

# CONTENTS

---

Current world prevalence of communicable diseases:	Page
United States, April 8–May 5, 1928.....	1321
Foreign countries.....	1324
Current State mortality statistics.....	1329
Loosely bound sulphur in pituitary extracts.....	1334
Court decision relating to public health .....	1342
Public health engineering abstracts.....	1342
Deaths during week ended May 19, 1928:	
Death claims reported by insurance companies.....	1347
Deaths in certain large cities of the United States.....	1347

## PREVALENCE OF DISEASE

### United States:

Current weekly State reports—	
Reports for weeks ended May 26, 1928, and May 28, 1927.....	1349
Report for week ended May 19, 1928.....	1351
Summary of monthly reports from States.....	1351
Reciprocal notifications, April, 1928.....	1353
General current summary and weekly reports from cities.....	1353
City reports for week ended May 12, 1928.....	1354
Summary of weekly reports from cities, April 8 to May 12, 1928—	
Rates—Comparison with 1927.....	1361

### Foreign and insular:

The Far East—Reports for the weeks ended April 28 and May 5, 1928..	1364
Angola—Communicable diseases—February, 1928.....	1365
Arabia—Aden—Plague conditions—Summary of prevalence to April 14, 1928.....	1365
Canada—	
Provinces—Communicable diseases—Week ended May 5, 1928..	1365
Quebec—Communicable diseases—Week ended May 12, 1928..	1365
Vital statistics—Quebec Province—March, 1928.....	1366
Estonia—Communicable diseases—March, 1928.....	1366
Great Britain—Castleford—Epidemic smallpox.....	1366
Haiti—Meningococcus meningitis.....	1366
Italy—Communicable diseases—February 13–26, 1928.....	1367
Latvia—Communicable diseases—March, 1928.....	1367
Union of South Africa—Cape Province—Typhus fever—Week ended April 7, 1928.....	1367
Uruguay—	
Montevideo—Communicable diseases—January, 1928.....	1367
Mortality from communicable diseases.....	1367
Cholera, plague, smallpox, typhus fever, and yellow fever—	
Cholera.....	1368
Plague.....	1370
Plague rats on vessels.....	1373
Smallpox.....	1374
Typhus fever.....	1380
Yellow fever.....	1382

# PUBLIC HEALTH REPORTS

VOL. 43

JUNE 1, 1928

NO. 22

## CURRENT WORLD PREVALENCE OF COMMUNICABLE DISEASES<sup>1</sup>

United States, April 8–May 5, 1928

The mortality from all causes in large cities continued high during the four weeks ended May 5 as compared with the corresponding weeks of last year; the average death rate in 66 large cities (annual basis) in these weeks was 15 per 1,000 population in the current year, 13.7 a year ago, and 14.2 in 1925. The average rate in the current year is the same as that for the preceding four weeks, and no tendency for the mortality to decline was indicated. The death rate for the week ended May 5 was 15.5, the highest so far reported for the cities this year. While the normal seasonal decline is somewhat overdue and the April mortality was higher than in the recent years not affected by marked respiratory epidemics, the general death rate in these cities for the first 18 weeks of 1928 (14.4) was about average; it was slightly higher than that for the corresponding period of 1927 (13.8), but the same as the rate in 1925. A comparison with 1926 is not made, since the mortality rate for the corresponding period of that year was abnormally high because of a respiratory epidemic.

*Influenza and pneumonia.*—Reported cases of influenza increased during April, and in the week ended May 5 there were 4,185 cases reported by 31 States, as compared with 3,300 in the preceding week. This increase occurred chiefly in Indiana, Wisconsin, Minnesota, North Dakota, Missouri, Arkansas, Texas, and New Mexico. The mortality from influenza and pneumonia in 95 cities was slightly lower for the two weeks ended April 21, the latest available, than for the preceding two weeks, when a maximum rate of 250 per 100,000 was reported, as shown in the accompanying table. The decline occurred in the average death rate for cities reporting in each of the geographic divisions except the West North Central and Mountain States. The mortality from influenza and pneumonia in these cities in the current year has exceeded that in 1927 in all sections except the South Atlantic and Pacific divisions, and the excess has been most marked in the East and West South Central and East North Central States.

<sup>1</sup> From the Office of Statistical Investigations, U. S. Public Health Service.

*Average death rates per 100,000 (annual basis) from influenza and pneumonia in cities in each geographic division from March 11 to April 21, 1928, compared with corresponding period of 1927*

Geographic division	1928			1927		
	Mar. 11-24	Mar. 25-Apr. 7	Apr. 8-21	Mar. 13-26	Mar. 27-Apr. 9	Apr. 10-23
Total (95 cities).....	245	250	232	205	185	175
New England.....	218	215	180	177	158	168
Middle Atlantic.....	275	284	269	256	215	208
East North Central.....	226	256	223	158	151	149
West North Central.....	145	143	198	125	125	143
South Atlantic.....	226	222	218	312	227	212
East South Central.....	374	418	285	284	265	223
West South Central.....	375	310	285	188	191	115
Mountain.....	292	168	198	188	233	165
Pacific.....	122	117	88	123	143	119

*Meningococcus meningitis.*—The total cases of meningococcus meningitis reported by 42 States in the four weeks ended May 5 numbered 538 as against 578 in the preceding four-week period and 249 in the corresponding period of 1927. While the number of new cases reported in most States has shown little change in recent weeks, a rather marked decline occurred in a number of the Western States where the incidence of the disease had been relatively high. In Colorado the number of reported cases dropped from 54 in the four weeks ended April 7 to 22 in the four weeks ended May 5; in Arizona the number dropped from 17 to 7; in Arkansas from 10 to 3; in Oklahoma from 15 to 8; in Texas from 8 to 3; in Utah from 16 to 9; and in Oregon from 14 to 6. On the other hand, the number of cases reported in New York State increased from 108 to 176.

*Smallpox.*—A gradual seasonal decline in the number of smallpox cases reported by 42 States was apparent in the returns for the four weeks ended May 5, the total number reported for the period being less than 3,900—a decline of approximately 900 from the preceding four-week period. The reported cases for these four weeks numbered about 1,000 more than for the corresponding period of each of the preceding two years. Some decline has occurred in nearly all the States; only Montana reported a definite increase, the number increasing from 52 in the four weeks ended April 7 to 99 in the four weeks ended May 5. In all the States in which an increased prevalence was noted in the four weeks ended April 7, a decrease was reported in the following four weeks, the decreases being especially marked in California, Colorado, New Mexico, Missouri, Indiana, and West Virginia. In Oklahoma, where smallpox has been prevalent in recent months, the number of reported cases dropped to 192 in the two weeks ended May 5, as against 340 in the preceding two weeks.

*Scarlet fever.*—A seasonal decline in the incidence of scarlet fever during April was evident from the reports for 41 States, which showed a total of 3,900 cases in the week ended May 5 as compared with about 4,900 in the week ended March 31. The number of cases reported by Massachusetts, Connecticut, New York, New Jersey, and Pennsylvania in the four weeks ended May 5 indicated a definite decline as compared with the preceding four-week period in these States, and smaller decreases occurred in most of the remaining States. Montana and Wyoming reported a slight increase, but the number of cases was small.

*Diphtheria.*—The number of cases of diphtheria reported weekly by 42 States has declined steadily since early in February, and in the week ended May 5 there were 1,300 cases reported as compared with 1,450 in the week ended April 7 and with 1,833 in the week ended March 3. The disease is still somewhat more prevalent than it was in 1926, but only slightly more so than it was in 1927.

*Measles.*—The total number of cases of measles reported by 38 States showed little or no change during March and April; the weekly number of cases reported was approximately 18,000. In general, the incidence of the disease has been higher in the current year than it was last year in the New England, Middle and South Atlantic, and East South Central States, but it has been lower than it was a year ago in the North Central, Mountain, and Pacific States. Among the States showing a rather high incidence the following reported an increase in the two weeks ended May 5 as compared with the preceding two weeks: Arkansas, Florida, Georgia, Louisiana, Tennessee, Kansas, Missouri, Indiana, Pennsylvania, New Jersey, New York, and Rhode Island. On the other hand, a decrease in cases was reported by Alabama, Maryland, Massachusetts, Michigan, North Carolina, New Mexico, and Texas. Measles epidemics are local in character and may occur at almost any season, but a general decline in prevalence should take place in May, and the summer months may be expected to bring the incidence to a low level.

*Typhoid fever.*—The typhoid fever incidence continued lower in April than in the same month for either of the preceding two years. No State reported as many as 20 cases a week in March or April, and the weekly case rates for 101 cities (annual basis) varied from 4 to 6 per 100,000 population, which is lower than the rates for any of the preceding four years at this season. The incidence rates have been higher in the South Atlantic and South Central States than in the remainder of the country, but have been favorable in these geographical districts as compared with earlier years.

*Poliomyelitis.*—The number of cases of poliomyelitis continued to decline during April, and 81 cases were reported by 43 States in the

four weeks ended May 5 as compared with 107 in the preceding four-week period. Of the 81 cases reported, 23 were in California, and no more than 5 in any other State.

### Foreign Countries <sup>1</sup>

The general prevalence for certain epidemic diseases in most foreign countries during February and March is summarized below.

*Plague.*—Eight plague cases were reported during the second half of March in Ben Gardane district in southern Tunis near the Tripoli frontier. Tunis had been free from plague since August, 1927, and these cases occurred a long distance from the scene of the outbreaks of 1926–27. Algeria and Greece were both free from plague in February and March.

Plague cases continued to occur at Suez in March; 80 cases were reported from the beginning of January up to April 7. Only three plague cases have been reported elsewhere in Egypt since the beginning of the year—one at Alexandria and two in Upper Egypt.

The outbreak at Aden increased during March, and 462 cases were reported in the three weeks ended April 7, as compared with 424 cases in the preceding three weeks. In the week ended April 14, there were 108 cases reported, indicating a slight decline in new cases. From the beginning of the outbreak to April 14, 1,300 cases and 943 deaths had been reported. During the whole of the epidemic in 1900, which hitherto had been the most severe, 708 cases and 576 deaths were reported.

Plague spread rapidly in India in the beginning of February, 1928. During the week ended February 4, 4,517 cases and 3,296 deaths were reported, as compared with 1,394 cases and 967 deaths during the corresponding week of the preceding year. The number of plague cases and deaths reported between the middle of December and the middle of February was practically the same, week for week, as that reported during the corresponding period of 1925–26, a year of moderately severe plague prevalence.

The accompanying table shows that, in comparison with 1926, the plague situation in February, 1928, was rather bad in the United Provinces, Hyderabad, and Burma, but very good in the Punjab and in Bihar. The severe outbreak at the city of Hyderabad began to decline early in February. In upper Burma the spread of plague appears to have come to a standstill except in the town of Mandalay.

<sup>1</sup> Data from the Monthly Epidemiological Report of the Health Section of the League of Nations' Secretariat, Apr. 15, 1928, supplemented by information published in the PUBLIC HEALTH REPORTS.

*Deaths from plague in the Provinces of India during the first six weeks of 1926, 1927, and 1928*

Provinces	1926		1927		1928	
	Jan. 3-23	Jan. 24-Feb. 13	Jan. 2-22	Jan. 23-Feb. 12	Jan. 1-21	Jan. 22-Feb. 11
Punjab, Delhi, and Punjab States.....	1,426	3,142	392	460	200	294
United Provinces.....	1,920	2,910	1,134	1,062	2,203	3,884
Bihar and Orissa.....	380	659	326	498	199	350
Central Provinces.....	344	478	413	495	366	569
Madras Presidency.....	259	275	210	153	197	224
Hyderabad.....	348	700	91	68	1,854	1,771
Mysore.....	329	365	151	84	58	64
Bombay Presidency.....	596	663	135	134	308	397
Burma.....	438	488	157	285	890	1,161
Other Indian States.....	162	242	63	61	21	63
Total.....	6,204	9,922	3,072	3,300	6,296	8,777

In the United Provinces the outlook is somewhat disquieting, the number of plague cases and deaths reported having trebled from the week ended January 28 (757 deaths) to the week ended February 18 (2,329 deaths). Such a rate of increase, at this time of the year, has not been seen in the United Provinces since 1918; the nearest approach was in 1924, when the number of deaths attributed to plague doubled during the corresponding three weeks.

Plague is slightly more prevalent in Java than it was in 1926, but less so than in 1924 and 1925. During the 12 weeks ended January 28, 1928, there were 2,604 deaths attributed to plague, as compared with 2,175 during the corresponding period of the preceding year. Central Java continues to be most heavily infected, but western Java has not escaped.

The actual incidence of plague in the east African centers of plague in Kenya, Uganda, and Madagascar is about the same as it was early in 1927. In Madagascar, 705 deaths were ascribed to plague during the first two months of 1928, as compared with 749 during the corresponding period of the preceding year. No plague case has been reported either in Mauritius or in Réunion since early in 1927.

In the Union of South Africa, 17 plague cases were reported on inland farms from the beginning of the year to March 24.

The plague season has not yet begun in the west African centers, but there have been a few cases at Lagos and Ijebu in Nigeria (37 cases up to March 10), and in Senegal (25 up to March 20).

*Cholera.*—The incidence of cholera was above normal at Calcutta in March, the disease having been very prevalent in Bengal during the winter. There was no cholera in ports west of Bombay.

Cholera in India, though slightly less prevalent in February than in January, caused about the same number of deaths as in the corresponding month of the two preceding years, but more than during the corresponding periods of 1922-25. During the three weeks ended February 18, 1928, 4,802 deaths were attributed to cholera, as compared with 4,331 deaths in 1927. The disease was almost entirely confined to the two most persistent centers—(1) Bengal, with Assam and Orissa, and (2) Madras Presidency.

*Cholera cases and deaths in maritime towns of the Far East in March, 1926, 1927, and 1928, reported to the Singapore Bureau*

Port	1926		1927		1928	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Bombay.....	0	0	0	0	-----	2
Tuticorin.....	0	0	0	0	-----	1
Negapatam.....	-----	2	-----	1	0	0
Madras.....	-----	30	-----	3	-----	9
Calcutta.....	-----	193	-----	195	-----	380
Bassein.....	0	0	-----	4	-----	5
Rangoon.....	-----	4	-----	12	-----	11
Mulmein.....	0	0	0	0	-----	4
Singapore.....	0	0	0	0	1	1
Bangkok.....	319	213	69	46	40	23
Saigon.....	3	2	2	2	52	33
Turane.....	0	0	0	0	1	1
Manila.....	2	0	0	0	0	0
Canton.....	-----	-----	0	0	1	1

In Siam, 395 cases were reported during the first eight weeks of 1928, as compared with 326 and 1,168 cases during the corresponding periods of 1927 and 1926, respectively. During the first eight weeks of each of the years from 1922 to 1925 only from 2 to 13 cholera cases were reported weekly in the whole country.

During the first quarter of 1928, cholera was prevalent in the southern part of French Indo-China, 220 cases being reported in Cambodia, 1,162 cases in Cochin-China, and 376 in Annam up to March 20. Tonkin and Laos were reported free from cholera.

*Yellow fever.*—In the Belgian Congo, there was one yellow fever case at Matadi on February 24 and one case on board a ship at Boma on March 5. No other case was reported there or elsewhere in Africa in March.

*Smallpox.*—Cases of smallpox were rare in most countries on the European continent early in 1928. No case was reported in Bulgaria, Czechoslovakia, Denmark, Gibraltar, Hungary, Lithuania, Luxemburg, and Rumania either in January or February; in Sweden up to March 15; in the Kingdom of the Serbs, Croats, and Slovenes up to March 21; nor in the Irish Free State, Northern Ireland, Scotland, and Switzerland up to March 24. Malta and Norway were both free from smallpox in January. Estonia, Finland, and Latvia each had reported one case in the first two months of the year; Belgium

reported one case up to March 24, and Germany one case up to March 10. Poland reported three cases up to March 10, and Italy three cases in the first two weeks of the year.

Greece, with eight cases of smallpox reported up to the end of February, and France, with 21 cases in the same period, showed marked improvement over the corresponding months of 1927, when they reported, respectively, 36 and 108 cases.

Portugal reported 258 smallpox cases with 30 deaths in the first two months. No information was available for Spain or for the Union of Soviet Socialist Republics.

In England and Wales smallpox was less prevalent in the first 12 weeks of the year than in the corresponding period of 1927; 4,377 cases were reported as compared with 5,774 in 1927.

Marked improvement in the smallpox situation in northern Africa is indicated by the early reports for 1928. In Algeria 174 cases had been reported up to March 24 as against 518 cases in the period of 1927; in Egypt only 2 cases up to February 11 as against 121; and in French Morocco 97 cases up to February 29 as compared with 265. In Tunis a slight increase occurred, and 39 cases were reported up to March 18 as compared with 26 in the corresponding period of 1927.

The severe form of smallpox persisted in northern Rhodesia in 1928; 388 cases and 46 deaths were reported up to February 4, and 297 cases and 42 deaths in the next five weeks.

There was an increase of smallpox cases in India after the middle of January, 18,336 cases being reported during the four weeks ended February 18 as compared with 12,668 cases in the preceding four weeks. The incidence was not quite as high, however, as in the preceding year, when 23,282 cases were reported during the four weeks ended February 19.

*Typhus fever.*—The serious outbreak of typhus fever which began last year in Morocco persisted unabated in the early months of 1928. Up to March 24, 2,464 cases were reported as compared with 484 during the corresponding period of the preceding year. The principal center of the disease is in the southern part of the country, especially at Marrakesh and in the Sous area, the principal town of which, Taroudant, has suffered most severely. During the period under review, 940 cases were reported in the town of Taroudant, which has about 8,000 inhabitants. There were 527 cases at Marrakesh and 218 at Casablanca. Unfavorable economic conditions resulting from the poor harvests of 1926 and 1927 in the part of the country south of the great Atlas Mountain Range has undoubtedly predisposed the population to the epidemic which is here of a severe type. It is said that typhus elsewhere in Morocco is usually of a relatively mild type.



In eastern Europe the typhus situation was satisfactory in the early part of 1928. In Poland 738 cases were notified up to March 10, as compared with 825 during the corresponding period of 1927. In Lithuania an increase occurred, and 223 cases were reported in January and February as compared with 46 cases in the first two months of last year. No reports were available for 1928 for the Union of Soviet Socialist Republics, but fewer cases were reported for the fourth quarter of 1927 than in the preceding years.

*Influenza.*—Influenza was little in evidence in Europe during the first quarter of 1928. Although minor outbreaks may occur in April or May, there is every indication that 1928 will be a year with low influenza incidence, comparable with 1921 or 1926.

In large towns of England and Wales the number of deaths attributed to influenza decreased in January, and then remained more or less stationary up to the middle of March; 270 deaths were reported during the two weeks ended March 31, as compared with 209 deaths during the preceding two weeks. During the first quarter of 1928, 1,467 deaths were ascribed to influenza, as against 7,477 during the first quarter of 1927. There was no increase of the general death rate during the period under review.

Mortality statistics of large German towns showed no evidence of influenza outbreaks up to March 10. During the first 10 weeks of 1928 there were 481 deaths ascribed to influenza; in the corresponding weeks of 1927 the number was 3,256.

Returns of influenza cases reported in Denmark, Norway, Sweden, and Finland showed a low prevalence of this disease in January and February. Very few deaths from influenza were reported in Polish towns during these months; at Warsaw, there were 7 deaths from this cause during the four weeks ended March 24. In Vienna 4 deaths were attributed to influenza in January and 16 deaths in Budapest during the four weeks ended March 24.

In Switzerland, only 65 deaths were ascribed to influenza in January, as compared with 1,648 during the corresponding month of 1927. In the Netherlands, 147 deaths were attributed to influenza in January, as against 2,015 in the corresponding month last year.

In Paris, there were 74 deaths from influenza in January, 62 in February, and 26 during the first 20 days of March; statistics for other French towns showed but little prevalence of the disease. There were very few deaths from influenza in Italian towns in January and February.

## CURRENT STATE MORTALITY STATISTICS

For the information of public health officials and others interested, the data in the following tables have been taken from the monthly mortality reports of State health departments for the latest month for which published records are available. Statistics of most communicable diseases are not included, since they are available in other tabulations in the Public Health Reports. Statistics of deaths from other causes are limited for the most part to those causes which appear in the State reports. In the case of States which publish detailed mortality reports each month, the record of only the principal groups of causes and certain important specific causes have been used.

For purposes of comparison, the mortality records for the corresponding month in a few preceding years have been compiled. The rates have been computed upon the populations as estimated for July 1 of each year represented.

These tabulations will be enlarged as the current data on mortality from additional States become available.

Summaries of annual mortality statistics for the year 1927 are appended whenever the data are available from the States, and comparisons with several prior years are included when practicable.

### Monthly Mortality Statistics

#### ALABAMA

Death classification by cause or age	February					
	White			Colored		
	1923	1927	1926	1923	1927	1926
Annual rate per 1,000: All causes.....	10.1	7.8	10.8	17.3	12.5	18.3
Rate per 1,000 live births: Infant mortality.....	78.4	44.1	73.0	118.0	75.5	106.1
Annual rate per 100,000:						
Influenza.....	83.9	30.7	141.4	112.8	35.0	165.9
Tuberculosis, all forms.....	53.9	46.8	60.6	179.1	136.9	163.0
Cancer, all forms.....	36.0	47.6	48.6	39.5	45.2	37.8
Diabetes mellitus.....	6.0	8.1	7.4	14.1	5.8	11.6
Cerebral hemorrhage, apoplexy.....	47.2	29.9	40.1	81.6	40.8	77.1
Diseases of the heart.....	116.9	94.4	103.6	150.9	119.4	142.6
Pneumonia, all forms.....	144.6	72.6	144.8	203.2	106.3	267.8
Diarrhea enteritis (under 2 years).....	6.0	4.8	10.6	9.9	7.3	2.9
Chronic nephritis.....	66.7	58.9	76.1	90.2	83.0	103.3
Puerperal state.....	21.0	12.1	15.5	16.9	32.0	32.0
Congenital malformation and other diseases of early infancy.....	70.4	57.3	75.3	98.7	58.3	85.9
Automobile accidents.....	14.2	17.8	10.6	7.0	8.7	7.3
Number of deaths:						
Under 1 year.....	233	142	206	201	130	173
1 to 4 years.....	90	56	84	61	27	68
5 to 14 years.....	46	45	47	44	36	36
15 to 44 years.....	232	227	262	386	292	336
45 to 64 years.....	242	177	255	304	205	306
65 years and over.....	489	319	454	223	155	268
Age not stated.....	11	4	6	9	9	8

## Monthly mortality statistics—Continued

## CONNECTICUT

Death classification by cause or age	February					
	1928	1927	1926	1925	1924	1923
Annual rate per 1,000: All causes.....	12.0	11.5	12.7	12.7	13.2	16.1
Rate per 1,000 live births: Infant mortality.....	55.7	65.2	75.7	71.9	83.9	81.6
Annual rate per 100,000:						
Influenza.....	25.8	24.7	31.8	52.0	42.7	130.8
Tuberculosis, all forms.....	75.1	78.9	86.1	81.0	91.3	99.0
Cancer.....	106.6	97.8	107.9	92.9	101.4	82.2
Diseases of the heart.....	200.3	207.9	204.9	167.0	203.6	( <sup>1</sup> )
Pneumonia, all forms.....	148.6	119.1	132.1	157.7	176.8	307.5
Diarrhea and enteritis (under 2 years).....	4.8	9.0	12.5	12.8	9.2	10.6
Puerperal diseases.....	8.9	12.3	10.0	8.5	11.7	14.1
Number of deaths:						
Under 1 year.....	133	155	185	188	216	206
1 to 4 years.....	61	54	81	66	83	111
5 to 64 years.....	607	677	717	714	720	794
65 years and over.....	685	514	530	520	571	712

<sup>1</sup> Not available.

## IOWA AND NORTH CAROLINA

MARCH, 1928

Death classification by cause or age	Iowa	North Carolina
Annual rate per 1,000: 1-205. All causes.....	12.1	( <sup>1</sup> )
Rate per 1,000 live births: Infant mortality.....	66.4	( <sup>1</sup> )
Annual rate per 100,000:		
11. Influenza.....	79.5	63.7
31- 37. Tuberculosis, all forms.....	38.8	86.6
43- 49. Cancer and other malignant tumors.....	121.2	
57. Diabetes mellitus.....	19.9	
70- 86. Diseases of the nervous system and of the organs of special sense.....	153.2	
74. Cerebral hemorrhage, apoplexy.....	111.5	
87- 96. Diseases of the circulatory system.....	310.8	
87- 90. Diseases of the heart.....	279.8	
97-107. Diseases of the respiratory system.....	105.2	
100-101. Pneumonia (broncho and lobar).....	98.4	168.7
108-127. Diseases of the digestive system.....	65.5	
113. Diarrhea & enteritis (under 2 years).....	5.8	10.0
128-142. Nonvenereal diseases of the genito-urinary system.....	64.5	
128, 129. Nephritis, all forms.....	53.8	
143-150. The puerperal state.....	11.2	
151-158. Diseases of the skin and of the bones and organs of locomotion.....	2.9	
159-163. Malformation and diseases of early infancy.....	61.1	
165-203. External causes.....	83.9	
165-174. Suicides (total).....		6.0
189c. Automobile accidents.....	12.1	8.8
197-200. Homicides.....		8.0
Number of deaths:		
Under 1 year.....	236	
1 to 4 years.....	66	
5 to 64 years.....	927	
65 years and over.....	1,265	

<sup>1</sup> Not available.

## Monthly mortality statistics—Continued

## INDIANA

Death classification by cause or age	February					
	1928	1927	1926	1925	1924	1923
Annual rate per 1,000: All causes .....	11.7	12.3	13.2	13.5	12.5	17.1
Rate per 1,000 live births: Infant mortality .....	59.8	67.1	74.2	77.1	75.6	91.7
Annual rate per 100,000:						
Influenza .....	44.0	46.3	62.6	77.5	47.2	220.2
Tuberculosis, all forms .....	67.4	79.0	88.9	86.8	80.0	120.9
Cancer .....	87.6	103.0	100.1	98.6	84.6	108.4
Apoplexy .....	122.5	107.6	121.9	109.5	(1)	(1)
Organic heart disease .....	158.1	169.7	177.3	155.8	(1)	(1)
Pneumonia, lobar and broncho .....	120.1	111.3	141.5	181.1	144.9	295.9
Diarrhea and enteritis (under 2 years) .....	10.7	7.4	7.1	9.2	9.9	12.9
Bright's disease .....	86.8	84.8	83.0	86.2	(1)	(1)
Puerperal causes .....	8.7	14.9	15.4	16.6	17.0	16.5
Number of deaths:						
Under 1 year .....	278	319	355	385	396	464
1 to 4 years .....	109	121	150	93	124	213
5 to 14 years .....	63	69	63	85	81	129
15 to 64 years .....	1,173	1,202	1,179	1,309	1,206	1,560
65 years and over .....	1,340	1,256	1,422	1,334	1,242	1,619

<sup>1</sup> Not available.<sup>2</sup> Puerperal septicemia.

## KANSAS AND OKLAHOMA

JANUARY, 1928

Death classification by cause or age	Kansas	Oklahoma
Annual rate per 1,000: 1-205. All causes .....	10.9	10.5
Rate per 1,000 live births: Infant mortality .....	70.0	86.2
Annual rate per 100,000:		
11. Influenza .....	53.3	21.8
31- 37. Tuberculosis, all forms .....	29.5	59.7
43- 49. Cancer and other malignant tumors .....	95.6	58.7
57. Diabetes mellitus .....	24.4	12.6
70- 86. Diseases of nervous system and of the organs of special sense .....	146.9	114.5
74. Cerebral hemorrhage, apoplexy .....	114.2	63.6
87- 96. Diseases of circulatory system .....	213.7	90.8
87- 90. Diseases of the heart .....	181.6	82.0
97-107. Diseases of respiratory system .....	126.4	209.7
100, 101. Pneumonia, all forms .....	105.9	198.0
108-127. Diseases of digestive system .....	62.9	62.1
113. Diarrhea and enteritis (under 2 years) .....	7.7	11.2
128-142. Nonvenereal diseases of the genito-urinary system .....	96.9	67.5
128, 129. Nephritis, all forms .....	85.3	64.1
143-150. The puerperal state .....	7.1	11.6
151-158. Diseases of the skin and bones and of the organs of locomotion .....	8.3	-----
159-163. Malformations and diseases of early infancy .....	53.9	86.9
165-203. External causes .....	80.8	72.8
188c. Automobile accidents .....	10.9	8.7
Number of deaths:		
Under 1 year .....	151	391
1 to 4 years .....	60	84
5 to 14 years .....	52	-----
15 to 44 years .....	241	-----
45 to 69 years .....	527	-----
70 years and over .....	665	-----
5 to 64 years .....	-----	908
65 years and over .....	-----	779

## Monthly mortality statistics—Continued

## NEW JERSEY

## JANUARY

Death classification by cause or age	1928	1927	1926	1925	1924	1923
Annual rate per 1,000: All causes.....	11.3	12.1	13.0	13.1	11.6	11.4
Annual rate per 100,000:						
Influenza.....	12.6	21.4	20.8	23.2	10.4	34.0
Tuberculosis, all forms.....	65.0	74.4	81.9	75.2	75.6	83.1
Cancer.....	99.2	94.5	98.9	103.0	84.6	86.6
Diseases of the nervous system.....	112.5	133.8	145.9	150.4	135.4	138.8
Diseases of the circulatory system.....	272.7	258.8	272.3	256.1	211.3	265.9
Diseases of the respiratory system (pneumonia and tuberculosis excepted).....	59.8	75.1	102.1	101.1	90.9	113.4
Pneumonia.....	80.4	97.7	128.9	122.3	92.9	139.8
Diseases of the digestive system <sup>1</sup> .....	47.5	63.4	51.2	46.8	45.1	47.1
Infantile diarrhea.....	9.6	14.8	13.8	16.7	16.7	17.9
Bright's disease.....	108.5	104.9	101.4	117.7	117.0	129.5
Automobile accidents.....	12.9	14.1	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Number of deaths:						
Under 1 year.....	417	466	431	514	501	516
1-4 years.....	134	119	196	181	180	279
5-59 years.....	1,548	1,668	1,639	1,639	1,405	1,570
60 years and over.....	1,576	1,601	1,794	1,656	1,395	1,632

## FEBRUARY

Annual rate per 1,000: All causes.....	12.4	12.5	14.9	12.6	13.1	18.3
Annual rate per 100,000:						
Influenza.....	16.1	20.9	17.4	20.6	15.0	95.1
Tuberculosis, all forms.....	70.8	76.5	96.4	82.9	81.8	100.8
Cancer.....	102.4	108.1	105.2	95.2	105.8	96.2
Diseases of the nervous system.....	120.9	136.3	160.1	139.8	148.3	177.3
Diseases of the circulatory system.....	272.4	268.1	299.7	240.1	265.2	345.0
Diseases of the respiratory system (pneumonia and tuberculosis excepted).....	71.8	71.6	120.1	84.4	100.1	176.9
Pneumonia.....	108.7	84.5	133.5	112.3	99.7	205.4
Diseases of the digestive system <sup>1</sup> .....	58.0	72.3	59.5	63.7	57.5	69.6
Infantile diarrhea.....	10.5	17.0	18.8	19.2	15.0	28.1
Bright's disease.....	118.6	107.8	153.2	105.7	114.0	144.9
Automobile accidents.....	17.1	21.2	13.1	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Number of deaths:						
Under 1 year.....	471	413	478	447	455	569
1 to 4 years.....	153	140	254	139	193	339
5 to 59 years.....	1,574	1,577	1,739	1,467	1,548	1,975
60 years and over.....	1,568	1,479	1,723	1,425	1,481	1,935

<sup>1</sup> Infantile diarrhea excepted.<sup>2</sup> Not available.

## PENNSYLVANIA

Death classification by cause	January				
	1928	1927	1926	1925	1924
Annual rate per 1,000: 1-205. All causes.....	12.4	13.6	14.2	13.8	14.0
Rate per 1,000 live births: Infant mortality	70.6	93.0	79.9	87.0	( <sup>2</sup> )
Annual rate per 100,000: <sup>1</sup>					
11. Influenza.....	37.3	50.7	52.3	43.0	36.5
31-37. Tuberculosis, all forms.....	64.7	67.1	83.1	78.5	87.7
43-49. Cancer.....	95.5	91.0	99.8	90.0	87.5
57. Diabetes.....	21.7	22.4	19.0	23.2	16.5
74. Apoplexy.....	100.0	99.8	( <sup>2</sup> )	93.4	( <sup>2</sup> )
87-90. Heart diseases.....	246.0	254.0	234.0	188.0	( <sup>2</sup> )
100-101. Pneumonia, all forms.....	131.0	177.0	205.0	204.0	214.8
113. Enteritis (under 2 years.).....	16.7	19.1	20.6	21.8	22.9
128, 129. Nephritis, all forms.....	117.0	127.0	122.0	123.0	123.6
143-150. The puerperal state <sup>1</sup> .....	5.3	6.5	7.0	6.7	( <sup>2</sup> )
159-163. Congenital malformation and diseases of early infancy <sup>1</sup> .....	34.9	40.3	40.3	42.4	( <sup>2</sup> )
188c. Automobile accidents.....	13.5	13.9	11.4	7.3	13.1

<sup>1</sup> Except the puerperal state and diseases of early infancy.<sup>2</sup> Rate per 1,000 total births.<sup>3</sup> Rate per 1,000 live births.<sup>4</sup> Not available.

## Monthly mortality statistics—Continued

## SOUTH CAROLINA

JANUARY, FEBRUARY, MARCH

Death classification by cause	January		February		March	
	1928	1927	1928	1927	1928	1927
Annual rate per 100,000:						
Influenza.....	49.9	22.3	81.7	27.6	132.6	28.7
Tuberculosis, all forms.....	72.6	76.6	74.9	62.2	87.2	102.1
Cancer and malignant tumors.....	30.3	30.6	39.2	40.3	51.2	36.4
Diabetes.....	12.6	5.7	13.5	9.9	11.4	11.5
Diseases of the circulatory system.....	220.5	241.9	278.2	272.7	277.9	277.0
Pneumonia, all forms.....	178.1	132.1	155.3	199.2	161.7	88.1
Intestinal diseases.....	18.9	30.0	23.6	20.5	90.8	27.4
Intestinal diseases of children under 1 year.....	3.8	7.7	8.8	8.5	8.2	10.8
Kidney diseases.....	83.4	78.4	90.9	80.5	108.6	93.2
Parturition and pregnancy.....	12.6	13.4	24.3	18.4	25.3	13.4
Premature births.....	37.3	42.6	58.7	48.6	37.8	45.9
Suicide.....	3.8	3.8	4.1	4.2	1.9	3.2
Homicide.....	8.8	7.7	9.5	7.8	5.7	12.8
Automobile accidents.....	11.4	16.2	10.8	8.5	11.4	9.6
Number of deaths under 1 year.....	305	292	305	257	385	329

## TENNESSEE

JANUARY, FEBRUARY, MARCH

Death classification by cause	January		February		March	
	1928	1927	1928	1927	1928	1927
Annual rate per 1,000: 1-205. All causes.....	11.8	10.8	12.9	11.4	12.3	11.9
Annual rate per 100,000:						
11. Influenza.....	77.2	40.3	89.5	45.6	88.5	68.2
31- 37. Tuberculosis, all forms.....	121.9	115.1	150.9	145.6	140.7	136.8
43- 49. Cancer.....	58.8	53.1	51.3	55.6	53.2	63.5
87- 90. Heart disease.....	105.9	(1)	137.3	(1)	101.9	(1)
100-101. Pneumonia, all forms.....	163.8	129.8	163.0	124.9	162.8	129.8
113. Diarrhea and enteritis (under 2 years).....	4.7	4.7	3.5	4.7	4.7	6.6
146. Puerperal septicemia.....	6.1	5.2	4.5	8.4	7.1	7.6
188c. Automobile accidents.....	13.2	9.0	10.6	7.9	9.4	7.1

1 Not available.

## Annual Mortality Statistics, 1927

Mortality statistics for 1927 have been received from Minnesota, and are given below.

*Mortality in Minnesota in 1927, compared with previous years*

Death classification by cause	1927	1926	1925	1924	1923	1922	1921	1920
Rate per 1,000: All causes.....	9.2	9.7	9.7	9.5	10.0	9.5	9.3	10.7
Rate per 1,000 live birth: Infant mortality.....	51.8	57.3	60.0	56.1	61.1	57.4	58.0	66.4
Rate per 100,000:								
Typhoid fever.....	1.0	1.0	1.8	1.4	2.4	2.2	3.7	3.0
Smallpox.....	0	0	7.6	11.9	.1	.3	1.4	.6
Measles.....	2.2	6.7	.6	5.4	11.2	1.5	1.3	6.6
Scarlet fever.....	2.4	5.8	6.0	8.1	9.3	7.3	7.8	4.9
Whooping cough.....	2.8	6.6	3.7	5.2	6.1	3.1	6.3	12.4
Diphtheria.....	8.1	5.8	8.0	8.5	8.4	7.7	9.0	10.1
Influenza.....	17.9	20.2	22.9	8.6	24.1	16.4	5.8	91.6
Acute anterior poliomyelitis.....	1.3	.6	5.5	1.2	.6	.8	4.2	.7
Meningococcus meningitis.....	2.2	.6	.7	.5	.8	.8	1.3	1.2
Tuberculosis, all forms.....	68.3	63.6	61.0	66.4	78.5	69.5	76.7	89.8
Cancer.....	101.9	99.7	104.3	99.5	93.8	94.9	89.5	95.1
Pneumonia.....	63.1	70.2	70.7	69.4	78.1	67.7	64.8	62.7
Diarrheal diseases of children.....	7.2	9.3	16.4	11.6	15.6	14.6	20.5	23.2
Puerperal septicemia <sup>1</sup> .....	3.1	3.6	3.9	4.0	8.2	3.6	5.6	6.1
Suicides.....	11.4	13.4	14.0	11.2	10.5	12.7	12.7	11.0
Accidents.....	60.9	60.6	63.0	62.6	67.7	61.2	62.0	62.7
Homicides.....	2.1	2.0	3.6	3.0	3.1	3.7	4.1	3.0

1 Rate per 1,000 living births.

## LOOSELY BOUND SULPHUR IN PITUITARY EXTRACTS

By M. X. SULLIVAN, *Biochemist*, and M. I. SMITH, *Senior Pharmacologist, Hygienic Laboratory, United States Public Health Service*

### INTRODUCTION

The rôle which sulphur, especially organically combined sulphur, plays in the economy of the animal body, and that of man in particular, has been greatly emphasized by the work of Hopkins (1921) and that of Abel and Geiling (1926). Thus, Hopkins succeeded in isolating glutathione, a peptide of cysteine and glutamic acid, from mammalian muscle and liver as well as from yeast, and concluded that this sulphur-containing peptide is the most important autoxidizable constituent of the cells. Abel and Geiling (1926) gave a fresh impetus to the study of sulphur when they demonstrated the high degree of lability of the sulphur in insulin and the relation of the loosely bound sulphur to the potency of insulin in lowering blood sugar.

Abel and Geiling found that the sulphur in insulin is liberated by short boiling with 0.1 N sodium carbonate, and that the amount of the "sodium carbonate sulphur" is directly proportional to the degree of hypoglycemic activity.

In later work with crystalline insulin du Vigneaud (1927) found that when it is split by acid hydrolysis cystine is found in the hydrolysate, as evidenced by the positive reaction with the Sullivan (1926) cystine test, which has been found highly specific for cystine or substances structurally like cystine. Du Vigneaud considers that insulin is most likely a derivative of cystine or of a compound like cystine.

Since insulin is the material elaborated by an endocrine gland, the islands of Langerhans, it became of interest to us to determine whether the active principle of other endocrine glands, as, for instance, the pituitary, contained cystine or cystinelike compounds, since, chemically speaking, little is known regarding the chemical nature of the active material of the pituitary gland.

The chemical study of the pituitary active principle is hampered by its instability and by the difficulty of getting a sufficient supply of material.

The pituitary body is divisible morphologically into two parts— anterior and posterior. From the posterior lobe extracts have been obtained which are endowed with various physiological activities such as stimulation of uterine contraction (oxytocic activity), augmentation of the blood pressure (pressor activity), and action on the kidney (renal activity).

The question as to whether the various activities of the posterior pituitary are due to one and the same active principle has long been

a moot one. Abel and Rouiller (1922) concluded that there is but one active principle, which, in its uninjured state, is not only a blood-pressure raising, but also is a plain-muscle-stimulating substance. This view has been consistently maintained by Abel and his associates, and evidence in favor of it is well reviewed by Abel (1924). Smith and McClosky (1924) likewise give evidence favoring a single active principle. On the other hand, other investigators, among whom may be mentioned Fühner in Germany (1913) and, especially, Dudley in England (1923), offer evidence suggesting the presence of more than one active principle.

Recently Kamm, Aldrich, Grote, Rowe, and Bugbee (1928) have apparently succeeded in separating two active principles from the posterior lobe of the pituitary gland, one of which raises blood pressure and another which stimulates contraction of the uterine muscle.

#### PHYSIOLOGICAL AND CHEMICAL TESTS OF EXTRACTS

The criterion of activity mainly relied on by us was the ability of the extract to raise the blood pressure when injected intravenously into an anesthetized dog.

The material which we have used in this work consisted of 21 samples of posterior pituitary and 12 samples of anterior pituitary. The pituitary preparations comprised the following.

1. Five samples of standard powdered pituitary ( $K_2$ ,  $I_2$ ,  $J_2$ ,  $M_2$ ,  $N_2$ ) which had been prepared by Smith and McClosky (1924) in the course of their work on the standardization of pituitary extracts.
2. A fresh gland extract (D), 1 cubic centimeter of which represented the physiological activity of 7 milligrams of standard powdered pituitary.
3. A sample of a commercial powdered posterior pituitary (L) which, when assayed in this laboratory, was found to be of standard potency.
4. Two commercial samples—one labeled hypophysis cerebri (M), the other labeled desiccated posterior pituitary (E). Both of these samples were physiologically inert.
5. A commercial sample of "pituitary body desiccated" (A), having a slight and almost negligible oxytocic activity.
6. Eleven commercial samples of posterior pituitary presumably made to conform to the U. S. P. X requirements. This material was kindly furnished by W. T. McClosky of the pharmacological laboratory of the Bureau of Food, Drug, and Insecticide Administration.
7. Twelve commercial samples of desiccated anterior pituitary furnished through the same source.

Extracts from these samples were made according to the U. S. P. X method of preparing extracts from standard pituitary. The pituitary powder was ground in an agate mortar with 10 cubic centimeter of 0.25 per cent acetic acid. The mixture was collected in pyrex test tubes and carefully brought to gentle boiling and filtered. The clear filtrates were then used for chemical and physiological



tests. In most cases 1 cubic centimeter of the extract represented 10 milligrams of pituitary powder. In some cases of potent extracts 1 cubic centimeter of solution represented only 5 milligrams of posterior pituitary powder, while with slightly potent powders and with the anterior, extracts were often used in which 1 cubic centimeter represented 20 milligrams of powder.

The pressor physiological activity, where indicated, was determined by the procedure described by Smith and McClosky (1924). Some observations have been made on the oxytocic power of the extracts by W. T. McClosky, to whom we are indebted. His findings have, in general, agreed with the pressor tests. The oxytocic study, however, will be reserved for a future publication in which the two physiological activities as measured by the pressor and oxytocic methods will be correlated quantitatively with the chemical reaction about to be described. For the present, as stated previously, the criterion of activity used by us is the power to raise the blood pressure when injected intravenously into a dog.

In the chemical work with the extracts a preliminary investigation was made to see whether any cystine or cystine complex was present in the standard extract. The unhydrolyzed extract gave a negative reaction for cysteine and cystine as determined by the Sullivan method. On hydrolysis for four hours with 20 per cent hydrochloric acid and bringing the hydrolysate to 0.1 N hydrochloric acid, a positive reaction for cystine or cystinelike compounds was obtained. While the hydrolysis was progressing, some tests were made on small amounts of the active extract for so-called loosely bound sulphur—that is, the formation of lead sulphide when heated with lead acetate and sodium hydroxide, along lines first laid down by Fleitmann (1848) in this work on the sulphur of proteins. This test proved to be decidedly positive; and since it required very little active extract and could be done speedily, attention was given to it, temporarily, rather than to the more time-taking cystine test. From application of the loosely bound sulphur test to the various extracts, an interesting relationship was indicated between the presence of highly reactive sulphur and physiological activity.

The expression “loosely bound sulphur” needs some explanation. It is a relative term and merely means that the sulphur is in a labile state and is more or less easily split off. The more dilute the alkali, the lower the temperature, and the shorter the time needed to split off the sulphur in the compound, the more labile is the sulphur. Compounds differ greatly in this respect. Cystine complexes, as, for instance, cystine in peptide arrangement, have a much more reactive sulphur than uncombined cystine, as first noted by Fischer

and Gerngross (1909). Isocystine as given by Gabriel (1905) is much more labile than cystine obtained from keratin by hydrolysis. We have at present in this laboratory organic sulphur compounds not related to cystine which will liberate sulphur with very dilute alkali and no heating.

After some experimenting the following test for loosely bound sulphur in pituitary extracts was evolved. To 2 cubic centimeters of the dilute acetic acid extract in a small test tube, there were added 0.1 cubic centimeter of half-saturated or saturated lead acetate solution and 1 centimeter of sodium hydroxide (usually normal), and the tube was placed in boiling water. Potent extracts begin to brown in 15 seconds and give a black precipitate within two to five minutes, while inactive preparations do not show such a coloration even if kept in boiling water for 15 minutes. Extracts of five samples of standard powdered pituitary, prepared at the Hygienic Laboratory, and earlier referred to as preparations K<sub>2</sub>, I<sub>2</sub>, J<sub>2</sub>, M<sub>2</sub>, and N<sub>2</sub>, gave a speedy and decisive precipitation of lead sulphide. The fresh gland extract (D) behaved likewise.

The first trials were carried out with 5 N sodium hydroxide. These tests demonstrated (1) that the acetic acid extracts of the posterior lobe contained reactive sulphur, as evidenced by the quick formation of lead sulphide; (2) that extracts of the anterior lobe contained little if any highly reactive sulphur, though in a few cases they did contain sulphur demonstrable by boiling with strong sodium hydroxide; (3) that the reactive sulphur appeared to stand in some relation to physiological activity, since extracts of inactive posterior powders failed to give the sulphide reaction.

TABLE 1.—*Loosely bound sulphur in posterior pituitary extracts (using 5 N sodium hydroxide)*

Sam- ple	Identification notation	Concentration of extract	PbS test in 2 to 5 minutes	Pressor test
1	I.....	1 c. c.=10 mg. powder.....	+	+
2	A.....	1 c. c.=10 mg. powder.....	—	1—
3	E.....	1 c. c.=20 mg. powder.....	—	—
4	N <sub>2</sub> .....	1 c. c.=20 mg. powder.....	++	++
5	M <sub>2</sub> .....	1 c. c.=10 mg. powder.....	+	+
6	M.....	1 c. c.=20 mg. powder.....	—	2—
7	PC 1544.....	1 c. c.=10 mg. powder.....	Slight.....	Slight.
8	PC 1469.....	1 c. c.=10 mg. powder.....	Very slight.....	Very slight.
9	PC 1483.....	1 c. c.=10 mg. powder.....	+	+
10	PC 1556.....	1 c. c.=10 mg. powder.....	Slight.....	Slight.

<sup>1</sup> A is a commercial sample labeled "Pituitary body desiccated."

<sup>2</sup> M is a commercial sample labeled "Hypophysis cerebri."

A and M were tested by the oxytocic method only.

TABLE 2.—Comparison of extracts of posterior and anterior lobes of the pituitary body in relation to loosely bound sulphur (using 5 N sodium hydroxide)

	Lobe	Identification notation	Lead sulphide, 1 to 5 minutes		Lobe	Identification notation	Lead sulphide, 1 to 5 minutes
1	Posterior.....	1544	+	13	Posterior.....	1553	+
2	Anterior.....	1543	—	14	Anterior.....	1552	—
3	Posterior.....	1469	Faint.	15	Posterior.....	1592	Slight.
4	Anterior.....	1471	Brown +.	16	Anterior.....	1591	—
5	Posterior.....	1483	+	17	Posterior.....	1548	+
6	Anterior.....	1482	—	18	Anterior.....	1547	—
7	Posterior.....	1556	Slight.	19	Posterior.....	1560	+
8	Anterior.....	1555	—	20	Anterior.....	1568	—
9	Posterior.....	1617	+	21	Posterior.....	1517	+
10	Anterior.....	1616	Brown +.	22	Anterior.....	1562	—
11	Posterior.....	1607	+	23	do.....	1462	+ slight brown.
12	Anterior.....	1606	—				

Using 5 N sodium hydroxide and a short heating period (2 to 5 minutes), the lead sulphide test was carried out on extracts of 16 samples of posterior pituitary powders and similar extracts of 12 anterior lobe preparations. Of the 16 posterior lobe preparations listed in Tables 1 and 2, the extracts of 12 gave a strong lead sulphide precipitate in from 1 to 3 minutes, 2 gave a faint reaction, and 3 were negative.

The posterior lobe extracts A, E, and M of Table 1, which gave a negative lead sulphide test, proved to be physiologically inert. Of the two extracts giving a faint lead sulphide test, one, No. 1469, showed but a trace of activity, physiologically, while the other, No. 1592 (Table 2), showed about 30 per cent activity as compared with a standard extract.

Sample No. 1592, which gives, as far as qualitative judgment goes, only a slight sulphide reaction, has as good physiological activity as some other samples which have given a strong lead sulphide test. While calling attention to this anomaly in our work we reserve judgment for further study of a quantitative nature.<sup>1</sup> Of the extracts of the 12 anterior powders, 9 were entirely negative, while 3 gave a definite positive test. The anterior extracts which gave indications of a positive lead sulphide test were tested physiologically and were found devoid of pressor activity.

As previously stated, the more dilute the alkali used and the shorter the time necessary to give a positive lead sulphide test in the presence of lead acetate, the more labile is the sulphur in question. Since heating with 5 N sodium hydroxide would split off more or less sulphur from compounds, such as cystine, which, in the light of recent work on labile sulphur, have only a slight lability, the chemical tests were repeated with weaker alkali. As a result of numerous experiments, it was found that N sodium hydroxide was very satis-

<sup>1</sup> The occurrence of nonspecific pressor amines may be mentioned as a possible cause of the discrepancy.

factory for the demonstration that extracts of the posterior lobe of the pituitary gland contained highly reactive sulphur. Thus, as shown in Table 3, with this modification of the test the extracts of the anterior lobe gave no reaction for highly reactive sulphur, while the extracts of the posterior lobe gave a sharp distinctive precipitation of lead sulphide within five minutes' heating.

As may be seen from Table 4, extracts of standard powders give a quick and sharp lead sulphide reaction, certain extracts, inactive physiologically, give little if any lead sulphide, and the commercial powders are less reactive than the standard powders, both physiologically and chemically. The work with the various samples of posterior pituitary is taken as a strong suggestion that a close relationship holds between the reactive sulphur and the physiological activity.

Cystine (0.5 milligram per cubic centimeters of 0.1 N hydrochloric acid), under the conditions given in Table 3, does not give a positive lead sulphide test. After 10 minutes' heating, cystine shows only a trace, if any, of lead sulphide. Glutathione, on the other hand, a peptide of cystine and glutamic acid in a concentration of only 1 milligram per cubic centimeter 0.1 N hydrochloric acid, gives a quick, sharp lead sulphide test.

It would seem that, in contrast to extracts of the anterior lobe or of inactive posterior lobe powders, the extracts of the active posterior lobe powders contain a peptide type of sulphur perhaps of the glutathione type. The less reactive sulphur, demonstrable in some cases of anterior lobe extracts (with the use of strong alkali or long boiling), must belong in all probability to more stable sulphur compounds.

TABLE 3.—*Comparison of extracts of posterior and anterior lobes of the pituitary body in relation to loosely bound sulphur (using N sodium hydroxide)*

	Lobe	Identification mark	Lead sulphide, 1 to 5 minutes		Lobe	Identification mark	Lead sulphide, 1 to 5 minutes
1	Posterior.....	1544	+	15	Posterior.....	1592	Slight.
2	Anterior.....	1543	—	16	Anterior.....	1591	—
3	Posterior.....	1469	Faint.	17	Posterior.....	1548	+
4	Anterior.....	1471	—	18	Anterior.....	1547	—
5	Posterior.....	1483	+	19	Posterior.....	1560	+
6	Anterior.....	1482	—yellow precipitate.	20	Anterior.....	1559	+
7	Posterior.....	1556	+slight.	21	Posterior.....	1517	+
	Anterior.....	1555	—	22	Anterior.....	1562	—
	Posterior.....	1617	+	23	do.....	1462	—
10	Anterior.....	1616	—slight yellow precipitate.	24	Posterior.....	K <sub>2</sub>	+
				25	do.....	I <sub>2</sub>	+
11	Posterior.....	1607	+	26	do.....	J <sub>2</sub>	+
12	Anterior.....	1606	—	27	do.....	M <sub>2</sub>	+
13	Posterior.....	1553	+	28	do.....	N <sub>2</sub>	+
14	Anterior.....	1552	—	29	do.....	L	+
				30	do.....	D	+

TABLE 4.—*Relation of reactive sulphur in posterior pituitary to physiological activity (using N sodium hydroxide)*

No.	Preparation	Physiological activity in terms of standard pituitary	Concentration milligrams powder per cubic centimeter	Lead sulphide reaction	Remarks
1	M <sub>1</sub> .....	100	10	Strong.....	These standard extracts gave a quick and decisive lead sulphide reaction, brown- ing in 15 to 30 seconds and a good pre- cipitate of PbS in 3 minutes.
2	N <sub>1</sub> .....	100	10	.....do.....	
3	I <sub>1</sub> .....	100	5	.....do.....	
4	J <sub>1</sub> .....	100	5	.....do.....	
5	K <sub>1</sub> .....	100	5	.....do.....	
6	L.....	100	10	.....do.....	
7	D.....	100	7	.....do.....	
8	1517.....	60	10	Good.....	Commercial powder.
9	1483.....	30	10	.....do.....	Do.
10	1553.....	50	10	.....do.....	Do.
11	1544.....	25	10	Slight.....	Do.
12	1556.....	20	10	.....do.....	Do.
13	1592.....	30	10	Very slight.....	Do.
14	A <sup>1</sup> .....	Inert.	20	Negative.....	Do.
15	M <sup>1</sup> .....	Trace.	20	.....do.....	Do.
16	E.....	Trace.	20	.....do.....	Do.
17	1469.....	Trace.	10	Very faint.....	Do.

<sup>1</sup> This preparation was labeled "Pituitary body desiccated."<sup>2</sup> Labeled "Hypophysis cerebri."

## INACTIVATION OF EXTRACTS BY HEATING WITH HYDROCHLORIC ACID

Abel and Nagayama (1920) found that pituitary extracts acidified to the extent of 0.5 per cent hydrochloric acid and boiled for half an hour lost practically all of their physiological activity. Accordingly, an experiment was made by us to determine what effect heating an active extract with 0.5 per cent hydrochloric acid would have on the reactive sulphur. Eight cubic centimeters of a 1 per cent extract of standard powdered pituitary, which gave a prompt and strong lead sulphide test, were treated with 0.21 cubic centimeters of 20 per cent hydrochloric acid to form a solution containing approximately 0.5 per cent hydrochloric acid. This solution was boiled for one hour under reflux condenser. Two cubic centimeters of the boiled solution in a small test tube were treated in the usual manner with 0.1 cubic centimeter half-saturated lead acetate solution and 1 cubic centimeter N sodium hydroxide, and the tube was placed in boiling water. A strong positive sulphide reaction occurred within three minutes. Physiologically, however, the extract was found to have lost most of its activity by the heating with 0.5 per cent hydrochloric acid.

If it is assumed that the reactive sulphur of post-pituitary extracts is not an incidental matter, but is rather directly associated with the physiological activity of the gland, then the discrepancy just noted—the loss of physiological activity on heating with dilute hydrochloric acid without noticeable effect on the lead sulphide reaction—must be explained. A possible explanation is that the active principle is a complex, one part of which contains labile sulphur. The labile sul-

phur part is not injured by the short heating with the dilute acid, while other components of the complex, essential for the known activity, are either split off or are chemically changed. This phase of the question we can not deal with now, but shall content ourselves by stating the fact that heating with dilute acid inactivates the extract but does not destroy the groups containing highly reactive sulphur.

#### SUMMARY

As the investigation stands, the tests on extracts of the posterior pituitary lobe showed that they contained highly reactive sulphur (reactive in the presence of N sodium hydroxide), while extracts of the anterior lobe did not. Secondly, certain extracts of the posterior lobe, which were found to have little or no physiological activity, were negative in the lead sulphide test. Of the many tests made, one posterior lobe extract (No. 1592) gave an anomalous reaction in that it gave only a slightly positive lead sulphide test, while physiologically it was found to be relatively fairly active. In general, there was a very remarkable agreement between the physiological test, as measured by the rise in blood pressure when injected into anesthetized dogs, and the chemical test—that is, quick formation of lead sulphide when heated with N sodium hydroxide and lead acetate.

Whether this agreement is coincidental or is an indication that the physiological activity of the posterior pituitary is tied up with the presence of highly reactive sulphur compounds must remain for further investigation, of a quantitative nature, which is now being planned. In either case the test for highly reactive sulphur should be useful in the isolation and purification of the active principles.

#### REFERENCES

- Abel, J. J. (1924): Physiological, chemical, and clinical studies on pituitary principles. *Bull. Johns Hopkins Hospital* **35**, 305.
- Abel, J. J., and Geiling, E. M. K. (1925): Researches on insulin. Is insulin an unstable sulphur compound? *Jour. Pharm. and Exp. Therap.* **25**, 423.
- Abel, J. J., and Rouiller, C. A. (1922-23): Evaluation of the hormone of the infundibulum of the pituitary gland in terms of histamine, with experiments on the action of repeated injections of the hormone on the blood pressure. *Jour. Pharm. and Exp. Therap.* **20**, 65.
- Abel, J. J., and Nagayama (1920): On the presence of histamine in extracts of the posterior lobe of the pituitary gland and on preliminary experiments with the pressor constituent. *Jour. Pharm. and Exp. Therap.* **15**, 347.
- Dudley, H. W. (1923): On the active principles of the pituitary gland. *Jour. Pharm. and Exp. Therap.* **21**, 103.
- Fischer, E., and Gerngross, O. (1909): Synthese von Polypeptidin. xxx. Derivate der 1 Cystins. *Ber.* **42**, 1485.
- Fleitmann, Th. (1848): Bestimmung des Verhältnisses in welchem der Schwefel in seinen verschiedenen Formen in den schwefel- und stickstoffhaltigen organischen Verbindungen enthalten ist. *Ann.* **66**, 380.

- Fühner, H. (1913): *Pharmakologische Untersuchungen über die wirksamen Bestandteile der Hypophyse.* Zeit. ges exp. Med. **I**, 397.
- Gabriel, S. (1905): *Ueber Isocystein und Isocystin.* Ber. **38**, 630.
- Hopkins, F. G. (1921): *On an autoxidizable constituent of the cell.* Biochem. Jour. **15**, 286.
- Kamm, O., Aldrich, T. B., Grote, I. W., Rowe, L. W., and Bugbee, E. P. (1928): *The active principles of the posterior lobe of the pituitary gland. I. The demonstration of the presence of two active principles. II. The separation of the two principles and their concentration in the form of potent solid preparations.* Jour. Amer. Chem. Soc. **50**, 573.
- Smith, M. I., and McClosky, W. T. (1924): *I. Studies on the bioassay of pituitary extracts: Concerning the use of a desiccated infundibular powder as a standard in the physiological evaluation of pituitary extracts. II. Some factors concerned in the deterioration of pituitary extracts.* Hygienic Lab. Bull. **138**.
- Smith, M. I., and McClosky, W. T. (1924): *On the dialysis of the physiologically active constituents of the infundibulum.* Jour. Pharm. and exp. Therap. **24**, 391.
- Sullivan, M. X. (1926): *A distinctive test for cysteine.* Pub. Health Rep. **41**, 1030.
- Sullivan, M. X. (1927): *The colorimetric estimation of cystine in casein by means of the naphthoquinone cysteine reaction.* Jour. Biol. Chem. **74**, xiv.
- Du Vigneaud, V. (1927): *The sulfur of insulin.* Jour. Biol. Chem. **LXXV**, 393.

---

## COURT DECISION RELATING TO PUBLIC HEALTH

*Sewer district act held constitutional.*—(Missouri Supreme Court; State ex rel. Gentry, Atty. Gen., v. Curtis et al., Sup'rs of Webster Groves General Sewer Dist. No. 1 of St. Louis County, 4 S. W. (2d) 467; decided March 17, 1928.) An act approved March 25, 1927 (Missouri Laws 1927, pp. 439-465), authorized the formation of sewer districts in counties having 75,000 or more population. A quo warranto proceeding was brought to oust certain persons as supervisors of a sewer district, it being contended that the above-mentioned act, under which the supervisors held office, was unconstitutional. Numerous grounds of unconstitutionality were urged, but the supreme court ruled against them all, thus holding the law to be a valid enactment.

---

## PUBLIC HEALTH ENGINEERING ABSTRACTS

**We Want Pure Air in Our Towns.** Louis Forest. *The World's Health*, vol. 9, No. 3, March, 1928, pp. 86-88. (Abstract by Leonard Greenburg.)

The author feels that we should make an effort to furnish city dwellers with pure air just as we furnish them with pure water. On March 22, 1926, he says, two members of the French Academy presented the following analysis of material which fell on a gauge placed in the center of Paris:

	Grs. per square meter
Carbon.....	2. 659
Hydrocarbons.....	1. 824
Sulphuric acid.....	2. 432
Chlorine.....	. 253
Ammonia.....	. 021

A further analysis made at Vitry disclosed 1.592 kilograms of soot to the square meter during the month of February. The author ascribes this latter figure to the use of coal rich in ash. The reaction of the distillation by-products of coal with Paris water which has been purified by chlorine is such as to produce an iodoform taste in the water sufficient to render the liquid, at times, undrinkable, according to the author.

A draft law has been brought before the Chamber of Deputies which will permit the authorities to proceed to study this problem and remedy the present state of affairs.

**Quantitative Measurements of the Inhalation, Retention, and Exhalation of Dusts and Fumes by Man: I. Concentrations of 50 to 450 Milligrams per Cubic Meter.** P. Drinker, R. M. Thomson, and J. L. Finn. *Journal of Industrial Hygiene*, vol. 10, No. 1, January, 1928, pp. 13-25. (Abstract by Leonard Greenburg.)

The purpose of this study was to determine quantitatively the retention of certain representative dusts and fumes by the lungs of persons forced to respire them. Zinc oxide of a particle size of 0.4 microns, Kadox, which is zinc oxide having a particle size of 0.15 microns, and marble dust, having a particle size of 0.3 to 6 microns, were utilized as the representative dusts. Each of these dusts was set up in a 1,600-cubic-foot gas cabinet. The subjects were seated outside of the cabinet and derived their supply of air containing the dust from the cabinet. The quantity of dust which was exhaled was determined by means of an electric precipitator, while the volume of air was found by the use of a spirometer. Concentrations of dust from 50 to 450 milligrams per cubic meter were used with exposures of from 5 to 40 minutes and with respirations from 6 to 18 per minute. Under these conditions the percentage retention for all three dusts averaged 55, with a standard deviation of 9.4. This study appears to be a very excellent and accurate piece of work.

**Studies in School Ventilation.** R. F. Heath and J. S. Patterson. *Contract Record and Engineering Review*, vol. 42, No. 1, January 4, 1928, pp. 8-13. (Abstract by R. E. Thompson.)

A description and discussion of observations made in a school building in Toronto. The heating equipment consists of low-pressure boilers for heating by direct radiation only. The ventilation vent, housed in the basement, comprises tempering coils, air washer of spray type, reheater and fan, with ducts to each room. Ozone can be introduced between the tempering coils and the washer. The air can be recirculated, or fresh air can be introduced into the system. The observations made included temperature, humidity, and wet and dry kata thermometer readings. The effects noted of temperatures above the "effective temperature" are described. Odors are not removed to any great extent by the air washer. Introduction of 0.013 p. p. m. of ozone effected some improvement, but did not eliminate all odors.

**Atmospheric Pollution with Arsenical Dust.** G. Sowden. *The Journal of State Medicine*, vol. 35, No. 11, November, 1927, pp. 668-670. (Abstract by Leonard Greenburg.)

This study arose because of a complaint that the dust from a power generating station was a nuisance and that it contained arsenic to the extent of 125 parts per million. Accordingly, samples of dust were taken from the roof, rain-water gutters, and chimney shaft of the power plant and several factories in the neighborhood. The pulverized coal used at the power plant contained but 3 parts of arsenic per million, whereas the samples from the roof of the plant contained from 50 to 175 parts, from rain-water gutters from 100 to 200 parts, and from flue dust from 7 to 500 parts. In spite of the fact that the pulverized coal apparently contained so little arsenic, it is the author's belief that all of this arsenic



originated in the coal that was being burned. It is pointed out that various types of coal may contain considerably larger amounts of arsenic than found here.

The question arises as to the health hazard brought about by the presence of this amount of arsenic in the furnace dust discharged in the atmosphere. It is conceivable that a workman might inhale more than that amount of arsenic which is specified as being the maximum permitted on imported apples. The requirements for apples at the present time specify that more than one one-hundredth of a grain of arsenic per pound of apples is undesirable. The author concludes that workmen engaged in cleaning out furnace flues would doubtless inhale more than this quantity of dust, but, on the other hand, there appears to be no knowledge of any injury having arisen from this cause.

In conclusion, the author points out that the public health smoke abatement act should tend to lessen atmospheric pollution of this nature.

**Experiments on the Ventilation of Small Bedrooms.** A. H. Barker. *Gas. J.* 180, 193-5; *Gas World* 87, 359-60 (1927). Abstract by R. W. Ryan in *Chemical Abstracts*, vol. 22, No. 1, January 10, 1928, p. 130.

"Three men slept in a room of 1,200 cubic feet capacity. At the start of the night the CO<sub>2</sub> content of the air was 4 parts per 10,000. With no ventilation the CO<sub>2</sub> increased to 27 parts per 10,000; with a window open 3 inches, to 20 parts; and with the window open 12 inches, to 11 parts, CO<sub>2</sub> per 10,000. With a small gas heater in a fireplace, connected with a chimney, the CO<sub>2</sub> increased to only 8 parts per 10,000."

**The School Ventilation Study in Syracuse, New York.** Thomas J. Duffield. *American Journal of Public Health and the Nation's Health*, vol. 18, No. 3, March, 1928, pp. 326-330. (Abstract by Leonard Greenburg.)

In this study the efficiencies of window and mechanical ventilation are contrasted on the basis of the respiratory disease associated with their use in the schools of Syracuse, N. Y.

Six schools, three of each type, were studied over the winter period 1926-27. The author brings out the fact that unless the factors of race and age are approximately equal in both types of schools one is not warranted in drawing a conclusion from rates of respiratory illness absenteeism that one type of ventilation is more favorable than the other. Because the original two groups of 3 schools each were not balanced in these respects, the author, by eliminating 2 schools, leaving a resultant group of 4, has balanced up these factors. The resulting group of four schools yielded the following results:

*Consolidated attendance and health records in two mechanically ventilated and two naturally ventilated schools in which the effects of race and age are approximately balanced*

	Mechanically ventilated schools <sup>1</sup>	Naturally ventilated schools <sup>1</sup>	Excesses in mechanically ventilated schools
			Per cent
Total absences.....	7.0	5.4	20
Absences due to respiratory illness.....	2.9	2.2	32
Respiratory illness among pupils present.....	8.8	7.8	13
All respiratory illness.....	11.7	10.0	17

<sup>1</sup> Per cent of total pupil sessions.

The author closes by pointing out that even with this somewhat refined treatment of his data one is hardly warranted from his study in drawing the conclusion that natural ventilation of schools is more healthful than mechanical ventilation.

**Failure of Slow Sand Filtration in Madras City.**—J. W. Madeley. *The Surveyor*, vol. 72, No. 1873, December 16, 1927, pp. 593-595. (Abstract by R. E. Thompson.)

This article gives a description of the water works of Madras, India, and of the difficulties experienced in the operation of the slow sand filters, together with an outline of suggested improvements. The source of supply is Red Hills Lake, situated 7 miles from the filter plant. The numerous villages situated on the watershed have no drainage systems, and during the rainy seasons their filth is washed directly into the lake without treatment. The water, consequently, is of poor quality. Vibrios have been found on a number of occasions. The average rainfall is 37 inches per annum. The water works were constructed to supply 25 gallons of water per capita per day, to a population of 660,000, and consist of an intake tower, a 7-mile underground conduit of concrete and brickwork, 17 open slow sand filters with total area of  $8\frac{1}{4}$  acres, 4 underground filtered-water tanks with total capacity of 6.5 m. g., a 1.5 m. g. elevated steel balancing tank, and a cast-iron pipe distribution system throughout the city. Most of these works were put in commission about 1914-15.

Filters Nos. 1-14 are each 200 by 100 feet, and Nos. 15-17 are 200 by 133 feet. The filtering medium consists of two layers of broken stone varying from  $\frac{3}{4}$  to  $\frac{1}{2}$  inch in size, 4 inches of coarse sand and 2 feet 4 inches of fine sand ( $\frac{1}{16}$  to  $\frac{1}{8}$  inch). The depth of water varies from 3 feet 10 inches to 4 feet 9 inches. The filtering layer consists of 2 distinct portions, both of which affect the rate of flow: (1) The sedimentary skin which forms on surface of sand, and (2) the gelatinous layer which consists of the top layer of sand. The former sometimes forms as a feltlike skin which, on drying, curls up in sheets about 5 feet square. There is normally no growth of algae in this skin; but on occasions when depth of water has been reduced for several days, rapid growth has occurred. The gelatinous layer is usually  $1\frac{1}{2}$  inches deep below sand surface and sometimes extends to a depth of 9 inches. When filter first becomes clogged, it can be restored for a time by simply removing the sedimentary layer. This may sometimes be repeated several times before removing and washing the surface sand. When the depth of filtering sand is reduced to 15 inches by removing surface layer for washing, the bed is made up to original depth with clean sand. To prevent penetration of finely divided organic matter into the sand of a newly washed filter, water is allowed to stand on surface for 24 hours to permit suspended matter to settle, and for first three days the rate of filtration is gradually increased from  $\frac{1}{2}$  inch to 4 inches, vertical, per 24 hours.

During the hot weather, hydrogen sulphide is produced in the filters. When the filters are stopped, a black layer about 2 inches thick is found at the bottom of the fine sand, immediately above the coarse sand; and occasionally a similar layer immediately below the surface of the fine sand. This is probably iron sulphide, as the sand contains iron. Liberation of the hydrogen sulphide through the sand of the filter causes formation of craterlike holes in the sand surface, which, of course, interfere with the efficiency. The presence of the hydrogen sulphide in the filtered water prevents satisfactory chlorination.

After studying the situation, the author recommended that the slow sand filters be converted into rapid sand filters by emptying and using filters Nos. 1-14 as preliminary settling basins, Nos. 15 and 17 as coagulation basins for alum treatment, and dividing No. 16 into 14 rapid sand filters to be operated at a rate of 100 vertical inches per hour. This would give a net capacity of 20 m. g. d., to supply a consumption of 17 m. g. d.

In spite of the recommendation, the corporation decided to extend the slow sand filters, but the Government refused to assist financially. As a result no action has been taken, and there is no prospect of any improvement in the near future.

**Sludge Thickening and Discharge.** A. W. Bull and G. M. Darby. *Water Works*, vol. 67, No. 2, February, 1928, p. 76. (Abstract by H. B. Hommon.)

In some laboratory tests it was found that the slow stirring of dilute suspensions of mud in water caused a concentration of sludge in 10 hours that was not equalled in 47 to 75 hours of quiescent settling. Tests were made with an experimental Dorr clarifier in which three methods of discharging sludge were tried: (1) Discharge through a swivelled pipe which could be readily swung up or down to control the discharge head; (2) combinations of the swivel pipe and different sized orifices; (3) by the use of a diaphragm pump.

The conclusions drawn from the tests were: (1) The clarifier demonstrated its ability to thicken river mud and to discharge the sludge with a water loss of less than 1 per cent; (2) for the handling of this type of sludge, the piping should be free from shoulders or any obstructions, flange joints being recommended; (3) either orifice or swivel discharge may be used, but either will require careful manipulation and fairly close attention; (4) the diaphragm pump handled and controlled the sludge discharge without any difficulty, and could consistently remove sludge of a greater density than could be continuously discharged through an orifice or through the swivel pipe.

**Value of Preliminary Sedimentation in Water Purification.** Frank Bachmann. Proceedings of Ninth Texas Water Works Short School, January, 1927, pp. 173-180. (Abstract by H. D. Cashmore.)

An article that should be of particular interest to those operators of water purification plants whose water is taken from rivers of the Mississippi drainage basin where wide fluctuations of turbidity is experienced.

The advantages of preliminary sedimentation in the treatment of turbid waters are as follows:

1. The removal of the bulk of the turbidity, thereby reducing the load on the coagulation basins and consequently the cost of cleaning these basins.

2. Presettling gives a water low in turbidity, which (a) results in smoother plant operation, (b) reduces materially the cost of chemicals for coagulation and softening, (c) reduces cost of water wasted with sludge as this water has not been treated with chemicals.

An interesting discussion of the above advantages is given, with several charts and tables to illustrate the points brought to light.

Figure A is a graph showing the reduction of turbidity obtained with a short period of sedimentation at several cities on the Mississippi, Missouri, and Arkansas Rivers. Figure B shows the form in which the mass of data available at nearly all filtration plants regarding turbidity and alkalinity and lime and alum consumption can be represented graphically. In Figure C some interesting data dealing with lime consumption for different turbidities for deduction of bicarbonate alkalinity are shown in graphs.

Two tables showing the operating results at Little Rock, Ark., and St. Louis, Mo., where presedimentation is used, are given to show what results can be obtained. The last table gives a comparison between the yearly operating costs at Waco, Tex., for the years 1918-19 and 1919-20, which shows the saving made by the installation of a sedimentation basin.

# DEATHS DURING WEEK ENDED MAY 19, 1928

*Summary of information received by telegraph from industrial insurance companies for the week ended May 19, 1928, and corresponding week of 1927. (From the Weekly Health Index, May 23, 1928, issued by the Bureau of the Census, Department of Commerce)*

	Week ended May 19, 1928	Corresponding week, 1927
Policies in force.....	71, 199, 412	67, 703, 113
Number of death claims.....	15, 244	13, 565
Death claims per 1,000 policies in force, annual rate..	11. 2	10. 4

*Deaths from all causes in certain large cities of the United States during the week ended May 19, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, May 23, 1928, issued by the Bureau of the Census, Department of Commerce)*

City	Week ended May 19, 1928		Annual death rate per 1,000, corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended May 19, 1928 <sup>3</sup>
	Total deaths	Death rate <sup>1</sup>		Week ended May 19, 1928	Corresponding week, 1927	
Total (70 cities).....	8, 410	14. 3	12. 3	925	721	75
Akron.....	55	—	—	9	7	98
Albany <sup>2</sup> .....	52	22. 6	16. 1	6	3	123
Atlanta.....	58	11. 9	14. 2	8	7	—
White.....	27	—	8. 0	4	3	—
Colored.....	31	( <sup>4</sup> )	28. 9	4	4	—
Baltimore <sup>2</sup> .....	243	15. 3	15. 3	29	20	92
White.....	197	—	13. 3	23	13	92
Colored.....	46	( <sup>4</sup> )	26. 8	6	7	94
Birmingham.....	83	19. 5	18. 5	8	10	68
White.....	40	—	16. 1	4	8	55
Colored.....	43	( <sup>4</sup> )	22. 2	4	2	90
Boston.....	273	17. 9	14. 0	41	25	113
Bridgeport.....	49	—	—	3	3	55
Buffalo.....	161	15. 1	16. 6	21	24	90
Cambridge.....	21	8. 7	10. 1	1	3	18
Camden.....	35	13. 5	9. 0	4	4	64
Canton.....	28	12. 5	8. 3	5	1	119
Chicago <sup>2</sup> .....	859	14. 2	11. 9	90	71	77
Cincinnati.....	146	18. 5	15. 6	14	8	85
Cleveland.....	224	11. 6	9. 3	19	20	52
Columbus.....	91	16. 0	17. 4	11	7	103
Dallas.....	39	9. 4	12. 8	7	9	—
White.....	25	—	10. 8	6	9	—
Colored.....	14	( <sup>4</sup> )	26. 6	1	0	—
Dayton.....	50	14. 2	12. 4	10	7	166
Denver.....	87	15. 5	14. 0	9	5	—
Des Moines.....	34	11. 7	9. 1	2	1	33
Detroit.....	349	13. 2	11. 8	52	42	80
Duluth.....	27	12. 1	15. 0	0	2	0
El Paso.....	35	15. 5	12. 9	10	10	—
Erie.....	26	—	—	0	4	0
Fall River <sup>2</sup> .....	35	13. 6	8. 7	7	3	120
Flint.....	27	9. 5	9. 5	7	3	89
Fort Worth.....	35	10. 9	10. 8	2	5	—
White.....	27	—	8. 3	1	5	—
Colored.....	8	( <sup>4</sup> )	29. 3	1	0	—
Grand Rapids.....	43	13. 7	10. 3	4	7	60
Houston.....	55	—	—	6	3	—
White.....	35	—	—	5	2	—
Colored.....	20	( <sup>4</sup> )	—	1	1	—
Indianapolis.....	108	14. 8	10. 9	7	8	53
White.....	88	—	10. 1	7	6	61
Colored.....	20	( <sup>4</sup> )	16. 3	0	2	0
Jersey City.....	98	15. 8	11. 8	10	6	75

<sup>1</sup> Annual rate per 1,000 population.

<sup>2</sup> Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.

<sup>3</sup> Deaths for week ended Friday, May 18, 1928.

<sup>4</sup> In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended May 19, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, May 23, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended May 19, 1928		Annual death rate per 1,000, corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended May 19, 1928
	Total deaths	Death rate		Week ended May 19, 1928	Corresponding week, 1927	
Kansas City, Kans.	37	16.4	13.3	3	2	63
White	25		13.0	2	2	49
Colored	12	( <sup>1</sup> )	14.8	1	0	145
Kansas City, Mo.	99	13.2	15.7	10	10	71
Knoxville	21	10.4	11.7	2	3	43
White	16		11.6	2	3	48
Colored	5	( <sup>1</sup> )	12.8	0	0	0
Los Angeles	259			25	31	72
Louisville	146	23.2	12.4	6	1	50
White	113		11.9	6	1	57
Colored	33	( <sup>1</sup> )	14.9	0	0	0
Lowell	30	14.2	10.9	3	3	63
Lynn	22	10.9	9.0	1	3	25
Memphis	66	18.1	22.2	8	5	94
White	27		18.5	4	1	75
Colored	39	( <sup>1</sup> )	28.8	4	4	125
Milwaukee	132	12.7	11.0	20	15	89
Minneapolis	109	12.5	11.2	12	11	72
Nashville	38	14.3	15.9	4	0	63
White	26		12.1	3	0	64
Colored	12	( <sup>1</sup> )	25.5	1	0	60
New Bedford	23	10.1	10.9	2	1	43
New Haven	49	13.6	9.6	3	3	42
New Orleans	165	20.1	18.8	16	14	77
White	95		15.4	6	6	44
Colored	70	( <sup>1</sup> )	28.4	10	8	145
New York	1,784	15.5	12.5	203	152	82
Bronx borough	222	12.2	8.8	24	13	73
Brooklyn borough	600	13.6	11.3	63	56	63
Manhattan borough	746	22.3	17.3	90	67	107
Queens borough	165	10.1	9.3	24	13	97
Richmond borough	51	17.7	13.5	2	3	36
Newark, N. J.	119	13.1	8.4	11	10	57
Oakland	65	12.4	10.1	5	2	54
Oklahoma City	20			0	5	
Omaha	56	13.1	11.7	7	2	81
Paterson	54	19.5	12.0	6	2	104
Philadelphia	512	13.0	11.1	50	41	67
Pittsburgh	196	15.3	12.7	18	17	59
Portland, Oreg.	70			4	1	43
Providence	61	11.1	11.5	4	8	35
Richmond	40	10.8	15.0	2	2	26
White	29		13.0	2	2	41
Colored	11	( <sup>1</sup> )	19.7	0	0	0
Rochester	71	11.3	12.2	12	12	97
St. Louis	208	12.8	12.1	19	14	64
St. Paul	45	9.3	12.1	3	7	29
Salt Lake City <sup>1</sup>	26	9.9	10.0	5	2	82
San Antonio	66	15.8	11.8	14	10	
San Diego	53	23.2	23.1	2	4	38
San Francisco	153	13.7	12.6	8	8	50
Schenectady	22	12.3	10.1	3	3	94
Seattle	70	9.6	6.7	9	3	92
Somerville	21	10.7	10.3	8	0	277
Spokane	22	10.5	11.5	1	0	25
Springfield, Mass.	52	18.1	11.0	8	2	127
Syracuse	75	19.7	15.1	11	3	134
Tacoma	16	7.6	11.2	1	1	26
Toledo	81	13.5	10.8	7	6	67
Trenton	42	15.8	10.3	6	2	102
Utica	28	14.0	15.6	3	7	68
Washington, D. C.	146	13.8	11.8	7	8	40
White	95		10.2	6	2	50
Colored	51	( <sup>1</sup> )	16.5	1	6	18
Waterbury	21			2	2	58
Wilmington, Del.	30	12.2	9.9	6	5	158
Worcester	61	16.1	12.8	6	4	73
Yonkers	23	9.9	5.7	1	1	23
Youngstown	34	10.2	6.5	5	1	67

<sup>1</sup> Deaths for week ended Friday, May 18, 1928.

<sup>2</sup> In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

# PREVALENCE OF DISEASE

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

## UNITED STATES

### CURRENT WEEKLY STATE REPORTS

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

Reports for Weeks Ended May 26, 1928, and May 28, 1927

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 26, 1928, and May 28, 1927*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927
New England States:								
Maine.....	2	12	22	1	35	143	0	0
New Hampshire.....	1				16		0	
Vermont.....		1			45	103	0	0
Massachusetts.....	61	75	52	6	937	470	4	4
Rhode Island.....	1	10			234	3	0	0
Connecticut.....	26	36	27	1	354	57	2	0
Middle Atlantic States:								
New York.....	369	431	178	116	4,024	928	38	8
New Jersey.....	145	103	21	8	1,894	78	5	6
Pennsylvania.....	177	222			2,767	809	12	3
East North Central States:								
Ohio.....	42		204		1,020		2	
Indiana.....	13	26	32	1	447	109	0	0
Illinois.....	111	104	157	21	244	728	12	5
Michigan.....	72	76	5	5	941	232	5	1
Wisconsin.....	26	35	820	59	61	867	3	10
West North Central States:								
Minnesota.....	11	17	5	4	111	110	4	1
Iowa.....	10						1	
Missouri.....	30	33	13	4	496	128	14	4
North Dakota.....	1	5	28		25	30	1	0
South Dakota.....	1	6	2	1	12	102	0	0
Nebraska.....	3	2	20	5	44	185	1	0
Kansas.....	5	8	1	22	150	753	7	1
South Atlantic States:								
Delaware.....					20	8	0	0
Maryland <sup>1</sup> .....	31	50	38	8	568	34	0	0
District of Columbia.....	27	26	1	2	191	10	0	1
Virginia.....								
West Virginia.....	12	9	243	3	56		1	1
North Carolina.....	10	11			904	1,586	1	1
South Carolina.....	14	3	460	397	211	231	0	0
Georgia.....	6	6	102	33	128	73	1	0
Florida.....	9	11	7	2	133	113	1	0
East South Central States:								
Kentucky.....	8		3		160		0	
Tennessee.....	10	4	110	11	140	49	0	2
Alabama.....	8	24	219	37	361	221	1	0
Mississippi.....	7	6					1	

<sup>1</sup> New York City only.

<sup>2</sup> Week ended Friday.

*Cases of certain communicable diseases reported by telegraph by State health officers  
for weeks ended May 26, 1928, and May 28, 1927—Continued*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927
<b>West South Central States:</b>								
Arkansas.....	5	4	170	31	178	50	3	0
Louisiana.....	7	21	29	13	118	33	2	1
Oklahoma <sup>1</sup> .....	12	5	200	43	256	317	4	1
Texas.....	11	23	83	20	116	102	0	0
<b>Mountain States:</b>								
Montana.....	3	5	1		36	39	1	3
Idaho.....					1		0	
Wyoming.....			2		21	117	0	0
Colorado.....	8	6			126	202	0	0
New Mexico.....	1	6			50	167	1	0
Arizona.....	8				9	31	0	0
Utah <sup>1</sup> .....	2	9	7			11	1	0
<b>Pacific States:</b>								
Washington.....	12	3		1	78	310	5	7
Oregon.....	9	5	20	16	43	284	1	2
California.....	85	128	52	19	89	924	3	9

  

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927
<b>New England States:</b>								
Maine.....	0	0	19	34	0	0	3	3
New Hampshire.....	0		9		0		0	
Vermont.....	0	0	6	3	1	0	1	0
Massachusetts.....	1	2	244	427	4	0	5	5
Rhode Island.....	0	0	27	12	0	0	2	1
Connecticut.....	0	0	78	4	2	0	1	5
<b>Middle Atlantic States:</b>								
New York.....	2	0	558	773	16	3	21	12
New Jersey.....	1	0	240	396		0	5	3
Pennsylvania.....	1	0	443	481	1	0	13	21
<b>East North Central States:</b>								
Ohio.....	1		151		38		6	
Indiana.....	0	0	67	70	89	106	3	1
Illinois.....	0	0	243	230	47	33	11	13
Michigan.....	1	0	255	237	13	37	3	5
Wisconsin.....	0	0	218	156	15	70	36	3
<b>West North Central States:</b>								
Minnesota.....	2	2	136	160	1	2	0	2
Iowa.....	0		51		52		0	
Missouri.....	0	0	63	57	22	8	7	4
North Dakota.....	0	0	23	46	6	1	0	0
South Dakota.....	0	0	25	18	2	4	0	0
Nebraska.....	0	1	38	18	39	5	0	2
Kansas.....	0	0	103	56	60	19	1	3
<b>South Atlantic States:</b>								
Delaware.....	0	0	0	8	0	0	1	0
Maryland <sup>1</sup> .....	0	0	63	64	1	0	6	4
District of Columbia.....	0	0	46	15	4	1	0	1
Virginia.....		0				3		
West Virginia.....	1	0	32	26	54	37	3	9
North Carolina.....	1	0	22	9	73	30	5	23
South Carolina.....	6	3	11	5	6	7	29	37
Georgia.....	0	1	11	11	0	22	18	36
Florida.....	0	0	1	5	1	40	6	21
<b>East South Central States:</b>								
Kentucky.....	0		43		40		4	
Tennessee.....	0	0	11	8	32	9	12	16
Alabama.....	0	0	11	7	25	26	11	39
Mississippi.....	1	2	7	7	4	2	5	21
<b>West South Central States:</b>								
Arkansas.....	1	0	26	6	17	2	18	20
Louisiana.....	0	2	15	6	19	7	11	39
Oklahoma <sup>1</sup> .....	0	1	47	13	88	45	3	15
Texas.....	1	1	55	8	47	34	2	11

<sup>1</sup> Week ended Friday.<sup>2</sup> Exclusive of Tulsa.

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 26, 1928, and May 28, 1927—Continued*

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927	Week ended May 26, 1928	Week ended May 28, 1927
<b>Mountain States:</b>								
Montana.....	0	0	13	21	19	4	1	5
Idaho.....	0		6		7		0	
Wyoming.....	0	0	22	25	1	8	0	0
Colorado.....	0	0	34	132	10	6	1	2
New Mexico.....	0	0	14	23	1	0	3	1
Arizona.....	2	2	0	1	12	0	2	0
Utah <sup>1</sup> .....	0	0	5	15	6	2	0	0
<b>Pacific States:</b>								
Washington.....	2	0	18	44	33	34	6	0
Oregon.....	1	0	20	22	39	16	5	12
California.....	3	4	154	117	12	17	17	12

<sup>1</sup> Exclusive of Tulsa.

**Report for Week Ended May 19, 1928**

IOWA	Cases	IOWA—continued	Cases
Diphtheria.....	6	Smallpox.....	38
Measles.....	15	Typhoid fever.....	1
Scarlet fever.....	57		

**SUMMARY OF MONTHLY REPORTS FROM STATES**

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Menin- gococ- cus menin- gitis	Diph- theria	Influ- enza	Ma- laria	Mea- sles	Pel- lagra	Polio- mye- litis	Scarlet fever	Small- pox	Ty- phoid fever
<i>April, 1928</i>										
District of Columbia.....	2	64			775		0	156	6	1
Florida.....	0	35	55	20	309	5	1	50	29	26
Georgia.....	3	33	410	126	510	32	0	64	29	18
Illinois.....	51	509	884	1	819		2	1,255	124	33
Louisiana.....	3	98	199	113	693	54	0	34	83	47
Maine.....	1	11	15		127		0	94	0	2
Maryland.....	2	125	118	0	3,630		1	314	2	32
Minnesota.....	10	97	151		292		4	554	7	9
Missouri.....	30	150	369	1	1,739		1	438	275	10
New York.....	151	1,387		8	12,426		4	3,045	13	46
Ohio.....	31	429	690	1	3,951		5	1,031	182	25
Pennsylvania.....	33	686		1	8,907		5	1,938	13	35
Tennessee.....	4	55	1,274	48	1,937	25	2	116	132	22
West Virginia.....	0	66	128		708		0	135	217	28
Wisconsin.....	26	85	3,788		422		5	667	35	10
Wyoming.....	9	1	8		69		0	107	7	2



<i>April, 1928</i>		<i>April, 1928—Continued</i>	
<b>Actinomycosis:</b>	<b>Cases</b>	<b>Mumps—Continued.</b>	<b>Cases</b>
Illinois.....	1	Missouri.....	577
<b>Anthrax:</b>		New York.....	2,068
New York.....	1	Ohio.....	1,362
Pennsylvania.....	1	Pennsylvania.....	3,531
<b>Chicken pox:</b>		Tennessee.....	343
District of Columbia.....	55	Wisconsin.....	641
Florida.....	246	Wyoming.....	24
Georgia.....	243	<b>Ophthalmia neonatorum:</b>	
Illinois.....	1,071	Illinois.....	25
Louisiana.....	30	New York.....	4
Maine.....	102	Ohio.....	100
Maryland.....	352	Pennsylvania.....	7
Minnesota.....	458	<b>Paratyphoid fever:</b>	
Missouri.....	239	Illinois.....	1
New York.....	1,719	Tennessee.....	2
Ohio.....	964	<b>Puerperal septicemia:</b>	
Pennsylvania.....	1,647	Illinois.....	10
Tennessee.....	111	New York.....	27
West Virginia.....	203	Ohio.....	5
Wisconsin.....	904	Pennsylvania.....	5
Wyoming.....	29	<b>Rabies in animals:</b>	
<b>Dengue:</b>		Maryland.....	3
Georgia.....	3	Missouri.....	4
<b>Dysentery:</b>		New York.....	20
Georgia.....	11	<b>Rabies in man:</b>	
Illinois.....	19	Illinois.....	2
Louisiana.....	2	Ohio.....	2
Maryland.....	2	Pennsylvania.....	2
New York.....	6	Tennessee.....	1
Tennessee.....	1	<b>Rocky Mountain spotted or tick fever:</b>	
<b>German measles:</b>		Wyoming.....	6
Georgia.....	1	<b>Scabies:</b>	
Illinois.....	103	Maryland.....	1
Maine.....	11	Wyoming.....	4
Maryland.....	241	<b>Septic sore throat:</b>	
New York.....	1,714	Georgia.....	24
Ohio.....	67	Illinois.....	8
Pennsylvania.....	517	Maine.....	4
Wyoming.....	1	Maryland.....	18
<b>Hookworm disease:</b>		Missouri.....	23
Florida.....	145	New York.....	17
Georgia.....	6	Ohio.....	75
Louisiana.....	29	Tennessee.....	1
<b>Lead poisoning:</b>		<b>Tetanus:</b>	
Illinois.....	6	Florida.....	4
Ohio.....	12	Georgia.....	2
<b>Leprosy:</b>		Illinois.....	3
Illinois.....	1	Louisiana.....	1
Louisiana.....	1	Maryland.....	1
<b>Lethargic encephalitis:</b>		New York.....	1
Georgia.....	1	Pennsylvania.....	5
Illinois.....	7	Tennessee.....	1
Maine.....	1	<b>Trachoma:</b>	
Maryland.....	3	Illinois.....	12
New York.....	27	Louisiana.....	1
Ohio.....	4	Missouri.....	11
Pennsylvania.....	7	New York.....	2
Tennessee.....	2	Ohio.....	8
Wisconsin.....	1	Pennsylvania.....	4
<b>Mumps:</b>		Tennessee.....	6
Florida.....	92	<b>Tularaemia:</b>	
Georgia.....	75	Georgia.....	2
Illinois.....	1,149	Louisiana.....	5
Louisiana.....	10	<b>Typhus fever:</b>	
Maine.....	154	Florida.....	5
Maryland.....	149		

<i>April, 1928—Continued</i>		<i>April, 1928—Continued</i>	
Undulant (Malta) fever:	Cases	Whooping cough—Continued.	Cases
Maine.....	1	Louisiana.....	36
Maryland.....	1	Maine.....	91
Vincent's angina:		Maryland.....	207
Illinois.....	1	Minnesota.....	157
Maine.....	3	Missouri.....	135
Maryland.....	11	New York.....	1,720
New York.....	85	Ohio.....	549
Whooping cough:		Pennsylvania.....	1,109
District of Columbia.....	32	Tennessee.....	145
Florida.....	32	West Virginia.....	45
Georgia.....	77	Wisconsin.....	190
Illinois.....	1,070	Wyoming.....	22

### RECIPROCAL NOTIFICATIONS

*Notifications regarding communicable diseases sent during the month of April, 1928, by departments of health of the States named to other State health departments*

Disease	Califor- nia	Connect- icut	Illinois	Minne- sota	New Mexico	New York	Wash- ington
Diphtheria.....			1			3	1
Measles.....						1	
Rabies <sup>1</sup> .....						1	
Scarlet fever.....		1	1		1	4	
Smallpox.....			5			1	
Tuberculosis.....	5			42			
Typhoid fever.....			1			1	
Whooping cough.....					1		

<sup>1</sup> In animals.

### GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 101 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,650,000. The estimated population of the 95 cities reporting deaths is more than 30,960,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

*Weeks ended May 12, 1928, and May 14, 1927*

	1928	1927	Estimated expectancy
<i>Cases reported</i>			
Diphtheria:			
41 States.....	1,225	1,547	
101 cities.....	733	1,037	861
Measles:			
40 States.....	18,357	12,997	
101 cities.....	8,330	3,587	
Poliomyelitis:			
41 States.....	32	20	
Scarlet fever:			
41 States.....	3,764	4,560	
101 cities.....	1,530	2,022	1,228
Smallpox:			
41 States.....	890	695	
101 cities.....	107	125	116
Typhoid fever:			
41 States.....	207	324	
101 cities.....	48	47	42
<i>Deaths reported</i>			
Influenza and pneumonia:			
95 cities.....	1,439	793	
Smallpox:			
95 cities.....	0	0	

## City reports for week ended May 12, 1923

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1922, estimated	Chick- en pox, cases re- ported	Diphtheria		Influenza		Meas- les, cases re- ported	Mumps, cases re- ported	Pneu- monia, deaths re- ported
			Cases, estimated expect- ancy	Cases re- ported	Cases re- ported	Deaths re- ported			
NEW ENGLAND									
Maine:									
Portland	76,400	6	0	0	0	0	9	4	1
New Hampshire:									
Concord	22,546	0	0	0	0	0	2	0	1
Manchester	84,000	9	1	1	0	2	0	0	1
Vermont:									
Barre	110,008	2	0	0	0	0	1	0	0
Massachusetts:									
Boston	787,000	13	39	25	15	2	151	8	40
Fall River	131,000	0	3	1	8	1	7	4	2
Springfield	145,000	3	2	1	1	2	4	22	6
Worcester	198,900	5	4	4	2	0	22	46	8
Rhode Island:									
Pawtucket	71,000	0	1	2	0	0	22	19	10
Providence	275,000	0	8	4	0	1	160	1	11
Connecticut:									
Bridgeport	( <sup>1</sup> )	2	5	5	3	1	13	0	6
Hartford	164,000	9	6	5	1	6	38	8	12
New Haven	182,000	19	3	2	12	0	63	28	20
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	3	9	13	0		48	54	17
New York	5,924,000	153	255	256	194	46	2,367	52	370
Rochester	321,000	8	10	4	0		62	22	8
Syracuse	185,000	24	4	2	0		182	15	9
New Jersey:									
Camden	131,000	4	5	1	0	0	57	5	0
Newark	469,000	22	12	19	8	0	277	12	23
Trenton	134,000	2	3	3	2	0	18	1	4
Pennsylvania:									
Philadelphia	2,008,000	59	68	49	1	12	1,463	49	68
Pittsburgh	637,000	24	18	17	0	6	120	39	49
Reading	114,000	8	3	0	0	0	33	1	5
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	10	7	6	0	3	26	0	20
Cleveland	960,000	51	21	36	40	7	79	90	37
Columbus	286,000	3	3	3	4	6	113	10	6
Toledo	296,000	21	4	1	10	8	156	11	5
Indiana:									
Fort Wayne	99,900	1	2	1	0	0	1	0	2
Indianapolis	367,000	25	3	2	0	2	155	51	19
South Bend	81,700	0	1	3	0	0	1	0	2
Terre Haute	71,900	3	1	0	0	0	2	0	4
Illinois:									
Chicago	3,048,000	66	73	67	58	25	35	30	148
Springfield	64,700	2	1	1	1	1	0	5	1
Michigan:									
Detroit	1,242,044	22	46	39	6	8	646	25	61
Flint	136,000	1	4	0	0	0	132	23	11
Grand Rapids	156,000	1	3	1	0	2	11	12	1

<sup>1</sup> Estimated, July 1, 1925.<sup>2</sup> No estimate made.<sup>3</sup> Special census.

## City reports for week ended May 12, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued									
Wisconsin:									
Kenosha.....	52,700	19	0	0	0	0	2	0	1
Milwaukee.....	517,000	48	11	7	10	10	0	14	35
Racine.....	69,400	6	1	0	7	1	1	0	2
Superior.....	139,671	0	1	0	0	0	0	0	5
WEST NORTH CENTRAL									
Minnesota:									
Duluth.....	113,000	2	0	0	0	4	0	3	2
Minneapolis.....	434,000	30	15	9	0	7	94	140	13
St. Paul.....	248,000	8	12	0	0	6	7	15	12
Iowa:									
Davenport.....	152,469	1	0	0	0	—	0	0	—
Des Moines.....	146,000	0	2	0	0	—	0	0	—
Sioux City.....	78,000	2	1	0	0	—	4	22	—
Waterloo.....	36,900	8	0	0	0	—	0	7	—
Missouri:									
Kansas City.....	375,000	17	5	2	1	3	59	48	13
St. Joseph.....	78,400	1	0	0	0	0	2	6	9
St. Louis.....	830,000	32	38	16	0	0	303	12	—
North Dakota:									
Fargo.....	126,403	3	0	0	0	1	0	0	2
Grand Forks.....	114,811	0	0	1	0	—	0	0	—
South Dakota:									
Aberdeen.....	115,036	0	0	0	0	—	1	0	—
Sioux Falls.....	130,127	0	0	0	0	—	0	0	—
Nebraska:									
Lincoln.....	62,000	8	1	0	0	0	1	15	0
Omaha.....	216,000	10	2	1	0	0	0	0	5
Kansas:									
Topeka.....	56,500	9	1	0	2	0	12	18	1
Wichita.....	92,500	11	1	0	0	0	0	1	2
SOUTH ATLANTIC									
Delaware:									
Wilmington.....	124,000	1	2	0	0	0	13	4	5
Maryland:									
Baltimore.....	808,000	61	22	23	10	0	501	67	0
Cumberland.....	133,741	4	0	0	2	0	5	0	0
Frederick.....	112,035	0	0	0	0	0	34	0	0
District of Columbia:									
Washington.....	528,000	11	12	14	4	2	181	0	15
Virginia:									
Lynchburg.....	138,493	3	1	0	0	0	23	8	1
Norfolk.....	174,000	5	1	0	0	0	41	10	5
Richmond.....	189,000	2	1	0	0	0	85	2	2
Roanoke.....	61,900	7	0	0	0	0	23	1	1
West Virginia:									
Charleston.....	50,700	2	0	1	0	1	3	0	2
Wheeling.....	156,208	7	1	0	0	0	7	1	4
North Carolina:									
Raleigh.....	130,371	1	1	1	0	0	23	0	0
Wilmington.....	37,700	1	0	0	0	0	1	0	2
Winston-Salem.....	71,800	4	0	0	0	0	12	15	3
South Carolina:									
Charleston.....	74,100	0	0	0	3	6	0	0	4
Columbia.....	41,800	4	0	1	0	0	0	21	1
Greenville.....	127,311	1	0	0	0	0	0	4	1
Georgia:									
Atlanta.....	(?)	8	1	3	18	0	18	8	2
Brunswick.....	116,809	0	0	0	0	0	1	0	0
Savannah.....	94,900	1	0	1	24	2	0	1	3
Florida:									
Miami.....	131,286	28	1	1	0	0	3	15	2
St. Petersburg.....	47,629	—	0	—	—	—	—	—	0
Tampa.....	102,000	5	1	3	0	0	1	2	0

1 Estimated, July 1, 1925.

2 No estimate made.

3 Special census.

## City reports for week ended May 19, 1925—Continued

Division, State, and city	Population, July 1, 1920, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL									
Kentucky:									
Covington.....	58,500	0	0	1	0	1	1	0	4
Louisville.....	311,000	1	3	1	4	0	161	7	5
Tennessee:									
Memphis.....	177,000	8	2	2	0	1	9	10	6
Nashville.....	137,000	0	1	2	0	3	38	1	5
Alabama:									
Birmingham.....	211,000	5	1	1	117	8	49	4	17
Mobile.....	66,800	0	0	0	2	1	18	0	0
Montgomery.....	47,000	4	0	0	12	-----	1	1	-----
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith.....	131,643	1	0	0	0	-----	0	0	-----
Little Rock.....	75,900	5	0	0	1	0	6	3	0
Louisiana:									
New Orleans.....	410,000	0	7	13	7	6	1	0	16
Shreveport.....	59,500	2	1	0	0	0	22	0	7
Oklahoma:									
Oklahoma City.....	(?)	1	1	3	13	1	11	1	4
Tulsa.....	133,000	18	1	0	0	-----	8	12	-----
Texas:									
Dallas.....	203,000	14	3	5	1	1	12	0	2
Fort Worth.....	159,000	13	1	1	0	2	5	1	2
Galveston.....	49,100	0	0	0	0	0	0	0	2
Houston.....	164,654	2	3	4	0	0	31	0	7
San Antonio.....	205,000	0	1	1	0	2	12	0	6
MOUNTAIN									
Montana:									
Billings.....	117,971	0	0	0	0	0	0	0	0
Great Falls.....	129,883	10	1	0	0	0	1	0	1
Helena.....	112,037	1	0	1	0	0	0	0	3
Missoula.....	112,668	0	0	0	0	0	0	0	0
Idaho:									
Boise.....	123,042	2	0	0	0	0	0	0	0
Colorado:									
Denver.....	285,000	59	10	4	-----	1	109	119	11
Pueblo.....	43,900	13	0	0	0	0	19	0	0
New Mexico:									
Albuquerque.....	121,000	4	1	0	0	0	2	0	1
Utah:									
Salt Lake City.....	133,000	18	4	2	0	2	0	0	0
Nevada:									
Reno.....	112,665	0	0	1	0	0	0	0	0
PACIFIC									
Washington:									
Seattle.....	(?)	34	5	4	0	-----	54	4	-----
Spokane.....	109,000	11	2	1	0	-----	0	0	-----
Tacoma.....	106,000	4	1	0	0	1	28	32	4
Oregon:									
Portland.....	1282,383	28	5	0	0	0	15	9	4
California:									
Los Angeles.....	(?)	76	41	19	24	3	24	52	21
Sacramento.....	73,400	11	2	0	0	0	4	15	1
San Francisco.....	567,000	16	19	16	3	1	18	37	3

\* Estimated, July 1, 1925.

\* No estimate made.

## City reports for week ended May 12, 1923—Continued

Division, State and city	Scarlet fever		Smallpox			Tuber- culosis, deaths reported	Typhoid fever			Whoop- ing cough, cases reported	Deaths, all causes
	Cases, esti- mated expect- ancy	Cases re- ported	Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		
NEW ENGLAND											
Maine:											
Portland.....	3	5	0	0	0	1	1	1	0	3	24
New Hampshire:											
Concord.....	1	1	0	0	0	0	0	0	0	0	7
Manchester.....	2	7	0	0	0	0	0	0	0	0	20
Vermont:											
Barre.....	0	0	0	0	0	1	0	0	0	0	2
Massachusetts:											
Boston.....	63	77	0	0	0	22	1	0	0	39	263
Fall River.....	4	7	0	0	0	4	0	0	0	0	31
Springfield.....	6	22	0	0	0	1	0	0	0	10	45
Worcester.....	10	8	0	0	0	5	0	0	0	14	57
Rhode Island:											
Pawtucket.....	1	4	0	0	0	0	0	0	0	0	22
Providence.....	9	20	0	0	0	1	0	1	0	6	64
Connecticut:											
Bridgeport.....	11	1	0	0	0	2	0	0	0	0	39
Hartford.....	5	6	0	0	0	1	0	0	0	13	59
New Haven.....	7	0	0	0	0	5	1	0	0	11	80
MIDDLE ATLANTIC											
New York:											
Buffalo.....	19	42	0	0	0	12	1	0	0	20	154
New York.....	270	355	1	0	0	127	8	4	0	173	1,920
Rochester.....	13	9	0	0	0	1	0	0	0	5	88
Syracuse.....	9	7	0	0	0	3	0	0	0	40	75
New Jersey:											
Camden.....	6	3	0	0	0	1	0	0	0	0	24
Newark.....	25	32	0	0	0	7	1	0	0	29	131
Trenton.....	3	1	0	0	0	2	0	0	0	1	44
Pennsylvania:											
Philadelphia.....	88	87	0	0	0	35	4	1	0	97	574
Pittsburgh.....	28	36	0	0	0	15	0	0	1	23	214
Reading.....	2	12	0	0	0	0	0	0	0	6	30
EAST NORTH CENTRAL											
Ohio:											
Cincinnati.....	18	45	2	3	0	12	1	0	0	13	177
Cleveland.....	38	28	1	0	0	19	1	2	0	61	260
Columbus.....	8	20	2	0	0	3	0	0	0	5	83
Toledo.....	12	4	3	0	0	6	1	0	0	3	91
Indiana:											
Fort Wayne.....	3	2	3	0	0	1	0	0	0	0	30
Indianapolis.....	9	21	13	7	0	9	0	0	0	6	106
South Bend.....	4	2	0	1	0	2	0	0	0	0	16
Terre Haute.....	3	0	0	4	0	2	0	0	0	0	21
Illinois:											
Chicago.....	116	71	2	4	0	54	3	1	0	97	925
Springfield.....	3	13	0	5	0	1	0	0	0	0	22
Michigan:											
Detroit.....	88	123	2	1	0	22	2	1	0	85	392
Flint.....	6	11	1	5	0	1	1	0	1	7	29
Grand Rapid.....	7	7	0	0	0	3	0	0	0	6	41
Wisconsin:											
Kenosha.....	3	0	0	0	0	0	0	0	0	14	8
Milwaukee.....	25	46	1	0	0	7	0	0	0	15	142
Racine.....	4	2	1	0	0	1	0	0	0	3	25
Superior.....	2	14	1	0	0	2	0	0	0	0	19
WEST NORTH CENTRAL											
Minnesota:											
Duluth.....	7	4	1	0	0	2	0	0	0	1	34
Minneapolis.....	41	23	6	0	0	3	1	1	0	15	110
St. Paul.....	22	12	3	0	0	4	0	0	0	40	88
Iowa:											
Davenport.....	1	3	2	3	-----	-----	0	0	-----	0	-----
Des Moines.....	6	3	1	15	-----	-----	0	0	-----	0	-----
Sioux City.....	2	0	2	0	-----	-----	0	0	-----	1	-----
Waterloo.....	1	8	0	3	-----	-----	0	0	-----	1	-----

## City reports for week ended May 18, 1926—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber- culosis, deaths re- ported	Typhoid fever			Whoop- ing cough, cases re- ported	Deaths, all causes
	Cases, esti- mated expect- ancy	Cases re- ported	Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		
WEST NORTH CENTRAL—CON.											
Missouri:											
Kansas City.....	10	27	2	4	0	6	0	1	0	19	98
St. Joseph.....	3	3	0	0	0	2	0	0	0	1	52
St. Louis.....	22	31	4	5	0	9	0	1	0	14	305
North Dakota:											
Fargo.....	2	0	0	0	0	1	0	0	0	14	9
Grand Forks.....	1	4	0	0	—	—	0	0	—	0	—
South Dakota:											
Aberdeen.....	2	0	0	0	—	—	0	0	—	0	—
Sioux Falls.....	1	9	0	0	—	—	0	0	—	0	—
Nebraska:											
Lincoln.....	1	8	0	4	0	0	0	0	0	0	16
Omaha.....	4	4	9	4	0	1	0	1	0	0	44
Kansas:											
Topeka.....	2	8	0	1	0	1	0	0	0	9	11
Wichita.....	2	4	1	5	0	0	0	0	0	5	24
SOUTH ATLANTIC											
Delaware:											
Wilmington.....	5	1	0	0	0	0	0	0	0	0	23
Maryland:											
Baltimore.....	33	26	1	0	0	0	2	3	0	37	239
Cumberland.....	1	0	0	0	0	0	0	0	0	0	13
Frederick.....	1	0	0	0	0	0	0	0	0	0	4
District of Col.:											
Washington.....	22	47	0	0	0	21	1	1	0	6	172
Virginia:											
Lynchburg.....	0	0	0	0	0	0	0	0	0	14	6
Norfolk.....	2	4	0	3	0	5	0	0	0	1	0
Richmond.....	4	3	0	1	0	0	1	0	0	0	47
Roanoke.....	1	0	1	0	0	0	0	0	0	1	16
West Virginia:											
Charleston.....	0	0	0	0	0	0	0	1	0	0	8
Wheeling.....	3	0	0	0	0	0	0	0	0	0	11
North Carolina:											
Raleigh.....	1	2	1	1	0	8	0	0	0	3	11
Wilmington.....	0	1	0	2	0	1	0	0	0	0	19
Winston-Salem.....	0	1	4	1	0	2	0	1	0	0	17
South Carolina:											
Charleston.....	0	0	1	2	0	2	0	1	0	7	33
Columbia.....	0	0	0	0	0	0	1	0	0	1	9
Greenville.....	0	1	1	0	0	0	0	0	0	0	8
Georgia:											
Atlanta.....	3	9	5	2	0	5	0	0	0	2	68
Brunswick.....	0	0	0	0	0	0	0	0	0	0	4
Savannah.....	0	0	0	0	0	0	0	1	0	1	31
Florida:											
Miami.....	0	1	1	0	0	0	1	1	0	0	10
St. Petersburg.....	9	—	0	—	0	1	0	—	0	—	12
Tampa.....	0	0	1	0	0	2	1	3	1	0	20
EAST SOUTH CENTRAL											
Kentucky:											
Covington.....	2	13	1	0	0	2	0	0	0	0	40
Louisville.....	7	15	1	0	0	3	1	1	0	1	67
Tennessee:											
Memphis.....	5	2	3	9	0	4	1	0	1	2	65
Nashville.....	2	0	0	0	0	4	1	1	0	1	47
Alabama:											
Birmingham.....	2	1	6	0	0	6	1	2	0	9	90
Mobile.....	0	0	1	0	0	0	0	0	0	0	17
Montgomery.....	0	0	0	0	—	—	0	—	—	0	—
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith.....	0	0	0	0	—	—	0	0	—	3	—
Little Rock.....	1	8	0	0	0	1	0	0	0	0	—

## City reports for week ended May 12, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber- culosis, deaths re-ported	Typhoid fever			Whoop- ing cough, cases re-ported	Deaths, all causes
	Cases, esti- mated expec- tancy	Cases re- ported	Cases, esti- mated expec- tancy	Cases re- ported	Deaths re- ported		Cases, esti- mated expec- tancy	Cases re- ported	Deaths re- ported		
WEST SOUTH CEN- TRAL—contd.											
Louisiana:											
New Orleans...	5	10	1	0	0	21	2	3	0	1	152
Shreveport....	0	2	1	1	0	0	0	0	0	1	42
Oklahoma:											
Oklahoma City.....	1	21	2	16	0	2	0	0	0	0	32
Tulsa.....	0	10	2	4			1	0		0	
Texas:											
Dallas.....	2	21	3	1	0	1	0	0	0	19	38
Fort Worth.....	2	8	4	6	0	0	0	0	0	2	42
Galveston.....	0	0	1	0	0	0	1	1	1	0	11
Houston.....	1	2	1	0	0	1	0	0	0	2	53
San Antonio....	0	3	0	0	0	8	0	0	0	0	78
MOUNTAIN											
Montana:											
Billings.....	1	0	0	1	0	0	0	0	0	3	9
Great Falls.....	2	0	1	3	0	0	0	0	0	0	5
Helena.....	0	0	0	2	0	1	0	0	0	0	7
Missoula.....	1	0	0	0	0	0	0	0	0	0	8
Idaho:											
Boise.....	1	0	0	0	0	0	0	0	0	0	5
Colorado:											
Denver.....	12	10	1	0	0	6	0	0	0	33	85
Pueblo.....	1	0	0	0	0	0	0	1	0	1	6
New Mexico:											
Albuquerque...	0	0	0	0	0	7	0	0	0	0	13
Utah:											
Salt Lake City	2	2	0	11	0	4	0	1	1	12	35
Nevada:											
Reno.....	0	1	0	1	0	0	0	0	0	0	6
PACIFIC											
Washington:											
Seattle.....	8	11	3	1			0	1		6	
Spokane.....	5	4	5	12			0	0		0	
Tacoma.....	2	2	3	1	0	0	0	0	0	4	21
Oregon:											
Portland.....	7	12	7	25	0	2	0	2	0	0	58
California:											
Los Angeles...	26	14	7	0	0	51	2	0	0	54	342
Sacramento....	1	13	0	0	0	2	0	1	0	5	22
San Francisco..	15	36	1	0	0	12	1	10	1	7	161

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Deaths
<b>NEW ENGLAND</b>								
Massachusetts:								
Boston.....	1	0	0	1	0	0	0	0
<b>MIDDLE ATLANTIC</b>								
New York:								
New York.....	26	12	7	2	0	0	1	2
Rochester.....	1	1	0	0	0	0	0	0
New Jersey:								
Newark.....	4	1	0	0	0	0	0	0
Pennsylvania:								
Philadelphia.....	1	1	1	2	0	0	0	0
Pittsburgh.....	3	1	0	0	0	0	0	0



## City reports for week ended May 12, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
<b>EAST NORTH CENTRAL</b>									
Ohio:									
Cincinnati.....	0	1	0	0	0	0	0	0	0
Cleveland.....	3	1	0	0	0	0	0	0	0
Columbus.....	0	1	0	0	0	0	0	0	0
Toledo.....	5	3	0	0	0	0	0	0	0
Indiana:									
Indianapolis.....	0	1	0	0	0	0	0	0	0
Illinois:									
Chicago.....	8	2	0	0	0	0	0	0	0
Michigan:									
Detroit.....	3	1	1	0	0	0	0	0	0
Wisconsin:									
Milwaukee.....	7	4	0	0	0	0	0	0	0
Racine.....	1	1	0	0	0	0	0	0	0
<b>WEST NORTH CENTRAL</b>									
Minnesota:									
Minneapolis.....	1	0	0	0	0	0	0	0	0
St. Paul.....	1	0	0	0	0	0	1	0	0
Missouri:									
Kansas City.....	10	8	0	0	0	0	0	0	0
St. Louis.....	7	3	0	0	0	0	0	0	0
North Dakota:									
Fargo.....	0	0	1	0	0	0	0	0	0
Nebraska:									
Lincoln.....	0	0	0	0	0	0	0	1	0
<b>SOUTH ATLANTIC</b>									
District of Columbia:									
Washington.....	0	0	0	0	0	0	0	2	2
Virginia:									
Richmond.....	0	0	0	0	0	1	0	0	0
South Carolina:									
Charleston.....	0	0	0	0	1	1	0	0	0
Georgia:									
Atlanta.....	0	1	0	0	1	0	0	0	0
Savannah.....	0	0	0	0	1	1	0	0	0
<b>EAST SOUTH CENTRAL</b>									
Tennessee:									
Memphis.....	0	0	0	1	0	0	0	0	0
Nashville.....	0	0	0	0	1	0	0	0	0
Alabama:									
Birmingham.....	0	0	1	0	0	0	0	0	0
Mobile.....	0	0	0	0	1	0	0	0	0
<b>WEST SOUTH CENTRAL</b>									
Louisiana:									
New Orleans.....	2	1	0	0	3	1	0	0	0
Texas:									
Houston.....	1	1	0	0	0	0	0	0	0
<b>MOUNTAIN</b>									
Colorado:									
Denver.....	2	0	0	1	0	0	0	0	0
<b>PACIFIC</b>									
Washington:									
Tacoma.....	1	1	0	0	0	0	0	0	1
California:									
Los Angeles.....	2	0	0	0	1	1	0	1	0
San Francisco.....	0	0	0	0	2	2	0	0	0

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended May 12, 1928, compared with those for a like period ended May 14, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1928 and 1927, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,657,000 in 1928 and 31,050,000 in 1927. The 95 cities reporting deaths had nearly 30,961,000 estimated population in 1928 and nearly 30,370,000 in 1927. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

*Summary of weekly reports from cities, April 8 to May 12, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927<sup>1</sup>*

## DIPHTHERIA CASE RATES

	Week ended—									
	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 26, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927
101 cities.....	144	174	157	179	128	171	123	133	121	174
New England.....	168	105	181	135	133	95	133	136	113	105
Middle Atlantic.....	269	271	264	270	272	242	179	272	177	283
East North Central.....	116	135	116	131	131	137	107	159	109	132
West North Central.....	101	109	80	141	84	158	78	131	55	135
South Atlantic.....	82	141	82	135	96	105	88	119	82	115
East South Central.....	40	86	40	30	45	76	40	76	35	81
West South Central.....	160	141	124	124	109	178	89	141	99	112
Mountain.....	133	108	80	188	133	99	80	152	71	99
Pacific.....	74	115	102	157	56	188	123	110	102	94

## MEASLES CASE RATES

	1,340	796	1,362	788	1,290	638	1,423	606	1,376	602
101 cities.....										
New England.....	1,726	223	1,743	295	1,593	323	1,322	270	1,129	346
Middle Atlantic.....	1,730	172	1,824	145	1,862	231	2,256	212	2,254	297
East North Central.....	998	885	817	797	728	637	794	564	788	450
West North Central.....	861	1,314	886	1,552	1,017	1,225	888	1,522	937	932
South Atlantic.....	2,115	1,311	2,358	1,580	1,767	1,017	2,109	1,577	1,704	1,546
East South Central.....	1,117	396	1,596	517	1,521	375	1,132	517	1,082	345
West South Central.....	428	1,005	390	1,249	396	922	392	877	336	567
Mountain.....	743	2,080	761	1,793	840	1,542	752	1,632	1,141	1,300
Pacific.....	824	2,267	393	2,103	286	1,523	266	1,601	327	1,259

## SCARLET FEVER CASE RATES

	226	391	264	262	256	339	258	360	253	346
101 cities.....										
New England.....	301	422	264	246	329	402	345	393	347	420
Middle Atlantic.....	273	581	287	528	312	446	303	540	285	474
East North Central.....	194	285	272	298	281	289	294	283	265	289
West North Central.....	277	306	288	242	275	333	218	271	242	319
South Atlantic.....	154	150	170	161	214	191	175	128	167	148
East South Central.....	234	218	200	167	209	193	304	183	155	152
West South Central.....	128	50	164	41	108	33	148	58	184	21
Mountain.....	239	950	212	932	203	950	274	1,004	115	726
Pacific.....	123	243	151	209	110	198	153	212	204	201

<sup>1</sup> The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1928, and 1927 respectively.

*Summary of weekly reports from cities, April 8 to May 12, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued*

### SMALLPOX CASE RATES

	Week ended—									
	Apr. 14, 1928	Apr. 16, 1927	Apr. 21, 1928	Apr. 23, 1927	Apr. 28, 1928	Apr. 30, 1927	May 5, 1928	May 7, 1927	May 12, 1928	May 14, 1927
101 cities.....	20	24	22	33	25	21	14	22	18	21
New England.....	0	0	0	0	0	0	0	0	0	0
Middle Atlantic.....	6	0	0	0	0	0	0	0	0	0
East North Central.....	24	32	31	29	28	33	15	28	20	20
West North Central.....	49	55	60	40	68	38	31	34	43	26
South Atlantic.....	11	27	12	65	33	18	14	36	21	38
East South Central.....	35	96	20	162	70	66	15	56	45	56
West South Central.....	16	87	8	95	28	25	36	33	8	58
Mountain.....	150	27	168	54	150	9	106	36	159	9
Pacific.....	74	26	59	97	43	65	31	73	36	91

### TYPHOID FEVER CASE RATES

101 cities.....	5	8	6	7	4	8	6	10	8	8
New England.....	9	9	7	0	5	5	2	2	5	5
Middle Atlantic.....	5	5	6	7	3	5	4	10	2	5
East North Central.....	1	1	3	3	2	6	3	7	3	3
West North Central.....	8	12	6	4	6	4	2	2	8	2
South Atlantic.....	4	13	9	11	7	16	18	18	19	9
East South Central.....	20	35	15	30	5	30	0	15	20	66
West South Central.....	20	17	20	12	24	12	28	37	16	25
Mountain.....	0	9	0	27	0	9	0	18	18	9
Pacific.....	3	18	3	10	0	18	15	3	31	10

## INFLUENZA DEATH RATES

95 cities.....	30	21	28	18	32	18	32	13	33	13
New England.....	9	16	7	12	14	7	21	5	16	14
Middle Atlantic.....	27	21	26	20	34	21	28	15	31	14
East North Central.....	27	11	28	11	35	10	36	7	43	10
West North Central.....	24	12	41	21	31	12	53	8	43	4
South Atlantic.....	30	38	16	22	30	29	21	16	9	25
East South Central.....	84	90	68	58	37	37	84	43	73	32
West South Central.....	90	42	45	30	37	47	25	13	37	13
Mountain.....	53	18	53	0	44	9	35	9	27	9
Pacific.....	14	14	14	10	17	21	7	21	17	7

## PNEUMONIA DEATH RATES

95 cities .....	207	153	198	159	196	143	206	131	210	123
New England.....	177	156	166	151	138	184	189	140	257	144
Middle Atlantic.....	243	175	242	199	246	168	264	166	267	151
East North Central.....	199	141	192	135	215	128	211	121	232	97
West North Central.....	175	128	155	124	90	56	128	68	120	70
South Atlantic.....	209	184	181	179	172	153	184	114	89	128
East South Central.....	183	138	235	160	178	133	214	149	193	128
West South Central.....	238	76	197	81	189	123	90	115	164	140
Mountain.....	186	152	106	161	106	188	159	99	133	54
Pacific.....	88	117	81	97	125	117	74	79	98	114

*Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1928 and 1927, respectively*

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1928	1927	1928	1927
Total.....	101	95	31,657,000	31,050,300	30,960,700	30,369,500
New England.....	12	12	2,274,400	2,242,700	2,274,400	2,242,700
Middle Atlantic.....	10	10	10,732,400	10,594,700	10,732,400	10,594,700
East North Central.....	16	16	7,991,400	7,820,700	7,991,400	7,820,700
West North Central.....	12	10	2,633,500	2,634,500	2,586,400	2,518,500
South Atlantic.....	21	21	2,981,900	2,890,700	2,981,900	2,890,700
East South Central.....	7	6	1,048,300	1,023,300	1,000,100	990,700
West South Central.....	8	7	1,307,600	1,260,700	1,274,100	1,227,800
Mountain.....	9	9	591,100	581,600	591,100	581,600
Pacific.....	6	4	2,046,400	1,996,400	1,548,900	1,512,100

# FOREIGN AND INSULAR

## THE FAR EAST

*Reports for the weeks ended April 28 and May 5, 1928.*—The following reports for the weeks ended April 28 and May 5, 1928, were transmitted by the Eastern Bureau of the Health Section of the Secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

*Week ended April 28, 1928*

Plague, cholera, or smallpox was reported present in the following ports:

### PLAGUE

*Egypt.*—Suez.

*Aden Protectorate.*—Aden.

*India.*—Bassein, Bombay, Rangoon.

*Siam.*—Bangkok.

### CHOLERA

*India.*—Bassein, Calcutta, Madras, Moulmein, Rangoon, Tuticorin.

*French India.*—Pondicherry.

*Straits Settlements.*—Singapore.

*Siam.*—Bangkok.

*French Indo-China.*—Saigon.

### SMALLPOX

*Iraq.*—Basra.

*India.*—Bombay, Calcutta, Madras, Moulmein, Negapatam, Rangoon, Tuticorin.

*French India.*—Pondicherry.

*China.*—Shanghai, Hong Kong.

*Japan.*—Osaka, Shimonoseki.

*Kwantung.*—Dairen.

*South Manchuria.*—Changchun.

*Manchuria.*—Mukden.

Returns for the week ended April 28 were not received from the following ports:

*Aden Protectorate.*—Perim.

*Dutch East Indies.*—Belawan-Deli, Samarinda, Padang.

*Union of Soviet Socialist Republics.*—Vladivostok.

*Week ended May 5, 1928*

Plague, cholera, or smallpox was reported present in the following ports:

### PLAGUE

*Aden Protectorate.*—Aden.

*India.*—Bassein, Bombay, Rangoon.

*Dutch East Indies.*—Surabaya.

*China.*—Hong Kong.

### CHOLERA

*India.*—Bassein, Bombay, Calcutta, Madras, Moulmein, Negapatam, Rangoon, Tuticorin.

*Siam.*—Bangkok.

*French Indo-China.*—Haiphong, Saigon.

### SMALLPOX

*India.*—Bassein, Bombay, Calcutta, Madras, Moulmein, Negapatam, Rangoon.

*French India.*—Pondicherry.

*Dutch East Indies.*—Banjermasin, Belawan-Deli.

*China.*—Shanghai, Hong Kong.

*Japan.*—Osaka, Shimonoseki.

*Kwantung.*—Dairen.

*South Manchuria.*—Changchun.

*Manchuria.*—Antung.

Returns for the week ended May 5 were not received from Vladivostok, Union of Soviet Socialist Republics.

## ANGOLA

*Communicable diseases—February, 1928.*—During the month of February, 1928, communicable diseases were reported in Angola as follows:

Disease	Coast district	Land frontier	Interior	Total
Ancylostomiasis.....	6	43	-----	49
Beriberi.....	1	-----	-----	1
Bilharzia.....	21	3	29	53
Chicken pox.....	3	2	2	7
Dengue.....	-----	-----	1	1
Diphtheria.....	-----	1	-----	1
Dysentery.....	38	12	1	51
Hemoglobin fever.....	16	4	8	28
Influenza.....	58	333	13	404
Leprosy.....	3	-----	-----	3
Malaria.....	435	267	128	830
Measles.....	21	6	-----	27
Mumps.....	2	5	3	10
Pneumonia.....	31	36	-----	67
Relapsing fever.....	-----	5	-----	5
Scabies.....	18	82	-----	100
Smallpox.....	-----	36	-----	36
Tetanus.....	4	-----	-----	4
Tuberculosis.....	31	3	1	36
Trypanosomiasis.....	77	103	4	184
Veneral diseases.....	170	150	33	353
Whooping cough.....	11	-----	2	13
Yaws.....	211	50	22	283

Population: 4,119,000.

## ARABIA

*Aden—Plague conditions—Summary of prevalence to April 14, 1928.*—Under date of April 16, 1928, it was stated that epidemic plague at Aden showed some abatement in the Crater, but that a new focus had developed in the Maala district, in the vicinity of the wharves. The total number of cases to April 14, 1928, was stated to be 1,387, with 1,006 deaths.

## CANADA

*Provinces—Communicable diseases—Week ended May 5, 1928.*—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended May 4, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever.....	-----	-----	1	2	-----	-----	-----	3
Influenza.....	18	-----	-----	11	-----	-----	-----	29
Smallpox.....	-----	-----	-----	8	7	12	3	30
Typhoid fever.....	-----	2	12	18	1	1	4	38

*Quebec—Communicable diseases—Week ended May 12, 1928.*—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended May 12, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox.....	40	Scarlet fever.....	94
Diphtheria.....	42	Smallpox.....	13
German measles.....	21	Tuberculosis.....	63
Influenza.....	5	Typhoid fever.....	19
Measles.....	227	Whooping cough.....	6

*Vital statistics—Quebec Province—March, 1928.*—Births and deaths in the Province of Quebec for the month of March, 1928, were reported as follows:

Estimated population.....	2,650,400	Deaths from—Continued.	
Births.....	6,999	Heart disease.....	325
Birth rate per 1,000 population.....	31.2	Influenza.....	120
Deaths.....	3,131	Measles.....	27
Death rate per 1,000 population.....	13.9	Pneumonia.....	330
Deaths under 1 year.....	840	Scarlet fever.....	12
Infant mortality rate.....	120.0	Smallpox.....	1
Deaths from—		Syphilis.....	6
Cancer.....	178	Tuberculosis (pulmonary).....	203
Cerebrospinal meningitis.....	12	Tuberculosis (all other causes).....	53
Diphtheria.....	33	Typhoid fever.....	15
Diabetes.....	20	Violence.....	63
Diarrhea.....	117	Whooping cough.....	41

### ESTONIA

*Communicable diseases—March, 1928.*—During the month of March, 1928, communicable diseases were reported in the Republic of Estonia as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis.....	14	Scarlet fever.....	420
Diphtheria.....	40	Tuberculosis.....	212
Measles.....	76	Typhoid fever.....	20

Population: 1,114,630.

### GREAT BRITAIN

*Castleford—Epidemic smallpox.*—Under date of April 28, 1928, epidemic smallpox, with 93 cases, was reported at Castleford, England, a manufacturing and mining town of 25,000 inhabitants situated in the vicinity of Leeds. The first case was stated to have occurred February 20, 1928.

### HAITI

*Meningococcus meningitis.*—A report dated May 9, 1928, states that the epidemic of meningococcus meningitis in the northern part of the island of Haiti had subsided. The disease was confined to mountain districts of the Department of the North, and did not reach epidemic proportions in any city or town. The fatality rate was said to be 12½ per cent among the treated cases. On May 5, 1928, 57 cases remained under treatment, all but 5 of which were convalescent.

## ITALY

*Communicable diseases—February 13-26, 1928.*—During the two weeks ended February 26, 1928, communicable diseases were reported in the Kingdom of Italy as follows:

Disease	Feb. 13-19, 1928		Feb. 20-26, 1928	
	Cases	Communes affected	Cases	Communes affected
Anthrax.....	13	13	21	20
Cerebrospinal meningitis.....	6	6	5	5
Chicken pox.....	336	126	370	110
Diphtheria.....	496	271	439	255
Dysentery.....	1	1	1	1
Lethargic encephalitis.....	6	7	9	9
Measles.....	3,359	350	2,896	358
Polioomyelitis.....	9	9	6	6
Scarlet fever.....	397	170	327	157
Smallpox.....	2	2	2	2
Typhoid fever.....	395	211	321	178

## LATVIA

*Communicable diseases—March, 1928.*—During the month of March, 1928, communicable diseases were reported in the Republic of Latvia as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis.....	15	Puerperal fever.....	6
Diphtheria.....	63	Scabies.....	3
Erysipelas.....	13	Scarlet fever.....	237
Influenza.....	49	Tetanus.....	2
Leprosy.....	2	Trachoma.....	40
Malaria.....	1	Typhoid fever.....	64
Measles.....	822	Typhus fever.....	26
Mumps.....	22	Whooping cough.....	166

Population, estimated: 1,950.

## UNION OF SOUTH AFRICA

*Cape Province—Typhus fever—Week ended April 7, 1928.*—During the week ended April 7, 1928, fresh outbreaks of typhus fever were reported in the Glen Gray and Xalanga districts, Cape Province, Union of South Africa.

## URUGUAY

*Montevideo—Communicable diseases—January, 1928.*—During the month of January, 1928, communicable diseases were reported at Montevideo, Uruguay, as follows:

Disease	Cases	Disease	Cases
Diphtheria.....	24	Scarlet fever.....	21
Leprosy.....	1	Tuberculosis.....	159
Measles.....	33	Typhoid fever.....	10

Population: 439,129.

*Mortality from communicable diseases.*—During the period under report 7 deaths from measles, 1 death from scarlet fever, and 104 deaths from tuberculosis were reported at Montevideo.



From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

[C, indicates cases; D, deaths; P, present]

[illegible]



## PLAGUE

**Week ended—**

[illegible]



[C, indicates cases; D, deaths; P, present]

[illegible]



# SMALLPOX

[C indicates cases; D, deaths; P, present]

[illegible]





**CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued**

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

[illegible]



## SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

[illegible]

S. S. Tjileboot at Hong Kong, from														
Shanghai..... C														
S. S. Yarmouth at Kingston, Jamaica, from Havana, Cuba..... C														
Place														
July, 1927	Aug., 1927	Sept., 1927	October, 1927	November, 1927	December, 1927		January, 1928		February, 1928		March, 1928		April, 1928	
							1-10	11-20	1-10	11-20	1-10	11-20	1-10	11-20
Algeria..... C	376	459	382	682										
Oran..... C	14	10	11	11										
Indo-China (French)..... C	19	3	21	25	33			40	18	50	31	90	57	71
Senegal..... C														69
Sudan (French)..... C														
Syria..... C									4		5	1	P	5
Aleppo..... C						1		1	15	11	26		12	7
Beirut..... C						2							4	2
Damascus..... C		3	5	22	13	12	11	2					1	1
													3	5
													2	1
Place														
July-Sep-tem-ber, 1927	Octo-ber, 1927	No-vem-ber, 1927	De-cem-ber, 1927	Janu-ary, 1928	Feb-ruary, 1928	March, 1928	Place		July-Sep-tem-ber, 1927	Octo-ber, 1927	No-vem-ber, 1927	De-cem-ber, 1927	Janu-ary, 1928	Feb-ruary, 1928
Angola..... C	51	73	71	7	10	36	Latvia..... C			2	157	157		1
Congo..... D	5	2					Mexico..... D		221	132	140	401	55	47
Cuanza-Norte..... C	1	77			36		Morocco..... C		180	81	275	317	39	30
Cuanza-Sul..... C		2		7	10		Nigeria..... D		820	223	93		39	45
Loanda..... C							Persia..... D		173	51	30		7	
Zaire..... C	3	4	1				Portugal..... D				2		143	215
Brazil: Porto Alegre..... C	11	4	1		1		Spain: Madrid..... D				1		22	8
British East Africa: Zanzibar..... C							U. S. S. R.: Railways, etc..... C						15	18
Chosen..... D	21	1	2		21		Other territories in Europe..... C		26	7	11	565		
Ecuador: Guayaquil..... D	6			4	2		Transcaucasus, Siberia, and Central Asia..... C		366	220	471			
France..... D	4	1		4	9	24	Ukraine..... C						20	6
Gold Coast..... C	37	7	4	14	11	13			80	40	21			
Greece..... C	7	4		5	6	19			27	11	20	17		
	10	4			2	2								

## TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

[illegible]

Place	1927						November, 1927			December, 1927			January, 1928			February, 1928		
	July	August	September	October	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-29		
Japan (see table below).....																		
Latvia (see table below).....																		
Lithuania (see table below).....																		
Mexico:																		
Guadalajara.....																		
Mexico City, including municipalities in Federal District.....																		
Monterrey.....																		
Morocco (see also table below).....																		
Palestine.....																		
Peru (see table below).....																		
Poland.....																		
Portugal (see also table below): Oporto.....																		
Rumania.....																		
Syria (See also table below): Aleppo.....																		
Tunisia.....																		
Union of South Africa:																		
Cape Province.....																		
Natal.....																		
Orange Free State.....																		
Transvaal.....																		
Union of Soviet Socialist Republics (see table below).....																		
Yugoslavia (see table below).....																		
On vessel: S. S. Gaika at Durban, Natal—from Mauritius.....																		
Algeria.....	67	33	10	12														
Algiers.....	13			1														
Bulgaria.....	12	2	6	2														
.....	24	7	2	2														
.....	1																	
Morocco.....	148	76	7	11	5	14	7		5	6								



