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THE ESTIMATION OF TISSUE PHENOLS

The Distribution of Phenol in the Tissues of the Normal and of the Poisoned Rabbit

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The problems of phenol metabolism and the fate of phenolic compounds in the animal body are intimately connected with the accurate estimation of phenol in the body tissues and fluids. The early investigations in this field, though contributing knowledge of a fundamental character, made progress slowly for lack of quick and reliable methods for the estimation of phenols in body tissues and fluids. Many investigators studied the problem of urinary phenols following Baumann's isolation of phenol sulphuric acid in 1876 (1). The older methods (2, 3), being time consuming, lacking in accuracy and requiring much material, made little headway until Folin and Denis, in 1912 (4), described their phosphotungstic-phosphomolybdic reagent for phenols, and in 1915 (5) described a colorimetric method for the determination of phenols in urine. Their method has received considerable criticism, the chief of which is that their reagent is not specific for phenols, but that it reacts also with many other substances, such as uric acid, tryptophane, tyrosine, indole and derivatives, and lactic acid (6). Nevertheless, with certain limitations their method has been found exceedingly useful in the determination of phenols in feces (7) as well as in urine, and their method has also been applied with some modifications to blood (8, 9, 10, 11).

In order to meet the criticism of nonspecificity of the phosphotungstic-phosphomolybdic reagent for phenols, Theis and Benedict (11) applied a diazotized p-nitroaniline reagent to protein-free blood filtrates. In this procedure they consider it unnecessary to remove uric acid first. In a series of analyses upon human blood they reported 1 to 2 mg free phenols per 100 cc. Added phenol was recovered from blood by this method to the extent of from 90 to 112 percent. In a previous investigation in which the phosphotungstic-phosphomolybdic reagent had been used, these authors reported an average of 4.70, with variations of from 1.87 to 7.96 mg phenol per 100 cc of human blood (8).

Rakestraw (10), using the Folin and Denis reagent and removing uric acid by means of $ZnCl_2$ and Na_2CO_3, probably the best procedure

yet devised, reported from 1.86 to 5.37 mg free phenol per 100 cc of human and dog's blood. In a series of 19 experiments on rabbits with this method we have recently obtained similar results. An average of 5.47, with variations of from 4.17 to 6.81 mg percent, was found for total blood phenols, and an average of 2.56 with the extremes of 1.79 to 3.84 mg percent was recorded for free phenols (12). Pelkan and Whipple (9), using a somewhat similar method, reported 2.74 to 4.28 mg total phenols per 100 cc of dog's blood.

While these methods may yield important information in certain types of carefully controlled experiments, it is certain that such values for blood phenols as have been reported in the literature are in no sense an index of the true phenols occurring normally in blood, either free or in such combination as may be split off by acid hydrolysis.

Since the phenols as measured by the methods referred to above include, with the possible exception of uric acid, which is more or less completely removed, all nonprotein constituents of the blood which may react with phenol reagents, it is evident that such methods are not suitable in investigations dealing with the fate of phenols and phenol compounds in the body, including their distribution, detoxification, conjugation, etc.

Haas and Schlesinger (13), recognizing this fundamental difficulty, undertook to determine blood phenols in dogs by distilling whole blood previously boiled with Na_2SO_4 and CH_3COOH and then estimating the phenol in the distillate with Millon's reagent. Their method requires 20 to 30 cc of blood, which is a serious drawback when working with small animals. Moreover, failing to deproteinize the blood prior to distillation, their method is not at all applicable to tissue phenols.

The problem of tissue phenols is even more difficult. With the exception of the recent work by Marenzi (14), there seems to have been no systematic study made of the quantitative distribution of phenols in the tissues. Marenzi applied the diazotized p-nitroaniline reagent of Theis and Benedict (11) to trichloracetic acid filtrates of various tissues of the rat and obtained average total phenol values ranging from 12.4 mg per 100 g of heart muscle to 21.2 mg per 100 g of spleen. Rat blood is reported to contain by this method 1.8 mg total phenols per 100 cc. The free phenols were reported to range from 11.0 mg per 100 g of heart to 18.0 mg per 100 g of spleen.

In our studies on the pharmacology of phenol esters we have been greatly interested in the problem of tissue phenols, and more particularly the phenols of the central nervous system. In a group of three experiments designed to determine the total phenols of the brain and spinal cord of the normal rabbit after the manner of Marenzi,

using the Folin and Denis reagent after the preliminary removal of uric acid by means of $ZnCl_2$ and Na_2CO_3, values were obtained ranging from 5.16 to 7.03 mg per 100 g of brain and from 4.0 to 5.99 mg percent of spinal cord. Values of the same order of magnitude were also obtained with the reagent of Theis and Benedict. These values, which are in keeping with the similarly high values reported by Marenzi for other tissues, obviously do not represent true phenols, and the criticism directed against the methods of blood-phenol estimation holds with equal, if not greater, force against the method of tissue phenol estimation as proposed by Marenzi.

The present work concerns itself exclusively with such volatile substances reacting with phenol reagents as may be recovered by distillation of protein-free filtrates of blood and tissues, either directly or subsequent to hydrolysis with mineral acids. The phenol reagents are the phosphotungstic-phosphomolybdic reagent of Folin and Denis (4) or the diazotized p-nitroaniline reagent of Theis and Benedict (11). The former is preferred, even though it is the less specific of the two, because it is colorless in blank solution while the Theis and Benedict reagent is yellow, and the error in estimating small quantities of phenol may be very considerable. Moreover, the greatest source of error in the prevailing methods of estimating phenols in biological material is not so much in the relative difference in specificity of the two reagents as it is in the variable and large amount of nonphenolic and phenol-like bodies that react with both reagents, and are measured along with the true phenols. In problems dealing with the fate and the mechanism of action of phenols and phenol compounds the primary consideration is the accurate quantitative estimation of phenols, in the strict sense of the term, which may occur in the blood and tissues free or in such combination as can be broken down by acid hydrolysis. It may be admitted that even the phenol-reacting volatile substances obtained by distillation of protein-free tissue extracts may not all be true phenols; nevertheless, the nonspecific substances, if any, are reduced in this procedure to a negligible minimum.

THE METHOD

The tissue is weighed accurately to the nearest centigram and is thoroughly pulped with pure sand in a glass mortar. Five to 10 grams of tissue will usually suffice. The material is then extracted with 5 volumes of 10 percent aqueous solution of trichloracetic acid and filtered. In computing the volume of the trichloracetic acid solution, the usual allowance should be made for the approximate 80 percent water content of the tissue. In the case of blood, a definite volume is simply stirred into 4 volumes of the trichloracetic acid solution and filtered. An aliquot of the filtrate, varying in amount

from 1.0 cc to 25 cc, i.e., the equivalent of from 0.2 to 5 g of tissue according to the phenol content, is then measured into a small distilling flask of 100–150-cc capacity, diluted to about 30 cc with water and distilled directly into a 50-cc or, if the phenol content is very low, a 25-cc volumetric flask. The distillation flask is provided with a long-stem, small separatory funnel so that distilled water may be added in the course of the distillation if desired. A few glass beads in the distillation flask will ensure uniform boiling.

Experiments with small quantities of phenol or orthocresol in amounts of from 0.1 to 0.3 mg added to about 25 cc of 10 percent trichloracetic acid solution or to trichloracetic protein-free tissue filtrates have shown that recovery of the phenols is usually quantitatively complete if the distillation is carried to about two thirds or three fourths of the total volume. To ensure complete recovery of the phenols, it is best that there be not much over 0.3 mg in about 30 cc; approximately two thirds of this should be distilled over, about 15 cc of distilled water should then be added and the distillation continued until another two thirds of the volume has distilled over.

The phenol is estimated in the combined distillates by adding 1 to 3 cc of the Folin and Denis phenol reagent,[1] 8 cc 20 percent Na_2CO_3 solution, and water to volume (4 cc Na_2CO_3 solution if the final volume is 25 cc). After 20 to 30 minutes the reading is made in the colorimeter in the usual manner, using phenol or preferably resorcin as a standard. The minimum amount of phenol that can be estimated quantitatively with some degree of accuracy is about 0.01 mg when matched against a standard of 0.03 mg phenol in 50 cc. Quantities of 0.05 to 0.4 mg phenol can be estimated with a degree of accuracy of about ± 5 to ± 10 percent if matched against appropriate standards.

In the case of estimating orthocresol in tissues of animals poisoned with this compound, the same general procedure is used, except that the final solution, after the reagent and alkali have been added, must be heated at 50–55° C. for about 20 minutes in order to bring out the maximum intensity of the blue color. The relative colorimetric values of phenol and the three cresols in relation to resorcin have been given in a previous publication (15).

The above procedure satisfactorily estimates free phenols in the blood or any of the tissues. Conjugated phenols appear to be sufficiently stable to withstand boiling in trichloracetic acid solution. This was determined in experiments on trichloracetic filtrates of tissues from animals poisoned with phenol in such a manner as to give rise to both free and conjugated phenols. The phenol values in such tissue extracts were found the same whether the trichloracetic filtrate was distilled directly or after the excess acid had been neutralized with NaOH to pH 5.0–6.0 (methyl red indicator).

[1] Approximately 1 cc reagent for each 0.1 mg phenol.

Total phenol is estimated in the same manner after the conjugated phenols have been hydrolyzed. Numerous experiments were made to ascertain the optimum conditions. An adequate concentration of hydrochloric acid is essential to effect complete hydrolysis and liberation of combined phenol. Excess acid must, however, be avoided, especially when working with concentrated tissue extracts, particularly liver, intestine, or kidney, with low phenol content. Prolonged hydrolysis of such tissue extracts with strong hydrochloric acid may yield too high values, probably due to liberation of volatile nonphenolic substances capable of reacting with the phenol reagent. Thus in one instance distillation of 25 cc of 1:5 trichloracetic acid extract of normal rabbit liver with 4.0 cc concentrated hydrochloric acid yielded in the distillate a phenol equivalent of 3.63 mg per 100 g This could hardly be true phenol.

Experience has shown that, for tissues of animals poisoned with phenol, containing in the neighborhood of 10 to as much as 200 mg conjugated phenols per 100 g, 2 cc concentrated hydrochloric acid added to 2 cc or less of the 1:5 trichloracetic filtrate diluted with water to about 25 cc is sufficient to hydrolyze completely the combined phenols in the course of distillation. If less acid is used, preliminary hydrolysis for about an hour on the boiling water bath may be required to ensure complete liberation of the combined phenols.

The difference between the total phenols so determined and the free phenols represents the conjugated phenols.

BLOOD AND TISSUE PHENOLS IN THE NORMAL RABBIT

Using the method as described above, a series of experiments was made to determine the extent of occurrence of volatile phenols or phenol-like substances in the blood and tissues of the normal rabbit. The following typical protocols will illustrate the results:

Experiment 35.—Rabbit, 2.5 kilos. Exsanguinated under ether anesthesia. Some of the blood was oxalated. Trichloracetic acid filtrates were prepared as described, and suitable aliquots, usually the equivalent of 3 to 4 g of tissue, were distilled. The phenol values obtained, reckoned in mg per 100 g of tissue, were as follows:

Blood	0.26
Brain	.89
Spinal cord	.65
Liver	.65
Spleen	1.39
Bone marrow	.34

It is evident that none of the tissues examined contain more than mere traces of what might be considered phenols. The relatively high value for spleen is probably due to experimental error involved in estimating minute quantities of phenols in a limited amount of tissue.

Experiment 34.—Rabbit, 2.5 kilos. Treated as in the preceding experiment. Aliquots of the trichloracetic acid filtrates representing the equivalents of from 3 to 5 g of tissue were treated with 0.5 cc concentrated HCl and distilled. The following phenol values, in mg per 100 g of tissue, were obtained:

Blood	0.50
Brain	.66
Spinal cord	.55
Skeletal muscle	.47
Liver	.61
Small intestine *	.75
Large intestine *	.71
Kidney	.54
Lung	.50

Experiment 29.—Rabbit, 2.8 kilos. Distilled 4.0 g equivalents of trichloracetic acid filtrates after adding 0.5 to 1.0 cc of 10 N H_2SO_4. Phenol estimation in the distillates showed the following, in mg percent:

Blood	0.37
Small intestine*	.34
Kidney	.30
Liver	.59

While the degree of acidity and time of hydrolysis may not have been entirely adequate, the last two experiments nevertheless give no evidence of any considerable amount of combined phenols in the blood or tissues of the normal rabbit.

TABLE 1.—*Recovery of phenols added to normal rabbit tissues*

Experiment	Tissue	Phenol added	Amount recovered	
			Mg per 100 g	Percent
		Mg per 100 g		
1	Intestine	Phenol—2	2.28	114
2	Blood	do	1.86	93
3	Brain	o-cresol—2	1.64	82
4	Blood	o-cresol—5	4.47	89
5	do	o-cresol—10	9.23	92
6	Kidney	Phenol—5	5.00	100
7	Liver	o-cresol—5	5.04	101
Average				96

Experiments made to ascertain to what extent added phenol or orthocresol can be recovered from normal tissues by this method are shown in table 1. Phenol or orthocresol added to such tissues as blood, brain, liver, kidney, and intestine, in the small amounts of from 2 to 10 mg per 100 g were recovered on an average of 96 percent of the amounts added. It may be concluded, therefore, that the tissues of the normal rabbit contain a mere trace of what might be regarded as true phenols, indeed not much over 0.5 mg percent; and that as little as 2.0 mg phenol percent added to normal tissues can be recovered practically quantitatively.

* Exclusive of contents.

THE DISTRIBUTION OF PHENOLS IN THE TISSUES OF THE POISONED RABBIT

In this series of experiments, phenol or orthocresol was administered in varying doses to rabbits and certain of the tissues were analyzed for free and total phenols by the present method. The chief findings in these experiments may be illustrated by a few protocols.

Experiment 36.—Rabbit, 2.6 kilos.

At 1:20 p.m. administered by stomach tube 0.7 g per kilo orthocresol in 50 cc water partially emulsified with the aid of 5 cc alcohol.

At 1:23 coarse generalized tremors, followed by general muscular weakness, coma and death within 1 hour. Immediately after death the orthocresol content of the various tissues was estimated with the following results, expressed in mg per 100 g of tissue:

	Free	Total
Blood	16.30	16.07
Brain	19.90	18.75
Spinal cord	19.21	----------
Liver	24.45	27.77
Kidney	25.86	40.68
Lung	15.73	19.90
Bone marrow	25.96	22.50
Skeletal muscle	6.94	7.21

It appears from the above that in acute fatal poisoning, orthocresol is widely distributed throughout the tissues of the body. Conjugation under these conditions is not in evidence, with the possible exception of the kidney.

In the next experiment the phenol distribution in the more prolonged, subacute type of poisoning is shown.

Experiment 37.—Rabbit, 2.7 kilos.

From 9:45 a.m. to 2 p.m. injected intramuscularly o-cresol in olive oil, in several repeated doses, until a total of about 1.5 cc per kilo had been received. Severe symptoms of poisoning were observed throughout. The animal was finally killed with chloroform, and the tissues were prepared as usual for orthocresol determination. The following results were obtained, expressed in terms of mg orthocresol per 100 g tissue:

	Free	Total		Free	Total
Blood	26.41	97.03	Bile	7.50	----------
Brain	20.96	----------	Kidney	72.31	254.00
Spinal cord	22.33	----------	Small intestine*	16.07	----------
Liver	15.79	44.31	Large intestine *	23.49	49.54

* Exclusive of contents.

From this experiment it appears that in slow phenol poisoning conjugated phenols may be found in many tissues. The kidney appears to be by far the most important organ for detoxification, if its high concentration in combined phenols may be taken as evidence

of phenol conjugation therein. It is, of course, possible that the high phenols found in the kidney may be accounted for by the excretory function of this organ. Obviously, more work will be needed to clarify this point. From the evidence that has been available heretofore it has generally been held that the liver is the main, if not the exclusive, site of phenol conjugation.

Embden and Glaessner (16) reviewed the contradictory experiments of the older literature and adduced evidence of their own, on the basis of perfusion experiments, that the liver is of foremost importance in the conjugation of phenol sulphuric acid. They ascribed this function also to a slight extent to the lungs and kidneys. More recently Pelkan and Whipple (17) concluded that, in the dog, phenol conjugation occurs in the liver exclusively. Their evidence is indirect and based on experimental data derived from inadequate methods of blood phenol analysis.

In the following experiment an attempt was made to ascertain the relation of tissue phenol concentration to symptoms of phenol poisoning. A toxic dose, approximately 50 percent of the minimum lethal dose of phenol, was injected; and as soon as symptoms of poisoning appeared, the animal was killed and tissue phenols were determined. The details and results follow.

Experiment 43.—Rabbit, 2.2 kilos.

At 11:10 injected subcutaneously 250 mg per kilo, 5 percent aqueous phenol solution.

At 11:20, moderately severe coarse tremors, some muscular weakness, and general hyperirritability. Killed by intravenous injection of 2 cc chloroform. Blood and tissue phenols were as follows, in terms of mg per 100 g:

	Free	Total	Conjugated, percent of total
Blood	8.10	8.93	9.3
Brain	8.93	8.92	0.0
Spinal cord	6.38	6.67	4.3
Liver	3.33	6.98	52.3
Kidney	7.14	11.54	38.1

This experiment shows again the rapid and wide distribution of phenol in the body tissues. The highest concentration of free phenol was found in the brain. There is no evidence of phenol conjugation in the brain or spinal cord, but decided evidence of its conjugation in the liver and kidney. The very slight and almost insignificant increase of the total phenols over the free fraction in the blood makes it likely that the 4.40 mg of conjugated phenol per 100 g of tissue found in the kidney had combined there.

The question of distribution of conjugated phenol was studied in somewhat greater detail in the following experiment:

Experiment 44.—Rabbit, 2.4 kilos.

At 11:10 a.m. to 2:50 p.m. injected subcutaneously 4 doses of a 5-percent aqueous solution of phenol, 150 mg per kilo each. There were slight to moderately severe symptoms of phenol poisoning throughout.

At 3:15 p.m. killed with chloroform. Anaylsis of the tissues for phenols showed the following:

	Free	Total	Conjugated, percent of total	Ratio of Conjugated to free
Blood	11.71	32.61	64.1	1.78
Brain	6.98	7.21	3.1	.03
Spinal cord	6.52	8.20	20.5	.25
Liver	4.68	21.63	78.3	3.62
Kidney	17.85	99.96	82.2	4.60
Small intestine *	7.85	21.63	63.7	1.75
Skeletal muscle	4.71	10.13	53.5	1.15

* Exclusive of contents.

This experiment demonstrates that, with the exception of the brain and spinal cord, all the tissues examined, including striated muscle, contained very appreciable amounts of bound phenols.

In view of the high ratios of conjugated to free phenol in the kidney, liver, small intestine, and striated muscle, in comparison with that of blood, it is scarcely possible to ascribe the conjugated phenols in these tissues to their blood content. That might possibly be the case with the relatively slight amount of bound phenol found in the nervous system. These findings certainly lend support to the view that the function of phenol conjugation is not limited to any one tissue or organ, and that, with the possible exception of the central nervous system, many tissues in the body appear to be capable of detoxifying phenols by conjugation.

SUMMARY AND CONCLUSIONS

A method has been described for the quantitative estimation of true phenols, free and conjugated, applicable to all body tissues and fluids.

The tissues of the normal rabbit (oat and cabbage diet) were found to contain less than 1.0 mg percent and usually not much over 0.5 mg percent of what might be regarded as true phenols.

In phenol or orthocresol poisoning, phenols were found in appreciable amounts in all the tissues examined. In acute lethal poisoning, free phenol was found in concentrations ranging from about 7 to 26 mg per 100 g of tissue, the lowest value having been found in skeletal muscle and the highest in the kidney. Conjugated phenols were not found in appreciable amount anywhere. In subacute poisoning, conjugated phenols were found in all the tissues examined with the exception of the central nervous system, which showed little or no combined phenols.

These findings suggest that the function of phenol conjugation is not limited to any one tissue, although it seems to occur predominantly in the kidney, liver, and intestine, while the brain and probably also the spinal cord appear to be devoid of this function.

As much as 6 to 8 mg free phenol per 100 g were found in the central nervous system of the rabbit following the administration of a toxic but nonfatal dose of phenol.

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ABSTRACT OF ANNUAL REPORT OF THE U.S. MARINE HOSPITAL, BALTIMORE, MD., FISCAL YEAR 1933 [1]

(Medical Director R. H. CREEL in charge)

Professional services at the marine hospital in Baltimore, Md., during the fiscal year 1933 were much the same as in previous years. The hospital continued to operate with maximum bed capacity. Whereas the normal number of beds was rated as 167, the average number of patients exceeded 193, and at times was in excess of 200. This excess over normal capacity was cared for by beds on porches and the utilization of temporary buildings. There have been very few complaints and many expressions of appreciation and commendation of ward personnel by patients.

During the year there were admitted 1,580 patients for a total of 70,464 days' treatment, and 6,798 out-patients were given an aggre-

[1] This summarized report of the Baltimore Marine Hospital is presented as more or less representative of the work of the other marine hospitals of the Public Health Service that are not devoted to the care of special patients.

gate of 49,063 treatments. Of the total number admitted, 1,037, or 66 percent, were merchant seamen, 182, or 12 percent, Coast Guardsmen, and 99, or 6 percent, beneficiaries of the Employees' Compensation Commission. The total number of in-patients during the year was 1,775. Of these the surgical service handled 765, or 43 percent; 602, or 34 percent, were cared for on medical service, of which number 82, or 5 percent, were in tuberculosis section; and 408, or 23 percent, were on venereal-disease service. Of the 38 deaths, 15 resulted from surgical conditions (partly operative), and 23 from medical conditions. Six of the surgical group died from cancer.

One hundred and five in-patient and 338 out-patient beneficiaries of the Employees' Compensation Commission were examined and treated, and in addition 671 Employees' Compensation Commission beneficiaries, 53 longshoremen, and 195 veterans were examined for purpose of report. These reports require considerable administrative attention, are time-consuming, and add very materially to the duties of the clerical force. The examination of compensation cases, in general, with the estimate of degree of disability, is difficult and perplexing. The determination of disability is simple in a certain number of cases in which the physical impairment is obvious; but a very substantial number of this group present no physical evidence of disability, and base their claim for such on complaints of subjective symptoms, such as pain or tenderness. Certainly, in a substantial number the symptoms are exaggerated for purpose of hospitalization or compensation. Not infrequently the physical impairment caused directly by accident is aggravated by focal infections or coincident ailments, and these factors add to the difficulty and confusion in estimating disability as directly due to the injury. One hundred and seventy beneficiaries of the Veterans' Administration were hospitalized for a total of 4,292 days, with reimbursement of $15,022. Incident to the enactment of new legislation, the latter part of the fiscal year, the hospitalization of this group was discontinued.

There was some addition to the equipment during the year. An electro-surgical unit for cauterizations and desiccations was purchased for the surgical department, and this contributed very much to the efficiency of operations for malignancies and brain work, and the so-called bloodless surgery wherever indicated.

SURGICAL SERVICE

The surgical service has a capacity of 85 beds, 12 of which are for colored patients. This number of beds proved to be inadequate, and transfers to other services and the discharge of patients before complete convalescence were necessary at times in order to provide available beds. Of the 1,580 patients admitted to the hospital, 681

were admitted to surgical service direct and 72 by transfer from other wards, and, in addition, 401 out-patient beneficiaries received surgical treatment, making a total of 1,154 patients treated on surgical service during the year. There were 1,251 operations performed in the general surgical section. These were exclusive of surgical procedures in the G-U section, dental clinic, eye, ear, nose, and throat clinic, and out-patient departments; likewise they do not include injections of arsenicals or minor operations in the medical section, such as spinal punctures, phlebotomy, pleurocentesis, pneumothorax, and similar procedures. The major operations included, among others, 101 appendectomies, 30 amputations, 137 hernia repairs, and 45 treatments of fractures. The employment of various anesthetics continued about the same as in former years, the majority of patients receiving spinal anesthesia or avertin. There were 490 cases which received general anesthesia, of which 61 percent received spinal, 12 percent avertin, and 26 percent gas and ether. Ether alone was given to 6 patients only during the year; 21 received gas and oxygen alone; 251 were given spinal anesthesia (spinocain), and 49 received rectal anesthesia (avertin) supplemented, however, in the majority of cases by gas or ether. Sixty patients received a combination of gas and ether. Other operations were performed under local anesthesia, generally produced by procaine. Nupercaine was the anesthetic generally used for cystoscopies. In operations below the umbilicus, spinal anesthesia continued to be the choice. Avertin was found to be a very satisfactory basal anesthetic, but in prolonged operations it not infrequently has to be supplemented by ether or gas. Avertin continued to be used in dental cases, with most satisfactory results, and this was particularly the case where a considerable number of teeth were to be extracted. Spinal anesthesia was administered to 253 patients without any untoward results or complications.

MEDICAL SERVICE

The medical service includes some 75 beds, 13 of which are for colored patients. This number of beds is inadequate for the service, and it is frequently necessary to discharge patients early in their convalescence in order to accommodate patients in greater need of hospitalization. Fourteen beds are allocated to tuberculous patients. Of the total number of 1,580 patients admitted to the hospital, 544 were admitted direct to medical wards and 43 subsequently transferred from other wards. Of this total, 67 were tuberculous and 8 were suffering from some psychosis. Treatments to medical out-patients totaled 199. The electro-cardiograph was used frequently as a diagnostic aid; 96 examinations of this nature were made during the year. Basal metabolism tests were made with more or less frequency, averaging throughout the year about 10 per month. The oxygen tent was used

with satisfactory results on some pneumonia patients, and the mortality rate was very low for the hospital practice as compared with general statistics. The case fatality rate for lobar pneumonia on medical service was 18 percent.

GENITO-URINARY SERVICE

In the G-U service some 424 patients were treated, practically all for venereal infection. There were 2,053 neoarsphenamine injections given to in-patients and 1,573 to out-patients. Bismuth and mercury injections were given in-patients 2,126 times, and to out-patients 1,842 times. There were occasional moderate reactions in the nature of dermatitis but none of serious consequence. Examination of spinal fluid in all cases of syphilis, both early and late, was continued as routine for white patients. The apprehension of the colored patients was such, and their opposition to spinal puncture so marked, that it could not be routinely resorted to among those patients. The routine adopted was that of spinal puncture after the third injection of neoarsphenamine. Those then showing spinal-fluid changes indicative of central-nervous-system lues were treated by malaria inoculation. A few of this group were also treated by mechanical hyperthermia. This form of therapy, however, was mainly utilized in the treatment of gonorrheal urethritis and gonorrheal arthritis. Of the 35 cases of central-nervous-system syphilis treated with the tertian type of malaria, 33 showed very marked improvement, and of the 48 cases treated by quartan-type malaria, 40 showed very marked improvement. The strain of malaria was maintained practically throughout the year by transfer from patient to patient. Malaria blood was furnished to the Johns Hopkins Hospital, University Hospital, Veterans' Administration Hospital at Perry Point, Md., and the Maryland State Hospital—in all, on 45 occasions. Spinal punctures were made 218 times.

EYE, EAR, NOSE, AND THROAT CLINIC

During the year there were given in the eye, ear, nose, and throat clinic 4,330 treatments to in-patients and 2,025 to out-patients. Fifty-five operations were performed, mainly of a minor character, as submucous resections and tonsillectomies. The more important operations on the eye were performed in the general surgical section, either by a member of the resident staff or a consultant or attending specialist.

DENTAL SERVICE

In this department there were administered 23,998 treatments to a total of 6,250 patients. This included both in-patients and out-patients. The dental service likewise took all X-ray pictures of teeth;

the number of exposures was 3,031. Operations of this department involved 139 alveolectomies, 260 full dentures, 2,956 extractions, 2,057 fillings, and the treatment of 3 fractured mandibles. The work of the dental service was carried on partly at the hospital and partly at the out-patient office in the customhouse, where two dental chairs were installed and a dental officer and oral hygienist were on duty.

CLINICAL LABORATORY

The clinical laboratory of the station is fairly well equipped, although in somewhat cramped quarters. A very substantial amount of work was carried out, however, including blood chemistry, quantitative and qualitative urinalysis, sputum examinations, typing of blood, gastric analyses, kidney and liver function tests, stool examinations, animal-inoculation tests, serological tests of spinal fluid, and miscellaneous bacteriological procedures. In accordance with more or less established procedure at this station, the genito-urinary department at the hospital and the out-patient office perform most of the examinations of urethral smears of patients under their respective charge. The routine examination of the blood of all patients admitted to the hospital, by the Kahn test for syphilis, was continued. This test was also made on out-patients whose symptoms were suggestive of syphilis. The laboratory work comprises an elaborate list of tests, but it may be noted that the laboratory made 4,602 red and white cell counts, 2,125 blood smears, approximately 600 blood-chemistry tests, 4,679 Kahn tests for syphilis, 4,693 urinalyses, 562 gastric analyses, almost 300 examinations of spinal fluid, 586 sputum examinations, and numerous other laboratory tests.

X-RAY DEPARTMENT

The work in the X-ray department showed a substantial increase over the preceding year; 7,374 exposures were made of the chest, bones and joints, gastro-intestinal and urogenital tracts, and skull and sinuses; 896 fluoroscopic examinations were made; and 436 X-ray treatments were given. The X-ray technician operates the electro-cardiograph, and took and developed electro-cardiographic films in 96 cases. Many clinical photographs were also taken. The X-ray department was a very substantial aid in the diagnostic field. Several unusual, more or less obscure, conditions were detected, involving in one instance a congenital single kidney, and in another a gastro-jejuno-colic fistula. During the latter part of the year the fluoroscope was employed more, mainly for economy in films.

PHYSICAL-THERAPY DEPARTMENT

The physical-therapy department functioned as in previous years, in cramped quarters and with consequent limitation of equipment. Helio-therapy, electro-therapy, massage and passive motion are used. Floor space is lacking for hydro-therapy. There were 12,574 treatments given to in-patients and 4,059 to out-patients.

OUT-PATIENT DEPARTMENT

The out-patient office, located in the customhouse in the downtown section of Baltimore, performs a very wide range of functions, including relief and physical examinations of the following classes: Candidates for license as mates, pilots, engineers; civil employees for retirement; civil-service appointees; beneficiaries of the United States Employees' Compensation Commission; seamen, and various others. The office likewise gives instructions in first aid and sanitation to ships' officers and applicants for ships' officers' papers. It attends to the issuance of permits for medicinal liquor and narcotics aboard ships. It issues port sanitary statements, and discharges various other miscellaneous functions. Adequate floor space has been provided by the collector of customs, well arranged and fully equipped. The office includes a very ample clinical laboratory, physical-therapy department, dental clinic, and other rooms for clinical work.

POST MORTEMS

Effort has been made to perform post mortems on every patient dying in the hospital, but consent of relatives cannot always be obtained. There were 38 deaths, of which number 14, or 36 percent, were examined post mortem by a member of the staff, attended by such other members as the work of the hospital would permit. Tissue examinations, both post mortem and ante mortem, are made at the National Institute of Health.

NURSING SERVICE

Twenty-five nurses, including the chief nurse, were accredited to the station. Excluding nurses employed solely in the operating room and in the various clinics and the out-patient office, and three on night duty, there remained 18 for nursing in the wards. Considering the absentees on annual leave or sick leave, there were available for day duty, on the average, 13 nurses. Nursing work, however, has been conducted in a very commendable manner. Wards are maintained in a clean, orderly condition, and the service rendered to patients has been very satisfactory.

A member of the clerical force devotes a limited amount of time performing commissions and aiding bed-ridden and helpless patients. Religious services and entertainments were not possible, as facilities remained limited. However, a Red Cross representative visited the hospital weekly and distributed small necessities to the patients. Of the 38 deaths during the year, 11 bodies were buried by the Public Health Service. The welfare clerk attended these funerals to see that they were carried out in a proper manner. Throughout the year, and especially during the winter months, numerous applicants for hospitalization were found ineligible, and arrangements were made through various city welfare agencies to care for them. Likewise, arrangements were made for some 23 convalescent patients, whom it was necessary to discharge although not yet able to return to duty, all of whom were without funds and were given board and lodging at the Anchorage (Y.M.C.A.).

The new hospital building is expected to be ready for occupancy about November 1, 1933. It is on the same reservation as the present hospital and so close that the building activity has caused some inconvenience to station operation. Despite this and the fact that some of the wards had to be torn down to make room for the new building, through various expedients the hospital work was conducted uninterruptedly and the full station bed-capacity was maintained.

COURT DECISIONS RELATING TO PUBLIC HEALTH

Bearing by counties of expense for public health work.—(Oklahoma Supreme Court; *Protest of Chicago, R. I. & P. Ry. Co.*, 23 P. (2d) 157, 158; decided June 13, 1933.) In cases involving protests against certain tax levies made by the excise boards of certain counties, the syllabi by the supreme court read, in part, as follows:

Under article 21 of the constitution of Oklahoma, an institution for the care of tubercular patients which is maintained by the State shall be at the expense of the State. That portion of section 5281, O.S. 1931, which attempts to place a portion of that tax burden upon the counties is in violation of the constitution and inoperative.

That portion of section 5281, O.S. 1931, which places the expense of caring for tubercular patients in a county, the expense of the prevention of conditions in a county that are predisposing causes of tuberculosis and other devastating diseases, the expense of prevention and control of epidemics in a county, the promotion of the public health in a county, and the expense of a county department of health, including compensation of its employees, upon that county, is a valid legislative enactment and is not in conflict with the provisions of article 21 of the constitution.

DEATHS DURING WEEK ENDED NOVEMBER 25, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Nov. 25, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	8,195	7,695
Deaths per 1,000 population, annual basis	11.5	11.0
Deaths under 1 year of age	599	579
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	52	47
Deaths per 1,000 population, annual basis, first 47 weeks of year	10.8	11.0
Data from industrial insurance companies:		
Policies in force	67,410,169	69,812,157
Number of death claims	13,329	10,950
Death claims per 1,000 policies in force, annual rate	10.3	8.2
Death claims per 1,000 policies, first 47 weeks of year, annual rate	9.8	9.5

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Dec. 2, 1933, and Dec. 3, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 2, 1933, and Dec. 3, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932
New England States:								
Maine	5	9	2	2	1	4	0	0
New Hampshire					26		0	0
Vermont	4				58		0	0
Massachusetts	20	35		4	372	83	0	3
Rhode Island	4	4			1	1	0	0
Connecticut	4	9	4	18	10	13	2	0
Middle Atlantic States:								
New York	48	50	[1] 30	[1] 17	363	653	2	9
New Jersey	29	50	19	13	44	242	1	0
Pennsylvania	76	140			258	347	5	3
East North Central States:								
Ohio	119	49	154	37	114	166	0	1
Indiana	96	117	46	247	31	16	3	0
Illinois	43	90	19	73	36	67	5	14
Michigan	23	20	3	2	52	272	0	0
Wisconsin	18	10	24	25	81	180	1	2
West North Central States:								
Minnesota	15	15		1	53	82	0	1
Iowa [2]	19	18			4	5	1	0
Missouri	79	66	7	123	41	12	2	0
North Dakota	23	13	2	1	15	49	0	0
South Dakota	5	10		1	219		0	1
Nebraska	4	48		4	6	3	0	0
Kansas	26	31		52	6	12	1	3
South Atlantic States:								
Delaware		4			1		0	0
Maryland [2]	23	16	17	16	2	4	0	1
District of Columbia	17	10	1	5	18	5	0	1
Virginia	89	50			46	113	3	1
West Virginia	56	40	57	36	2	77	4	1
North Carolina	62	61	9	11	347	58	4	2
South Carolina [3]	16	16	587	543	187	31	0	0
Georgia [3]	28	32		297	126	6	1	1
Florida	15	15	2	10	1	2	0	0
East South Central States:								
Kentucky	126	75	35	108	8		0	3
Tennessee	6	84	37	946	87	3	2	1
Alabama [3]	49	34	65	3,527	51	3	0	1
Mississippi [3]	25	35						0

See footnotes at end of tabla.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 2, 1933, and Dec. 3, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932
West South Central States:								
Arkansas	22	30	42	204	213	5	0	0
Louisiana [3]	36	34	4	1,183	3	3	0	2
Oklahoma [4]	73	50	29	152	43	2	3	0
Texas [2]	305	154	139	111	19	44	1	3
Mountain States:								
Montana	3	1	5			371	0	0
Idaho		3	1	19	5	2	0	0
Wyoming	1			1	34	5	0	0
Colorado	3	9	37	1,034	3	10	0	1
New Mexico	16	5	2	2,750	26	1	0	0
Arizona	8	4	21	688	3	1	0	0
Utah [2]	1	2		37	75		0	1
Pacific States:								
Washington	9	6		7	113	3	0	0
Oregon		2	14	284	22	41	0	0
California	38	69	57	1,702	162	47	2	3
Total	1,687	1,625	1,481	14,291	3,388	3,044	43	59

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932
New England States:								
Maine	1	2	10	17	0	0	1	6
New Hampshire	0	0	22	10	0	0	0	0
Vermont	0	0	6	12	0	1	0	0
Massachusetts	1	1	171	277	0	0	1	2
Rhode Island	0	0	18	33	0	0	0	0
Connecticut	1	0	54	73	0	0	0	0
Middle Atlantic States:								
New York	5	0	380	603	0	16	5	9
New Jersey	0	1	133	183	0	0	6	5
Pennsylvania	6	4	494	538	0	0	23	35
East North Central States:								
Ohio	5	1	697	506	4	19	9	8
Indiana	1	0	198	142	2	7	7	12
Illinois	1	1	358	389	0	0	12	12
Michigan	0	2	203	211	3	3	6	3
Wisconsin	2	0	133	79	17	2	1	2
West North Central States:								
Minnesota	3	1	53	78	2	1	0	1
Iowa [2]	0	0	86	52	33	44	0	2
Missouri	0	0	163	138	1	0	10	3
North Dakota	0	0	37	5	0	0	1	0
South Dakota	0	1	11	19	0	0	0	0
Nebraska	1	1	23	65	2	4	5	0
Kansas	1	0	120	82	3	1	3	5
South Atlantic States:								
Delaware	0	0	5	12	0	0	3	0
Maryland [2]	3	2	96	85	0	0	5	6
District of Columbia	0	0	12	10	0	0	1	0
Virginia	0	0	133	61	0	0	13	7
West Virginia	2	0	151	74	1	0	6	14
North Carolina	0	0	156	111	0	0	3	17
South Carolina [2]	0	0	21	11	0	2	9	4
Georgia [2]	0	0	22	18	0	0	9	2
Florida	0	0	4	10	0	0	2	1
East South Central States:								
Kentucky	0	1	142	91	0	4	14	19
Tennessee	0	1	120	70	0	1	12	14
Alabama [2]	2	0	46	42	2	4	11	7
Mississippi [2]	0	1	24	28	1	1	4	5

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 2, 1933, and Dec. 3, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932	Week ended Dec. 2, 1933	Week ended Dec. 3, 1932
West South Central States:								
Arkansas	0	0	18	50	0	0	2	3
Louisiana [3]	0	0	29	18	4	3	9	5
Oklahoma [4]	0	0	64	30	0	0	17	7
Texas [3]	3	2	152	81	6	13	33	15
Mountain States:								
Montana	1	0	16	13	0	0	0	4
Idaho	0	0	5	0	6	4	0	3
Wyoming	0	0	8	8	0	0	1	0
Colorado	1	0	38	65	10	0	1	3
New Mexico	1	0	26	34	0	0	7	2
Arizona	1	0	8	6	0	0	1	0
Utah [3]	1	0	11	4	0	0	0	0
Pacific States:								
Washington	0	3	24	36	1	3	5	1
Oregon	4	0	49	26	7	4	1	1
California	4	3	164	152	6	2	27	8
Total	51	28	4,914	4,658	111	139	286	253

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Dec. 2, 1933, 35 cases, as follows: South Carolina, 1; Georgia, 16; Alabama, 15; Louisiana, 1; Texas, 2.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
October 1933										
Kansas	2	123		2	22		6	569	6	25
Mississippi		229	1,674	12,860	182	363	1	150	7	30
Washington	7	48	35		117		19	127	10	14

October 1933

Chicken pox:	Cases
Kansas	197
Mississippi	141
Washington	376
Dengue:	
Mississippi	8
Dysentery:	
Mississippi (amoebic)	51
Washington (bacillary)	1
Enteritis:	
Washington (under 2 years)	6
Washington (over 2 years)	8
German measles:	
Kansas	6
Washington	13
Hookworm disease:	
Mississippi	745

Impetigo contagiosa:	Cases
Kansas	17
Lethargic encephalitis:	
Kansas	43
Washington	2
Mumps:	
Kansas	68
Mississippi	68
Washington	127
Ophthalmia neonatorum:	
Kansas	1
Paratyphoid fever:	
Kansas	1
Puerperal septicemia:	
Mississippi	14
Washington	3
Rabies in animals:	
Mississippi	3
Washington	3

Septic sore throat:	Cases
Kansas	7
Washington	4
Tetanus:	
Kansas	3
Tularaemia:	
Kansas	1
Typhus fever:	
Mississippi	1
Undulant fever:	
Kansas	2
Mississippi	3
Washington	2
Vincent's infection:	
Kansas	6
Whooping cough:	
Kansas	263
Mississippi	513
Washington	52

PLAGUE-INFECTED GROUND SQUIRREL, SANTA CLARA COUNTY, CALIF.

The Director of Public Health of the State of California reports that a ground squirrel shot 15 miles northeast of San Jose, near the Calaveras Dam, in the interior of Santa Clara County, Calif., was proved positive for plague by animal inoculation on November 29, 1933.

WEEKLY REPORTS FROM CITIES

City reports for week ended Nov. 25, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	0	3	0	0	0	2	6	26
New Hampshire:											
Concord	0	------	0	0	0	0	0	1	0	0	12
Manchester	0	------	0	4	0	2	0	0	0	0	13
Nashua	2	------	0	1	0	10	0	0	0	0	0
Vermont:											
Barre	0	------	0	51	0	2	0	0	0	2	3
Burlington	4	------	0	0	0	1	0	0	0	0	10
Massachusetts:											
Boston	3	------	0	127	28	55	0	10	0	65	226
Fall River	0	------	0	0	1	4	0	0	0	1	30
Springfield	0	------	0	0	1	2	0	2	0	14	33
Worcester	2	------	0	227	5	10	0	3	0	31	--------
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	20
Providence	1	------	1	0	2	6	0	2	1	24	56
Connecticut:											
Bridgeport	1	------	0	12	4	11	0	0	0	3	45
Hartford	0	------	0	0	2	18	0	1	1	0	44
New Haven	0	1	0	0	3	1	0	0	0	7	58
New York:											
Buffalo	5	------	2	43	29	17	0	7	0	25	136
New York	33	17	5	18	161	101	0	82	6	98	1,520
Rochester	0	------	0	1	7	6	0	0	0	10	71
Syracuse	0	------	0	0	6	7	0	0	1	55	46
New Jersey:											
Camden	1	------	0	0	3	7	0	1	0	0	38
Newark	2	5	2	5	12	16	0	3	0	16	88
Trenton	1	1	0	0	1	5	0	2	0	3	42
Pennsylvania:											
Philadelphia	6	14	9	109	50	72	0	15	2	37	571
Pittsburgh	2	4	2	0	17	23	0	12	0	58	163
Reading	0	------	0	3	1	4	0	2	0	5	23
Scranton	0	------	0	0	0	1	0	0	0	1	0
Ohio:											
Cincinnati	14	------	0	41	11	24	0	11	0	10	128
Cleveland	11	71	2	2	16	57	0	11	1	50	197
Columbus	4	------	0	1	6	51	0	4	0	6	95
Toledo	3	1	1	3	4	24	0	3	0	12	56
Indiana:											
Fort Wayne	6	------	1	0	6	2	0	1	0	0	30
Indianapolis	7	------	0	0	6	25	0	4	1	7	--------
South Bend	0	------	0	0	0	1	0	0	0	3	18
Terre Haute	1	------	0	23	2	6	0	0	0	0	15
Illinois:											
Chicago	1	11	4	4	52	157	0	30	0	92	681
Cicero	0	------	0	0	0	0	0	0	0	0	5
Springfield	9	------	0	2	2	3	0	1	0	5	20
Michigan:											
Detroit	7	3	0	12	28	50	0	23	1	87	250
Flint	0	------	0	1	2	26	0	0	0	10	21
Grand Rapids	0	------	0	0	1	4	0	0	0	1	31
Wisconsin:											
Kenosha	0	------	0	2	0	6	0	0	0	5	5
Madison	0	------	--------	0	-------	2	0	------	0	20	30
Milwaukee	0	2	2	2	4	12	1	3	1	88	89
Racine	1	------	0	1	0	17	0	1	0	0	15
Superior	0	------	0	0	0	3	0	0	0	3	8

City reports for week ended Nov. 25, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Minnesota:											
Duluth	0	------	0	0	3	3	0	2	0	1	25
Minneapolis	1	------	1	1	8	15	0	1	0	14	88
St. Paul	0	------	0	2	3	15	0	4	1	7	71
Iowa:											
Des Moines	3	------	--------	1	-------	25	0	-------	0	0	36
Sioux City	4	------	--------	0	-------	5	0	-------	0	3	--------
Waterloo	0	------	--------	0	-------	0	0	-------	0	1	--------
Missouri:											
Kansas City	2	------	1	0	12	26	0	8	0	6	105
St. Joseph	1	------	0	0	1	2	0	0	0	0	13
St. Louis	23	------	--------	29	13	19	0	12	3	26	191
North Dakota:											
Fargo	0	------	0	4	0	1	0	0	0	4	0
Grand Forks	0	------	0	0	0	0	0	0	0	3	0
South Dakota:											
Aberdeen	0	------	0	0	0	0	0	0	0	0	0
Sioux Falls	0	------	0	122	0	0	0	0	0	0	6
Nebraska:											
Omaha	0	------	0	13	4	15	9	3	0	8	50
Kansas:											
Topeka	0	------	0	1	0	4	0	1	0	6	5
Wichita	2	------	0	1	1	8	0	1	0	2	18
Delaware:											
Wilmington	1	------	0	0	2	2	0	2	0	2	22
Maryland:											
Baltimore	4	4	2	1	21	28	0	20	2	72	218
Cumberland	4	------	0	0	0	6	0	0	0	3	7
Frederick	0	------	0	0	0	1	0	0	0	0	3
District of Columbia:											
Washington	22	1	1	9	17	21	0	16	1	15	168
Virginia:											
Lynchburg	6	------	0	0	1	1	0	0	1	0	15
Norfolk	1	------	0	0	0	9	0	0	1	0	27
Richmond	7	------	0	0	5	10	0	1	1	0	46
Roanoke	7	------	0	1	0	8	0	0	0	0	9
West Virginia:											
Charleston	7	2	0	0	2	4	0	3	[1] 1	0	26
Huntington	3	------	0	0	0	17	0	0	0	0	0
Wheeling	0	------	0	0	3	12	0	0	0	2	17
North Carolina:											
Raleigh	0	------	0	0	1	9	0	0	0	3	4
Wilmington	0	------	0	0	1	0	0	0	0	0	8
Winston-Salem	11	------	0	193	2	15	0	1	0	0	22
South Carolina:											
Charleston	0	10	0	0	2	1	0	3	1	4	28
Columbia	0	------	0	0	9	0	0	1	0	0	46
Greenville	0	------	0	0	0	0	0	0	0	0	6
Georgia:											
Atlanta	21	20	5	1	10	3	0	8	0	7	81
Brunswick	0	------	0	0	0	0	0	0	0	3	2
Savannah	6	3	0	1	5	6	0	6	1	0	36
Florida:											
Miami	0	1	0	0	0	4	0	2	0	0	25
Tampa	3	1	1	0	1	0	0	2	0	0	25
Kentucky:											
Ashland	6	------	--------	0	-------	1	0	-------	1	6	--------
Lexington	6	5	0	0	2	4	0	2	0	6	15
Louisville	13	------	0	0	8	21	0	2	0	0	51
Tennessee:											
Memphis	8	------	1	3	11	13	0	3	1	1	74
Nashville	6	------	0	1	8	10	0	0	3	6	51
Alabama:											
Birmingham	3	3	1	0	4	10	0	4	2	0	59
Mobile	1	------	2	0	2	0	0	1	0	0	31
Montgomery	2	1	--------	0	-------	5	0	-------	0	0	--------
Arkansas:											
Fort Smith	2	------	--------	1	-------	0	0	-------	0	1	--------
Little Rock	3	------	0	0	2	5	0	0	0	0	2
Louisiana:											
New Orleans	15	3	0	3	8	8	0	12	2	0	152
Shreveport	5	------	0	0	2	4	0	1	0	0	36

[1] Imported.

City reports for week ended Nov. 25, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Texas:											
Dallas	30	1	1	0	5	9	0	1	0	0	58
Fort Worth	10	------	1	0	3	10	0	1	2	0	40
Galveston	0	------	0	0	6	1	0	3	0	0	20
Houston	16	------	0	0	8	6	0	3	0	0	70
San Antonio	5	------	1	1	6	3	0	6	0	0	77
Montana:											
Billings	0	------	0	0	0	0	0	0	0	0	9
Great Falls	0	------	0	0	0	0	0	1	0	0	10
Helena	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	------	0	0	0	3	0	0	0	0	10
Idaho:											
Boise	0	------	0	1	0	1	0	0	0	0	6
Colorado:											
Denver	1	29	0	0	4	17	0	4	0	35	71
Pueblo	0	------	0	1	1	0	0	0	0	2	9
New Mexico:											
Albuquerque	0	------	0	0	0	2	0	4	1	0	8
Utah:											
Salt Lake City	0	------	0	117	2	8	0	1	1	5	23
Nevada:											
Reno	0	------	0	1	0	0	0	0	0	0	3
Washington:											
Seattle	0	------	1	0	3	12	0	2	2	49	74
Spokane	0	------	--------	98	2	2	0	-------	0	1	21
Tacoma	2	------	1	0	2	1	0	1	0	4	23
Oregon:											
Portland	0	------	0	2	2	16	1	2	0	0	67
Salem	0	------	0	0	0	0	0	0	0	1	0
California:											
Los Angeles	20	40	1	4	25	69	0	15	0	70	272
Sacramento	0	1	0	13	1	2	0	2	0	0	29
San Francisco	2	10	1	0	9	11	0	9	0	27	148

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Minnesota:			
Springfield	0	0	1	Minneapolis	0	0	2
New York:				Missouri:			
New York	4	2	0	St. Joseph	1	0	0
Pennsylvania:				St. Louis	1	0	0
Philadelphia	1	0	2	Kansas:			
Pittsburgh	0	0	1	Topeka	1	0	0
Scranton	0	0	1	Georgia:			
Ohio:				Atlanta	1	0	0
Cleveland	0	0	2	Louisiana:			
Indiana:				New Orleans	1	1	0
Indianapolis	2	0	0	Oregon:			
Illinois:				Portland	0	0	1
Chicago	4	3	1	California:			
Wisconsin:				Los Angeles	2	1	0
Milwaukee	1	0	0	San Francisco	0	1	0

Lethargic encephalitis.—Cases: New York, 2; Pittsburgh, Pa., 1; Cleveland, 1; Milwaukee, 1; Kansas City, Mo., 3; St. Louis, 2; San Antonio, Tex., 1.

Typhus fever.—Cases: New York, 3; Norfolk, Va., 2; Atlanta, 2; Savannah, 2; New Orleans, 1; Houston, Tex., 1.

Pellagra.—Cases: Atlanta, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Two weeks ended November 18, 1933.—During the 2 weeks ended November 18, 1933, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis					3					3
Chicken pox		7		326	500	182	56	35	168	1,274
Diphtheria	1	4	8	57	12	26	1	1		110
Dysentery					1					1
Erysipelas				7	5	3	1	2		18
Influenza		10		4	8	2			22	46
Lethargic encephalitis						2		1		3
Measles				265	67	1	6		1	340
Mumps					91	14	18		82	205
Paratyphoid fever					5					5
Pneumonia (all forms)		5			20		1		10	36
Poliomyelitis				6	3		2	1		12
Scarlet fever	6	8	15	146	230	43	5	16	122	591
Smallpox					1					1
Tuberculosis		1	12	102	53	21	44	6	39	278
Typhoid fever		2	3	49	14	4	3		6	81
Undulant fever					4					4
Whooping cough		5	9	277	162	54	10	19	43	579

CZECHOSLOVAKIA

Communicable diseases—September 1933.—During the month of September 1933, certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	4		Malaria	361	
Cerebrospinal meningitis	5	1	Paratyphoid fever	21	
Chicken pox	104		Poliomyelitis	28	1
Diphtheria	2,188	129	Puerperal fever	35	11
Dysentery	22		Scarlet fever	2,087	17
Influenza	17	1	Trachoma	140	
Lethargic encephalitis	1		Typhoid fever	729	46

TRINIDAD

Port of Spain—Vital statistics—1932.—During the year 1932, certain vital statistics were reported in Port of Spain, Trinidad, as follows:

Population	71,066
Total births	2,021
Birth rate per 1,000 population	28.44
Total deaths	1,125
Death rate per 1,000 population	15.83
Deaths under 1 year	207
Infant mortality rate per 1,000 births	102.42
Deaths from—	
Ancylostomiasis	1
Bright's disease and nephritis	71
Bronchitis	51
Cancer	44
Cardiac and vascular diseases	175
Diarrhea and enteritis	56
Dysentery	12
Influenza	3
Lethargic encephalitis	1
Malaria	36
Pneumonia	55
Syphilis	26
Tuberculosis	122
Typhoid fever	4

YUGOSLAVIA

Communicable diseases—October 1933.—During the month of October 1933, certain communicable diseases were reported in Yugoslavia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	80	2	Poliomyelitis	2	1
Cerebrospinal meningitis	4	3	Scarlet fever	527	15
Diphtheria and croup	994	101	Sepsis	9	4
Dysentery	226	34	Tetanus	49	26
Erysipelas	229	7	Typhoid fever	507	42
Measles	939	15	Typhus fever	41	5
Paratyphoid fever	15	1			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Nov. 24, 1933, pp. 1431-1442. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Dec. 29, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands.—During the week ended December 2, 1933, cholera was reported in the Philippine Islands as follows: Antique Province—Dao, 8 cases, 6 deaths. Bohol Province, Antequera, 2 cases, 2 deaths; Balilihan, 1 case; Calape, 3 cases, 1 death; Clarin, 2 cases, 1 death; Loon, 3 cases, 1 death; Tubigon, 40 cases, 20 deaths. Cebu Province—Argao, 5 cases, 5 deaths; Liloan, 3 cases; Naga, 4 cases,

3 deaths; Opon, 2 cases, 1 death; Toledo, 1 case, 1 death. Occidental Negros Province—San Carlos, 2 cases, 1 death.

Plague [1]

France—Marseille.—On November 7, 1933, one plague-infected rat was found on a dock at Marseille, France.

United States—California.—A report dated December 1, 1933, states that one ground squirrel shot in Santa Clara County, 15 miles northeast of San Jose, Calif., was proved positive for plague November 29, 1933.

Yellow Fever

Senegal.—During the week ended November 18, 1933, 1 case of yellow fever with 1 death was reported in Dakar, Senegal. On November 29, 1933, one case of yellow fever was reported in Kaolak, Nioro Circle, Senegal.

[1] Including plague in the United States.