,812 units installed in 20 counties. Since the program started in 1934 there have been a total of 13,626 units installed for homes, dairies, railroads, schools, etc.

Men assigned from the regular WPA rolls and paid by WPA, work directly under county supervisors who have charge of the operation of the project in their respective counties. The average crew which worked in each county during the year was from 12 to 18 men.

In most counties the buildings are constructed in a central plant located on publicly owned property. Where this operation is not the most practicable, some smaller plants are operated which are conveniently located near a lumber yard.

The county supervisors and crews are under the supervision of one state supervisor, furnished by the State Department of Health and the United States Public Health Service. The county supervisors are responsible to the State Department of Health for all reports relative to costs of construction and location of installation. Much time is spent by the state supervisor in instruction and training of men who have direct charge of construction and installation of the units. This is important to make certain the buildings are fly-tight and are not located so contamination of drinking water supplies will result.

The operation of the project was slowed up somewhat during the year due to operation of WPA Projects sponsored by the Department of the Interior — mainly the clearing of the Coulee Dam Basin and the Coulee-Bonneville transmission line. These projects had preference over other

WPA projects and in counties near the clearing operation it was necessary to suspend the Community Sanitation Project. However, during the last couple of months this situation is rapidly changing with the offer of men for the continuation of the Community Sanitation Program.

WPA officials throughout the state have shown a great interest in the operation of the Community Sanitation Project and through the recommendation of the State Director of Operations, a state-wide Community Sanitation Project proposal was submitted. The proposal was submitted to Washington, D. C., in October and approval was received late in December. The date for the opening of the State-wide project is January 29, 1940, and calls for an expenditure of $208,304.00 of federal funds and $161,705.00 of sponsor's funds; the sponsor's share to be the material furnished by the party obtaining the unit, plus a delivery charge.

During the past year certain portions of the state operated as WPA Zone-Wide Projects, while in other locations each county operated as a separate unit. In most cases it was found that the Zone-Wide operations were more satisfactory.

In many counties having full-time health units, where the project is operating, the sanitarians and sanitary engineers are taking an active interest in promotion of the project. This cooperation has proven to be very beneficial in that it assures continuous operation and renders a service to the people which is of value in the community.

Many governmental agencies have shown interest in the promotion of the Community Sanitation Program. The Farm Security Agency has placed a number of sanitary units on the small farms which are being equipped for the tenants. This agency is also making loans for the improvement of sanitation. Dairy inspectors have taken an active interest which is shown by the number of units placed at dairy barns throughout the state. In the Grays Harbor district and on the Tulalip Indian Reservation the Indian agencies are taking advantage of the program by purchasing material for units to be placed at homes of the Indians.

A portable privy has been designed which is the same as the standard unit, except the floor and riser are of creosote treated wood instead of concrete. This unit will be of practical use for WPA construction crews, berry fields, hop yards, etc., where in the past it was difficult to move the heavy slabs. Six of these units have been built in Yakima County, the material being furnished by WPA and are to be used by WPA crews in Yakima County.

Resort owners are showing more interest in the program, especially in the King County area. Multiple units, using any number of slabs desired, have been installed, the largest installations using fourteen concrete slabs to the building. By painting these larger units to

correspond with the other buildings at the resort it makes a very attractive, satisfactory installation. Recipients have indicated that this type of building is solving a problem of sanitation which has long been a problem at the resorts, patronized by thousands of people every Sunday during the summer months.

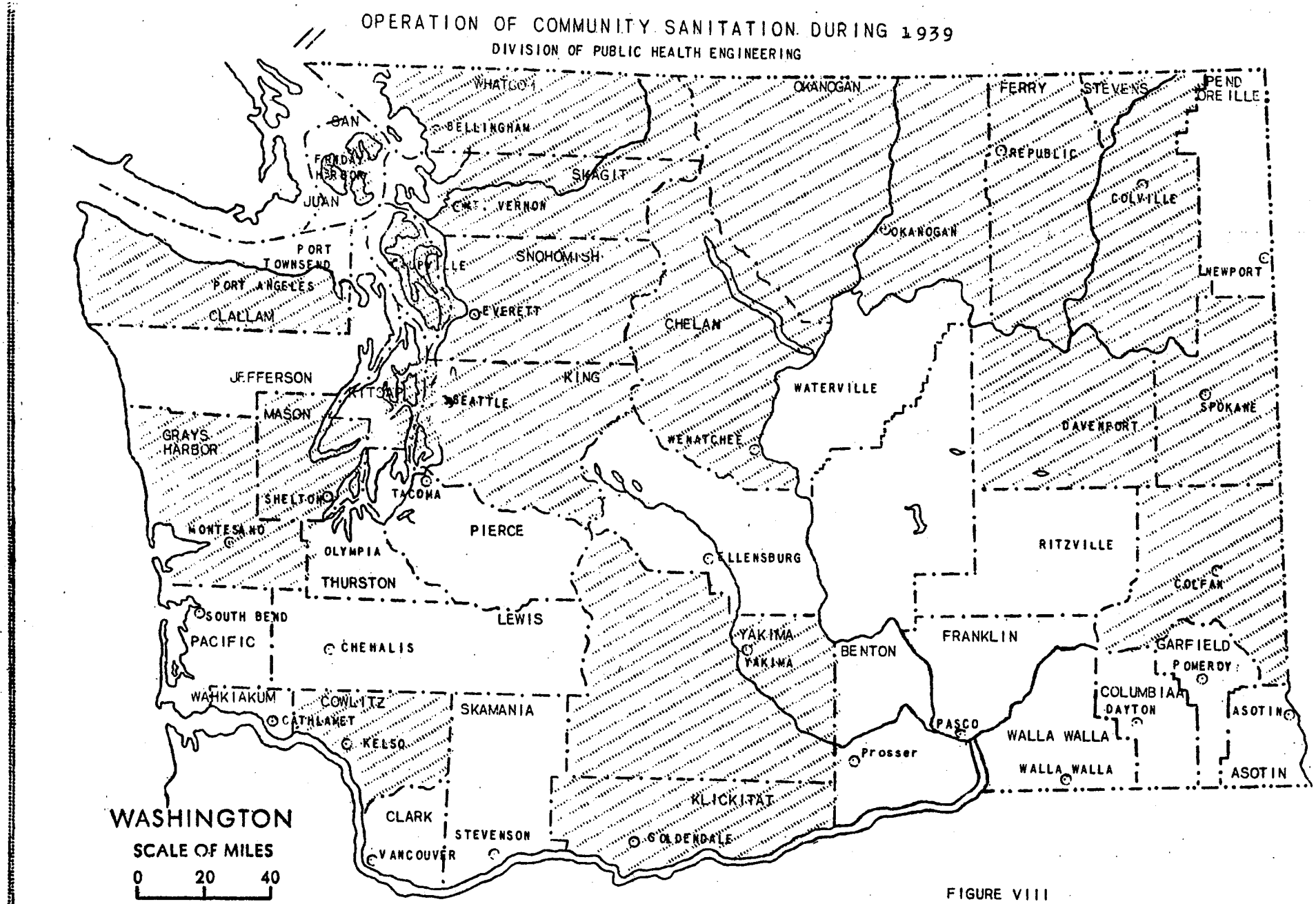

OPERATION OF COMMUNITY SANITATION DURING 1939
DIVISION OF PUBLIC HEALTH ENGINEERING
WHATCOM
SAN JUAN
FRIDAY HARBOR
BELLINGHAM
SKAGIT
MT. VERNON
OKANOGAN
FERRY
STEVENS
PEND OREILLE
REPUBLIC
COLVILLE
OKANOGAN
NEWPORT
PORT TOWNSEND
PORT ANGELES
CLALLAM
SNOHOMISH
EVERETT
CHELAN
JEFFERSON
KITSAP
SEATTLE
KING
WATERVILLE
SPOKANE
DAVENPORT
MASON
GRAYS HARBOR
WENATCHEE
SHELTON
TACOMA
MONTESANO
PIERCE
OLYMPIA
ELLENSBURG
RITZVILLE
COLFAX
THURSTON
SOUTH BEND
LEWIS
PACIFIC
CHEHALIS
YAKIMA
YAKIMA
BENTON
FRANKLIN
GARFIELD
POMEROY
WAHKIAKUM
COWLITZ
SKAMANIA
COLUMBIA
DAYTON
ASOTIN
CATHLAMET
KELSO
PASCO
WALLA WALLA
Prosser
WALLA WALLA
ASOTIN
KLICKITAT
CLARK
STEVENSON
GOLDENDALE
VANCOUVER
WASHINGTON
SCALE OF MILES
0 20 40

FIGURE VIII

TABLE IX.

COMMUNITY SANITATION ACTIVITIES DURING 1939 UNDER W.P.A.

COUNTIES	NEW SANITARY PRIVIES INSTALLED	TOTAL MONTHS WORKED	TOTAL MAN HOURS	TOTAL W.P.A. EXPENDITURES	TOTAL SPONSOR'S CONTRIBUTION	AVERAGE NUMBER OF MEN
Spokane, Lincoln, Stevens, Ferry, Whitman	152	10	15230	$11994.19	$3554.52	16
Yakima	377	12	32045	18380.32	6099.40	25
Chelan	8	2	1144	1458.16	161.87	9
Okanogan	26	4	2730	2349.78	778.84	13
Snohomish	279	12	29295	17760.98	5743.15	24
San Juan, Whatcom	164	12	19680	9584.26	4198.66	15
Island	53	7	4240	3041.60	2091.00	6
Clallam	43	6	7740	3614.35	907.25	14
Skagit	20	3	2500	1214.68	437.90	9
King	334	12	40560	26436.78	3717.63	28
Kitsap	69	9	8970	5696.53	1406.45	10
Grays Harbor	92	12	11960	7740.04	1624.95	11
Mason	2	1	212	58.79	44.00	2
Cowlitz	133	5	7890	4831.02	2799.50	19
Klickitat	60	2	3120	1478.88	W.P.A.	12
TOTALS	1812	109	187406	$115640.34	$33565.12	213
Previous Totals	11805			$592049.00	$206122.47	
Total To Date	13617			$707689.34	$239687.59	

TABLE X.

DISTRIBUTION OF INSTALLATIONS	
Homes, including Indian Reservation Homes	667
Service Stations, Taverns, Stores	135
Resorts, tourist cabins, fair grounds, dance halls	479
Schools	53
Dairies	95
Churches, cemeteries, grange halls, State Highway Dept., etc.	108
Construction camps	98
Hop yards, berry fields	109
Railroads	68
TOTAL	1812

MATTRESS AND BEDDING INSPECTION

January 1, 1940, there were 438 retail stores, 134 furniture factories and upholstering shops, and 78 mattress factories handling merchandise or doing work that comes under the scope of the Mattress and Bedding Laws.

Every effort is being made to protect the public health by eliminating all possible causes of contamination of materials used in the manufacture of all new merchandise, and to improve methods of handling second-hand material. All second-hand merchandise containing hidden filling material must be labeled as such, and fumigated in a chamber approved by the State Department of Health, before it can be sold or offered for sale. Both an insecticide and germicide are used in these fumigation chambers, which assures the consumer of sanitary merchandise. Very little second-hand merchandise is shipped into Washington from other states, but when it is it must be fumigated by a fumigation chamber approved by the Washington State Department of Health.

Manufacturing plants, upholstering shops, and mattress factories are inspected as to cleanliness of materials used and general sanitation. Every piece of merchandise must be labeled with a Washington State Department of Health label, properly filled in as to contents, percentage of filling material used, and the manufacturer's name. Retail stores must see that all merchandise, whether it is new or used, is properly labeled before it can be sold or offered for sale. If the merchandise has had prior use it must be fumigated by an approved fumigation chamber before it can be sold.

In the year 1939 there were 71 samples collected and analyzed. There were 37 pieces of merchandise confiscated, taken off sale until labeled correctly, or returned to the manufacturer. This included 18 pillows in one group that were labeled 100% down. A tolerance of 10% feather by weight is allowed in down. After an analysis of these pillows was taken it was found that they contained only 78% down and 22% feather. The manufacturer was orderec to relabel these pillows correctly before they could be sold.

Inspections made during 1939:

Furniture Factories	647
Retail Stores	1452
Mattress Factories	442
Fumigation Chambers	181
Total	2722

TABLE XI.

LABELS SOLD DURING 1939					
CLASSIFICATION	LARGE LABELS @ $15.00 a Thousand		SMALL LABELS @ $7.50 a Thousand		TOTAL
ALL NEW MATERIAL	364,000	$5,460.00	316,000	$2,370.00	$7830.00
OWNERS OWN MATERIAL	32,750	491.25	5,500	41.25	532.50
USED MATERIAL	43,250	648.75	1,000	7.50	656.25
TOTAL	440,000	$6,600.00	322,500	$2,418.75	$9018.75

TABLE XII.

APPROVED FUMIGATION CHAMBERS

CITY	NAME OF ESTABLISHMENT	ADDRESS	TYPE OF FUMIGATION
Aberdeen	A. A. Star Transfer Co.	M & Hume Sts.	Cyanide & Formaldehyde
Bellingham	Bellingham Bedding Co.	Iowa & Orlean Sts.	Sulphur & Formaldehyde
"	Bellingham Upholstering Co.	1246 State St.	"
Bremerton	Bremerton Carpet Shop	540 Bay St.	"
Camas	Stoller Furniture Co.	Camas	"
Centralia	American Store	520 N. Tower Ave.	"
Chehalis	Chehalis City Laundry	Chehalis	Cyanide & Formaldehyde
Cle Elum	Greer Mattress Factory	CleElum	"
Dayton	C. E. Suffield Furniture Co.	Dayton	"
Ellensburg	K. & E. Cleaners	310 N. Pine	Sulphur & Formaldehyde
"	Star Laundry	Ellensburg	"
Everett	Union Laundry	222 Everett Ave.	Cyanide & Formaldehyde
Goldendale	Home Furniture Co.	Goldendale	Sulphur & Formaldehyde
Grand Coulee	Levitt's Auction House	Grand Coulee	"
"	Snyder Mattress Factory	B Street	"
Longview	Har La Mar Cleaners	1115 Commerce St.	Cyanide & Formaldehyde
Monroe	Dever's Furniture Co.	Monroe	Sulphur & Formaldehyde
Mount Vernon	Dod's Furniture Store	Mt. Vernon	"
Olympia	Capitol Laundry	514 4th Ave.E.	Cyanide & Formaldehyde
Orchards	Ideal Fumigating Co.	Orchards	"
Port Angeles	Brown's Mattress Factory	Port Angeles	Sulphur & Formaldehyde
Pullman	College Laundry	Pullman	"
Puyallup	Puyallup Furniture Co.	Puyallup	"
"	Wilson Auction	Puyallup	"
Seattle	A.A.A. Fumigating Co.	9214 12th N.W.	"
"	American Marine Cyanide Fumigating Co.	1962 1st S.	Cyanide & Formaldehyde
"	Bushell's Auction House	2006 2nd	Sulphur & Formaldehyde

CITY	NAME OF ESTABLISHMENT	ADDRESS	TYPE OF FUMIGATION
Seattle	Frederick & Nelson	Pine St.	Sulphur & Formaldehyde
"	Good Will Industries	1400 Lane St.	"
"	Greenfield's Auction House	2001 Second Ave.	"
"	Grunbaum's Furniture Co.	1521 6th Ave.	"
"	Harry N. Leckenby	Pier 40	Cyanide & Formaldehyde
"	Reliance Mattress Co.	N. 85th & Phinney	Sulphur & Formaldehyde
"	Salvation Army	9th & Virginia	"
"	St. Vincent De Paul Society	724 Taylor Ave.	"
"	Simmons Co.	99 Spokane St.	"
"	Standard Furniture Co.	2nd and Pine Sts.	"
Sedro Wooley	Cudmore Furniture Co.	Sedro Wooley	"
Spokane	Barrett Mfg. Co.	724 E. Sprague Ave.	"
"	Commercial Fumigating Co.	512 Hyde Bldg.	Cyanide & Formaldehyde
"	Home Mattress Works	E. 723-2nd Ave.	Sulphur & Formaldehyde
"	Ideal Laundry	E. 27 Boone St.	Cyanide & Formaldehyde
"	Inland Mattress & Furniture Co.	W. 309 2nd Ave.	Steam & Formaldehyde
"	Phil's Auction House	242 W. Sprague	Sulphur & Formaldehyde
"	Spokane Fumigating Co.	Monroe & College Sts.	"
Tacoma	Carpet Shop	1505 Commerce St.	"
"	Empire Furniture & Mfg. Co.	2914 S. Alaska	"
"	Sprague Co.	416 Washington Bldg.	Cyanide & Formaldehyde
"	Tacoma Ave. Auction House	923 Tacoma Ave.	Sulphur & Formaldehyde
"	Tacoma Goodwill Industries	2356 Tacoma Ave.	"

CITY	NAME OF ESTABLISHMENT	ADDRESS	TYPE OF FUMIGATION
Tacoma	Tacoma Laundry	624 Wright Ave.	Cyanide & Formaldehyde
"	Volunteers of America	S. 15171 Broadway	Sulphur & Formaldehyde
Vancouver	Northwest Fumigating Co.	Vancouver	Cyanide & Formaldehyde
"	Reliable Insecticide Co.	Portland, Ore.	"
Walla Walla	Bean Bros. Furniture Co.	210 W. Main	Sulphur & Formaldehyde
Walla Walla	Garden City Furniture	47-51 Main St.	Cyanide & Formaldehyde
Wenatchee	Wenatchee Matress Works	536 S. Wenatchee Ave.	Sulphur & Formaldehyde
Yakima	Acme Fumigating Co.	S. 1st	Cyanide & Formaldehyde
"	Yakima Transfer & Storage	Yakima	"

TABLE XIII.

SUMMARY OF ALL FIELD ACTIVITIES OF THE DIVISION OF PUBLIC HEALTH ENGINEERING

	1936	1937	1938	1939
WATER SUPPLY				
Public Supply Investigations	80	281	201	249
Private Supply Investigations	21	43	24	20
Conferences Public Supplies	--	--	141	184
Highway Water Supply Inspections	--	--	74	10
Supplies Approved for Interstate Carriers	40	35	33	30
Supplies Prohibited for Interstate Carriers	2	3	5	3
Plans Reviewed and Approved	14	48	70	79
Emergencies	--	2	3	3
SEWERAGE				
Public System Investigations	37	78	95	75
Private System Investigations	28	36	20	8
Conferences Public Systems	--	--	93	52
Industrial Waste Investigations	26	25	13	8
Industrial Waste Conferences	--	--	11	6
Stream Pollution	130	17	13	6
Plans Reviewed and Approved	24	44	84	42
FOOD SANITATION				
Shellfish Inspections (Total)	2206	2008	1196	1675
Shellfish Certificates Issued (Total)	180	172	129	161
Shellfish Growing Area Surveys	--	1	6	3
Milk Sanitation - Rating Surveys	4	11	2	8
Milk Sanitation - Dairy Inspections	--	--	548	853
MATTRESS AND BEDDING LAW ENFORCEMENT				
Total Inspections	990	1653	3436	2722
GENERAL SANITATION ACTIVITIES				
Camp Sanitation (Tourist, Resort & Industrial)	2	288	1490	38
Refuse Disposal Investigations	3	21	7	6
Institutions - Water and Sewage	18	19	23	34
Swimming Pool Inspections	9	20	23	29
Swimming Pool Plans Approved	--	4	5	6
Conferences and Miscellaneous Meetings	19	71	24	145
Conferences, Local Health Departments	--	147	107	218
Field Work, Local Health Departments	--	--	33	44
Lectures or Talks (Scheduled and Prepared)	--	14	24	28
Special Studies and Reports	6	10	21	26
Miscellaneous	14	18	4	29

APPENDIX A.

OLYMPIA:

During May an explosive outbreak of gastroenteritis occurred in the Garfield School and vicinity in Olympia. The first case was reported on May 4, with the outbreak reaching a peak of 44 cases reported on May 10. A total number of 92 students attending the Garfield school and persons living in the vicinity of the school were affected. Epidemiological investigations were conducted by the State Department of Health and the Thurston County Health Department which lead to the following conclusions:

1. The school lunchroom was eliminated as the source of infection, inasmuch as only 17 of the 75 pupils who were ill had bought any or part of their lunch at the school.

2. Milk was also eliminated as the source of infection, since the milk sold at the school was pasteurized and bottled and bought from three different dairies. None of the other schools in Olympia using milk or milk products from these dairies reported any cases of gastroenteritis upsets.

3. The clinical findings were few, only six of those ill having any fever. The symptoms were quite typical with a rather sudden onset of nausea, slight vertigo, and vomiting. The illness was of rather short duration, averaging about eighteen hours and ranging from six to forty-eight hours. Of the 76 pupils ill, 57 vomited and 16 had diarrhea; of the 14 adults there were 9 with vomiting and 11 with diarrhea. Two preschool children who had become ill had no diarrhea but vomited three to six times. These clinical symptoms indicated an irritation of the upper end of the gastrointestinal tract.

4. Of the 92 found to be ill, 80 were school children and adults who had been drinking of the Garfield school water during and within 10 days of their illness. The remaining 12 are all on the same water system supplying the school.

5. Laboratory findings were significantly negative; water samples were bacteriologically negative; a few vomitus and stool samples of the first day's illnesses showed no pathogens.

6. The final conclusions drawn in the epidemiological investigation was that the one factor common to all of the cases was the water supply. It is highly significant that all of those who became ill either attended the Garfield school, which is supplied with city water, or lived in houses which had a city water service connection with the distribution system in the vicinity of the Garfield school.

The engineering investigations were conducted by the division of public health engineering and immediately revealed that the elevated steel water tank located in the immediate vicinity of the Garfield school had been out of service between April 3 and May 3 for the purpose of painting the inside of the tank. The tank was returned to service on May 3 and the first case of gastroenteritis was reported on May 4. Investigation revealed further that the tank was painted in the following manner: the existing enamel was removed and a priming coat composed of coal tar pitch base and a coal tar distillate solvent was applied, allowing not less than 24 hours nor more than 96 hours for drying before application of the hot enamel. The enamel composed of coal tar pitch and a siliceous mineral filler was then applied at a temperature of between 485°F. and 500°F. Before placing the tank back in service the inside of the tank was washed down with water but was not disinfected with chlorine. The inside of the tank in the vapor space above the water surface, however, was not washed down. Just prior to the painting of the elevated steel tank in the vicinity of the Garfield school, two other elevated steel tanks on the city water supply system had been painted. The painting procedure in all three was exactly the same with one exception -- the inside of two of the tanks in the vapor space above the water surface was painted with aluminum paint after priming and enameling had been completed. The vapor space of the tank in the vicinity of the Garfield school was not painted at this time because it had been painted two years previously.

In view of the epidemiological evidence which pointed to the water supply, the clinical symptoms which indicated a chemical poisoning rather than a bacterial infection by reason of the upper end of the gastrointestinal tract being affected, the correlation of time between the placing in service of the elevated tank after painting and the outbreak, and the use of coal tar distillate for priming purposes, the conclusion was drawn that by some method the coal tar distillate primer (possibly by condensation in the vapor space and subsequent washing down into the tank contents by condensation of water vapor) had entered the water supply.

In the course of the investigation it was further discovered that although the pumping station serving the area in which the elevated tank and the Garfield school were located was equipped with 200, 500, and 680 gallons per minute pumps, that only the 200 gallons per minute pump was ordinarily maintained in use. Upon investigating the hydraulic conditions existing in the distribution system with the tank out of service and the 200 gallons per minute pump operating, it was found that by opening a hydrant 1/4 of a turn to give the same effect as a sudden draft on the distribution system that the pressure in the vicinity of the school dropped to zero pressure. In other words, with the tank on the line and any equivalent draft placed on the distribution system, the entire normal demand would be made up entirely from the elevated steel tank. It was therefore finally concluded that the coal tar distillate used in the priming compound had entered the water system via the elevated storage tank as previously described, and that the explosive nature of the outbreak was attributed to the fact that a heavy draft on the distribution system, possibly from the Garfield school itself, had resulted in suddenly drawing a large quantity of water from the elevated

tank, thus carrying the toxic coal tar distillate out into the distribution system.

The outbreak has taught one lesson and confirmed an oft repeated thesis by which public health officials and water works operators can well profit. The lesson taught is that the washing down of those portions of closed water reservoirs which come in contact with water when in use is insufficient; the area above the water surface must also be thoroughly washed and cleaned because of the possibility of entrapped vapors subsequently entering the supply. The oft repeated thesis which has been confirmed is the fact that the minimum pressures which may be reached in a distribution system have a definite bearing on waterborne disease. Although it is felt that the low pressures which were experienced from time to time in this system resulted in the explosive nature of the outbreak, it is also considered that a waterborne epidemic of more serious consequences as a result of back-siphonage during periods of drop in pressure was averted only by good fortune.

APPENDIX B.

SEQUIM TYPHOID EPIDEMIC: In late May and early June one of the major typhoid outbreaks in the history of the State as to number of cases occurred in Sequim. The first case was reported on May 21 with the epidemic reaching its peak on June 1. The outbreak occurred in the public grade school.

Epidemiological investigations by the State Department of Health and the county health department, revealed the source to be the school cafeteria, operated as a WPA project, where 275 to 300 children were accustomed to eat their midday lunch. The vehicle of infection proved to be potato salad and jello containing sliced bananas and other fruits which were prepared and allowed to stand over night at room temperature, since no refrigeration was provided in the cafeteria. These articles of food were prepared by the kitchen help, one of whom proved to be a carrier of typhoid bacilli. The engineering staff of the State Department of Health in cooperation with the county health department assisted in a program of sanitary control in order to prevent the development of secondary cases.

The water supply was placed under direct control of the department. Chlorination of the supply was increased in order to provide a chlorine residual substantially above that normally used.

The town of Sequim is provided with a sewerage system, the outfall discharging into the Strait of Juan de Fuca in the vicinity of the inlet to Washington Harbor. Marketable shellfish are grown in Washington Harbor, and in order that precautionary measures might be taken to protect this possible source of secondary contamination, float studies were conducted to determine the possibility of tidal currents carrying sewage from the Sequim outfall within Washington Harbor.

All swimming pools in the county were placed under the direct supervision of the department, and two pools which did not provide adequate disinfection of the pool waters were closed during the period of the epidemic.

Every residence where a typhoid case was confined was subjected to strict sanitary inspection. Instructions were given for disinfection of the water supplies, and all privies were required to be made entirely fly-tight. Chlorinated lime was distributed for the purpose of disinfection of the contents of privy vaults. Two days following the inspection of these residences, a reinspection was made, at which time it was determined that all recommendations regarding sanitary protection had been carried out.

Sanitary inspections were made on all farms producing milk for shipment at which cases were confined or had been living just prior to the outbreak. All typhoid cases were removed from these premises or the dairy required to cease shipping milk. Sanitary requirements regarding the water supply, sewage disposal, screening of milk houses, and sterilization of equipment were enforced.

All foodhandling establishments were given a thorough sanitary inspection and were required to comply in all instances with the State

Board of Health Rules and Regulations relative to foodhandling establishments. All vegetables, and other articles of food displayed in the open, were required to be tightly screened.

Of immense personal satisfaction to members of the staff is the fact that although the epidemic produced 114 cases and one death, there was not one secondary case of typhoid fever reported.

DIVISION OF VITAL STATISTICS

Francis D. Rhoads, M. A.

GENERAL OFFICE ROUTINE 1939

The year 1939 saw a further increase in the activities of the Division of Vital Statistics both with regard to number of original records handled and service to the general public under the provisions of the Vital Statistics Act. In this respect the Division follows the trend of the past five years, in each of which there has been a significant increase over the preceding year. Administratively also, due to the dissemination of information concerning the existence and value of vital records and to the increased demands made upon the Division by a greater extension of government into the field of service to the citizen, particularly through the ramifications of the Social Security program, problems of organization of the field personnel and of the office routine in the central division have increased enormously. Not least of the vexing problems of the Division during 1939 has been that of securing payment of fees to Local Registrars of Vital Statistics for their services in registering original birth and death records.

The best rough index of the amount of work done in the Division is, perhaps, indicated by the amount of money transmitted to the State Treasurer for certified copies of birth and death certificates issued during the year 1939, which amounted to $3,885,00. This sum was only $3,087.50 in 1938, and has steadily increased since 1933 when the sum was $1,346.00. The principal increase in the work of the Division has not been, however, in certified copies issued, but in verification of births for various social agencies, and in the filing of affidavits of birth.

On the basis of estimates of the Division made on spot checks, twice as much service was given to the general public in 1939 as in 1938, and five times as much service as in 1936. This, of course, is measured by actual number of items handled. In spite of the fact that every effort was made, not only within the budgetary limitations of the Division but of the Department of Health itself, it was impossible at times to carry out all desirable activities of the Division. In no case however, was there any appreciable delay in the issuance of certified copies or in the furnishing of basic information to the general public concerning specific cases of births and deaths.

During 1939 an increasing number of counties have endeavored to

shift the responsibility for paying local registrars of vital statistics from the general fund where it had rested for over thirty years to the special three mill levy for Social Security. Since there are special restrictions around the use of these ear-marked funds, some of which do not dove-tail with the provisions of the Vital Statistics Act great difficulty was encountered in certain cases in securing payment of fees to local registrars for their services in registering certificates. Special adjustments were made in most cases upon representation made to the County Auditors by the State Registrar. Since a great many of the County Auditors did not include the item for registration in their annual budget, mechanism was set up to refer this matter to them at the end of the calendar year to avoid further delay.

The staff of the Division of Vital Statistics during the year 1939 consisted of the State Registrar, the Assistant State Registrar, three clerks, a punch card operator, and during the last two months of the year, a statistician. Rapid growth of full time health work in the State has made necessary the furnishing of a great deal more statistical information, and the addition of the statistician is in consequence a logical development of the expansion of full-time work.

Another source of additional work during the year has been the setting up and staffing of the Division to take care of the creation of new birth certificates in cases of adoption. This is in accordance with the provisions of an act passed by the Legislsture of 1939 which provided that in each case of adoption a certificate of such adoption should be filed with the State Registrar, who should create for the child adopted a new certificate bearing the names and information of the foster rather than that of the natural parents. Passage of this law has filled a long felt social need and has made it possible for the first time for an adopted child to have a birth certificate in the name of his foster parents.

FIELD ACTIVITIES

While during the year 1939 an increasing contact with the field was maintained, it is desirable that this be further extended and amplified. Not only do local registrars require constant supervision and help, but with the development of county health work it becomes necessary for the Division of Vital Statistics to enter closely into the problems of county administration, particularly concerning statistics, and this, of course, requires field work. In some cases also compliance with the law has shown a falling off on the part of physicians and funeral directors, and this condition can only be remedied by personal contact. Certainly with regard to statistical problems the Division of Vital Statistics should serve as a clearing house and as a

TABLE I

COMMUNICABLE DISEASE CASES REPORTED TO THE STATE DEPARTMENT OF HEALTH

1940

Disease	Number of Cases
Typhoid	93
Diphtheria	103
Scarlet Fever	1,696
Measles	17,254
Whooping Cough	2,576
Smallpox	14
Tuberculosis	1,647
Pneumonia	349
Chickenpox	5,540
Mumps	2,911
German Measles	570
Poliomyelitis	447
Cerebrospinal Meningitis	23
Encephalitis	107
Influenza	9,539
Undulant Fever	28
Amoebic Dysentery	8
Bacillary Dysentery	35
Diarrhea and Enteritis	140
Vincent's Infection	18
Tetanus	3
Erysipelas	46
Septic Sore Throat	39
Rabies (animal)	49
Food Poisoning	180
Malaria	2
Tularemia	1
Rocky Mountain Spotted Fever	5
Trachoma	24

general advisory body endeavoring to bring about uniformity with regard to the collection of statistical facts and the utilization of them in standard procedure. This can only be done by close contact with the field, routinely carried on by the Division.

EXTENSION OF STATISTICAL ACTIVITIES

During the year 1939 the Division of Vital Statistics began publication of a special statistical bulletin, two number of which were printed during the last months of the year. There is a definite need for first hand information concerning births, deaths, and communicable diseases to be furnished routinely and in the form of special reports to the field staff of local health jurisdictions. This information on the basis of allocation to residence can only be complied by the State Department of Health.

Cooperation with the United States Bureau of the Census continued during the year 1939 as it has in the past, transcripts of all certificates of births and deaths having been forwarded to the Bureau of the Census for the purpose of statistical tabulation. This, of course, insures the Department completion of statistics by The Bureau of the Census, made without regard to any local prejudice and comparable in all respects with other states.

STATISTICAL REPORT 1939

In 1939 there were 26,538 births and 18,516 deaths reported for the State of Washington representing slight decreases in both births and deaths over the year 1938. Infant mortality rate for the year 1939, based on 976 infant deaths, was 36.8 per 1,000 live births, the lowest infant mortality rate ever recorded in the State of Washington and one of the lowest in the nation. Maternal mortality rate (deaths of mothers as a result of child birth) was 3.6 per 1,000 live births, slightly higher than the rate of 3.3 for the year 1938. This was based on 95 deaths of mothers from puerperal causes.

The leading causes of death in Washington were diseases of the heart, with a rate for 1939 of 293.7 as compared with 295.1 per 100,000 population for 1938. These rates are not strictly comparable as the 1939 figures are based on a changed assignment of causes of death, which throws a great many cases previously given into nephritis. Next in importance was cancer with a rate of 134.8. The rate for accidents (all causes) rose slightly from 1938 to 1939; the rate being 84.8 and the 1939 rate being 88.3. Cerebral hemorrhage and other inter-cranial lesions of vascular origin remained practically constant, the 1938 rate being 105.0 and the 1939 rate 104.6. Tuberculosis also remained practically constant, the respective rates for 1938 and 1939 being 42.2 and 41.5. Pneumonia, however, showed a striking decline from 64.9 to 50.7.

This report endeavors to set forth no detailed statistical tabulation. For a discussion of such material reference should be made to the reports carried in the Statistical Bulletin, which is issued from time to time. Specific compilations for the year 1939 included Volume 1, No. 1, "General Summary of Population", and Volume II, No. 2, "Tuberculosis Deaths in Washington".

MATERNAL & CHILD HYGIENE ANNUAL REPORT FOR 1939

Division of Maternal & Child Hygiene
Percy F. Guy, M. D., M. P. H.

The activities of the Maternal & Child Hygiene Division of the State Department of Health continued in 1939 as they did in 1938 with certain additions and revisions which will be noted in this report.

MATERNAL & CHILD HEALTH CENTERS

In May 1939 the first Maternal Health Center under the supervision of this Department was opened at the Court House in Everett in the quarters of the Snohomish County Health Department. A practicing physician was recommended by the Snohomish County Medical Society to serve as part time physician to the Health Center. He was approved by the Maternal & Child Hygiene Medical Advisory Committee, and appointed by the Director of Health. A practicing obstetrician was appointed as consultant.

In November 1939 a branch center was established at Granite Falls. An examining physician was appointed in the same manner as above.

In December 1939 examining physicians and a consultant were recommended, approved and appointed for the prospective Maternal & Child Health Centers in Vancouver, Washington.

These Centers are provided for through Maternal & Child Hygiene funds received from the Children's Bureau and are supervised by the Chief of the Maternal & Child Hygiene Division in cooperation with the local health department and the local county medical society. They provide periodic examinations for children and expectant mothers of indigent and borderline famliles.

The Maternal Health Centers in Snohomish County operate every two weeks in Everett and once a month in Granite Falls. Maternal & Child Health Centers being provided for in Clark County will be held alternately every week at the county hospital.

MATERNAL MORTALITY SURVEY

The Medical Advisory Committee to the Maternal & Child Hygiene Di-

vision (called the "Committee of Eight") met four times in 1939; February 26, June 4, August 27, and December 17. Three of these meetings were in Seattle, and one in Spokane.

The Maternal Mortality Survey, begun in 1938, was continued under the auspices of the "Committee of Eight". The questionnaire, which is sent to each physician having a maternal death was revised twice. These questionnaires are studied and classified. Seventy-one questionnaires were reviewed during the year. While it will be understood that the number reviewed to date is too small to be statistically reliable, attention is called to the fact that in 40% of the deaths the expectant mother had not called on a physician for prenatal care by the end of the fourth month of gestation, and in 30% a physician had not been seen by the end of the fifth month.

Transcripts of questionnaires were furnished in one instance for medical educational work at a hospital staff meeting.

MATERNAL & CHILD HYGIENE LITERATURE FOR FREE DISTRIBUTION

One of the services rendered to the people of this state by the Department of Health is the free distribution of literature for the care of infants snd children and the guidance of expectant mothers. This literature is sent direct on request to the expectant mother, to local health departments, and practicing physicians for distribution. During 1939, 17,500 copies of the pamphlets "Infant Care", "Prenatal Care," and "The Child From One to Six" and 4,500 miscellaneous booklets and pamphlets were purchased for free distribution.

As in the past, monthly instructive letters have been mailed to expetant mothers upon request. During 1939, 605 sets of these prenatal letters were mailed out. There are eight of these letters to a set.

We are impressed by the fact that from year to year these letters are being requested earlier in the period of expectancy.

POST GRADUATE MEDICAL EDUCATION

An Obstetric Refresher Course was given for the practicing physicians of this state. The course was conducted similarly to the course a year ago, that is, on a three weeks' circuit basis, the lecturer returning to the same lecture point on the same day of the week for three

successive weeks. This year, however, the circuit was set up in the eastern part of the state as the result of a lesson learned last year at which time the whole state was covered and the lecturer's energies unnecessarily taxed by travel.

The lecturer this year was brought from the Harvard Medical School. Lecture points were Spokane, Wenetchee, Ellensburg, Pasco, Walla Walla, Colfax and Vancouver. There was no enrollment fee, the course was provided entirely from Maternal & Child Hygiene funds from the Children's Bureau. Thirty-six lectures were given in all and 613 physicians attended, an average of 17 per lecture.

NUTRITION PROGRAM

The Nutrition Program continued during the early part of 1939 much as it had been carried on in the past. During the latter part of 1939, however, the full time county health departments were offered a program of staff education. The plan was promoted by the Chief of the Maternal & Child Hygiene Division and built around a series of six lectures on the fundamentals of nutrition which were given by the Nutrition Consultant. These lecutres were primarily for the county health department staff, but others who were interested in nutrition in the area were offered the course. Home economics teachers from the high schools, dietitians from hospitals and doctors' offices, nurses who were responsible for checking diets, welfare workers, home demonstration agents, and others whose background or interest was in nutrition or allied fields were offered an opportunity to enroll. In the interim between lectures the nutritionist made visits to the field with the Public Health Nurses and demonstrated the application of the principles laid down in the lecture work.

A supply of textbooks was made available to those attending the lectures.

During the last few months of 1939 this program was carried out successfully in two counties (King and Pierce). In King County the program was made available to the King County Health Department; in Pierce County the progfam was put on for the combined Pierce County and Tacoma Health Departments.

This Division took an active interest in the high school lunch, and as far as possible attempts were made to emphasize the opportunity of teaching practical nutrition in connection with these lunches. The limitations as well as the possibilities in the school lunch were carefully defined.

MATERNAL DEMONSTRATION AREA

On June 30, 1939, the Maternal Demonstration in Snohomish County was concluded. The demonstration was started in 1936, and its story runs through the 1937 and 1938 Annual Reports. We feel that these reports have shown that the objectives for which the Maternal Demonstration was established were reached. The first phase of the program was the demonstration of the fact that prenatal nursing care could be carried on intensively and successfully in a small area of this state by public health nurses. The second phase of the program was the demonstration of the same program in a whole county. This phase began when Snohomish County became a full-time health unit.

Further objectives in maternal demonstration were not attempted in Snohomish County for two reasons. First, the City of Everett remained outside of the full-time county health department, and second, the extensive area of the county did not lend itself readily to the work. These two faults were absent in Clark County, where a well-organized full-time health department includes the City of Vancouver. Clark County has a greater concentration of population than Snohomish County. The population included in the jurisdiction of the health department is 4/5 of thst included in the Snohomish Health Department jurisdiction, while in the former the area is only 1/3 the latter. Clark County was selected as a demonstration of a program which would provide that no expectant mother need go without medical and nursing prenatal care.

To accomplish this the maternal and child health centers referred to above were planned, and second, three public health nurses were provided from Children's Bureau funds.

The program got away to a slow start when the full time health officer resigned and progress was interrupted until his successor could acquaint himself with the local situation.

ORAL HYGIENE

The Oral Hygiene Program continued as a strictly educational program. The local dental programs of education and inspection of children's teeth were encouraged and aided by the Dental Consultant. Emphasis was directed toward the pre-school child.

A temporary Dental Advisory Committee was formed from members of the State Dental Association. This committee cooperated in the planning of the Dental Refresher Course.

In 1939 a Dental Refresher Course was conducted for the first time by this Department. A lecturer was brought in from the Middlewest. He spent two weeks in the state lecturing to practicing dentists on the dentistry of childhood. The lectures were held at Aberdeen Bellingham, Chehalis, Port Angeles, Spokane, Seattle, Tacoma Vancouver, Walla Walla, Wenatchee and Yakima. The total attendance to these lectures was 351.

IMMUNIZATION

Eternal vigilance is necessary on the part of state and local health departments in the prevention of epidemics of the ordinary communicable diseases such as diphtheria and smallpox. This Division cooperates with the Division of Epidemiology directly and indirectly in this phase of preventive medicine.

A small fund was budgeted in 1939 for aid to local areas in the state in securing vaccine and diphtheria toxoid when local funds for this purpose were not available or ran out.

We have no laws in this state requiring compulsory immunization. We must, therefore work through education and publicity. In May 1939 this Division sponsored and educational campaign in diphtheria immunization. Six county health departments took part in this project (Franklin, Okanogan, Pacific, Snohomish, Whatcom, and Yakima). 55,000 slips calling attention to the fact that diphtheria immunization was important and that it could be obtained from the private physician or the local health department were distributed to school children to take home. Incidental to this campaign was a survey. These slips provided a space where the parent was requested to indicate in instances where immunization had already been done, at what age it had been given the child. 10,570 of these slips were returned to the teachers by the school children, giving the age at which they have been immuized.

It is not the purpose of this report to go into the details of immunization procedures and techniques, but it is important to call attention to the fact that the optimum time for diphtheria immunization is between the ages of nine months and one year of age. This statement will indicate the significance of this survey which shows of the total number immunized less than 12% were immunized before reaching the age of six years; less than 3% had been immunized before the age of two years was reached. Less than 1½% had been immunized before the age of one year had been reached. These figures are being used to stimulate more interest in early immunization against diphtheria.

PROGRAM FOR THE BETTER CARE OF PREMATURE INFANTS

Our infant mortality in this state has been cut almost in two during the last twenty-five years. It can be cut further. Our next big problem is the premature infant. Approximately one-third of all the infants that die in our state die as a result of being born too soon. A program for the better care of these premature infants was studied during 1939 by the "Committee of Eight". A plan was endorsed whereby incubators would be provided for a limited number of hospitals needing them. (Only two of the county hospitals in this state have incubators). A second phase of the program provided for establishing a center at some hospital in the state where a course in training and observation in the nursing care of the premature infant would be available. A third phase recognizes the urgent need of breast milk for these infants. At times their own mother does not have it for them. In days gone by the "wet nurse" supplied the want.Today there are twenty-three breast milk stations in the United States. Interest is being fostered in such a station for the State of Washington.

MEDICAL CARE OF BORDERLINE MATERNITY CASES

In November 1939 the Snohomish County Medical Society. through its Maternal and Child Health Committee sent a request to the "Committee of Eight" for aid in the medical care of the socio-economic borderline maternity cases. A plan was prepared for utilizing some of the funds available from the Children's Bureau for medical aid for maternity cases where the family was not entitled to aid by the county welfare department and still were not able to finance their medical care.

NURSING DELIVERY CARE IN THE HOME

We may feel particularly proud in this state of the fact that about three-fourths of our babies are born in hospitals. Hospitals are the safest place for babies to be born. Only four or five states have a higher percentage of deliveries in hospitals than the State of Washington.

We are reluctant to launch upon any program that would seem to be out of line with the encouragement of deliveries in hospitals. However, there are rural districts in our state where the percentage of hospital deliveries is less than 50%. Extensive areas of this sort are few. One of them is Whitman County. Some steps have been taken toward a nursing delivery service in this county. Under this program physicians who are delivering patients in their own homes would feel free to call upon the health department for a nurse to aid in that delivery.

DIVISION OF PUBLIC HEALTH NURSING

The program of the Division of Public Health Nursing for 1939 was outlined with the aim toward improving the public health nursing consultant service of the division that greater assistance in every phase of a public health nursing program might be offered to the local health departments.

In most counties in the state there is a large population to be served by one public health nurse over an extensive travel area. Careful planning is necessary to enable the public health nurse to serve the community to the best advantage of time and travel, and it is essential that each nurse be well prepared to serve the families of the community in all nursing services of the health department program.

The objectives of the Division of Public Health Nursing, therefore, are to assist the local health department areas; first, to secure well qualified public health nurses; second, to assist in planning public health nursing activities for well balanced services to the community; third, to aid the public health nurses in developing methods and procedures for improvement in quality of service.

In reviewing the activities of the division for the year certain results indicate that to some measure these objectives are being attained.

Two public health nursing consultants have been added to the staff of the division. Through funds made available from the federal government for venereal disease control, one public health nurse consultant in venereal disease control was added to the staff June first. To correlate more fully the public health nursing activities with the Crippled Children's Program, the Department of Social Security allocated the public health nurse consultant in orthopedic nursing for this program, to the division of public health nursing.

The public health nursing staff of the division now consists of the chief of the division and four public health nursing consultants. One consultant acts as assistant to the chief and each of the other three emphasizes special fields as maternal and child hygiene, venereal diseases, and orthopedic public health nursing, respectively.

The public health nursing consultants with preparation in special fields do not confine their activities entirely to this service, but aid in the general public health nursing program in their visits to the field. This increased public health nursing consultant service has encouraged the development of staff conferences in the local health departments, and stimulated in-service staff education programs as the

most far-reaching means of increasing knowledge in the various fields.

There has been a constantly increasing interest in venereal disease public health nursing service through the public health nursing consultant service to the local health departments. A better understanding of the public health nurses' participation in this program has been attained. The integration of this service in the generalized public health nursing program is being successfully carried on in a number of full time county health departments with the assistance of the public health nursing consultant. A public health nurse in venereal disease control has been added to the staff of the City Health Departments in Spokane and Tacoma. A small circulating library of books on venereal disease control has been started and been most enthusiastically received.

The allocation of the public health nurse consultant to the division has greatly facilitated the public health nurses' activities in the Crippled Children's Program. Since being added to the staff the public health nursing consultant in orthopedic nursing has participated in health department staff conferences in seventeen counties, to give to public health nurses educational material on case finding and follow-up care of orthopedic cases. In Tacoma, a staff education study on early recognition of crippled children cases was conducted for the county, city and school public health nurses in Pierce County and Tacoma.

Reports from the counties indicate increased activities in maternal hygiene. The public health nursing consultant in maternal and child hygiene assisted in the full time county health department staff education programs, which have included studies in the content of the home visit in maternal hygiene, demonstration of material to be used in prenatal and infant care, and instruction in bag technique.

In Clark County the establishment by the State Department of Health of a maternal demonstration program has increased public health nursing activities in this service. Three public health nurses were added to the staff to aid in the integration of a maternal and child hygiene public health nursing service in the generalized public health nursing service in the generalized service of the county.

The public health nursing consultant in maternal and child hygiene assisted in planning the public health nursing services in these prenatal clinics, the well baby conferences and in the general public health nursing activities in the maternal and child hygiene program.

The assistant to the chief of the division has given public health nursing consultant service in all public health nursing activities. Assistance has been given in planning in-service staff education programs and in interpreting public health nursing functions to county officials and other members of the community. Public health nursing consultant service of some type has been given during the year to every county in the state.

The law passed by the 1939 Legislature providing for definite financing of public health programs has considerably increased public

health nursing personnel in certain counties of the state. This, with a growing interest in generalized public health nursing services to the community has materially strengthened public health nursing staffs particularly in full time county health departments.

In those counties where school and health department services were combined in 1937 and 1938, to provide generalized public health nursing service to the community rather than a specialized service to the school population, the service has proved satisfactory, and in 1939 other school and health department services have been combined, thus increasing the generalized public health nursing service in the health department of the county. School districts have expressed appreciation for the effective program in the schools brought about by the health department activities to the community.

In Whatcom County the United States Indian Service is providing an additional public health nurse in the health department that the Indians in the county may be included in the generalized public health nursing service. The Indians in the county were formerly cared for by a public health nurse in the Indian Service. This is the first demonstration of this combined service in the state, and marks a step forward in generalized public health nursing service to all groups.

In all, the public health nursing staff in the local county health departments was increased by eighteen; from 78 in 1938 to 96 in 1939. This is exclusive of the special services in the counties and all public health nursing services in cities of the first class.

The strengthening of public health nursing staffs in full time county health departments has enabled health officers to improve the organization of the nursing service with public health nursing supervisor and staff. This affords greater opportunity for staff education programs to provide a greater uniformity of public health nursing service to each district of the county.

Effectiveness of the public health nursing activities in the health department program is evidenced by continued interest in securing additional qualified public health nurses. Communities are showing a great appreciation and understanding in the value of qualified public health nursing service. Qualified public health nurses have gradually replaced unqualified nurses when available positions occurred on staffs until at the present time 93% of the public health nurses on county official health agencies within the state are qualified public health nurses.

In an effort to meet the demands for qualified public health nurses within the state, stipends were given to five public health nurses to aid in preparing them for public health nursing positions.

The University of Washington School of Nursing offers one quarter

postgraduate course in public health nursing in venereal disease control with field experience in Seattle and Tacoma Health Departments. A number of requests have been made for this additional education in venereal disease public health nursing. Two stipends for this course have been given and others are being planned for the coming year.

Accomplishments during the past year in quantity and quality of public health nursing service indicate that continued progress is being made in public health nursing services within the state.

DIVISION OF HEALTH EDUCATION

Charles Hilton, M. A.

During the year 1939 the division of health education concentrated on school health problems and on public information. The normal activities of the division were carried on with usual thoroughness but were not selected for special emphasis.

SCHOOL HEALTH:

In the field of school health three programs chiefly occupied the division, namely: developing a program for interesting teachers in the field in school health problems; developing suggestions for a sound system of teacher training in health education; and working out a cooperative relationship between the work of the division of health education and the work of the school health education survey conducted by the public health division of the State Planning Council.

The first program was furthered by developing a series of summer health education lectures. They were used for summer conferences and special classes by the Eastern Washington College of Education. Lack of available time and personnel prevented the extension of the service to other schools. The division participated in the discussions of the health section of the Inland Empire Education Association meeting at Spokane in April, and the County Institute at Goldendale, September 23. It is hoped that time will be available for developing a lecture program for the health and physical education section of the regional meetings of the Washington Education Association during the fall of 1940.

Studies leading to the formulation of a plan for a more adequate teacher training program in health education were undertaken during the year. This plan, based on a study and analysis of the personnel, curricula, and administration, was on the following schools: Eastern Washington College of Education, Walla Walla College, Whitman College, Central Washington College of Education, Whitworth College, and the College of Puget Sound. This work involved several conferences with the faculties and administrators of these schools and for that purpose two field trips were scheduled in the early spring and fall. The plans were completed in a tentative form by October and by December had the approval of the State Health Department, the State Department of Education, and influential members of the public health committee of the State Planning Council.

The proposed plan will be presented to the schools for their consideration during the months of January and February 1940. It is hoped

that favorable action will be taken upon it in time for work to get under way in some of the schools at least by September.

The division of health education assisted in the work of formulation of a basic working plan for the school health education survey of the public health committee of the State Planning Council and in furnishing material which will form a basic part of this survey. This last involved many conferences with the director of the survey, prominent school leaders, and meetings with the committee, as well as with the several division chiefs of the State Health Department.

As a supplementary service the division showed films in several school systems of the state including syphilis films to all high schools in Clallam and Pend Oreille Counties.

In cooperation with the agricultural extension service of the State College and the division of maternal and child hygiene, the division worked out a three year program of health education for the state 4-H Clubs. Three units of this program have already been completed, and have received considerable favorable comment from 4-H Club leaders both in this and in other states. This joint program is a pioneering effort. No other state as yet has entered into a program of similar variety and scope.

The State Department of Education joined with the division of health education in a consideration of improving the health curriculum for the state schools. It is hoped that with the results of the school health education survey available early next fall, work may be started on a revision of the present curriculum by the first of the year.

PUBLIC INFORMATION:

The general public continued to demand information either about the work of the health department as a whole, or about specific items of its work. This demand the division, in cooperation with the other divisions of the health department continued to supply. It furnished 1,750 copies of a booklet, "The State Department of Health, Organization and History", chiefly to the universities and colleges in the state. In most of them this booklet has been made a regular part of the work of certain courses.

In the field of news releases and broadcasts policy underwent a marked change in order to bring the division's work more into line with the needs of county health units. News releases were prepared in such a way that they could be released directly through the county health office to the local papers. Also, radio scripts were furnished the full

time county health units in order to aid them with their radio work.

The State Health Department maintained its regular weekly radio time throughout the year, concentrating chiefly on syphilis, maternal and child hygiene, and nutrition. With the cooperation of the Federal Theatre Project, four dramatic broadcasts were given.

The following pamphlets and leaflets were added to the division's supply of literature for free distribution: "Syphilis and Your Town", "Gonorrhea the Crippler", "Health for Man and Boy", and "Women and Their Health".

The division cooperated with the Federal Theatre in arranging for the production of a play, "Spirochete", a dramatic presentation of the syphilis problem. This play filled the Metropolitan Theatre with capacity audiences for several weeks.

VISUAL INSTRUCTION:

Public health exhibits were set up for the Washington Conference of Social Work, Spokane; State Federation of Women's Clubs, Bellingham; State Medical Society, Spokane; Western Washington State Fair, Puyallup; and the Seattle Federation of Women's Clubs Health Institute. In addition, available exhibits were loaned to Whitman, Whatcom, Grant-Douglas-Grand Coulee District, Walla Walla, and Chelan health units.

Considerable time was spent in securing new films for review. This resulted in the purchase of two films, "Prenatal Care", and "With These Weapons".

The division made 54 film showings to a total of 4,885 persons, chiefly in grade and high schools and nine talks, without films, to 361 persons.

A small circulating library on syphilis control for the use of the personnel in the county health units was added to the division's library and has proven so popular that it suggests a similar service in other subject matter should be taken under advisement. During the year 86 college, high school, and grade school text books on health were sent to the division for review. Teachers visiting the division frequently consult these texts.

PUBLICATION AND DUPLICATION:

In spite of severe efforts at economy and the elimination of every possible item the division's duplicating work exceeded the 1938 quota of runs by 3,879. In 1938 676,850 items were run, whereas in 1939 the

total was 680,729. Some economy was effected in the number of stencils used. In 1938 we cut 1,386 whereas in 1939 only 1,219 were used. In the large part this reduction was no doubt due to the fact that a number of forms which were mimeographed in 1938 and 1937 were developed to a point of perfection which made printing them feasible. The following table indicates the extent to which the several divisions of the health department made use of our duplicating facilities. During the past three or four years the bulk of our duplicating work has been devoted to the production of forms and records. As experience indicates the permanent desirability of these forms they will be printed which will free our facilities for the production of reports and other additional material the nature of which will not require wide distribution. The bulletins of the division of vital statistics on population and tuberculosis deaths are an indication of this trend.

TABLE OF DUPLICATING WORK DONE BY THE DIVISION
DURING THE CALENDAR YEAR 1939

	Stencils Cut	Copies Run
Administration	425	133,114
Public Health Nursing	80	37,425
Accounting	20	16,500
Maternal and Child Hygiene	90	128,670
Laboratory	27	5,410
Health Education	203	116,365
Engineering	184	95,550
Vital Statistics	106	78,630
Epidemiology	84	69,065
Total for 1939	1219	680,729

THE STOCKROOM:

During the year the stockroom outgrew the space it occupied during the last two years and was moved into new and larger quarters. Several new cabinets and sets of steel shelving were added to its equipment.

The following is a list of literature released through the stockroom's mailing service during the year. In all, 39,277 pieces of literature were sent out. This represents a considerable decrease from last year's total which was 55,789.

LITERATURE DISTRIBUTED 1939

Rules and Regulations Book II	1674
Rules and Regulations Book V	204
Rules and Regulations Book V (Parts 1-15 Inclusive)	1215
Rules and Regulations Book VI	258
Public Health Engineering #1	724
Rabies pamphlet	750
You Owe it to Yourself and Family to Know These Facts	3500
Syphilis, its Cause, its Spread, Its Cure	4670
Smallpox and Vaccination	510
Diphtheria pamphlets	655
Deciduous Teeth	682
Food and Teeth	700
Keeping Teeth Clean	1062
Permanent Teeth	756
Teeth and Personal Appearance	675
Mr. A. King Tooth	1110
Your Health Department - Organization and History	1320
Prenatal Care	4312
Infant Care	5069
Child from 1-6	3086
Child Management	1712
Guiding the Adolescent	1173
Good Posture in the Little Child	380
Miscellaneous M.C.H. Literature	3080
	39,277

DIVISION OF LABORATORIES

A.U.Simpson, M. D.

The State Laboratory service is for physicians and health officers in localities in the State where laboratory facilities are not available and for persons unable to obtain the services elsewhere.

The work consists of bacteriological and serological examinations of specimens and cultures for evidence of diseases which may be transmitted from one person to another -- diphtheria, dysentery, epidemic meningitis, gonorrhea, scarlet fever, septic sore throat, syphilis, tuberculosis, tularemia, typhoid fever and undulant fever, and the examination of specimens from animals suspected of being infected with rabies, anthrax, glanders or other diseases communicable to man; also water, milk, shellfish and other foods are examined bacteriologically for dangerous contamination. The laboratory serves many local county and city health officers and practicing physicians to an increasing extent each year, as well as hospitals, clinics and other institutions throughout the state.

During the year 93,238 outfits and containers for sending specimens to the laboratory were prepared and distributed to physicians, health officers and other persons, upon request, as shown in Table II. The majority of these were tubes for collecting blood specimens for the Wassermann test.

A monthly tabulation of the various types of examinations made, classified as positive, negative, doubtful or unsatisfactory, is shown in Table I. The total number of examinations for the year was 112,126 -- an increase of 17% over 1938.

Syphilis: The most marked increase was in specimens received to be examined for evidence of syphilis -- 61,304; an increase of 18% over 1938, and more than double the number received three years ago. Table III shows the number of specimens received from each county for the years 1936--1939; also the number of physicians in each county receiving service in 1938--1939.

Comparison of serologic tests for syphilis as performed in the laboratory of the State Department of Health and as performed in municipal, county, hospital and private laboratories in the State is shown in Table IV. Forty-eight local laboratories, with a rating of 90 or over, were placed on the Approved list for serological tests for syphilis.

Typhoid Vaccination: Following an outbreak of typhoid fever at Sequim, over 2000 persons were given typhoid, paratyphoid vaccine by the intradermal method (Small intracutaneous injections -- 0.1 c.c., 0.2 c.c. and 0.2 c.c., at weekly intervals), and approximately 1000 persons were given vaccine by the standard army method (subcutaneous injections - 0.5 c.c., 1 c.c. and 1 c.c., at weekly intervals). The general reactions that frequently follow the subcutaneous and intramuscular injections in prophylactic vaccinations against typhoid and paratyphoid fever were eliminated by the intradermal method. Table V compares the agglutinin response in persons vaccinated by the two methods.

TABLE I — SUMMARY OF DIAGNOSTIC AND SANITARY EXAMINATIONS MADE BY THE STATE DEPARTMENT OF HEALTH LABORATORY FOR THE YEAR 1939

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT	OCT.	NOV.	DEC.	TOTALS
DIPHTHERIA — Cultures													
Positive	1	3	0	0	11	17	9	1	10	15	41	12	120
Negative	719	757	571	292	375	287	125	56	147	480	479	542	4830
Doubtful	0	0	0	4	1	4	8	0	4	6	13	4	44
Total	720	760	571	296	387	308	142	57	161	501	533	558	4994
Supplementary tests	52	14	30	63	179	157	99	40	93	181	269	148	1325
SCARLET FEVER — Hemolytic Strep.													
Positive	176	225	176	73	44	41	10	1	25	101	79	110	1061
Negative	497	522	375	205	201	152	43	22	65	254	243	350	2929
Doubtful	0	0	0	0	0	0	0	0	0	1	1	1	3
Total	673	747	551	278	245	193	53	23	90	356	323	461	3993
TUBERCULOSIS — Sputum Examination													
Positive	55	44	76	59	55	58	70	59	44	73	50	58	701
Negative	221	157	251	225	249	209	202	261	175	211	164	219	2544
Unsatisfactory	2	1	0	0	1	1	1	1	1	2	1	2	13
Total	278	202	327	284	305	268	273	321	220	286	215	279	3258
TYPHOID FEVER — Blood Agglutination													
Positive	2	5	1	5	4	11	38	14	15	9	13	10	127
Negative	127	118	185	113	152	156	174	179	154	145	172	168	1843
Doubtful	9	6	19	12	20	17	28	24	21	29	30	10	225
Total	138	129	205	130	176	184	240	217	190	183	215	188	2195
Supplementary tests	276	258	410	260	352	368	480	434	380	366	430	376	4390
UNDULANT FEVER — Agglutination													
Positive	5	4	7	3	4	5	4	5	3	1	5	4	50
Negative	127	121	192	124	163	174	226	200	177	176	198	180	2058
Doubtful	6	4	6	3	9	5	10	12	10	6	12	4	87
Total	138	129	205	130	176	184	240	217	190	183	215	188	2195
TULARAEMIA — Agglutination	8	9	13	6	16	9	19	10	7	4	2	10	113
WEIL-FELIX — Reaction (Proteus 0x19)	5	8	9	5	11	7	19	9	7	4	2	9	95
GONORRHEA — Microscopical Exam.													
Positive	80	60	63	47	45	45	44	53	57	79	70	40	373
Negative	345	290	378	284	221	377	242	239	326	280	242	272	3496
Doubtful	17	5	8	3	3	6	4	4	7	4	3	2	66
Total	442	355	449	334	269	428	310	306	390	363	315	314	4275
—Complement Fixation													
Positive	4	1	1	1	0	0	1	1	0	2	4	3	18
Negative	28	15	18	10	26	17	15	12	17	28	18	10	214
Doubtful — Unsatisfactory	13	1	7	19	8	5	4	1	1	7	4	1	71
Total	45	17	26	30	34	22	20	14	18	37	26	14	303
SYPHILIS — Blood — Sp. Fl. Wassermann													
Positive	343	451	387	254	240	306	258	255	243	195	230	190	3352
Doubtful	434	356	356	235	390	267	255	267	272	244	257	223	3626
Negative	4163	3655	4550	3883	4279	6279	4223	4237	4326	4669	4462	3447	52173
Unsatisfactory	153	136	125	76	134	198	290	253	173	210	229	176	2153
Total	5093	4598	5418	4498	5043	7070	5026	5012	5014	5318	5178	4036	61304
Supplementary Tests													
Kahn	545	340	363	211	289	115	284	188	189	181	132	113	2951
Spinal Fluid-Globulin	1284	1189	1121	887	979	954	1032	864	904	778	957	803	11752
Dark Field Examination	71	96	76	63	79	47	53	80	90	85	102	78	920
Positive	0	3	3	2	1	0	1	1	0	2	4	2	19
MENINGITIS — Epidemic	0	1	2	0	0	0	0	0	0	0	0	0	3
Spinal Fluid													
Naso Pharyngeal Culture	3	1	4	4	1	0	1	0	0	4	2	2	22
Positive	5	23	4	1	0	0	0	0	0	0	5	5	43
TYPHOID — Cultures	1	0	2	0	0	0	0	0	0	0	0	3	6
Blood													
Feces	67	69	91	58	104	76	115	106	85	77	77	104	1039
Urine	17	20	17	5	19	69	147	30	67	66	44	16	517
Other Specimens	12	18	14	4	17	52	143	15	27	49	37	12	400
Positive	1	3	5	1	1	1	1	0	0	3	0	4	20
	0	2	0	0	0	12	11	2	1	0	1	4	33
VINCENT'S INFECTION — Smear													
Positive	8	9	10	11	4	7	13	10	4	9	1	9	95
	1	4	6	2	2	5	6	5	3	1	0	5	40

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY.	AUG.	SEPT	OCT.	NOV.	DEC.	TOTALS
RABIES-Microscopical Exam.													
Positive	13	16	13	14	9	5	2	3	7	6	2	5	95
Negative	10	12	14	6	8	8	6	2	4	3	3	3	79
Unsatisfactory	0	0	1	1	3	0	1	1	0	0	0	0	7
Total	23	28	28	21	20	13	9	6	11	9	5	8	181
BRUCELLA INFECTION-Animals													
Blood Agglutination	2	1	0	0	0	0	0	0	0	0	0	0	3
Milk Agglutination	1	4	37	1	2	5	15	2	5	3	16	6	97
Positive	3	0	4	0	0	0	2	0	2	0	0	0	11
MILK-Colony Counts	30	21	27	26	27	27	62	23	364	32	53	26	718
Sediment-Culture	2	6	12	12	7	9	35	3	6	10	11	25	138
WATER-Bacteriological Exam.													
Complying with Standard	251	202	292	252	301	320	309	326	236	215	236	201	3141
Not Complying with Standard	112	83	68	43	100	140	163	246	170	113	81	103	1422
Unsatisfactory	1	1	3	2	1	4	3	6	5	3	4	3	36
Total	364	286	363	297	402	464	475	578	411	331	321	307	4599
SHELLFISH AND SEAWATER	9	11	21	9	10	3	6	0	0	1	3	2	75
MISCELLANEOUS TESTS	5	2	4	7	8	11	3	3	10	16	4	14	87
TOTAL	10317	9356	10414	7944	9163	11052	9316	8569	8933	9448	9497	8117	112126

TABLE II SUMMARY OF DISTRIBUTION OF OUTFITS FOR COLLECTIONG SPECIMENS - 1939

	JAN.	FEB.	MAR.	APR.	MAY.	JUNE	JULY	AUG.	SEPT	OCT.	NOV.	DEC.	TOTALS
DIPHTHERIA-Culture Outfits	982	1174	644	603	597	240	284	99	386	896	950	746	7601
TUBERCULOSIS-Sputum Outfits	170	182	207	153	221	325	175	232	205	198	245	360	2574
TYPHOID FEVER-Blood Outfits	0	0	1	0	0	0	0	8	12	6	16	28	71
TYPHOID SPECIMENS-U&F Outfits	0	16	15	0	5	6	114	34	62	66	45	2	365
GONORRHEA-Smear Outfits	242	207	390	206	347	182	184	164	225	253	279	296	2975
SYPHILIS-Blood Specimen Outfits	5459	4536	5872	5002	5241	7307	5163	4793	5899	6192	4871	5653	66988
SYPHILIS-Chancre Fluid Outfits	12	0	7	3	0	0	0	2	0	0	4	4	32
MENINGITIS-Naso-Pharyngeal Cult.	0	0	6	6	2	0	0	0	0	0	0	14	28
WATER-Container Outfits	356	359	393	272	566	430	276	496	289	477	402	294	4610
Miscellaneous Outfits	196	176	1497	398	410	1074	437	1379	876	651	421	359	7894
TOTAL.....	7417	6650	9032	6643	7389	9564	6634	7207	8954	8749	7233	7756	93238

TABLE III WASSERMANN TESTS STATE LABORATORY SERVICE YEARS 1936-1939
SHOWING DISTRIBUTION BY COUNTIES AND INSTITUTIONS, AND THE NUMBER OF PHYSICIANS
IN EACH COUNTY RECEIVING SERVICE IN 1938-1939

COUNTIES	1936	1937	1938	1939	Increase Decrease* 1936-39	No. Physicians 1938	1939
Adams	33	21	39	68	35	6	6
Asotin	1	11	10	1	0	1	1
Benton	30	62	83	174	144	6	7
Chelan	205	146	409	1013	808	23	21
Clallam	608	1020	241	375	233*	19	12
Clark	1205	1777	2607	2776	1571	32	28
Columbia	30	44	89	112	82	3	3
Cowlitz	1500	2348	3192	3414	1914	26	21
Douglas	2	9	33	78	76	3	3
Ferry	1	0	34	46	45	1	3
Franklin	30	92	86	157	127	4	6
Garfield	9	29	80	164	155	3	4
Grant	5	50	239	315	310	2	6
Grays Harbor	824	1222	1495	1630	806	28	24
Island	33	48	63	78	45	3	3
Jefferson	145	277	486	895	750	8	5
King	4925	7415	7576	9128	4203	206	185
Kitsap	321	614	741	1143	822	21	22
Kittitas	260	300	399	438	178	15	13
Klickitat	93	153	231	629	536	8	11
Lewis	1938	2257	2422	2788	850	30	28
Lincoln	3	17	71	152	149	11	11
Mason	729	940	583	777	48	6	8
Okanogan	135	471	615	613	478	16	16
Pacific	170	882	652	697	527	10	8
Pend Oreille	53	21	55	56	3	3	6
Pierce	7679	8613	11653	12420	4741	104	111
San Juan	9	7	32	17	8	1	1
Skagit	980	1100	1360	1848	868	24	18
Skamania	7	5	14	27	20	2	2
Snohomish	589	1123	1568	2082	1493	52	44
Spokane	142	1008	2066	3495	3353	48	44
Stevens	42	78	231	361	319	6	8
Thurston	225	1412	1553	1560	1335	27	24
Wahkiakum	24	64	152	176	152	2	3
Walla Walla	894	1400	1530	1612	718	23	18
Whatcom	179	289	444	565	386	28	19
Whitman	177	693	1858	1220	1043	27	19
Yakima	602	1170	1680	2552	1950	31	30
Grand Coulee Dist.	820	797	1590	2557	1737	12	9
Washington Girls Home	87	23	22	5	82*		
State School for Girls	323	279	264	117	206*		
State Penitentiary	629	639	626	642	13		
State Reformatory	449	471	521	691	242		
State Training School for Boys	269	279	307	287	18		
U. S. Public Health Service	178	134	359	364	186		
U. S. Veteran Administration	999	1126	1056	587	412*		
U. S. Marine Hospital	192	194	176	158	34*		
Miscellaneous	438	751	293	244	194*		
TOTALS	29221	41881	51886	61304	32083	881	811
Increases over previous year	2887	12660	10005	9418			
Per cent increases	11	43	23	18	110		

TABLE IV – COMPARISON OF SEROLOGIC TESTS FOR SYPHILIS AS PERFORMED IN THE LABORATORY OF THE STATE DEPARTMENT OF HEALTH AND AS PERFORMED IN LOCAL LABORATORIES IN THE STATE OF WASHINGTON – 1939

(Rating of each local laboratory is based upon the percentage of agreement. Full credit for complete agreement and one half credit for partial agreement and partial disagreement)

	Complete Agreement				Partial Agreement			Partial Disagreement			Complete Disagreement			
State Laboratory / Local Laboratory Number	Pos. Pos.	Dbt. Dbt.	Neg. Neg.	%	Pos.. Dbt. Dbt.	Dbt. Pos. Pos.	%	Dbt. Neg. Neg.	Neg. Dbt. Dbt.	%	Pos. Neg. Neg.	Neg.. Pos. Pos.	%	Rating
1	5	–	15	100	–	–	–	–	–	–	–	–	–	100.0
2	2	2	15	95	–	–	–	1	–	5	–	–	–	97.5
4	2	–	14	80	–	–	–	2	–	10	2	–	10	85.0
5	3	–	14	85	–	1	5	–	2	10	–	–	–	92.5
6	3	–	14	85	–	–	–	2	–	10	–	1	5	90.0
7	4	–	15	95	–	–	–	1	–	5	–	–	–	97.5
8	4	1	11	80	1	1	10	2	–	10	–	–	–	90.0
9	8	2	8	90	–	2	10	–	–	–	–	–	–	95.0
10	2	5	10	85	–	–	–	2	1	15	–	–	–	92.5
11	6	–	12	90	–	1	5	1	–	5	–	–	–	95.0
12	3	1	9	55	–	2	10	–	2	10	–	3	15	75.0
13	5	–	13	90	–	–	–	–	2	10	–	–	–	95.0
14	4	–	15	95	–	–	–	1	–	5	–	–	–	97.5
15	2	1	15	90	–	–	–	2	–	10	–	–	–	95.0
16	3	3	13	95	–	–	–	–	1	5	–	–	–	97.5
17	3	–	15	90	–	1	5	–	1	5	–	–	–	95.0
18	3	2	14	95	–	–	–	1	–	5	–	–	–	97.5
19	3	–	15	90	–	–	–	1	1	10	–	–	–	95.0
20	4	1	14	95	–	–	–	1	–	5	–	–	–	97.5
21	4	1	15	100	–	–	–	–	–	–	–	–	–	100.0
22	1	–	15	80	2	–	10	2	–	10	–	–	–	90.0
23	3	–	11	70	–	1	5	–	2	10	–	3	15	77.5
24	–	2	17	95	–	–	–	1	–	5	–	–	–	97.5
25	2	1	14	85	–	–	–	–	2	10	–	1	5	90.0
26	2	2	14	90	–	–	–	2	–	10	–	–	–	95.0
27	6	1	9	80	–	3	15	–	1	5	–	–	–	90.0
28	–	–	12	60	–	–	–	2	–	10	2	4	30	65.0
29	5	–	14	95	–	–	–	–	1	5	–	–	–	97.5
30	3	–	16	95	–	1	5	–	–	–	–	–	–	97.5
31	1	–	14	75	–	–	–	2	–	10	3	–	15	80.0
32	3	1	12	80	–	2	10	1	1	10	–	–	–	90.0
33	3	1	15	95	–	–	–	1	–	5	–	–	–	97.5
34	4	–	12	80	–	1	5	–	3	15	–	–	–	90.0
35	3	1	14	90	–	–	–	1	1	10	–	–	–	95.0
37	2	–	16	90	1	–	5	1	–	5	–	–	–	95.0
38	–	1	15	85	–	1	5	2	–	10	–	–	–	92.5
39	4	2	12	90	1	–	5	–	1	5	–	–	–	95.0
40	7	–	12	95	–	1	5	–	–	–	–	–	–	97.5
41	4	–	12	80	–	1	5	–	3	15	–	–	–	90.0
42	2	–	17	95	–	–	–	–	–	–	–	1	5	95.0
43	2	–	18	100	–	–	–	–	–	–	–	–	–	100.0
44	3	–	2	25	–	1	5	–	–	–	1	13	70	27.5
45	5	–	5	50	–	2	10	–	1	5	–	7	35	57.5
46	2	1	16	95	–	–	–	1	–	5	–	–	–	97.5
47	4	1	11	80	–	–	–	–	4	20	–	–	–	90.0
48	4	1	14	95	–	1	5	–	–	–	–	–	–	97.5
49	5	2	11	90	–	1	5	–	1	5	–	–	–	95.0
50	3	–	14	85	1	–	5	1	1	10	–	–	–	92.5
51	3	1	14	90	–	–	–	–	1	5	–	1	5	92.5
52	3	–	15	90	1	–	5	–	1	5	–	–	–	95.0
53	7	1	9	80	–	1	5	2	1	15	–	–	–	90.0
54	3	1	14	90	–	–	–	2	–	10	–	–	–	95.0
56	4	–	14	90	–	1	5	–	–	–	–	1	5	92.5
57	6	1	9	80	–	2	10	2	–	10	–	–	–	90.0
59	7	2	4	65	–	–	–	–	6	30	–	1	5	80.0
60	6	–	13	95	–	–	–	–	1	5	–	–	–	97.5

INTRADERMAL TYPHOID VACCINATION

Comparison of Agglutins Developed in Blood of Persons Injected with Mixed Typhoid Vaccine (B. Typhosus 1000 Million, Para A and Para B each 500 Million per cc.) by Intradermal and Subcutaneous Methods.

			Intradermal Injections				Blood Obtained	Agglution Titer Serum Dilution			
	Case	Age	0.1	0.2	0.2cc.	Vaccine	Date	Typhoid	Para.	Para B.	
1	CD	55	6/5	6/12	6/19	LEDERLE	7/6	1:640	1:80	1:320	
2	LL	30	"	"	"	"	"	1:1280	1:160	1:320	
3	AL	22	"	"	"	"	"	1:320	1:160	1:640	
4	KO	39	"	"	"	"	"	1:320	1:80	1:320	
5	PO	28	"	"	"	"	"	1:320	1:40	1:160	Typhoid Fever 1934
6	LS	20	"	"	"	"	"	1:80	1:80	1:80	
7	GAS	50	"	"	"	"	"	1:160	1:160	1:320	
8	WS	53	"	"	"	"	"	1:1280	1:160	1:160	
9	ES	38	"	"	"	"	"	1:320	1:80	1:320	
10	RS	40	"	"	"	"	"	1:1280	1:320	1:320	
11	WW	56	"	"	"	"	"	1:320	1:80	1:80	
12	RW	59	"	"	"	"	"	1:1280	1:320	1:160	
13	BD	18	6/1	6/8	6/15	LILLY	7/5	1:640	1:40	1:40	
14	ET	18	6/2	6/9	6/16	"	"	1:160	1:80	1:80	
15	CER	67	6/9	6/16	6/25	1-CUTTER 2-LEDERLE	7/6	1:640	1:640	1:320	
16	BCR	38	6/5	6/12	6/19	LEDERLE	"	1:640	1:320	1:640	
17	HE	23	6/13	-	-	"	7/7	1:40	1:80	1:80	Ty.Vac. 3-sub-q 1937
18	LEP	31	6/5	-	-	"	"	1:80	1:80	1:80	" " " 1936
19	FFS	34	6/10	6/19	6/24	CUTTER	7/10	1:40	1:80	1:160	
20	AP	24	6/16	6/23	6/30	"	7/12	1:40	1:80	1:80	
							AVERAGE	1:494	1:156	1:234	

			Subcutaneous Injections								
			0.5	1.0	1.0cc.	Vaccine	Date				
21	HB	20	6/3	6/10	6/17	LEDERLE	7/15	1:320	1:80	1:160	
22	MH	29	6/5	6/12	6/19	"	"	1:320	1:160	1:320	
23	JLMc	39	6/3	6/10	6/17	"	"	1:1280	1:640	1:1280	" " " 1926
24	MrsMc	38	"	6/11	6/17	"	"	1:160	1:160	1:160	" " " 1925
25	DS-	20	6/5	6/13	6/19	"	"	1:640	1:320	1:320	
26	MB	60	6/2	6/9	-	1 LEDERLE 1 LILLY	"	1:160	1:80	1:80	" " 2-sub-q 1934
27	MAB	31	6/2	6/9	6/16	LILLY	"	1:640	1:640	1:160	
28	BJ	49	6/2	6/9	6/16	"	"	1:160	1:40	1:40	
29	JP	35	6/2	6/9	6/16	"	"	1:160	1:80	Neg	
30	YS	22	6/2	6/12	-	"	"	1:160	1:80	1:40	
31	GV	22	6/2	6/9	6/16	"	"	1:80	1:40	1:40	
							AVERAGE	1:371	1:211	1:237	

Agglution test made at Washington State Department of Health Laboratory, July, 1939.

ANNUAL REPORT - SYLVATIC PLAGUE STUDIES AND RODENT CONTROL

STATE OF WASHINGTON - 1939

Llewelyn J. Hughes
Field Supervisor, Plague Studies.

Report on Sylvatic Plague Studies and Rodent Control for the year ending December 31, 1939.

Counties visited:

Adams	Asotin
Grant	Lincoln
Klickitat	Skamania
Whitman	Spokane
Yakima	Pend O'Rielle
Stevens	Grays Harbor

A total of 1353 miscellaneous rodents and 4410 parasites were collected.

Plague was demonstrated in ground squirrels in Adams, Lincoln and Spokane counties. In Lincoln county, near Pacific Lake north of Odessa, a cotton tail rabbit was found dead and tissue from this animal was proved positive for plague. This is the first time on record that plague has been found in rabbits in nature.

Of 113 specimens sent to the U. S. Public Health Service Laboratory in San Francisco, 12 positive reactions were obtained. Two of these specimens were positive for Tularemia - one being a human case in Wilbur, Lincoln county.

The original foci of 1937 in the Lind Coulee showed to be still present there, and also ten miles west and about ten miles east of the first focus. New points of infection were found this year in Lincoln and Spokane counties. The focus in the Marcellus coulee north of Ritzville may be considered new, although there is a possibility that it may have originated at Rocky Ford, four miles northwest of Marcellus where plague was found in April, 1938. In Spokane county plague has occurred among the Columbian ground squirrels. This is the first time

that it has been proved that plague exists among those squirrels in the State of Washington. Previous reports from the Turnbull slough area near Cheney pointed out that some disease occurred here off and on for the past ten years, and this may prove to be the reservoir of Sylvatic Plague in this state. The disease does not wipe out the Columbian ground squirrel as it does the Washington ground squirrels (Citellus Washingtoni), which are found in Lincoln and Adams counties.

The Turnbull slough area in Spokane county, where plague was demonstrated this year in the Columbian ground squirrel, also shows a large increase in the domestic rats. These rats have been found to use the squirrel holes for their own purposes, when a food supply is near. We have devoted some time to this problem of rat extermination in this particular region, instructing farmers and others in rat-proofing their premises and pointing out the danger of human infection from plague should the rats become involved through their close contact with the squirrels.

RAT CONTROL:

During the year the Field Laboratory personnel carried on rat control activities along with Plague Studies among wild rodents.

Assistance was given to towns, communities and business houses requesting our help, as follows:

Colfax, Whitman County,
Bingen, Klickitat County
White Salmon, Klickitat County
Stevenson, Skamania County
North Bonneville, Skamania County
Cheney, Spokane County
Grays Harbor Dairymen's Association,
Creamery, Satsop

Due to the prevalence of Plague in Eastern Washington we have emphasized the importance of eliminating the domestic rats from the infected areas.

The city of Spokane was found to be infested with three types of rats found in the Western States, ie.,

Rattus Rattus (Black rat)
Rattus Alexandrinus (Ship rat)
Rattus Norvigicus (Norway or Brown rat)

The Rattus Rattus are quite numerous in the downtown business area south of the Spokane river, with a few Rattus Alexandrinus along with them; these two species live together and have identical habits. Rattus Norvegicus do not seem to be as numerous in the downtown area, while in the outlying districts they seem to be in the majority.

Our study showed that the flea index on rats in Spokane is very low. --.07 per rat.

There is room for an extensive rat extermination campaign in Spokane, but not until an improvement takes place in the method of garbage collection will anyone have any degree of success in exterminating the pests within the city.

HISTORY OF FATAL EPIZOOTICS:

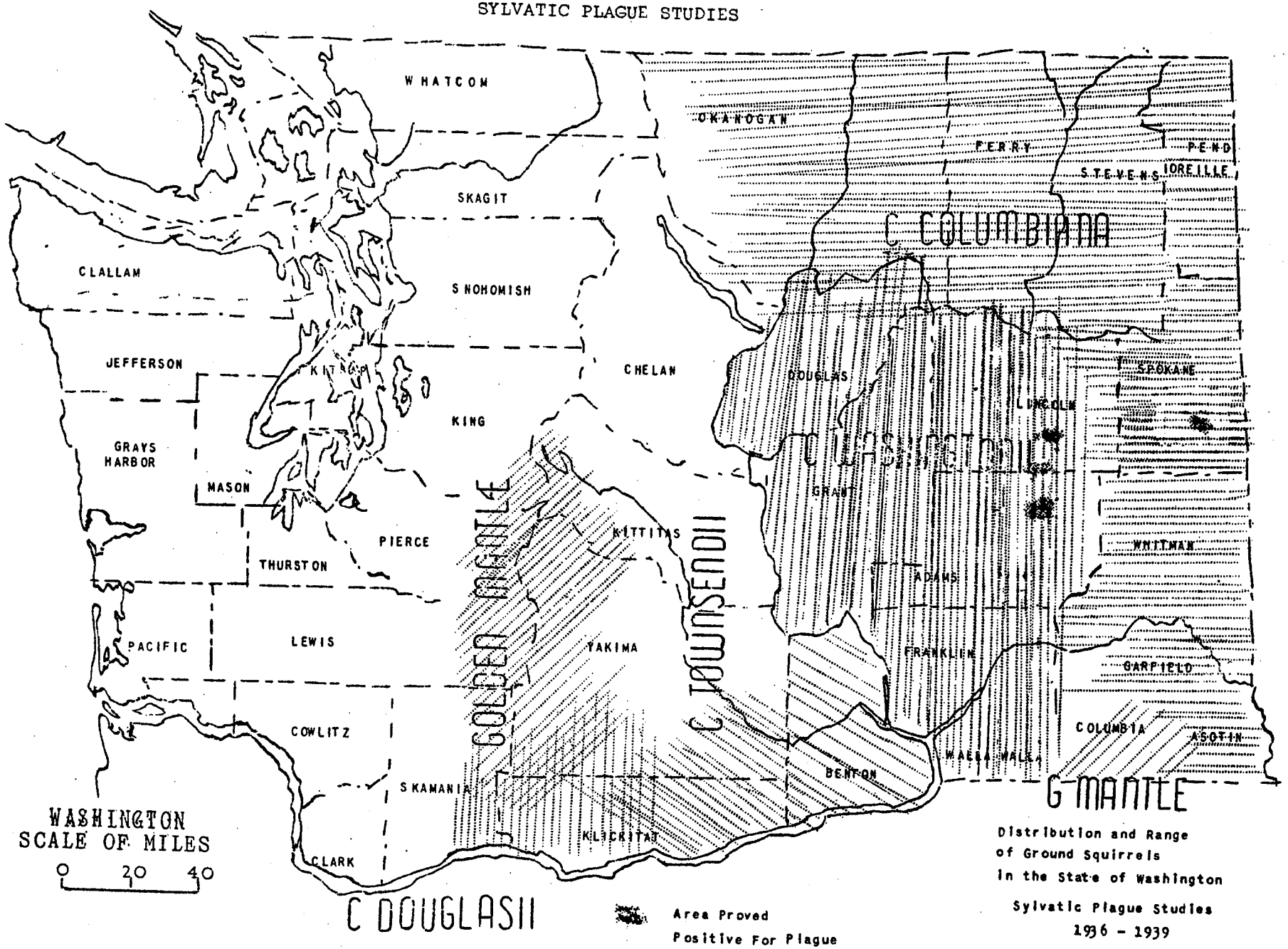
During the course of our activities we have learned of some disease occurring years ago among ground squirrels in Eastern Washington. A manuscript by the late Dr. S. B. Nelson, Washington State College, mentions that in the summer of 1896 an epidemic broke out among the C. Townsendii, which subsequently spread over much of their range, killing a very large proportion of them. From then on we find that the disease occurred at different times among four species of ground squirrels, ie. C. Townsendii, C. Yakimensi, C., Columbiana and Golden Mantled, as follows:

Year Occurred	Area Involved	Species of Ground Squirrel
1914 - 1915	Northern Garfield and Columbia counties	Citellus Townsendii*
1922 - 1923	Eastern Klickitat county	Citellus Mollis Yakimensi*
1926 - 1927	Godman Springs area - Blue Mountains	Golden Mantled
1928 - 1929	Turnbull Slough, Spokane County	Citellus Columbiana
1928 -	Near Richland, Benton County	Citellus Mollis Yakimensi*
1931 - 1934	Benge-Winona area and Hooper-Kahlotus area, Adams county	Citellus Townsendii*
1935 - 1936	Ritzville coulee, Adams county	Citellus Townsendii*
1937 -	Plague demonstrated at junction of Lind-Ritzville coulee	

*Revision of the North American Ground Squirrel (printed April 1938), North American Fauna No, 56, designates Citellus Townsendii as Citellus Washingtoni, and Citellus Mollis Yakimensi as Citellus Townsendii.

Opinions differ as to the origin of the present spread of sylvatic plague among wild rodents. Perhaps these epizootics of the past years were caused by plague infection, not recognized at the time as such, and would indicate that it might be endemic. On the other hand, it is believed that it was transmitted from rats to ground squirrels in California and spread from that point.

SYLVATIC PLAGUE STUDIES



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ADMINISTRATION

The national defense program developing during the year of 1940 placed added responsibilities and problems on the State Department of Health and was perhaps the year's most outstanding problem. Mobilization of large numbers of men coming from scattered areas of the country introduced to this State disease hazards not ordinarily experienced in normal times. The health problem relative to many of the communicable diseases are of prime importance in such a mobilization for military service, and have a direct bearing on the civilian population of the State, as well as the military personnel. It has been necessary for the State Department of Health to augment and improve existing facilities in local health departments in order to adequately protect the civilian population, as well as the military personnel in extra cantonment areas.

Protective measures of general sanitation around Army cantonments required the services of emergency sanitary personnel for a period until the local departments could absorb the increased load. The enforcement of regulations in providing safe water supplies and the proper supervision of a milk supply and the safe disposal of sewage, in addition to careful inspection of good supplies, were all factors in this increased load. The excellent cooperation received from local health departments and military authorities enabled the State Department to keep abreast of the increased demands made upon it.

The State Department of Health laboratory has had to increase its services to its utmost capacity in order to provide a blood test for each individual examined by draft boards within the State. Public laboratories in local areas, approved by the State Department have assumed their share of such tests, but such laboratories are limited in number. In addition to the tests furnished for individuals examined by the draft boards the laboratory has extended its services to other Federal programs related to the national defense. The examination of 5,000 NYA personnel, requiring a blood test on each, overtaxed the facilities of the State Department of Health laboratory until the excess load was relieved in part through the facilities of local county health department laboratories.

The improvement made in tuberculosis control efforts throughout the State in a period of one year more than justifies the measures taken by The Department in 1939 to meet this need. The State Board of Health revised the requirements for school employees' examination and health certification in April of this year. The revised requirements have protected many children from exposures to such school employees as may unknowingly be ill with tuberculosis. Additional details relative to such health examination may be found in the section on epidemiology of this report.

The Children's Bureau of the U. S. Department of Labor, which allocates Title V Federal funds to the State, for Maternal and Child Health services, advised this State under date of November 1, 1939 of the requirements of Parts I and II of Title V of the Social Security Act as amended August 10, 1939. This amendment requires State and local employees under plans for Maternal and Child Health services to be covered by a Merit System. Shortly after January 1, 1940 we were advised by the U. S. Public Health Service that public health personnel Operating under budgets of Title VI of the Social Security Act and the Venereal Disease Control Act would have to be employed under an acceptable Merit System of personnel administration. In view of the fact that no specific legislation in the State provided for a Merit system of personnel of the State Department of Health or local health departments, it was necessary to secure the approval of the Governor of the State, and the State Board of Health, for the formulation of a Merit System. The State Department of Health worked jointly with the State Department of Social Security in developing this system, meeting the Federal requirements applicable to personnel of both departments. The rules and regulations as adopted by the two State agencies were approved by the Federal agencies in October of 1940. The Department of Health has not been able to complete a classification plan or compensation plan acceptable to the Federal agencies at the close of the year. Continued efforts are directed toward the completion of these plans early in 1941. In addition, the Department is faced with the requirement of securing legislation providing for a Merit System to enable them to meet the Federal requirements for funds allocated to this State for public health purposes.

The financial plan adopted by the State Department of Health last year as a means of affording assistance to local health departments in carrying on public health work was further improved during 1940. The mandatory public health law passed by the 1939 Legislature is utilized in the financial plan as a foundation upon which minimum public health work may be developed. The State Department allocates to the counties in which .4 of a mill is lesser than the 30¢ per capita, sufficient funds to raise them to the 30¢ per capita level. Additional funds required above the 30¢ per capita level for public health work in the county is shared between local funds and Federal funds on a matching ratio basis, which provides still further equalization between the several counties as determined from consideration of their population, assessed valuation and area. A larger percentage of Federal funds in proportion to local funds is allowed those counties having special health problems, or in supporting laboratory services.

No additional full-time health departments were developed in the State during 1940, although considerable interest has been shown by a number of counties in their consideration of developing full-time departments. With approximately 75% of the State's population now receiving services from full-time health departments, the addition of the three large counties remaining with populations large enough to support full-time health departments would provide this service to approximately 86% of the State's population.

DIVISION OF EPIDEMIOLOGY

L. A. Dewey, M. D.
Chief

K. M. Soderstrom, M.D.
Tuberculosis Control Officer

In Table I are shown the communicable disease cases reported to the State Department of Health during the year 1940, with the exception of the venereal diseases which are listed in another section of the report. Unusual disease incidences are noted under measles, smallpox, poliomyelitis, encephalitis and influenza. The incidence of all other diseases as indicated by the reports does not differ significantly from that experienced in recent years, with the exception of typhoid. The ninety-three cases of typhoid indicate a low incidence of this disease during 1940 than has ever before been experienced by the state. This number is not significantly lower than the number reported in several preceding years, but does indicate the continuance of a downward trend in typhoid incidence which has been noticeable for the last twenty years and which was only interrupted by the epidemic prevalence of the disease in one portion of the state in 1939.

The measles epidemic which reached its peak in 1939 was continued in 1940 and by the summer of 1940 all sections of the state had been swept by the disease within the past two years. This high incidence of the disease has no particular significance other than to indicate that most of the population has now been immunized against measles by an attack of the disease and we may expect a low incidence for the next two or three years.

More influenza cases were reported in 1940 than have ever before been reported in a single year. Of the 9,539 cases reported 8,975 were reported during the month of December. This number probably represents only a fraction of the number of cases that actually occurred during this month. Most of the cases were of a very mild type and very few deaths or serious complications resulted. It is impossible to predict

the future course of the epidemic, as to duration or severity, but it seems certain that the increase in influenza incidence will be continued in the early part of 1941.

The incidence of smallpox in the state during 1940 is notable because of the rarity of this disease. Only fourteen cases of smallpox were reported in the entire state during the year. This is by far the lowest number of cases ever recorded in the state since the reporting of communicable diseases was instituted, and this incidence compares favorably with that in any other state in the Union, but can only be maintained if vaccination programs begun during the last few years are continued with undiminished intensity.

POLIOMYELITIS:

A severe epidemic of poliomyelitis was experienced by the state in 1940. There were 447 cases of this disease reported in the state during the year. The last previous epidemic occurred in 1934 when over seven hundred cases were reported. The epidemic began in the month of May in Tacoma and Pierce County and reached its greatest prevalence in this area. In June cases were reported from several other areas in the state and more and more areas became involved as the summer progressed. A decrease in the incidence of the disease was noted in the latter part of October and by November there were definite signs that the epidemic had largely abated. By the end of 1940 all but seven counties of the state had suffered from the epidemic, although in the majority of counties the incidence was very low. The distribution of cases by months, by counties and cities is shown in Table II.

During the epidemic every known procedure for limiting the spread of infection was put into operation but it is felt that none of these had any appreciable effect. This observation agrees with the experience of nearly all health authorities in similar epidemics.

Thirty-one deaths were reported as resulting from the disease, producing approximately the same case fatality rate that was experienced in the epidemic of 1934. Much of the health department's effort during the epidemic was directed toward discovering and securing proper care for paralytic cases. The more obvious paralyses were discovered at once and immediate steps were taken to institute proper care in order to minimize permanent muscle damage. A great many cases of respiratory paralysis occurred which necessitated the provision of a large number of mechanical respirators. To discover the less severe paralytic cases it is necessary to make a careful check of all muscles of the body. Such checks are being carried on at the present time, but all cases have not yet been reached by this survey. At the close of 1940 one hundred fifty-three cases had been discovered which showed some degree of paralysis.

TABLE II. POLIOMYELITIS CASES REPORTED TO THE STATE DEPARTMENT OF HEALTH IN 1940
BY MONTH OF ONSET AND BY COUNTIES AND CITIES

COUNTIES Cities	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS	DEATHS
ADAMS														
ASOTIN							1						1	
BENTON								1					1	
CHELAN												1	1	
Wenatchee														
CLALLAM									2				2	
Port Angeles									1	2			3	
CLARK								2					2	1
Vancouver				1					1		1		3	
COLUMBIA														
COWLITZ								1	1	1			3	
Longview										1			1	
DOUGLAS					1			2					3	1
FERRY														
FRANKLIN														
GARFIELD										2			2	
GRANT						2	2	3					7	
GRAYS HARBOR								4		4			8	2
Aberdeen								1					1	
Hoquiam														
ISLAND														
JEFFERSON														
KING						2	4	6	6	8	2	1	29	1
Seattle						3	11	11	27	13	2	1	68	2
KITSAP	1								2	6	5		14	1
Bremerton						1			1				2	1
KITTITAS							2	2					4	
KLICKITAT						1			1				2	
LEWIS							1		1				2	
LINCOLN								1	1				2	
MASON										1			1	
OKANOGAN						1	1	1	1	1	1		6	1
PACIFIC								1		1			2	
PEND OREILLE										1			1	
PIERCE					33	25	20	8	6	6	2	1	101	9
Tacoma				1	28	35	14	11	8	8		1	106	5
SAN JUAN														
SKAGIT							2	1	1	2			6	
SKAMANIA											1		1	
SNOHOMISH								3	2	4		1	10	1
Everett					1		1			1	1		4	2
SPOKANE							1			1			2	
Spokane							1		1	3			5	1
STEVENS							2						2	2
THURSTON														
Olympia								1					1	
WAHKIAKUM														
WALLA WALLA										0	2		2	
Walla Walla											1		1	
WHATCOM												1	1	
Bellingham									2				2	
WHITMAN							1	3	2				6	
YAKIMA		1					1	9	4	3	1		19	3
Yakima								2	3	2			7	
TOTALS	1	1	0	2	63	70	65	74	73	71	19	7	447	31

ENCEPHALITIS:

In 1939 an unusually high incidence of encephalitis occurred in the state due to an epidemic of equine encephalomyelitis in the Yakima Valley. This disease appeared again in 1940, affecting chiefly the same area as in 1939 although many other areas of the state were affected to some extent. As in 1939 the epidemic began in the Yakima Valley in late July and continued through August and into September. A total of 107 cases of encephalitis were reported during the year of which 98 were diagnosed clinically as being of the equine type. In many of these the diagnosis was confirmed by laboratory procedures. Thirty deaths were reported as resulting from all forms of encephalitis and twenty-three of these were reported as resulting from the equine type of the disease. The distribution of cases by month of onset and by counties and cities is shown in Table III.

The mode of transmission of equine encephalomyelitis has not yet been definitely established although some features of the disease point to the possibility of an insect vector as the transmitting agent. Lack of knowledge of the disease is a serious handicap in formulating control procedures. Ordinary isolation and quarantine measures were instituted in connection with the cases but it was impossible to determine whether or not these measures had any effect on the prevalence of the disease.

VENEREAL DISEASES

No radical changes have been made during 1940 in the general policies governing the operation of the venereal disease control program in the state. The objectives of the program are to provide case-finding and treatment facilities in local areas and to make these facilities available to as large a proportion of the population of the state as is possible. All direct service to patients in the venereal disease program is furnished through local health departments, the local health officer having full direction of and responsibility for his program. The State Health Department encourages these local programs through grants of funds, which may be used for the employment of personnel or the purchase of equipment, and through technical advice and consultation.

The case-finding involves the employment of investigative personnel to discover contacts of known cases. It also involves the employment of clinicians and the provision of both clinical and diagnostic facilities, in order that immediate and accurate diagnosis may be made on contacts brought in for examination.

When cases are discovered it is necessary that they be immediately placed under adequate treatment in order that their infectiousness may be effectively controlled and that they may in this way be eliminated as sources of further infection. An effort is made to obtain treatments

TABLE III. DISTRIBUTION OF ENCEPHALITIS CASES REPORTED IN 1940 BY MONTH OF ONSET AND COUNTIES AND CITIES

COUNTIES Cities	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS	DEATHS
ADAMS														
ASOTIN														
BENTON														
CHELAN								1	2				3	
Wenatchee										1			1	1
CLALLAM														
Port Angeles														
CLARK														
Vancouver														
COLUMBIA														
COWLITZ														
Longview							1						1	1
DOUGLAS														
FERRY														
FRANKLIN														
GARFIELD														
GRANT														
GRAYS HARBOR									1				1	1
Aberdeen			1										1	1
Hoquiam														
ISLAND										1			1	1
JEFFERSON									1				1	1
KING			1								1		2	
Seattle		1					1		2				4	2
KITSAP										1			1	1
Bremerton														
KITTITAS							1						1	
KLICKITAT														
LEWIS														
LINCOLN														
MASON														
OKANOGAN						1	1						2	
PACIFIC		1											1	1
PEND OREILLE														
PIERCE						1							1	
Tacoma														
SAN JUAN														
SKAGIT							1						1	1
SKAMANIA														
SNOHOMISH														
Everett														
SPOKANE														
Spokane														
STEVENS														
THURSTON								1					1	
Olympia														
WAHKIAKUM														
WALLA WALLA										1			1	1
Walla Walla														
WHATCOM														
Bellingham														
WHITMAN							1						1	
YAKIMA						10	45	12	1				68	18
Yakima						4	9	1					14	
TOTALS	0	2	2	0	0	18	59	20	4	2	0	107	30	

under care of private physicians, for as many of these cases as possible, but many of them are financially unable to obtain private treatment and for these free treatment facilities must be maintained in connection with local health departments.

Through the first six months of 1940, seventeen clinics for the treatment of venereal disease were operated in connection with local departments within the state. On July 1, this number was diminished to sixteen, due to the fact that the Tacoma City Clinic and the Pierce County Clinic were consolidated in order to eliminate duplication of effort. This did not result in any decrease in service to the people of this area as the Tacoma City Clinic was increased in size and entirely re-equipped to adequately handle the load.

Efforts were made to increase the efficiency of existing clinics through grants of funds to local health departments. Through the use of such funds one clinician for the treatment of syphilis, one clinician for the treatment of gonorrhea, and one case-contact investigator were added to the staff on the Tacoma City Health Department. One venereal disease clinician and one case-contact investigator were added to the staff of the Thurston County Health Department. One case-contact investigator was added to the staff of the Snohomish County Health Department, and temporary increases in investigative personnel to meet special problems were made possible in the Cowlitz County and Lewis County Health Departments. Provisions for additional personnel have been made in Seattle, Yakima County and Spokane. The diagnostic program was aided by the provision of funds for the equipping of a diagnostic laboratory in the Whitman County Health Department. The diagnostic program was further advanced by the provision of funds for the purchase of equipment for performing cultures for the gonococcus in all local laboratories of the state.

Until 1940 the control of syphilis had been the major concern in the venereal disease control program in this state. During 1940 greatly increased emphasis has been placed on the control of gonorrhea. Three factors have played a part in bringing this about: First, the syphilis control program has become well established and fairly well standardized, which has released personnel-time for other activities; second, newly discovered drugs have made gonorrhea much more contrallable and have increased the possibilities of a successful control program; third, gonorrhea is by far the most troublesome of the venereal diseases in most military organizations and this fact has made emphasis on the gonorrhea control program absolutely essential.

The emphasis on the gonorrhea control program has been brought about through the provision to health departments of clinicians skilled in the treatment of gonorrhea; of improved facilities for the diagnosis and through the provision to local health department clinics of the newer, more effective anti-gonorrheal drugs.

Cases of syphilis and gonorrhea reported to the State Department of Health from all sources from 1937 to 1940 inclusive are shown in Table IV. Nineteen thirty seven was the year following the initiation of greatly increased venereal disease control activities in the state and a greater number of cases of both syphilis and gonorrhea were reported during that year than during any other year on record. Since 1937 there has been a steady decrease in reported cases of syphilis which has continued through 1940. A corresponding decrease in reporting of gonorrhea took place through 1939, but in 1940 a considerable increase in case reports is noticed, bringing the total above the reports for the year 1938. This increase must be attributed at least in part, to the increased emphasis placed on the gonorrhea control program during 1940, and would seem to indicate that during 1940 cases were discovered which had previous not come to the attention of a recognized treatment source.

The distribution of free drugs to private physicians for the treatment of syphilis has been continued during 1940. In addition to this, the distribution of drugs to public health clinics for the treatment of gonorrhea was begun in October and carried on during the last three months of the year. The quantities of drugs so distributed are shown in Table V.

In Table VI are listed new cases of both syphilis and gonnorhea reported to the State Department of Health as being placed under treatment for the first time by private physicians and by public health clinics. In addition the activities of the public health clinic in caring for their patients are tabulated. The average monthly patient load listed in the Table represents the average number of patients treated each month in the clinics of the state.

The average patient load for syphilis is somewhat larger than the reported number of new cases because of the fact that the treatment of syphilis requires from one to two years, and a number of patients are carried over from the preceding year. On the other hand, the average patient load for gonorrhea is much smaller than the reported number of new admissions because of the fact that the treatment of gonorrhea requires only a few weeks and the average patient is counted in the load only one or two months.

The control of the venereal diseases depends upon the finding of new cases among the contacts of known cases and upon the continuance of treatment of known cases until they have been cured or at least rendered noninfectious. To carry out this program it is necessary to provide personnel on the staffs of local health departments who will search out and bring in for examination contacts of known cases and who will also interview cases who fail to take their treatments regularly in order to return them to regular treatment. The services of this type tendered by health department personnel during 1940 are listed in Table VII. These services are rendered to private physicians upon request - delinquent patients being returned to the individual private

TABLE IV

CASES OF SYPHILIS AND GONORRHEA REPORTED 1937 THROUGH 1940

Year	Syphilis	Gonorrhea
1937	3,512	4,585
1938	3,191	3,496
1939	2,925	3,220
1940	2,543	3,686

TABLE V

DISTRIBUTION OF FREE DRUGS BY STATE DEPARTMENT OF HEALTH

	Antisyphilitic Drugs - Doses	Antigonorrheal Drugs - Doses
To Private Physicians:		
Arsenicals	26,300	
Heavy Metals	35,237	
To Public Health Clinics:		
Sulfapyridine		12,000
Sulfathiazole		10,000
TOTALS	61,537	22,000

TABLE VI

NEW CASES OF SYPHILIS AND GONORRHEA REPORTED IN WASHINGTON DURING 1940 AND TREATMENTS ADMINISTERED IN LOCAL PUBLIC HEALTH CLINICS

	Syphilis	Gonorrhea
New cases reported under treatment by private physicians	1,079	1,757
New cases reported under treatment by Public Health Clinics	1,464	1,929
Average Monthly Patient load in Public Health Clinics	1,727	280
Treatments administered in Clinics	77,782	16,836

TABLE VII

EPIDEMIOLOGICAL SERVICES RENDERED TO PRIVATE PRACTITIONERS AND CLINICS BY INVESTIGATIVE PERSONNEL IN LOCAL HEALTH DEPARTMENTS

TYPE OF SERVICE	SERVICES TO: Private Physicians	Clinics
Visits to Delinquents	95	1,897
Delinquents Returned to Treatment	62	2,062
Visits to Contacts	51	760
Contacts brought under Treatment	16	287
Visits to Contacts and/or Delinquents	0	355
Contacts and/or Delinquents brought under Treatment	0	408

TABLE VIII

REPORTS OF SEROLOGICAL TESTS ON PREGNANT WOMEN DURING 1940

	Negative	Positive	Doubtful	Total	Results of Test Not Stated	Grand Total
Number	13,027	217	12	13,256	851	14,107
Per Cent	98.3	1.6	0.1	100.00	6.0	100.00

physician for treatment, the contacts being examined by the physician of their choice or by the health department. It will be noted in the table that the number of visits to delinquents is somewhat less than the number of delinquents returned to treatment. This is brought about by the fact that in an effort to save personnel-time an attempt is made to contact the patient by letter and persuade him to return to treatment without making a visit necessary. Many of these letters are successful and the patient returns to treatment without a personal visit ever having been made. The last two classifications in the table are made necessary by the fact that in some clinics the work done on contacts and on delinquents was not recorded separately, and consequently it was impossible to determine the number of services rendered to each class of patient.

The law requiring a serological test for syphilis on every pregnant woman went into effect on January 2, 1940. An attempt has been made by this department to obtain reports on these tests to use as a basis for statistical study of the prevalence of syphilis throughout the state. Reports were received of tests on 14,107 individuals. A brief tabulation of the results of these tests is shown in Table VIII. The percentages obtained in this table cannot be considered reliable because of the fact that there are normally approximately 25,000 births in the state each year. This means that somewhat over 40 per cent of the tests performed on these individuals during the year were not reported, and it is impossible to make any estimate of the percentage of positives in this unreported group. An attempt is being made to obtain the information on this unreported group.

The most significant fact shown by these figures is that there have been 217 cases of syphilis discovered in pregnant women, who as a result have in all probability borne healthy children while without the examination a high percentage would have borne syphilitic children. In addition to this, examination of the families of these women has led to the discovery and treatment of a large number of additional cases who otherwise would have gone undiscovered until the development of serious physical disabilities.

VENEREAL DISEASES IN RELATION TO THE DEFENSE PROGRAM:

The venereal disease program in the state was tremendously influenced by the military expansion program during 1940. The expansion of military forces began in the month of August when maneuvers involving in excess of forty thousand troops were held in and around the Fort Lewis military reservation. In September the 41st Division, comprising National Guard Troops from the Northwestern states, was inducted into federal service and was stationed at Camp Murray. Through the remainder

of the year the existing units were increased in size through enlistments, until by the end of 1940 the number of troops stationed in the Fort Lewis area had more than tripled.

Whenever large number of troops are introduced into an area unfamiliar to them the control of the venereal diseases is always one of the chief problems to be considered. During the World War the venereal diseases caused more time lost from active duty than did any other type of illness. This fact illustrates the importance of venereal disease control in a successful military training program.

The Army authorities requested that the State Department of Health take special precautions to control venereal diseases in civilian areas surrounding military concentrations, and promised fullest cooperation of the Army in this work. Immediate steps were taken to increase venereal disease control facilities in areas surrounding the Fort Lewis military reservation. Both clinical and investigative personnel were increased in Tacoma and Olympia. Larger and more satisfactory quarters were secured by the city of Tacoma for housing the Tacoma Public Health Clinic for the treatment of venereal diseases. Federal funds received through the United States Public Health Service were allotted by the State Department of Health for fully equipping these quarters. Similar funds were used for supplying the additional personnel in these units.

An agreement was reached with the Army authorities, the essential points of which are as follows:

1. That the Army would report immediately to the health department all cases of venereal disease in Army personnel;

2. That an investigator from the Health Department would immediately interview all cases so reported in an effort to determine the source of the infection;

3. That all civilians cited as contacts by Army cases would be immediately examined by the health department and if found infected placed under treatment until cured;

4. That the health department would report immediately to Army authorities any Army personnel cited as contacts by civilian cases.

This program was immediately put into operation and a special male investigator was attached to the staff of the State Department of Health for the purpose of interviewing venereal disease cases in Army personnel.

SUMMARY OF CASES INTERVIEWED BY VENEREAL DISEASE INVESTIGATOR FOR ARMED FORCES

STATE OF WASHINGTON

January 10, 1941

Cases Reported: Gonorrhea 235
Syphilis 11
Chancroid 20

Total Cases Interviewed TO DATE 266

RESULT OF INVESTIGATION OF CONTACTS GIVEN BY PATIENTS IN INTERVIEW		
	In State	Out of State
Number of Contacts Given	215	86
Reports not as yet received on Request for Investigation	103	59
Reported Unable to Locate	5	-
Reported Moved	11	-
Indefinite Information given, of no value in locating	30	25
Found positive and placed under treatment	38	1
Found negative upon examination	28	1
Found negative but now under observation	1	-

TABLE X

TYPES OF CONTACTS GIVEN BY VENEREAL DISEASE CASES IN THE MILITARY FORCES, JULY 24 - DECEMBER 31, 1940

Prostitutes	179
Streetwalker	29
Tavern Pickup	31
Dance Hall	9
Friend	38
Others (Includes wife)	20
Total Contacts Given	306

Up to January 1, 1941, the Army authorities reported to the State Department of Health 235 cases of gonorrhea, 11 cases of syphilis, and 20 cases of chancroid, all of which were interviewed by the special investigator in an effort to determine the sources and contacts. This number of cases represents a slight decrease in rate compared to that previously experienced by the Army in this area, but nevertheless, a tremendous amount of lost time is represented by these cases. There is reason to believe that intensified effort may result in further decreases in the rate.

In Table IX are listed the activities of the special investigator and the results of these activities as far as they are complete. The regular procedure has been for the investigator to turn over to local health departments the information secured in the interview of the venereal disease case. The local health department is then responsible for the examination of the contacts. The reports on the results of the examination on almost half of the contacts have not yet been received by this department. It is interesting to note, however, that considerably more than half of the contacts who have been thoroughly examined have been found infected. These infected individuals have been placed under treatment and so have been removed as sources of further infection.

In Table X the contacts cited by infected Army personnel are listed according to type in an effort to show the classes most responsible for the transmission of venereal disease. Commercialized prostitutes contributed 179 contacts out of 306, or approximately 58%. It follows that the elimination of commercialized prostitution would do away with half our problem of venereal disease transmission among the Army personnel, and probably among the civilian population as well.

TUBERCULOSIS:

At this writing it is too early to secure corrected and carefully checked death rates for 1940. Early study on this matter would indicate that a slight drop in the death rate will be noted. This may indicate a small reduction in the State's tuberculosis problem. However, evidence is mounting the country over that mortality rates are poor, and possibly impracticable, rates for the calculation of tuberculosis case loads. Therefore, declining death rates are not to be considered as clear evidence that our tuberculosis problem is taking care of itself. On the contrary, there are just as many patients on the sanatoria waiting lists today as there were a decade ago and many local areas in the State are justly asking for more sanatoria beds to help solve their ever present problem of treating and isolating sick tuberculous patients. There has been no material addition to the bed capacity of the State in the last year.

Since the 1939 report, we are able to report that seven counties have been included in the cooperative clinics wherein skilled special lists hold the clinics in conjunction with local health departments, for the express purpose of bringing clinical consultation to physicians in local but somewhat isolated areas. The various local county tuberculosis leagues are encouraged to work with the health officers in making these clinics a success.

Approximately 25 suspected or contact cases of tuberculosis make up the clinic material in our cooperative clinics. No children below adolescent years are permitted in the clinic and no case is seen unless the referring physician or the local health officer secures an X-ray film prior to the clinic. Only in this way can a clinic be said to be complete. Further, a blood sedimentation test is done on all clinic admissions. Such a clinic leaves no reason why the visiting clinician cannot give a definite diagnosis, or at least specific recommendations for each case presented. Unless the health officer can administer the second strength P.P.D., or its equivalent in O.T., the tuberculin test is not used.

The argument has frequently been raised as to the worth of finding cases if adequate facilities are not available for their care. To answer this, one has simply to say that an individual who knows he has tuberculosis can be taught to minimize his hazard to others and though it may be of little help to him, the community is well served. Further the more existent cases known, but not under care in a community, the more the public will realize its responsibility in this public health problem.

Perhaps the largest task for 1940, coming under the classification of tuberculosis, was the administration of the school employees health examinations. A specific examination for tuberculosis was substituted for the original annual complete physical examination requirement which had been in existence for many years. The complete inadequacy of the original general examination for the purpose of disease prevention was apparent. Tuberculosis is one disease that can exist in a communicable stage month after month and yet not be easily recognized. However, it can be found when specific means are used to diagnose it. The X-ray though not infallible, is the best means of diagnosis in tuberculosis. It has, therefore, been included in the requirement for health certification of school employees. Below is quoted the revised regulation as affects school employees, and is self-explanatory.

"Sec. 55. - No person employed in any school in this state shall work at such employment while suffering from any communicable disease. No contract of any teacher, bus driver, janitor, clerk or other employee who comes in direct contact with students in any school in this state

shall become operative for the ensuing year until such employee has filed with the local county or city superintendent of schools evidence that said employee is not suffering from active pulmonary tuberculosis. Such evidence shall consist of health certificate issued by the State Department of Health which shall be granted upon receipt of either a satisfactory report of a negative reaction to the tuberculin test or a satisfactory roentgenogram of the chest which shows no evidence of active tuberculosis. A satisfactory report of a negative reaction to the tuberculin test shall be signed by a Doctor of Medicine duly licensed in the State of Washington and shall consist of a report of a Mantoux test in which 0.1 mgm. of Old Tuberculin or its equivalent has been used and which test shall have been performed within six months of the opening date of the school year."

"In the event that the Mantoux test is positive, the teacher, bus driver, janitor, clerk or other employee shall have a satisfactory roentgenogram of the chest and shall not be required to have further Mantoux tests performed. Provided, further, that if the individual is less than thirty-five years of age that a satisfactory roentgenogram of the chest shall be submitted at each two years interval thereafter and if over thirty-five years of age, a satisfactory roentgenogram of the chest shall be submitted at five year intervals, except that more frequent roentgenograms of the chest may be required by the interpreting board in cases where the diagnosis is doubtful. A satisfactory roentgenogram is deemed to be one that is technically satisfactory for diagnostic purposes, as determined by a board of competent chest specialists and roentgenologists. Roentgenograms shall be interpreted by a board appointed for this purpose by the State Director of Health. This Board shall consist of the State Tuberculosis Control Officer, who shall act as Secretary to the Board, and ten recognized specialists in tuberculosis of X-ray diagnosis who shall serve without compensation but who, if residing outside Seattle, may collect necessary traveling expenses incurred in attendance at board meetings. The Secretary and two other members of the Board shall constitute a quorum at any meeting."

"Roentgenograms unsatisfactory for diagnostic purposes shall be returned to the physician or agency by whom they were made and said physician or agency shall submit a satisfactory roentgenogram of the chest to the State Department of Health without additional charge to the employee. Each employee shall receive a report of findings of his or her roentgenogram and each Doctor of Medicine submitting the roentgenogram shall receive a duplicate report. The health certificate shall show the date of issuance and the date of expiration and shall be forwarded by the State Department of Health to the employee who shall file the certificate with the County Superintendent of Schools except in districts of the first class, when said certificate shall be filed with the City Superintendent of Schools. Whenever an employee transfers from one district to another, the local superintendent of schools shall remit to the employee his or her health certificate, which shall be filed with the Superintendent of Schools in the new locality."

The State Department of Health is quite satisfied that the use of the tuberculin test has not been to the advantage of the program. From an economic standpoint, both as effects the school employees and the State Department of Health, the tuberculin test could well be dropped and in its place routine Roentgenography be substituted. The question of gross inaccuracies could then be reasonably dispelled.

It is not too optimistic to say that the result of the first year of this rather radical change in school health examinations has been highly successful. Such an undertaking has had, as was expected, many obstacles in its path. Misunderstandings as regards examinee and examinor were expected and occurred in liberal quantities. Further, misunderstandings between school authorities and the State Department of Health were not infrequent. All of these have fortunately been turned into constructive use for the future and the year of 1941 should see the burden of administration of this program materially lessened. If the tuberculin test is abandoned, administration difficulties will be halved,

Growing out of the school employees program has been an intimate cooperation and understanding between physicians engaged in private practice and the State Department of Health. Approximately 10,000 roentgenograms were interpreted by the Reviewing Board and not one dollar in salary was paid to the members of the board. This speaks well indeed for physicians in the State of Washington as regards their attitude in the interests of good health. While ten members comprise the reviewing board at any one time, a total of 17 have given service for all or part of the year,

Late in the year of 1939 a radiological technician was hired to devote his whole time to the task of improving the quality of the X-ray films taken by private physicians as well as hospitals - both private and public. It is the belief of this Department that most cases of tuberculosis present themselves first to the private physician. Any help given to him in making early diagnosis of these cases would seem to make for good public health practice in the end, This technician travels over the whole state calling upon physicians and institutions and working with them in attempting to improve the quality of chest roentgenograms, The results of his efforts are seen in the effect it has had on the quality of school employee examination X-rays. At the beginning of the year, when roentgenograms on school employees first began, upwards to 40% of certain batches of films reviewed by the Board were rejected. At the close of the year less than 5% of the films taken from all over the state were found to be technically of poor quality. Two things have been accomplished thereby; many physicians have learned better X-ray technique and what constitutes a fine detailed chest film, There is a constant demand by the doctors in this state for this service.

The year of 1940 marked the time when the state institutions and the State Department of Health joined in a tuberculosis survey and con-

trol program for the institutions. This includes one of the two custodial schools and the three psychiatric hospitals. This work will continue indefinitely. It is indeed no small task and will probably prove an endless one as it is planned that new admissions shall have chest roentgenograms and as funds permit, scheduled refilming will be done of old admissions. Employees are being studied as well as patients of the institutions. The unusually large number of manifest tuberculous findings in state institutions, as compared to the general public, has been apparent to investigators for many years. The Washington State institutions have similar findings. A positive need for this particular work was evident from the beginning when the X-ray revealed many cases not previously diagnosed.

The cooperation of the institutions and the State Department of Health is as follows: The doctors in charge of the institution's medical problems secure X-ray films on their patients and employees in association with other medical duties. Then when about 200 or more films have accrued, the State Department of Health's Tuberculosis Control Officer is notified. The latter then calls at the institution and takes charge of the interpretation of the films and at the same time makes recommendations as to the disposition of cases with manifest disease or X-ray findings of a questionable nature. This system has proved to be harmonious to all concerned.

SUMMARY

The last two years, 1939, and 1940, have seen a slight decline in the tuberculosis death rate in the State of Washington. This does not mean our tuberculosis problem is declining. On the contrary, as we know more scientific truths about the control of tuberculosis, our problem of application becomes greater.

These two years have given a new clinic idea to the state. Likewise, a new and effective means of tuberculosis control in the schools has been instituted. Through this later program the physicians throughout the state have had a better understanding of the diagnostic problems of tuberculosis.

The state institutions and the State Department of Health have collaborated in an institutional tuberculosis control program.

DEATHS FROM TUBERCULOSIS (ALL FORMS) IN THE STATE OF WASHINGTON BY SEX AND AGE FOR THE YEAR 1939 - ALLOCATED TO RESIDENCE OF DECEASED - FINAL TABULATION

Sex	Under 1 Year	1 to 9 Years	10 to 14 Years	15 to 19 Years	20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	65 to 74 Years	75 years and over	TOTAL
Male	3	11	8	19	25	62	67	107	83	45	26	456
Female	3	16	4	12	27	62	36	22	29	20	6	237
Total	6	27	12	31	52	124	103	129	112	65	32	693

DEATHS AND DEATH RATES PER 100,000 POPULATION FROM ALL TYPES OF TUBERCULOSIS AND FROM PULMONARY TUBERCULOSIS ALONE IN THE STATE OF WASHINGTON, THE CITY OF SEATTLE, AND THE COUNTY OF KING EXCLUSIVE OF SEATTLE FOR THE YEAR OF 1939 (Based on preliminary Census figures for 1940) AND FOR THE YEAR OF 1938 (Based on old population estimate for 1938) - ALLOCATED TO RESIDENCE OF DECEASED.

Year	State of Washington					King County exclusive of Seattle					Seattle				
	Population (Prelim. figures 1940 Census)	All Types		Pulmonary		Population (Prelim. figures 1940 Census)	All Types		Pulmonary		Population (Prelim. figures 1940 Census)	All Types		Pulmonary	
		No.	Rate	No.	Rate		No.	Rate	No.	Rate		No.	Rate	No.	Rate
1939	1,721,376	693	40.3	600	34.9	136,347	35	25.7	33	24.2	366,847	176	48.0	155	42.3
1938	Estimated Population 1938					Estimated Population 1938					Estimated Population 1938				
	1,675,000	692	41.3	596	35.6	104,090	46	44.2	42	40.3	386,850	172	44.5	148	38.2

DIVISION OF PUBLIC HEALTH ENGINEERING

Roy M. Harris, M.S., C.E., Chief

INTRODUCTION

The activities and personnel of the division for the year 1940 were the same as the previous year; however, there occurred during the course of the year several emergencies, and various special reports were made which are of special interest and deserve amplification.

In addition to the regular functional duties of the division, considerable time has been devoted to sanitation activities within the military zone adjacent to Fort Lewis and McChord Field, particularly prior to and during the August army maneuvers.

COOPERATION WITH OTHER AGENCIES

Cooperation of the division with other agencies, both official and non-official, required more of the division's time in 1940 than in previous years. The various state and federal agencies with which the division cooperates are listed in Feb. 2 of the 1939 report.

Of these the following require special mention:

Indian Service

The division assisted the Indian Service in obtaining a suitable water supply for the school at Inchelium, the former water supply having become unfit for domestic purposes as a result of the raising of the Columbia River behind Grand Coulee Dam. Assistance was also furnished the Indian Agency at Nespelem in making plans for providing an emergency water supply for use during dry weather flow and also for improvement of the existing method of sewage disposal from the agency.

Farm Security Administration

Recommendations were made for the rehabilitation of water supplies on farms receiving financial assistance from the Farm Security Administration, and special plans were worked out for making the community sanitation project available to these farms.

The division cooperated with the Farm Security Administration in the location of sites for migratory labor camps and in the preparation of plans for water supplies and sewage treatment plants for these camps. At various times assistance was given to the FSA in the field in the form of supervising the placing of sewage treatment plants in operation.

Bureau of Reclamation

During the course of the year, much time was spent by the chief of the division in active work on committees with reference to the Joint-Investigations of problems of settlement and development for the Columbia Basin Irrigation Project. The interest of the division in regard to the Columbia River Basin Project centers chiefly around the relocation of water supplies and sewage disposal facilities and in the recreational resources and needs of the basin. In connection with the latter, a report was prepared on the affect on recreational resources of the discharge of sewage from the City of Spokane into the Spokane River. The complete report on the "Pollution of the Spokane River" will be found in Appendix A.

United States Housing Authority

The national defense activities throughout the Puget Sound area have necessitated the construction of large housing projects adjacent to vital areas. The division cooperated with the housing authority in the preparation of plans for sewage disposal from the housing projects at the Sand Point Naval Air Station and Bremerton housing projects.

Army and Navy

The tremendous increase in officers and men at existing army and navy bases and the construction of new cantonments has created many problems in treatment and disposal of the sewage from these areas. During the latter months of 1940, many conferences were held with representatives of the army and navy relative to this problem, and by the end of the year plans for sewage treatment plants for Fort Lewis, McChord Field, Snohomish County Airport, Sunset Airport at Spokane, and the Sand Point Naval Air Station (separate from Sand Point Housing Project) were being prepared.

SANITATION ACTIVITIES, ARMY MANEUVER AREA - Through cooperation with the United States Public Health Service and the Surgeon General of the United States Army, the division assisted the army in matters pertaining to public health within the area in which the army maneuvers were held during the month of August.

Material assistance was given the army in sanitation of water supplies, milk supplies, food sanitation, and the sanitation of tourist camps.

Activities were directed from a temporary branch office which was set up in Olympia with a staff of fourteen, including public health engineers, sanitarians, and milk sanitarians. The branch office was in operation for the six weeks period from July 15 to August 24.

Recommendations as to the availability of satisfactory water supplies from 89 public and semi-public sources were submitted to the army, and 94 man days were expended on these water supplies. Foodhandling establishments numbering 284 were registered, with a total of 1,280 inspections. Lists of disapproved foodhandling establishments were furnished the army before the beginning of maneuvers; 150 man days were required for foodhandling establishment supervision.

The number of tourist camps registered was 117, with 167 inspections being made, requiring 23 man days.

Assistance was given to the army in obtaining satisfactory sources of milk supply, and 68 man days were devoted to this work.

Not only did the division supply the army with essential information pertaining to matters of sanitation during the army maneuvers, but personnel were trained and experience gained for placing in the field a similar organization under emergency conditions should the occasion demand.

STATE DEPARTMENT OF PUBLIC SERVICE

Close coordination with the Department of Public Service in the improvement of privately owned public water supplies from the standpoint of sanitary control, quality of water, and efficient operation was continued. In many instances public meetings were attended jointly by representatives from the Department of Public Service and the division for the purpose of settling disputes and improving the conditions referred to above.

WATER AND SEWAGE WORKS OPERATORS' SHORT-COURSE

The division again cooperated with the Oregon and Idaho State Boards of Health, the Pacific Northwest Section of the American Water Works Association, and the Oregon State College, at Corvallis, in the short-course conducted annually for water and sewage works operators in Washington, Oregon, and Idaho. The course is conducted for the purpose of training operators in the efficient and safe operation of these utilities. The staff assisted in preparation of the course and an assistant engineer delivered lectures for the 1940 short school, held at Corvallis, Oregon.

PUBLIC HEALTH ENGINEEEING ACTIVITIES

The division of time for the chief public health engineer and two assistant public health engineers of the division for 1940 was as follows:

Field work	30.7%
Office	51.4%
Travel	17.9%

The division of time as to activities of the three engineers was as follows:

Water supplies	30.3%
Sewerage and sewage disposal	11.7%
General sanitation	16.9%
Miscellaneous meetings & conferences	19.4%
Special studies	15.4%
Emergencies	3.7%
Micsellaneous	2.6%
	100.0%

WATER SUPPLY SANITATION

In connection with this activity, plans for 86 projects were reviewed and approved by this department, shown in Table 1.

Conditions developed on 12 public water supplies which required emergency action by the division in order to protect the public from waterborne disease. These emergencies and the measures taken to restore the water supply to a safe condition are as follows:

TEKOA - The City of Tekoa is served by a well located in a pit adjacent to a creek. A drain had been placed in the pit leading to the creek. g An openin g existed in the top of the well between the drop-pipe and the casing. This annular opening had originally been sealed, but during the summer 1939, the pump had been pulled and the seal which was then broken was never replaced. The creek adjacent to the well had reached flood stage and this highly contaminated creek water backed up in the drain, flooded the pump pit, and overflowed the top of the well casing, thus entering the well itself. When the pump was started, this highly contaminated water was pumped into the city reservoir and distribution system.

The city became aware of the condition when muddy water was withdrawn from the service taps. An engineer from the division was immediately dispatched to Tekoa, the contaminated well was cut out of service

TABLE I.

WATER SUPPLY PLANS REVIEWED AND APPROVED, 1940

Bellingham	Water Works Improvement
"	Larson Supply Line
"	Water Supply Improvement
"	Water Main Extension
"	Water Main Installation
"	Water Main Replacement
"	" " "
"	" " "
"	" " "
"	" " "
"	" " "
"	" " "
"	" " "
Bremerton	Water Supply Improvements
Cheney	Deep-Well Turbine Pump Installation
"	Water Main Replacement and Extension
Colville	Water Main Replacement
Dayton	Water Main Installation
Eatonville	Water Main Extension
Elma	Water Main Replacement
"	Water Main Replacement
Endicott	Concrete Reservoir
Enumclaw	Water Main Extension
Ephrata	Well Site
Everson	Well Site
FSA Walla Walla Farm Workers' Camp.	Water Supply (Preliminary)
" " " " " "	Water Supply
Fircrest	Well Site
"	Water Supply Improvement
Granite Falls	Combination Well and Reservoir Site
Harrington	Deep-Well Pump Installation
"	Well Pit Construction
Illahee	Water System Replacements
Kalama	Well Sites
Kettle Falls	Well Site
King County Water District No. 20	Water Main Replacement
" " " " " 43	Pipe Line Extension
" " " " " 49	Well Site
" " " " " 59	Well Site
" " " " " 64	Well and Water System
Kitsap County, Manchester-Waterman School District	Water Supplies
Leavenworth	Chlorinator House
Longview	Filter Plant (Preliminary)
"	" "
Lynden	Water System Extensions & Replacements
Mansfield	Water Main Extension and Replacement
Moses Lake	Water Distribution System
Newport	Water Main Replacements
North Woodland	Water System
Omak	Water Main Replacement
"	Water Main Extensions
Opportunity	Water Main Replacements

Water Supply Plans Reviewed and Approved, 1940

	Water Supply Improvements & Extensions
Pateros	Water Supply
Pierce County, McChord Field	Pump House
Subdivision	Water Supply
" " " "	Watershed Improvement
Port Gamble Reservation	Water System Improvements
Raymond	Water System Improvements
St. John	Water Supply Improvements
Seattle	Well Site
Sedro Woolley	Water Main Installations
Snoqualmie	Water Main Extension
Soap Lake	Pipe Line Extension
" "	Extension to Water System
" "	Reservoir Improvement
South Bend	Low Pressure Reservoir No. 2
" "	Water Main Extension on Pingham Road
Spokane	Water Main Extension on 84th Street
Summit (Pierce County)	Water Mains, Crescent Heights District
" " "	Water Main Extension, Brown's Point Blvd.
Tacoma	Water Main Extensions
"	Water Main Extension and Replacement
Toppenish	Well Site
Tumwater	Water Main Extensions
University Place	Water System Replacements & Extensions
Vancouver	Water Supply Improvements
"	Water Main Installation
"	Water Supply, Minnehaha District
"	Well Site, Minnehaha District
"	Water Main Extension
"	Water Main Extension on Grant Street
"	Deep-Well Pump Installation
"	Reservoir
"	Water Works Project
Wilbur	Well Site
Wishram	
Woodland	
"	

the reservoir emptied and disinfected, and the entire distribution system disinfected. Recommendations were subsequently made by the division and carried out by the city in such a manner as to preclude the possibility of the supply again becoming contaminated in the manner.

HARRINGTON - Due to an unprecedented run-off in eastern Washington, several water supplies were flooded during the first week of February. An engineer provided with portable disinfection equipment made Harrington his first stop. At this city bacterial counts on the water were running high and the supply was very turbid. The initial survey indicated that the well's curbing afforded no protection from surface contamination; this condition being aggravated by a nearby creek which was in flood and the presence of a main sewer line six feet from the well. Because of other calls the engineer did not wish to tie up the department's equipment, so the chlorinator from the school district's swimming pool, which had been closed down, was borrowed and installed. The entire system was flushed and disinfected and the people advised of transpiring events by handbills.

No cases of sickness have been attributable to this incident due to the vigilance of the local health officer, who ordered the water boiled, and the cooperation of local officials in following out the recommendations of the engineer and the health officer.

This supply has now been rehabilitated so that it is fully protected against any future happenings of this nature. This reconstruction work was carried on in complete compliance with the department's recommendations shortly after the incident occurred.

DARRINGTON - The Darrington water supply is derived from a surface stream, and during the low flow in the summer the supply became insufficient to supply the needs of the town. The town was without water when the division was notified and an engineer dispatched immediately to Darrington. An emergency supply was located at an adjacent lake; pumping equipment, the necessary piping to connect the auxiliary source up with the city supply, and an emergency chlorinator were installed on the supply for the duration of its use. The division and the State Department of Public Service cooperated in restoring water service in this case.

DUVALL - The Town of Duvall for a number of years has obtained its source of water supply from a dug well. In order to provide an increase in water supply, the town drilled a well adjacent to the existing dug well. In the course of the drilling operations a shift occurred in the underground strata which cut off the flow to the dug well. The drilled well had not been completed and in a short time the city was without water. The division was notified and an engineer with emergency chlorination equipment proceeded immediately to Duvall. The town had obtained auxiliary pumping equipment in the form of a county fire truck.

The only available source of water supply was the Snoqualmie River, which is contaminated and unfit for domestic consumption without treatment. The emergency was met by using the fire pump to pump from the Snoqualmie River into the town's dug well. The emergency chlorination equipment was installed to feed chlorine into the town's pump suction, and water service was quickly restored to the town without the danger of supplying untreated river water to the consumers.

ORTING - During the summer months, the Town of Orting, which derives its water supply from springs, found itself confronted with an acute water shortage. An auxiliary source of supply was available from a small stream. Since this stream was subject to contamination the town had been advised to notify the division before using it for domestic purposes. Upon receiving word from Orting that a water shortage existed and that it was desired to place the auxiliary source in service, an engineer was detailed to Orting. An emergency chlorinator was installed on the gravity supply line leading from the stream, and a condition of water shortage and the use of contaminated surface water averted.

BUCODA - For a number of years Bucoda has obtained its water supply from a highly contaminated stream. Treatment of the supply was obtained by filtration and chlorination. The filtration and chlorination equipment had long ago outlived its usefulness, and upon recommendation of the State Department of Health, the town had under construction a drilled well. Upon completion of the well, the surface supply and filter plant were to be abandoned. During one of the routine surveys of the water supply, it was observed that the filtration and chlorination equipment had deteriorated to a point at which it was considered insufficient treatment was being obtained to render the supply safe for domestic use. Instructions were given to the water superintendent for operation of the filtration equipment to its best advantage and an emergency chlorinator was immediately installed to assure adequate disinfection of the filtered water pending completion of the well supply.

McCLEARY - The McCleary water supply is derived from a heavily contaminated stream. Treatment of the supply is by chlorination alone. During one of the routine surveys of the water supply, it was found that the chlorinator was not operating due to its failure as a result of corrosion by escaping chlorine gas. An emergency chlorinator was immediately installed for the purpose of disinfecting the supply until parts could be received and installed on the town's chlorinator to replace those that had ceased to function.

ANACORTES - MOUNT VERNON - BURLINGTON - LA CONNER- These four cities obtain their water supply from the Skagit River, a highly contaminated stream. Treatment is by coagulation, filtration, and chlorination. Severe storms occurring on the watersheds of mountain streams tributary to the Skagit had resulted in excessive amounts of clay and mud being washed into the Skagit River. The cities called upon the

division for assistance, stating that the river was running thick with mud and that it was passing through the filter plant with no apparent improvement, and being received at the service taps in that condition. An engineer immediately proceeded to Mount Vernon and found the condition as described. Under ordinary circumstances coagulation of the Skagit River water is obtained with aluminum sulphate alone. Due to the acidity of the clay which had been washed into the river, the river had lost its natural alkalinity, and coagulation with aluminum sulphate was not being accomplished; the muddy water consequently passing through the coagulation basin and filters and into the distribution system, carrying the heavy contamination of the river with it.

Satisfactory coagulation was finally obtained by the use of excessive amounts of lime in conjunction with aluminum sulphate. Upon restoring coagulation and filtration to normal at Mount Vernon, the reservoir was emptied and filled with clean finished water, one reservoir being kept in reserve for fire protection until the other was filled.

The same assistance was given to Anacortes, LaConner, and Burlington, in turn; and seventeen hours after the division had first been notified that muddy water was being received at the taps in the four cities, clear, sparkling water was being delivered to the consumers in a safe and sanitary condition.

PIERCE COUNTY SANATORIUM - On indication of contamination of the McChord Field water supply in the vicinity of the Old Hangar, as evidenced by bacteriological analyses of samples submitted to this department, an engineer from the division made an inspection of the source of water supply serving this portion of McChord Field for the purpose of determining the possible source of contamination. It was found that the troops stationed in the Old Hangar at McChord Field were obtaining their water supply from the Pierce County Sanatorium well immediately adjacent. Upon investigation it was found that the army had constructed an 80-hole latrine approximately 450 feet from the sanatorium well. The entire area is glacial moraine consisting of loose sand and gravel. Previous experiences of the division have indicated that contamination will travel for considerable distances through this type of material. Further investigation revealed the fact that the army latrine lay in a direct line with the sanatorium's well and an area in which blasting operations were conducted during the construction of McChord Field; and, further, that during the blasting operations, water in the sanatorium well had become discolored, and upon completion of blasting operations the water would again become clear. The distance from the point of blasting in this case to the well was approximately 2,000 feet and the line of flow passed directly through the site of the latrine which was later constructed by the army. Topographical conditions indicated that the ground water flow was from the latrine in the direction of the well. It was therefore concluded that the Pierce County Sanatorium well had become grossly contaminated by reason of the location of the army

latrine, 450 feet distant under unsuitable soil conditions. This conclusion was later verified by the addition of salt to the army latrine. with a subsequent increase in the salt content of the sanatorium well as determined by titration of samples collected from the well at regular intervals.

Immediately upon determining the fact that the sanatorium well was contaminated, the division recommended the installation of suitable equipment on this supply to effectively disinfect it. This recommendation was immediately carried out by the county commissioners. Reecommendations were then issued to the army for correction of the existing method of excreta disposal from the Old McChord Field Hangar. This recommendation was immediately complied with by the army.

ROADSIDE WATER SUPPLIES

The joint program between the State Highway Department and this Department for the development of roadside water supplies continued. During the year 1940 there was a slackening in the development of approved sources, but the department maintained checks on existing approved supplies and made inspections for some additional supplies which were to be developed during the slack season in road maintenance. Some existing roadside water supplies were beautified and additional sanitary facilities were provided near the sites of the fountains which materially increased their utility and added to the comfort of the travelers using Washington roads.

SEWAGE DISPOSAL AND TREATMENT

One of the primary functions of the division is the improvement of environmental sanitation by promotion of adequate sewerage systems and sewage treatment and disposal plants. This activity requires talks of an educational nature before city councils, and public and civic groups. Assistance of a technical nature for the promotion of these works is furnished municipalities in the form of methods of financing and advice in the collection of pertinent information and the preparation of preliminary plans for getting these projects presented to the voters for action. During 1940, educational and technical assistance for the development of sewerage systems and sewage treatment works was given the following cities:

Bingen
Colville
Friday Harbor
Goldendale
Grandview
Kirkland
North Kelso
Omak
Port Orchard
Pullman
Puyallup
Reardan

Klickitat
Long Beach
Morton
Neah Bay
North Bonneville
North Bremerton
Spokane
Stevenson
Tacoma
Tonasket
Vancouver
Waterville

During the year, plans for 39 sewerage and sewage disposal projects were reviewed and approved by the division as indicated in Table 2.

Nine new sewage treatment plants were completed and placed in operation and four other plants were under construction during the year. The plants that have been completed are as follows:

ISSAQUAH - This plant is designed to treat domestic sewage from a population of 1,500 plus creamery wastes from a large creamery equivalent to a population of 500. The plant will handle a peak flow of 340,000 gallons a day. The essential features of the design are bar screens, Parshall measuring flume, a mechanically equipped primary clarifier, circular trickling filter designed for a maximum application rate of 13,800,000 gallons per acre per day with recirculation of the effluent, mechanically cleaned secondary clarifier, two-stage separate sludge digestion, sand sludge drying beds, and provision for chlorination at two points through the plant and of the final effluent. Provision is also made for the application of lime to the raw sewage for the purpose of correcting any acid conditions developed by the creamery waste. The sewerage system for the town, constructed at the same time includes more than 33,000 feet of 6 to 15 inch pipe.

EPHRATA - The Ephrata sewage treatment plant is the first plant of the activated sludge type to be constructed in the state. The plant is designed for a population of 2,000 persons and a maximum flow of 200,000 gallons a day. The main features of the plant are a bar screen for the removal of coarse suspended matter, a circular primary clarifier equipped with mechanical sludge removal mechanism, a combined mechanical aerator and secondary clarifier, separate sludge digestion of the sewage solids, sand beds for the drying of the digested sludge, and chlorination at two points in the process, including the final plant effluent.

An interesting feature of the Ephrata treatment plant is that the highly clarified plant effluent is pumped to higher ground for irrigation purposes.

ORTING - Because of the topography in Orting, two plants were constructed--one to serve the north side and the other to serve the southwest side of the city. Both plants are of the Imhoff tank type and are provided with sand sludge drying beds. The north side plant serves a tributary population of 1,000 persons with a peak flow of 200,000 gallons a day. The southwest side plant serves a tributary population of

TABLE II.

SEWERAGE PLANS REVIEWED AND APPROVED, 1940

Aberdeen	Sewer Extension
Anacortes	Sewer Extension
Bellingham	Sanitary Sewer on Plymouth Drive
"	" " " Elm & Illinois Sts.
"	" " " W. Illinois & Elizabeth
"	" " " Oregon Street
Bremerton, U.S.H.A. Project	Sewerage System
Centralia	Sewer Laterals
Chehalis	Sewer Installation
Coupeville	Sewer Extensions
Enumclaw	Sewer Extension
FSA Granger Farm Workers' Camp	Sewerage System
FSA Walla Walla Farm Workers' Camp	Sewage Treatment Plant
Fircrest	Sewerage Improvement
Goldendale	Sewage Treatment (Preliminary)
Kitsap County, Manchester-Waterman School District	Sewage Disposal Systems
Lewis County Tuberculosis Sanatorium	Sewage Treatment Plant (Preliminary)
North Beach	Sewage Treatment Plant
North Kelso	Sewerage District
Omak	Sewerage System
Port Orchard	Sewerage System
Pullman	Sewage Treatment (Preliminary)
Raymond	Sewerage System for Ellis Gardens
"	Sewer Extension
Sand Point, U.S.H.A. Project	Sewage Treatment Plant
Seattle	Henderson Street Trunk Sewer
"	Temporary Sewage Treatment Plant
Sedro Woolley	Sewage Treatment Plant (Preliminary)
Tacoma	Sewer Installation
"	Blanket Storm and Sanitary Sewer Project
"	Sewers, Franklin Lake District
"	Sewers, L.I.D. No. 1739
"	Buckley Gulch Outfall Sewer
"	Sewer Reconstruction
"	Sanitary Sewer
"	" "
"	" "
Whatcom County Hospital	Sewage Disposal
Yakima, (J. M. Perry Institute)	Sewage Treatment Plant

600 persons with a peak of 150,000 gallons a day. Both plants are provided with screens for the removal of coarse suspended solids and provision is made for reversal of flow in the flowing-through compartments of both plants.

RICHMOND BEACH - The Richmond Beach sewerage system and sewage disposal plant, constructed by King County Sewer and Drainage District No. 3, provides for comminution and chlorination of the sewage before discharge into Puget Sound with an outfall elevation at 40 feet below extreme low tide.

COWLITZ COUNTY HOSPITAL - The institution's sewage had formerly been disposed of by means of a septic tank. The tank had become grossly overloaded and had ceased to function properly with a resultant failure of the disposal field. For some considerable time sewage had been flowing over the surface of the ground in the vicinity of the institution and adjacent residences. The Cowlitz-Wahkiakum County Health Department assisted the county commissioners in reconstructing the old plant to provide a suitable means of sewage disposal. The county sanitary engineer, in redesigning the old plant, made use of the existing units as much as was practicable. The final design embodied preliminary sedimentation with application of the settled sewage on contact beds and subsequent chlorination before discharge to the Cowlitz River.

GRAND MOUND STATE SCHOOL FOR GIRLS - The sewage disposal system provides for the domestic sewage from 120 persons. The disposal system includes bar screens, septic tank, two alternating automatic sewage dosing siphons, and 1,750 lineal feet of subsurface disposal field.

FARM SECURITY ADMINISTRATION MIGRATORY LABOR CAMPS - Sewage disposal plants were constructed during the year for migratory labor camps at Yakima, Granger, and Walla Walla. The essential features of design for each one of the plants are as follows:

Yakima - This plant was designed for 1,750 persons, with an average daily sewage discharge of 87,500 gallons. Treatment is provided by sedimentation in an Imhoff tank, secondary treatment of the settled sewage on a trickling filter, final sedimentation, and chlorination. Sludge drying beds are provided.

Granger - The Granger plant is designed for 850 persons, with an average sewage flow of 42,500 gallons a day. In this case, the Farm security Administration desired to use subsurface disposal rather than secondary treatment, and the resulting design provided for preliminary sedimentation by Imhoff tanks, automatic sewage dosing siphon, and final disposal by subsurface irrigation.

Walla Walla - This plant is designed to serve 760 persons with an average domestic sewage flow of 38,000 gallons a day. The essential features of design include bar screen, Parshall measuring flume, primary sedimentation with a Dortmund-type tank, secondary treatment by trickling filter with provision for recirculation of the plant effluent, secondary sedimentation by a Dortmund-type tank, separate sludge digestion, sludge drying beds, and chlorination of the plant effluent.

The following treatment plants were placed under construction during 1940, and it is anticipated that they will be completed during 1941:

SAND POINT HOUSING PROJECT, at Seattle - Complete treatment by activated sludge process.

THE J.M.PERRY INSTITUTE, at Yakima - Preliminary sedimentation by clarigester and secondary treatment by single-stage biofiltration with chlorination.

KING COUNTY SEWER AND DRAINAGE DISTRICT NO. 2, at North Beach - Preliminary treatment with Imhoff tank and chlorination.

WHATCOM COUNTY HOSPITAL - Complete treatment with Imhoff tank and standard trickling filter with chlorination.

The unusual practice of making field visits to sewage treatment plants for the purpose of assisting the operators in making routine sewage analysis determinations for evaluation of plant efficiencies and for assisting and instructing operators in efficient methods of plant operation were carried out at most of the plants. Due to limited personnel, it was not possible to provide the amount of plant supervision which would be desirable.

DEVELOPMENT OF SEWAGE TREATMENT

Fig. 5 of the 1939 report illustrates the increase in municipal sewage treatment facilities during that year, with 1940 indicated for those plants which were then under construction. With the completion of the Issaquah, Ephrata, Orting, and Richmond Beach plants in 1940, the population served was increased to 137,400, or approximately 13.7 per cent of the urban sewered population.

INDUSTRIAL WASTES AND STREAM POLLUTION

STATE POLLUTION COMMISSION ACTIVITY - The state Director of Health is a member of the State Pollution Commission, and the chief of the Division of Public Health Engineering is a member of the technical advisory staff to the State Pollution Commission. During the year, the major activities of the pollution commission that consumed time of the chief of the division are as follows:

Study of the Pollution in Grays Harbor - The majority of the field work in the study of Grays Harbor was concluded near the end of 1939, and during the forepart of 1940 the field staff was engaged in compiling these data into a publication entitled "The Occurrence and Cause of Pollution in Grays Harbor." This publication, known as Pollution Series --Bulletin No. 2, contains 100 printed pages and was issued June, 1940. This report established the degree of pollution and made certain recommendations with regard to correction of existing conditions.

During the summer of 1940, certain rechecks on the pollution in Grays Harbor were made by the field staff, and the engineers of this division together with the State Fisheries Department personnel were engaged in cooperative studies with representatives of the Grays Harbor Division of Rayonier, Incorporated, to determine means of correcting the existing pollution.

Pollution Studies, Everett Harbor - During the majority of the year 1940, the field staff was engaged in studying the pollution in Everett Harbor, and considerable data were collected which will be published early in 1941.

Columbia River Joint Investigations - For a number of years the commercial fishermen in the lower Columbia River area have been registering complaints with regard to the industrial waste pollution of the Columbia River and its adverse affect upon their equipment and upon the catch of fish. This group appealed jointly to the Oregon State Sanitary Authority and the Washington State Pollution Commission for an investigation of the alleged pollution in the Columbia River. As a result of this request, joint cooperation in a survey and an interstate agreement as to the method of conducting and financing such a survey were outlined during September, and by the conclusion of the year a start was made upon a study which will probably consume at least one year's time before a detailed report of the findings can be submitted. In conducting these investigational studies, the services of a chemist, a biologist, and a bacteriologist will be employed. The work is under the immediate supervision of a joint interstate advisory committee composed of members of the technical advisory board of the State Pollution Commission and members of the advisory board of the Oregon State Sanitary Authority.

COOPERATION WITH UTAH-IDAHO SUGAR COMPANY, AT TOPPENISH- During the year, the studies that had formerly been made with the field staff of the Utah-Idaho Sugar Company on determining the effects of their wastes in the Yakima River were continued under the indirect supervision of the Division of Public Health Engineering. Considerable data with regard to the affect of these wastes on a stream were secured, as well as certain information pertaining to their methods of primary waste treatment which are being developed at this time.

PERSONNEL TRAINING IN STREAM POLLUTION ADMINISTRATION - During June, the division took advantage of an opportunity to have one of the assistant engineers trained in stream sanitation techniques through the offices of the United States Public Health Service. One of the engineers reported to the stream sanitation office of the United States Public Health Service, in Cincinnati, late in June. While he was assigned at this station, the engineer was given every opportunity to observe the procedures and techniques developed by the Service in carrying out its far-reaching Ohio River Survey. This is the first survey of an area so extensive and with such diversities of water usage. An opportunity was given to the engineer to study the success of various techniques and to observe laboratory procedures which had been devised and tested on this particular project. In addition, the rare opportunity of making a study of the methods and procedures utilized by various state agencies in the administration of a stream pollution program was afforded. It was the first time that a work of this nature has been attempted by direct contact with the various agencies and divisions of them engaged in this work. A report on the findings of this investigation was submitted to the Service, and this department is fortunate in having a copy for its own use in devising successful and well-tried policies and enabling legislation.

SWIMMING POOLS

The division followed out its established practice of securing rehabilitation of old fill-and-draw pools and securing proper operation of all pools through cooperation of local health units and by the direct inspection of the engineers of the division. Revisions improving the sanitary conditions of several pools were made throughout the state and plans were approved for two new swimming pools, at Selah and North Bend. Both of these pools embody the latest techniques for producing a satisfactory and healthful swimming place.

In addition, the division made several studies on proposed natural bathing area developments and assisted local health units in securing proper supervision of such areas.

MISCELLANEOUS ACTIVITIES

Special reports, based upon field investigations, were written on the following:

(1) ELLIOTT BAY SURVEY, Seattle - A bacteriological survey was made of a portion of Elliott Bay for the purpose of determining to what extent these waters had become contaminated as a result of the discharge of untreated domestic sewage. The complete report will be found under Appendix B.

(2) SEATTLE Y.M.C.A. SWIMMING POOL - In response to a request from the Seattle Y.M.C.A. officials, an investigation was made of the filtration and purification equipment of the pool. Recommendations were submitted for sanitary and efficient operation of the pool and its appurtenances.

(3) PULLMAN SEWAGE TREATMENT PLANT - Because of the increased state of degradation in the south fork of the Palouse River immediately below the City of Pullman, a survey was made on the efficiency of the treatment plant serving the City of Pullman and the Washington State College. This survey indicated that the existing treatment plant was grossly overloaded and that the conditions in the stream immediately and for some distance below the plant were in deplorable state. A complete report on this project indicated the relative inefficiencies of the plant, the stream condition, and made recommendations as to the size of the units which should be installed to secure good stream conditions.

(4) McNEIL ISLAND FILTER PLANT - At the request of the authorities at the federal penitentiary at McNeil Island, and of the interstate sanitary engineer of District No. 5, United States Public Health Service, one of the engineers of the department spent a week at McNeil Island on a test on the filter plant in order to determine the cause and remedy for taste and odor problems as well as corrosion which is being experienced from this water supply. The engineer was successful in finding out the causes of the undesirable features and made extensive recommendations for the refinement and treatment necessary to produce a palatable water of desirable physical qualities at all times.

(5) KING COUNTY WATER DISTRICT NO. 40 - One of the assistant engineers, in response to numerous complaints from consumers, and at the request of the commissioners of King County Water District No. 40, made a survey of the water supply serving the district. This supply, which is contained in superficial springs, was insufficient to furnish the complete water needs of the community and restrictions were applied by the district so as to conserve the water entirely for domestic use. The engineer made a survey of potential water sources in the area and recommended that the district secure an additional supply, principally by drilling a well on their existing watershed.

(6) STATE INSTITUTIONS - Surveys of the following state institutions were made with respect to water supplies, sewage disposal, garbage disposal, and general sanitation: Eastern State Hospital, Eastern State Custodial School, McKay Memorial Hospital, and the Washington State Reformatory at Monroe.

(7) CHASE LAKE SANATORIUM, Snohomish County - A complete report was made on the water supply, sewage disposal, and general sanitation of this institution.

(8) ARCADE NURSING HOME, King County - A complete report was made on the water supply sewage disposal, and general sanitation of this institution.

(9) WATERVILLE WATER SUPPLY - The City of Waterville has for the past three years been experiencing periods of water restriction during the late summer months. At the request of the city council, an engineer from the division made a complete survey of the existing water sources of the city with the view in mind of perhaps developing additional quantities of water from these existing sources. To accomplish this, a survey was made of the wells serving the city and a complete survey of the watershed was arranged. As a result of this survey, the engineer was able to indicate that additional water sources could be developed in the spring supply line; and the city undertook the project for such development work during the following summer. This, along with recommendations on protection of well supplies materially increased the safety as well as the adequacy of the Waterville supply.

(10) NOTICE TO WELL DRILLERS - During the year, a complete list of well drillers operating in the state was developed. In order to advise these drillers of the requirements of this department relative to approval of well sites and submission of plans for water works, a "Notice to Well Drillers" was prepared for distribution. The notice included sections of the rules and regulations relative to submission of plans to the department before any work is undertaken and a resume of the general requirements and policies of the department in regard to the location and development of ground water supplies.

(11) YAKIMA SWIMMING POOL CONFERENCE - The division assisted the Yakima County Health Department in a swimming pool conference held under the auspices of that department and attended by pool owners and operators throughout the Yakima Valley.

MILK SANITATION

Milk sanitation as an advisory service of the department has for its purpose the encouragement of county and city health departments to carry on a milk sanitation program for the protection of the fluid milk on the local market, and the selection of trained and qualified personnel capable of accomplishing this purpose. Assistance is given the local health departments in forming milk programs, training milk sanitarians, and assisting with special problems. Advisory assistance is given local departments in the revision of obsolete milk ordinances which have not kept pace with the milk industry.

Keeping in mind that milk is one of our most perfect foods, it also is one of the most perfect foods for propagating bacteria, and when placed in untrained hands may become a dangerous vehicle for transmitting disease. Even when one ignores the possibilities of disease transmission and only considers cleanliness, the problem is still there.

There are certain facts that must be recognized and satisfactorily met. They are: The decentralized industry with dairies on all roads and sideroads and the type of employee on these farms. To meet these problems it is necessary to carry on a continual educational program for the purpose of assisting the dairymen to produce a good grade of milk, However, in those rare cases where producers will not meet recognized minimum standards, the problem must be met by eliminating those few from the market and thus protect the public from a dangerous or unclean produce. To do this with any degree of thoroughness, constant supervision by well-trained men in public health is required. At the present time there is a ratio of one milk sanitarian to more than two thousand dairies. That ratio, according to the United States Public Health Service, should be about one to three hundred..

There were no new territories opened up for local inspection in 1940. A number of changes and replacements were made, however, that required extensive training of new men. Pullman adopted the grading ordinance and some of the dairies there are now producing Grade A milk, although the ordinance does not actually go into effect until September 1, 1941.

Among special duties performed by the milk specialist, were assisting the cities of Seattle and Tacoma in giving civil service examinations for milk sanitarians.

A school was held in Walla Walla to further acquaint the pasteurizing men of the importance of their work.

An inspection was made of the dairies of all the state institutions and recommendations made to improve them.

This department sponsored a milk sanitation seminar and was assisted by the United States Public Health Service in conducting it. Seventy-four were in attendance, registered from Alaska, British Columbia, Idaho, Oregon, and Washington. The seminar was developed to unify inspection and give a needed training to milk sanitarians.

An active part was taken in the National Defense Program in assisting the army in procuring a Grade A milk supply which would meet army regulations. This work alone took up a great deal of time, but was used in such a way that it reflected back on the civilian milk supply in most cases. With the army officials accepting inspections only from this department, or inspectors trained by this department, it has increased the demand for service and given a recognition to this phase of sanitation not previously received.

TABLE III.

ACTIVITY REPORT — MILK SANITATION

DATE	DAILY INSPECTIONS TRAINING No.	TRAINING Hrs.	SURVEY No.	SURVEY Hrs.	CONFERENCES HEALTH DEPARTMENT No.	HEALTH DEPARTMENT Hrs.	OFFICIAL CITY, ETC. No.	OFFICIAL CITY, ETC. Hrs.	INDUSTRY OTHER No.	INDUSTRY OTHER Hrs.	EDUCATIONAL LECTURES ETC. No.	LECTURES ETC. Hrs.	MEETINGS No.	MEETINGS Hrs.	OFFICE Hrs.	MISC. Hrs.	ARMY No.	ARMY Hrs.
JAN.	18	15	0	0	11	26	2	3	2	3	0	0	0	0	84	24	--	--
FEB.	64	34	0	0	6	10	1	3	6	7	1	3	0	0	55	44	--	--
MAR.	26	40	0	0	7	22	3	8	0	0	4	20	0	0	52	24	--	--
APR.	3	4	0	0	11	20	3	6	0	0	0	0	0	0	79	42	--	--
MAY	58	50	0	0	10	28	2	4	3	3	4	9	2	11	49	3	--	--
JUNE	66	56	0	0	3	5	0	0	0	0	0	0	3	20	72	6	--	--
JULY	8	8	0	0	3	4	6	22	5	10	1	1	0	0	60	31	54	47
AUG.	0	0	0	0	11	30	6	9	15	25	0	0	4	17	20	0	31	37
SEPT.	31	26	0	0	3	8	6	15	9	16	0	0	0	0	15	8	34	21
OCT.	28	36	0	0	7	16	3	3	12	23	0	0	0	0	50	8	22	14
NOV.	11	11	29	18	4	6	0	0	11	22	1	2	0	0	39	12	72	35
DEC.	0	0	0	0	7	20	1	1	11	25	1	1	4	29	47	0	63	37
TOTAL	313	280	29	18	83	195	33	74	74	134	12	36	13	77	622	202	276	191
	15.31%		.97%		10.67%		4.04%		7.32%		1.97%		4.21%		34.01%	11.06%	10.44%	

DIVISION OF TIME BY ACTIVITIES

SHELLFISH SANITATION

Inspections

Shellfish inspections for 1940 totaled 1,871: 616 inspections were made of shucking plants; 326 inspections were made of culling houses and floats; 239 shoreline inspections were made; 290 sanitary inspections were made of retail markets and fish dealers in the principal cities of the state to determine any violations of the rules and regulations of the State Board of Health pertaining to the marketing of shellfish; 214 growing area inspections were made; and 186 sanitary inspections were made of loading and shipping docks.

Laboratory Analyses

53 samples for bacteriological tests of shellfish and sea water were collected from growing areas and shucking plants and examined in the State Department of Health laboratory: 20 were sea water, 8 fresh water, 15 oysters, 5 mussels, and 5 crab meat.

Certifications

150 shellfish producers and shippers were approved: This number includes those approved for shellstock only and those approved for shucking, packing, and repacking plants only.

Health Data Cards

Health data cards were issued by the State Department of Health to 121 shellfish handlers employed in shucking, packing, and repacking plants, as well as those employed on the growing areas.

Violations

As a result of observed violations of the rules and regulations of the State Board of Health pertaining to shellfish sanitation, two confiscations were made and two shucking plant certificates suspended: 1½ sacks of Eastern oysters shipped into the state from California were confiscated due to the fact that they bore no certificate number indicating approval by the United States Public Health Service for interstate shipment; 3 gallons of shucked oysters were confiscated because of a market owner shucking oysters in front of his establishment; and 2 shucking plant certificates were suspended due to lack of adequate sterilization equipment.

TABLE 4

MONTH	INSPECTIONS						SAMPLES										
	Plants	Culling Houses & Floats	Shoreline	Markets	Growing Areas	Docks	Sea Water	Fresh Water	Oysters	Clams	Mussels	Crabs	Shrimps	Scallops	Office Days	Certificates	Health Cards
JANUARY	56	22	16	24	17	21	--	--	2	--	--	5	--	--	9	5	16
FEBRUARY	42	33	22	18	19	14	12	2	5	--	--	--	--	--	17	3	7
MARCH	51	28	19	29	17	11	--	3	4	--	--	--	--	--	9	4	--
APRIL	47	27	21	26	21	17	--	2	--	--	--	--	--	--	7	1	55
MAY	49	23	19	22	19	14	--	--	2	--	--	--	--	--	7	2	16
JUNE	44	21	16	21	14	14	--	--	--	--	1	--	--	--	9	--	12
JULY	46	24	18	24	16	12	--	--	--	--	2	--	--	--	5	51	--
AUGUST	52	32	16	13	17	14	8	--	--	--	2	--	--	--	11	46	15
SEPTEMBER	56	31	22	33	13	14	--	--	--	--	--	--	--	--	10	20	14
OCTOBER	52	26	21	27	18	19	--	1	--	--	--	--	--	--	12	11	17
NOVEMBER	63	27	23	26	21	17	--	--	--	--	--	--	--	--	9	5	11
DECEMBER	58	32	26	27	22	19	--	--	2	--	--	--	--	--	12	2	8
TOTAL	616	326	239	290	214	186	20	8	15	--	5	5	--	--	117	150	171

MATTRESS AND BEDDING INSPECTION

On December 31, 1940 there were 451 retail stores, 141 furniture factories and upholstering shops, and 76 mattress factories handling merchandise or doing work which comes under the scope of the mattress and bedding law.

It is the responsibility of the manufacturer to see that every piece of merchandise containing hidden filling material has a Washington State Department of Health label attached, properly filled in as to percentage and kinds of material used before it leaves the plant. Retail stores must check to see that this procedure has been followed before the merchandise is offered for sale. All merchandise which has had prior use must have a second hand material label attached and must be fumigated by an approved fumigation chamber before it can be sold or offered for sale. There is a total of 64 approved fumigation chambers located at strategic points throughout the state. There were 4 fumigation chambers condemned and 8 new fumigation chambers built and approved during the year.

During the year 1940, there was a total of 1,859 inspections made by one full-time inspector. There were 112 samples collected and analyzed; 136 pieces of merchandise were taken off sale because of improper labeling, returned to the manufacturer, or confiscated.

Table 5 LABELS SOLD DURING 1940

CLASSIFICATION	LARGE LABELS $15.00 a Thousand		SMALL LABELS $7.50 a Thousand		TOTAL
ALL NEW MATERIAL	399,750	$5,996.25	365,500	$2,741.25	$8,737.50
OWNERS OWN MATERIAL	30,000	450.00	2,250	33.75	483.75
USED MATERIAL	42,250	633.75	2,500	18.75	652.50
Total	472,000	$7,080.00	370,250	$2,793.75	$9,873.75

COMMUNITY SANITATION

The community sanitation program consists of a W.P.A. project sponsored by the State Department of Health for the building and installing of outside sanitary toilets. These toilets are built and installed for the purchaser without cost of labor, the only cost to the receiver of such a unit being the cost of materials.

The purpose of this program is to make this facility available to those who would not otherwise have a sanitary fly-tight toilet. In such a program the community is likewise benefited, as flies and disease know no boundaries.

The type of unit built consists of a wood curbed pit having a concrete collar, slab, and riser over which is placed a substantial building. The cribbing prevents caving and the curbing and cover keeps out flies as well as preventing rodents from burrowing into the pit. This type of unit is approved by the United States Public Health Service and has been successfully used all over the United States. It has been a very satisfactory low cost method for excreta disposal in rural and unsewered areas.

On January 29, 1940 the project for the first time was put on a state-wide basis. This meant that units could be built in centrally located plants and, if necessary, delivered in other counties. The number of projects was cut down, but the projects were so spaced throughout the state that nearly any county could be served.

During 1940, 1,630 units were installed throughout the state. The state was served by 11 plants in 8 counties, employing 141 men or an average of about 18 to a project. To date 15,256 units have been installed in Washington.

The supervision of the projects was carried on by one full-time supervisor for each project together with such part-time supervision as the local health department could give. The State Department of Health furnished one sanitary engineer to coordinate the projects and exercise overall supervision as well as consultant service.

The sudden increase in military personnel at army cantonments has called for larger quantities of milk meeting higher sanitary standards. The community sanitation project this year has been of material assistance to the milk producers in meeting the standards of excreta disposal on dairy farms as required by the army.

The resort owners have made more use of the project this year, and because of this more and more resorts are provided with improved sanitary facilities. Satisfactory resort sanitation, because of the large number of people involved, is of great importance.

Considerable assistance was given the Farm Security Administration and numerous Indian Reservations in providing these sanitary units.

While there is a great deal of work yet to be done, we feel that this project has gone a long way in solving rural sanitation needs.

TABLE VI.

COMMUNITY SANITATION ACTIVITIES DURING 1940 UNDER W.P.A.

COUNTY	NEW SANITARY PRIVIES INSTALLED	TOTAL MONTHS WORKED	TOTAL MAN HOURS	TOTAL W.P.A. EXPENDI-TURES	TOTAL SPONSOR'S CONTRI-BUTION	AVERAGE NUMBER OF MEN
Yakima	565	12	46751.50	$25276.51	$10665.50	31
Snohomish	242	12	32090.00	16730.10	4998.50	21
Whatcom	153	12	16793.00	9441.32	3460.08	12
Skagit	75	9	9688.00	5002.14	1471.86	8
King	308	10	28730.50	17914.54	5580.43	23
Clallam	56	6	7569.00	4495.91	1146.52	9
Grays Harbor	147	12	17844.00	9774.44	3028.64	12
Pierce	84	2	4986.00	2522.70	1764.00	25
TOTAL	1630	75	164452.00	$91157.66	$32115.53	141
Previous Totals	13626			$707689.34	$239687.59	
Total To Date	15256			$798847.00	$271803.12	

TABLE VII.

LOCATION OF PRIVY INSTALLATIONS DURING 1940 UNDER W.P.A.

Homes	779
Service Stations, Taverns, Stores	77
Camps, Resorts, Tourist Camps, Fair Grounds, Parks, etc.	460
Schools	26
Dairies	29
Churches, Grange Halls, etc.	40
Hop Yards, Berry Fields	103
Warehouses, Factories, Misc.	116
Total Installations	1630

TABLE VIII

SUMMARY OF ALL FIELD ACTIVITIES OF THE DIVISION OF PUBLIC HEALTH ENGINEERING

	1940
WATER SUPPLY	
Public Supply Investigations	254
Private Supply Investigations	30
Conferences Public Supplies	125
Highway Water Supply Inspections	2
Supplies Approved for Interstate Carriers	29
Supplies Prohibited for Interstate Carriers	3
Plans Reviewed and Approved	86
Emergencies	3
SEWERAGE	
Public System Investigations	56
Private System Investigations	18
Conferences Public Systems	72
Industrial Waste Investigations	9
Industrial Waste Conferences	8
Stream Pollution	See Text
Plans Reviewed and Approved	39
FOOD SANITATION	
Shellfish Inspections (Total)	1871
Shellfish Certificates Issued (Total)	150
Shellfish Growing Area Surveys	--
Milk Sanitation - Rating Surveys	2
Milk Sanitation - Dairy Inspections	313
Milk Sanitation - Dairy Inspections - Army	276
MATTRESS AND BEDDING LAW ENFORCEMENT	
Total Inspections	1859
GENERAL SANITATION ACTIVITIES	
Camp Sanitation (Tourist, Resort & Industrial)	232
Refuse Disposal Investigations	6
Institutions - Water and Sewage	28
Swimming Pool Inspections	26
Swimming Pool Plans Approved	3
Conferences and Miscellaneous Meetings	93
Conferences, Local Health Departments	92
Field Work, Local Health Departments	18
Lectures or Talks (Scheduled and Prepared)	20
Special Studies and Reports	87
Miscellaneous	32

APPENDIX A

R E P O R T O N

POLLUTION OF SPOKANE RIVER

For

COLUMBIA BASIN IRRIGATION PROJECT
JOINT INVESTIGATIONS
Problem No. 26

Pollution of the Spokane River from domestic sewage and industrial wastes has been under observation for many years by several different agencies. The City of Spokane studied the river periodically from about 1921 to 1933. An independent investigator, the late Dr. W. A. Buice, conducted bacteriological studies during 1936, and more complete studies during 1938. The State Department of Health studied the biochemical and bacteriological characteristics of the river during 1936 and 1937. A summary of these three investigations was published in the February, 1937 issue of "Northwest Science" in the form of three articles by A. D. Butler, Spokane City Engineer, Dr. W. A. Buice, and Roy M. Harris. Certain important findings and conclusions of these three papers will be summarized for the information of the Committee.

Of first consideration, are the sources of pollution. These are as follows:

1. Millwood. At this location, just above Spokane, the Inland Empire Empire Paper Mill discharges its sewage and, during a portion of the year, the mill wastes. The population equivalent of the entire output of the plant has been estimated as 115,000, based upon the biochemical oxygen demand of the wastes. During the summer months, however, the waste sulphite liquor has been used as a dust palliative on Spokane's city streets, and this has greatly reduced the pollution entering the river from this plant during periods of low flow. No estimate is available of the domestic population contributing sewage to the river at this point, but this is comparatively small.

2. City of Spokane. Spokane has approximately twenty-five sub-trunk sewers entering the river at various places, and, in addition, there are numerous small industries along the river banks which discharge their wastes directly into the stream. The population equivalent of sewage contributed by the City of Spokane is estimated to be approximately 175,000, based upon the biochemical oxygen demand of the combined wastes.

3. Fort George Wright. At Fort George Wright sewage is discharged into the river, although at the present time an attempt is being made by the State Department of Health to have the army correct this condition.

The foregoing three sources are the only significant contributors to the pollution of the Spokane River. Prior to 1939, the City of Coeur d'Alene, in Idaho, discharged raw sewage into the Spokane River, but during 1939 their sewage treatment plant went into operation and this source of pollution has now been eliminated.

There are two fundamental recognized indices of measuring pollution: One is the biochemical oxygen demand of the stream, and the other is the B. coli index. The biochemical oxygen demand is a measure of the organic matter present in an unoxidized, or unstable, form. It is the measure of the putrescrible matter present that will cause oxygen to be taken out of the water in the stream and used up for the purpose of oxidizing the contributed wastes. When the dissolved oxygen content of a stream is depleted to the point of exhaustion, the stream will be foul, offensive and unsightly. Fish life also will disappear in any water that is devoid of oxygen. If we use the B.O.D. of the Spokane River as an index of its quality, we find that the river has a remarkable power of self-purification, due, of course, to its turbulent flow. At no sampling point on the river was it found that the dissolved oxygen content was below that necessary for the proper maintenance of fish life. We may conclude, therefore, that the Spokane River does not receive sufficient wastes to produce a nuisance, nor to produce conditions inimical to fish life, provided the dissolved oxygen or the B.O.D. of the water is used as an index.

If we next consider the importance of the public health aspect of a stream pollution problem, we must consider, primarily, the bacteriological quality of the water that may be used for drinking purposes or for recreational use. These B. coli indices indicate the relative number of fecal type organisms that are present in any water. When B. coli are ejected from the human body in the feces of man, they enjoy, first, a brief and rapid growth when in contact with the sewage laden waters. This growth then decreases rapidly in the form of a unimolecular type curve. The controlling factors governing the death rate of bacteria are time and temperature. These organisms have a tendency to survive longer in colder water than they do in warmer water. If time is the most important factor in the death rate of bacteria, it is extremely important to remember that the more swiftly the stream flows, the greater will be the distance over which bacteria will be distributed. It is important to bear this fact in mind, because of the age-old fallacy that "A flowing stream purifies itself." As a means of establishing the relative degrees of bacterial pollution in the river, it might be mentioned that any sample taken from a drinking water supply must show the

total absence of B. coli to be considered as meeting the standards for purity of the U. S. Public Health Service. Also when sewage is known to be present, any water containing 10 or more B. coli per 100 c.c.'s is deemed to be unsatisfactory for natural swimming waters.

In Doctor Buice's study, samples were taken at four locations: One, above Millwood, the second, at Seven-Mile Bridge below Spokane, the third, on the Spokane River at Lincoln, and the fourth, on the Columbia River just above the junction of the Spokane River. The average B. coli index from May to November, 1936, for these four stations is as follows: Millwood, 70; Seven-Mile Bridge, 6,000; Lincoln, 170; Columbia River above junction, 8. These values, of course, show a high increase due to Spokane's sewage and also indicate a gradual decreasing of the B. coli organisms due to self-purification of the river down to the mouth of the Spokane River. They also indicate that the Columbia River above the junction is comparatively free from fecal type organisms. These values also indicate that the City of Spokane adds about eighty-five times as much sewage to the river as is contained in the stream when it enters the City from the east. It will also be noted that the concentration of B. coli organisms in the Spokane River near its mouth is about twenty-two times as great as in the Columbia River up-stream from the junction of the two. Again, it will be noted that more sewage reaches Lincoln near the mouth of the Spokane River than enters the City of Spokane. To quote from Doctor Buice's paper, "Comparing the averages of the second and third stations, it appears that approximately one thirty-fifth of the coli aerogenes (B. coli) in Spokane's sewage reach the Columbia River. It is well-known that the members of this group and the typhoid bacterium compare very favorably in their capacities to resist the unfavorable living conditions outside the human intestine. Therefore, we may justly infer that some of the typhoid organisms which find their way into Spokane's sewerage system must ultimately reach the Columbia River. In other words, theoretically, at least, there is a potential danger of Spokane's sewage carrying typhoid to swimmers and the thirsty as far as its confluence with the Columbia."

The State Department of Health, in their studies that were made during 1936, established a number of stations below the City of Spokane and on the Columbia River, as well as some control stations above the City of Spokane. For the purposes of this condensed report, a comparison of a station at the Up-River Pumping Plant (near the upper city limits) with that at the Seven-Mile Bridge will be made. In addition, another comparison between a station at Gerome on the Columbia River and at Coulee Dam will be included. Bacteriological results for these two sets of stations were treated according to mathematical probability studies and plotted on logarithmic probablility paper. From the curve

representing these data, the following values are obtained:

(a) For twenty-five per cent of the time, the Up-River station will probably exceed 60 B. coli per 100 c.c.'s; the Seven-Mile station will probably exceed 22,000 B. coli per 100 c.c.'s.

(b) For fifty per cent of the time, the Up-River station will probably exceed 8 B. Coli per 100 c.c.'s; the Seven-Mile station will probably exceed 7,000 B. coli per 100 c.c.'s.

(c) For seventy-five per cent of the time, the Up-River station will probably exceed 5 B. coli per 100 c.c.'s; the Seven-Mile station will probably exceed 1,500 B. coli per 100 c.c.'s.

This tremendous increase in the coli index indicates the influence of sewage from the City of Spokane on the Spokane River.

Another interesting comparison is between the Columbia River stations at Gerome, above the mouth of the Spokane River, and at Coulee Dam. For these two stations the comparison is as follows:

(a) For twenty-five per cent of the time, Gerome will probably exceed 8 B. coli per 100 c.c.'s; Coulee Dam will probably exceed 38 B. coli per 100 c.c.'s.

(b) For fifth per cent of the time, Gerome will probably exceed 4 B. coli per 100 c.c.'s; Coulee Dam will probably exceed 13 B. coli per 100 c.c.'s.

(c) Seventy five per cent of the time, Gerome will probably exceed 1.5 B. coli per 100 c.c.'s; Coulee Dam will probably exceed 4.5 B. coli per 100 c.c.'s.

From the above tabulation, it may be concluded that the Columbia River at Gerome is relatively free from harmful pollution. By the same token, it may be inferred that the sewage from the City of Spokane, which is contributed to the Spokane River, is to some extent reaching as far as Coulee Dam during periods of normal river flow. This does not necessarily mean that the water at Coulee Dam is highly polluted, for it is relatively clean compared with the more polluted waters in the Spokane River; but it does indicate that there is some influence of Spokane's sewage felt this far downstream from the mouth of the Spokane River.

The State Department of Health has for many years considered the Spokane River below the City of Spokane to be unsafe for recreational use. It is a recognized fact that this river is widely used for recreational purposes in spite of the fact that raw sewage is being discharged into this stream. For these reasons, the State Department of Health has repeatedly recommended and urged that the City of Spokane construct adequate intercepting and trunk sewers and satisfactory sewage treatment plants to eliminate the present harmful pollution from the river.

The city officials of Spokane were aware of their responsibility in this respect and submitted a bond issue to the voters on November 21, 1933 for the purpose of providing funds for intercepting sewers and sewage treatment plants. Because of adverse newspaper policy, the bond issue was defeated. Again on March 10, 1936, the City Commissioners submitted a proposal to the voters for authority to construct trunk and intercepting sewers and a sewage treatment plant; and,as before, adverse newspaper policy resulted in defeat of this bond issue. During the latter part of 1939, another attempt was made to secure funds from one department to enable the City of Spokane to construct the northside intercepting sewer, but this proposal was again referred to the people and, subsequently, defeated.

The State Department of Health has, according to our basic statutes, the power to order the City of Spokane to construct adequate sewage treatment facilities. However, if the expenditures for such facilities involve a bond issue, this proposal must be submitted to the voters, and if rejected by the voters, the Department of Health is powerless to enforce their order. Contempt proceedings could probably be instituted against the city officials, but this would not effect a solution to the problem. If public sentiment was not so warped against sewage treatment by Spokane's leading newspapers, it seems logical to believe that the citizens of that City would realize the importance of cleaning up the river and the moral obligation that they have for preventing the spread of their own filth to the extended areas below the City.

CONCLUSIONS

(1) Considerable data has been collected on the affect of Spokane's sewage on the Spokane River.

(2) As measured in terms of the biochemical oxygen demand of the river water itself and of the dissolved oxygen content of the water, the Spokane River is not in a putrescible state and not likely to produce a common nuisance. Also, there is sufficient oxygen available to support fish life.

(3) Bacteriological studies indicate that pollution arising from Spokane's sewage is detrimental to the public health if these waters are used for recreational purposes, particularly swimming and occasional drinking.

(4) Plans for sewage treatment plants and intercepting sewers have been considered by the voters of Spokane but have been rejected because of adverse newspaper policy.

(5) Correction of this pollution problem and the subsequent reclamation of the Spokane River for recreational use can be effected if the citizens of Spokane are made to understand their moral responsibility in this regard. This will probably only be accomplished through the leadership of influential groups, such as Chambers of Commerce and other similar organizations.

APPENDIX B

REPORT OF ELLIOTT BAY SURVEY
(Vicinity of Perkins Lane)

During October, 1940 a survey was made of the waters of Elliott Bay in the vicinity of Perkins Lane to determine the existing bacterial index. This survey was occasioned by the desire of the City of Seattle to construct a new sewer outfall at the foot of West Halladay Street and the protests of such an action by certain residents living near that location.

The survey was made by Robert E. Leaver, Jr. Public Health Engineer of the State Department of Health, and D. A. Anderson, of the City Engineer's office. In order to secure representative samples for both high and low tides the following schedule was established:

TABLE I - SCHEDULE FOR COLLECTING SAMPLES

Tuesday, October 1, 1940

Low Tide	10:15 A.M.
High Tide	4:00 P.M.

Wednesday, October 2, 1940

Low Tide	10:45 A.M.
High Tide	4:45 P.M.

Monday, October 7, 1940

High Tide	10:00 A.M.

Tuesday, October 8, 1940

High Tide	11:30 A.M.

Monday, October 14, 1940

Low Tide	9:30 A.M.
High Tide	3:30 P.M.

Monday, October 21, 1940

High Tide	9:30 A.M.

Tuesday, October 28, 1940

Low Tide	9:00 A.M.
High Tide	2:45 P.M.

At all stations the low tide samples were collected at a point offshore where the estimated water depth was thirty feet, and the high tide samples were collected near shore. All samples were collected just below the surface.

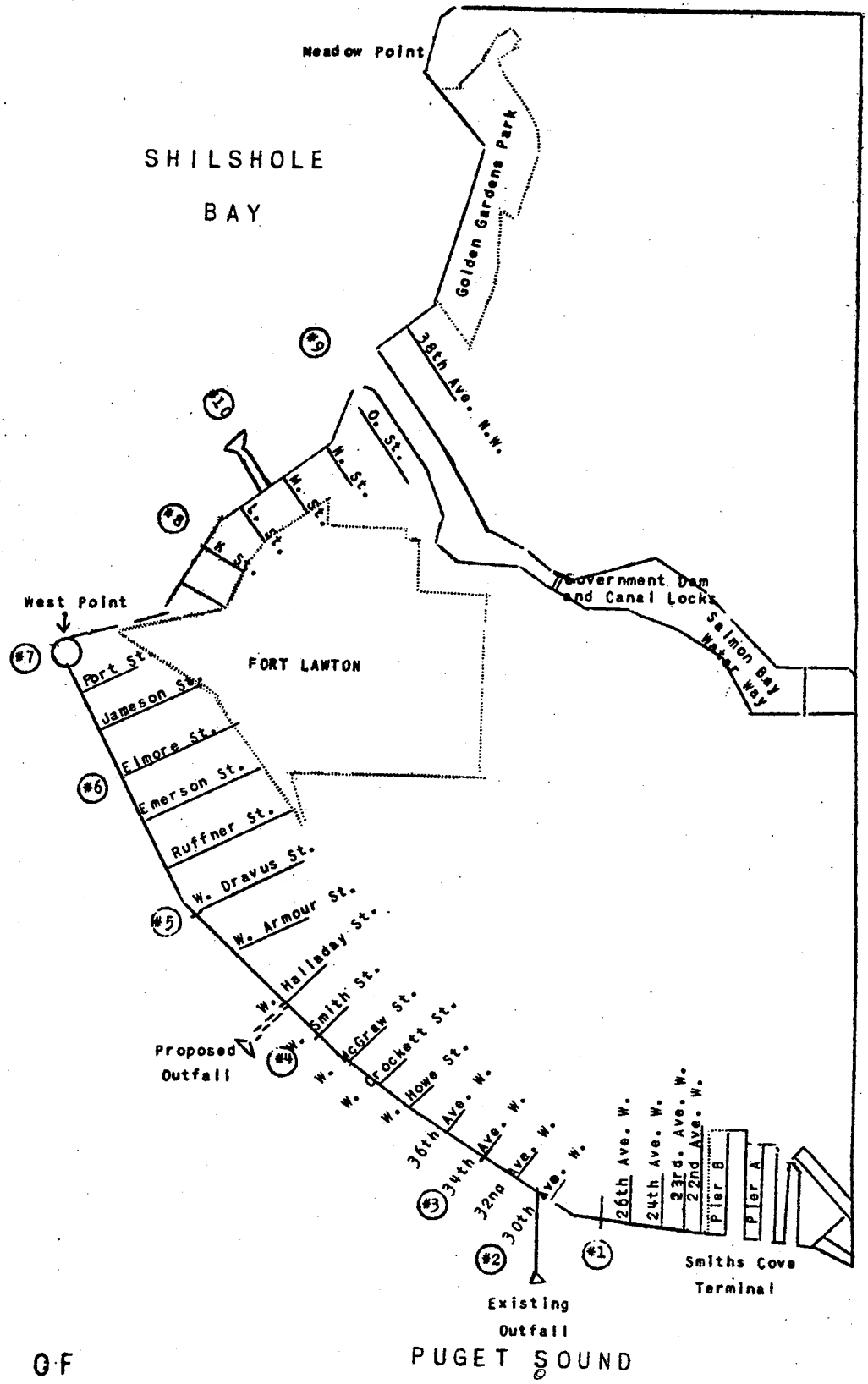
Samples were collected at the stations shown on the attached map and described in Table II. Stations 1 to 5, inclusive, were the principal sampling points.

TABLE II - SAMPLING POINTS

1. At the end of 28th Street; white cross-arm triangulation point and chicken yard as guide.
2. At the end of 32nd Street outfall sewer.
3. West of 32nd Street, approximately where 35th Street would intersect the bay. A point between two clusters of piles was used as a guide mark.
4. Lighthouse Rock.
5. Directly out from the house of Mr. Charles Smith, 2643 Perkins.
6. Half way between lighthouse and West Point Lighthouse, about one mile off shore in 20 feet of water.
7. Near buoy off West Point Lighthouse, approximately one-half mile from shore.
8. Off the end of K Street in deep water.
9. Near lighthouse in the Salmon Bay Channel.
10. One-hundred feet off the end of a large outfall sewer near Salmon Channel Lighthouse.

Samples were run in the Division of Laboratories of the State Department of Health in accordance with the procedure outlined by Standard Methods. The results of these analyses are shown in Table III. Results of the B. Coli test are shown as number of organisms per 100 c.c. of sample. The 20°C. and 37°C. tests are recorded as number of organisms growing on the particular media per c.c. of sample incubated at the indicated temperatures.

It might be pointed out that the B. Coli group represents a measure of fecal contamination always associated with domestic sewage. These organisms come from the intestinal tract of man.



MAP OF
SAMPLING POINTS

TABLE III - RESULTS OF BACTERIOLOGICAL SAMPLES

SAMPLING STATIONS

	#1		#2		#3		#4		#5	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
10-1-40	#4101	#4110	#4102	#4111	#4103	#4112	#4104	#4113	#4105	#4114
B. $_o$COLI	10,000	1,000	10,000	1,000	10,000	100	10,000	1,000	1,000	100
37$_o$BACT.	160	100	360	26	150	60	250	20	150	40
20 BACT.	360	1,200	500	800	400	660	5,100	2,400	3,200	1,300
10-2-40	#4141	#4159	#4142	#4160	#4143	#4161	#4144	#4162	#4143	#4163
B. $_o$COLI	10,000	10,000	1,000	10,000	10,000	10,000	1,000	1,000	100	100
37$_o$BACT.	300	40	140	40	1,440	80	120	80	8	60
20 BACT.	600	1,200	360	360	1,400	360	500	1,700	80	1,100
10-7-40		#4208		#4209		#4210		#4211		#4212
B. $_o$COLI		1,000		10,000		100		1,000		1,000
37$_o$BACT.		60		200		30		15		32
20 BACT.		240		480		130		66		2,280
10-8-40		#4230		#4231		#4232		#4233		#4234
B. $_o$COLI		100		10,000		100		100		100
37$_o$BACT.		20		40		24		21		12
20 BACT.		240		300		180		360		300
10-14-40	#4331	#4341	#4332	#4342	#4333	#4343	#4334	#4344	#4335	#4345
B. $_o$COLI	1,000	1,000	1,000	10,000	1,000	1,000	10,000	1,000	100	1,000
37$_o$BACT.	240	720	500	300	420	200	240	80	60	60
20 BACT.	1,260	1,080	2,000	450	1,440	600	840	720	200	1,500
10-21-40		#4474		#4475		#4476		#4477		#4478
B. $_o$COLI		10,000		10,000		1,000		1,000		10,000
37$_o$BACT.		300		260		140		240		480
20 BACT.		1,200		1,080		3,600		1,700		10,000
10-29-40	#4610	#4639		#4640	#4612	#4641	#4613	#4642	#4614	#4643
B. $_o$COLI	10,000	1,000		10,000	1,000	1,000	1,000	1,000	10,000	1,000
37$_o$BACT.	100	240		180	180	1,700	110	300	300	540
20 BACT.	4,100	10,000		5,400	2,100	10,000	2,700	5,000	3,000	6,000

	#6		#7		#8		#9		#10	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
10-14-40	#4336		#4337		#4338		#4339		#4340	
B. $_o$COLI	1,000		1,000		10,000		1,000		100,000	
37$_o$BACT.	24		24		1,560		210		36,000	
20 BACT.	300		70		2,700		360		90,000	

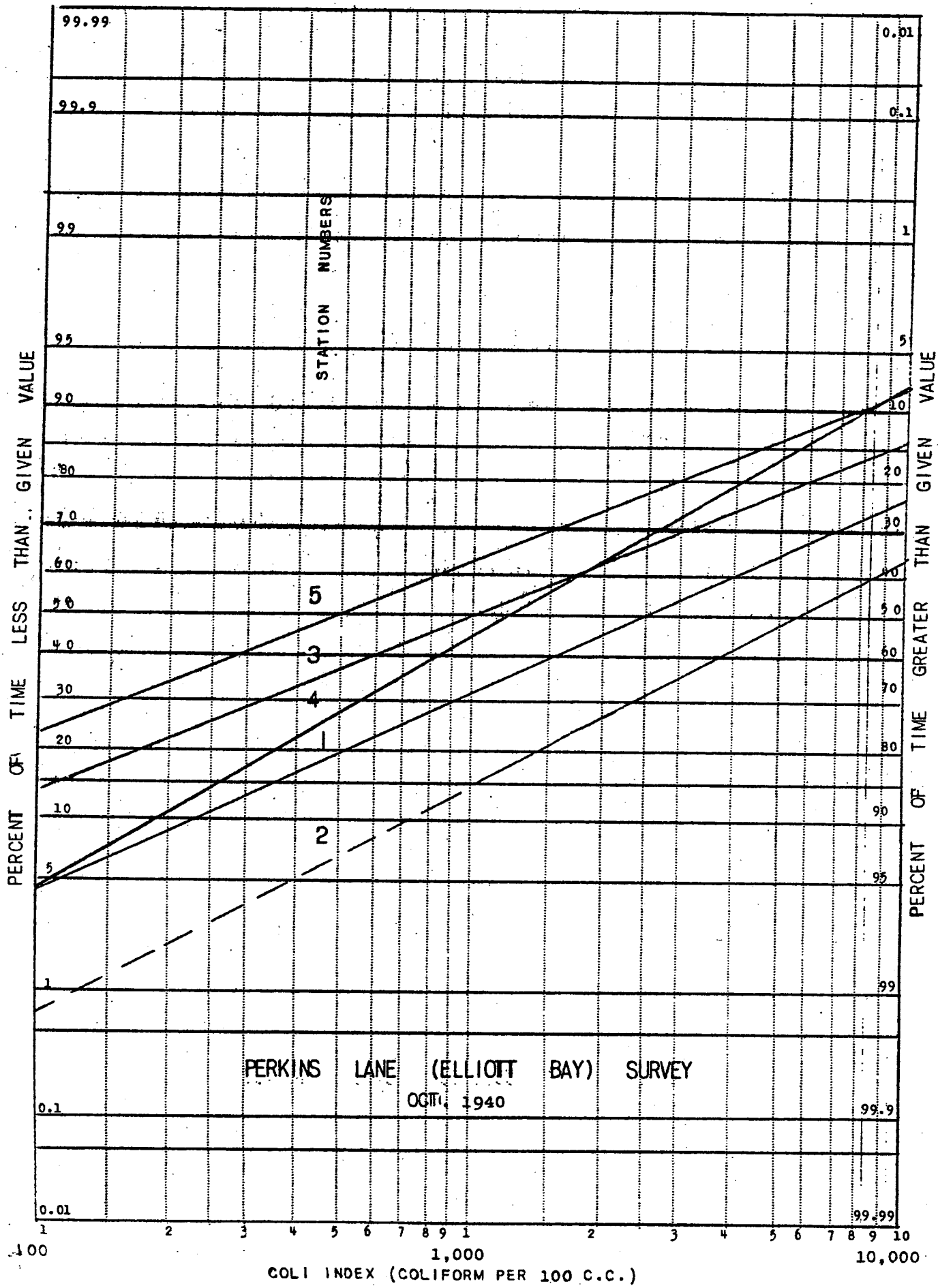


FIG. 1 — COLI INDEX OF PRINCIPAL SAMPLING STATIONS

RESULTS OF SURVEY

Figure 1 indicates the probable B. Coli index (number of B. Coli organisms per 100 c.c.) as found from analyses of the collected samples. These data were treated as probability curves and plotted as straight lines on logarithmic-probability paper.

Station 2, near the existing outfall, naturally shows the highest degree of contamination, with Stations 1 and 3 on each side of the outfall, as well as Station 4, showing somewhat lower counts. Even Station 5, at some distance from the present outfall, shows a B. Coli index higher than that usually allowed for safe natural bathing places.

Table IV gives certain points on these curves for comparative purposes:

TABLE IV - COMPARATIVE SCORES FOR PRINCIPAL SAMPLING STATIONS

Station Number	Percent of time indicated results will probably be exceeded		
	25%	50%	75%
	B. Coli Index		
2	10,000	5,600	1,800
1	9,000	2,500	700
3	4,200	1,000	250
4	4,500	1,300	450
5	2,000	500	100

CONCLUSIONS

(1) Sufficient untreated sewage is going into Elliott Bay at the present time to render the area studied as unsafe for bathing.

(2) The disposal of any additional untreated sewage in this area would increase the present bacterial load.

DIVISION OF VITAL STATISTICS

Francis D. Rhoads, M. A.

GENERAL OFFICE ROUTINE 1940

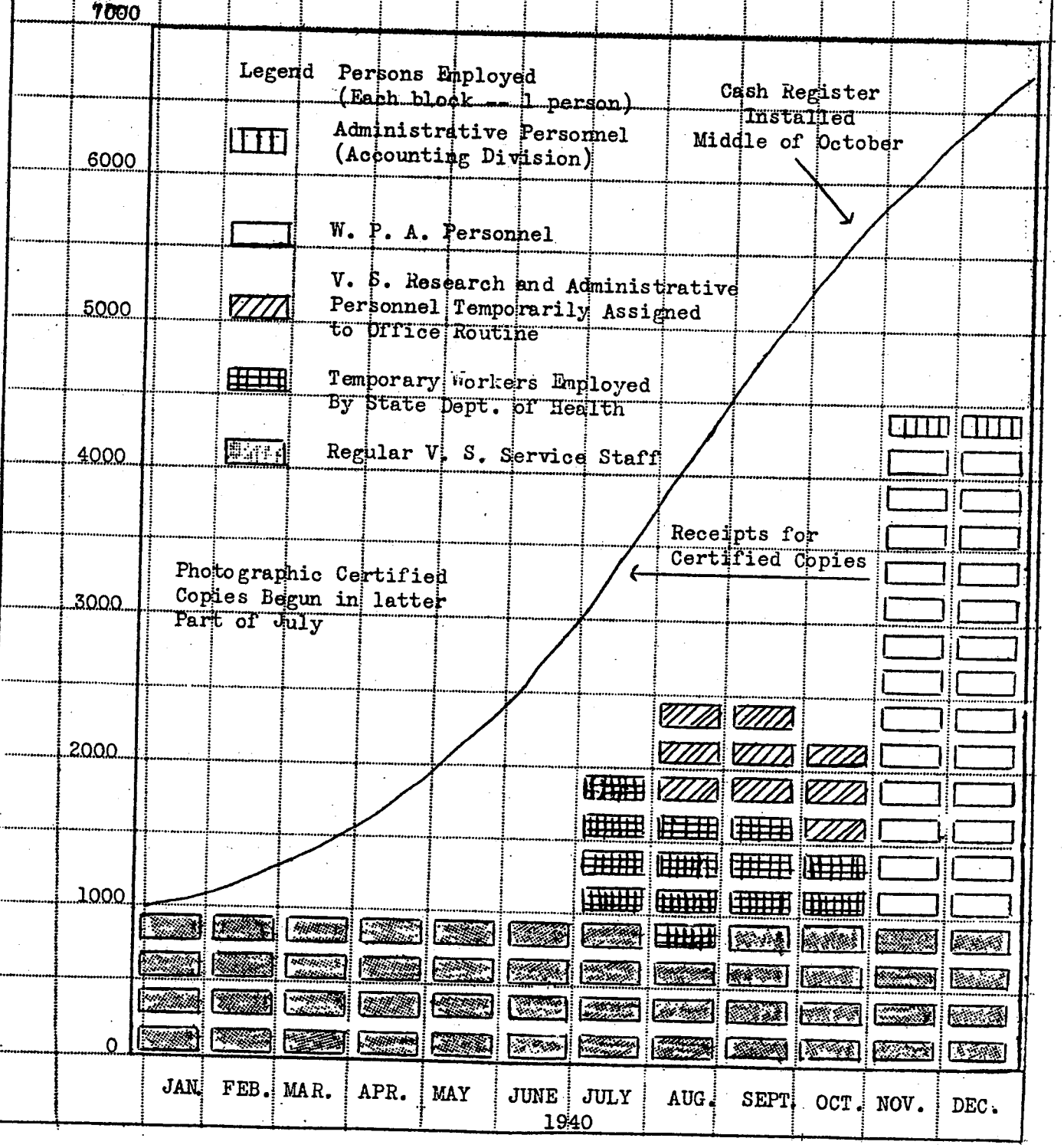
The most significant development in the Division of Vital Statistics, as far as operations were concerned for the year 1940, was the overwhelming demand beginning about the middle of the year, for certified copies of birth certificates. This was largely as a result of the activities of wartime industries and the national defense program.

The accompanying table and Graph I illustrate the emergency nature of the work from the month of June on. Needless to say, the regular staff was in no way able to keep up with the demand, and issuance of certified copies was at times as much as six weeks behind, even though members of the staff assigned to other tasks were taken from their regular occupations and placed on certification work, and a great many persons worked constantly overtime Saturday afternoons and evenings. Four additional persons were hired on a temporary basis in July, this number being reduced to three late in August, but even they were not able to keep pace with the current demand, or to catch up the work which was behind, but it was felt that a very material increase in efficiency had been brought about through more effective organization of office procedures to take care of larger volume and by the addition of labor saving machinery. Adoption of the photostat principle of reproducing certified copies in July of 1940 and the installation of a cash register system in October of that year materially reduced the amount of actual labor and made it possible to handle large volumes of material in a systematic and orderly fashion. Assistance was also extended in October from the Central Administration to the Division in that one person was made available in the accounting division to take care of the financial end of the certification and search of records. It was only in the month of November, when additional help was made available through a W.P.A. grant that the accumulation of back work was reduced to the extent that by the first of January, 1941, routine operations of the Division were once again on a normal footing.

This task was made easier through reason of the fact that the peak of the demand, which occurred during the middle of October, declined materially during the rest of the year. (See Graph II) During the month of November and December an average of thirteen people paid out of Federal funds through the Works Progress Administration were actively engaged in assistance to the State Registrar in handling requests for certificates of birth and for the filing of delayed registration of birth.

GRAPH I

RECEIPTS FOR CERTIFIED COPIES OF BIRTHS AND DEATHS ISSUED IN THE DIVISION OF VITAL STATISTICS BY QUARTERS, 1940 AND NUMBER OF PERSONS EMPLOYED BY TYPE FOR THE SAME PERIOD



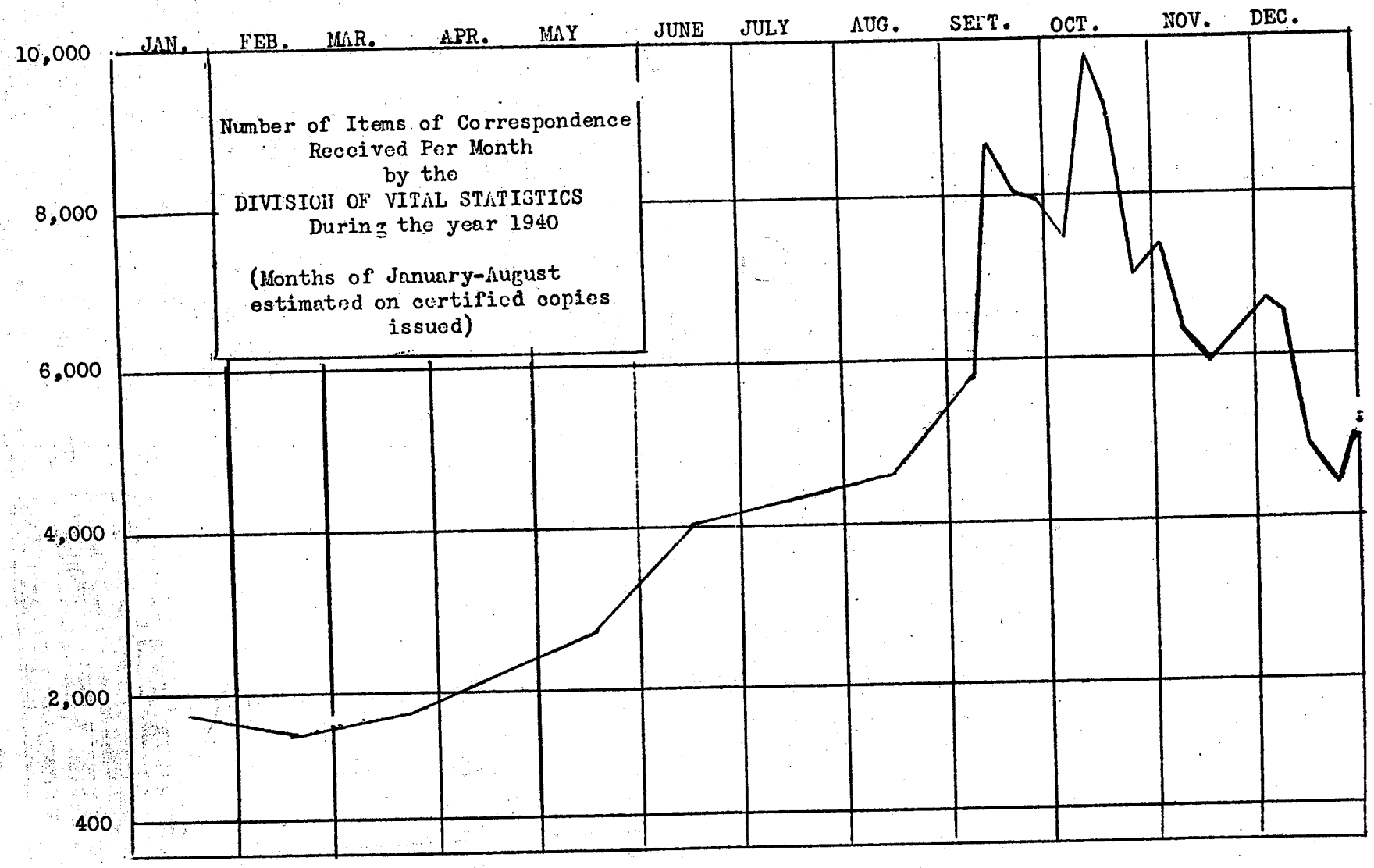

JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
10,000
8,000
6,000
4,000
2,000
400
Number of Items of Correspondence
Received Per Month
by the
DIVISION OF VITAL STATISTICS
During the year 1940
(Months of January-August
estimated on certified copies
issued)

TABLE I

RECEIPTS FROM CERTIFIED COPIES OF BIRTHS AND DEATHS

ISSUED BY THE DIVISION OF VITAL STATISTICS BY QUARTERS

- 1940 -

QUARTER	CERTIFIED COPIES ISSUED	AMOUNT RECEIVED
1st	2,423	1,211.50
2nd	4,440	2,220.00
3rd	8,520	4,260.00
4th	12,320	6,160.00
TOTAL YEAR	27,703	13,851.00

TABLE II.

NUMBER OF ITEMS OF CORRESPONDENCE RECEIVED FOR MONTH BY THE DIVISION OF VITAL STATISTICS DURING THE YEAR 1940

MONTH	NUMBER OF CERTIFIED COPIES	OTHER CORRESPONDENCE	TOTAL
JANUARY	825	825*	1,650*
FEBRUARY	764	764*	1,528*
MARCH	812	812*	1,624*
APRIL	1,050	1,050*	2,100*
MAY	1,350	1,350*	2,700*
JUNE	2,016	2,016*	4,032*
JULY	2,160	2,160*	4,320*
AUGUST	2,350	2,350*	4,700*
SEPTEMBER	3,201	3,836*	4,700*
1st week	665	746	1,411
2nd week	800	1,184	1,984
3rd week	838	1,000	1,838
4th week	898	906	1,804
OCTOBER	3,603	3,931	1,534
1st week	917	789	1,706
2nd week	1,096	1,111	2,207
3rd week	840	1,180	2,020
4th week	750	851	1,601
NOVEMBER	2,581	3,342	5,923
1st week	808	867	1,675
2nd week	595	840	1,435
3rd week	523	816	1,339
4th week	655	819	1,474
DECEMBER	2,237	2,705	4,942
1st week	564	932	1,496
2nd week	641	722	1,363
3rd week	533	554	1,087
4th week	499	497	996
TOTAL	22,949	25,141	48,090

*Estimated on Ratio of Certified Copies to total items handled August 15, 1940 to January 15, 1941.

Another indication of the excessive demand made upon the Division is seen in the fact that during the year 1940 $13,851.50 was transmitted to the State Treasurer for certified copies of births and deaths issued, whereas in 1939 only $3,885.00 was so transmitted, and in 1938 $3,087.50.

Difficulty in the payment of fees to Local Registrars, which had arisen in 1939, also continued to be troublesome in 1940. Principal difficulty had been the contention on the part of some of the auditors that since statements had not been presented before the 10th of January on fees due local registrars for the preceeding quarter, payment could not be made during the year 1940 but was laid over until 1941. The Department's position was that it was following the Vital Statistics Act which provided that statements should be made to the County Auditors during the month following the quarter, which had in this case been done, and that it was impossible to certify earlier than the 15th of the month inasmuch as reports from the local registrars were not received before that time. This position was confirmed by the Attorney General who ruled in a decision, as of May the 3rd, 1940, that County Auditors must pay local registrars from funds which they must find. In order to obviate this difficulty occurring in 1942, the State Registrar asked all registrars to report early in order that certifications might be made to the auditors of the State early in the month of January. This was accordingly done and it is anticipated that no further difficulty will arise.

STATISTICAL REPORT 1940

Since detailed figures for the year 1940 are not as yet available, effort will be made to give only the roughest idea of the number of births and deaths for the year as far as statistical tabulations are concerned. Certificates received in this office up to and including The 31st of January, 1941 are as follows: Births, 27,512; Deaths, 19,964. These figures only tentatively indicate a trend, and are not in any way indicative of what the final result will be, inasmuch as certification for the last ten days of 1940 is not received in this office until the first part of February. For detailed rates and statistical information concerning mortality and natality we refer the reader to the forthcoming series of special bulletins which will be issued during the year 1941, and will set forth salient information concerning the statistical activities of the year 1940.

Bulletins issued during 1940 include Volume I, No. 3, "Cancer Deaths in Washington" and Volume I, No. 4, "Births and Deaths in Washington" was compiled in December of 1940, but it was not yet mimeographed at the end of the year's period.

In addition to Works Progress Administration service rendered this Division to help the State Registrar in certification of births and deaths and in registering births, Project assistance was also afforded

in May of 1940 for the purpose of re-indexing the state's birth and death records from July 1, 1907, when they were first centralized with the State Department of Health, to December 31, 1939. An average of seventy-five people have been engaged in this work since June of 1940. The birth index at the end of December, 1940, had been completed up to and through the year 1929. Indexing is carried on by means of typing of names on punch cards, sorting them mechanically, arranging and racking them, and photographing them on sheets. The completed index will be in ledger form and will take the place of the card files now used, which are difficult to use, inaccurate, and antiquated. The Project was set up for a year's time and will continue until May of 1941.

DIVISION OF MATERNAL & CHILD HYGIENE

Percy F. Guy, M. D., M. P. H.

The activities of the Maternal and Child Hygiene Division of the Washington State Department of Health continued in 1940 as in 1939 with certain exceptions. The changes that have taken place can best be understood by comparing this report with that of 1939.

By way of introduction, attention is called to the following: First, the Dental Consultant resigned July 1 and a suitable replacement was not found during the remainder of the year. Second, the program for medical care and hospitalization of borderline maternity cases in Snohomish County became a fact in February 1940. Third, a Maternal Health Center went into operation at the office of the Spokane County Health Department in April, 1940, and in addition, two Child Health Centers were established, one at Deer Park in April and one at Cheney in May. The Maternal & Child Health Centers for Clark County referred to in the 1939 report started in January 1940.

MATERNAL & CHILD HEALTH CENTERS

The Maternal & Child Health Centers provide a means of furnishing actual medical service to expectant mothers, children and infants, but they may be looked upon as having a more important function. The Maternal Health Centers, for example, serve as a demonstration of the desirability of early and adequate prenatal care. This Division with the close cooperation of the MCH Medical Advisory Committee (Committee of Eight) is interested in making prenatal care the habit of the community. There are a number of methods of promoting health education of this sort but it would seem logical that a demonstration can be more effective than most of the other methods at our disposal.

The Maternal Health Center at the Spokane County Health Office opened in April and during the remainder of the year 660 medical examinations were made on prenatal and postnatal cases. The Child Health Center at Deer Park went into operation in April and during the remainder of the year 152 children and infants were examined. The Child Health Center in Cheney opened in May and 65 examinations of children and infants were made from then to the end of the year.

The Clark County Maternal & Child Health Centers opened in Vancouver in January and 170 and 337 medical examinations were made respectively during 1940.

The Maternal Health Centers at Everett and Granite Falls, which were established in 1939, continued throughout 1940. There were 130 prenatal and postnatal medical examinations at the Center in Everett at the office of the Snohomish County Health Department and 30 examinations at the Center in Granite Falls.

MATERNAL MORTALITY SURVEY

This survey was continued as in 1939. The "Committee of Eight" continued by means of this survey to study the underlying reasons back of our maternal deaths.

Material from the questionnaires was utilized as the main feature of the State Obstetrical Society's program on October 5. Three panel discussions were provided on hemorrhage. Thirty-three questionnaires were used in all. There was one panel on antepartum hemorrhage, one on intra-natal hemorrhage, and one on postpartum hemorrhage.

NEONATAL SURVEY

A request from the Maternal & Child Welfare Committee of the State Medical Association was sent to the Medical Advisory Committee of the MCH Division for a survey of infant deaths in this state. Plans for a neonatal survey have been set up in response to this request. The survey is ready to go into operation early in 1941.

MATERNAL & CHILD HYGIENE LITERATURE FOR FREE DISTRIBUTION

Children's Bureau Literature Distributed:

Infant Care	7855	Are You Training Your Child to be Happy	1576
Prenatal Care	5491		
Child One to Six	2968	Good Posture In The Little Child	391
Child Management	1485		
Guiding the Adolescent	1231	Well Nourished Child	173
Breast Feeding	368	Out of Babyhood	52
		Other	306

865 sets of prenatal informative letters were sent out. This is the largest number of sets for any one year.

POSTGRADUATE MEDICAL EDUCATION

In 1940 an Obstetric Refresher course was put on in the western part of the state. Yakima was the only lecture point not strictly in

the western part of the state. Yakima, Aberdeen, Olympia, Longview, Centralia, Port Angeles, Everett, Bellingham, Tacoma, and Seattle were selected as lecture points. The obstetric lecturer, Dr. Harold M. Teel was the same as in 1939. His first lecture date was June 20 and continued until July 13. The course was given on a circuit plan as in previous years. On each lecture day an afternoon and evening lecture was given. In cities where the whole course was given, two lectures a day were given on three different days, making a total of six lectures. The total attendance was 667 practicing physicians. This was an average of over 16 physicians per lecture.

In addition to the obstetrical lecturer, Dr. Charles F. McKhann, Professor of Pediatrics of the University of Michigan, was engaged for the last week of the course, and he and Dr. Teel discussed problems common to the practice of obstetrics and pediatrics during the last circuit.

Reference is made under the heading Maternal Mortality Survey of the use of the material gathered from the questionnaires for postgraduate medical education.

During 1940 plans were developed jointly by this Division and the MCH Division of the Oregon State Board of Health for an intramural obstetric refresher course to be held at the University of Oregon Medical School in Portland, early in 1941.

Twenty-five practicing physicians were enrolled from this state. Opportunity to enroll was offered to physicians outside of the three largest cities, who had cooperated in the maternal mortality survey.

NUTRITION PROGRAM

In the 1939 annual report it was stated that during the latter part of that year the nutrition program was rearranged in such a manner as to make its principle objective staff education for local county health departments. This plan proved very successful. It was continued throughout 1940.

The program was scheduled in conference with the county health officers several weeks to several months in advance. In this manner sufficient time was allowed for the health officer to adjust the routine of his staff to facilitate attendance to the six lectures and field demonstrations given by the Nutritionist.

The program was put on in the following counties in the order given: Snohomish County for four weeks, the program being concluded in January; Thurston-Mason County, four weeks; Whitman County, four weeks.

Four weeks were spent in Clallam County during June and July, and incidentally the Nutritionist aided at the summer camp for underprivileged children. In September and October a six weeks' program was put on in Yakima County. November 5 to November 29 was spent in Chelan County. On December 10 a six weeks' program was started in Clark County.

In addition to this, aid was given in the promotion of the school lunch project in various parts of the state.

MATERNAL DEMONSTRATION AREA

The Maternal Demonstration in Clark County continued during 1940 towards its objective of providing means whereby no expectant mother need go without medical and nursing prenatal care.

In November 1940 a class in mothercraft started at Ridgefield. This is the first of six proposed classes of this sort for Clark County. The County has been divided into six districts, one district will have a class for expectant mothers every month throughout the year.

Mothers' classes have been conducted at various times by public health nurses in various parts of the state, but in most instances sporadically. The program referred to above promises to be the first independent and sustained project for classes of this sort. The term "Independent" is used to differentiate classes conducted in the old Demonstration Area in Snohomish County (in 1937 and 1938) where mothers' classes were held with the continued assistance of the Maternal & Child Hygiene Division personnel and also to differentiate from mothers' classes held at present at two county hospitals for expectant mothers who are waiting their turn at the prenatal clinics.

ORAL HYGIENE

The oral hygiene program continued during the first half of 1940 as it had during the preceding few years. July 1 the Dental Consultant resigned and the position remained vacant for the remainder of the year.

The Chief of the Division with the aid of the Dental Advisory Committee which was formed in 1939 is carrying on a skeleton program until such time as a new consultant is engaged.

PROGRAM FOR MEDICAL CARE & HOSPITALIZATION OF BORDERLINE MATERNITY CASES IN SNOHOMISH COUNTY

Reference is made to plans for aid in the maternal care for fami-

lies of low income in the 1939 annual report. This plan went into operation in February 1940. Under the plan, a patient enrolled in the program paid as much as possible towards the physician's fee for delivery, and the remainder of the fee was paid from the Children's Bureau funds allotted to this Division. Prenatal care was provided for at the Maternal Health Center, or if the physician preferred he could give the prenatal care at his office without charge.

In June 1940 a hospitalization program was added. The patient was hospitalized for five days, and the expense was handled as the delivery fee. The Everett General Hospital and the Providence Hospital of Everett were approved for hospitalization under this plan.

In November 1940 plans for ten days' hospitalization of these borderline maternity cases went into effect. During the same month the Snohomish General Hospital at Snohomish was approved for hospitalization of borderline maternity cases under this program.

The cooperation of the Snohomish County Welfare Department was sought in determining the extent to which the patient enrolled in this program should participate financially. The Snohomish County Welfare Administrator gave assistance in setting up a self-support budget for the family, taking into account the income, the number of people in the family, the age of the children in the family, and certain necessary unpredictable expenditures. This budget is used as a basis for determining as fairly as possible the extent to which the family can participate in the program. The Welfare Administrator also provided whatever information he had in his records on cases enrolled in the program. Desired information was frequently lacking because of the fact that many of these cases had never been enrolled in the county relief program, and in instances where they had been enrolled at some time in the past, the information was more or less out-of-date. This meant that supplementary information had to be obtained from the attending physician, the county health officer, and the county health nurses. The arrangement was not very satisfactory.

Late in 1940 plans were developed for more complete and up-to-date information on the financial ability of the family of the enrolled patient to participate in the program, from the county welfare department. It was arranged to take over part of the salary of one of the home visitors in order that she might spend a definite amount of time preparing appraisals for use in the program.

In the interests of better maternal care, it is planned to enroll only expectant mothers applying early in the period of expectancy. However, until the program becomes generally known to the community, cases will be accepted without this requirement.

PROGRAM FOR THE BETTER CARE OF PREMATURE INFANTS

Plans for this program will be found in the 1939 annual report.

During 1940 five incubators for the care of premature infants were purchased and placed in the following five county hospitals: Clark, Cowlitz, Kittitas, Whatcom, and Snohomish. Stimulated by this program, the Yakima County Hospital was able to obtain an incubator by donations from local public-spirited or organizations.

Hoods suitable for the administration of oxygen to premature infants have been purchased and are being distributed to the county hospitals.

A training course for nurses from the county hospitals was established at the King County Hospital. In preparation for this course, the supervisor of the nursery at the King County Hospital was given a refresher course in care of premature infants in the Midwest. Children's Bureau funds are used to pay the tuition and living expenses of nurses from the county hospital for one month's training. The qualifications of the proposed trainee are passed upon by the Public Health Nursing Division. Training has been given to nurses from Clark, Snohomish and Pierce counties. The training program will continue in 1941.

At the meeting of the House of Delegates of the Washington State Medical Association in August, 1940, a definition of a premature infant as recommended by the "Committee of Eight" was adopted. The definition includes the weight. The premature infant is one weighing less than five an on-half pounds (2500 grams).

MENTAL HYGIENE PROGRAM

The mental hygiene program was altered considerably during 1940. It has been arranged that the part time Mental Hygiene Consultant provide a staff education program for local county health departments which is modeled somewhat after the nutrition program.

DIVISION OF PUBLIC HEALTH NURSING

Anna R. Moore, R. N.

The Division of Public Health Nursing during 1940 continued to direct its activities toward the development of public health nursing services of high quality which will meet to best advantage community needs in all health department areas within the State.

The staff has given advisory service to health departments as requested and required in general and special fields to strengthen all nursing programs in public health.

During the year, public health nurses from county and city health departments within the State visit thousands of homes to teach health protection, communicable disease control, maternal, infant, preschool, school and adult hygiene and nursing care. Each nurse is qualified to give nursing care to all age groups.

It is the public health nurses, who through their visits, individualize the health department's services by teaching how each activity affects the family group. Their ability to do nursing and to teach others nursing care is an important factor in establishing a family relationship for teaching health. The extent of their growing activities is in part due to the community's appreciation of the services offered through the health department's program. When a nurse has demonstrated successfully her usefulness in a community, the local demand for increased service is cared for through additional personnel more adequately to meet the needs of the population to be served.

Chelan, King, Pierce, Snohomish, Thurston, Walla Walla, Whitman and Yakima counties during the year have each increased its staff of nurses to meet more nearly the minimum ratio of one nurse to five thousand population.

A comparison of activity reports for 1940 with those of 1939 from all counties in the state indicate a better distribution of nursing service, as shown by the number of nursing services given per number of admissions to nursing service in Disease Control, Maternal and Child Hygiene, School Hygiene, Crippled Children, etc. The figures show the total number of admissions to nursing service, all activities, and the total number of nursing visits. It gives evidence of an increase in public health nursing activities, for the year.

In presenting these figures, attention is called to the fact that the numbers of visits does not give the entire picture of nursing ser-

PUBLIC HEALTH NURSING SERVICE 1940

Counties	Admissions to Nursing Service All Services		Field Nursing Visits		Office Nursing Visits	
	1939	1940	1939	1940	1939	1940
Adams	3	0	646	897	353	346
Asotin	7	296	473	497	92	183
Benton	119	134	225	573	214	27
Chelan	1,289	4,149	2,788	2,242	1,939	2,040
Clallam	4,890	1,019	3,056	3,056	383	606
Clark	6,455	3,968	3,513	4,684	6,588	3,868
Columbia	0	2	0	205	0	60
Cowlitz-Wahkiakum	455	447	1,676	2,440	822	1,442
Douglas-Grant	1,187	1,177	1,925	2,115	433	192
Ferry	710	566	811	610	169	112
Franklin	226	251	550	1,023	4	34
Garfield	3	0	0	0	0	0
Grays Harbor	2	118	987	730	1,229	536
Island	0	17	164	111	13	0
Jefferson	298	256	1,015	1,286	259	846
King	14,851	20,985	16,807	18,160	20,321	20,723
Kitsap	1,311	726	2,149	1,666	1,803	1,623
Kittitas	391	49	831	311	73	8
Klickitat	11	0	512	740	0	0
Lewis	544	668	1,406	1,576	857	1,600
Lincoln	107	174	118	207	43	98
Mason-Thurston	1,365	2,269	5,749	6,123	6,004	3,619
Oaknogan	505	640	1,130	1,138	515	254
Pacific	0	0	0	0	0	0
Pend Oreille	382	326	307	443	31	30
Pierce	2,434	1,274	8,131	6,756	1,577	680
San Juan	898	1,130	1,585	1,979	381	570
Skagit	0	355	0	1,908	0	504
Skamania	99	50	295	171	124	101
Snohomish	6,287	8,612	6,944	7,846	1,227	3,915
Spokane	1,711	1,723	2,661	2,964	324	180
Stevens	321	675	549	1,090	91	152
Walla Walla	3,074	1,066	1,322	1,383	942	1,506
Whatcom	2,031	2,362	2,939	4,582	415	1,348
Whitman	447	242	827	965	161	641
Yakima	1,167	1,244	3,404	5,914	1,957	1,910
Totals	53,580	57,248	74,458	86,415	49,394	49,754

	1939	1940
Total Nursing Services	123,352	136,169

vices. Content and quality of visit unfortunately cannot be shown. Such factors as number of new cases admitted to nursing service, type of service, location, travel area, are to be considered.

In an analysis of the reports for each service, change of emphasis in certain activities may decrease number of visits, but produce a better balanced program. This is true in some of the counties showing a decrease in number of visits in this report.

It is of interest, however, to note that the total number of visits made in 1940 presents an increase of 32,317 over 1939 nursing services throughout the State.

Reports from observations made by the public health nursing consultants from the Division in their visits to the field would indicate that improvement is being made in quality as well as quantity of visits. This is brought about in most counties through well planned staff education programs, in which the staff members of the State Department of Health participate

Through the courtesy of the National Society for the Prevention of Blindness, the services of Miss Eleanor Mumford, Associate in Public Health Nursing, were obtained to hold institutes for nurses in Sight Conservation. In cooperation with the Division for the Blind, Department of Social Security, institutes for county nurses and medical social workers were held in three districts of the State. These institutes were a valuable means of improving the nurses participation in eye health programs for all age groups.

The public health nurses participation in the venereal disease control program has been markedly increased in some districts, particularly in those areas now being used for military encampments. The nursing consultant in Venereal Disease Control has given valuable assistance in these districts in guiding their activities in this service. During the year, the nursing consultant in Venereal Disease Control, made forty visits to local health departments and gave special instruction in eleven staff education conferences. Assistance was given in finding contacts and in other venereal disease control measures during two venereal disease epidemics.

Four public health nurses were given stipends for a three months post graduate course in venereal disease congrol nursing. These stipends were granted for the purpose of improving services in the respective areas.

The epidemic of poliomyelitis increased the activities of the consultant in orthopedic nursing in giving instruction to public health nurses in follow-up care. During the year, staff education programs in

orthopedic nursing were held in twelve full time county health departments. Special orthopedic services were given in eleven counties. Visits were made to the local areas to explain and discuss the crippled children's program. The orthopedic nursing consultant assisted at thirteen clinics held by the Department of Social Security for the examination of crippled children and advised the public health nurses of the physicians' instructions for follow-up care. She also assisted the public health nurses in follow-up care of orthopedic cases after hospitalization.

Public health nursing advisory service in Maternal and Child Hygiene was given by the consultant in maternal and child hygiene and in all services by the generalized nursing consultants and Chief of the Division.

The success of the public health nursing programs depends on type and quality of personnel, and for that reason the Division of Public Health Nursing acts as a clearing agency recommending qualified nurses. Public health nurses are invited to place their credentials with the Division for referral to local health officers and others seeking public health nursing personnel. Every effort is made to aid in securing the nurse best qualified to meet the needs of available positions and the community to be served, however, no appointments to local positions are made by the Division.

During the year, thirty-six qualified public health nurses were recommended for nine new positions and twenty-seven replacements.

With the increasing demands for public health nursing services in all states, it has been desirable to aid in preparing nurses for positions in public health. Stipends were given to four to aid in obtaining public health nursing certificates, and to two, for public health nursing supervision.

Four full-time health departments, King, Pierce, Whatcom and Mason-Thurston, cooperate with the School of Nursing Education, University of Washington, in offering field experience to students in public health nursing. Spokane County is offering field experience for basic students in nursing Education in cooperation with Washington State College. This experience is valuable to the staff as a means of upholding a high standard of nursing procedures in all services.

From observations made in all areas visited and from analyses of activity reports, it is evident that there is need for a clearer interpretation of recording activities in order to present a true representation of services rendered; a need for better program planning; a need for improving nursing technics and a need for increasing nursing services.

More nearly to meet these needs, it was planned during the year to add two public health nurses to the staff of the Division of Public Health Nursing in order to establish districts in the State and provide a public health nursing consultant for each district, offering more thorough generalized public health nursing consultant services.

District I includes Whatcom, San Juan, Island, Skagit, Snohomish, Chelan, Kittitas, King, Kitsap, Jefferson and Clallam Counties.

District II, Grays Harbor, Thurston-Mason, Pierce, Pacific, Lewis, Yakima, Klickitat, Skamania, Clark, Cowlitz- Wahkiakum Counties.

District III, Okanogan, Ferry, Stevens, Pend Oreille, Grant-Douglas Lincoln, Spokane, Adams, Whitman, Benton, Franklin Walla Walla, Asotin, Garfield, and Columbia Counties.

Public Health Nursing Consultants in special fields will continue to serve all counties. This will enable the Division of Public Health Nursing to give greater assistance to local health departments. The District Consultant Nurses will be able to spend sufficient time in a department to gain a better understanding of needs and interpretation of activities. More frequent contact with the departments for longer periods of time will aid in the improvement of services and in establishing better uniformity of reporting those services.

Based on the progress made in 1940 with the outlined plan, continued improvement is anticipated in 1941.

DIVISION OF HEALTH EDUCATION

Charles Hilton, M.A.

The policies of the Division of Health Education were altered but little during the year of 1940. Special emphasis was given to its developing school health program, and to its program for public health information. The year also witnessed an extension of the division field activities and a marked increase in its participation in the work of community organizations. The normal activities of the division were conducted with the usual thoroughness but no special emphasis was given them.

PUBLIC INFORMATION

In order to meet the demands of the public for information either about the work of the health department or about public health problems throughout the state, it was necessary to devote considerable time to the preparation and distribution of material of an informative nature. Two thousand five hundred copies of a booklet, "The State Department of Health, Its Organization and History" were contributed to universities, colleges and civic organizations, and 53 talks to audiences totaling 6,669 people were given outlining the activities of the State Department of Health and public health problems in the State of Washington.

Seventy-five news releases were prepared for distribution through the county health departments. In order to secure the maximum use of these releases the Division of Health Education prepared for the guidance of the County Health Departments a bulletin on "Health Education Through the Newspapers." A number of demands for special news material were received from County Health Departments during the year. These demands were complied with as promptly as limited personnel would permit.

In addition to news releases the division prepared a number of radio scripts for use by the county health departments in their radio programs. Whitman, Thurston, Mason, Yakima and Chelan Counties conduct regular radio programs which are of a high order. Ten recordings from the New York State Department of Health and six from the United States Public Health Service were purchased for use by the County Health Department.

The State Department of Health devoted considerable time to improving its regular weekly radio programs. These improvements were made possible through the cooperation of staff members of the other divisions of the department and through the cooperation of the State Medical Society, The Woman's Field Army for the Control of Cancer, State Tuberculosis Association, and the Anti-Tuberculosis League of King County.

Visual Instruction

Because there were fewer demands this year upon our exhibit budget we were able to improve the quality of our work in this field. We furnished an exhibit on tuberculosis for the annual meeting of the Washington State Medical Society at Tacoma, and an exhibit at the Western Washington State Fair at Puyallup, which concentrated upon rural sanitation, tuberculosis control, and the control of syphilis. Approximately, 35,000 people viewed this exhibit, In addition, exhibits were furnished to Whatcom and Grant-Douglas County Health Departments. Walla Walla County and Whitman County consulted the division upon the construction of exhibits for their county fairs.

A marked increase was noted in the number of films which were shown by the division during 1940. The division participated in 64 programs and showed films before audiences totalling 5,874. With a view to purchasing desirable items, considerable time was spent by the division in previewing new film offerings. As a result, several new films, " A New Day", "Moving X-rays", "Man Against Microbes", "A Cloud in the Sky", "Once upon a Time", "Choose to Live", "The Nurse's Responsibility in Saving Sight", and "Eyes of the World" were added to the division circulating film library.

During the last few weeks of 1940, negotiations were entered into with the N. Y. A. for the purpose of setting up a health poster project. It is hoped that posters will be available for distribution by the county health departments early in 1941.

School Health

A number of gratifying accomplishments in the field of school health work crowned the efforts of the division during 1940. As indicated in the annual report for the year 1939, suggestions for setting up courses of study in the field of health education were submitted for consideration to Whitworth College, Eastern Washington College of Education, Whitman College, Central Washington College of Education, and Walla Walla College. Whitman College, Eastern Washington College of Education, Walla Walla College, and Central Washington College of Education adopted these suggestions in whole or in part. With the health education courses already in operation at the State College, the University of Washington, and Western Washington College of Education, the state now approaches a superior standard in the field of teacher training for school health work.

Gratifying also were a number of activities designed to bring about improvements in the material offered in the State's health courses. The Division of Health Education was fortunate in being able to cooperate with the Social Security Department's Division for the Blind in bringing to the attention of the teachers' training schools some of the problems that the state faces in the prevention of blindness and the conservation of sight. This activity of the division for the blind was well received and considerable interest in the problems of sight conservation and blindness prevention was stimulated among educational leaders.

Although most teachers' training schools give some attention in their curriculum to first aid, few of them devote much time to accident prevention or safety. It was, therefore, with considerable satisfaction, that the division participated during 1940 in the work of the Safety Committee of the State Department of Education. One of the aims of this committee is to encourage the inclusion of more safety materials in the courses now being taught to teachers. In this work the division shares a common interest with the State Patrol and the State Department of Highways. Although the division cannot claim any specific credit for them, nevertheless, due to activities in which it participated, a safety conference was held at the University of Washington which elicited considerable response from educators throughout the state, and a safety workshop was set up under the sponsorship of the School of Education of Washington State College.

The State Department of Health was consulted on plans for setting up a health education course in the School of Bacteriology of Public Health at Washington State College.

Branching into what was for it a new field the Division of Health Education made a survey of the health situation in the junior colleges of the State of Washington.

During the year, the Division of Health Education cooperated with the Public Health Division of the State Planning Council in conducting a survey of school health throughout the state.

Because there is little point in producing teachers with excellent training in the field of Health Education, unless they are absorbed into the state school system, the Division of Health Education began this fall to organize public and professional opinion towards this end. Several conferences were held with the members of the State Association for Health, Physical Education and Recreation in order to secure their cooperation. Talks on the subject of trained teachers for health teaching jobs were given at Stevens, Ferry, Grant, and Island Counties Teachers Institutes.

The activities of the division on the primary and secondary school level were partially of a service nature. Educational programs relative to syphilis control were conducted in Okanogan, Stevens, Ferry, and Skagit Counties. All of the high schools in these counties were visited. This program was materially aided by the new syphilis film, "With these Weapons".

The division was represented at the following educational meetings: The Inland Empire, Education Association's annual meeting, W. E. A. actions meetings, meetings of the School Masters Club, and the annual meeting of the Northwest Association for Health, Physical Education, and Recreation.

Field Activities

In addition to participating in the work for the State Association for Health, Physical Education, and Recreation, through membership in its executive board, the Division for Health Education participated in the educational program of the Lion's, Kiwanis, and Rotary Clubs. It did considerable work with the State Federation of Women's Clubs through its local organizations, the Parent-Teachers Association and the 4-H Clubs. In addition to personal conferences on specific problems, material and reports, literature, films and talks were supplied these organizations.

Publication and Duplication

For the first time in several years the duplication work for the division appears to have dropped off somewhat. Year by year the division has experienced a marked increase in the number items run. This year 865 stencils were cut, and from them 667,881 runs were made. Last Year 680,729 runs were made from 1,219 stencils, or a net decrease this year of 12,847 runs and 354 stencils. This reduction in work, more apparent than real, is due in part to two things.

(1) Efficient long term planning which enables more items to be produced from fewer stencils.

(2) No annual report was issued for 1939. This job, requiring as it does mosd of the divisions working time for a month, consumes over a hundred stencils and at least 110 reams of paper.

DUPLICATING WORK FOR 1940

	Stencils Cut	Copies Run
ADMINISTRATION	225	44,521
PUBLIC HEALTH NURSING	45	22,905
ACCOUNTING	5	10,000
MATERNAL AND CHILD HYGIENE	62	48,395
LABORATORY	15	4,550
HEALTH EDUCATION	155	104,365
ENGINEERING	85	46,740
VITAL STATISTICS	110	265,665
EPIDEMIOLOGY	163	120,740
Total	865	667,881

DIVISION OF LABORATORIES

A. U. Simpson, M. D.

The number of specimens received for examination in the State Laboratory continue to increase. The total number of examinations for the year 1940 was 118,892 – an increase of 6% over 1939, and exceeding the number of examinations made in 1921 by over 100,000.

The monthly tabulation of various types of examinations for 1940, and the distribution of outfits for collecting specimens, are shown in Tables I and II. A yearly tabulation of certain types of examinations made, covering a 20-year period, is shown in Tables III and IV.

Syphilis: The number of specimens received during 1940 to be examined for evidence of syphilis was 70,310 – an increase of 11% over 1939. City, county, hospital and private laboratories in the State also show an increase for this type of work. Physicians of the State, in carrying out the syphilis control program, are having laboratory examinations of cases made in increasing numbers each year. The following Table shows the number of specimens examined by each group of laboratories and the percentage of increase for each year for a 5-year period.

SUMMARIES – SEROLOGIC TESTS FOR SYPHILIS, REPORTED BY REGISTERED LABORATORIES IN THE STATE OF WASHINGTON FOR THE FIVE-YEAR PERIOD 1936 – 1940

	1936	1937	1938	1939	1940	Increase, 1940 Over 1936	
State Department of Health Laboratory	29221	41881	51884	61304	70310	41089	140%
Increase over preceding year	11%	43%	23%	18%	11%		
City and County Health Dept. Lab's.	21440	24515	30424	34198	49872	28432	132%
Increase over preceding year	1%	14%	24%	12%	45%		
County Hospital Laboratories	9565	9850	13277	13395	14926	5361	56%
Increase over preceding year	19%	3%	34%	1%	11%		
Private Hospital Laboratories	18959	21817	28929	30723	36727	17768	93%
Increase over preceding year	54%	15%	32%	6%	22%		
Private Clinical Laboratories	16690	26370	26890	28132	30256	13566	81%
Increase over preceding year	28%	58%	2%	4%	7%		
Total Specimens Examined	95875	124434	151404	167752	202091	106216	110%
Increase over preceding year	18%	29%	21%	10%	20%		

TABLE I - SUMMARY OF DIAGNOSTIC AND SANITARY EXAMINATIONS MADE
BY THE STATE DEPARTMENT OF HEALTH LABORATORY
FORTHE YEAR 1940

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
DIPHTHERIA-Cultures													
Positive	12	13	1	5	1	0	14	13	7	17	13	25	121
Negative	497	464	419	329	392	199	136	158	167	252	187	479	3679
Doubtful	4	4	0	0	8	1	11	0	3	4	4	5	44
Total	513	481	420	334	401	200	161	171	177	273	204	509	3844
Supplementary Tests	78	78	40	41	51	42	120	116	134	114	52	181	1047
SCARLET FEVER-Hemolytic Strep.													
Positive	127	134	114	47	49	43	1	7	8	13	46	85	674
Negative	334	282	266	250	329	134	50	69	44	169	127	304	2358
Doubtful	0	0	0	0	1	0	0	0	0	0	1	0	2
Total	461	416	380	297	379	177	51	76	52	182	174	389	3034
TUBERCULOSIS-Sputum Exam.													
Positive	65	78	51	44	66	98	53	41	21	94	50	54	725
Negative	217	218	231	231	257	225	216	231	147	307	190	276	2746
Unsatisfactory	0	2	0	2	1	1	1	3	2	0	0	0	12
Total	282	298	282	277	324	324	280	275	170	401	240	330	3483
TYPHOID FEVER-Blood Agglutinations													
Positive	8	7	11	4	5	3	10	6	5	12	5	1	77
Negative	167	148	154	245	202	139	155	155	207	150	110	138	1970
Doubtful	19	9	8	10	13	12	15	14	24	12	19	8	163
Total	194	164	173	259	220	154	180	175	236	174	134	147	2210
Supplementary tests	388	328	348	393	220	163	185	182	239	178	134	152	2910
UNDULANT FEVER-Agglutinations													
Positive	3	3	4	7	3	3	2	6	4	4	2	0	41
Negative	183	154	167	249	213	148	170	162	225	167	126	143	2107
Doubtful	8	7	2	3	4	3	8	7	7	3	6	4	62
Total	194	164	173	259	220	154	180	175	236	174	134	147	2210
TULARAEMIA-Agglutination	10	11	11	7	8	3	4	6	4	1	2	5	72
WEIL-FELIX - Reactions (Proteus OX19)	10	1	4	132	220	154	180	175	236	174	134	147	1567
GONORRHEA-Microscopical Exam.													
Positive	49	55	43	51	77	48	64	67	68	76	41	44	693
Negative	247	267	287	294	248	237	258	296	245	394	244	233	3250
Doubtful	5	5	2	5	2	2	4	9	12	5	3	3	58
Total	302	327	332	360	327	287	325	372	325	475	288	280	4001
- Complement Fixation													
Positive	8	5	7	5	2	1	2	2	1	9	7	4	53
Negative	32	14	12	11	15	5	8	10	12	10	7	6	142
Doubtful-Unsatisfactory	4	1	6	10	4	4	5	6	12	9	7	14	83
Total	44	20	25	26	21	10	15	18	25	28	21	24	278
SYPHILIS-Blood-Sp.Fl.													
Wassermann													
Positive	308	320	329	263	219	235	251	257	283	259	231	260	3225
Doubtful	259	205	179	205	177	185	254	322	402	278	225	266	2968
Negative	5519	4874	4848	5381	4856	4732	4981	5036	5557	5756	4092	5705	61337
Unsatisfactory	245	286	237	260	233	237	271	239	234	188	144	206	2780
Total.....	6331	5685	5593	6109	5485	5390	5757	5864	5476	6481	4692	6437	70310
Supplementary Tests	273	95	22	15	32	157	1	0	41	45	16	30	727
Kahn	1306	1033	1023	941	1041	1102	1101	1070	1258	1436	828	921	13060
Spinal Fluid-Globulin	101	88	91	89	54	125	141	134	106	143	135	101	1309
Dark-field Examination	3	0	1	0	1	1	0	4	4	1	1	0	16
Positive	1	0	0	0	0	0	0	1	0	0	0	0	2
MENINGITIS-Epidemic													
Spinal Fluid	2	2	0	0	4	7	4	1	5	2	1	0	28
Naso-pharyngeal Culture	2	4	2	0	17	4	4	5	22	6	8	16	91
Positive	0	1	0	0	5	3	3	0	3	2	3	5	25
TYPHOID-Culture													
Blood	90	80	87	79	82	75	116	109	57	80	33	45	944
Feces	16	25	36	48	25	22	32	34	30	51	31	20	372
Urine	12	18	15	33	11	15	24	27	17	26	15	10	224
Other specimens	1	0	4	2	22	5	0	1	1	1	1	0	38
Positive	2	2	2	4	8	4	8	5	7	6	6	2	56

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTALS
VINCENT'S INFECTION-Smear	9	5	4	8	6	6	8	7	1	8	12	11	87
Positive	2	1	3	6	1	1	2	2	1	3	6	4	32
RABIES-Microscopical Examination													
Positive	6	4	3	3	0	4	2	0	3	2	0	0	27
Negative	6	7	8	1	2	5	8	2	1	2	0	0	42
Unsatisfactory	0	0	0	0	0	0	0	1	0	0	0	0	1
Total.....	12	11	11	4	2	9	10	3	4	4	0	0	70
BRUCELLA INFECTION-Animals													
Blood Agglutination	0	0	0	0	0	0	0	0	0	0	3	0	3
Milk Agglutination	29	2	3	7	39	0	8	8	3	101	66	66	332
Positive	2	1	0	0	0	0	0	0	2	45	11	2	63
MILK-Colony Counts	42	23	38	25	44	50	47	64	409	95	63	19	939
Sediment Cultures	2	4	4	0	2	1	19	17	5	4	0	15	73
WATER-Bacteriological Exam.													
Complying with Standard	268	252	260	295	309	370	470	350	243	345	272	220	3654
Not complying with Standard	55	57	64	84	125	142	268	238	192	264	125	83	1697
Unsatisfactory	1	2	5	3	3	2	6	0	1	1	7	0	31
Total	324	311	329	382	437	514	744	588	436	610	404	303	5382
SHELLFISH AND SEA-WATER	4	15	10	3	2	0	0	8	0	0	0	2	44
MISCELLANEOUS TESTS	10	2	7	73	21	8	8	10	21	18	5	4	187
Total.....	11045	9692	9468	10203	9741	9159	9717	9696	10740	11286	7833	10312	118892

TABLE II - SUMMARY OF DISTRIBUTION OF OUTFITS FOR COLLECTING SPECIMENS - 1940

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT	OCT.	NOV.	DEC.	TOTALS
DIPHTHERIA-Culture Outfits	1132	764	529	758	387	252	250	289	334	414	454	728	6301
TUBERCULOSIS-Sputim Outfits	296	183	195	286	227	272	338	230	268	347	154	184	2980
TYPHOID SPECIMENS-U&F Outfits	41	26	28	49	45	21	36	23	41	43	21	4	378
GONORRHEA-Smear Outfits	233	179	238	178	219	400	184	240	120	248	256	232	2727
SYPHILIS-Blood Specimen Outfits	7409	5506	7514	6707	5936	8046	6414	5885	6230	5962	7498	9722	83929
SYPHILIS-Chancre Fluid Outfits	4	0	0	3	3	0	0	6	0	4	0	2	22
MENINGITIS-Naso-pharyngeal Cult.	0	8	8	12	12	0	0	0	36	0	6	16	98
WATER-Container Outfits	335	353	368	382	457	585	720	534	478	541	457	395	5715
Miscellaneous Outfits	836	449	1276	860	600	1458	516	749	621	1567	868	644	10444
TOTAL.....	10286	7568	10156	9235	8896	11034	8468	8056	8128	9126	9714	11927	112594

TABLE III - DIAGNOSTIC AND SANITARY EXAMINATIONS MADE BY THE STATE DEPARTMENT OF HEALTH LABORATORY FOR THE TEN YEAR PERIOD

1921 - 1930

	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
DIPHTHERIA-Cultures	6909	9227	7965	11828	7081	5351	4184	2177	2461	2563
Positive	1252	1385	861	1847	721	744	611	375	393	358
TUBERCULOSIS-Sputum Examinations	1320	1871	1801	2152	2372	2474	2823	2457	1858	2553
Positive	454	483	621	730	840	711	835	601	557	706
GONORRHEA-Microscopical Exams.	958	946	1197	1366	1472	1477	1808	2461	2684	3235
Positive	117	122	168	201	211	245	354	566	519	624
SYPHILIS-Blood-Sp.Fl.-Wassermann	6445	6271	7348	8225	9088	11263	13513	18388	17840	19265
Positive	1132	1160	1188	1538	1695	1607	1732	3271	3313	2457
TYPHOID FEVER-Blood Agglutination	338	379	400	330	411	362	349	411	408	352
Positive	99	96	105	94	118	69	52	52	60	42
RABIES-ANIMAL-Microscopical Ex.	1	31	17	18	32	11	11	14	15	11
Positive	0	14	3	5	14	3	2	7	3	1
Human Rabies Deaths	-	-	-	1	-	-	-	-	-	-
WATER-Bacteriological Exam.	1009	1553	1512	1634	1878	2159	2339	2310	2198	2300
Complying with Standard	486	828	694	807	944	1113	1146	1053	863	1408
MISCELLANEOUS TESTS	642	1072	13861	21022	18557	177 99	19355	7225	11109	15381
TOTAL TESTS AND EXAMINATIONS	17622	21350	34101	45575	40891	40896	44382	35443	38573	45760

TABLE IV - DIAGNOSTIC AND SANITARY EXAMINATIONS MADE BY THE STATE DEPARTMENT OF HEALTH LABORATORY FOR THE TEN YEAR PERIOD

1931 - 1940

	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
DIPHTHERIA- Cultures	3825	2615	2582	2462	2698	1338	3021	3436	4994	3844
Positive	394	196	194	88	155	26	82	45	120	121
TUBERCULOSIS-Sputum Examinations	2404	2266	2384	2460	2884	3188	3148	3054	3258	3483
Positive	794	729	775	624	717	932	716	602	701	725
GONORRHEA-Microscopical Exam.	3381	3791	3544	3337	3591	4135	4555	4612	4275	4001
Positive	508	567	448	400	503	708	694	597	373	693
SYPHILIS-Blood-Sp.Fl.-Wassermann	21658	19953	21875	24611	26334	29221	41881	51886	61304	70310
Positive	23733	2663	2319	2328	2303	2408	3192	3445	3352	3225
TYPHOID FEVER-Blood Agglutinations	744	825	945	1614	1384	1500	1600	1896	2195	2210
Positive	108	77	87	70	64	71	59	90	127	77
RABIES-Animal-Microscopical Ex	6	19	43	72	53	76	159	108	181	70
Positive	0	6	19	39	30	36	73	54	95	27
Human Rabies Deaths	-	-	1	2	2	-	-	1	1	-
WATER-Bacteriological Exam.	2335	1842	2133	2933	2955	3519	4170	4805	4599	5382
Complying with Standard	1523	1327	1495	1773	1808	2102	2717	3208	3141	3654
MISCELLANEOUS TESTS	16725	14641	14674	18840	18260	17401	22673	25836	31410	29592
TOTAL TESTS AND EXAMINATIONS	51078	45952	48180	56329	58159	60378	81207	95633	112126	118892

Food Poisoning: Several outbreaks of severe gastro-enteritis, five or six hours after eating, occurred during the year. Staphylococcus aureus was isolated from custard-filled doughnuts, boiled ham sandwiches, Chicken a la King, Boston cream pie and sliced baked ham, each of which was a causative food in an outbreak. Several persons ate the causative foods without apparent symptoms. One attack did not protect against another.

In each instance the food was permitted to stand at room temperature from six to twentyfour hours after being prepared by a carrier. (Staphylococcus aureus was isolated from nose or throat and in one instance from an infected abrasion on a finger). The several strains of staphylococcus aureus varied in their reaction on Stone's medium and blood agar plates. However, all agreed in that none of the strains were agglutinated by normal horse serum.

SYLVATIC PLAGUE STUDIES - JANUARY 1, 1940 to JUNE 30, 1940.

Sylvatic Plague Study was discontinued by the State of Washington Department of Health on June 30, 1940, and the Activity was taken up by the United States Public Health Service on July 1, 1940, and details of the field laboratory procedure and area to be covered were given to Mr. Edward O'Gara, technician in charge of the U. S. Public Health Service, Field Laboratory Unit in Lewiston, Idaho, during the last week of June, 1940.

During the period January 1, 1940 to June 30, 1940, the State of Washington Field Laboratory Unit operated in ten counties and collected 1267 miscellaneous animals and 4809 parasites.

Plague and Tularaemia were demonstrated in Spokane, Lincoln, Adams and Benton counties. In Spokane county the Turnbull Slough area near Cheney seems to be a persistent focus, there being five positive reactions in this region; and for the second time during our studies the cotton tail rabbit was again involved. Fleas taken from this specimen were plague infected. In Lincoln county two positive specimens were obtained on the Laney ranches, 13 miles east of Odessa on Crab Creek. Ticks from a cotton tail rabbit near Ritzville, Adams county, proved positive for Tularaemia, and a suspected human case of Tularaemia was found in Sunnyside, Washington, with a story of infection originating in Benton county from handling of infected jack rabbits.

During the winter months of January and February assistance was given in the extermination of rats in Spokane county, especially in the areas adjoining Turnbull Slough. Most of our work being concentrated at the State Hospital grounds, Medical Lake, where there was a very heavy rat infestation.

The Sylvatic Plague situation in the State of Washington may be summed up as follows, for 1940:

The Lind-Coulee focus seemed to be dormant this year, as no positive reactions were found in any of the specimens sent to the U. S. P. H. S. Laboratory.

The Rocky Ford focus on Crab Creek is active, as proved by specimen from the Laney ranches, 13 miles east of Odessa.

The Turnbull Slough focus seems to have been very active and has extended, in area involved, beyond the confines of the Game Refuge. Five positive reactions were secured in the area this year. Some very thorough extermination work was carried on in the Federal Game Refuge by the Bureau of Biological Survey, but the surrounding territory is still heavily infested with squirrels.

SUMMARY OF OPERATIONS

Personnel - 1 Field Supervisor
1 Field Assistant

Area Covered - Counties Visited - 10
Counties Infected- 3

Rodents Collected	Ground Squirrels	1028	
	Marmots	28	
	Field Mice	12	
	Jack Rabbits	55	
	Cotton Tail Rabbits	13	
	Idaho Pigmy Rabbits	1	
	Rats - Domestic	129	
	Coyotes	1	
	Total		1267
Wood Rat Nests Collected		2	2
Parasites Collected	Fleas	4659	
	Ticks	150	
	Total		4809
Parasites shipped:			
To U.S.P.H.S. Laboratory for Plague tests	Fleas	3971	
	Ticks	150	
To U.S.P.H.S. Laboratory for Identification	Fleas	640	
	Ticks	0	
Retained by Field Laboratory for Identification	Fleas	48	
	Ticks	0	
	Total		4809

Post Mortems:

Examinations performed by Field Laboratory crew	1214
Number of specimens sent to U.S.P.H.S. Laboratory	95
Number of specimens proved Plague Infected	7
Number of specimens proved Tularaemia Infected	1
Number of animals found suspicious on autopsy	16

CLASSIFICATION OF RODENTS COLLECTED:

Ground Squirrels –	(Citellus Townsendi)	6
	(Citellus Washingtoni)	441
	(Citellus Columbiana)	581
Marmots	(Yellow Bellied Marmota)	28
Field Mice	(Peromyscus)	12
Rabbits	(Jacks)	55
	(Cotton Tail)(Sylvilagus Nuttalis)	13
	(Idaho Pigmy)	1
Coyote		1
Rats	(Rattus Norvegicus)	108
	(Rattus Rattus)	15
	(Rattus Alexandrinus)	6
	Total	1267