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PREVALENCE OF POLIOMYELITIS

During the week ended September 2, 479 cases of poliomyelitis were reported in the United States, as compared with 391 cases during the preceding week and a median of 333 cases for the corresponding week of the years 1934–38. The incidence during the current week was over 40 percent in excess of the median for the preceding 5 years.

Michigan reported 109 cases (with 51 in Detroit), as compared with 115 during the preceding week. Other States reporting a high incidence of the disease were: New York, 100 cases (of which 47 were reported in Buffalo and 20 in New York City); Minnesota, 60 (with 15 cases in Minneapolis); California, 50 (with 20 cases in Los Angeles); Pennsylvania, 44 (of which 15 cases were reported in Philadelphia); Ohio, 11 cases. The number of cases reported in New Jersey dropped to 10, in Illinois to 9, in Texas to 8, and in South Carolina to 6.

DENTAL PROGRAMS SPONSORED BY HEALTH AGENCIES IN 94 SELECTED COUNTIES*

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Because of the growing interest in dental programs as a part of public health work, advantage was taken of the opportunities afforded by the Health Facilities Study of the National Health Inventory for determining the extent to which such programs are sponsored by 1,861 health agencies in 94 selected counties. In the present report, as in previous ones of the series,[1] caution should again be urged against

*From the Division of Public Health Methods, National Institute of Health. Study conducted in connection with the National Health Inventory.

[1] Articles of this series already published are:

(a) Mountin, Joseph W.: How expenditures for selected public health services are apportioned. Pub. Health Rep., 52: 1384 (October 1, 1937).

(b) Mountin, Joseph W., Borowski, Anthony J., and O'Hara, Hazel: Variations in the form and services of public health organizations. Pub. Health Rep., 53: 523 (April 8, 1938).

(c) Borowski, Anthony J.: Positions and rates of pay in public health agencies. Am. J. Pub. Health, 28: 1197 (October 1938).

(d) Borowski, Anthony J., and Plumley, Margaret Lovell: Preventive clinic facilities available in 94 selected counties of the United States. Pub. Health Rep., 54: 335 (March 3, 1939).

(e) Mountin, Joseph W., and Flook, Evelyn: Organized public nursing and variation of field programs in 94 selected counties. Pub. Health Rep., 54: 815 (May 19, 1939).

assuming that the aggregate figures presented here are representative of the entire United States, for, as explained in the earlier articles, the counties studied are disproportionately urban and include most of the large cities of the country. As a result, health services of all types are probably much better developed in the study areas than in the Nation as a whole. Despite this selective factor, it is possible to contrast conditions existing in the rural counties surveyed with those found in the populous districts, and to apply the findings to other areas of corresponding characteristics.

For purposes of the present report, measurement of dental service is based upon the volume of examinations, cleanings, fillings, extractions, gum and root canal treatments, bridge work, and orthodontia reported by the various health organizations. Reports from the agencies made no distinction between the work performed by dentists and that done by dental hygienists. Therefore, services of the latter must be considered as cooperative rather than as isolated contributions to the programs concerned. In 22 of the 94 counties studied, or approximately 23 percent, there is no definite provision for public dental service through health agencies. Areas without dental programs are largely rural, since 18 of the 22 counties referred to have less than 40,000 inhabitants. In only 1 county without dental service sponsored by public health agencies does the population exceed 100,000. That dental service is omitted from the public health activities of 18 counties of the lowest population group becomes increasingly significant when it is realized that these 18 jurisdictions represent more than half of the 32 counties of this size category included in the study. However, for the purpose of showing the extent to which dental care is supplied through health agencies for people living in areas having different characteristics, the population of counties without as well as of those with programs for such work is included in all calculations.

Of the 1,861 health organizations which filed reports, 390 furnish some form of dental service to the public. Distribution of these agencies by type of control shows that 100 of them are health departments, 169 are designated as other official agencies, chiefly health divisions in the departments of education and welfare, and 121 are classified as nonofficial or voluntary health agencies. The latter group is composed of such organizations as visiting nurse associations, maternal and child welfare societies, tuberculosis associations, the American Red Cross, and similar bodies having special health interests.

Borowski,[2] in his study of health agency personnel, states that 390 health agencies sponsoring dental programs employ a total of 818 dentists, but that only 136 of this number devote all of their time to public service. All others are employed on a part-time basis. It should be added that the aforementioned dental staff is supplemented

[2] See footnote 1 (c).

by 220 dental hygienists, 169 of whom serve full time (table 1). Consequently, the services analyzed in this report represent the work of 1,038 professional and technical persons; however, less than one-third of this number contribute all of their time to the programs under discussion.

TABLE 1.—*Number of health agencies which sponsor dental programs, and number of full- and part-time dental personnel employed by agencies of each type*

Type of agency	Agencies of each type which sponsor dental programs	Dental personnel employed by agencies of each type					
		Total dental personnel		Dentists		Dental hygienists	
		Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
All types	390	305	733	136	682	169	51
Health departments	100	161	148	76	140	85	8
Other official agencies	169	75	144	16	122	59	22
Nonofficial agencies	121	69	441	44	420	25	21

Since the majority of dental personnel serve only part time, and since part-time employment is so variable as to compensation and service requirements, the number of personnel employed is perhaps a less satisfactory criterion for judging the comparative emphasis which agencies of different types place upon dental activities than is the amount of money allotted by each to dental programs. According to an earlier study made by one of the authors (Mountin),[3] 2 percent of the total budget of health agencies in the 94 counties studied is assigned to dentists' salaries. When funds expended for the remuneration of dental hygienists are added, the proportion is increased to 2.8 percent of all expenditures for items of service designated as public health work. Notwithstanding the fact that this is a relatively low percentage when compared with the salary budgets for other types of health agency personnel, the sum allocated for payment of dental workers amounts to the appreciable figure of more than $800,000. Health departments spend approximately two-fifths of this, other official agencies nearly one-third, and voluntary health organizations about one-fourth. It is recognized, of course, that additional funds not determined here are expended by all types of health organizations for dental materials and equipment.

In the report previously referred to,[3] it is shown that the proportion of the total health outlay which is set aside for dental work varies according to the type of agency. Although health departments rank first in aggregate expenditures for dental salaries, other official agencies devote relatively more of their total health budgets to this purpose than do health organizations of any type considered. This difference

[3] See footnote 1 (*a*).

is probably a reflection of dissimilarity in the major interests of the several classes of agencies. Activities of health departments cover a much wider range than do those of health units in departments of education; consequently, within the programs of health departments dental service is given relatively less emphasis than within those of other official health groups. Furthermore, health units of school boards are primarily concerned with the well-being of school children, and it is this segment of the population which receives most of the dental service rendered by the agencies studied. Among the group of nonofficial agencies, home nursing overshadows any other item of service, particularly dental care.

Inasmuch as preliminary inspection of the reports submitted revealed that, almost without exception, the dental service provided was predominantly for school children (only 2 percent of all persons served were adults), all analyses herein reported are restricted to service for the group receiving primary consideration. Some idea of the extent to which dental service is furnished school children[4] living in counties of different population categories may be gained by referring to table 2. This tabulation presents an over-all picture of the dental work reported for the school population involved. Examinations, cleanings, fillings, extractions, and unclassified services designated as "other" are given equal weight in this enumeration of total dental activity. It is immediately apparent that urbanization is a primary factor in determining the amount of dental service received. As the population level rises, there is a steady increase in the proportionate number of dental services reported. Relatively three times as many services were rendered in counties having populations exceeding 500,000 as in those with less than 40,000 inhabitants.

TABLE 2.—*Number of dental services per 1,000 school population*[1] *reported by specified types of health agencies in counties of different population classes*

Population classification of county	Number of counties of each population class	Total school population in counties of each population class	Dental services per 1,000 school population reported by specified type of agency			
			All agencies	Health departments	Other official agencies	Nonofficial agencies
All counties studied	94	5,935,558	817	411	196	210
Under 40,000	32	133,135	293	170	78	45
40,000-99,999	22	284,723	430	122	255	53
100,000-499,999	26	1,305,574	683	166	400	117
500,000 and over	14	4,212,126	901	515	132	254

[1] See text, footnote 4.

[4] Fifteenth Census of the United States, 1930. Population, vol. III, table 11, Children 5–14 years of age. U. S. Bureau of the Census. For the purposes of this study, school population is considered to be the equivalent of children 6–15 years of age. The 1930 Census enumeration of children 5–14 has been used as the best available estimate of children within this age group.

From the standpoint of all study counties considered as a group, health departments performed as many services as did official and nonofficial agencies combined. This performance becomes even more significant when it is recalled that dental service is one of the less prominent features of health department activity. The outstanding position of health departments in this regard is accentuated in counties of the smallest and in those of the largest population categories. In counties of the two intermediate population brackets, however, other official health agencies exceed health departments in the volume of dental services reported. This variation among localities of different sizes with respect to the kind of agencies providing the most dental work is, in all probability, caused by a difference in the general organization of their entire health programs. Whereas in some communities, particularly in large cities, tax-supported health services tend to be centralized under health department administration, in many less populous jurisdictions certain elements of the program are delegated to associated agencies; hence, the performance of the latter group is elevated, and the volume rendered by health departments is, on a relative basis, reduced. Nonofficial agencies function primarily in urban localities; therefore, it is not surprising to find that children living in counties of less than 100,000 population receive relatively little dental service from these organizations. Only in counties of 500,000 or more population do nonofficial agencies emerge from the lowest rank as sponsors of public dental service. In these urban counties voluntary agencies surpass official agencies other than health departments with respect to this item. However, even in the most populous counties, the volume of service reported by nonofficial agencies is only about half that performed by dental employees of health departments.

The foregoing presentation of the dental activity of health agencies affords a general view of the volume of service rendered by different types of agencies in communities of varying size. More detailed analysis is necessary, however, if the true nature of such service is to be understood. The figures presented in table 3 are a result of further study of the situation. From the standpoint of all services enumerated for the entire group of counties studied, examinations alone account for more than two-fifths of the total volume of dental work. It is apparent that relatively little time is given to oral hygiene, since prophylaxis is the type of service least frequently reported. On the other hand, for every extraction made, approximately two fillings were placed. X-ray, gum and root canal treatments, bridge work, othodontia, and other miscellaneous services comprise one-tenth of all services.

The expression of dental activity in terms of the relative emphasis placed upon each type of service gives some conception of the general

pattern of dental care as rendered by health agencies. Evaluation of the extent to which health agencies contribute to the solution of the entire problem is facilitated when the dental performance of these groups is related to, first, the total dental needs of school children, and, second, all dental services received by corresponding population groups.

TABLE 3.—*Percentage distribution of dental services reported by health agencies operating in counties of different population classes, according to the kind of service rendered*

Population classification of county	Total number of dental services reported	Percent of services which were of each type				
		Examinations	Prophylaxis	Fillings	Extractions	Other
All counties studied	4,849,681	42.8	7.1	25.9	13.5	10.7
Under 40,000	38,982	60.7	4.4	29.6	4.6	.7
40,000–99,999	122,330	64.6	14.5	8.9	11.9	.1
100,000–499,999	891,954	50.9	7.7	19.3	14.1	8.0
500,000 and over	3,796,415	40.0	6.7	27.9	13.6	11.8

A survey of the current dental needs and past dental treatment of school children in 26 States made in 1933–34[5] included 26 of the counties subsequently covered by the Health Facilities Study. Therefore, the data given in this survey of current dental needs were used as an index for determining the approximate contribution to dental care made by health agencies. According to the findings reported in the above survey,[5] about two-thirds of the children examined in these overlapping study areas required dental prophylaxis, and a child representing the average needed 1.1 teeth (permanent and deciduous) extracted. Comparisons based upon the needs reported in the reference under citation and the services rendered by health agencies operating in identical districts reveal that facilities of public health agencies meet about 10 percent of the need for prophylaxis and 15 percent of the need for extractions.

The report of the 1933–34 survey does not provide tabulations of defective tooth surfaces per child which require fillings, but Klein, Palmer, and Knutson,[6] in a study of 4,416 grade school children in Hagerstown, Md., found for that particular city that the average child had 7.5 carious tooth surfaces (deciduous and permanent) requiring fillings. If this average is applied to the combined population of the 94 counties studied and related to the performance of health agencies, the resulting calculation suggests that such agencies place only about 3 percent of the estimated number of fillings required.

[5] Messner, C. T., Gafafer, W. M., Cady, F. C., and Dean, H. T.: Dental Survey of School Children, Ages 6–14 Years, Made in 1933–34 in 26 States. Public Health Bulletin No. 226 (May 1936). U. S. Government Printing Office, Washington, D. C.

[6] Klein, Henry, Palmer, Carroll E., and Knutson, John W.: Studies on dental caries. I. Dental status and dental needs of elementary school children. Pub. Health Rep., 53: 751 (May 13, 1938).

It cannot be assumed that all additional dental needs are adequately met through private facilities. As a matter of fact, recent information on the subject reveals a large unmet need. Collins,[7] in a report on dental services received by 9,000 white families during a 12-month period, suggests that the number of annual dental services from all sources reported for children 6–15 years of age averages 110 prophylaxis treatments, 524 fillings, and 221 extractions per 1,000 children. On a basis of the estimated dental needs for children of similar age groups,[8] it appears that public and private facilities combined provide only one-sixth of the indicated prophylaxis, one-fifth of the necessary extractions, and 7 percent of the required fillings. While the service described meets only a small part of the need, public health agencies make a significant contribution. Of the work done to meet this need, such organizations render service equivalent to 52 percent of the prophylaxis, 40 percent of the fillings, and 50 percent of the extractions.

By comparing the ratio of service to need in the three categories (prophylaxis, fillings, and extractions), it would appear that, in the dental programs of health agencies, preventive and corrective activities are subordinate to work which might be termed "emergency," even though the total volume of extractions is only half as great as the number of fillings placed. It might be explained, in extenuation of such procedure, that most of the dental service reported is performed for an age group wherein a high proportion of the extractions represents removal of deciduous teeth. However, it is encouraging to note that in some communities there is a tendency to sponsor preventive and corrective dental programs. The gross total of prophylaxis and fillings reported bears evidence of this.

Generally speaking, dental service, like all other types of public health activity, tends to be of a more diversified character in populous communities than in rural areas (table 3). Whereas examinations constitute 60 percent of the dental service received by children residing in counties of less than 40,000 inhabitants, and fillings represent the only other service reported in any significant amount, in counties having 500,000 or more persons only 40 percent of all services recorded were classified as examinations, while extractions and miscellaneous services, as well as fillings, were provided with a moderate degree of frequency. The fact that comparatively few fillings were placed in the two intermediate groups of counties is probably a reflection of the general policy of other official agencies which predominate as dispensers of school dental service in areas of this size. As will be emphasized later, these agencies do not specialize in corrective work.

[7] Collins, Selwyn D.: Frequency of dental services among 9,000 families, based on Nation-wide periodic canvasses, 1928-31. Pub. Health Rep., 54: 629 (April 21, 1939).

[8] See footnotes 5 and 6.

That urbanization of an area influences the distribution of public dental care therein is confirmed by the variation between counties of different population categories with regard to the proportion of estimated need taken care of through health agencies.

The type of dental service featured is largely dependent upon the agency sponsoring the program. Table 4 indicates that health departments not only render a greater volume of dental service than do agencies of any other type, but that they also provide a greater variety of service. Agencies of this class are unique in that they are characterized by a higher number of fillings than of examinations. Health departments also place a certain amount of emphasis upon extractions and miscellaneous services designated as "other." In general, the pattern of dental service rendered by nonofficial agencies conforms closely to that described for health departments. The most noticeable variation lies in the tendency of nonofficial agencies to limit miscellaneous care. At the same time, other official agencies are apt to restrict their dental activities to examinations only; nearly three-fourths of all services reported were so classified. The fact that health units controlled by school authorities provide relatively little actual dental care in the form of fillings suggests that these organizations sponsor programs which are largely informational in character. Parents are notified of dental defects found upon examination, and the responsibility of correction rests with the family. It would appear, therefore, that two factors contribute toward the variation in dental service available to residents of different types of communities, first, urbanization, as expressed by county population, and, second, the type of health agency most active in the area.

TABLE 4.—*Percentage distribution of dental services reported by health agencies of specified type, according to the kind of service rendered*

Type of health agency	Total number of dental services reported	Percent of services which were of each type				
		Examinations	Prophylaxis	Fillings	Extractions	Other
All agencies	4,849,681	42.8	7.1	25.9	13.5	10.7
Health departments	2,441,244	30.5	7.8	30.8	15.1	15.8
Other official agencies	1,163,531	72.6	7.2	9.5	7.0	3.7
Nonofficial agencies	1,244,906	39.0	5.5	31.5	16.6	7.4

Up to this point in the present paper all analyses of dental programs have been made on the basis of activity as expressed in services rendered, rather than from the standpoint of the proportion of all school children who were recipients of the various forms of dental service. The number of children benefited by dental projects of health agencies is no less important than the volume and kinds of service rendered, and parallelism between the two cannot be assumed to exist. For instance, it is the policy of some organizations to

examine every school child in the jurisdiction, and then to notify the parents of each defect found. Remedial work, in a system of this kind, depends upon the financial ability and interest of the parents, although some dental corrections might be made for extremely indigent children. Under such circumstances the proportion of the school population examined would be high, whereas the proportion receiving other types of service would be exceedingly low. Other agencies might charge a nominal fee for each service rendered. The percentage of children served would then depend upon the number presenting the fee required. Still another scheme is that of concentrating service by examining only children in particular school grades and then making all corrections indicated. It is evident that such procedure would result in examinations for relatively few, but in more thorough care for a proportionately large number.

These, and many other individual policies, help to determine the final fact that approximately one-third of the entire school population of the 94 surveyed counties received a dental examination during the 1-year period under consideration. Of those examined, not more than 29 percent were given any type of preventive or corrective dental care. More children had fillings than extractions, and there was a wider spread of both of these services than of prophylaxis or such care referred to as "other."

When, earlier in this report, the aggregate volume of recorded dental service was related to population characteristics of the surveyed counties, it was suggested that urbanization of an area fosters development of public dental programs for school children. Figures which are based on the proportion of all children served, and which are presented in table 5, substantiate this relationship. Moreover, they further reveal that services are distributed in such a manner that children of urban counties are assured a better chance of receiving all kinds of dental services than are those of rural areas. In counties with more than 100,000 inhabitants nearly twice as many children per population unit were given dental examinations as in counties with less than 40,000 population.

Differences are even more exaggerated when actual care is involved. Two examples might be cited. The proportion of all children who received fillings increases steadily as the population level rises; indeed, relatively four times as many children in counties of the highest population bracket as in areas with fewest inhabitants were recipients of such service. The comparative number for whom extractions were made likewise rises in accordance with greater urbanization. In counties with over 500,000 inhabitants, extractions were recorded for proportionately ten times as many children as in areas of the lowest population category.

TABLE 5.—*Number of children per 1,000 school population [1] who received selected kinds of dental service from health agencies operating in counties of different population classes*

Population classification of county	Total school population in counties of each population class	Children per 1,000 school population who received selected kinds of dental service				
		Examinations	Prophylaxis	Fillings	Extractions	Other
All counties studied	5,935,558	323	56	94	83	47
Under 40,000	133,135	178	12	25	9	2
40,000–99,999	284,723	277	62	31	41	(2)
100,000–499,999	1,305,574	342	50	68	57	29
500,000 and over	4,212,126	324	58	108	96	57

[1] See text, footnote 1.
[2] Less than 0.5 of 1 child per 1,000 school population.

Table 6 shows that official agencies other than health departments were responsible for examination of the greatest number of children; health departments and nonofficial agencies follow in the order named. At first glance, this statement appears to contradict findings already reported, for, it will be remembered, health departments performed over half of the entire volume of service reported. More careful study of table 6 reveals, however, that other official agencies supersede health departments only in the instance of children examined, and even then the difference is relatively slight. Insofar as actual treatment or care is concerned, health departments served more children than all other agencies combined, irrespective of whether the criterion of comparison is prophylaxis, fillings, extractions, or miscellaneous services. These findings indicate that the dental programs of health departments are wider in scope than are those of other official agencies, and that the health department policy benefits more children than does the plan pursued by health units under the control of other governmental bodies. As a matter of fact, more children were given fillings and extractions by dental personnel of nonofficial health organizations than by those connected with official agencies other than health departments.

TABLE 6.—*Number of children per 1,000 school population [1] who received selected kinds of dental service from specified types of health agencies*

Type of health agency	Children per 1,000 school population who received selected kinds of dental service				
	Examinations	Prophylaxis	Fillings	Extractions	Other
All agencies	323	56	94	83	47
Health departments	118	32	58	54	35
Other official agencies	125	13	13	11	4
Nonofficial agencies	80	11	23	18	8

[1] See text, footnote 4.

SUMMARY

In slightly over three-fourths of the 94 counties surveyed for purposes of the Health Facilities Study of the National Health Inventory, some sort of public dental program is sponsored by one or more official or nonofficial health agencies. Counties without any definite dental program are largely rural. Agencies supplying dental service in the 72 counties number 390; of these, 100 are health departments, 169 are other official agencies, and 121 are voluntary health organizations. Both dentists and dental hygienists contribute to the service rendered. Great variation characterizes programs sponsored by different health agencies. Some organizations provide only examination, while others perform some of the corrective work indicated. Health units in the departments of education allocate a larger proportion of their total health budget to dental service than do either health departments or nonofficial agencies.

During the period of 1 year covered by this study a total of nearly 5 million individual dental services was rendered to school children in the surveyed areas. This aggregate volume includes examinations, prophylaxis, fillings, extractions, and a scattered number of orthodontic, gum, and root-canal treatments. It is estimated that health agencies provide between two-fifths and one-half of all dental services received by children of school age, but that this record of service represents only a small fraction of the total need for dental care. Public health organizations do proportionately more toward meeting the need for extractions than for fillings or prophylaxis. Consequently, their programs might be described as being of an emergency nature rather than as corrective or preventive in character. Urbanization of an area fosters development of dental activities, for relatively three times as many services were rendered in counties with 500,000 or more inhabitants as in localities having less than 40,000 population. Likewise, a higher proportion of estimated need is met in populous counties than in those which are sparsely settled.

More dental service was reported by health departments than by all other official agencies and nonofficial agencies combined. Furthermore, health departments offer a greater variety of service; 70 percent of their performance was preventive or remedial in character, whereas this type of work constituted only a little over one-fourth of the services rendered by other official groups. Dental programs of nonofficial health organizations provide for somewhat more diversified services than do those of other official agencies, but are less varied than the dental projects of health departments.

Association of reported services with proportion of the total school population who received the various kinds of dental attention leads to the conclusion that official agencies other than the health department

are responsible for the examination of relatively more children than are health agencies of any other type. At the same time, proportionately more children were given actual care by the dental personnel of health departments than by corresponding workers either of other official or of voluntary agencies. Of the two latter classes, nonofficial organizations provided treatment for more children than did health units controlled by school authorities. The number of children per population unit who received any type of dental service considered is larger for densely populated counties than for rural communities.

THE SOLUBILITY OF LEAD ARSENATE IN BODY FLUIDS

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The widespread use of lead arsenate as an insecticide has encouraged further study of certain of its properties. Exposure to lead arsenate varies in form from the inhalation of lead arsenate dust by workers in plants engaged in the manufacture of lead arsenate insecticide (*1*) or in the spraying of fruit trees, to the ingestion of lead arsenate by the consumer of sprayed foodstuffs. The type of lead arsenate of greatest commercial importance is the dilead orthoarsenate $PbHAsO_4$. Little has been known with regard to what occurs after the arsenate enters the human body. In spite of its insolubility in water, it does not pass through the alimentary canal unchanged, but, as has been recently shown (*2*), is more or less completely broken down in the body, since for the most part the arsenic is excreted by the kidneys and the lead through the gastrointestinal tract. The inhaled lead arsenate carried into the lungs and deposited there is exposed to a different sort of solvent action from that in the alimentary tract. The arsenate deposited in the lungs comes into contact with tissue fluid, which is probably best approximated in composition by blood serum. Furthermore, it has recently been shown (*3*) that, while the intraperitoneal injection of lead or its ordinary compounds is not immediately attended by any serious consequences, lead arsenate so injected produces a marked toxic effect. The following investigation was concerned with the determination of the solvent action of certain fluid media with which the arsenate comes into contact in the body through inhalation or ingestion.

EXPERIMENTAL PROCEDURE

The initial experiments consisted in shaking an excess of the solid lead arsenate with the solvent in bottles in a thermostat at 25° C. The equilibrium mixture, after settling, was filtered in a Zsigmondy

membrane high-pressure ultrafilter, using two No. 600 cellophane disks which gave a filtrate practically protein free. The filtrates were analyzed for arsenic and for lead.

It was soon apparent that, while the filtrates from lead arsenate-water mixtures contained only traces of either arsenic or lead, the serum-lead arsenate filtrates contained a considerable amount of arsenic, while the amount of soluble lead did not differ greatly from those cases where water alone was used as solvent. Furthermore, it was found that the amount of soluble arsenic differed with different amounts of lead arsenate (solid). It reached a maximum with increasing amounts of the latter and then diminished. Therefore, it was apparent that, while lead arsenate itself is very slightly soluble, the arsenic undergoes change in contact with serum.

When serum was added to water in increasing amount with a fixed amount of solid lead arsenate, an increasing quantity of arsenic dissolved, reaching a maximum with a 100-percent serum-lead arsenate mixture. An artificial serum containing the salts of normal serum and egg albumin gave results similar to those of normal serum, although somewhat lower. Finally, isotonic sodium chloride solution also gave filtrates containing soluble arsenic.

These results show that a transformation occurs, the soluble arsenic being split off while the lead portion of the molecule is not affected. The simplest explanation of this change is that serum and similarly allied media promote the transformation of dilead ortho-arsenate to trilead orthoarsenate, as follows:

$$3\ PbH\ (AsO_4) \rightleftharpoons Pb_3(AsO_4)_2 + H_3AsO_4.$$

McDonnell and Graham (*4*), however, found that dilead arsenate is slowly decomposed by water (over a period of months), with the formation of a basic lead arsenate (hydroxymimetite), $Pb_4(PbOH)(AsO_4)_3.H_2O$, and free arsenic acid.

The results obtained with water alone in this investigation agree with the results obtained by McDonnell and Graham. A mixture of an excess of dilead arsenate shaken with water showed a very slow liberation of arsenic acid as follows:

Time	*Arsenic (gram per liter)*
10 days	0.0067
49 days	.0068
348 days	.035

With serum or with sodium chloride, decomposition proceeds much more rapidly, so that the chemical change is completed in a few days. When serum was shaken for several months with dilead arsenate, no further change was apparent than had occurred in a shorter period of time (table 1).

TABLE 1.—*Solvent effect of serum upon lead arsenate*

Time	Lead arsenate (solid) (grams)	Serum (cc.)	Soluble arsenic (grams As/liter at 25° C.)
2 hours	3	200	0.059
4 days	3	200	.458
48 days	3	200	1.02
54 days	3	200	1.08
55 days	3	200	.99

The addition of serum to distilled water in increasing amounts showed that the amount of soluble arsenic split off is proportional to the amount of serum present. When 1-gram amounts of solid lead arsenate were shaken for 10 days with 200 cc. of serum-water mixtures at 25° C. increasing amounts of dissolved arsenate were found (table 2).

TABLE 2.—*Solvent effect of serum-water mixtures upon lead arsenate*

Volume percent of serum	Lead dissolved (grams Pb/liter)	Soluble arsenic (grams As/liter)	Volume percent of serum	Lead dissolved (grams Pb/liter)	Soluble arsenic (grams As/liter)
0	0.00006	0.0067	10.0	0.00007	0.209
0.5		.010	25.0	.00031	.242
1.0	.00051	.014	37.5	.00021	.304
2.5	.00014	.049	50.0	.00030	.418
5.0	.00002	.150			

Further experiments were made to determine whether the increased amount of dissolved arsenic was due to partial reduction to arsenite, but analyses of the filtrates showed only a negligible amount of arsenite to be present.

A study of other factors, such as protein content, slight shifts in hydrogen ion concentration, and variation in salt content, showed that sodium chloride solution had as pronounced a solvent action as serum. The amount of dissolved arsenate rose to a maximum with increasing amounts of solid lead arsenate and then markedly diminished (table 3). The mixtures in each case were shaken to equilibrium.

TABLE 3.—*Solvent effect of isotonic sodium chloride solution upon lead arsenate*

Isotonic sodium chloride (cc.)	Lead arsenate (solid) (grams)	Lead dissolved (grams Pb/liter)	Dissolved arsenate (grams As/liter)
200	0.1	0.0024	0.06
200	1.0	.0017	.47
200	5.0	.0023	1.02
200	7.0	.0020	.64
200	10.0		.38
200	20.0	.0030	.11

While lead arsenate is not dissolved to a greater extent in isotonic sodium chloride solution than in serum, with increasing amounts of sodium chloride both the dissolved arsenic and dissolved lead are increased. In other words, in addition to the soluble arsenate split from the molecule of lead arsenate there is a pronounced solvent action upon the lead arsenate itself with an increasing concentration of sodium chloride, which is probably due to interionic action (table 4).

TABLE 4.—*The solvent effect of sodium chloride upon lead arsenate at 25° C.*

Sodium chloride concentration (percent)	Lead arsenate (solid) (grams)	Lead dissolved (grams Pb/liter)	Arsenate dissolved (grams As/liter)	Sodium chloride concentration (percent)	Lead arsenate (solid) (grams)	Lead dissolved (grams Pb/liter)	Arsenate dissolved (grams As/liter)
0	3	0.00088	0.0068	5	3	0.0266	0.94
1	3	.0068	1.06	10	3	.0414	1.43
2	3	.0104	1.74	25	3	.836	1.58

These results indicate that, while the amount of soluble arsenate split off remains at nearly a constant figure, there is a pronounced increase in the amount of lead in solution.

A somewhat similar, although less pronounced, effect is noted when dilead orthoarsenate is shaken with solutions of potassium nitrate. Values obtained in this case were as follows:

Potassium nitrate solution (percent)	*Dissolved lead (Grams Pb/liter of filtrate)*	*Dissolved arsenic (Grams As/liter of filtrate)*
1.25	0.0035	0.050
10.0	.0194	.060
25.0	.0393	.050

With increasing concentrations of potassium nitrate, an increasing amount of lead arsenate is dissolved, but the amount of dissolved arsenate is less than with sodium chloride. There is, therefore, less evidence of a chemical change than of solubility with potassium nitrate.

The effect of high concentrations of sodium chloride is of less interest, whether the effect is that of interionic action or not, than the splitting off of the soluble arsenate that occurs with either serum or isotonic sodium chloride solution alone. The fact that lead is not carried into solution proportionately to the arsenic in the latter case indicates that this is not true solution, but is evidence of the occurrence of a chemical reaction between the dilead arsenate and one of the constituents of the solution (sodium chloride). Verification of this was obtained by analysis of the solid phase after equilibrium was attained (table 5).

TABLE 5.—*Variation of the molecular ratio PbO/As_2O_5 with the composition of the equilibrium mixture*

Composition of the equilibrium mixture/100 cc.	Analysis of solid phase		Molecular ratio PbO/As_2O_5
	PbO (percent)	As_2O_5 (percent)	
ISOTONIC SODIUM CHLORIDE SOLUTION			
Isotonic NaCl: 1 gm. $PbHAsO_4$	74.93	23.39	3.20
Isotonic NaCl: 3 gm. $PbHAsO_4$	73.89	23.64	3.12
Isotonic NaCl: 5 gm. $PbHAsO_4$	69.47	28.08	2.47
Isotonic NaCl: 7 gm. $PbHAsO_4$	66.99	30.60	2.19
Isotonic NaCl: 10 gm. $PbHAsO_4$	65.61	30.55	2.14
Isotonic NaCl: 20 gm. $PbHAsO_4$	64.38	32.10	2.01
SERUM			
Serum: 1 gm. $PbHAsO_4$	[1] 72.65	21.75	3.34
Serum: 2 gm. $PbHAsO_4$	[1] 73.40	21.59	3.39
Serum: 3 gm. $PbHAsO_4$	68.99	21.64	3.18
Serum: 5 gm. $PbHAsO_4$	68.59	24.26	2.82
Serum: 10 gm. $PbHAsO_4$	66.10	27.27	2.42
Serum: 20 gm. $PbHAsO_4$	64.58	31.44	2.05
THEORETICAL COMPOSITION			
$PbHAsO_4$	64.38	33.12	1.94
$Pb_4(PbCl)(AsO_4)_3$	74.97	23.18	3.23

[1] Solid residues could not be freed from protein entirely.

It is apparent from these results that, while the molecular ratio of lead oxide to arsenic pentoxide approaches that of pure dilead orthoarsenate (1.94), with increasing quantities in the serum-arsenate or isotonic sodium chloride-arsenate mixture, as might be expected, the value of the ratio approaches a larger figure as the amount of solid phase becomes smaller. In other words, a small amount of dilead orthoarsenate is converted into another compound. This compound was found to have the crystalline structure and chemical composition of pentalead chlorarsenate, $Pb_4(PbCl)(AsO_4)_3$, first prepared by the wet method at ordinary temperatures by McDonnell and Smith (*5*).

Analysis of the solid phases when 1-gm. samples of dilead orthoarsenate were shaken with isotonic sodium chloride solution to equilibrium, as shown in table 5, gave a composition which compares favorably with that for pentalead chlorarsenate:

	Composition found (percent)	Theoretical composition of pentalead chlorarsenate $Pb_4(PbCl)(AsO_4)_3$ (percent)
PbO	74.93	74.97
As_2O_5	23.39	23.18
Cl	2.38	2.38
	100.70	100.53
O, equivalent to Cl	.53	.53
	100.17	100.00

In table 5 it will be noted that the molecular ratio PbO/As_2O_5 increases from its initial value of 1.94 as the amount of solid is diminished in the equilibrium mixture, both in the case of serum and of isotonic sodium chloride, and approaches the theoretical value (3.23) for pentalead chlorarsenate. The maximum molecular ratios with 1 gram samples in the two latter cases were 3.39 and 3.20, respectively. The value 3.39 is high, owing to analytical difficulties arising from the presence of protein. Numerous small crystals with parallel extinction and structurally resembling pentalead chlorarsenate were present in the residues.

It would appear from the foregoing experiments that dilead orthoarsenate in contact with body fluids of normal saline content is converted in the following manner:

$$5PbHAsO_4+NaCl\rightleftharpoons Pb_4(PbCl)(AsO_4)_3+NaH_2AsO_4+H_3AsO_4$$

In other words, two-fifths of the arsenic acid is split from the molecule and remains in solution as soluble arsenate, leaving a residue of the insoluble chloro derivative.

The solubility of lead arsenate in other body fluids is more marked in the case of saliva and of gastric juice than in the case of bile (table 6). The latter did not tend to split off soluble arsenate to the extent that serum itself did. Saliva, however, appears to dissolve about five times as much lead arsenate as serum does. The solvent effect of gastric juice is more marked than that of any of the other media that were investigated. An artificial gastric juice prepared from freshly killed hog stomach digested with 0.4 percent of hydrochloric acid dissolved lead arsenate to the extent of 0.747 gram per liter at 25° C., while 0.4 percent of hydrochloric acid dissolved a maximum of 0.790 gram at the same temperature. These values compare favorably with results obtained by Carlson and Woelfel (*6*) with human gastric juice. Carlson's results, when recalculated in terms of solubility of lead arsenate per liter of solution at 38° C., give a value of 0.520 gram. The free acidity of the gastric juice in Carlson's experiments varied from 0.42 percent to 0.47 percent.

The results obtained with gastric juice differ from those obtained with serum in that lead arsenate tends to dissolve as an entity in the former, whereas with serum a portion (nearly one-third) of the arsenic passes into solution as soluble arsenates while the lead remains fixed in the insoluble complex pentalead chlorarsenate.

It may be because of this fixation of lead that workers inhaling lead arsenate spray and mist do not have the rapid absorption of lead that occurs following exposure to lead monoxide and lead carbonate. Certainly the incidence of lead poisoning among sprayers is not high.

TABLE 6.—*The solubility of dilead orthoarsenate in various media at 25° C.*

Medium	Dissolved arsenates (grams As_2O_5 per liter)	Solubility of $PbHAsO_4$ based upon the amount of dissolved lead (grams $PbHAsO_4$ per liter)
Water	0.0537	0.00022
Serum:		
Human	.7025	.00072
Dog	.9586	.00050
Horse	.8436	.00034
Cow	.9847	.00034
Bile	.2569	.00042
Artificial serum	2.300	.00190
Saliva	.7290	.00246
Isotonic sodium chloride	1.733	.00450
Artificial gastric juice	.2653	.7470
0.4 percent hydrochloric acid	.6253	.790

The pronounced solubility of dilead orthoarsenate in gastric juice, on the other hand, is sufficient to account for the fact that ingested lead arsenate is so broken down that its components may be absorbed in passing through the gastrointestinal tract. The actual mechanism of absorption of the lead and arsenic components in the alimentary canal is a problem that still awaits solution.

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BREAST CANCER AND THE PEDIGREE RELATIONSHIP OF FOSTERED A STOCK MICE [1]

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The A strain of mice has been inbred since 1918 (Strong (*11*)) and representatives of the fifty-seventh generation have been obtained.

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The subline used in these investigations had a breast-tumor incidence of 83.6 percent in breeding females (11.1 months) and 4.9 percent in virgin females (18.5 months) (*6*). The numbers of mice observed were 1,093 and 223, respectively. Primary lung carcinoma developed in 89.2 percent of the virgin females, in 74.4 percent of the males used as breeders, and in 7.8 percent of the breeding females. Thus, the A stock breast or mammary cancer incidence is high in multiparous females and low in nonbreeding females.

In other publications we have reported on the decrease in the breast-tumor incidence in breeding females of the A stock by fostering the young the day of birth (within 24 hours) to low breast-tumor stock females (*1–4, 7–10*). The data are tabulated in table 1. Ten fostered females, used as breeders, were observed to develop breast cancer in a group of 127 mice, or 7.9 percent. The average age at which the growths were recorded was similar to that of the control group. The progeny or descendants of the fostered mice which were nonbreast-cancerous numbered 525 and gave a breast-cancer ratio of 6.1 percent. Eighty-two of the progeny of fostered females which developed breast cancer were mated and they showed an incidence of 58.5 percent. The nonbreast-cancerous animals of each class lived, on an average, considerably longer than the control animals.

TABLE 1.—*Breast-cancer incidence in fostered A stock females, their progeny depending on the cause of death of the fostered females, and in the unfostered breeding and virgin females*

Class	Number of mice	Number with cancer	Percent with cancer	Average age (months)	
				Cancer	Noncancer
A. Fostered females	127	10	7.9	11.2	17.7
B. Progeny of noncancer fostered females	525	32	6.1	12.6	16.8
C. Progeny of cancer fostered females	82	48	58.5	11.8	17.2
D. Controls or unfostered females	1,093	914	83.6	11.1	12.5
E. Virgin females	223	11	4.9	18.5	19.2

The fostered young were permitted to nurse their A stock high tumor mothers a maximum of 24 hours before they were transferred. A few A stock young remained with their mothers for periods of 1 to 5 days before they were fostered. These data are shown in table 2. The incidence of breast tumors is comparable to that observed for the control stock.

In table 3 are listed, by litters, all the fostered females of which any of the progeny were mated. The cause of death and the age are indicated, and the number of the progeny or descendants, with their breast tumor ratios. Only 6 of the 10 fostered mice which developed mammary cancer are listed, as the others were members of litters from which no young were obtained.

TABLE 2.—*Breast tumor incidence and average ages for A stock mice fostered the day of birth or from 1 to 5 days after birth by low tumor stock females*

	Number	Percent having cancer
Fostered day of birth	127	7.9
Average cancer age	11.2 months.	
Average noncancer age	17.7 months.	
Fostered after birth (days):		
1	3	100.0
2	7	71.4
3	2	100.0
4	0	
5	3	100.0
Total	15	86.7
Average cancer age	9.8 months.	
Average noncancer age	15.2 months.	

TABLE 3.—*Fostered A stock females, by litters, with diagnosis, age at death, number of progeny and descendants, and the number and percentage which developed breast cancer*

[M. Gl.=mammary carcinoma; L. Tu.=lung carcinoma; N. T.=noncancerous; and N. A.=no autopsy for lung cancer]

Litter No.	Ledger No.	Diagnosis	Age (days)	Progeny and descendants		
				Number of mice	Number with mammary carcinoma	Percent with mammary carcinoma
1	38430	N. T	563	5	0	0
	38431	M. Gl	356	40	21	52.5
	38432	L. Tu	563	111	6	5.4
	38433	L. Tu	384	8	4	50.0
2	38713	L. Tu	551	41	0	0
	38714	M. Gl	365	2	0	0
	38715	L. Tu	551	11	1	9.1
3	51232	N. T	583	0		
	51233	N. T	195	9	0	0
	51234	N. T	544	0		
	51235	M. Gl	216	0		
4	51239	N. A	344	0		
	51241	M. Gl	383	33	21	63.6
	51242	L. Tu	483	0		
	51243	L. Tu	579	0		
	51244	N. T	579	0		
	51245	L. Tu	579	0		
	51246	N. T	532	3	0	0
5	51249	N. A	464	21	0	0
	51250	L. Tu	532	0		
	51251	N. T	593	2	0	0
	51252	N. T	506	2	0	0
	51253	L. Tu	593	34	1	2.9
	51255	N. T	399	0		
	51256	N. T	623	0		
6	51259	L. Tu	424	34	2	5.9
	51260	L. Tu	468	14	0	0
	51261	L. Tu	663	0		
	51262	L. Tu	475	0		
7	51267	L. Tu	475	5	0	0
	51268	L. Tu	585	14	1	7.1
	51269	N. T	597	1	0	0
	51270	L. Tu	585	24	0	0
	51271	L. Tu	585	4	0	0
	51272	L. Tu	502	0		
8	51428	N. A	716	0		
	51429	N. T	521	0		
	51431	L. Tu	609	7	1	14.3

TABLE 3.—*Fostered A stock females, by litters, with diagnosis, age at death, number of progeny and descendants, and the number and percentage which developed breast cancer*—Continued

Litter No.	Ledger No.	Diagnosis	Age (days)	Progeny and descendants		
				Number of mice	Number with mammary carcinoma	Percent with mammary carcinoma
9	51456	N. T.	433	0		
	51457	N. T.	432	0		
	51458	N. T.	577	2	0	0
	51459	L. Tu.	551	2	0	0
	51460	N. T.	433	0		
	51461	N. T.	384	1	0	0
	51462	N. T.	383	4	1	25.0
10	51613	L. Tu.	525	0		
	51614	N. T.	349	12	2	16.7
	51615	L. Tu.	578	0		
	51616	L. Tu.	578	11	1	9.1
11	55871	N. A.	402	8	0	0
	55872	N. A.	661	1	0	0
	55873	L. Tu.	612	0		
	55874	N. A.	402	5	0	0
	55875	N. A.	402	3	0	0
12	56127	L. Tu.	518	0		
	56128	L. Tu.	678	0		
	56129	N. T.	442	0		
	56130	L. Tu.	678	3	0	0
	56131	N. T.	512	8	0	0
	56132	N. A.	631	0		
13	56282	N. A.	371	0		
	56283	N. A.	520	1	0	0
	56284	N. T.	352	0		
	56285	L. Tu.	362	0		
	56286	L. Tu.	391	8	1	12.5
14	56319	L. Tu.	464	0		
	56320	L. Tu.	464	4	0	0
	56321	L. Tu.	464	2	0	0
	56322	L. Tu.	464	4	0	0
	56323	N. T.	464	1	0	0
15	56398	N. A.	440	1	0	0
	56399	M. Gl.	293	0		
	56401	M. Gl.	447	1	0	0
	56402	N. T.	447	8	5	62.5
	56403	L. Tu.	428	10	6	60.0
16	56615	N. A.	458	4	0	0
	56616	N. A.	458	3	0	0
	56617	N. A.	458	8	0	0
	56618	N. A.	458	0		
	56619	N. A.	458	0		
17	56623	L. Tu.	662	0		
	56624	N. A.	662	3	0	0
	56625	L. Tu.	662	2	0	0
	56626	N. A.	367	0		
	56627	L. Tu.	587	3	0	0
18	56631	N. A.	518	0		
	56632	M. Gl.	269	3	3	100.0
19	56637	N. A.	653	0		
	56638	N. T.	498	4	0	0
20	56645	N. T.	677	0		
	56646	N. T.	332	3	0	0
	56647	N. T.	606	5	0	0
	56648	N. T.	465	3	0	0
21	56652	N. A.	500	5	0	0
	56653	N. A.	573	0		
22	57119	L. Tu.	581	3	0	0
	57120	L. Tu.	581	6	0	0
23	57124	L. Tu.	555	4	0	0
	57125	N. T.	580	2	0	0
24	57243	N. A.	570	3	0	0
25	57253	N. A.	618	0		
	57254	N. T.	486	2	0	0
26	57350	L. Tu.	612	0		
	57351	M. Gl.	229	3	3	100.0
27	57762	L. Tu.	573	3	0	0
	57763	L. Tu.	573	1	0	0
	57764	L. Tu.	621	2	0	0
	57765	L. Tu.	595	0		
28	57771	L. Tu.	595	0		
	57772	N. T.	514	2	0	0
	57773	N. A.	522	0		
	57774	N. A.	522	5	0	0

It will be noted that three nonbreast-cancer fostered females had young which showed a high breast-tumor ratio. These mice were from litters in which one or more breast-cancerous individuals were observed, as shown in table 4. All lived beyond the average breast-cancer age. As stated above, the breast-tumor ratio observed in the descendants of breast-cancer fostered females was 58.5 percent. The three nonbreast-cancer females had progeny which had a breast-cancer incidence of 57.7 percent.

TABLE 4.—*Breast-tumor incidence for the progeny of (A) breast-cancerous fostered females; and (B) nonbreast-cancerous fostered females transmitting this type of susceptibility. The incidence for the progeny of litter mates is also given*

(A) MAMMARY CANCER FOSTERED "A" MICE

[M. Gl.=mammary carcinoma; L. Tu.=lung carcinoma; N. T.=noncancerous; N. A.=no autopsy]

No.	Diagnosis	Age (days)	Descendants		Descendants of litter mates		Litter mates		
			Number	Percent with cancer	Number	Percent with cancer	No	Diagnosis	Age (days)
57351	M. Gl.	229	3	100.0	0				
56632	M. Gl.	269	3	100.0	0				
*38431	M. Gl.	356	40	52.5	5	0	*38430	N. T.	563
					111	5.4	*38432	L. Tu.	563
					8	50.0	*38433	L. Tu.	384
38714	M. Gl.	365	2	0	52	1.9			
51241	M. Gl.	383	33	63.6	3	0			
*56401	M. Gl.	447	1	0	1	0	*56398	N. A.	440
					8	50.0	*56402	N. T.	447
					10	60.0	*56403	L. Tu.	428
	Total		82	58.5					

(B) NONMAMMARY CANCER FOSTERED "A" MICE

*38433	L. Tu.	384	8	50.0	5	0	*38430	N. T.	563
					40	52.5	*38431	M. Gl.	356
					111	5.4	*38432	L. Tu.	563
*56402	N. T.	447	8	62.5	1	0	*56398	N. A.	440
					1	0	*56401	M. Gl.	447
*56403	L. Tu.	428	10	60.0					
	Total		26	57.7					

*Litter mates.

If one female of a litter developed mammary carcinoma and transmitted the influence, not all of her litter mates did likewise. Litter No. 1 (tables 3 and 4) is an example. Female No. 38431 developed breast cancer and 52.5 percent of her descendants showed similar growths. Her sister, No. 38433, had lung carcinoma, and yet 50 percent of her progeny had breast cancer. Two other litter mates were nonbreast-cancerous and of their 116 descendants only 5 percent had mammary carcinoma.

While the incidence of breast cancer among the descendants of the breast-cancerous and the 3 nonbreast-cancerous fostered females is higher than was observed for the other classes of fostered animals, it is lower than was recorded in the control stock. In the first generation the progeny of the cancerous females showed an incidence of 80 percent (table 5). The ratio decreased with each succeeding generation and the fourth generation mice gave a ratio of 36.8 percent for the 19 animals observed. The progeny of the 3 noncancerous females gave similar results for the number of mice continued.

TABLE 5.—*Progeny and descendants of fostered mothers developing breast cancer and nonbreast-cancerous fostered females*

[M. Gl.=mammary carcinoma; N. T.=noncancerous; L. Tu.=lung carcinoma]

	Diagnosis and age (days)	1st generation		2d generation		3d generation		4th +	
		Cancer	N.T.	Cancer	N.T.	Cancer	N.T.	Cancer	N.T.
Fostered breast-cancer mothers:									
No. 57351	M. Gl. 229	3	0						
No. 56632	M. Gl. 269	3	0						
No. 38431	M. Gl. 356	10	1	0	2	4	4	7	12
No. 38714	M. Gl. 365	0	2						
No. 51241	M. Gl. 383	4	1	9	3	8	8		
No. 56401	M. Gl. 447	0	1						
Total		20	5	9	5	12	12	7	12
Percent with breast cancer		80.0		64.3		50.0		36.8	
Nonbreast-cancer fostered females:									
No. 38433	L. Tu. 384	3	2	1	2				
No. 56402	N. T. 447	5	3						
No. 56403	L. Tu. 428	4	3	2	1				
Total		12	8	3	3				
Percent with breast cancer		60.0		50.0					

If any of the descendants of a tested nonbreast-cancerous fostered female develops breast cancer, do the progeny of this breast-cancerous female show a high breast-cancer ratio? Observations bearing on this point are tabulated in table 6. Five tested noncancerous fostered females are listed which had 201 descendants having a cancer ratio of 5.5 percent. Seven of their descendants had breast cancer and 3 had progeny which were mated. The 19 progeny showed an incidence of 5.3 percent. Ninety-nine descendents of litter mates of these 7 cancerous females were tested and 4.0 percent of the individuals had breast cancer.

TABLE 6.—*Progeny and descendants of nonbreast-cancerous fostered A stock mothers having breast-cancerous progeny and the incidence for the progeny of the fostered females, their breast-cancerous descendants, litter mates of the latter, and for fostered females which developed breast cancer*

[M. Gl.=mammary carcinoma; L. Tu.=lung carcinoma]

Fostered A females			Descendants		M. Gl. descendants			Progeny of M. Gl. descendants		Progeny of litter mates of M. Gl. descendants	
No.	Diagnosis	Age (days)	Number	Percent with cancer	No.	Diagnosis	Age (days)	Number	Percent with cancer	Number	Percent with cancer
38432	L. Tu	563	111	5.4	48612	M. Gl	390	15	6.7	59	7.0
					53968	M. Gl	337	2	0	4	0
					51753	M. Gl	210	0		18	0
38715	L. Tu	551	11	9.1	48588	M. Gl	303	0		6	0
51253	L. Tu	593	34	2.9	55573	M. Gl	214	0		5	0
51259	L. Tu	424	34	5.9	56517	M. Gl	357	0		2	0
51616	L. Tu	578	11	9.1	53646	M. Gl	305	2	0	5	0
	Total		201	5.5				19	5.3	99	4.0
Progeny of fostered breast-cancerous females								82	58.5		

Ten A fostered mothers are listed in table 7. Six of the 10 nursed progeny, numbering 29 mice, which were mated and no breast tumors resulted. Twenty-seven female progeny of these females were nursed by A high breast-tumor stock females and 88.9 percent of these mice developed mammary carcinoma.

TABLE 7.—*Breast-tumor incidence for the progeny and descendants of fostered A stock females which were nursed by the fostered females or by high cancer stock females*

[L. Tu.=lung carcinoma; N. T.=noncancerous; N. A.=no autopsy for lung carcinoma]

Fostered A mothers			Descendants nursed by fostered females		Descendants nursed by high cancer stock females	
No.	Diagnosis	Age (days)	Number	Percent with cancer	Number	Percent with cancer
56130	L. Tu	678	3	0	2	100.0
56131	N. T	512	8	0	2	100.0
56616	N. A	458	3	0	6	100.0
56637	N. A	653	0		3	33.3
56638	N. T	498	4	0	2	100.0
57120	L. Tu	581	6	0	2	100.0
57504	L. Tu	713	0		4	75.0
57774	N. A	522	5	0	4	100.0
57938	N. T	515	0		1	100.0
57955	L. Tu	502	0		1	100.0
	Total		29	0	27	88.9

DISCUSSION

If the cancerous transformation of mammary tissue of A stock breeding females is dependent on the action of three "influences" (*8, 9*), young nursed by low tumor strain females might lack only the

"influence" which apparently is carried in the milk of cancerous stock females. All mice of the inbred A strain should be homozygous for breast-cancer susceptibility and the hormonal stimulation of parity was probably also the same for breeding females of the control and fostered groups.

Young born to A stock high cancer mothers which were permitted to nurse for more than 24 hours before they were transferred showed no reduction in the observed breast-tumor ratio (table 2). As a significant decrease in the tumor incidence was noted for young which nursed their high tumor mothers for less than 24 hours, the time element between birth and the transfer of the young is very important. Evidently only a very small amount of the milk "influence" must be procured from the high breast-cancer stock mothers to initiate the development of breast cancer when the other influences are also present. As the nipples were not sealed, milk was available to the young before they were fostered, and 7.9 percent of the fostered females developed breast cancer. A sufficient number of the progeny of 4 of the 10 breast-cancer females which had been fostered were mated for testing purposes and gave observations which indicated that they had the "breast-cancer producing influence" in their milk, for a considerable percentage of their progeny showed breast cancer. Three litter mates of the tested breast-cancerous fostered females which died nonbreast-cancerous also behaved as cancerous parents. The first generation progeny of these mice had a breast-tumor ratio characteristic of the control A stock. The incidence decreased with each succeeding generation. In this respect the cancerous fostered females differed markedly from the cancerous and noncancerous females of the control line where the progeny showed a high breast-tumor ratio regardless of the diagnosis of the mother (*5*).

One or more of the progeny from 59 nonbreast-cancerous fostered females were continued. The incidence among their descendants was 6.1 percent (525 mice, table 1). If the animals descended from the 3 females which transmitted the breast-cancer tendency but which did not develop breast cancer are omitted, the percentage for the remaining 499 breeding animals was 3.4 percent, which was slightly less than was observed for the virgin females of the A stock (4.9 percent).

If breast cancer is observed in the progeny of the tested nonbreast-cancer females it is not transmitted. The percentages are 5.3 for the progeny of the cancerous mice and 4.0 for the progeny of their litter mates (table 6). Such growths apparently are not dependent on the presence of the milk influence, are not transmitted, and may have a different etiology than do breast carcinomata which are inherited.

If the young of noncancerous fostered A stock mice are given to control A stock females to be nursed the incidence observed in such a group is very high (table 7). These young differed from their mothers only in the source of the milk which they obtained while nursing; the mothers and the progeny which they suckled showed a low incidence; the young which were transferred to control A stock females showed a high breast-tumor ratio which was equal to that observed in the control stock.

SUMMARY

A study of the pedigree of the A stock fostered females indicates that:

1. The percentage of fostered females developing breast cancer is dependent largely upon the length of time they are permitted to nurse their high tumor stock mothers before they are transferred to low tumor stock females.

2. The progeny of breast-cancerous fostered females have a higher breast-cancer ratio than do the progeny of tested nonbreast-cancer mothers.

3. The incidence of breast cancer in the progeny of breast-cancerous fostered females decreases with each succeeding generation.

4. The progeny of tested nonbreast-cancerous fostered females show a low cancer ratio.

5. When breast cancer developed in the progeny of tested nonbreast-cancerous fostered females it was not transmitted.

6. The progeny of tested nonbreast-cancerous fostered females which were nursed by high breast-tumor stock females showed a high breast-cancer ratio.

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DEATHS DURING WEEK ENDED AUGUST 19, 1939

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

	Week ended Aug. 19, 1939	Corresponding week, 1938
Data from 88 large cities of the United States:		
Total deaths	7,239	7,573
Average for 3 prior years	[1] 7,440	
Total deaths, first 33 weeks of year	280,219	273,443
Deaths under 1 year of age	478	534
Average for 3 prior years	[1] 514	
Deaths under 1 year of age, first 33 weeks of year	16,752	17,530
Data from industrial insurance companies:		
Policies in force	66,825,741	68,423,734
Number of death claims	10,794	10,854
Death claims per 1,000 policies in force, annual rate	8.4	8.3
Death claims per 1,000 policies, first 33 weeks of year, annual rate	10.5	9.4

[1] Data for 86 cities.

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.

In these and the following tables, a zero (0) indicates a positive report and has the same significance as any other figure, while leaders (----) represent no report, with the implication that cases or deaths may have occurred but were not reported to the State health officer.

Cases of certain diseases reported by telegraph by State health officers for the week ended Aug. 26, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median

Division and State	Diphtheria				Influenza				Measles			
	Aug. 26, 1939, rate	Aug. 26, 1939, cases	Aug. 27, 1938, cases	1934–38, median	Aug. 26, 1939, rate	Aug. 26, 1939, cases	Aug. 27, 1938, cases	1934–38, median	Aug. 26, 1939, rate	Aug. 26, 1939, cases	Aug. 27, 1938, cases	1934–38 median
NEW ENG.												
Maine	0	0	3	1	----	----	----	----	36	6	----	7
New Hampshire	0	0	0	0	----	----	----	----	0	0	----	0
Vermont	0	0	0	0	----	----	----	----	214	16	2	7
Massachusetts	5	4	2	2	----	----	----	----	39	33	36	21
Rhode Island	0	0	0	0	----	----	----	----	84	11	4	3
Connecticut	0	0	0	1	----	----	3	----	27	9	4	8
MID. ATL.												
New York	3	8	9	11	[1]1	[1]2	[1]3	[1]2	26	64	93	93
New Jersey	0	0	8	8	2	2	8	6	12	10	12	32
Pennsylvania	7	13	15	20	----	----	----	----	14	28	35	39
E. NO. CEN.												
Ohio	6	8	13	13	2	2	----	2	11	14	20	17
Indiana	7	5	9	10	4	3	5	7	4	3	5	5
Illinois	10	15	14	15	3	4	3	4	8	12	36	36
Michigan [2]	14	13	6	6	1	1	1	----	0	0	39	24
Wisconsin	7	4	1	1	51	29	15	15	42	24	39	39
W. NO. CEN.												
Minnesota	6	3	6	1	2	1	2	----	45	23	18	2
Iowa	4	2	2	2	----	----	----	----	16	8	10	3
Missouri	12	9	3	6	1	1	23	8	1	1	2	6
North Dakota	15	2	2	2	----	----	1	----	7	1	6	3
South Dakota	30	4	0	0	----	----	----	----	8	1	----	0
Nebraska	8	2	1	2	----	----	----	----	4	1	4	3
Kansas	8	3	2	3	3	1	----	----	31	11	9	5

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended Aug. 26, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Diphtheria				Influenza				Measles			
	Aug. 26, 1939, rate	Aug. 26, 1939, cases	Aug. 27, 1938, cases	1934–38, median	Aug. 26, 1939, rate	Aug. 26, 1939, cases	Aug. 27, 1938, cases	1934–38, median	Aug. 26, 1939, rate	Aug. 26, 1939, cases	Aug. 27, 1938, cases	1934–38 median
SO. ATL.												
Delaware	0	0	1	0	----	----	----	----	39	2	----	0
Maryland [2]	0	0	1	4	----	----	2	2	9	3	10	10
Dist. of Col	16	2	0	3	8	1	----	----	16	2	2	2
Virginia	34	18	23	22	39	21	----	----	9	5	15	16
West Virginia	8	3	6	10	22	8	13	13	3	1	2	5
North Carolina [2]	45	31	45	34	----	----	1	----	7	5	56	24
South Carolina [2]	25	9	35	9	391	143	112	80	11	4	27	4
Georgia [2]	66	40	35	20	2	1	----	----	3	2	----	0
Florida [2]	9	3	11	6	9	3	----	----	6	2	----	4
E. SO. CEN.												
Kentucky	30	17	9	15	5	3	6	---	3	2	3	31
Tennessee [2]	11	6	17	14	32	18	9	12	12	7	30	14
Alabama [2]	30	17	29	29	11	6	18	5	30	17	34	5
Mississippi [2 3]	48	19	15	15	----	----	----	----	----	----	----	0
W. SO. CEN.												
Arkansas	20	8	14	11	37	15	18	5	12	5	6	0
Louisiana [2]	12	5	11	11	17	7	7	7	2	1	3	3
Oklahoma	14	7	8	8	20	10	10	6	6	3	4	4
Texas [2]	19	23	41	39	30	36	98	28	13	16	15	8
MOUNTAIN												
Montana	9	1	1	1	84	9	12	----	56	6	30	4
Idaho	0	0	1	0	----	----	4	1	10	1	8	2
Wyoming	0	0	2	0	----	----	----	----	65	3	----	1
Colorado	48	10	7	4	10	2	----	----	14	3	2	4
New Mexico [2]	12	1	2	2	----	----	1	----	0	0	5	5
Arizona	74	6	0	2	184	15	18	7	37	3	3	2
Utah [2]	0	0	1	1	30	3	----	----	60	6	6	4
PACIFIC												
Washington	3	1	2	2	----	----	----	----	80	26	6	13
Oregon	15	3	0	1	5	1	10	8	45	9	5	5
California	14	17	12	19	7	8	12	11	40	49	99	49
Total	16	342	425	425	14	356	415	286	19	459	745	745
34 weeks	17	12,403	14,940	15,440	178	152,006	46,473	104,369	415	348,906	761,325	669,077

Division and State	Meningitis, meningococcus				Poliomyelitis				Scarlet fever			
	Aug. 26, 1939, rate	Aug. 26, 1939, cases	Aug. 27, 1938, cases	1934–38, median	Aug. 26, 1939, rate	Aug. 26, 1939, cases	Aug. 27, 1938, cases	1934–38, median	Aug. 26, 1939, rate	Aug. 26, 1939, cases	Aug. 27, 1938, cases	1934–38, median
NEW ENG.												
Maine	0	0	0	0	0	0	0	0	12	2	3	3
New Hampshire	0	0	0	0	0	0	0	0	0	0	----	0
Vermont	0	0	0	0	0	0	1	1	40	3	2	1
Massachusetts	0	0	0	1	2.4	2	4	4	14	12	25	34
Rhode Island	0	0	0	0	0	0	1	1	0	0	----	4
Connecticut	0	0	0	1	0	0	0	1	15	5	6	6
MID. ATL.												
New York	0.8	2	1	4	24	60	12	12	22	54	43	67
New Jersey	1.2	1	0	1	24	20	4	4	18	15	13	18
Pennsylvania	2	4	2	2	5	10	6	8	15	30	43	84

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended Aug. 26, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Meningitis, meningococcus				Poliomyelitis				Scarlet fever			
	Aug. 26, 1939, rate	Aug. 26, 1939, cases	Aug. 27, 1938, cases	1934-38, median	Aug. 26, 1939, rate	Aug. 26, 1939, cases	Aug. 27, 1938, cases	1934-38, median	Aug. 26, 1939, rate	Aug. 26, 1939, cases	Aug. 27, 1938, cases	1934-38, median
E. NO. CEN.												
Ohio	0.8	1	1	1	1.5	2	4	8	33	43	35	51
Indiana	0	0	0	0	0	0	0	1	31	21	20	22
Illinois	0.7	1	2	4	9	14	11	14	33	51	52	66
Michigan [2]	0	0	0	0	122	115	2	9	39	37	40	46
Wisconsin	0	0	5	1	11	6	8	8	69	39	24	27
W. NO. CEN.												
Minnesota	0	0	0	0	74	38	2	2	31	16	16	16
Iowa	0	0	1	2	2	1	4	2	20	10	20	16
Missouri	0	0	1	1	2.6	2	2	1	19	15	22	21
North Dakota	0	0	1	0	15	2	0	0	29	4	5	9
South Dakota	0	0	0	0	23	3	2	1	60	8	7	3
Nebraska	0	0	0	0	0	0	2	2	19	5	1	3
Kansas	2.8	1	0	1	2.8	1	0	0	53	19	18	18
SO. ATL.												
Delaware	0	0	0	0	0	0	0	0	0	0	0	0
Maryland [2]	3	1	0	0	3	1	0	0	22	7	3	13
Dist. of Col	0	0	0	1	8	1	2	2	40	5	5	5
Virginia	0	0	0	1	1.9	1	4	4	45	24	7	11
West Virginia	0	0	1	1	0	0	0	4	65	24	6	19
North Carolina [2]	1.5	1	2	1	13	9	2	2	35	24	21	16
South Carolina [2]	2.7	1	0	0	44	16	1	1	14	5	9	2
Georgia [2]	0	0	0	0	7	4	2	1	13	8	15	10
Florida [2]	0	0	0	0	6	2	0	0	6	2	3	2
E. SO. CEN.												
Kentucky	0	0	0	1	1.7	1	0	5	47	27	16	16
Tennessee [2]	0	0	1	1	4	2	2	6	28	16	12	15
Alabama [2]	1.8	1	1	1	1.8	1	1	4	46	26	9	9
Mississippi [2 3]	0	0	0	0	2.5	1	1	1	10	4	8	5
W. SO. CEN.												
Arkansas	0	0	1	0	2.5	1	1	1	22	9	5	6
Louisiana [2]	0	0	1	1	2.4	1	0	2	24	10	3	2
Oklahoma	4	2	0	0	2	1	1	1	10	5	17	9
Texas [2]	0.8	1	3	1	8	10	3	4	21	25	23	20
MOUNTAIN												
Montana	9	1	0	0	0	0	5	1	56	6	7	6
Idaho	0	0	0	0	0	0	0	0	10	1	6	5
Wyoming	0	0	0	0	0	0	0	0	65	3	3	3
Colorado	5	1	1	1	14	3	0	0	34	7	10	8
New Mexico [2]	12	1	0	1	37	3	0	0	37	3	1	2
Arizona	0	0	0	0	37	3	0	0	12	1	1	1
Utah [2]	10	1	0	0	20	2	0	1	139	14	4	5
PACIFIC												
Washington	0	0	0	0	3	1	0	2	19	6	10	10
Oregon	0	0	0	0	5	1	0	0	10	2	4	8
California	0	0	0	2	41	50	4	24	36	44	63	59
Total	0.8	21	25	51	16	391	94	289	28	697	666	843
34 weeks	1.6	1,408	2,188	4,221	8	2,539	1,027	4,054	137	117,179	137,851	165,702

For footnotes see end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended Aug 26, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Smallpox				Typhoid and paratyphoid fever				Whooping cough		
	Aug. 26, 1939, rate	Aug. 26, 1939, cases	Aug. 27, 1938, cases	1934–38, median	Aug. 26, 1939, rate	Aug. 26, 1939, cases	Aug. 27, 1938, cases	1934–38, median	Aug. 26, 1939, rate	Aug. 26, 1939, cases	Aug. 27, 1938, cases
NEW ENG.											
Maine	0	0	0	0	6	1	2	6	175	29	37
New Hampshire	0	0	0	0	0	0	0	1	0	0	0
Vermont	0	0	0	0	0	0	2	0	724	54	29
Massachusetts	0	0	0	0	5	4	4	3	112	95	94
Rhode Island	0	0	0	0	15	2	2	1	183	24	------
Connecticut	0	0	0	0	12	4	4	1	223	75	67
MID. ATL.											
New York	0	0	0	0	6	14	43	30	144	359	731
New Jersey	0	0	0	0	8	7	3	9	130	109	279
Pennsylvania	0	0	0	0	6	12	25	26	118	232	212
E. NO. CEN.											
Ohio	2	3	0	0	12	15	17	27	113	147	214
Indiana	0	0	2	1	7	5	16	11	74	50	16
Illinois	5	8	4	0	15	23	29	29	134	205	522
Michigan [2]	0	0	1	1	7	7	13	14	191	181	296
Wisconsin	5	3	0	0	16	9	1	2	262	149	341
W. NO. CEN.											
Minnesota	0	0	0	0	8	4	1	3	81	42	47
Iowa	6	3	0	1	57	28	3	4	26	13	48
Missouri	0	0	0	0	33	26	25	23	39	30	20
North Dakota	15	2	1	0	37	5	0	1	226	31	22
South Dakota	15	2	0	0	23	3	1	1	23	3	7
Nebraska	0	0	0	0	4	1	0	1	15	4	10
Kansas	6	2	1	0	17	6	11	11	70	25	72
SO. ATL.											
Delaware	0	0	0	0	0	0	0	1	59	3	3
Maryland [2]	0	0	0	0	22	7	21	20	173	56	30
District of Columbia	0	0	0	0	8	1	3	3	283	35	7
Virginia	0	0	0	0	37	20	19	20	107	57	28
West Virginia	0	0	1	0	16	6	22	22	19	7	13
North Carolina [3]	1	1	0	0	20	14	20	20	167	114	169
South Carolina [3]	0	0	0	0	19	7	14	16	49	18	70
Georgia [3]	2	1	0	0	46	28	37	30	10	6	24
Florida [3]	0	0	0	0	9	3	10	1	18	6	16
E. SO. CEN.											
Kentucky	0	0	0	0	52	30	31	56	70	40	57
Tennessee [3]	0	0	0	0	26	15	17	47	74	42	18
Alabama [3]	0	0	0	0	30	17	19	22	79	45	64
Mississippi [2 3]	0	0	0	0	38	15	8	8	------	------	------
W. SO. CEN.											
Arkansas	0	0	0	0	55	22	35	14	15	6	23
Louisiana [3]	0	0	0	0	70	29	14	23	7	3	15
Oklahoma	4	2	0	0	48	24	26	24	12	6	8
Texas [3]	0	0	2	0	23	28	46	50	49	59	101
MOUNTAIN											
Montana	0	0	2	2	9	1	2	3	19	2	70
Idaho	10	1	2	0	10	1	1	1	31	3	7
Wyoming	0	0	0	0	44	2	0	0	0	0	3
Colorado	5	1	4	0	5	1	6	6	48	10	40
New Mexico [3]	0	0	1	0	12	1	4	7	74	6	12
Arizona	12	1	1	0	61	5	7	5	736	60	17
Utah [2]	0	0	0	0	60	6	3	1	497	50	24
PACIFIC											
Washington	0	0	7	7	12	4	7	4	43	14	37
Oregon	0	0	4	1	30	6	4	4	60	12	13
California	3	4	1	1	8	10	6	11	74	90	116
Total	1	34	34	34	19	479	584	633	105	2,607	4,049
34 weeks	10	8,691	12,727	6,118	9	7,584	8,726	8,818	154	129,238	148,064

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Typhus fever, week ended Aug. 26, 1939, 122 cases as follows: North Carolina, 2; South Carolina, 10; Georgia, 46; Florida, 14; Tennessee, 2; Alabama, 18; Mississippi, 1; Louisiana, 7; Texas, 20; New Mexico, 2.

ROCKY MOUNTAIN SPOTTED FEVER

Cases reported by States, Feb. 26 to Sept. 2, 1939

State	Feb. 26 to Mar. 25	Mar. 26 to Apr. 22	Apr. 23 to May 20	May 21 to June 17	June 18 to July 15	July 16 to Aug. 12	Week ended Aug. 19	Week ended Aug. 26	Week ended Sept. 2
Eastern:									
New York				3	3	1			1
New Jersey				4	8	7	6	1	1
Pennsylvania				6	3	4		1	
Delaware				3			1		
Maryland			7	13	11	23	2	6	3
District of Columbia			2	2	2	3	1	1	
Virginia			1	13	10	11	2	1	2
West Virginia						1			
North Carolina				3	13	13	3	2	
Georgia					1	1			
Central:									
Ohio				3	2	4		3	
Indiana				2	1	3	2	1	
Illinois			1	1	5	7	1		
Kentucky							3	2	
Tennessee					5	5	4	2	1
Iowa			1	10	9	6	1		
Missouri				1		4	1	1	1
Western:									
Montana	[1] 2	2	8	5	1	2			1
Idaho		4	7	4	5				
Wyoming		3	14	16	5	5			
Colorado		2	3	9	4				
Utah		2	5	5	6	2			
Washington		2	3	2					
Oregon		9	16	7	2	1			

[1] 1 other case was reported in Montana as occurring in February, exact date not given.

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	Meningitis, meningococcus	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid and paratyphoid fever
July 1939										
Nebraska	1	6			30		4	18	11	0
Nevada	0	0					0	1	0	0
Oregon	0	7	30	2	192		1	28	2	9
Washington	0	6	5		1,180		0	38	5	10

July 1939

Chickenpox:	Cases
Nebraska	7
Oregon	51
Washington	205
Dysentery:	
Oregon (amoebic)	1
Encephalitis, epidemic or lethargic:	
Oregon	1
Washington	1
Enteritis:	
Washington (under 2 yrs.)	3
Washington (over 2 yrs.)	2
German measles:	
Washington	3
Impetigo contagiosa:	Cases
Oregon	11
Washington	1
Mumps:	
Nebraska	20
Nevada	5
Oregon	69
Washington	40
Rabies in animals:	
Washington	18
Rocky Mountain spotted fever:	
Oregon	3
Scabies:	
Oregon	11
Septic sore throat:	Cases
Nebraska	1
Oregon	8
Washington	3
Trachoma:	
Oregon	4
Tularaemia:	
Nevada	3
Undulant fever:	
Oregon	1
Washington	1
Vincent's infection:	
Oregon	5
Whooping cough:	
Nebraska	120
Oregon	70
Washington	69

WEEKLY REPORTS FROM CITIES

City reports for week ended Aug. 19, 1939

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table.

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								
Data for 90 cities:											
5-year average	88	34	11	256	282	247	3	342	85	1,303	----
Current week [1]	68	45	8	173	229	157	2	315	63	1,063	----
Maine:											
Portland	0	----	0	1	0	1	0	0	0	8	26
New Hampshire:											
Concord	0	----	0	0	0	0	0	0	0	0	12
Manchester	0	----	0	0	1	0	0	0	0	0	9
Nashua	0	----	0	1	0	1	0	0	0	0	6
Vermont:											
Barre	0	----	0	0	0	0	0	0	0	6	3
Burlington	0	----	0	0	0	0	0	0	0	0	10
Rutland	0	----	0	0	0	0	0	0	0	0	13
Massachusetts:											
Boston	3	----	0	14	11	0	0	6	2	30	189
Fall River	1	----	0	0	1	0	0	1	0	7	21
Springfield	0	----	0	0	0	0	0	0	0	3	30
Worcester	0	----	0	3	3	1	0	0	0	23	47
Rhode Island:											
Pawtucket	0	----	----	0	----	0	0	----	0	0	----
Providence	0	1	0	15	0	1	0	2	0	14	46
Connecticut:											
Bridgeport	0	----	0	2	0	0	0	1	0	0	30
Hartford	0	----	0	0	1	0	0	0	0	2	29
New Haven	0	----	0	5	0	0	0	0	0	4	45
New York:											
Buffalo	0	----	0	2	5	6	0	9	0	9	115
New York	7	6	1	24	32	13	0	65	4	114	1,258
Rochester	0	2	0	3	6	1	0	0	0	7	66
Syracuse	0	----	0	0	0	0	0	1	0	41	40
New Jersey:											
Camden	0	----	0	1	0	2	0	0	0	4	24
Newark	0	----	0	0	1	1	0	5	1	32	78
Trenton	0	----	0	0	0	1	0	3	0	3	31
Pennsylvania:											
Philadelphia	1	----	0	5	13	6	0	15	6	122	426
Pittsburgh	2	2	0	0	6	0	0	11	1	23	122
Reading	2	----	0	1	0	0	0	1	0	0	20
Scranton	0	----	----	0	----	0	0	----	1	0	----
Ohio:											
Cincinnati	1	----	1	1	3	3	0	5	0	13	100
Cleveland	0	1	0	6	4	10	0	14	1	55	177
Columbus	3	----	0	2	4	2	0	0	2	7	77
Toledo	0	----	0	5	3	2	0	1	0	20	67
Indiana:											
Anderson	0	----	0	0	0	0	0	1	0	5	6
Fort Wayne	1	----	0	0	2	0	0	1	0	0	20
Indianapolis	2	----	0	3	4	3	0	4	1	37	104
Muncie	0	----	0	0	0	1	0	0	0	1	9
South Bend	0	----	0	0	0	0	0	0	0	0	11
Terre Haute	0	----	0	0	0	0	0	0	0	0	19
Illinois:											
Alton	0	----	0	0	0	0	0	0	1	1	6
Chicago	7	----	0	3	15	17	0	40	0	97	579
Elgin	0	----	0	0	0	0	0	0	0	13	18
Moline	0	----	0	0	0	0	0	0	0	2	9
Springfield	0	----	0	0	1	0	0	0	0	0	17
Michigan:											
Detroit	5	2	0	4	4	10	0	12	5	56	215
Flint	1	----	0	0	0	2	0	1	0	8	19
Grand Rapids	0	----	0	4	0	3	0	0	0	3	29
Wisconsin:											
Kenosha	0	----	0	0	0	1	0	0	0	1	6
Madison	1	----	0	1	0	0	0	1	1	13	21
Milwaukee	0	----	0	2	0	7	0	2	0	20	74
Racine	0	----	0	1	0	0	0	0	0	7	7
Superior	0	----	0	0	0	2	0	0	0	0	9

[1] Figures for Salt Lake City estimated; report not received.

City reports for week ended Aug. 19, 1939—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	2	0	0	0	2	0	1	22
Minneapolis	0	------	0	2	2	2	0	1	0	10	84
St. Paul	0	------	------	0	------	3	0	------	0	31	------
Iowa:											
Cedar Rapids	0	------	------	0	------	0	0	------	0	0	------
Davenport	0	------	------	1	------	2	1	------	1	0	------
Des Moines	0	------	0	0	0	2	0	0	0	0	29
Sioux City	0	------	------	0	------	0	0	------	0	1	------
Waterloo	0	------	------	0	------	3	0	------	0	2	------
Missouri											
Kansas City	0	------	0	0	3	0	0	4	2	0	87
St. Joseph	0	------	0	0	1	1	0	2	1	0	15
St. Louis	0	------	1	0	2	4	0	1	4	24	180
North Dakota:											
Fargo	0	------	0	0	0	0	0	0	1	1	6
Grand Forks	0	------	------	0	------	0	0	------	0	0	------
Minot	0	------	0	0	0	0	0	0	0	0	3
South Dakota:											
Sioux Falls	0	------	0	0	0	1	0	0	0	0	7
Nebraska:											
Lincoln	1	------	0	1	0	1	0	0	0	6	11
Omaha	4	------	0	0	3	0	0	1	0	2	49
Kansas:											
Lawrence	0	------	0	0	0	0	0	0	0	0	2
Topeka	0	------	0	0	1	0	0	0	0	0	10
Wichita	0	------	0	0	1	0	0	0	0	7	24
Delaware:											
Wilmington	0	------	0	0	2	0	0	0	0	3	22
Maryland:											
Baltimore	3	------	0	0	9	1	0	15	0	49	190
Cumberland	0	------	0	0	1	1	0	0	0	0	10
Frederick	0	------	0	0	0	0	0	1	0	0	3
District of Columbia:											
Washington	0	------	0	6	9	5	0	6	3	39	153
Virginia:											
Lynchburg	0	------	0	4	0	0	0	0	0	18	11
Norfolk	1	------	0	0	3	0	0	1	0	0	24
Richmond	0	------	0	0	1	2	0	2	0	1	45
Roanoke	0	------	0	4	3	0	0	0	0	1	15
West Virginia:											
Charleston	0	------	0	0	1	1	0	1	0	0	20
Huntington	0	------	------	0	------	0	0	------	0	0	------
Wheeling	0	------	0	1	0	0	0	1	0	0	20
North Carolina:											
Gastonia	0	------	------	0	------	0	0	------	0	0	------
Raleigh	0	------	0	0	0	0	0	1	0	4	14
Wilmington	0	------	0	0	0	0	0	0	0	0	13
Winston-Salem	0	------	0	0	0	0	0	1	0	0	11
South Carolina:											
Charleston	0	15	1	0	3	0	0	0	3	0	19
Florence	0	------	0	0	0	0	0	0	0	0	8
Greenville	0	------	0	0	0	0	0	0	0	2	20
Georgia:											
Atlanta	1	1	1	0	3	4	0	3	4	0	77
Brunswick	0	------	0	0	0	0	0	1	0	0	6
Savannah	0	2	0	0	0	0	0	2	0	1	24
Florida:											
Miami	0	------	0	0	1	0	0	0	1	0	16
Tampa	1	2	2	1	3	0	0	0	1	1	30
Kentucky:											
Ashland	0	------	0	0	0	0	0	0	1	0	5
Covington	0	------	0	0	1	2	0	2	0	0	13
Lexington	0	------	0	0	0	0	0	0	6	1	17
Louisville	0	------	0	1	2	1	0	5	0	19	88
Tennessee:											
Knoxville	2	------	0	0	2	3	0	0	3	0	26
Memphis	0	------	0	2	2	0	0	3	0	18	67
Nashville	4	------	0	0	1	3	0	0	1	18	28
Alabama:											
Birmingham	1	------	0	0	5	0	0	1	3	0	55
Mobile	0	4	0	0	0	4	0	0	0	1	20
Montgomery	0	------	------	0	------	0	0	------	1	0	------
Arkansas:											
Fort Smith	0	------	------	0	------	0	0	------	0	0	------
Little Rock	0	------	1	0	2	0	0	5	1	0	8

City reports for week ended Aug. 19, 1939—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								
Louisiana:											
Lake Charles	0	------	0	2	1	0	0	0	0	0	6
New Orleans	1	1	0	3	9	3	0	7	8	5	130
Shreveport	0	------	0	0	5	2	0	1	2	0	38
Oklahoma:											
Oklahoma City	1	------	0	0	3	2	0	2	0	0	36
Tulsa	0	------	--------	0	-------	0	0	-------	2	0	--------
Texas:											
Dallas	6	------	0	1	4	1	0	4	1	8	72
Fort Worth	0	------	0	0	1	1	0	1	0	0	24
Galveston	0	------	0	0	2	0	0	0	0	0	12
Houston	1	------	0	0	7	0	0	3	0	0	64
San Antonio	1	1	0	0	2	0	0	7	0	1	60
Montana:											
Billings	0	------	0	0	0	0	0	0	0	2	9
Great Falls	0	------	0	3	0	5	0	0	0	0	4
Helena	0	------	0	0	0	0	0	0	0	0	3
Missoula	0	------	0	0	0	0	0	0	2	0	6
Idaho:											
Boise	0	------	0	0	1	0	0	0	0	0	11
Colorado:											
Colorado Springs	0	------	0	0	0	4	0	1	0	0	13
Denver	5	------	0	1	7	3	0	1	1	10	77
Pueblo	0	------	0	0	1	0	0	1	0	1	8
New Mexico:											
Albuquerque	0	------	0	0	0	1	0	2	0	0	12
Utah:											
Salt Lake City	-------	------	--------	-------	-------	-------	-------	-------	-------	-------	--------
Washington:											
Seattle	1	------	0	13	2	2	0	2	1	4	95
Spokane	0	------	0	3	1	3	0	0	1	1	46
Tacoma	0	------	0	6	0	0	0	0	0	0	30
Oregon:											
Portland	0	------	0	0	2	0	0	3	0	0	54
Salem	0	------	--------	1	-------	1	0	-------	0	3	--------
California:											
Los Angeles	1	5	0	12	3	10	0	24	0	21	303
Sacramento	2	------	0	1	2	0	0	1	0	0	27
San Francisco	0	------	0	2	7	2	0	6	0	2	155

State and city	Meningitis, meningococcus		Poliomyelitis cases	State and city	Meningitis, meningococcus		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Missouri:			
Boston	0	0	1	Kansas City	1	0	1
New York:				Nebraska:			
Buffalo	0	0	15	Lincoln	1	0	0
New York	6	2	16	Maryland:			
Rochester	0	0	1	Baltimore	1	0	1
New Jersey:				District of Columbia:			
Camden	0	0	5	Washington	0	0	4
Newark	1	0	0	North Carolina:			
Pennsylvania:				Wilmington	0	0	1
Philadelphia	0	0	19	South Carolina:			
Pittsburgh	0	0	3	Charleston	0	0	5
Ohio:				Florida:			
Cleveland	0	0	3	Miami	0	0	1
Illinois:				Texas:			
Chicago	0	0	6	Houston	0	0	3
Springfield	0	0	1	Colorado:			
Michigan:				Denver	0	0	1
Detroit	0	0	66	Pueblo	0	0	2
Wisconsin:				Oregon:			
Kenosha	0	0	1	Portland	0	0	1
Madison	0	0	1	California:			
Milwaukee	0	0	1	Los Angeles	0	0	15
Minnesota:				Sacramento	0	0	1
Minneapolis	0	0	11	San Francisco	0	0	1

Encephalitis, epidemic or lethargic.—Cases: New York, 2; Alton, Ill., 1.
Pellagra.—Cases: Baltimore, 1; Charleston, S. C., 1.
Rabies in man.—Deaths: Chicago, 1.
Typhus fever.—Cases: Boston, 1; New York, 1; Charleston, S. C., 3; Atlanta, 3; Tampa, 1; Birmingham, 1; Mobile, 3; Montgomery, 2; New Orleans, 1; Dallas, 1; Fort Worth, 1; Houston, 1; Los Angeles, 1.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended July 22, 1939.—During the week ended July 22, 1939, 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
Chickenpox		7		43	102	14	14	23	22	225
Diphtheria		3	4	25	1	5				38
Influenza		6							24	30
Measles		25	4	212	252	32		2	5	532
Mumps					22	4	1	3		30
Pneumonia		7			7				7	21
Poliomyelitis					14		1			15
Scarlet fever	1	1	11	83	64	5	2	11	1	179
Smallpox						1				1
Tuberculosis	4	4	10	102	53	4	2	5		184
Typhoid and paratyphoid fever			2	11	4	2	4		2	25
Whooping cough		49	6	76	74	11	19		9	244

CUBA

Habana—Communicable diseases—4 weeks ended July 29, 1939.—During the 4 weeks ended July 29, 1939, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	15	2	Scarlet fever	4	
Leprosy	1		Tuberculosis	1	1
Malaria	6	1	Typhoid fever	26	3
Poliomyelitis	10	1			

FINLAND

Communicable diseases—July 1939.—During the month of July 1939, cases of certain communicable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Diphtheria	164	Paratyphoid fever	77
Dysentery	2	Poliomyelitis	5
Influenza	458	Scarlet fever	300
Lethargic encephalitis	1	Typhoid fever	14

SWEDEN

Notifiable diseases—June 1939.—During the month of June 1939, cases of certain notifiable diseases were reported in Sweden as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	2	Scarlet fever	4,464
Diphtheria	3	Syphilis	39
Dysentery	11	Typhoid fever	9
Gonorrhea	969	Undulant fever	9
Paratyphoid fever	54	Weil's disease	5
Poliomyelitis	5		

YUGOSLAVIA

Communicable diseases—4 weeks ended July 16, 1939.—During the 4 weeks ended July 16, 1939, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	40	1	Paratyphoid fever	44	1
Cerebrospinal meningitis	37	9	Poliomyelitis	9	----
Diphtheria and croup	358	15	Scarlet fever	169	1
Dysentery	38	4	Sepsis	4	2
Erysipelas	138	4	Tetanus	48	12
Favus	10	----	Typhoid fever	194	7
Lethargic encephalitis	2	----	Typhus fever	28	----

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

NOTE.—A cumulative table giving current information regarding the world prevalence of quarantinable diseases for a six-month period appeared in the PUBLIC HEALTH REPORTS of August 25, 1939, pages 1573–1585. A similar cumulative table will appear in future issues of the PUBLIC HEALTH REPORTS for the last Friday of each month.

Cholera

Iraq—Basra.—According to a report dated August 23, 1939, 1 suspected case of cholera has occurred in Basra, Iraq.

Plague

Dutch East Indies—Java—Batavia.—During the week ended August 19, 1939, 1 imported case of plague was reported in Batavia, Java, Dutch East Indies.

Smallpox

Algeria—Oran Department—Perregaux.—During the week ended July 29, 1939, 2 cases of smallpox were reported in Perreguax, Oran Department, Algeria.

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