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SIMPLIFIED APPRAISAL OF DENTAL-HEALTH PROGRAMS

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Several methods which might be used in appraising community dental-health programs, and discussions on the relative merits of each method have been reported (*1, 2, 3, 4, 5, 6, 7, 8, 9*). This paper is concerned primarily with the presentation of a simplified procedure for evaluating a county-wide dental program for school children. The procedure is designed to afford determinations, by age, of dental-caries prevalence, and of tooth mortality in the permanent teeth of school children. Evaluation is dependent on periodic comparisons of these determinations. The method used to obtain prevalence of dental caries is based on the observation (*10*) that a functional relationship exists between the proportion of children having at least one DMF (decayed, missing or filled) permanent tooth and the average number of DMF permanent teeth per child. Age-specific-tooth mortality rates are obtained from actual counts of permanent teeth which have been extracted or are indicated for extraction. Use of the simplified method of appraisal is illustrated by application to a county-wide dental program which has been in operation for more than 5 years. Although the technique of evaluation is not dependent on the means employed to improve dental health, a brief review of the conditions and procedures under which the program operated seems to be indicated.

THE NICOLLET COUNTY DENTAL PROGRAM

At the beginning of the 1940–41 school year, a dental program, which was sponsored by the Minnesota Department of Health in cooperation with the United States Public Health Service, was inaugurated in Nicollet County, Minnesota. The broad objective of

this program was to improve the dental health of the school children. One of the specific purposes of this undertaking, however, was to develop and test simplified program records and techniques of evaluation. The means used to bring about an improvement in dental health was to advocate and promote at least one dental examination per year, supplemented by the necessary dental treatment for each school child. School teachers and principals were encouraged to participate in this effort. In January 1942, a dental-health advisor was assigned to the program to work in cooperation with the county nurse, and to assist the teachers in attaining in their own classrooms the yearly goal of a dental examination and necessary dental treatment for each child. Through the financial assistance of the county welfare board, dental care was made available to children of dependent mothers and of families who were relief clients.

Nicollet County comprises an area of 459 square miles, and in 1940, its population was 18,282. At that time there were 10 dentists practicing in the county, one of whom was employed full time at the St. Peter State Hospital. Since June 1942, three of the dentists have served in the armed forces for an average of 3 years. St. Peter, the largest town in the county, with a population of 5,870 in 1940, is the county seat. There are three smaller towns, but the population of the county is predominantly rural. In addition to the public and parochial town schools, there were, at the beginning of the 1940–41 school year, 44 rural district schools with enrollments ranging from 4 to 27 children.

To facilitate a periodic check during each school year on the effectiveness of application of the means used to attain the objective of the dental program, a Dental Health Report Card (*5*) was provided yearly for each school child. This card contained spaces for the name of the child and for the dentist's signature upon completion of the necessary dental care. The completed card was returned by the child to his school teacher. The use of this card during the school year immediately preceding the inauguration of the special demonstration program indicated that 26 percent of the children enrolled in the elementary grades (through the eighth grade) had received complete dental care. Thereafter, the percentage of children who received complete dental treatment increased progressively from 53.8 for the school year ending June 1941 to 79.1 for the school year ending June 1946.

The use of the Dental Health Report Card system indicated that the percentage of children who received a dental examination and necessary dental treatment at least annually was increased markedly under the program. However, evaluation by this system alone, as measured by increases in the proportion of children who received annual dental

examination and care, does not necessarily provide an objective measure of improvement in dental health. It merely affords a measure of the frequency with which the means chosen to improve dental health has been applied. One of the prime purposes of promoting periodic examination and timely dental-treatment services for children is the early detection and treatment of carious teeth in order to prevent tooth loss. Therefore, a specific measure of the effectiveness of the dental program itself is afforded by periodic tooth-loss rates which may be used comparatively to determine the reduction in tooth loss accomplished under the program.

BASE-LINE DATA

During the fall of 1940, detailed dental examinations were made of the children enrolled in the elementary and high-school grades of all schools, parochial and public, of Nicollet County. The method of examination has been described in detail in a previous report (*11*). Of the 2,627 children (aged 6 to 18 years) examined, 2,064 (78.6 percent) were enrolled in public and 563 (21.4 percent) in parochial schools. About two-fifths of these children were attending rural schools, 918 being enrolled in the 44 rural public schools and 202 in the 5 rural parochial schools.

The examinations were made by one of us (J.W.K.) with the assistance of a recorder, and were completed in a 2-month period. Decoding and processing of the dental-examination records required a minimum of 3 clerk-months. Analysis of the findings indicated that the average incidence of dental decay in the permanent teeth of Nicollet County school children was slightly less than one tooth attacked per child per year, and that roughly two-thirds of the DMF (decayed, missing, or filled) teeth had been filled (*5*). Thus, by comparison with findings among children in other communities surveyed, such as Hagerstown, Maryland, for example (*5*, *11*), the level of dental care was relatively high at the beginning of the program.

EVALUATION TECHNIQUE

In May 1946, after more than 5 years of operation of the program, a determination of the dental status of the Nicollet County school children was undertaken again. This time, however, an effort was made to set up an examination form from which sufficient comparative data could be derived to evaluate the program adequately, and at the same time to shorten as much as possible the examination and tabulation time involved. The information secured for each child was as follows:

1. Name, age, and sex.
2. Are there one or more DMF permanent teeth in the mouth?
3. Are there one or more fillings in permanent teeth?

4. Are there one or more fillings in deciduous teeth?

5. How many permanent teeth are indicated for extraction? (Specify tooth or teeth indicated for extraction.)

6. How many permanent teeth have been extracted? (Specify tooth or teeth extracted.)

7. What is the total number of missing teeth? (Permanent teeth indicated for extraction plus those extracted.)

8. Qualifying remarks.

Questions 2, 3, and 4 were answered by a "plus" or a "nought" sign, the examiner calling out one or the other to the recorder in answer to each of these questions as he examined each child's teeth. Questions 5 and 6 were used to specify, by position in the mouth, teeth indicated for extraction or already extracted, and question 7 to indicate the total number of teeth specified under questions 5 and 6. Space for remarks provided for qualifying notes, such as "tooth congenitally missing," "tooth lost because of severe trauma," and for notes on other special conditions. The form used in making the survey is reproduced in figure 1.

DENTAL SURVEY

COUNTY Nicollet SCHOOL District No 32 EXAMINER W. A. Jordan
CITY Rural ADDRESS _____ DATE 4-24-46

NAME OF PUPIL	AGE	SEX	PERMANENT TEETH (EXCEPT FOR FILLINGS)						
			DMF	FILLINGS		MISSING			REMARKS
				P	D	EXTRACTION INDICATED	EXTRACTED	TOTAL	
Jones, Mary	9	F	+	+	+	0	0	0	
Smyth, Abe	9	F	0	0	0	0	0	0	
White, Peter	9	M	+	0	0	6/	\6	2	
Black, John	9	M	+	+	0	0	0	0	2/ Congenitally Missing
Mann, Vern	9	M	+	0	0	0	6\6	2	
Lee, James	9	M	+	+	+	6	0	1	

P=Permanent, D=Deciduous

FIGURE 1.

The examination of 2,310 children by this abbreviated procedure was completed in 3 days by three teams of examiners. Each examining team consisted of a dentist and a recorder. Although one such team can examine approximately 125 children per hour, a considerable amount of travel time was involved in visits to each of the rural schools as well as to each of the schools in urban centers. Processing and final tabulation of the data were completed in less than 1 clerk-week. Examinations were made of the children in 40 of the 42 rural public schools and in the 4 rural parochial schools, as well as in the public and parochial schools in the urban centers of the county.

COMPARISON OF FINDINGS 1940–1946

The proportions of children, by age, having one or more decayed permanent teeth, for the years 1940 and 1946, are presented in figure 2.

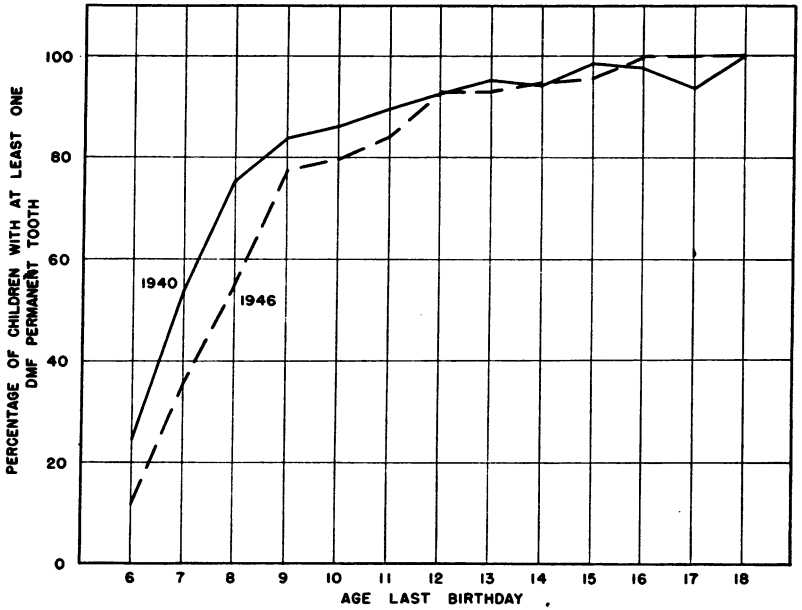

FIGURE 2.—Percentage of children with at least one DMF (decayed, missing or filled) permanent tooth by age, for 2,627 Nicollet County, Minnesota, school children in 1940 and 2,310 in 1946.

Comparison indicates that the percentages are consistently lower for children aged 6 through 11 years for 1946 than for 1940, but that they are strikingly similar for children aged 12 to 18 years. The 1940 findings are based on the results of dental examinations made with the aid of a mouth mirror and explorer, whereas those for 1946 were obtained with the aid of a tongue blade only. Therefore, the differences in the proportions of children having one or more DMF permanent teeth for children aged 6 to 11 years are most likely a reflection of the difference in the technique of examination rather than a true difference in the caries attack rate. The similarity of the proportions for children aged 12 to 18 is in accord with this conclusion, because at this age level relatively few children experience their first perceptible caries in permanent teeth. Since there is more evidence of caries among the children aged 12 to 18 years than among children in the younger age classes, the explorer and mirror are much more frequently needed to diagnose the first objective sign of caries in the permanent teeth of the latter group. Thus, it is presumed that no real difference exists between the caries incidence in 1946 and that in 1940, with the reservation that this conclusion would be more justifiable if identical techniques of examination had been used. The correctness of this

conclusion, however, is of no great importance to the purposes of this presentation. The simplified technique, as used to obtain the 1946 findings on caries prevalence, is advocated for general use, both for obtaining base-line data and data for subsequent comparisons.

Comparison of the tooth-loss or tooth-mortality rates, which are based on extracted permanent teeth plus permanent teeth indicated for extraction, is presented in figure 3. It will be noted that the

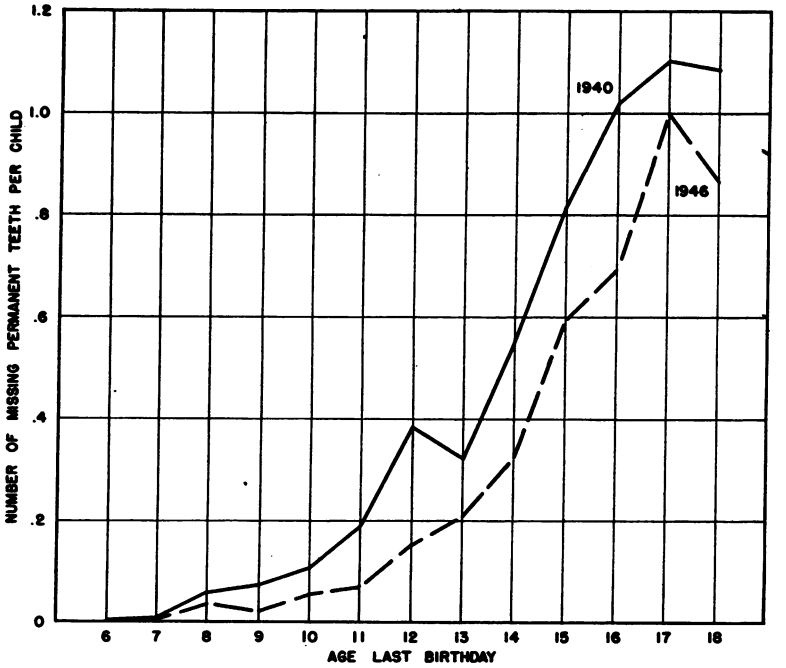

FIGURE 3.—Tooth mortality, by age, for 2,627 Nicollet County, Minnesota, school children in 1940 and 2,310 in 1946.

tooth-mortality rates are consistently lower in 1946 than in 1940. The over-all reduction is approximately 30 percent. The appreciable reduction in tooth-mortality rates accomplished by the program in a period of less than 6 years is objective evidence of the effectiveness of the program in accomplishing its purpose. The result is particularly gratifying in view of the fact that the tooth-loss rates for children in Nicollet County in 1940 were approximately half those for Hagerstown children examined in the spring of 1937. This difference was due to a relatively high level of dental care among Nicollet County children at the beginning of the program (*5*).

Information on the proportions of children having one or more filled permanent teeth and of children with one or more filled deciduous teeth is not essential to the appraisal. However, because of the ease with which these data can be obtained, without appreciably increasing

the time necessary to collect the essential information, they were collected simultaneously. Comparisons of the findings on fillings for 1940 and 1946 are presented in figures 4 and 5. These comparisons

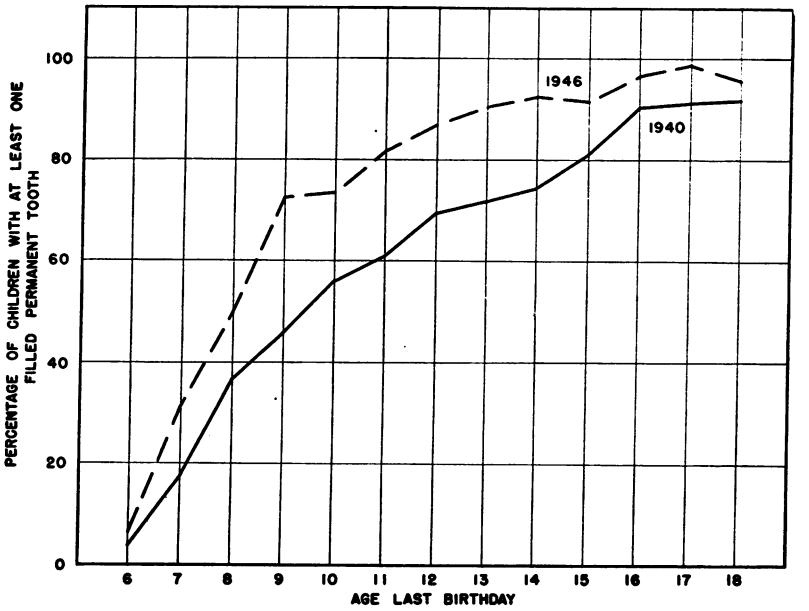

FIGURE 4.—Percentage of children with at least one filled permanent tooth, by age, for 2,627 Nicollet County Minnesota, school children in 1940 and 2,310 in 1946.

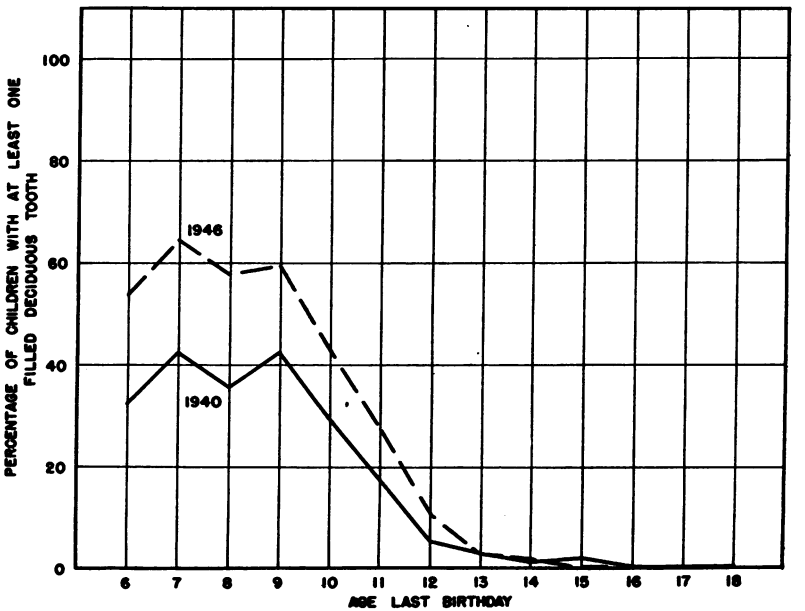

FIGURE 5.—Percentage of children with at least one filled deciduous tooth, by age, for 2,627 Nicollet County Minnesota, school children in 1940 and 2,310 in 1946.

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TABLE 1.—*Number of children examined, by age, and number and percentages of children affected by specified dental conditions, among 2,677 children in 1940 and 2,310 in 1946, for Nicollet County, Minnesota*

Year	Age last birthday (in years)												
	6	7	8	9	10	11	12	13	14	15	16	17	18
	Age distribution of children												
1940	259	252	276	282	276	265	289	231	159	142	93	79	24
1946	164	269	235	252	219	247	207	235	172	120	91	77	22
	Number of children with at least one DMF [1] permanent tooth												
1940	63	135	208	237	238	238	268	220	150	140	91	74	24
1946	19	95	129	195	175	208	192	219	163	115	91	77	22
	Percentage of children with at least one DMF [1] permanent tooth												
1940	24.3	53.6	75.4	84.0	86.2	89.8	92.7	95.2	94.3	98.6	97.8	93.7	100.0
1946	11.6	35.3	54.9	77.4	79.9	84.2	92.8	93.2	94.8	95.8	100.0	100.0	100.0
	Number of missing [2] permanent teeth												
1940	1	2	16	20	29	50	111	74	87	116	95	87	26
1946	0	1	9	5	12	17	31	49	64	71	63	77	19
	Number of missing [2] permanent teeth, per child												
1940	.004	.008	.058	.071	.105	.189	.384	.320	.547	.817	1.002	1.101	1.083
1946	.000	.004	.038	.020	.055	.069	.150	.209	.327	.592	.692	1.000	.864
	Number of children with at least one filled permanent tooth												
1940	10	43	101	129	154	161	200	166	118	115	84	72	22
1946	10	83	117	182	160	202	180	213	159	110	88	76	21
	Percentage of children with at least one filled permanent tooth												
1940	3.9	17.1	36.6	45.7	55.8	60.8	69.2	71.9	74.2	81.0	90.3	91.1	91.7
1946	6.1	30.9	49.8	72.2	73.1	81.8	87.0	90.6	92.4	91.7	96.7	98.7	95.5
	Number of children with at least one filled deciduous tooth												
1940	84	107	99	119	82	47	16	7	2	3	0	0	0
1946	88	173	136	149	94	68	22	7	3	0	0	0	0
	Percentage of children with at least one filled deciduous tooth												
1940	32.4	42.5	35.9	42.2	29.7	17.7	5.5	3.0	1.3	2.1	0.0	0.0	0.0
1946	53.7	64.3	57.9	59.1	42.9	27.5	10.6	3.0	1.7	0.0	0.0	0.0	0.0

[1] Decayed, missing or filled teeth. A tooth both decayed and filled is counted as one DMF tooth.
[2] Extracted teeth and teeth indicated for extraction.

indicate that the percentages of children showing objective evidence of dental care, in the form of filled permanent and filled deciduous teeth, respectively, were consistently higher in 1946 than in 1940. Approximately 20 percent more of the children examined in 1946 exhibited at least one filled permanent tooth than did children examined

in 1940. In excess of 50 percent more of the children aged 6 to 12 examined in 1946 exhibited at least one filled deciduous tooth than did children of the same age classes examined in 1940.

SUMMARY

A simple procedure for evaluating a dental program has been described. The use of the method has been illustrated by its use in the appraisal of a dental program which had been in operation for a period of 5½ years. The essential information collected for purposes of evaluation included: the number of children, by age, having one or more DMF permanent teeth, and the number of extracted permanent teeth and teeth indicated for extraction, by age of child. Since it has been demonstrated (*10*) that the prevalence of dental caries and the proportion of children having at least one carious permanent tooth are closely associated, the latter can be used to estimate the level of caries prevalence in the teeth of school children. For purposes of evaluating a treatment program, it is essential that the comparability of the periodically collected data be established, so that changes in tooth-loss rates may be attributed to the treatment program rather than to changes in the rate of caries attack. On the other hand, if the program is designed to prevent dental caries, then success should be reflected in reduced percentages of children with one or more DMF permanent teeth.

Supplemental information which may be collected readily, and which affords complementary data on the effectiveness of a dental-treatment program, is the number of children, by age, who show objective evidence of having one or more filled permanent teeth and the number who have one or more filled deciduous teeth.

For the purposes of the evaluation, all the elementary grade and high-school children of Nicollet County, a rural county in Minnesota, were examined within the equivalent of 9 days by a team consisting of a dentist and a recorder. The data on the 2,310 children examined were processed for analysis in less than 1 clerk-week. Thus, the technique of evaluation meets the very practical criterion of being not only reliable but simple and relatively rapid of application.

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SHADOWED REPLICAS OF GROUND SECTIONS THROUGH TEETH [1]

By DAVID B. SCOTT, *Senior Assistant Dental Surgeon*, and RALPH W. G. WYCKOFF, *Scientist Director, United States Public Health Service*

In previous publications (*1*, *2*) it has been shown that considerable information can be obtained concerning the fine structure of tooth surfaces through the microscopic study of their metal-shadowed collodion replicas. This technique further provides a new approach to the study of histological structures appearing in longitudinal and cross sections through teeth without the thin-sectioning required by standard procedures. Many of the structures found on replicas of these sections are, as would be expected, the same as those observed in thin sections, but it is apparent from preliminary investigations that much can be demonstrated that is new about the internal fine structure of teeth.

Shadowed replicas of tooth sections were made in the following manner: Sections for study were obtained by the conventional grinding methods described by others (*3*, *4*, *5*). These methods consist of grinding to the desired level with abrasive wheels of various coarseness under running water, followed by rough polishing on a lap covered with abrasives and final polishing on a series of polishing slabs or with ragwheels impregnated with tripoli and rouge. These polished sections are then etched with various acids to bring out their structures. Replicas are taken both before and after etching by covering the sections with an appropriately diluted collodion solution and stripping off the dried films that form. The elevations and depressions in the replicas are made evident for microscopy by the oblique evaporation onto them of a semitransparent film of metal (*6*).

The illustrations in this paper are representative photomicrographs of shadowed replicas of ground sections of teeth etched with various acids to demonstrate the histological detail made evident by this

[1] From the Division of Physiology, Dental Research Section, and Industrial Hygiene Research Laboratory, National Institute of Health.

procedure. Ground sections for the photomicrographs were etched with dilutions of hydrochloric, nitric, citric, and lactic acids ranging in concentration from 0.1 N. to 5.0 N., the exposure time to acid in all instances being 5 seconds. As can be seen from the photographs, the microscopic details that become visible depend on the choice of acid-concentration and type of acid (weak or strong). These differences will be the subject of more detailed future study.

The replicas shown in figures 1 and 2 were photographed directly in a photoenlarger in order to provide a convenient way of identifying the regions photographed on other similarly ground teeth at higher magnifications. The reference numbers on these first figures indicate the regions shown in the correspondingly numbered photomicrographs. The replica shown in figure 1 was taken from an upper premolar which had been ground longitudinally to approximately the center of the pulp chamber. Figure 2 shows the replica of an upper molar ground transversely to a point just below the bottom of the occlusal fissures and at the base of the cusps.

A longitudinal section through enamel (see fig. 1) etched with 0.4 N. HCl yielded the replica shown in figure 3. The individual rod outlines can be seen, as well as the ends of many rod segments which were cut as they left the plane of the section. Components of the enamel structure were more clearly defined when less concentrated inorganic acid (e. g., 0.1 N. HCl) was used. Figures 4 and 5 show the result of such a weaker etch. In these areas the rods run in two directions to give the typical appearance of Shreger's lines. It is worthy of note that the interprismatic substance has been etched to a greater degree than the rods themselves. This can best be seen from a study of the shadows cast by the thin projections arising between the rods. These elevations on the replica correspond to depressions in the section and represent regions where the enamel structure is more susceptible to the action of acid.

The enamel in transversely cut section, shown in figures 6 and 7 (see fig. 2), was etched with 0.1 N. HCl. Evidently zones in the enamel structure vary considerably in their resistance to acid. At many points in the center of a rod the etch was deeper than at nearby points. Narrow regions at the periphery of a rod were most deeply etched, whereas another area between the rods was more deeply etched than the rods themselves but less than the regions at the periphery. This differentiation was lost through the action of stronger inorganic acids which resulted in shadows long enough to obscure and confuse much of the detail at the edges of the rods.

Exposure of dentin to acid reveals a narrow zone at the *dentino-enamel junction* that appears more resistant to etch than the central portion. This region can be seen in figure 2 (at A) and figure 8 (at

DEJ), which is from a replica of a transverse section treated with 3.2 N. HCl.

The replicas shown in figures 9, 10, and 11 were taken from *longitudinal sections of dentin*, also etched with 3.2 N. HCl. Although much of the fine detail was lost by using such strong acid, certain structural details were brought out very clearly. Thus, the distribution and curvatures of the tubules are evident in figure 9, and the pattern of susceptibility to acid seen in figures 10 and 11 suggests the contour lines of Owen. These cross striations point to restricted regions in the dentin which were more deeply etched than the rest.

The fine structure of *transversely sectioned dentin* is best revealed by exposure to dilute organic acids. The replicas shown in figures 12 and 13, taken from dentin which was treated with 0.4 N. citric acid, point to definite differences in susceptibility to etch between the matrix, the periphery of the tubule, and the region between the central projection and the periphery of the tubule. The projection from the center of each tubule, which produces the long narrow shadow, is difficult to interpret at this time; it is in the position supposedly occupied by Tomes' fibril. A study of replicas taken before etching demonstrates that the deep channels in the dentin responsible for these spikes were not present before the acid treatment.

Figure 14 was taken from a replica of *transversely sectioned dentin* etched with 1.6 N. HCl. Here the depth to which the tubules were etched was considerably greater, and much of the fine detail can no longer be seen. Dentin was so rapidly damaged by even the more dilute inorganic acids that it rarely provided replicas flat enough so that an entire field could be brought into focus even under low-power microscopic objectives.

The action of strong acid, such as 3.2 N. HCl, on *transversely sectioned dentin* exposed a matted network of long fibrous strands (figs. 15 and 16). This network is much more pronounced toward the central portion of the dentin and is seldom seen immediately adjacent to or in the zone near the dentino-enamel junction. Further study of these structures is necessary before conclusions can be drawn regarding their significance.

From the foregoing discussion it is obvious that this method of study makes feasible a variety of instructive investigations. Thus, many serial sections through a tooth can be made by progressively repolishing to remove the previously etched tooth substance, which ordinarily is only a few microns thick. In this way a particular structural detail can be identified on successive sections and its three-dimensional configuration fully determined in a single tooth. Corrosion produced by various types of acid in different concentrations can be studied with especial ease and directness, as can also the effect

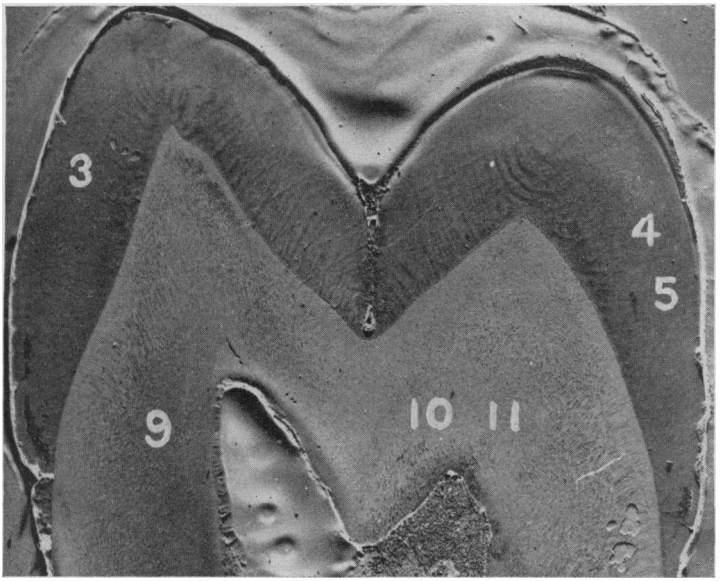

FIGURE 1.—Longitudinal ground section of an upper premolar. Note reference numbers. (× 7)

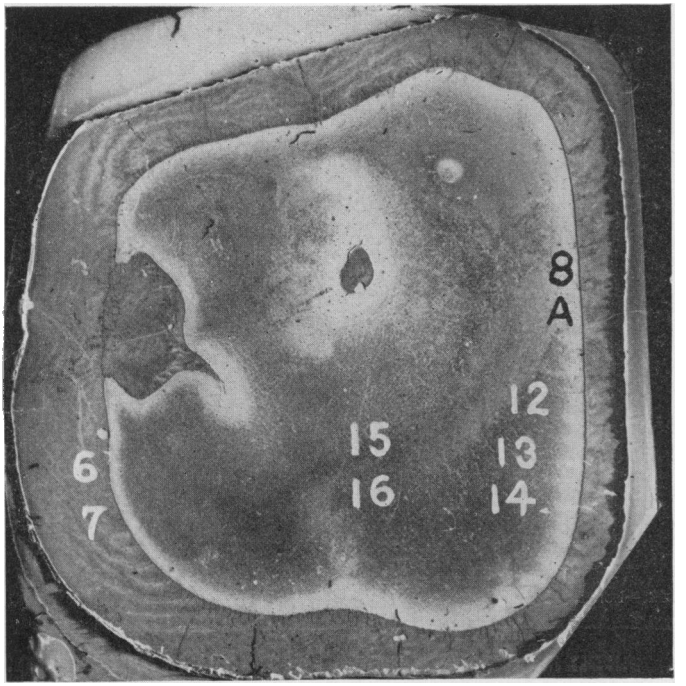

FIGURE 2.—Transverse ground section of an upper molar. Note reference numbers. (× 7)

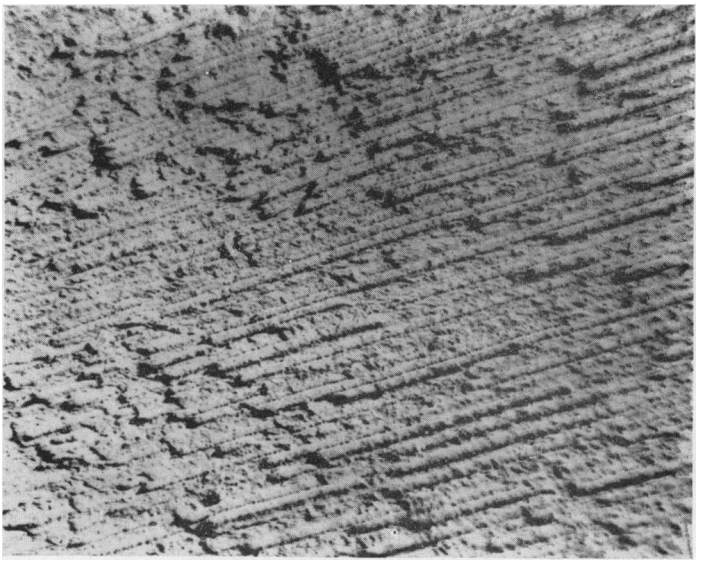

FIGURE 3.—Longitudinal section through enamel. Etched 5 seconds with 0.4 N. HCl. (× 200)

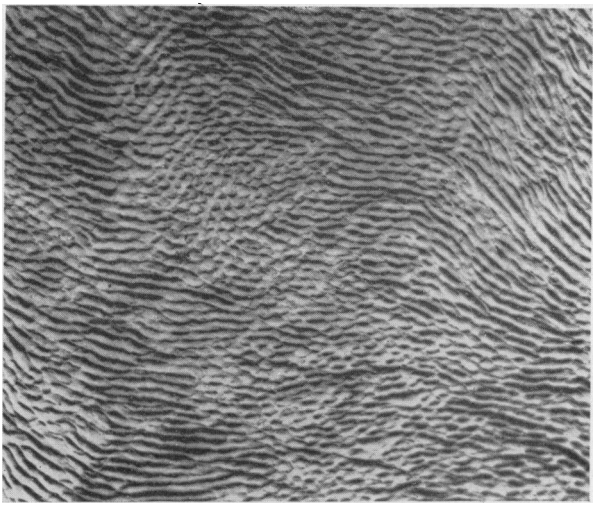

FIGURE 4.—Longitudinal section through enamel. Etched 5 seconds with 0.1 N. HCl. (× 200)

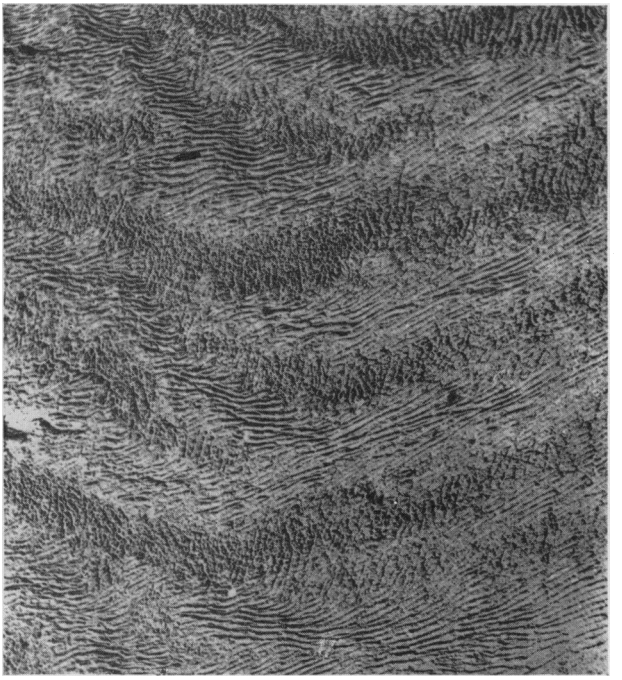

FIGURE 5.—Longitudinal section through enamel. Etched 5 seconds with 0.1 N. HCl. (× 200)

FIGURE 6.—Transverse section through enamel. Etched 5 seconds with 0.1 N. HCl. (× 900)

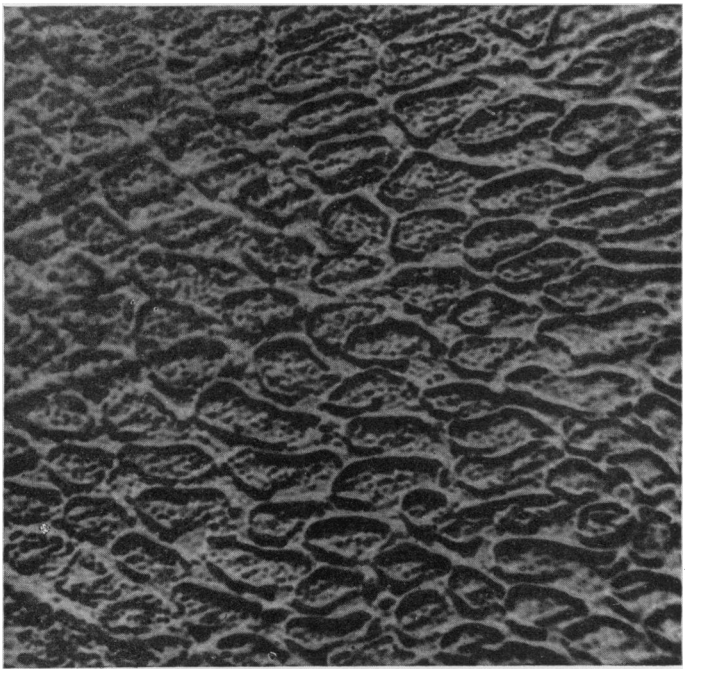

FIGURE 7.—Transverse section through enamel. Etched 5 seconds with 0.1 N.HCl. (× 1500)

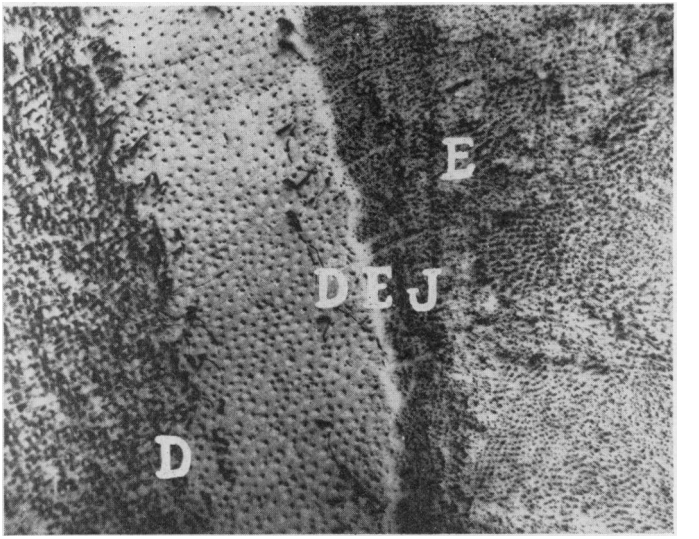

FIGURE 8.—Transverse section through enamel and dentin at dentino-enamel junction. Etched 5 seconds with 3.2 N. HCl. (E=enamel, D=dentin, DEJ=dentino-enamel junction). (× 100)

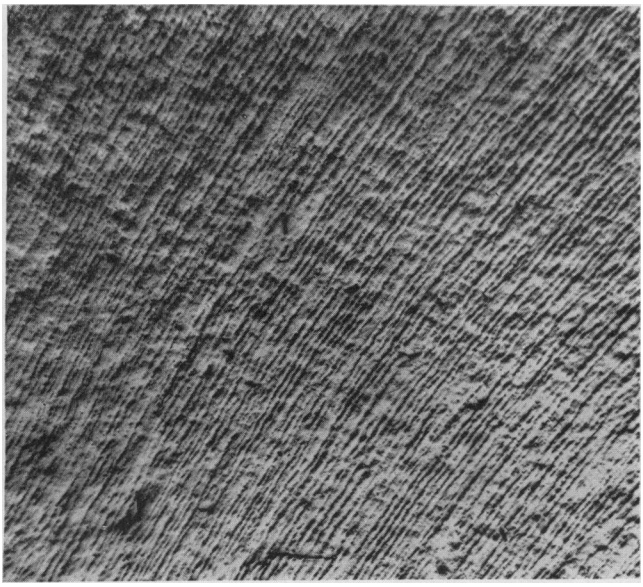

FIGURE 9.—Longitudinal section through dentin. Etched 5 seconds with 3.2 N. HCl. (× 200)

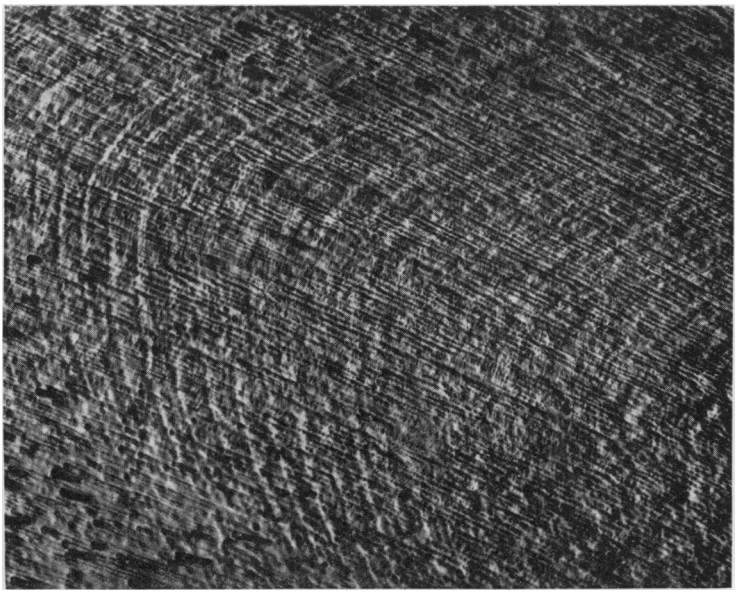

FIGURE 10.—Longitudinal section through dentin. Etched 5 seconds with 3.2 N. HCl. (× 200)

FIGURE 11.—Longitudinal section through dentin. Etched 5 seconds with 3.2 N. HCl. (× 600)

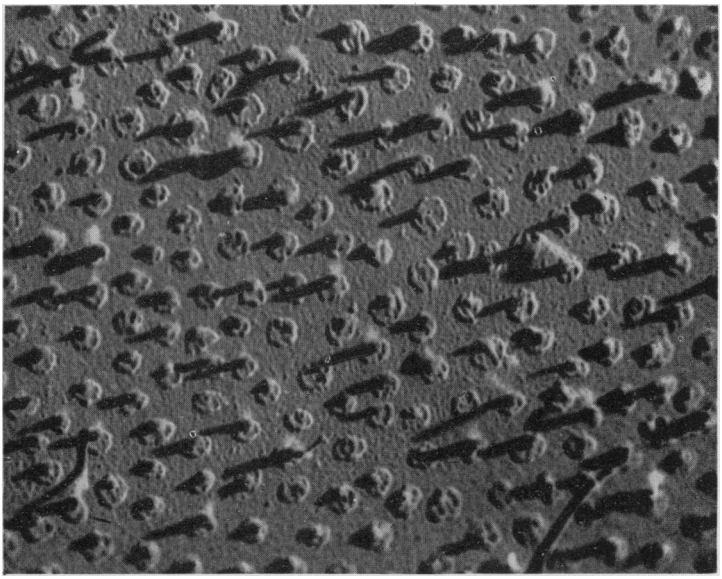

FIGURE 12.—Transverse section through dentin. Etched 5 seconds with 0.4 N. citric acid. (× 1200)

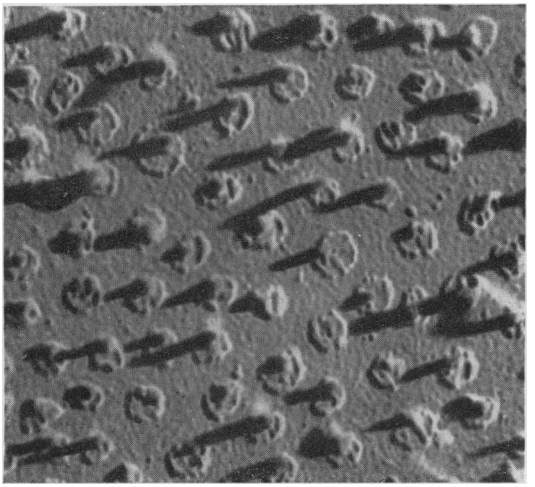

FIGURE 13.—Transverse section through dentin. Etched 5 seconds with 0.4 N. citric acid. (× 1600)

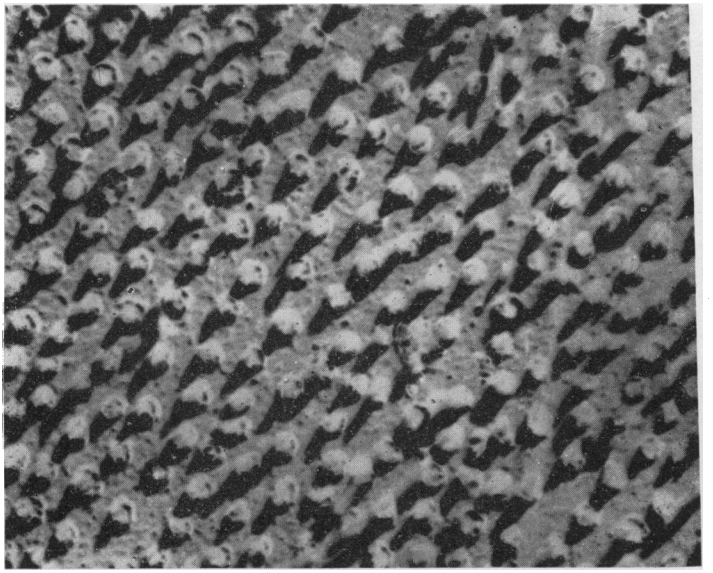

FIGURE 14.—Transverse section through dentin. Etched 5 seconds with 1.6 N. HCl. (× 800)

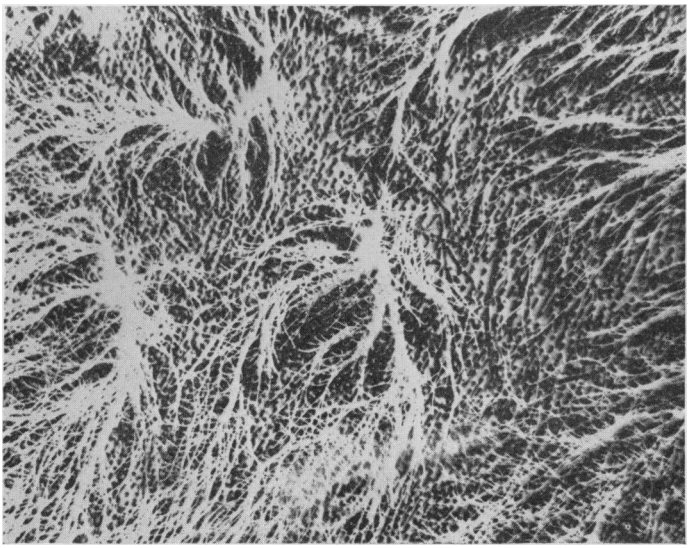

FIGURE 15.—Transverse section through dentin. Etched 5 seconds with 3.2 N. HCl. (× 100)

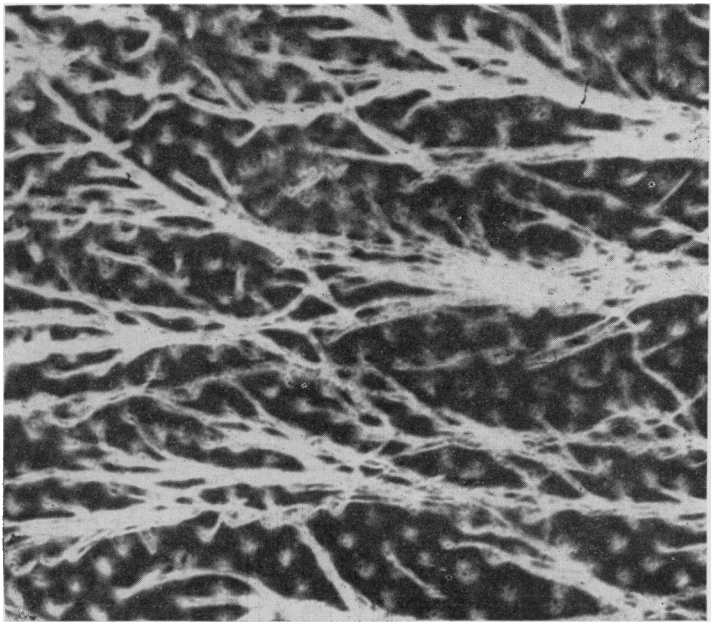

FIGURE 16.—Transverse section through dentin. Etched 5 seconds with 3.2 N. HCl. (× 600)

of agents such as fluorides or silver nitrate on the various histological components of tooth substance. The ability to prepare replicas of the same surface before and after any treatment is of obvious value in such studies. Furthermore, when desired, a part of any section can be reserved as a direct control by covering it with a plastic film [2] or vaseline, which are removed after treatment of the other half and prior to taking the final replica.

SUMMARY

A method is presented for the study of ground sections through teeth by preparation of metal-shadowed collodion replicas of their etched surfaces. The histological detail revealed on these replicas is described. Typical photomicrographs are included to demonstrate the fine structural detail obtained by this procedure.

The applications of this technique to other histological problems is discussed.

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THE EFFECT OF TOPICALLY APPLIED SODIUM FLUORIDE ON DENTAL CARIES EXPERIENCE

IV. REPORT OF FINDINGS WITH TWO, FOUR AND SIX APPLICATIONS[1]

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Reports of studies on the caries-inhibiting effect of fluoride solutions topically applied to the teeth have been made by several investigators. Both the results of such studies and the methods of treatment have varied rather widely. Cheyne (*1*) concluded from his study based

[2] The material used in these studies was Faxfilm, manufactured by the Faxfilm Co., 1220 West Sixth Street, Cleveland 13, Ohio.

[1] From the Dental Section, States Relations Division, U. S. Public Health Service, Washington, D. C., in cooperation with the Minnesota Department of Health, Minneapolis, Minn., the Laboratory of Dental Research, University of Minnesota, Minneapolis, Minn., and the Department of Health, Rochester, Minn.

on two applications of a 0.05 percent potassium fluoride solution that caries incidence in deciduous teeth was reduced 50 percent by the treatments. Bibby (*3*) reported that a 0.1 percent solution of sodium fluoride applied to the teeth every 4 months effected a 30 percent reduction in caries incidence. Knutson and Armstrong (*4, 5, 6*) applied a 2 percent sodium fluoride solution 7 to 15 times during a 2-month treatment period and obtained a 40 percent reduction. Arnold et al. (*7*) reported no reduction obtained with one treatment in which 1.0 percent acidulated sodium fluoride was used. Jordan and his associates (*8*) tested the effectiveness of one, two, and three topical applications of 2 percent sodium fluoride solution, and reported 5, 10, and 21 percent reductions, respectively, in caries incidence.

It is evident that variations in results may be due to one or several factors: age of child or more specifically tooth age, type and concentration of the fluoride solution, number of applications in the treatment series, and differences in methods of application. This report presents the results of varying numbers of treatments in which 2 percent sodium fluoride was used throughout as the fluoride solution and in which the applications were not preceded by a dental prophylaxis.

Briefly, the results seem to indicate that omission of prophylaxis prior to initiation of the series of fluoride applications had a noticeable effect. Reduction in caries incidence obtained after two, four, and six topical applications is, on the whole, lower than the reduction obtained in previous studies in which dental prophylaxis was included as part of the treatment procedure. With two fluoride applications, initial caries in fluoride-treated teeth were 9.3 percent less than in untreated teeth. With four and six topical fluoride applications, initial caries in treated teeth was 20.1 and 21.3 percent less, respectively, than in untreated teeth.

MATERIAL AND METHODS

During a 3-month treatment period beginning September 1943, three groups of Rochester, Minn., school children received a series of topical fluoride applications to the teeth in half the mouth. The children in the first of these three groups received two fluoride applications, the second group received four, and the third received six. Half the children in each group were treated in the left side of the mouth and the other half in the right side of the mouth. The teeth in the untreated mouth quadrants served as controls. A dental examination and record of findings was made for each of the 2,016 children participating. The children ranged in age from 7 to 15 years.

The dental examinations were made with mouth mirror and ex-

plorer under artificial light and with compressed air available for use at the examiners' discretion. In each case, only the teeth in the upper and lower quadrants of one side the mouth were fluoride-treated. The treatment consisted of isolating the teeth with cotton rolls, drying with compressed air, and wetting the crown surfaces with a 2 percent solution of sodium fluoride. The applied solution was allowed to dry in air for approximately 4 minutes. The series of fluoride treatments was not preceded by and did not include dental prophylaxis. For each child, a maximum of two treatments was given per week, and the treatments were completed in 3 weeks or less.

Two years after the series of fluoride applications, the teeth of the children in the three treatment groups were reexamined. Both the initial and subsequent dental examinations were made by one of us (J.W.K). Although there were initially 2,016 children included in the study, the 2-year report presented here is based on the 1,458 cases available for reexamination. Most of the children not available had moved away, a few had discontinued schooling, and some were absent at the time of reexamination. Analysis of the data on caries experience is confined to the erupted permanent teeth present in the mouth at the time of the initial examination. The age classification of the children refers to age at the time treatment was given.

FINDINGS

The age distribution of the children included in this analysis, distributed by the number of topical applications of sodium fluoride, is shown in table 1. The proportions of children at each age from

TABLE 1.— *Age distribution of Rochester, Minn., school children examined at the end of the 2-year study period, showing the number of sodium fluoride applications*

Number of applications	All ages	Children by age at time of treatment								
		7	8	9	10	11	12	13	14	15
2	472	12	61	66	64	68	73	62	53	13
4	504	13	61	76	72	64	72	76	61	9
6	482	14	61	63	72	63	68	66	61	13
Total	1,458	39	183	205	208	195*	214	204	175	35

7 to 15 included in each of the three treatment groups are approximately equal. Boys and girls are about equally represented, and the children included in each treatment group were selected in about equal proportions from the seven grade schools and two junior high schools in Rochester.

Table 2 presents the caries experience in fluoride-treated and untreated permanent teeth for the 2-year study period by upper and

lower mouth quadrants, and separately for the groups of children who had received two, four, and six topical fluoride applications.

TABLE 2.—*Dental caries experience during the 2-year period ending November 1945 for permanent teeth in the sodium-fluoride-treated and untreated mouth quadrants of the mouths of 1,458 Rochester, Minn., school children*

Treatment groups by treated and untreated quadrants	Number of noncarious teeth (Sept. 1943)	New DF[1] teeth (Nov. 1945)	DF surfaces in new DF teeth	New DF surfaces in previously carious teeth	Total new DF surfaces
	Upper				
2 applications:					
Treated quadrant	1,692	285	370	165	535
Untreated quadrant	1,684	316	416	213	629
4 applications:					
Treated quadrant	1,818	245	304	178	482
Untreated quadrant	1,810	324	380	197	577
6 applications:					
Treated quadrant	1,726	223	266	160	426
Untreated quadrant	1,740	300	343	208	551
	Lower				
2 applications:					
Treated quadrant	1,939	181	245	186	431
Untreated quadrant	1,920	198	259	206	465
4 applications:					
Treated quadrant	2,053	156	191	170	361
Untreated quadrant	2,039	178	234	188	422
6 applications:					
Treated quadrant	1,964	124	146	176	322
Untreated quadrant	1,947	141	174	224	398

[1] DF=carious (decayed or filled).

Table 3 shows the percentage reduction in new caries experience in fluoride-treated teeth, during the 2-year period, compared with untreated teeth.

In the upper jaw quadrants of those children who received two fluoride treatments, 285 fluoride-treated teeth became carious as compared with 316 untreated teeth, a difference of 9.8 percent. In the group that received 4 fluoride treatments, 245 treated teeth became carious as compared with 324 untreated teeth in upper mouth quadrants, a difference of 24.4 percent. In the six-treatment group, there

TABLE 3.—*Percentage reduction in new caries experience during the 2-year period ending November 1945 in the permanent teeth of sodium-fluoride-treated mouth quadrants of a group of Rochester, Minn., school children*

Number of applications	Upper jaw	Lower jaw	Both jaws	Number of applications	Upper jaw	Lower jaw	Both jaws
	Percentage reduction in newly carious teeth				Percentage reduction in newly carious surfaces in previously carious teeth		
2	9.8	8.6	9.3				
4	24.4	12.4	20.1	2	22.5	9.7	16.2
6	25.7	12.1	21.3	4	9.6	9.6	9.6
				6	23.1	21.4	22.2

were 223 newly carious teeth in upper treated quadrants and 300 in untreated quadrants, a difference of 25.7 percent.

In the lower jaw for the group of children given two fluoride applications, initial caries occurred in 181 treated teeth and in 198 untreated teeth, an 8.6 percent difference. For children who received four fluoride treatments, the number of newly carious teeth in lower quadrants was 156 as compared with 178 in untreated quadrants, a 12.4 percent difference. In the lower jaws of the six-treatment group, 124 treated teeth and 141 untreated teeth became carious, a 12.1 percent difference.

Combining initial caries experience for teeth in upper and lower mouth quadrants, there is an over-all difference between treated and untreated teeth of 9.3 percent associated with two fluoride applications, 20.1 percent with four applications, and 21.3 percent with six applications.

Data on the occurrence of newly carious surfaces in previously carious teeth are also presented in tables 2 and 3. The number of additional tooth surfaces which became carious, during the 2-year study period, in teeth which were decayed at the time of treatment was less for fluoride-treated than for untreated carious teeth. The percentage differences were 16.2 for carious teeth given two fluoride applications, 9.6 percent for four applications, and 22.2 percent for six applications. The irregularity in the pattern of these differences is difficult to explain, since it would be expected that four treatments would effect a greater difference than two.

Comparison of the results of this study and that conducted by Jordan and his associates (*8*) is of special interest. In both investigations, 2 percent sodium fluoride solution was topically applied, and the same treatment procedure was used, with the exception that one was preceded by dental prophylaxis and the other was not. In Jordan's study, the reduction in caries incidence associated with one, two and three fluoride applications was 5, 10, and 21 percent, respectively. In the present study, two, four, and six applications effected a 9.3, 20.1, and 21.3 percent reduction, respectively. Thus, four and six applications of 2 percent sodium fluoride solution to the teeth, without prior prophylaxis, were only as effective in inhibiting dental caries as three treatments preceded by a dental prophylaxis. In an earlier study (*4, 5, 6*), teeth treated, after prophylaxis, with 7 to 15 applications of 2 percent sodium fluoride solution had approximately 40 percent less caries than untreated teeth. Analysis of the composite findings of the three studies suggests, therefore, that four fluoride treatments preceded by dental prophylaxis are likely to give the maximum reduction in caries incidence obtainable with 2 percent sodium fluoride solution, using the treatment procedure herein de-

scribed. Confirmation of this conclusion, however, must await the results of studies now in progress.

SUMMARY

Data on the incidence of dental caries in the permanent teeth of three groups of Rochester, Minn., school children who received two, four, and six applications, respectively, of 2 percent sodium fluoride solution to the teeth in half the mouth have been presented and analyzed. The initial dental examinations and the fluoride treatment series were completed during a 3-month period beginning September 1943, and the follow-up examinations were made approximately 2 years later in November 1935. The teeth in the untreated half of the mouth served as controls. The treatment procedure used in this study did not include a dental prophylaxis. Analysis of the data indicates that for the 2-year period following the fluoride treatments:

1. The incidence of initial caries in permanent teeth which were noncarious at the time of treatment was 9.3, 20.1, and 21.3 percent less in teeth treated with two, four, and six applications of fluoride solution, respectively, than in untreated teeth.

2. The numbers of additional permanent tooth surfaces which became carious in teeth which were carious at the time of treatment were 16.2, 9.6, and 22.2 percent less in fluoride-treated carious teeth given two, four, and six applications, respectively, than in untreated carious teeth.

3. Comparison of the results of this investigation with those previously reported (*4*, *5*, *6*, *8*) indicates that omission of a dental prophylaxis from the treatment procedure materially reduces the caries-inhibiting effects of the topical fluorides.

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PLAGUE INFECTION REPORTED IN THE UNITED STATES IN 1945[1]

No human case of plague was reported in the United States during 1945. The last reported human infection was a case of primary pneumonic plague which occurred in June 1944 in a medical officer of the Public Health Service who was engaged in research at the Plague Laboratory in San Francisco. The patient recovered.[2] The last reported human case acquired in nature occurred in Siskiyou County, California, in August 1943.[3]

PLAGUE INFECTION IN RODENTS AND ECTOPARASITES

During 1945 plague infection in rodents or their ectoparasites was reported in 8 counties in California, 1 county in Idaho, 1 county in Wyoming, and 2 counties in Kansas. Infection was found in specimens of tissue or ectoparasites of the following listed species: Ground squirrels (*Citellus beecheyi*, *Citellus beldingi*, *Callospermophilus lateralis*, and *Otospermophilus fisheri*), mice (*Peromyscus* sp., *Microtus* sp., and *Reithrodontomys* sp.), and rats (*Neotoma* sp.).

The proved area of infection in wild rodents of the western States was extended farther east by the finding of positive specimens of fleas from mice (*Peromyscus* sp., *Microtus* sp., and *Reithrodontomys* sp.) and from rats (*Neotoma* sp.) taken in Cheyenne and Morton Counties, Kansas, in June, July, and August. These are the first instances reported of plague infection being found in this State, and the localities are the farthest east that the infection had been reported in wild rodents or their ectoparasites in the United States up to the end of 1945. They are slightly farther east than Cimarron County, Oklahoma, where infected fleas from wood rats (*Neotoma* sp.) and white-footed mice (*Peromyscus* sp.) were found in June 1944.

The reports summarized in the accompanying table should not be interpreted as a delineation of areas in which plague infection was present in wild rodents of the Western States in 1945, nor as a quantitative measure of infection. The field surveys are limited by the number of personnel, the areas in which the surveys are conducted, and the seasonal periods favorable for field operations. At best, these field surveys are essentially sampling procedures. However, over a period of years they have demonstrated a wide biologic and

[1] Consolidation of reports received from the Plague Laboratory of the United States Public Health Service in San Francisco, Calif., and the California State Department of Health, and published currently in the PUBLIC HEALTH REPORTS. For a similar report for 1944 and a summary of human cases reported in the United States for 1900 to 1944, inclusive, see Pub. Health Rep. 60: 1361-1365 (Nov. 16, 1945).

[2] Pub. Health Rep. 60: 1361; J. Am. Med. Assoc., 128: 281-283 (May 26, 1945).

[3] Pub. Health Rep. 59: 911 (July 14, 1944).

geographic distribution of plague infection in western United States and a gradual extension eastward of the area of proved infection.

In the reports presented in the table, plague infection in animal tissue and ectoparasites was proved in each instance bacteriologically and by the inoculation of laboratory animals, especially by mass inoculation with emulsions of parasites.

TABLE 1.—*Plague infection in wild rodents and their ectoparasites reported to the United States Public Health Service during 1945*

State and county	Date [1]	Infection found in—
California:		
Alpine County	Aug. 16	Tissue from 1 ground squirrel, *Citellus beldingi*, taken in Hope Valley, 6 miles west of Woodfords on Kit Carson Pass Highway No. 88.
Do	Aug. 21	Tissue from 2 ground squirrels, *Citellus beldingi*, taken at same location.
Do	Sept. 6	Tissue from 1 ground squirrel, *Citellus beldingi*, shot at Kit Carson Public Camp, 4 miles west of Woodfords on Highway No. 89; and a pool of 24 fleas from 2 golden-mantled ground squirrels, *Callospermophilus* sp., taken in Mono National Forest, Crystal Springs Public Camp grounds, 1 mile west of Woodfords.
Kern County	July 31, Aug. 7	A pool of 200 fleas and 87 lice and an additional pool of 200 fleas from 35 ground squirrels, *Citellus beecheyi*, shot on east side of Castair Lake, 1½ miles east and ½ mile north of Lebec.
Do	Aug. 7	A pool of 185 fleas from 4 ground squirrels, *Citellus beecheyi*, taken 1½ miles east and ½ mile south of Lebec.
Do	Aug. 21, 27, 30	3 pools of 200 fleas each from 34 ground squirrels, *Citellus beecheyi*, shot on El Tejon ranch, on east side of Castair Lake (proved positive on Aug. 21, 27, and 30, respectively).
Do	Aug. 27	A pool of 215 fleas from 14 ground squirrels, *Citellus beecheyi*, shot 1 mile south of Lebec.
Do	do	Tissue from 1 ground squirrel, *Citellus beecheyi*, shot 2 miles east and 2–4 miles north of Lebec.
Do	Aug. 30	A pool of 50 lice from 42 ground squirrels, *Citellus beecheyi*, taken 2 miles east and 2–4 miles north of Lebec, and a pool of 200 fleas from 34 ground squirrels, *Citellus beecheyi*, taken 2½ miles west and 1 mile south of Cummings Valley School.
Do	Sept. 6	A pool of 200 fleas from 53 ground squirrels, *Citellus beecheyi*, taken 2½ miles south and 3 miles west of Cummings Valley School.
Do	Sept. 12	A pool of 200 fleas from 13 ground squirrels, *Citellus beecheyi* taken 2 miles south and 1½ miles west of same school.
Merced County	Sept. 28	A pool of 200 fleas from 54 ground squirrels, *Citellus beecheyi*, shot 12 miles west and 1 mile north of Los Banos.
Placer County	Sept. 20	A pool of 54 fleas from 9 ground squirrels, *C. beecheyi*, taken in Tahoe National Forest, 1½ miles north of Tahoe City.
San Benito County	May 14	Tissue from 1 ground squirrel, *C. beecheyi*, taken 7 miles east and 3 miles south of Tres Pinos.
Do	June 22	A pool of 192 fleas from 57 ground squirrels, same species, taken in same location; a pool of 400 fleas from 62 ground squirrels, same species taken 13 miles southeast of Tres Pinos; a pool of 400 fleas and 9 ticks from 37 ground squirrels, same species, taken in Brown's Valley, 7 miles east and 5 miles south of Tres Pinos; and a pool of 200 fleas from 23 ground squirrels, same species, taken in Brown's Valley, 8 miles east and 5 miles south of Tres Pinos.

[1] Date proved positive in laboratory.

TABLE 1.—*Plague infection in wild rodents and their ectoparasites reported to the United States Public Health Service during 1945*—Continued

State and county	Date [1]	Infection found in—
San Benito County—Con	June 27	A pool of 203 fleas from 17 ground squirrels, *C. beecheyi*, taken 7 miles east of Tres Pinos; tissue from 5 ground squirrels, same species, taken 8 miles east and 5 miles south of Tres Pinos; a pool of 400 additional fleas from the same 57 ground squirrels which were proved positive on June 22; 379 additional fleas from the same 37 ground squirrels (Brown's Valley) which were proved positive on June 22; and 185 additional fleas from the same 23 ground squirrels taken in Brown's Valley and proved positive on June 22.
Do	July 5	An additional pool of 200 fleas from the same 57 ground squirrels taken in Brown's Valley and proved positive on June 22; and a pool of 204 fleas from 59 ground squirrels, *C. beecheyi*, taken 5 miles east of Tres Pinos.
Do	July 13	A pool of 750 fleas from 27 ground squirrels, and tissue from 5 ground squirrels, *C. beecheyi*, taken in Brown's Valley, 7 miles east and 5 miles south of Tres Pinos; a pool of 1,650 fleas from 41 ground squirrels and tissue from 5 ground squirrels, *C. beecheyi*, taken in Brown's Valley, 8 miles east and 5 miles south of Tres Pinos; and a pool of 150 fleas from 47 ground squirrels, *C. beecheyi*, taken 7 miles east of Tres Pinos.
Do	July 17	A pool of 150 fleas from 35 ground squirrels and tissue from 5 ground squirrels, *C. beecheyi*, taken 1 miles east of Tres Pinos.
Do	July 25	A pool of 150 fleas from 41 ground squirrels, *C. beecheyi*, taken 8 miles east and 5 miles south of Tres Pinos.
San Bernardino County	June 27	A pool of 11 fleas from 15 mice, *Peromyscus* sp., taken 1 mile north of Fawnskin, and a pool of 52 fleas from 3 ground squirrels, *Otospermophilus fisheri*, taken 1 mile west and 1 mile north of Big Bear Lake.
San Luis Obispo County	Dec. 13	A pool of 200 fleas from 26 ground squirrels, *C. beecheyi*, taken on Santa Margarita Rancho, Pozo Road, Santa Margarita.
Santa Clara County	July 16 [2]	A pool of 150 fleas from 35 ground squirrels, *C. beecheyi*, taken 5 miles east and 1½ miles north of Gilroy.
Do	Sept. 12	A pool of 400 fleas from 80 ground squirrels, *C. beecheyi*, taken 16 miles southeast of Gilroy, and a pool of 200 fleas from 13 ground squirrels and tissue from 1 ground squirrel, *C. beecheyi*, taken 6½ miles east and 2 miles south of Gilroy.
Do	Sept. 13	Tissue from 2 ground squirrels, *C. beecheyi*, taken 16 miles southeast of Gilroy.
Idaho:		
Bannock County	June 14	A pool of 16 fleas from 28 mice, *Peromyscus* sp., taken 1 mile east of State Highway No. 34, 4 miles south of Grace. (Collected June 1.)
Do	June 18	A pool of 265 fleas, 7 ticks, and 8 lice from 3 marmots taken at the same location.
Kansas:		
Cheyenne County	June 23	A pool of 105 fleas from mice, *Peromyscus*, sp., *Microtus*, sp., and *Reithrodontomys*, sp., taken 5 miles south of Benkleman, Nebr., on Highway No. 61 and 5 miles east on unmarked road.[3]
Cheyenne County	July 17	A pool of 17 fleas from 21 mice, *Microtus* sp., and a pool of 73 fleas from 116 mice, *Peromyscus* sp., taken from same location.
Morton County	Aug. 17	A pool of 43 fleas from 83 mice, *Peromyscus* sp., and 52 fleas from 6 rats, *Neotoma* sp., taken 10 miles north of Elkhart, State Highway No. 27, and 5 miles west along river bottom.[4]
Wyoming:		
Laramie County	Aug. 14	A pool of 33 fleas from 108 ground squirrels, *Callospermophilus lateralis*, taken 34 miles west of Cheyenne, on U. S. Highway No. 30, in Medicine Bow National Forest.

[1] Date received at laboratory.

[3] This is the first reported incidence of plague infection found in Kansas, and this locality is the farthest east in which infection had been found in wild rodents or their ectoparasites in the United States up to Dec. 31, 1945.

[4] This location is approximately the same longitude as that of the locality in Cheyenne County.

INCIDENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

January 26–February 22, 1947

The accompanying table summarizes the incidence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in PUBLIC HEALTH REPORTS under the section "Incidence of Disease." The table gives the number of cases of these diseases for the 4 weeks ended February 22, 1947, the number reported for the corresponding period in 1946, and the median number for the years 1942–46.

DISEASES ABOVE MEDIAN INCIDENCE

Diphtheria.—For the 4 weeks ended February 22 there were 1,165 cases of diphtheria reported, as compared with 1,487 cases during the corresponding 4 weeks in 1946 and a 1942–46 median of 1,158 cases. For the first time since the 4 weeks ended August 10, 1946, the current incidence is higher than the preceding 5-year median for a corresponding 4-week period. The North Atlantic and East North Central sections are now reporting a relatively high number of cases of this disease, while in the southern sections of the country, where the incidence has been unusually high, the cases either closely approximated the median or fell considerably below it. In the West North Central, Mountain, and Pacific sections the incidence is about normal.

Poliomyelitis.—The number of cases of poliomyelitis dropped from 315 during the preceding 4 weeks to 184 for the current 4-week period. The number of cases was, however, 30 percent above the 1946 figure for the corresponding period and 80 percent above the 1942–46 median (101 cases). The South Atlantic, East South Central, West South Central, and Mountain sections reported fewer cases than in 1946, but only two sections, the East South Central and Mountain, reported a decline from the 1942–46 median. The number of cases reported for the entire country was 40 percent greater during the first 8 weeks of the current year than for the same weeks in 1946.

Whooping cough.—The number of cases (10,259) of this disease was 1.5 times the number reported for the corresponding 4 weeks in 1946 and was slightly higher than the 1942–46 median. The greatest increases over the normal seasonal expectancy were reported from the East North Central and West South Central sections, with slighter increases in the North Atlantic sections. In the other five sections, the incidence was relatively low.

DISEASES BELOW MEDIAN INCIDENCE

Influenza.—For the country as a whole, the incidence of influenza declined during the 4 weeks ended February 22. Of the total of 15,707 cases reported, as compared with 16,910 during the preceding 4 weeks, 12,725, or more than 80 percent of the total, occurred in four States (Texas 7,768 cases, Virginia 1,825, South Carolina 1,693, and Colorado 1,449). The highest previous incidence had been confined largely to the first three States mentioned, but the number of cases in Colorado rose from 140 and 144, respectively, for the two preceding weeks to 1,117 during the week ended February 22. Compared with preceding years, the incidence was lower than in 1946 in each geographic section and lower than the 1942–46 median in all sections except the Mountain, which includes Colorado. The current incidence was the lowest recorded since 1938, when approximately 13,000 cases were reported for the corresponding 4 weeks.

Measles.—The number of reported cases (20,417) of measles was less than one-half of the number reported during the corresponding weeks in 1946 and about one-third of the 1942–46 median (approximately 60,000 cases). The incidence was relatively high in the New England and South Atlantic sections, but in all other sections of the country the numbers of cases were below the median expectancy. Since the median period (1942–46) contains 3 years in which this disease was unusually prevalent, the medians are represented in most sections by rather high numbers. The median for more normal recent years is approximately 25,000 cases.

Meningococcus meningitis.—During the 4 weeks ended February 22 there were 322 cases of meningococcus meningitis reported. The number was less than 50 percent of that reported for the corresponding period in 1946, and less than 35 percent of the 1942–46 median. In each section of the country the current incidence was below that in 1946 and also below the preceding 5-year median. For the country as a whole, the current incidence was the lowest since 1942 when 273 cases were reported for the corresponding 4 weeks.

Scarlet fever.—The incidence of scarlet fever was the lowest reported during this period in the 19 years for which data are available in this form. For the 4 weeks ended February 22 there were 11,017 cases reported, as compared with 13,443 for the corresponding 4 weeks in 1946 and a 1942–46 median of 16,265 cases. In each section of the country the current incidence was lower than the preceding 5-year median expectancy.

Smallpox.—The 13 cases of smallpox reported for the current 4-week period was less than one-half of the cases reported for the corresponding period in 1946 and less than one-fourth of the 1942–46

median. Five cases in the East North Central section compared with a seasonal expectancy of 16 cases, and 4 cases in the East South Central section was the same as the median expectancy. For the entire country, the current incidence is the lowest in the 19 years for which these data are available; the nearest approach to the current figure was in 1942 and 1943 when 15 and 17 cases, respectively, were reported for the corresponding 4 weeks.

Typhoid and paratyphoid fever.—The number of cases (167) of these diseases was slightly higher than that reported for the corresponding period in 1946, but it was only about 65 percent of the preceding 5-year median (258 cases). In the Mountain and Pacific sections, the incidence was somewhat above the median expectancy, but in all other sections the numbers of cases were relatively low. The cur-

Number of reported cases of nine communicable diseases in the United States during the 4-week period January 26–February 22, 1947, the number for the corresponding period in 1946, and the median number of cases reported for the corresponding period, 1942–46

Division	Current period	1946	5-year median	Current period	1946	5-year median	Current period	1946	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	1,165	1,487	1,158	15,707	38,746	22,139	20,417	48,914	60,335
New England	75	30	25	65	146	127	6,036	1,314	4,084
Middle Atlantic	166	169	116	63	133	133	3,444	13,341	13,341
East North Central	176	307	160	169	1,011	495	3,471	12,128	7,455
West North Central	97	158	97	228	277	235	438	4,753	4,753
South Atlantic	160	228	185	3,893	10,003	6,738	3,376	3,298	3,298
East South Central	114	122	106	503	3,016	2,825	301	2,494	2,494
West South Central	169	223	247	8,484	19,712	9,817	786	2,669	2,785
Mountain	59	74	65	2,147	2,637	1,999	1,661	1,934	3,215
Pacific	149	176	156	155	1,811	634	904	6,983	6,983
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	322	733	1,034	184	143	101	11,017	13,443	16,265
New England	13	41	41	7	3	3	1,038	1,156	2,036
Middle Atlantic	83	153	213	19	15	15	2,835	3,498	3,945
East North Central	42	118	151	30	11	9	3,391	3,757	4,801
West North Central	27	70	70	19	7	7	1,027	1,393	1,880
South Atlantic	44	103	161	26	32	14	742	1,122	1,293
East South Central	23	84	107	13	16	14	447	430	687
West South Central	43	72	94	16	17	13	236	506	506
Mountain	7	11	22	4	7	7	440	481	1,008
Pacific	40	81	107	50	35	27	861	1,100	1,100
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	13	29	64	167	150	258	10,259	6,998	9,357
New England	0	0	0	10	12	12	1,147	910	1,141
Middle Atlantic	0	1	0	23	12	36	2,072	1,925	1,925
East North Central	5	3	16	23	22	28	2,597	1,481	1,625
West North Central	2	3	5	8	7	11	372	182	515
South Atlantic	0	1	2	31	38	43	1,219	850	1,469
East South Central	4	2	4	15	9	22	381	226	397
West South Central	1	15	16	29	25	38	1,545	579	658
Mountain	0	3	3	11	6	8	318	361	469
Pacific	1	1	1	17	19	16	608	484	1,073

[1] Mississippi and New York excluded; New York City included.
[2] Mississippi excluded.

rent incidence represents a 10-percent increase over the 150 cases that were reported for this period in 1946, which was the lowest incidence during these weeks in the 19 years for which data are available in this form.

MORTALITY, ALL CAUSES

For the 4 weeks ended February 22 there were 39,014 deaths from all causes reported to the National Office of Vital Statistics by 93 large cities. The median number of deaths reported for the same weeks in 1944–46 was 39,409. For the first 2 weeks of the 4-week period, the figures were below the preceding 3-year medians, but during the last 2 weeks the current figures were higher than the median; for the entire 4-week period the current total was slightly lower than the 3-year median.

INCIDENCE 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

REPORTS FROM STATES FOR WEEK ENDED MARCH 1, 1947

Summary

Of the total of 7,974 cases of influenza (as compared with 5,192 last week), the 8 States reporting currently more than 130 cases reported an aggregate of 7,259 cases, or 91 percent (last week 4,575, or 88 percent). These States are as follows (last week's figures in parentheses): Kansas 325 (61); Virginia 491 (534), South Carolina 628 (225), Georgia 454 (39), Arkansas 376 (126), Texas 3,636 (2,465), Colorado 1,212 (1,117), and Indiana 137 (8). Only 2 other States reported more than 71 cases each—Alabama (130) and Missouri (90). The total to date is 40,591, as compared with 160,350 for the corresponding period last year and a 5-year (1942–46) median of 44,521.

Of 51 cases of poliomyelitis reported currently (last week 37, 5-year median 23), California reported 15 (last week 9), Mississippi 5, Wisconsin 4, and Illinois and Florida 3 each. The cumulative total is 551, as compared with 406 for the corresponding period last year and a 5-year median of 247.

Of 173 cases of undulant fever reported during the current week (last week 114), 57 occurred in Iowa, 26 in Missouri, and 15 each in Illinois and Texas. The cumulative total is 921, as compared with 573 and 760, respectively, for the corresponding periods of 1946 and 1945.

The current incidence of diphtheria, typhoid and paratyphoid fever, and whooping cough is slightly above the corresponding 5-year medians. The cumulative figure for whooping cough, 22,393, as compared with 20,816 for the 5-year median, is above figures for the corresponding periods of the past 3 years, but less than two-thirds of the figures for the same periods of the years 1942–44.

The combined total to date for dysentery (amebic, bacillary, and undefined) is 5,473, as compared with 4,004 for the corresponding period last year, and the cumulative total for tularemia is 390, as compared with 189 for the corresponding period last year.

Deaths recorded for the week in 93 large cities of the United States totaled 10,165, as compared with 9,741 last week, 10,390 and 9,866, respectively, for the corresponding weeks of 1946 and 1945, and a 3-year (1944–46) median of 9,866. The cumulative figure is 89,943, as compared with 94,394 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended March 1, 1947, and comparison with corresponding week of 1946 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46
	Mar. 1, 1947	Mar. 2, 1946		Mar. 1, 1947	Mar. 2, 1946		Mar. 1, 1947	Mar. 2, 1946		Mar. 1, 1947	Mar. 2, 1946	
NEW ENGLAND												
Maine	1	1	1	3	30	1	201	10	10	1	4	4
New Hampshire	0	0	0	-	-	-	19	-	-	0	1	1
Vermont	0	4	0	-	10	-	150	2	20	0	0	0
Massachusetts	14	6	6	-	-	-	450	446	593	1	2	11
Rhode Island	0	1	1	-	2	1	150	6	27	0	0	4
Connecticut	0	1	1	1	4	3	457	107	259	0	3	4
MIDDLE ATLANTIC												
New York	13	19	19	[1] 7	[1] 8	[1] 10	257	4,228	2,040	10	18	34
New Jersey	17	3	3	15	15	11	222	1,259	1,259	2	2	13
Pennsylvania	10	13	11	4	5	3	480	2,869	976	10	24	24
EAST NORTH CENTRAL												
Ohio	8	32	8	3	11	11	509	156	261	4	12	11
Indiana	17	18	9	137	5	35	43	529	320	0	2	4
Illinois	8	14	14	6	8	16	64	1,888	835	5	23	20
Michigan [2]	7	7	4	1	2	2	68	2,867	241	3	8	8
Wisconsin	0	0	0	11	310	59	255	729	729	3	2	4
WEST NORTH CENTRAL												
Minnesota	8	8	5	-	2	1	53	25	58	3	6	3
Iowa	5	4	3	-	-	1	94	45	298	1	3	1
Missouri	1	8	4	90	7	6	8	560	387	2	4	7
North Dakota	0	3	0	12	11	11	6	2	53	0	2	1
South Dakota	3	1	1	-	-	-	8	83	68	1	0	0
Nebraska	0	1	3	15	19	19	20	114	114	0	0	0
Kansas	7	7	7	325	1	8	10	875	428	0	2	2
SOUTH ATLANTIC												
Delaware	0	3	0	-	-	-	2	22	20	0	2	1
Maryland [2]	6	9	9	2	4	18	20	232	232	1	6	6
District of Columbia	0	0	0	2	1	2	9	124	113	1	0	2
Virginia	5	5	6	491	430	616	547	591	338	1	6	10
West Virginia	2	5	4	52	12	38	80	42	42	0	2	2
North Carolina	11	10	11	-	-	19	257	323	323	0	6	8
South Carolina	2	5	3	628	711	711	75	264	192	0	1	4
Georgia	4	0	5	454	30	115	229	224	224	0	2	4
Florida	4	2	2	1	4	4	6	53	53	2	7	7
EAST SOUTH CENTRAL												
Kentucky	7	20	5	14	173	35	286	648	205	8	3	8
Tennessee	7	4	4	33	47	47	164	242	242	3	6	7
Alabama	9	6	6	130	308	232	69	135	135	3	4	4
Mississippi [2]	10	12	6	-	-	-	-	-	-	1	5	5
WEST SOUTH CENTRAL												
Arkansas	5	18	5	376	223	174	130	70	90	1	3	3
Louisiana	10	1	2	54	140	8	27	23	85	6	1	3
Oklahoma	10	10	6	62	198	198	4	155	107	0	2	1
Texas	22	49	37	3,636	1,792	1,634	286	574	574	9	5	6
MOUNTAIN												
Montana	1	7	1	20	12	24	188	11	90	0	0	0
Idaho	1	2	0	10	54	-	5	86	86	0	1	0
Wyoming	4	0	0	31	-	9	7	12	73	1	1	1
Colorado	8	3	6	1,212	91	67	81	275	275	0	1	1
New Mexico	1	0	2	6	9	8	24	9	12	0	0	0
Arizona	1	2	1	71	213	184	40	48	48	2	0	1
Utah [2]	1	0	0	13	60	60	7	512	124	0	0	0
Nevada	0	0	0	-	-	3	-	13	7	0	0	0
PACIFIC												
Washington	1	11	5	13	-	2	37	687	151	2	3	3
Oregon	7	9	2	8	14	25	54	229	142	0	1	1
California	23	18	20	25	361	87	230	2,386	1,712	8	16	18
Total	281	362	270	7,974	5,337	5,249	6,388	24,790	18,496	95	202	267
9 weeks	2,724	3,573	2,880	40,591	160,350	44,521	41,825	93,989	114,719	762	1,845	2,254
Seasonal low week [3]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	10,290	15,217	11,822	73,566	522,598	80,383	64,712	120,113	152,945	1,734	3,349	4,705

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic morbidity reports from State health officers for the week ended March 1, 1947, and comparison with corresponding week of 1946 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [4]		
	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46
	Mar. 1, 1947	Mar. 2, 1946		Mar. 1, 1947	Mar. 2, 1946		Mar. 1, 1947	Mar. 2, 1946		Mar. 1, 1947	Mar. 2, 1946	
NEW ENGLAND												
Maine	0	0	0	21	65	37	0	0	0	1	1	0
New Hampshire	0	0	0	3	35	11	0	0	0	0	0	0
Vermont	0	0	0	4	2	8	0	0	0	0	0	0
Massachusetts	0	1	0	136	198	322	0	0	0	1	5	1
Rhode Island	0	0	0	12	13	17	0	0	0	0	0	0
Connecticut	1	0	0	38	53	61	0	0	0	0	1	1
MIDDLE ATLANTIC												
New York	1	2	1	422	596	569	0	0	0	1	5	5
New Jersey	0	1	1	132	144	175	0	0	0	1	1	1
Pennsylvania	2	0	0	259	407	563	0	0	0	3	1	5
EAST NORTH CENTRAL												
Ohio	2	1	1	453	350	399	0	0	0	2	0	0
Indiana	0	0	0	129	103	166	0	2	1	4	2	1
Illinois	3	0	0	166	269	333	0	0	0	4	5	2
Michigan [2]	1	0	0	144	166	250	0	0	0	1	0	1
Wisconsin	4	1	0	62	166	280	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	1	0	0	75	61	96	0	0	0	1	0	0
Iowa	0	0	0	29	71	71	0	0	1	0	0	0
Missouri	1	0	0	46	77	117	0	0	0	4	0	1
North Dakota	0	0	0	5	3	19	0	0	0	1	0	0
South Dakota	0	0	0	9	23	23	0	0	0	0	1	0
Nebraska	0	0	0	49	43	67	0	1	1	0	0	0
Kansas	1	0	0	53	90	102	0	0	0	1	1	0
SOUTH ATLANTIC												
Delaware	0	0	0	8	8	8	0	0	0	0	0	0
Maryland [2]	0	0	0	26	119	119	0	0	0	0	0	1
District of Columbia	0	1	0	13	25	26	0	0	0	0	0	0
Virginia	2	3	1	50	135	63	0	0	0	4	4	1
West Virginia	0	0	0	17	36	36	0	0	0	0	0	0
North Carolina	0	0	1	41	42	42	0	0	0	0	0	0
South Carolina	0	3	0	9	9	9	0	0	0	0	0	0
Georgia	2	0	0	19	13	17	0	0	0	3	2	3
Florida	3	18	1	12	7	12	0	0	0	1	0	
EAST SOUTH CENTRAL												
Kentucky	0	1	1	37	31	73	0	0	0	0	3	
Tennessee	1	0	1	60	44	65	1	0	0	1	2	2
Alabama	0	0	0	14	16	20	0	0	0	0	0	0
Mississippi [2]	5	0	0	11	3	10	0	0	0	1	2	0
WEST SOUTH CENTRAL												
Arkansas	1	1	1	11	14	6	0	0	0	0	1	1
Louisiana	0	2	1	11	2	6	0	0	0	8	2	1
Oklahoma	0	0	0	6	17	27	0	0	0	1	0	0
Texas	1	1	1	67	74	79	0	1	1	3	3	4
MOUNTAIN												
Montana	0	4	1	3	10	35	0	0	0	0	0	0
Idaho	0	0	0	15	8	8	0	0	0	0	0	0
Wyoming	2	0	0	20	17	17	0	0	0	0	0	0
Colorado	0	0	0	75	44	53	0	0	0	0	2	2
New Mexico	0	0	0	6	5	10	0	0	0	0	0	0
Arizona	0	0	0	3	14	14	0	0	0	0	0	0
Utah [2]	0	0	0	14	29	38	0	0	0	0	0	0
Nevada	0	0	0	1	0	2	0	0	0	0	0	0
PACIFIC												
Washington	0	7	1	50	38	66	0	0	0	1	0	0
Oregon	2	0	0	38	26	26	0	0	0	0	0	1
California	15	6	3	148	227	227	0	1	0	13	3	3
Total	51	53	23	3,032	3,948	4,357	1	5	11	61	47	49
9 weeks	551	406	247	23,737	28,330	34,622	31	63	124	394	367	525
Seasonal low week [3]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	25,326	13,743	12,323	50,423	66,901	73,718	85	139	241	3,922	4,618	5,661

[2] Period ended earlier than Saturday.
[3] Dates between which the approximate low week ends. The specific date will vary from year to year.
[4] Including paratyphoid fever reported separately, as follows: Massachusetts 1 (salmonella infection); Missouri 2; Georgia 2; Louisiana 1; Texas 1; California 13.

Telegraphic morbidity reports from State health officers for the week ended March 1, 1947, and comparison with corresponding week of 1946 and 5-year median—Con.

Division and State	Whooping cough			Week ended Mar. 1, 1947							
	Week ended—		Median 1942–46	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Mar. 1, 1947	Mar. 2, 1946		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	20	26	26								
New Hampshire	25		1								
Vermont	16	7	35								
Massachusetts	90	120	173		6						2
Rhode Island	11	58	33								
Connecticut	62	82	40				1			1	3
MIDDLE ATLANTIC											
New York	152	168	234	3	3		1				8
New Jersey	115	140	140	3				1			
Pennsylvania	175	113	171						1		
EAST NORTH CENTRAL											
Ohio	117	51	170							1	
Indiana	47	25	29				4				
Illinois	91	77	85	3			1		2		15
Michigan [2]	200	138	130	1					2		3
Wisconsin	187	81	81	1			1				10
WEST NORTH CENTRAL											
Minnesota	19	1	39								2
Iowa	2	14	14						1		57
Missouri	32	3	9						4		26
North Dakota	1		8								
South Dakota			1								
Nebraska	29	2	4				1				1
Kansas	20	37	44	1					1		3
SOUTH ATLANTIC											
Delaware	5	7									
Maryland [2]	47	19	38								1
District of Columbia	2	6	6								
Virginia	105	37	51	2		71			1		1
West Virginia	37	48	48								1
North Carolina	48	32	116						5	2	
South Carolina	22	52	54		13				1	1	
Georgia	67	25	25		3				1	16	2
Florida	45	6	23							1	
EAST SOUTH CENTRAL											
Kentucky	32	15	44								
Tennessee	21	4	24						3	1	1
Alabama	33	10	10							3	4
Mississippi [2]										1	1
WEST SOUTH CENTRAL											
Arkansas	29	16	16	2	2					2	1
Louisiana	19	2	2	8					1	1	3
Oklahoma	9	4	9				1	1			1
Texas	440	95	167	10	216	107				6	15
MOUNTAIN											
Montana	7	6	6								
Idaho	4	14	9								2
Wyoming		1	2								
Colorado	7	29	29								1
New Mexico	18	6	17	1	1	1					
Arizona	17	16	23			22					
Utah [2]	6	18	18						1		1
Nevada											
PACIFIC											
Washington	48	46	46	2		18					3
Oregon	13	10	13	1							
California	132	98	272	3	1					1	5
Total	2,624	1,765	2,393	41	245	219	10	2	24	37	173
Same week, 1946	1,765			41	195	63	5	0	14	22	70
Median, 1942–46	2,393			24	195	63	12	0	12	32	[3] 78
9 weeks: 1947	22,393			401	3,228	1,844	62	6	390	422	921
1946	16,161			363	2,623	1,018	66	3	189	460	573
Median, 1942–46	20,816			216	1,873	577	68	3	189	460	[3] 667

[2] Period ended earlier than Saturday.
[3] 2-year average, 1945–46.

Anthrax: New York 1 case.
Leprosy: California 1 case.

WEEKLY REPORTS FROM CITIES [1]

City reports for week ended Feb. 22, 1947

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	1	0	------	0	0	0	2	0	0	11
New Hampshire:												
Concord	0	0	------	0	------	0	0	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	16	0	1	0	0	0	0	1
Massachusetts:												
Boston	10	0	------	0	18	1	15	0	21	0	0	20
Fall River	0	0	------	0	------	0	0	0	8	0	0	------
Springfield	2	0	------	0	4	0	2	0	4	0	0	7
Worcester	0	0	------	0	------	0	6	0	5	0	0	26
Rhode Island:												
Providence	0	0	1	0	145	0	4	0	8	0	0	9
Connecticut:												
Bridgeport	0	0	------	0	2	0	2	0	0	0	0	4
Hartford	0	0	------	0	3	0	1	0	2	0	0	2
New Haven	0	0	------	0	24	0	0	0	9	0	0	8
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0	------	0	------	0	7	0	2	0	0	8
New York	12	0	7	2	125	4	65	0	141	0	0	53
Rochester	0	0	------	0	3	0	1	0	10	0	0	2
Syracuse	0	0	------	0	------	0	2	0	16	0	0	4
New Jersey:												
Camden	3	0	------	0	------	0	0	0	1	0	0	3
Newark	1	0	1	0	3	1	7	0	12	0	0	24
Trenton	0	0	------	0	25	0	3	0	6	0	0	1
Pennsylvania:												
Philadelphia	2	0	------	0	8	2	29	0	46	0	0	45
Pittsburgh	3	0	1	1	85	0	8	0	11	0	0	4
Reading	0	0	------	0	------	0	0	0	1	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	1	0	------	0	3	0	6	0	0	1
Cleveland	0	0	5	0	316	1	12	0	33	0	1	23
Columbus	1	0	------	0	3	0	3	0	11	0	0	------
Indiana:												
Indianapolis	0	0	------	0	1	1	5	0	32	0	0	56
South Bend	0	1	------	0	4	0	0	0	5	0	0	1
Terre Haute	0	0	------	0	------	0	2	0	2	0	0	------
Illinois:												
Chicago	0	0	------	2	47	3	34	0	43	0	0	34
Michigan:												
Detroit	1	0	1	0	12	0	11	1	48	0	1	80
Flint	0	0	------	0	------	0	3	0	4	0	0	9
Grand Rapids	0	0	------	1	2	0	0	0	14	0	0	4
Wisconsin:												
Kenosha	0	0	------	0	------	0	0	0	4	0	0	2
Milwaukee	0	0	------	0	5	0	3	0	17	0	0	54
Racine	0	0	------	0	------	0	0	0	3	0	0	12
Superior	0	0	------	0	1	0	1	0	2	0	0	------
WEST NORTH CENTRAL												
Minnesota:												
Duluth	1	0	------	0	------	1	3	0	2	0	0	1
Minneapolis	3	0	------	0	12	0	9	0	4	0	0	6
St. Paul	1	0	------	0	14	2	4	0	10	0	0	3
Missouri:												
Kansas City	0	0	------	0	1	0	2	0	4	0	0	3
St. Joseph	0	0	------	0	------	0	0	0	2	0	0	4
St. Louis	0	0	6	0	1	1	12	0	17	0	0	12

[1] In some instances the figures include nonresident cases.

City reports for week ended Feb. 22, 1947—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	0	1	0	4	0	3	0	0	3
Kansas:												
Topeka	1	0	------	0	1	0	0	0	10	0	0	------
Wichita	0	0	------	0	------	0	2	0	7	0	0	1
SOUTH ATLANTIC												
Delaware:												
Wilmington	1	0	------	0	------	0	0	0	2	0	0	3
Maryland:												
Baltimore	3	0	2	0	7	1	8	0	9	0	0	71
Cumberland	0	0	------	0	2	0	0	0	0	0	0	------
Frederick	0	0	------	0	------	0	0	0	0	0	0	------
District of Columbia:												
Washington	1	0	1	1	11	0	10	0	11	0	0	9
Virginia:												
Lynchburg	0	0	------	0	------	0	2	0	0	0	0	------
Richmond	0	0	------	0	80	0	3	0	1	0	0	4
Roanoke	0	0	------	0	1	0	0	0	4	0	0	------
West Virginia:												
Charleston	0	0	------	0	------	0	0	0	1	0	0	------
Wheeling	0	0	------	1	------	0	1	0	0	0	0	------
North Carolina:												
Raleigh	0	0	------	0	5	0	0	0	0	0	0	6
Wilmington	1	0	------	0	6	0	1	0	0	0	0	------
South Carolina:												
Charleston	0	0	7	0	------	0	0	0	1	0	0	3
Georgia:												
Atlanta	0	0	20	0	2	0	3	0	6	0	0	------
Brunswick	0	0	------	0	------	0	0	0	0	0	0	------
Savannah	0	0	1	0	47	0	3	0	0	0	0	------
Florida:												
Tampa	1	0	5	0	2	0	2	0	5	0	0	------
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	2	0	6	0	1	1	9	0	3	0	0	10
Nashville	0	0	------	0	1	0	5	0	3	0	0	1
Alabama:												
Birmingham	2	0	3	0	5	0	4	0	3	0	0	2
Mobile	0	0	------	2	17	0	3	0	1	0	0	1
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	5	0	1	1	0	0	1	0	0	------
Louisiana:												
New Orleans	2	0	1	1	11	1	8	0	4	0	1	3
Shreveport	0	0	------	0	------	0	14	0	0	0	0	------
Oklahoma:												
Oklahoma City	1	0	5	0	------	0	0	0	0	0	0	1
Texas:												
Dallas	1	0	------	0	6	0	6	0	2	0	0	10
Galveston	0	0	------	0	------	0	1	0	6	0	0	------
Houston	1	0	------	0	------	0	6	1	3	0	0	------
San Antonio	3	0	1	0	2	0	4	0	1	0	0	4
MOUNTAIN												
Montana:												
Billings	0	0	------	0	------	0	2	0	0	0	0	------
Great Falls	2	0	------	0	175	0	0	0	1	0	0	------
Helena	0	0	------	0	9	0	0	0	1	0	0	1
Missoula	0	0	------	0	1	0	0	0	2	0	0	------
Idaho:												
Boise	0	0	1	0	------	0	1	0	0	0	0	------
Colorado:												
Denver	1	0	65	3	16	0	15	0	21	0	0	5
Pueblo	0	0	------	0	------	0	0	0	1	0	0	2
Utah:												
Salt Lake City	1	0	------	0	3	0	4	0	4	0	0	------

City reports for week ended Feb. 22, 1947—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	4	0	3	0	7	0	0	2
Spokane	0	0	------	0	15	0	4	0	3	0	0	6
Tacoma	0	0	------	0	2	0	0	0	1	0	0	------
California:												
Los Angeles	13	0	4	1	8	2	6	1	26	0	0	24
Sacramento	1	0	------	0	4	0	0	0	4	0	0	2
San Francisco	2	0	1	0	7	0	3	0	15	0	0	1
Total	81	1	152	15	1,333	23	397	4	735	0	3	713
Corresponding week, 1946*	87	------	200	37	7,034	------	456	------	938	0	5	453
Average 1942-46*	70	------	226	[2] 44	[3] 4,579	------	[2] 470	------	1,590	1	10	689

[2] 3-year average, 1944-46.
[3] 5-year median, 1942-46.
*Exclusive of Oklahoma City.
Anthrax.—Cases: Philadelphia 1.
Dysentery, amebic.—Cases: New York 9; Memphis 1; Salt Lake City 1.
Dysentery, bacillary.—Cases: Worcester 1; New York 1.
Dysentery, unspecified.—Cases: Worcester 1; San Antonio 5.
Typhus fever, endemic.—Cases: Bridgeport 1; Baltimore 1; Tampa 2; Mobile 1; Dallas 1; Los Angeles 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (latest available estimated population, 34,345,500)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	31.4	0.0	5.2	0.0	554	2.6	81.0	0.0	154	0.0	0.0	230
Middle Atlantic	10.2	0.0	4.2	1.4	115	3.2	56.5	0.0	114	0.0	0.0	67
East North Central	1.2	0.6	4.4	1.9	243	3.1	47.9	0.6	139	0.0	1.2	172
West North Central	12.1	0.0	12.1	0.0	60	8.0	72.4	0.0	119	0.0	0.0	66
South Atlantic	11.7	0.0	60.1	3.3	272	1.7	55.1	0.0	67	0.0	0.0	160
East South Central	23.6	0.0	53.1	11.8	142	5.9	123.9	0.0	59	0.0	0.0	83
West South Central	20.3	0.0	30.5	2.5	51	5.1	99.1	2.5	28	0.0	2.5	46
Mountain	31.8	0.0	524.2	23.8	1,620	0.0	174.7	0.0	238	0.0	0.0	64
Pacific	25.3	0.0	7.9	1.6	63	3.2	25.3	3.2	89	0.0	0.0	55
Total	12.3	0.2	23.1	2.3	203	3.5	60.4	0.6	112	0.0	0.5	109

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—January 1947.—During the month of January 1947, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Residence [1]									
	Panama City		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	22		6		4		4		36	
Diphtheria	54	1					10		64	1
Dysentery:										
Amebic							1		1	
Bacillary	1		1		2		2		6	
Leprosy								2		2
Malaria [2]	17		3	1	49	1	50	5	119	7
Measles	8		9		6		1		24	
Meningitis, meningococcus					1				1	
Mumps			3		3				6	
Paratyphoid fever			1						1	
Pneumonia		8		5	16	1		2	[3] 16	16
Tuberculosis		17		6	3	2		8	[3] 3	33
Typhoid fever			1				3		4	
Typhus fever							1		1	
Whooping cough					2				[3] 2	

[1] If place of infection is known, cases are so listed instead of by residence.
[2] 11 recurrent cases.
[3] In the Canal Zone only.

* * *

DEATHS DURING WEEK ENDED FEB. 22, 1947

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Feb. 22, 1947	Corresponding week, 1946
Data for 93 large cities of the United States:		
Total deaths	9,741	9,474
Median for 3 prior years	9,474	
Total deaths, first 8 weeks of year	79,778	84,004
Deaths under 1 year of age	787	594
Median for 3 prior years	594	
Deaths under 1 year of age, first 8 weeks of year	6,583	4,854
Data from industrial insurance companies:		
Policies in force	67,313,350	67,171,224
Number of death claims	13,321	12,300
Death claims per 1,000 policies in force, annual rate	10.3	9.5
Death claims per 1,000 policies, first 8 weeks of year, annual rate	9.7	11.2

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended February 8, 1947.—During the week ended February 8, 1947, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		13		263	301	19	27	55	87	765
Diphtheria	1	2		19	7	4	1	1		35
Dysentery:										
Amebic					4					4
Bacillary				2						2
Unspecified					1					1
German measles				7	52	1	1	9	6	76
Influenza		60			7	6			1	74
Measles		137	4	209	56	286	102	437	482	1,713
Meningitis, meningococcus				3	2	2				7
Mumps		6		92	426	58	144	23	365	1,114
Poliomyelitis					2					2
Scarlet fever		10	3	77	98	11	2	11	11	223
Tuberculosis (all forms)		10	20	89	31	13	19	20	42	244
Typhoid and paratyphoid fever		2		6	4					12
Undulant fever				1	1			3		5
Venereal diseases:										
Gonorrhea	3	15	11	76	89	37	14	39	59	343
Syphilis	3	3	7	105	67	18	18	16	38	275
Whooping cough		27	3	79	93	15	2	8	22	249

CUBA

Habana—Communicable diseases—3 weeks ended January 25, 1947.—During the 3 weeks ended January 25, 1947, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Chickenpox	1		Tuberculosis	3	1
Diphtheria	16	1	Typhoid fever	11	
Measles	8				

Provinces—Notifiable diseases—4 weeks ended January 25, 1947.—During the 4 weeks ended January 25, 1947, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	10	8	16	17	4	22	77
Chickenpox		2					2
Diphtheria	1	25		4	2	1	33
Leprosy		7				1	8
Malaria		4		2	4	87	97
Measles		12					12
Poliomyelitis	6	4		2	1	1	14
Tuberculosis	28	24	15	44	10	49	170
Typhoid fever	8	37	5	20	5	35	110
Whooping cough					1		1

[1] Includes the city of Habana.

FINLAND

Helsinki—Measles epidemic.—Information received on February 4, 1947, states that a current epidemic of measles in Helsinki, Finland, was causing some concern to the health authorities. It was also stated that measles epidemics are serious in Finland, as "active tuberculosis and other serious ailments are concomitants" of the disease.

JAMAICA

Notifiable diseases—4 weeks ended February 8, 1947.—During the 4 weeks ended February 8, 1947, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis	2	2	Puerperal sepsis	----------	1
Chickenpox	12	14	Scarlet fever	----------	1
Diphtheria	3	1	Tuberculosis (pulmonary)	44	61
Dysentery, unspecified	----------	9	Typhoid fever	15	76
Leprosy	----------	3	Typhus fever (murine)	1	----------

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

Siam (Thailand).—For the week ended February 8, 1947, 166 cases of cholera with 106 deaths, including 15 cases of cholera with 5 deaths reported in Bangkok, were reported in Siam.

Plague

Brazil.—Plague has been reported in Brazil as follows: For the month of June 1946, Ceara State, 15 cases, 1 death; Pernambuco State, 3 cases; Sergipe State, 1 case; for the month of July 1946, Bahia State, 1 case; Ceara State, 24 cases, 6 deaths; for the month of August 1946, Bahia State, 1 case, 1 death; Ceara State, 37 cases, 7 deaths.

Burma.—For the week ended February 8, 1947, 125 cases of plague with 95 deaths were reported in Burma.

Java.—According to press reports, not officially confirmed, the prevalence of both bubonic and pneumonic plague was reported in central Java during 1946 as follows: Adikarto regency, 33 deaths;

Bantoel regency, 278 deaths; Djocjakarte, 907 deaths; Koelonprogo regency, 23 deaths; Slemen regency, 445 deaths; Wonosari regency, 723 deaths; a total of 2,409 deaths. Pneumonic plague was reported in Soekaboemi area, Proenger district in western Java.

It is stated that plague first appeared in epidemic form in Djocjakarte during 1945, when efforts of the Japanese to retard it were said to have been ineffective. Plague has been endemic in the Preanger district for many years, but it was stated that the Dutch sanitary measures were able to keep it from spreading. It was also stated that the Dutch authorities fear that the disease may spread rapidly in the interior of Java.

Peru.—Plague has been reported in Peru as follows: For the month of October 1946, Lima Department, 1 case; Piura Department, 19 cases, 2 deaths; for the month of November 1946, Libertad Department, 1 case; Lima Department, 3 cases; Piura Department, 22 cases, 2 deaths.

Smallpox

Malay States (Federated)—Trengganu.—For the week ended February 22, 1947, 218 cases of smallpox with 41 deaths were reported in Trengganu, Federated Malay States.

Uruguay.—According to a report dated February 19, 1947, 138 cases of smallpox (alastrim) have occurred in Uruguay during the past few months. The outbreak is said to be declining.

Typhus Fever

Colombia.—For the month of January 1947, 127 cases of typhus fever with 3 deaths were reported in Colombia.

Yellow Fever

Colombia.—Yellow fever has been reported in Colombia as follows: Caldas Department—La Dorado, January 22, 1947, 1 death; Cundinamarca Department—Caparrapi, January 19, 1947, 1 death; Santander Department—Barranca Bermeja, December 30, 1946, 1 death; Lebrija, January 16, 1947, 1 death; Rio Negro, January 1–20, 1947, 3 deaths; San Vincente de Chucuri, January 1–11, 1947, 4 deaths; Simacota, January 2–10, 1947, 3 deaths; Tolima Department—Armero, January 22, 1947, 1 death.

×