PUBLIC HEALTH REPORTS

VOL. 50

JANUARY 11, 1935

NO. 2

A NOTE ON THE INCIDENCE OF AMOEBIC DYSENTERY IN NEW YORK CITY *

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Prior to October 1933 neither amoebic nor bacillary dysentery was reported with any degree of frequency in New York City. In fact, the reports of these two diseases were combined in the official records of the Department of Health, as shown in table 1. Thus 19, 20, and 20 cases were reported during the years 1930, 1931, and 1932, respectively, relatively small numbers for a large city. However, these few reports do not necessarily represent the real incidence of the diseases as they may actually have occurred, for many cases are not made known to the health authorities, through inadvertance, neglect, or failure to recognize the conditions involved. But even though not strictly accurate, this scarcity of reports indicates that the dysenteries were not being encountered or not being recognized to any considerable extent.

In October 1933, reports of cases of dysentery in New York City began to increase in number. However, investigation of the 11 cases of dysentery reported during that month disclosed that 10 were bacillary and only 1 was amoebic in type. Therefore, there was no indication at that time of the unusual incidence of amoebic dysentery that was impending. Early in November 1933 a warning was received from the health authorities in Chicago that a sharp epidemic of amoebic dysentery was occurring in that city. Furthermore, many of the persons who had acquired the infection in Chicago were visitors from various parts of the country. It was regarded as inevitable that these individuals would have the disease upon returning to their homes and, consequently, would constitute a definite local public health problem. At this time it became known that an outbreak of amoebic dysentery had occurred in Chicago during August 1933 among the employees and guests of several hotels and eating establishments.¹ At first regarded as an infection due to

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¹ Bundesen, Herman N., Rawlings, Isaac D., and Fishbein, William I.: The health hazard of amoebie dysentery. Jour. Am. Med. Assoc., 101: 21, 1639, Nov. 18, 1933.

human carriers, it was afterward disclosed, as a result of epidemiological investigations, that the infection had undoubtedly been conveyed through the medium of water in faulty plumbing.

The influx of amoebic dysentery cases into New York City caused the immediate inauguration and continuation of intensive epidemiological studies of all cases of the disease reported to the Department of Health. A review of the data that have been gathered is particularly interesting as illustrating the rapid spread of the amoebic infection from its original focus in Chicago. Incidentally it was noted that some cases of the disease, not traceable to focal contact in Chicago, were coincidentally reported in New York City, the number of these cases being somewhat larger than the figures shown in table 1.

From November 1, 1933, to September 30, 1934, 121 cases of amoebic dysentery were reported to the Department of Health in New York City. The age groups, sex, and sources of infection of the individuals included in this group are shown in table 2. The various findings and their implications will be discussed briefly.

Sex incidence.—As shown in table 2, 71 males and 50 females in the group under consideration had amoebic dysentery. Of the entire group, 45 males and 28 females, a total of 73, or 60.3 percent, acquired the infection in Chicago. That many more males than females were recorded as suffering from the disease may be accounted for to some extent by the fact that many men who visited Chicago at that time were not accompanied by members of their families. However, there were several instances in which both husband and wife had the disease.

Age incidence.—It is interesting to note that, among the total number of cases recorded, only 1 of the patients was under 9 years of age and only 5 were between 10 and 19 years of age. Here again it may be surmised that younger members of families may not have accompanied their elders to Chicago, although no dearth of children and young people was noticeable at the Century of Progress Exposition, the occasion for most of the visits.

Extra-Chicago sources of amoebic infection.—Table 2 also shows that 48, or 39.7 percent, of the 121 cases of amoebic dysentery could not be charged to infection acquired in Chicago. Thus, 13 cases apparently originated in New York City, 15 in places in the United States other than Chicago and New York City, and 12 in foreign countries. In 8 instances the source of infection could not be ascertained. All cases which failed to give a definite history of having been out of town within a reasonable period of time prior to the onset of the illness were classified as of New York City origin. In no instance was there any direct contact or close association between any two cases of this group. This supports McCoy's contention that, "There appears to be very little evidence that clinical cases originating in Chicago have led to any considerable spread of the infection in the communities to which the infected individuals have gone."²

TABLE 1.—Number of	f cases of	dysentery (a	ull forms)	reported in	New	York	City,	by
	months,	from 1929	to 1933, i	nclusive			• ·	-

		Year		
1929	1930	1931	1932	1933
	12	23		2
	7	2 4 2		1 1 8
	2		413	102
2	1 2 1	43	6 5 1	11 20
2	2 19	20	20	29
		1929 1930 1 -	Year 1929 1930 1931 2 3 2 3 1 2 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 2 1 2 1 2 1 2 1 2 19	Year 1929 1930 1931 1932 2 3 7 2 1 4 1 4 1 4 1 4 3 1 4 6 1 4 6 1 4 5 2 3 5 2 3 2 1 4 6 2 1 2 2 19 20 20

 TABLE 2.—Age groups, sex, and sources of infection of 121 persons reported as having amoebic dysentery in New York City, from Nov. 1, 1933, to Sept. 30, 1934

				1	Source of	infect	ion				
			Male	•				Fema	le		
Age group (years)	Chi- cago	New York City	Other places in Unit- ed States	For- eign coun- tries	Un- known	Chi- cago	New York City	Other places in Unit- ed States	For- eign coun- tries	Un- known	Total
0-9	1 2 10 17 9 6	1 4 2 	1 3 1 1	3 3 1	1 2 1	3 9 10 5 1	 1 1 2	1 4 3 1	23	1 1 2	1 5 22 31 33 19 10
Total	45	9	6	7	4	28	4	9	5	4	121

Sources of infection in Chicago.—According to the Chicago Board of Health, two hotels in that city were believed to have been the principal sources of amoebic dysentery infection. The epidemiological studies conducted in New York City disclosed that of the 73 persons affected with the disease 58 had eaten in hotel A, 6 in hotel B, and 4 in both hotels A and B. Of the remainder, 4 persons gave no history of having eaten in either of these hotels while in Chicago, while in one instance no information could be obtained, the patient having died.

Outcome of illness.—On September 30, 1934, 17 deaths, a percentage of 14.0, had already been recorded among the 121 patients with

² McCoy, G. W.: Control of amoebic dysentery. Pub. Health Rep., 49: 11, 359, March 16, 1934.

amoebic dysentery. Among the remainder, 41 were said to have recovered from the malady while 63 were still under treatment. That additional deaths occurred among those under treatment is quite likely. These and additional facts are shown in table 3. It will be noted that deaths occurred among individuals whose infection was apparently acquired outside of Chicago.

TABLE 3.—Outcome (recovery, continued treatment, or death, as of Sept. 30, 1934) among 121 persons with amoebic dysentery in New York City, according to the probable source of infection

Probable source of infection	Recovered	Under treatment	Died	Total
Chicago New York City Other places in United States	30 2 6 3	37 8 7 7 4	6 3 2 2 4	73 13 15 12 8
Total	41	63	17	121

AMOEBIC DYSENTERY



FIGURE 1.-Cases of amoebic dysentery in New York City by source of infection.

Monthly incidence of amoebic dysentery in New York City.—The rise and fall in amoebic dysentery incidence during the period under discussion is shown in table 4. Figures are available from January 1, 1933, to September 30, 1934. The largest number of cases, 27, was reported in December 1933. Thereafter the affection declined irregularly but decidedly. This information is displayed graphically in figure 1. The uniform incidence of cases originating in foreign countries is plainly shown. It is believed that insofar as New York City is concerned much of the so-called normal incidence of amoebic dysentery may be ascribed to persons who bring the infection from foreign countries and from other parts of the United States. From January 1, 1934, to September 30, 1934, 32 cases of amoebic dysentery and 158 cases of bacillary dysentery, having other than Chicago as the source of infection, were reported in New York City. These figures afford a better indication of the incidence of dysentery in the city. The apparent increase in the number of cases may be due to greater interest in the disease on the part of physicians, better reporting, or increased diagnostic skill.

 TABLE 4.—Incidence of amoebic dysentery, by months, in New York City (Jan. 1, 1933, to Sept. 30, 1934), according to probable sources of infection

			Source of	infection	•,	
Month	Chicago	New York City	Other places in United States	Foreign	Unknown	Total
1933 January				1		1
August September		1	1	1		
October November December	20 21	2 1	1 1	2 1	3	25 27
1934 January February March April May June	13 4 3 2 3 3 2	1 2 1 1 1 1	3 3 1	2 2 1 1 1	2	21 11 5 3 5 0 2
August September	1	1	33		2	87
Total	73	12	16	12	8	121

Onset of disease and date of report.—Reference has already been made to the observation of Bundesen et al. that an outbreak of amoebic dysentery occurred in Chicago in August 1933. The available information quite clearly shows that many of the amoebic dysentery patients encountered in New York City acquired the disease at the time specified. From table 5 it will be seen that the onset of a considerable number of cases, 57, was set as occurring during the months of July, August, September, and October 1933, while reports to the Department of Health were first made in November. These facts are of considerable importance as indicating the interval that elapsed between the onset of symptoms and the date the Department of Health first learned of the infection in New York City.

Month and year of onset	Number of cases	Cases re- ported to the De- partment of Health	Month and year of onset	Number of cases	Cases re- ported to the De- partment of Health
Prior to January 1933 1933 January February March April May June July August September	6 1 1 4 1 9 9 16	 1 1 1 1	1934 January February March April May June June July August September Total	6 4 1 2 2 2 4 3 1 121	21 11 3 3 5 6 6 6 2 3 3 7 7 7 121
October November December	23 21 5	1 25 27			

 TABLE 5.—Onset and report of cases of amoebic dysentery, by months, in New York City, from Jan. 1, 1933 to July 31, 1934

The chronicity of amoebic dysentery is apparent from the histories of 6 cases in which the dates of onset were 14, 13, 11, 7, 6, and 3 years, respectively, prior to the reporting of the disease. These cases are displayed separately in figure 2.



AMOEBIC DYSENTERY

CONCLUSIONS

1. Amoebic dysentery in sufficient degree to cause noticeable symptoms, is probably present in New York City at all times. Α

considerable number of cases are probably not reported to the Department of Health.

2. Much of the amoebic dysentery reported in New York City appears to have originated outside of the city or in foreign countries. The amount of the foreign infection appears to be steady and constant, though not considerable.

3. The outbreak of amoebic dysentery in Chicago in August, September, and October 1933, was responsible for the appearance of the disease in at least 73 persons who visited Chicago and returned to New York City. It is believed that this number represents only a portion of those who acquired the infection at that time.

4. The mortality of 14.0 percent among the 121 patients included in the present report directs attention to the relative severity of the infection, and the need for prompt diagnosis and adequate treatment.

5. Because of efficient transportation facilities, the frequency with which people travel about the country, and the rapidity of disease transference from one section to another, all public health officials have a common problem in preventing and controlling such affections as amoebic dysentery.

6. It is essential that the existence of a disease to an unusual extent be made known promptly to public health officials generally, probably through a central clearing house. With such information it would be possible to institute prompt and appropriate action.

7. Inasmuch as the dysentery infection in Chicago is believed to have been conveyed through the medium of defective plumbing, it behooves all municipalities to take such steps as may be required to prevent the repetition of such an occurrence.

EFFECT OF EXPERIMENTAL LOCAL IRRITATION UPON SUS-CEPTIBILITY TO VACCINE AND ENCEPHALITIS VIRUS (St. Louis type)*

By CHARLES ARMSTRONG, Surgeon, United States Public Health Service

Different agents have been reported as exerting a local modifying influence upon the character of vaccine "takes" in animals by Ledingham (1), Carnot and his coworkers (2), Le Fevre (3), Rivers and associates (4), Seiffert (5), Armstrong (6), and others.

The author (6) in a previous communication showed that the site of a positive Schick response in rabbits remained relatively insusceptible to vaccine virus for at least 20 days. Subsequent to that publication the local inhibitory effect of a previous irritation with diphtheria toxin was further investigated by instilling this agent into the left eyes of rabbits, the instillations being repeated

^{*}From the National Institute of Health, Washington, D. C.

until a conjunctivitis was induced. The animals were then allowed to remain untreated from 3 to 4 weeks until the toxin-treated eyes had apparently returned to normal. An appropriate dilution in saline of heat-selected vaccine virus 28628 (7) was then instilled into each eye, the lower lid being pulled from the eye by gentle traction on the palpebral hair held between the thumb and finger of an attendant. The pocket thus formed behind the lid was then filled with 1:10 dilution of vaccine virus which was allowed to remain therein for 30 seconds.

Both eves of each rabbit received similar treatment. No scarification of any kind was attempted, as it had been found that in this concentration the virus employed would usually "take" on the unscarified surface of the eye. The eyes were examined daily thereafter, and their condition was recorded. By reference to table 1 it may be noted that the toxin-treated eyes tended to be involved later, to be less severely affected, and to recover earlier and more completely than did the nontreated control eyes of the same animals. With the control eyes the lids were often left markedly thickened and puckered and the cornea opaque, while the toxin-prepared eyes tended to return more nearly to normal (figs. 1 and 2). The skin below the control eyes was usually relatively more "scalded" by the greater amount of exudate than was the skin of the toxin-prepared eyes. While the prepared eye became infected with vaccine virus in one instance where its untreated mate remained normal (rabbit 2335), the opposite was true in 3 instances (rabbits 2336, 2337, 2341). The treated eyes in 12 rabbits that survived to recovery evidenced acute vaccinal lesions for a total of 75 days, while the untreated eyes showed acute changes for a total of 128 davs.

In view of these results with the conjunctivae it becomes a matter of interest to determine whether the mucous membrane of the nose, a natural route for infection, can be rendered less susceptible to infection through previous irritation. For determining this point white mice were treated by instilling various mild irritants into the nostrils at weekly intervals and then testing them for susceptibility, 4 days to 1 week after the last instillation, by inoculating them with the virus of encephalitis (St. Louis type) by the same route.

Sodium alum, hypertonic saline, and concentrated glucose solutions were used as preliminary irritants. By reference to table 2 it may be seen that the variously prepared groups of animals tended to resist intranasal inoculation better than did the controls. The group receiving preliminary inoculations of 3 percent alum showed 83 percent survivals following the intranasal virus inoculations, those receiving 4 percent saline showed 64 percent, and those treated with

Public Health Reports, Vol. 50, No. 2, January 11, 1935



FIGURE 1.—Effect of vaccine virus upon toxin-prepared left eye (Rabbit 2208). Lid slightly thickened, not puckered. Cornea clear. (April 25, 1933)

PLATE 1

10 percent to 20 percent glucose solution showed 48 percent survivals, as compared with 38 percent of survivals for the nonprepared control group. Deaths, when they occurred, also tended to be later in the prepared groups.

Since 3 percent sodium alum solution gave the best results of any agents tried, it was deemed desirable to test the effect of weaker solutions. From table 3 it may be noted that they were less effective. Stronger solutions tended to kill some of the animals within a few hours, probably due to the tissue changes mechanically interfering with respiration.

In considering the modifying action of diphtheria toxin upon the cutaneous response to vaccine virus in rabbits, it was shown (6) that the effect was due to the induced tissue response which modified the subsequent local and general reaction to vaccine virus rather than to any direct action of the toxin upon the infectious agent. It is believed that the same explanation applies to the effects above recorded with agents introduced into the nostrils, although it is conceivable that these effects may be due to a toughening of the mucous membranes by the astringent agents which rendered them mechanically impermeable to the virus. That this latter explanation is not the correct one is indicated by the fact (table 3), that 42 of 63 intranasally prepared white mice which survived the intranasal virus inoculation proved to be immune to an intracerebral inoculation of virus which killed all of 55 normal control mice, while among 52 unprepared animals which survived the intranasal inoculation there were 29 which survived the intracerebral immunity test.

It was found that the intranasal inoculation of alum did not influence the resistance of mice to an intracerebral inoculation of virus, thus indicating that the protective effect of the alum was a purely local one. Olitsky and Cox (8) recently reported that tannic acid, 0.5 to 1 percent solution, when instilled into the nostrils of white mice 3 times daily for 3 successive days, rendered the mice temporarily markedly resistant to the intranasal inoculation of equine encephalomyelitis virus administered 1 day following the last tannic acid treatment, but report no immunity tests on the survivors.

The experimental results above recorded suggest that through the occasional introduction of astringent or other agents into the nostrils, the local tissues may be so modified that resistance to recognizable infection by this route may be increased while the capacity to develop specific immunity through subclinical infection is not interfered with or may even be enhanced. It is possible, however, that such astringent or mildly irritant treatment, if applied in the face of an epidemic or in the presence of the virus, might enhance susceptibility to infection. In order to test this possibility, groups of mice were given 0.04 cc of 3 percent alum intranasally 1 day before and 1, 2, and 3

vaccine virus	Remarks	No ulcers on cornea.		Cornea opaque; no ulcers.	Normal.	Normal.	Sl. opaque; lid sl. thick.	Pneumonia.	Normal.	Cornea clear; lid thickened.	Normal.	Normal.	Normal.	Normal.	Normal.	Normal.
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TABLE 1.—Conjunctivitis induced by diphtheria toxin and its influence upon subsequent local infection with vaccine virus

•ou :	Treatment dates					5	Cond	tion	of no	npre	pare	d rigi	ht ey	68 (C	ontro	d (si	y da	7s fol	lowir	ıg ap	plica	tion	of vaccine virus
lddsA	Diphtheria toxin 1:1 (left eye)	Vaccine virus 1:10 dil.	3	4	2			6	2	=	13	13	14	15	16	11	99	10	8		8	8	4 Remarks
2205				-	3	8	3										11					\vdash	Ulcers on cornea.
2206		•	1	1	1			 .				1	1	1	1	1	1	1	1				
2207		33	1	-	5	8	0		[**	~	8	A					Ī	ΓŤ	Ħ				Central ulcer-opaque.
2208		61 '0	-	~	4	4	4	4	4	4	4	4	4	3	3	2	-	-	-				Cornea opaque, lid thick.
2209		I .18	1	1	-	10	3	~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~	~	3	4	4	4	3	•	10	-				Pupil irregular, lid thick.
2210		W	1	-	5	~ ~		4	4	4	4	4	4	4	°°	ŝ	3	5	-				Cornea opaque, lid very thick.
2211		•	1	1	1				A									Ħ	ίŤ				
2212		·	1	1		61	8	~~	~ ~	°	8	~	10	-	-	1		İİ.				$\left \frac{1}{2} \right $	Normal.
2335			1	1		<u> </u>			<u> </u>			<u> </u>	1	1	1	1	1	<u> </u>					Normal.
2336			T	1	-	5	5	8	8	3	5	-	-	1	1	1	1	$\frac{1}{1}$				$\left \right $	Normal.
2337		1933	-	6	67	8	8	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	2 Cornea cloudy, lid thick.
2338		'0I ·	1	1	1						1	1	1	1	1	1	1	1					Normal.
2330		V.B.N	1	1					1	1	1	11	1	1	1	1	1	1					Normal.
2340		 I	1	-	8	4	4	4	4	4	4	4	4	4	4	~	3	~	10	10	61	0	I Cornea opaque, lid thick.
2341		•	1	-	3	4		1	3	8	ŝ	8	2	2	-	-	-	11			+	$\left \frac{1}{1} \right $	Normal.
			1		1	-	-	-	-								1	-	-	-	-	-	

1=slight irritation. 2=slight irritation and swelling. 3=marked irritation, swelling, watery exudate.

4=swollen shut, pussy exudate. D=died. TABLE 2.—Effect of the intranasal administration of various substances upon subsequent intranasal exposure to encephalitis virus (white mice)

bəvivu	Percent s	82338	
of mice surviving noitsingon	8823		
of mice inoculated	19danN ni	6 8333	
	M.JqeS		
ı viru	Sept. 23		
alitis	Sept. 22	1 1	
œph	Sept. 21		
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ation	Sept. 18	6	
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Dea	Sept. 8		
En- Cepha- litis virus, 1:800 dil. dil. sally	Sept. 7	++++	1.1
ant	Sept. 3	+++1	1
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al tre	8I .3nA	+++1	
anasi 1934)	01 .3nV	+++।	
intr (\$.3n¥	+++1	
lo se	1njA 32	+++1	
Dat	91 Tuly 18	+++1	
Preliminary intranasal treatment materials		Sodium alum, 3 percent. Bodium chloride, 4 percent. Olucose, 10 to 20 percent. Nontreated controls.	1 Mine duine mithin 1 dome of the

¹ Mice dying within 4 days of the intranasal inoculation are excluded.

TABLE 3.—The effect of the intranasal administration of various dilutions of sodium alum upon subsequent intranasal exposure to encephalitis virus (white mice)

of mice surving tion 4 days or more	Number inocula	21 13 13
of mice inoculated intranasally	Number	***
	Nov. 16	
viru	Nov. 15	-
litis	Mov. 14	
epha	Nov. 13	1
1 600	Nov. 12	
witl	11 .voN	
tion	Nov. 10	
oculs	8 .voN	3
e lin	8.voN	36
BDBS	7.VoV	12 5 2
intr	8 .voN	69 F9 69
wing	Nov. 5	
follo	№ .voN	
lays	8 .voN	
by d	Nov. 2	
aths	1.voN	
Ď	Oct. 31	
Date of intrana- sal inoc- ulation with enceph- alitis virus	Oct. 30	+++
34)	0ct. 23	+++
Date Intrest tree (190	Oct. 16	+++
Preliminary intranasal treatment	-	Solution of sodium alum, 3 percent. Solution of sodium alum, 1.5 percent

TABLB 4.—The effect of the intranasal administration of 3% sodium alum when given shortly before and shortly after the intranasal exposure to encephalitis virus (white mice)

355 3 5 3 36 pt. 23 11 framasal 11 1 26 pt. 23 11 1 26 pt. 23 11 1 26 pt. 24 11 1 26 pt. 25 11 1 26 pt. 25 11 1 26 pt. 26 11 1 1 11 1 1 11 1 1 11 1 1 11 1 1 11 1 1 11 1 1 11 1 1 11 1 1 11 1 1 11 1 1 11 1 1 11 1 1	
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Freliminary intranssal treatment tion of sodium alum, 3 percent	

days following the intranasal virus inoculations. The results (table 4) indicate that such application just preceding or soon after the intranasal administration of the virus does not increase susceptibility but may actually decrease it. The experimental work here reported therefore suggests lines of study which may possibly lead to the development of procedures of practical value in preventing infections contracted by way of the nasal mucous membranes.

SUMMARY

1. Previous irritation of the conjunctivae of rabbits by the instillation of diphtheria toxin tends to render the eye relatively resistant to infection with vaccine virus for at least 26 days after the last toxin application.

2. The action of 3 percent sodium alum when introduced at weekly intervals into the nostrils of white mice tends to render the animals relatively resistant to infection with encephalitis virus (St. Louis type) administered by the same route. Saline, 4 percent, and glucose, 10 percent to 20 percent, exert a similar though less marked effect.

3. The immunity response to intranasal inoculation with encephalitis virus is not prevented by the preliminary treatments of the avenue of infection.

4. Alum 3 percent when administered intranasally to white mice, just before or just after the application of encephalitis virus by the same route, did not enhance the susceptibility of the animals to the virus.

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BLOOD CHOLESTEROL IN LEPROSY

A Study of the Total and Free Cholesterol, Cholesterol Esters, Van den Bergh Reaction, and the Complement Fixation Test

By SAM H. BLACK, Acting Assistant Surgeon, and HILARY ROSS, Medical Technician, U. S. Public Health Service, National Leprosarium, Carville, La.

In recent years considerable attention has been given to the subject of cholesterol and its diagnostic importance. It has long been known that cholesterol occurs in the animal body in two principal forms; namely, free and combined with the higher fatty acids as cholesterol oleate, palmitate, and stearate, termed "cholesterol esters." Cholesterol is possibly an almost universal constituent of the body tissues. It enters into the structural make-up of the cells. It is found abundantly in the nerve tissue, liver, bile, red blood cells, and plasma. It is a constituent of the normal skin secretions, both the sebum and perspiration.

The values of the cholesterol in the blood of human beings represent the resultant of many factors. It is agreed that the greatest source is exogenous, and that this alimentary absorption depends on the amount of cholesterol in the ingested food and the presence of fatty acids, bile, and pancreatic juices in the intestine. There can be no doubt of the endogenous production of cholesterol, since Channon (1) points out that on cholesterol-poor diets animals grow and will produce far more cholesterol in the tissues than they receive. Hawk (2) is of the opinion that most of the cholesterol is exogenous, but that under special stress the body may be able to produce endogenous cholesterol. There is as yet, however, no clear conception of the origin of the esters of cholesterol in the body. Morse (3) states: "Bloor believes that much of the digested fat, especially the unsaturated fatty acids, is carried through the blood stream as cholesterol esters, the esterification being accomplished by way of the secondary alcohol." Bloor, Okey, and Corner (4), in a study of the lipoid content of the corpus luteum of the sow, observed that cholesterol esters were found to vary inversely with the activity of the gland, a high content being characteristic of the degenerated organ, and concluded that cholesterol esters seem to be related to inactivity or retrogression.

The fact that cholesterol plays a part in lymphoid defense (Dewey and Nuzum (5), Luden (6)), its ability to protect blood cells from hemolysis, and the universal presence of cholesterol or related sterols in plant and animal cells may lead one to suspect cholesterol to be an element in the nonspecific mechanism of defense in the body. It seemed, therefore, that the possible influence of cholesterol as a defensive agent or index of nonspecific defense should be particularly conspicuous in a chronic infection, such as leprosy, which produces pathological changes in the liver, many tissues of the body, and peripheral nerves. In a study by one of us (7) the albumin-globulin ratio, perhaps also to be included among the nonspecific defense indices, was found to be considerably affected. The hope of detecting a similar role for cholesterol was one of the reasons that the present study was begun.

A second reason was to determine whether the cholesterol metabolism bore any relation to the complement fixation test in leprosy. The fact that the sera of lepers give so high a percentage of positive reactions with antigens ordinarily used for the Wassermann test seemed to us to be interpreted illogically as indicative of a superimposed or underlying infection with syphilis. We know that the test is not biologically specific and does not represent a true inter-reaction between an antibody and an antigen in a strictly immunologic sense. Kolmer (8) states, in substance, that all definitely known of the reaction is that while lipoidal extracts (antigens) as well as normal and luetic serums may separately absorb or fix small amounts of complement, a mixture of a suitable extract and a syphilitic serum is capable of fixing large amounts of complement.

It occurred to us that cholesterol, which is one of the lipoids, might play a part in the reaction, and if so, this fact could be brought out by doing serial Wassermann tests and parallel cholesterol determinations; then, on tabulating the results, any correlation between the variations in the cholesterol content and the degree of fixation in the Wassermann could be observed.

The 200 patients selected were of various types, duration of leprosy, and state of progression, and their blood was analyzed for total cholesterol and cholesterol esters, and their sera for the Van den Bergh test and the complement fixation.

Control blood and sera were collected from 20 young men and women, employees of this institution, and analyzed coincidentally with the patient's blood and sera.

ANALYTICAL METHODS

Approximately 10 cc of blood were collected for analysis from a cubital vein. The blood was collected after a 16-hour fast, to exclude the effect of digestion from the previous meal. Bloor (9) has found that the postabsorptive condition 8 to 16 hours after the last meal is "practically the only time when the blood is free from the influence of ingested or mobilized fat." Whole blood was used for the cholesterol and cholesterol-ester determinations; and serum, which was removed from the clot from 3 to 4 hours after the specimen had been taken, was used for the Van den Bergh test and the complement fixation. The serum was preserved at a temperature of 6° to 8° C. All analyses were completed within a week.

The total cholesterol was determined according to the method of Bloor (10); the cholesterol esters were determined by the Bloor and Knudson method (11), utilizing for both the Lieberman-Burchard reaction as modified by Mirsky and Bruger (12) for the color development; free cholesterol was determined by subtracting the cholesterol esters from the total cholesterol, the Van den Bergh test, direct and indirect (quoted by Kolmer and Boerner) (13); the complement fixation by Kolmer's quantitative method.

TABLE 1.—Determination for controls

20 CASES

	Choleste	rol, milligran blo	ms per 100 cc bod	of whole
	(D-4-)		Es	ter
	TOTAL	F166	Amount	Percent
Minimum A verage Maximum	133 150 178	45 64 95	68 86 106	45. 1 57. 6 67. 8

The general literature on the total cholesterol content of the blood presents results of wide variability, ranging as low as 110 mg, and as high as 250 mg per 100 cc of whole blood, although various textbooks of physiologic chemistry (e. g., Meyers (14)) and Morse (3) state that the normal limits of cholesterol in whole blood are from Although our figures for the controls (table 1) range 140 to 170 mg. from 133 to 178 mg, we have found in an earlier experiment as high as 200 mg in apparently normal individuals. We have therefore considered a blood cholesterol below 130 mg as subnormal (hypocholesterolemia); from 130 to 180 mg as the average normal range; from 180 to 200 mg as suggestive of hypercholesterolemia, but still within the normal limits; and above 200 mg as definitely elevated (hypercholesterolemia). The average figures for cholesterol esters agree with the findings of Bloor and Knudson (11). The Van den Bergh test, direct and indirect, as well as the complement fixation, is negative in all cases.

The data which have been obtained on the whole blood and sera of lepers have been divided into the three stages of activity; namely, those cases showing improvement (table 2), those remaining stationary (table 3), and those cases showing retrogression (table 4).

TABLE 2.—Stage of activity, improving

78 CASES

	Cholesterol	, millig r ams	per 100 cc of	whole blood	
			Ester		
	Total	Free	Amount	Percent	
Minimum Average Maximum	132 182 320	28 70 160	60 110 177	40 60. 6 83	

The results presented in table 2 show that the average findings for the total and free cholesterol, cholesterol esters, and the percentage of esters are slightly higher as compared with the controls, but fall 101955°-35----2 within the normal range. Of the 78 cases, 63 showed normal values for total cholesterol, while 15 showed a definite hypercholesterolemia. Of the 63 cases showing a normal total cholesterol, 11 showed a definite percentage increase of esters, while in the 15 cases showing a hypercholesterolemia an increase was found in 3 cases. The Van den Bergh test was positive in 55 of the cases, and 30 showed a positive complement fixation.

TABLE	3.—Stage	of	activity,	stationary
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	Cholesterol, milligrams per 100 cc of whole blo						
			Es	Ester			
	Total	Free	Amount	Percent			
71 CASE	S		•				
Minimum Average Maximum	139 181 246	21 63 144	58 117 177	40. 7 64. 9 86. 5			

The results presented in table 3 show that the average of the findings for the total cholesterol approximates that in table 2. The amount of esters, as well as the percentage of esters, is slightly higher, though within the normal range. Of the 71 cases, 58 showed normal values for total cholesterol, 13 showing a definite hypercholesterolemia. Of the 58 cases showing a normal total cholesterol, 21 have a definite percentage increase of esters, while 4 of those showing a hypercholesterolemia have a high percentage of esters. The Van den Bergh test was positive in 43 cases, and 31 showed a positive complement fixation.

TABLE 4.—Stage of activity, retrograding)

	Cholesterol, milligrams per 100 cc of whole bloo							
	Total		Ester					
		Free	Amount	Percent				
51 CASE	3							
Minimum A verage Maximum	120 175 295	22 48 125	72 127 188	48. 3 72. 7 88. 7				

The results presented in table 4 show that the average of the findings for the total and free cholesterol is lower than that in the two preceding tables. The average results of the esters are higher, whereas there was a more striking increase in the percentage of esters than in those cases showing improvement and remaining stationary (tables 2 and 3).

Of the 51 cases, 38 showed normal total cholesterol values, 11 showed a definite hypercholesterolemia, and 2 cases showed a hypocholesterolemia. Of the 38 cases showing a normal total cholesterol, 29 have a percentage of esters above normal; while of the 11 showing a hypercholesterolemia, 9 have an increase in the percentage of esters. The Van den Bergh was positive in 40 of the cases; while in the complement fixation, 22 were positive.

In the entire series (tables 2, 3, and 4) the total cholesterol, as well as the percentage of esters, fluctuated within comparatively wide limits. The total cholesterol ranged from 120 mg to 320 mg per 100 cc of whole blood; while in the controls, the total cholesterol ranged from 133 mg to 178 mg. The percentage of esters in the patients' blood ranged from 40 to 88.7 percent, as against 45.1 to 67.8 percent in the controls.

Of the 200 cases, 159 showed a normal total cholesterol; and of these, 61 had an increase in the percentage of esters. A definite hypercholesterolemia was found in 39 of the cases; and of these, 16 had an increase in the percentage of esters. There were only two cases showing a hypocholesterolemia.

The Van den Bergh test was positive in 138 of the cases. Of the complement fixation, 83 were found to be positive.

The duration of leprosy ranged from 5 months to 30 years.

In view of the close association of cholesterol with lipoid nephrosis, and of the findings of Epstein (15), who has attempted to distinguish as a pathological entity a condition which runs a chronic course and is characterized by oedema, excessive albuminuria, high cholesterol, and the absence of any marked nitrogen retention of the blood, determinations have been made of the blood urea nitrogen on 18 of the patients who showed a hypercholesterolemia, and urinalyses on 39 of the patients (total number showing a hypercholesterolemia) to determine any nitrogen retention and if albuminuria was present.

The results showed that 12 of the 18 cases had a urea nitrogen retention ranging from 22 to 40 mg per 100 cc of whole blood. Of these, only 1 case showed albuminuria. The urinalyses were negative for sugar and albumin in 38 of the 39 cases. No definite relation existed between the hypercholesterolemia and the degree of urea nitrogen retention in the cases studied. The increase in the cholesterol content in the above series is probably not associated with lipoid nephrosis.

It was thought that the administration of chaulmoogra oil, or its preparations, in large doses, such as given in the treatment of leprosy, might in some way affect the lipoid metabolism of the body, and any alteration caused by their administration might be reflected in the cholesterol content of the blood. An investigation was made and it was found that neither the oral nor intramuscular injections of the oil or its esters had any influence on the total, free, or cholesterol esters.

		Chole	sterol	
			Est	0 rs
	Total Free —		Amount	Percent
Negative (11)	7 cases)		<u> </u>	
Minimum A verage Maximum	129 180 295	22 64 144	60 117 177	40. 0 64. 8 86. 2
One plus (25	cases)			
Minimum A verage Maximum	120 179 266	24 65 116	70 114 188	40. 0 63. 9 88. 7
Two plus (2	5 cases)		<u> </u>	
Minimum A verage Maximum	133 169 215	21 55 88	80 114 160	47.6 67.6 86.5
Three plus (2	0 cases)			
Minimum A verage Maximum	128 177 240	23 57 104	86 120 186	48. 0 67. 9 82. 7
Four plus (13	cases)			
Minimum A verage Maximum	139 191 320	32 70 160	72 121 177	45. 0 63. 5 83. 1

TABLE 5.—Cholesterol and its relation to the complement fixation

Table 5 gives the minimum average and maximum findings in the patients who have a negative complement fixation, those that are 1 plus, 2 plus, 3 plus, and 4 plus. The results show very little variation between the groups into which the cases have been divided. The average of findings for total cholesterol is highest in those cases that are 4 plus, but falls within the normal average range. In some cases the cholesterol values parallel roughly the degree of fixation, while in others no such correlation could be found.

DISCUSSION

Regarding the fate of cholesterol in the body, there is some evidence that it may be oxidized, and also that it may be a source of the bile acids. Ordinarily, however, the greatest part, if not all, of the excess of cholesterol is excreted in the feces or by the skin after partly undergoing slight oxidation or reduction. It is excreted in the intestine practically entirely free, while in the skin secretions it appears almost entirely as esters of the fatty acids. The data obtained from the 200 cases show that the cholesterol esters may be considerably higher in lepers than in normal individuals. It is apparent, too, that this increase is associated with retrogression. We know that leprosy produces pathological changes in many tissues of the body. Degenerative processes manifest themselves in various organs, such as the liver, spleen, and kidney. The prominent clinical manifestations occurring in the skin may be functional, structural, or circulatory functional, as the various types of anesthesia; structural, as the various types of pigmentation, atrophy, infiltration, suppuration; and circulatory, as hyperemia, ischemia, or oedema.

When one considers the excessive breakdown of tissues, and the above cited functional, structural, and circulatory changes of the skin, it seems logical that there should be a partial suppression of the excretory function of the skin. We know that in addition to the kidneys, lungs, and intestinal tract, the skin also plays a part in removing some of the deleterious or used-up products from the body. If there is a reduced capacity to excrete the end products, there will be an accumulation of them in the blood. Also, while it may be that the excretion of sterols is a mechanism of the body for getting rid of a waste product of metabolism, it is also possible that the constant secretion of sterols on the surfaces of the body is necessary to preserve their normal physical, chemical, and immunologic status; and this is not maintained in leprosy, as the skin of the patient is not supple and soft.

It is impossible at this time to explain satisfactorily the interrelation between leprosy and the increase in cholesterol esters, as most phases of cholesterol metabolism are still awaiting an intelligent solution, but it seems from our findings that the blood cholesterol ester changes associated with leprosy appear to be the result of a widespread disorder of function of the body tissues, involving the skin, sweat and sebaceous glands, and probably the internal organs.

SUMMARY

Blood from 20 normal, healthy, young men and women was examined for total and free cholesterol, cholesterol esters, and the percentage of esters; and sera were used for the Van den Bergh test, direct and indirect, and the complement fixation test. Blood from 200 lepers, representing the various types and stages of progression and activity of the disease, was similarly examined. The esters, as well as the percentage of esters, averaged higher in the lepers than in the normal controls, the highest being found in the group retrograding.

A definite hypercholesterolemia was found in 39 of the cases. A study of the blood urea nitrogen on 18 of the cases was made, and urinalyses on the 39 cases. The results showed no definite relation between the hypercholesterolemia and the degree of nitrogen retention. Albuminuria was present in one case. The increase of cholesterol in these cases is probably not associated with lipoid nephrosis, but with other metabolic disturbances.

Serum bilirubin was determined qualitatively and quantitatively, and was found to be positive in 138 cases. The qualitative was of the delayed type, showing the possibility of early hepatic lesions rather than duct occlusion. The quantitative showing hyperbilirubinemia fell in the zone of latent jaundice.

A study of serial complement fixation tests with parallel cholesterol determinations on the blood was made. In some cases, the cholesterol values parallel roughly the degree of fixation, while in others no such correlation could be found. The degree of fixation seems to be independent of the cholesterol content of the blood.

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COURT DECISION ON PUBLIC HEALTH

Law regulating barbering upheld in action seeking to enjoin enforcement.—(South Dakota Supreme Court; Mundell v. Graph et al., 256 N. W. 121; decided July 30, 1934.) The plaintiff, a barber, refused to secure a renewal or restoration of his certificate of registration under the South Dakota act regulating the practice of barbering upon the broad ground that the whole law was unconstitutional. He commenced an action asking that the State barber board and certain other officials be permanently enjoined from enforcing the provisions of the barber law and from interfering with or arresting him on account of his noncompliance therewith.

In disposing of certain points raised against the law on the ground that it was a tax measure, the supreme court said that "it is plain beyond possibility of controversy that the statute was intended to be and is an exercise of the police power and not of the taxing power" and that "Constitutional restrictions applicable solely to the legisla tive exercise of the taxing power are not pertinent here."

It was also claimed by the plaintiff that the act was not sustainable as a health measure. In entering upon a consideration of this contention the court stated:

That the business of barbering so directly affects the health and welfare of the public as to be subject to control and regulation under the police power appears universally to be held, so far as we have been able to discover, in every State where the question has been presented. * * *

The court declared itself satisfied that the act was an exercise of the police power and that the occupation of barbering was subject to regulation under the police power. The opinion closed with the following language:

The statute here involved contains a "saving clause" (sec. 23) similar to that considered in the case of *State ex rel. Botkin* v. *Welsh* (1933) 61 S. D. —, 251 N. W. 189, at page 215, providing that partial invalidity shall not destroy the act. Many of the objections urged by respondent he is not in position to present in this case, and it is not here necessary for us to examine and review every section or every clause of the statute and determine the individual validity thereof. Conceivably various provisions of the law might be held unconstitutional and yet the act could stand as a whole. The validity of specific portions of the act will be reviewed by this court if and when they are presented here by a person who is being adversely affected by them. Respondent has already done

everything the act requires to entitle him to his certificate save only to submit proof of his present freedom from infectious and contagious disease and pay a fee. He makes no allegation that either of those two requirements is in itself unreasonable or arbitrary or unconstitutional, and he must therefore stand or fall on the proposition that the statute is so infirm as to be entirely invalid. Whether every specific provision of the statute is in all respects valid and enforceable according to the terms thereof we have made no investigation and we do not undertake to determine in this case. We are satisfied that the act is an exercise of the police power and that the business or occupation of barbering is subject to regulation and control under the police power and that, after eliminating all portions of the act, the validity of which might be at all questionable, a complete workable and constitutional whole would remain which would have to be sustained in the light of the legislative declaration as to its intention in case of partial invalidity. That being true, the present attack upon the statute by this respondent, which is bottomed upon establishing invalidity so extensive as to destroy the whole law, must fail.

DEATHS DURING WEEK ENDED DEC. 22, 1934

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

	Week ended Dec. 22, 1934	Correspond- ing week, 1933
Data from 86 large cities of the United States: Total deaths. Deaths per 1,000 population, annual basis. Deaths under 1 year of age e. Deaths per 1,000 population, annual basis. Deaths under 1 year of age per 1,000 estimated live births. Deaths per 1,000 population, annual basis, first 51 weeks of year. Data from industrial insurance companies: Policies in force. Number of death claims. Death claims per 1,000 policies, first 51 weeks of year, annual rate. Death claims per 1,000 policies, first 51 weeks of year, annual rate.	9,019 12.7 584 55 11.3 67,079,418 13,066 10.2 9.8	8, 566 12. 0 667 1 49 10. 9 67, 291. 366 13, 664 10. 6 9. 8

¹ Data for 81 cities.

PREVALENCE OF DISEASE

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

UNITED STATES

CURRENT WEEKLY STATE REPORTS

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

Reports for Weeks Ended Dec. 29, 1934, and Dec. 30, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 29, 1934, and Dec. 30, 1933

	Diph	theria	Influ	ienza	Me	Measles		Meningococcus meningitis	
Division and State	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	
New England States: Maine New Hampshire Vermont Massachusetts Rhode Island Connectiont	1 17 6	 18 3 7	2		$ \begin{array}{r} 3 \\ 24 \\ 2 \\ 112 \\ 6 \\ 278 \end{array} $	165 40 567 2	1 0 0 1 0	000000000000000000000000000000000000000	
Niddle Atlantic States: New York New Jersey Pennsylvania.	38 33 42	52 30 56	1 76 360	¹ 14 18	218 378 48 815	437 129 509	2 2 1	0 0 5	
OhioIndianaIllinois Michigan Wisconsin	97 39 73 16 6	101 39 53 11 5	360 50 57 8 25	84 63 27 30	435 211 1, 056 101 369	$156 \\ 108 \\ 53 \\ 16 \\ 168$	7 1 7 2 4	1 0 7 2 1	
West North Central States: Minnesota Iowa ³ Missouri North Dakota South Dakota Nebraska Kansas	13 7 37 16 11 9	6 13 45 4 7 13 31	2 80 32 	2 3 10	298 917 213 126 18 44 327	14 51 158 62 197 8 24	0 3 1 0 3 2	0 1 0 1 0 0	
South Atlantic States: Delaware	3 5 30 29 17 5 20 10	3 9 55 32 34 7 9 11	4 115 3 	2 30 1 	2 42 4 112 237 503 8 9 7	13 18 48 109 18 706 75 291 27	0 0 1 2 0 1 0 2 0	0 1 3 1 9 2 0	

See footnotes at end of table.

January 11, 1935

Cases of	certain communicable	diseases reported by	telegraph by State health	officers
·	for weeks ended Dec.	. 29, 1934, and Dec.	30, 1933Continued	-

	Dipl	htheria	Infl	uenza	Me	asles	Menin men	gococcus ingitis
Division and State	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933
East South Central States: Kentucky	36 32 28 8	20 26 30 9	23 79 258	12 53 17	140 11 174	23 148 64	1 0 4	0011
West South Central States: Arkansas. Louisiana. Oklahoma ¹ . Texas ³ .	15 19 17 67	19 49 35 198	16 6 123 208	44 1 109 138	18 23 4 32	63 91 174	0 1 1	000000000000000000000000000000000000000
Mountain States: Montana. Idaho W yoming. Colorado. New Mexico.	10 2 12 3	2	5	7	68 3 5 309 31	3 1 107 5 31	0 1 0 1 1	000000000000000000000000000000000000000
Arizona Utah Pacific States: Washington Oregon California	1 1 1 48	4 3 7 13	32 4 1 74 42	40 3 46 10	16 16 69 13 66	4 429 201 19 326		000000000000000000000000000000000000000
Total	888	1, 093	3, 975	1, 158	7, 703	5, 861	62	31
	Poliomyelitis Scarlet fever Smallpox		Poliomyelitis Scarlet fever Smallpox 7		Typho	id fever		
Division and State	Week ended Dec. 29, 1954	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933
New England States: Maine New Hampshire Vermont Massachusetts Rhode Island Connecticut Uiddlo Atlonetic Scates	0 0 0 0 0 0	0 0 0 0 0	18 19 17 145 12 46	6 8 19 179 10 48	0 0 0 0 0	0 0 0 0 0	4 1 0 2 0 1	3 0 0 4 1 1
New Jersey Pennsylvania East North Central States	1 1 1	2 1 1	450 104 361	420 135 480	0 0 0	0 0 0	7 4 7	9 4 16
Ohio Indiana Illinois Michigan Wiscorsin Ware block Octavel Octave	2 0 1 0 0	4 0 3 0 2	805 202 610 276 375	517 167 481 124 154	1 0 4 1 19	0 0 0 1 35	4 7 11 0 0	4 5 25 7 0
Minnesota Iowa ² Minsouri North Dakota South Dakota Nebraska Kansas	1 0 1 0 1 0	1 0 0 0 2 0	106 64 57 69 13 30 67	46 65 77 18 5 35 94	6 0 4 5 10 2	2 7 5 0 0 6 1	1 4 9 0 0 0 2	2 0 5 0 1 2
South Atlantic States: Delaware. Maryland ² . District of Columbia Virginia West Virginia. North Carolina ³ . South Carolina. Georgia ³ . Florida.	0 0 1 0 0 0 0 0 2	0 0 1 1 1 2 1 0	7 101 28 86 125 42 8 16 16	7 61 19 95 73 63 6 8 1	0 0 0 0 0 1 0 1	0 0 0 4 1 0 0 0	0 1 7 1 11 5 7 2	0 4 2 7 1 1 1 3 4

See footnotes at end of table.

	Poliomye!itis		Scarlet fever		Smallpox		Typhoid fever	
Division and State	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933	Week ended Dec. 29, 1934	Week ended Dec. 30, 1933
East South Central States: Kentucky Tennessee Alabama ³ Mississippi ³ Wort South Central States:	0 0 0 1	0 0 0 1	57 61 12 17	21 72 25 17	0 2 1 0	0 5 1 0	4 5 10 4	8
Arkansas. Louisiana Oklahoma ¹ Texas ³	1 0 2 1	0 1 0 0	12 22 46 50	14 29 53 110	5 4 1 5	4 0 1 13	10 11 12 19	1 3 3 20
Molinkan States: Montana Idaho Wyoming Colorado New Mexico Arizona Utah	0 0 0 0 1 0	0 0 0 0 1 0	10 2 13 179 17 14 53	11 6 15 11 5 16 17	0 4 1 0 0	0 2 0 9 0 0 13	0 0 0 2 4 0	
Pacific States: Washington Oregon California	0 2 26	2 0 2	27 62 170	26 38 129	29 1 6	5 5 5	2 0 5	0
Total	46	29	5, 099	4, 036	113	125	187	188

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 29, 1934, and Dec. 30, 1933—Continued

 New York City only.
 Week ended earlier than Saturday.
 Typhus fever, week ended Dec. 29, 1934, 27 cases, as follows: North Carolina, 1; Georgia, 18; Alabama, 1; Texas, 7. ⁴ Dengue, week ended Dec. 29, 1934, 36 cases in Georgia. ⁴ Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Menin- gococ- cus menin- gitis	Diph- theria	Influ- enza	Malaria	Measles	Pel- lagra	Polio- mye- litis	Scarlet fever	Small- pox	Ty- phoid fever
Notember 1934 Arizona	3 5 1 	22 68 113 112 43 4 52 2 18 356 21	93 8 22 29 29 33 13 2 114 14 126 77	153 2 1 1 2 2 23	55 32 534 22 155 399 1 220 52 103 628 411	1 	9 1 10 6 4 7 1 12 0 4 48	172 29 251 90 416 63 11 137 219 93 540 186	4 2 8 0 0 0 0 55 0 114 99	30 5 8 43 31 5 33 4 7 5 31 13
Wisconsin Wyoming	22	30 5			813 16		í	1, 540	8	Ő

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November 1934		November 1934		November 1934	
Actinomycosis:	Cases	Lothargic encephalitis:	Cases	Septic sore throat-Contd.	Cases
Washington	3	Kansas	2	Wisconsin	- 4
Chicken pox:	-	Louisiana	1	Wyoming	2
Arizona	56	Montana	1	Tetanus:	-
Idaho	53	North Dakota	1	Kansas	2
Kansas	588	Washington	1	Louisiana	5
Louisiana	8	Mumps:	•	South Dakota	1
Maryland	318	Arizona	9	rachoma:	40
Montana	166	Kansas	121	Arizona	43
Nevada	22	Maryland	37	Montana	1
North Dakota	203	Nonth Debote	132	Tuleroomie:	•
Oregon	1/2	Oregon	158	Louisiana	1
South Dakota	100	South Dakota	100	Maryland	- i
Virginia	192	Virginia	126	Neveda	î
Wisconsin	2 630	Washington	174	Virginia	
Wyoming	37	Wisconsin	323	Wisconsin	7
Conjunctivitis:		Wyoming	ĩ	1 vohus fever:	•
Arizona	4	Ophthalmia neonatorum:	-	Louisiana	2
Devil's grippe (Dabney's		Maryland	4	Maryland	1
grippe (isuble):		South Dakota	ī	Virginia	1
Virginia	3	Virginia	1	(ndulant fever:	
Diarrhea:		Paratyphoid fever:		Kansas	6
Maryland	14	Kansas	1	Louisiana	2
Diarrhea and dysentery:		Louisiana	1	Maryland	7
Virginia	84	Virginia	3	Montana	1
Dysentery:		Puerperal septicemia:	_	Oregon	4
Arizona	15	Washington	2	South Dakota	1
Louisiana (amoebic)	5	Rabies in animals:		Virginia.	2
Louisiana (bacillary)	- 4	Kansas	6	wasnington	3
Maryland	5	Louisiana	15	Wisconsin	3
Oregon	1	Maryland	1	Vincent's injection:	10
Washington (amoebic)	1	Weghington	4	Manyland	10
Washington (Dacmary)	1	Debies in men:	•	Montene	10
Food poisoning.	1	L'anisiana	1	North Dekote	ż.
Gormon meeslos:	1	Rocky Mountain spotted	-	Oregon	Ř
Arizona	26	favor.		Whooping cough:	•.
Konsas	24	South Dakota	2	Arizona	49
Maryland	8	Virginia	ī	Idaho	35
Montana	73	Scabies:	-	Kansas	243
Washington	59	Kansas	7	Louisiana	12
Hookworm disease:		Maryland	4	Maryland	184
Louisiana	19	Montana	9	Montana	71
Impetigo contagiosa:		Oregon	44	North Dakota	191
Kansas	12	Septic sore throat:		Oregon	44
Maryland	81	Arizona	2	South Dakota	64
Montana	29	Idaho	3	Virginia	455
Oregon	54	Kansas	3	Washington	114
Washington	1	Louisiana	.4	Wisconsin	1,011
Jaundice, epidemic:	-	Maryland	10	w yoming	17
Alontana	1		1		
Leprosy:	_	Vregon	, Z		
Louisiana	2	v irginia	14		

WEEKLY REPORTS FROM CITIES

City reports for week ended Dec. 22, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and situ	Diph-	Influenza		Mea-	Pneu- monia	Scar- let	Small-	Tuber-	Ty- phoid	Whooping	Deaths,
State and city	cases	Cases	Deaths	cases	deaths	fever cases	cases	deaths	fever cases	cough cases	causes
Maine:											
Portland	0			0		5	0		0	3	19
New Hampshire:		1	1 1								
Concord	0			0		0	0		0	0	13
Nashua	0			0		1	0		. 0	0	
Vermont:											
Barre	U U		0	0	0	0	0	1	0	5	3
Burlington	0		0	0	0	3	0	0	0	0	12
Massachusetts:				-							
Boston	2		0	8	18	31	0	6	1	23	214
Fall River	1		0	47	1	0	0	1	1	1	28
Springfield	0		0	4	1	5	0	0	0	1	33
Worcester	1		0	0	2	12	0	2	0	3	44

City	reports f	or	week	ended	Dec.	2 2,	1934—	Continued
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State and city	Diph- theria		uenza	Mea-	Pneu-	Scar- let	Small-	Tuber-	Ty- phoid	Whoop- ing	Deaths,
State and City	cases	Cases	Deaths	cases	deaths	fever cases	cases	deaths	fever cases	cough cases	causes
Rhode Island:											
Pawtucket Providence	0		0	0	11	0 3	0	1	0	0 15	17 47
Connecticut: Bridgeport Hertford	0		0	0 153	3 2	2	0	3	0	1	29 35
New York	v		v	100	-	Ű	Ů	Ů	, i	Ĵ	~
Buffalo New York Rochester Syracuse	0 48 0 0	65	0 16 0 0	20 71 121 1	16 203 4 3	45 164 10 4	0 0 0	3 11 1 0	0 5 0 0	39 256 10 12	139 1,686 62 53
New Jersey: Camden Newark	1	5 104	2	039	3 12	5 10	C O O	0 3	0	3 38	32 115 43
Pennsylvania:	1	Ů	U	2	ů				Ŭ	-	10
Philadelphia Pittsburgh Reading	16 3 2	24 4	7 1 2	5 49 1	58 13 1	71 40 4	000000000000000000000000000000000000000	32 4 0	0 0 0	99 31 12	589 160 27
Scranton	1			11		2	0		0	7	
Ohio: Cincinneti	12		2	3	9	31	0	11	0	2	171
Cleveland	7	125	ō	13	12	38	Ŏ	7	Ö	47	170
Toledo	8	1	0	32	94 5	30 20	ŏ	2	ŏ	14	105
Indiana: Fort Wayne	3		0	2	3	4	0	1	0	0	28
Indianapolis	ĩ		Ŏ	Ō	23	20	Ŏ	ī	Ŏ	8	
South Bend	0		02	17	2	3 0	0	0 0	0	ŏ	19
Illinois: Chicago	7	22	12	95	79 4	297	0	36	3	40 3	783
Michigan:			0			12		-			
Detroit Flint Grand Papids	5 3 0	8 	3 0 0	33 1 1	21 1 2	81 12 9	0	29 3 1	20	37 5 7	288 30 29
Wisconsin:			ů		-			_		15	
Kenosna Madison	0		ő	15	1	4	ŏ	ŏ	ŏ	10 2	16
Milwaukee	0	1	1	83	6	243		3	0	41 0	89 7
Superior	ŏ	1	ĭ	39	ĩ	ĭ	ĭ	Ô	ŏ	ŏ	4
Minnesoca:	•			104			•	,	0		10
Minneapolis	1		1	194 446	10	37	ŏ	1	1	3	103
St. Paul	0		0	9	10	11	0	4	0	5	80
Davenport	0			29		1	Ç		0	0	
Des Moines	1		0	0 17	0	83	0	0	0 0	0 4	46
Waterloo	3		ŏ	336	ŏ	8	Ŏ	Ŏ	Õ	2	1
Missouri: Kansas City	1		0	1	16	9	0	8	0	0	123
St. Joseph	3		0	1	4	0	0	1	0	17	28 220
North Dakota:	14	-	U	-	12		U				220
Fargo	0		0	03	0	3	0	0	0	20	3
South Dakota:						, ,			•		
Aberdeen	0			6		U	1		۲	1	
Omaha	3		1	1	4	14	0	5	0	0	56
Topeka	ò		. 0	õ	4	3	0	1	0	4	27
Wichita	4		0	2	8	U	U	Ű		°	-11
Wilmington	0		0	0	9	1	0	2	0	0	31
Maryland: Baltimore	5	17	2	1	18	43	0	14	1	25	217
Cumberland	Ő		<u>ŏ</u>	4	2	4	0	0	0	0	12 2
District of Columbia:									,		100
Washington	· 11	ו ער ו	41	11	14	29 1	U	01			100

City reports for week ended Dec. 22, 1934-Continued

State and city	Diph- theria	Inf	luenza	Mea- sles	Pneu- monia	Scar- let fever	Small- pox	Tuber- culosis	Ty- phoid fever	Whoop- ing cough	Deaths, all
	Cases	Cases	Deaths	Cases	deaths	Cases	cases	deaths	Cases	Cases	Caluses
Virginia: Lynchburg Norfolk Richmond Roanoke	0 0 1 2		0 0 0 0	5 0 5 0	2 4 2 0	8 1 11 5	0 0 0 0	1 2 2 3	1 0 0	4 10 0	· 11 35 46 12
West Virginia: Charleston Huntington Wheeling	· 4 · 1 0		0 0	8 1 2	5 1	7 6 19	0 0 0	1	0 0 0	3 0 11	26 18
North Carolina: Raleigh Wilmington Winston-Salem	1 0 1		0 0 0	1 0 1	2 0 1	1 1 4	0 0 0	3 0 0	0 0 0	1 0 21	14 15 11
Charleston Columbia Greenville	1 0 0	47	0 0 0	0 0 0	2 3 0	1 0 0	0 0 0	1 1 1	0 0 0	1 0 2	19 24 18
Georgia: Atlanta Brunswick Savannah Florida:	8 0 0	112 	2 0 0	000	7 0 3	3 1 0	0 0 0	7 0 1	0 0 0	5 0 3	97 3 35
Miami Tampa Kentucky:	1 3		0 0	0	0 1	6 1	0	1 1	0	3 0	37 33
Ashland Lexington Louisville Tennessee:	0 2 3	7 5	0 0 2	0 0 8	0 1 7	1 2 17	0 0 0	0 1 4	0 0 0	0 0 5	0 17 72
Memphis Nashville Alabama:	3 4		2 0	1 0	14 0	7 10	0	5 2	1 0	5 4	112 59
Birmingham Mobile Montgomery	3 0 3	3 	1 3 	1 0 0	5 3 	2 1 0	0 0 0	2 1	2 0 0	3 0 0	52 19
Fort Smith Little Rock	0 0		ō	0 0	3	0 1	0 0	<u>1</u>	0	4 0	······
New Orleans Shreveport Oklahoma:	19 0	4	5 0	1	21 3	6 1	0 0	12 0	7 0	0 0	197 37
Tuisa Texas: Dallas	1 10	2	2	1	0 7	2 5	0	0	1 0	2 1	1 64
Galveston Houston San Antonio	2 3 5 4		0 0 0 4	0 0 0 0	6 6 7 14	3 0 0 0	0 0 1 0	2 0 2 6	1 0 0 1	0 0 0 0	40 21 90 86
Montana: Billings Great Falls Helena Missoula Idaho:	3 1 0 0		0 0 0 0	11 0 21 0	0 1 0 1	2 0 1 1	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	6 6 1 6
Boise Colorado:	0		0	1	0	0	0	0	0	0	4
Pueblo New Mexico:	4		0	220	11 2	112 5	2 0	1	10	6 0	94 13
Albuquerque Arizona: Utah: Nevada:	0		0	20	0	2	1	0	0	0	7
Reno Washington:	0		0	0	1	0	• •	0	0	0	5
Seattle Spokane Tacoma Oregon:	0 0 1	2	2 0	0 15 0	6 3	1 5 1	4 0 5	0 1	1 0 0	1 0 0	38 29
Portland Salem California:	0	3.	1	4 0 .	6 	8 2	0.	1	0	0 0 -	78
Los Angeles Sacramento San Francisco	19 2 0	25 6	1 0 3	9 0 4	15 2 17	38 3 15	9 0 0	14 2 11	0 1 0	4 0 15	316 40 190

State and city	Mening meni	ococcus ngitis	Polio- mye-	State and city	Mening meni	Polio- mye-	
	Cases	Deaths	cases		Cases	Deaths	cases
Massachusetts:				Georgia:			
Boston	2	0	0	Atlanta	1	0	0
New York:				Kentucky:			
New York	3	2	1	Louisvilla	0	1 1	
Pennsylvania:	2	· ·	0	Mamphis	0	1 1	(
Chio:	J	· ·	, v	Louisiana	v	•	
Cleveland	1	0	0	New Orleans	2	1	(
Columbus	ī	1	Ó	Texas:			
Illinois:				Dallas	1	1	
Chicago	6	1	0	California:			
Michigan:				Los Angeles	U U	N N	2
Detroit	0		U	Sacramento	U	U U	
Wisconsin: Milwaukee	0	0	1				
North Dakota:							
Fargo	1	0	0				

City reports for week ended Dec. 22, 1934-Continued

Dengue.—Cases: Savannah, 31; Tampa, 1. Lethargic encephalitis.—Cases: St. Louis, 1; Topeka, 1; Dallas, 1. Pellagra.—Cases: Charleston, S. C., 1; Savannah, 3; Miami, 1; New Orleans, 1. Typhus fever.—Cases. Wilmington, N. C., 1; Atlanta, 2; Savannah, 2; Montgomery, 2.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended December 15, 1934.—During the 2 weeks ended December 15, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Bruns- wick	Quebec	Ontario	Mani- toba	Sas- katch- ewan	Alberta	British Colum- bia	Total
Cerebrospinal men-					3					3
Chicken pox		49		590	955	140	225	24	173	2, 156
Diphtheria		8	2	49	23	53	7	2	3	147
Ervsipelas				ĺ ő	5	4	1	2	4	22
Influenza		4		3	15		2	_	161	185
Lethargic enceph-						1				,
Measles		403	3	413	263	447	362	16	12	1. 919
Mumps					216	21	9	15	82	343
Paratyphoid fever		1								1
Pneumonia		1			17		4		23	45
Poliomyelitis		1		1	7		1		1	11
Scarlet fever	7	9	19	274	359	89	53	22	67	899
Trachoma					1				15	16
Tuberculosis	1	2	20	114	64	6	55	4	39	305
Typhoid fever		2	4	37	16	10	2		4	75
Undulant fever					2		4			6
Whooping cough		50	10	370	303	20	36	34	43	866

CUBA

Habana—Communicable diseases—4 weeks ended December 22, 1934.—During the 4 weeks ended December 22, 1934, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Dipbtheria Malaria	2 1 51	1	Tuberculosis Typhoid fever	4 1 15	43

¹ Includes imported cases.

Provinces—Notifiable diseases—4 weeks ended November 17, 1934.— During the 4 weeks ended November 17, 1934, cases of certain notifiable diseases were reported in the provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matan- zas	Santa Clara	Cama- guey	Oriente	Total
Cancer. Cerebrospinal meningitis	1	1		7		3	11
Chicken pox. Diphtheria Hookworm disease		1	1	2 5 6			27
Malaria Measles	805	23 4	239	2, 522	1, 855	3, 480	20 8, 924 43
Poliomyelitis Scarlet fever Tuberculosis Typhoid fever	11 	5 2 7 9	2 21 30	5 1 80 83	 7 33	 54 11	23 3 173 180

YUGOSLAVIA

Communicable diseases—November 1934.—During the month of November 1934 certain communicable diseases were reported in Yugoslavia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax. Cerebrospinal meningitis Diphtheria and croup Dysentery Erysipelas Measles Paratyphoid fever	43 6 1, 949 188 224 848 23	6 3 210 33 10 35 25	Poliomyelitis Scarlet fever Sepsis Tetanus Typhoid fever Typhus fever	4 553 13 30 1, 232 10	10 6 20 148 2

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

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Dec. 28, 1934, pp. 1585–1599. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Jan. 25, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Plague

Argentina—Santiago del Estero Province—Lavalle.—According to a newspaper report of December 4, 1934, one suspected case of bubonic plague had occurred at Lavalle, Santiago del Estero Province, Argentina. Precautionary measures were being taken.

Smallpox

Mexico—Coahuila—Allende.—A report dated December 18, 1934, states that 25 cases of smallpox had occurred at Allende, Coahuila, Mexico.

Palestine—Haifa.—During the week ended December 22, 1934, one imported case of smallpox was reported at Haifa, Palestine.

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