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CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

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The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the PUBLIC HEALTH REPORTS, under the section entitled "Prevalence of Disease."

Poliomyelitis.—During the 4 weeks ended July 15, Massachusetts reported 36 cases of poliomyelitis, as compared with 2 and 32 for the corresponding periods of 1932 and 1931, respectively. Only a normal seasonal increase was reported from other States, and some reported decreases. The State of Washington reported 13 cases for this period last year, whereas this year there were no cases reported.

For the entire reporting area the cases totaled 188, which represented a 10 percent increase over last year and a 40 percent increase over the same period in 1929—a normal year. For this period in 1931 and 1930 the numbers of cases were 291 and 611, respectively. A survey of geographic areas shows that, owing to the large number of cases reported from Massachusetts, the incidence in the New England area was more than four times that of last year, but all other areas closely approximated last year's incidence.

Diphtheria.—The incidence of diphtheria continued to decline during the 4 weeks ended July 15 and compared very favorably with the incidence in recent years. The number of cases reported (1,732) was the lowest recorded for this period in the 5 years for which data are available. Texas, in the West South Central area, reporting 205 cases for the current period as against 119 for the same period last year, seemed responsible for the only increase over last year in any geographic area. Decreases in the other areas ranged from 10 percent in the Mountain and Pacific regions to 55 percent in the New

[1] From the Office of Statistical Investigations, U.S. Public Health Service. The numbers of States included for the various diseases are as follows: Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 47; diphtheria, 48; scarlet fever, 48; influenza, 38 States and New York City. The District of Columbia is counted as a State in these reports.

England States. In the South Atlantic States the incidence was the same as that of last year.

Scarlet fever.—The number of cases of scarlet fever (6,759) was less than 50 percent of the number reported for the preceding 4-week period. In relation to previous years the incidence was 10 percent below that of last year, approximately the same as in 1931 and 1929, and more than 40 percent in excess of the incidence during this period in 1930. In the South Atlantic States the number of cases (380) was the highest reported for this period in 5 years, and in the Mountain and Pacific areas the numbers of cases, 164 and 475, were 1.5 times the numbers reported last year. Considerable decreases were reported from some areas while in others the incidence followed that of last year very closely.

Typhoid fever.—The number of cases of typhoid fever (2,745) reported for the current 4-week period was more than twice that recorded for the preceding 4 weeks. A comparison with previous years shows that the incidence was slightly below that of last year (2,814 cases). It was approximately 600 cases above the average for this period for the 3 preceding years. The disease was most prevalent again this year in the East North Central and South Central areas.

Smallpox.—The reported incidence of smallpox approached more closely the incidence for a corresponding 4-week period last year than at any time during the current year. For the 4 weeks ended July 15 the number of cases was 424, as compared with 482, 1,675, and 3,111 for the same period in the years 1932, 1931, and 1930, respectively. The New England and Middle Atlantic States were entirely free from the disease, the East North Central, West South Central, Mountain, and Pacific areas reported increases over last year's figure, and the West North Central, South Atlantic, and East South Central areas reported appreciable decreases. Individual States showing considerable excesses over last year were Wisconsin, Texas, Colorado, and Oregon. For the country as a whole, the incidence continued to be the lowest in the 5 years for which data are available.

Meningococcus meningitis.—Illinois reported 30 cases of meningococcus meningitis for the current period, as compared with 8 and 11 for the corresponding periods of 1932 and 1931, respectively. Other States in the East North Central area, as well as in other sections, closely approximated last year's incidence. For the entire reporting area 145 cases were reported, as against 141, 244, and 347 for the years 1932, 1931, and 1930, respectively. For this period in 1929—the peak of the recent epidemic wave—there were 610 cases reported.

Measles.—Measles declined more than 50 percent during the current 4-week period from the preceding 4 weeks. The total number of cases (19,423) was about 75 percent of the number recorded for the corresponding period in each of the 2 preceding years. For this period

in 1930 and 1929 the numbers of cases were 29,215 and 23,099, respectively. In the New England, Middle Atlantic, and East North Central areas the incidence for the current period was considerably below that of last year, while the West North Central, South Atlantic, South Central, and Far Western regions reported very appreciable increases over last year. The reported incidence in the East South Central States was more than nine times that of last year, and in the West South Central section the number of cases (1,190) was more than five times last year's figure. California, reporting 1,782 cases for the current period as against 596 last year, seemed to be responsible for most of the increase in the Pacific area.

Influenza.—Influenza continued to decline, and for the current 4-week period the number of cases (936) was slightly below the average for the preceding 4 years. With one exception, the West South Central section, the incidence in all areas was below that of last year. The four States in the West South Central group reported 259 cases, 184 of which were from Texas, as against 158 last year.

Mortality, all causes.—The average death rate for all causes in large cities as reported by the Bureau of the Census for the 4 weeks ended July 15 was 9.9 per thousand inhabitants (annual basis). For this period in the years 1932, 1931, and 1930 the rate was 10, 11.2, and 10.8, respectively. The current rate is the lowest for this period in the 8 years for which data are available.

THE INJECTION OF MOSQUITO SPOROZOITES IN MALARIA THERAPY

By Bruce Mayne, *Special Expert, United States Public Health Service*

Malaria sporozoites isolated in suspended media from salivary glands of mosquitoes were kept for periods of 1 hour to 5 days and 1 hour and reproduced malarial fevers when injected intravenously into patients for the purpose of malaria therapy. The reactions and subsequent clinical histories appeared to be no different from those in cases treated with bites of infected anopheline mosquitoes.

The three species of Plasmodia—tertian, estivo-autumnal, and quartan—were thus successfully reproduced. The medium used in these instances consisted of sodium citrate alone or mixed with freshly drawn, defebrinated human blood, enriched with 1 percent of dextrose. [1]

[1] The blood drawn from a healthy donor immediately preceding the planting of the dissected salivary gland emulsion is thoroughly defibrinated in a sterile flask containing the measured quantity of 50 percent dextrose. It is distributed by means of a glass syringe in 15-cc rubber-capped serum bottles. Ten cc of blood mixed with 1 percent dextrose is the amount of medium usually employed. The salivary glands of the infected mosquito are flooded with one half cc of sterile 2 percent sodium citrate on the glass slide, drawn back into the syringe, then added to the blood by piercing the rubber cap. The serum bottles covered with sterile gauze are then placed in the electric refrigerator, where a temperature of 50° F. is constantly maintained.

In these tests all attempts at mixing the sporozoites with glycerine and sodium chloride treated in identical manner were unsuccessful. Sporozoites kept in suspended cultures at temperatures below 42° F. did not prove viable upon human transplantation.

In developing malaria therapy practical difficulties were encountered when mosquitoes were applied by biting. It was not feasible to forward live mosquitoes unaccompanied by an attendant for use by medical officers in hospitals or by private physicians, and the carriage of these insects by a special attendant over long distances by train was too costly. The transportation by mail of infective material in the form of gland sporozoites was next attempted. Here encouraging results were obtained, considering the value of time and the saving of material. After a preliminary test of a suitable medium for the maintenance *in vitro* of dissected-out sporozoites, an attempt was made to determine the length of time sporzoites from the insects' salivary glands may remain viable. More than 50 experiments were made, and the following table gives the data of the successful trials:

TABLE 1.—*Tabulation of data summarizing successful sporozoite inoculations*

Patient inoculated	Number of mosquitoes used	Interval following mosquito's first infective blood meal	Extent of sporozoite infection in mosquito	Medium used for gland suspension	Time sporozoites in vitro	Method of injection	Incubation period	
							Clinical	Parasite
PLASMODIUM VIVAX								
		Days					*Days*	*Days*
H.F.	1	17	Very numerous	2% sod. citrate	40 minutes	Subscapular	13	14
N.M.	1	19	Numerous	do	2½ hours	do	13	13
S.S.	1	35	Moderate	Dextrose blood	44 hours	Intravenous	14	16
E.J.	1	26	Numerous	2% sod. citrate	35 minutes	do	17	19
B.S.	1	24	Moderate	Dextrose blood	45½ hours	do	16	17
M.J.M.	1	33	Very numerous	do	24 hours	do	22	22
B.S.K.	1	33	do	do	3 days	do	21	21
E.R.D.	2	19	Moderate	do	22 hours	do	13	14
Do.		19	Numerous	do	do	do		
F.B.	1	19	do	do	5 days, 1 hour	do	14	15
H.Z.	3	19	Few	do	do	Subscapular	20	20
Do.		19	Moderate	do				
Do.		19	Very scanty					
P. FALCIPARUM								
S.F.	2	40	Numerous	Dextrose blood	3 days, 6 hours	Intravenous	14	15
Do.		40	do	do				
D.S.	2	37	Scanty	do	4 days	Intravenous	16	17
Do.		37	do	do				
J.D.	2	22	Few	do	4 days	Intravenous	12	13
Do.		22	do	do				
E.H.	3	23	Numerous	do	4 days	Intravenous	14	13
Do.		22	do	do				
Do.		22	Few	do				
L.B.	2	22	Scanty	do	4 days, 1½ hours	Subscapular	14	13
Do.		22	Numerous	do				
P. MALARIAE								
B.K.	2	30	Moderate	2% sod. citrate	1 hour	Intravenous	32	33
Do.		30	Numerous	do				

An analysis of the data presented in the table indicates the production of malaria in 16 patients injected with the contents of the salivary glands of one to three mosquitoes. In two instances successful injections resulted from the use of the sporozoites (of one mosquito) held *in vitro* at intervals of 1 to 3 days. In all the tests the suspended media were maintained uniformly at a temperature of 48° to 52° F.

In this report clinical incubation is interpreted as the occurrence of the first elevation of temperature (usually 102° F. and above), accompanied by a sharp paroxysm. Here the initial rise to 100° F. is not considered unless the characteristic rigor is present. Parasite incubation is defined as the first appearance of malaria plasmodia in a thick smear preparation.

It will be observed that usually the microscopic finding marks the termination of the incubation period 1 to 2 days following the onset of clinical symptoms. In several instances there is a recorded deviation in a protracted incubation. This is surmised to be due to the masking of symptoms on account of the associated specific infection present in this type of patient.

The clinical incubation periods developing from the inoculations, whether intravenous or intramuscular (subscapular), were 12 to 16 days in the estivo-autumnal strain, 13 to 22 days in the tertian, and 32 days in quartan. The parasite incubation was found to be 13 to 15 days in the estivo-autumnal, 13 to 22 days in the tertian, and 33 days in the quartan type.

For comparative purposes a similar group of 16 patients in whom malaria was induced by mosquito biting gives the following data:

TABLE 2.—*Group of general paralysis patients in whom malaria was induced through mosquito biting*

Patient bitten	Number of mosquitoes applied	Incubation period	
		Clinical	Parasite
PLASMODIUM VIVAX			
		Days	*Days*
A. S. A.	1	16	16
L. M. G.	1	12	13
R. G. H.	1	16	17
P. H.	6	18	18
W. D. I.	2	17	17
E. S.	5	17	18
J. W.	8	11	13
C. M. Y.	1	17	18
L. S.	2	15	16
M. H.	1	15	17
R. C. H.	10	16	17
M. M. L.	10	18	20
I. T.	3	22	23

TABLE 2.—*Group of general paralysis patients in whom malaria was induced through mosquito biting*—Continued

P. FALCIPARUM

		Days	Days
J. C.	9	10	11
E. E.	5	12	13

P. MALARIAE

		Days	Days
J. W.	2	34	39

Here from 1 to 10 mosquitoes were applied and produced the disease in clinical incubation periods of 11 to 18 days with the tertian strain, 10 to 12 days in the estivo-autumnal, and 34 days in the quartan infections. Correspondingly, the parasite incubation was effected in 13 to 20 days for the tertian, 11 to 13 days for the estivo-autumnal, and 39 days for the quartan type.

Although there appears no valid objection to the use of wild mosquitoes for conveyance of malaria by biting, this does not hold for the injection method. In every instance it is aimed to employ only laboratory-bred anophelines when salivary gland suspensions are applied in malaria therapy.

In instances in which mosquitoes are known to harbor an unusually large number of parasites, it is found profitable to combine the conveyance of the infection through the biting of one patient and in another patient by inoculation with sporozoites, either immediately or after the blood meal is digested. This is a simple procedure where the practice is to insure infection through biting followed by immediate killing and dissection.

The extraordinary potentialities for producing infection with these organisms may be appreciated when it is recalled that a single mosquito which was instrumental in producing malaria by biting 10 or more persons, upon dissection of its salivary glands, revealed enough undischarged sporozoites to infect several more persons by intravenous transmission of these parasites.

THE RELATION OF TEMPERATURES

In numerous failures it was noted that temperatures in which the material was kept were apparently too low; when the infected forms were kept under 42° F. for as much as 1 week to 10 days, few, if any, infections were reproduced. This factor was considered in the present attempts. On the other hand, it was essential to maintain a low enough temperature to minimize the rapid growth of invading bacteria introduced with the drawn blood. It was found that a temperature of 48° F. to 52° F. was satisfactory in this regard.

PROCEDURE FOLLOWED IN ISOLATING THE GLAND SPOROZOITES

In these tests only the sporozoites from the salivary glands proved to be infectious in malaria reproduction, a substantial number of tests showing that sporozoites washed and suspended from the discharging gut oocysts were impotent for this purpose. The method consisted essentially in observing as strict asepsis as possible; all operations were conducted with scrupulous regard for surgical cleanliness, aiming to produce at least a reaction bacteriostatic in effect. All glassware and instruments employed were rendered sterile, as were the solutions employed. The mosquito, following ether anesthesia, was immersed for 3 to 5 minutes in a solution of 1:100,000 merthiolate, then soaked in two changes of 2 percent sterile sodium citrate. Legs and wings were separated and salivary glands removed and examined microscopically. If found harboring sporozoites, the salivary glands were drawn up into a glass syringe and planted at once into a serum bottle containing the desired culture medium. For immediate transplantation the glands were directly transferred to the vein of the prepared patient; but if found desirable to keep the infectious material for a short period, the necessary defibrinated human blood, mixed with 1 percent of dextrose, was added. When it was required to transport the material by mail, a suitable bottle was kept chilled for 1 day, then the ice was removed to bring the temperature to above 42° F., and the prepared serum bottles were wrapped in cotton wool and placed in it. Ordinary mail was employed in shipping to a destination 2 days distant, while the facilities afforded by air mail were employed for longer distances. In this way we shipped with successful results preparations containing mosquito sporozoites from strains of *P. vivax* and *P. falciparum* from Columbia, S. C., to points as distant and as widely separated as Miami, Fla., Richmond, Va., and San Francisco, Calif. The time element involved in the successful inoculations was 22 hours and 45 hours, respectively, in the Richmond and Miami shipments, and 3 days and 6 hours in the case of the San Francisco shipment.

As a result of these successful trials, it is demonstrated that material can remain alive and be shipped to practically any point in the United States. Recently a sporozoite preparation maintained *in vitro* for longer than 5 days was successfully inoculated. The probability of a "take" should be greatly enhanced, since we are using an agent of known infectiousness.

PRACTICAL ASPECTS OF TRANSPORTING SPOROZOITE MATERIAL

The injection of sporozoite-seeded blood requires no more skill in the hands of the average physician than does the injection of malaria blood mixed with an anticoagulant. It affords all of the advantages of conveyance of malaria through mosquito biting, in addition to

being of greater economy in time and money. At present the only satisfactory method of distribution of mosquitoes is that of personal carriage and the attendance of a trained assistant. The former plan of utilizing the services of clinicians in various institutions to care for infected mosquitoes shipped at a distance was found unsatisfactory and unsafe.

CONTAMINATION OF SUSPENDED MEDIA

Except when administered in instances of chronic hepatitis and gastro-intestinal upset—admittedly contra-indications—no bad effects have been observed in nearly 50 inoculations of artificial media used in sporozoite suspensions. The reactions following intravenous injections resemble the rigor accompanying the injection of any foreign protein. Rarely the severity differs from similar injections of an equal quantity of citrated malaria blood. The presence of bacteria during a cultural period in intervals as long as 22 days while the infective protozoan organism is held in suspension is, of course, not unusual. Regardless of the nature of the material held, the presence of protein decomposition products would be inevitable.

A constant check was made, whenever feasible, of the microscopical appearance of the infectious material injected into the 16 patients used in these experiments. In this connection, the general impression was gained that, although bacteria were present, there was no greater contamination than would occur in similar material kept as control cultures, suggesting that the introduced mosquito tissue could not be held accountable.

Another reason for the numerous microscopical tests was the attempt to demonstrate the presence of sporozoites, either free or showing developmental change of form. In several instances, and only those in which sodium citrate was the medium used for gland suspension, fully formed sporozoites were revealed. After 3 hours these forms were never found. For this purpose many "hanging drops" and stained specimens prepared from the material left in the syringe following an injection were examined. Likewise, there were not present any organisms which might be interpreted as rings in blood used as culture medium up to a period of 22 days after sporozoites were planted.

In this connection it should be recalled that all media employed were maintained at an average temperature of 50° F., with the intention of inhibiting growth which might prove contaminative.

Bacteriological cultures made of a 5-day-old sporozoite suspension revealed the presence of Gram-negative bacilli and some staphylococci. This material was injected with a resulting immediate, though short-lived, reaction resembling anaphylactic shock which subsided within 4 hours.

However, this difficulty may be alleviated in intramuscular injections, by preference subscapular, which offers no greater disadvantages.

The advent of this inoculation reaction meets with no serious objection, when considering the desirability of producing controlled temperature elevations. The febrile reaction observed accompanying sporozoite suspension injection was not different from that produced in the administration of simple blood transfusion—the latter of untyped material in quantities under 10 cubic centimeters.

LITERATURE

Aside from the work of the Sergents, in Algeria, and my own efforts in India, in the routine injection of sporozoites dissected from culicine mosquitoes in reproducing bird malaria, the only investigations similar to the present were contributed by James, Nichol, and Shute (1927),[2] who, in a method of procedure to test the effect of quinine, to ascertain whether or not this drug is a preventive of malaria infection, injected sporozoites from mosquitoes harboring *Plasmodium vivax* into seven patients, producing malarial fever in each of them. The solutions used were blood serum and Locke's solution. The contents of the mosquitoes' salivary glands were crushed under the cover slip on a glass slide and, after remaining for 15 minutes, were injected with a hypodermic syringe. The resulting incubation period varied from 6 to 13 days.

ACKNOWLEDGMENTS

Grateful acknowledgment is made of the valuable cooperation of my assistant, Senior Medical Technician H. E. Hingst, whose meticulous zeal in the preparations of dissected mosquitoes and the scrupulous care of cultures made possible the success of our present undertaking.

I wish to express my indebtedness to Dr. Mark F. Boyd, of the Rockefeller Foundation, at the malaria research station in Florida, for his generous assistance in furnishing insectary-bred mosquitoes infected in the experiments recorded.

My grateful thanks are also due Dr. Charles Frederick Williams, superintendent, Dr. Eugene Leroy Horger, clinical director, and members of the staff of the South Carolina State Hospital for their stimulating aid in proffering unstintedly the facilities of that institution.

[2] James, S. P., Nichol, W. D., and Shute, P. G.: Note on a new procedure for malaria research. Trans Roy. Soc. Trop. Med. and Hyg., vol. XXI, no. 3, Nov. 1927, pp. 233-236.

SEASONAL ACUTE CONJUNCTIVITIS OCCURRING IN THE SOUTHERN STATES

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A seasonal acute conjunctivitis in which the infection is largely transmitted by the gnat *Hippelates pusio* Loew occurs in certain sections of the country, notably in southern Georgia, in Florida, in the Coachella Valley, Calif., and also in other parts of the South.

The condition in southern Georgia was brought to the attention of the United States Public Health Service in connection with trachoma eradication and prevention work during the years 1930–32. The writer, who was engaged in a study of the etiology of trachoma during this time, undertook a study of trachoma in Georgia with the purpose of ascertaining whether the results would be similar to those obtained in the study of trachoma in the State of Missouri. It was very soon observed that organisms resembling the Koch-Weeks bacillus were frequently present in the Georgia cases, whereas it had been found that organisms of this group were of such rare occurrence in Missouri as to be practically negligible.

A study of the situation in Decatur and Mitchell Counties led Dr. C. E. Rice, medical officer in charge of trachoma prevention, United States Public Health Service, to express the opinion that true trachoma is present in southern Georgia. This opinion was based on the clinical appearance and history of the cases. The presence of pannus and of conjunctival scar tissue supported this view. Some cases exhibited the well-known sequelae of the active trachomatous condition, i.e., trichiasis, entropion, corneal opacity, and occasionally blindness. In a number of the cases investigated, a family history of the affection was obtained. Certain of those examined, or their parents or relatives had been patients at the Pelham (Ga.) Trachoma Hospital during the two periods of its existence, November 1921 to April 1922 and April 1923 to August 1923. In view of these considerations it was felt that the presence of the Koch-Weeks bacillus indicated a superimposed infection on the trachomatous condition. In spite of this added infection, however, the cases on the whole were much milder than the Missouri type and yielded more readily to treatment.

It was learned in connection with the above studies that there was present in this section of the country a seasonal acute conjunctivitis which, on account of its widespread occurrence and probable transmission by the "eye gnat", was of rather serious consequence. This report is concerned primarily with a discussion of the acute affection, though the occurrence of the organisms concerned as probable secondary invaders in trachoma will be considered incidentally. A special

study of the subject was made in September 1932, at Bainbridge, Ga., at the instance of Dr. M. A. Fort, county health officer of Decatur County.

LITERATURE

Epidemics of acute conjunctivitis in the Coachella Valley of California in which the "eye gnat" is concerned as the probable vector have been described in this country by Schneider and by Herms.

Schneider designates the disease as "Coachella pseudo-trachoma." It is endemic in the Salton Sea regions of California, which is an irrigated area below sea level where the diurnal summer temperature ranges from 100° to 120° F., and where the annual precipitation is only ½ to 1½ inches. The disease is said to be at its worst in the early spring.

The conditions in the Coachella Valley have also been described by Herms, who visited that locality in 1926. He states that "during the past 10 years, *Hippelates* flies have become increasingly numerous until they are now a veritable pest, and, together with numerous cases of so-called 'pink eye' affecting the people of the valley and the known relation of this fly to the disease, there exists a really serious situation." According to physicians of long residence in the region the disease existed in this locality as early as 1912, and in 1920 and 1921 reached epidemic proportions. Attention is called to the seriousness of the disease from an economic standpoint and to the large number of absences of children from school.

The occurrence of the "eye gnat" and its connection with "sore eyes" has been referred to by L. O. Howard and E. A. Schwarz in publications of the Bureau of Entomology of the United States Department of Agriculture. In discussing the occurrence of gnats under the title, "The Hippelates Plague in Florida", Schwarz states that the flies are particularly numerous in Florida but have also been encountered in Alabama, Texas, and Virginia. The United States Bureau of Entomology is at present engaged in a study of methods for the control of the pest in the Coachella Valley region.

The role of flies and gnats in the spread of eye diseases is recognized in other parts of the world. A recent publication by Ranganatha Rao reports the results in a study of 1,000 cases of acute conjunctivitis in Bangalore, India. The seasonal epidemic starts about the middle of May, reaches its height in June or July, and recedes to the preepidemic level about the first of November. The Koch-Weeks bacillus was found in about 60 percent of the cases and a few cases showed the pneumococcus and streptococcus. Ranganatha Rao considers mango gnats and house flies as agents for the transmission of the disease, but believes that the majority of the cases are due to direct transmission between members of the family. He therefore

considers that the observation of individual hygiene is more imperative than public health measures against the gnats and flies, though he considers the latter also important.

In a recent publication, reviewing the literature of *Oscinidae* (Diptera) as vectors of conjunctivitis, Graham-Smith refers to Ayyar, who considers Siphunculina (*Siphonella, Microneurum*) *funicola* de Meijere, 1905, the "eye fly" of India, Ceylon, and Java as responsible for transmitting certain forms of ophthalmia occurring in the countries named. In Egypt and other countries of northern Africa also, flies belonging to this family are very common, and it is believed that they are concerned in transmitting both trachoma and acute conjunctival conditions. It has been suggested that the *Hippelates* of the Coachella Valley were imported with date shoots from northern Africa.

THE "EYE GNAT" IN GEORGIA

The gnat encountered in southern Georgia has been identified by Dr. J. M. Aldrich of the United States National Museum as *Hippelates pusio* Loew. It makes its appearance about May and continues its activities until the first frost in the fall. The evidence points to this fly as largely responsible for the seasonal occurrence of the disease known in the common parlance of that section of the country as "gnat sore eyes." The incidence of the disease is somewhat limited in adults but well nigh universal among young children.

The annoyance from the gnats is so great in some of the schools that half sessions only are held during the first several weeks of the school year. On entering some of the school rooms one is struck by the constant fanning with the hands to keep the gnats away from the eyes. They are particularly noticeable around the eyes of children in whom there is a discharge. They alight at the inner canthus of the palpebral fissure, where the discharge usually accumulates, or on the margin of the lids, where they burrow into the lashes and appear to be feeding. Sometimes they find their way into the eyes and are carried into the cul-de-sac of the lower lid. It is not unusual to find several dead gnats in the eyes of the young children who are quite unaware of their presence. The disease in some seasons occasions a greater number of absences from school than any other one cause.

HABITS AND DEVELOPMENT OF THE EYE GNAT

A study has recently been made by Hall of the habits, breeding media, development, and stages of *Hippelates pusio* Loew. It measures about 2 millimeters in length. The greatest annoyance from the gnats is observed on warm and humid days. They are attracted to places where moisture is abundant and seem to have a highly developed olfactory sense. The life cycle was studied under

insectary conditions and it was found that the complete development from egg to adult could take place in 11 days, though sometimes as long as 3 months was necessary. The average length of time was 18.5 days. The average incubation period of the eggs under proper moisture conditions was 3.7 days, and the length of the larval period ranged from 5 to 46 days, depending on the medium, moisture, and temperature. The average pupal period was 9.8 days. A study was made of various media suitable for larval development. Human excrement proved to be the most favorable medium. Decaying fruit and vegetables were less favorable. As a result of his studies, Hall suggests that the problem of control of the eye gnat is one of sanitation as well as of agricultural practice.

INCIDENCE OF THE DISEASE IN THE LOCALITIES STUDIED

Through the cooperation of the United States Public Health Service, State and county health officials, and the principals and teachers in the schools of the counties in which the investigation was undertaken, information was obtained in regard to the incidence of the disease during September 1932. It seemed to be generally conceded that the disease had been less prevalent that year than in some former years. The opinion was expressed by some that the cases were fewer than they had been earlier in the summer, though it was stated by some of the principals and teachers that the disease had spread in the schools. The latter seems probable, as the close contact of the children and the presence of numerous gnats in some of the schools afforded ample opportunity for the conveyance of the disease from one child to another. The accompanying figures show the incidence of the disease and the absences resulting therefrom. Rather complete figures were obtained from Decatur, Mitchell, and Early Counties, and less complete from Grady, Baker, and Miller Counties.

Incidence of "gnat sore eyes" in certain Georgia counties

County	School enrollment	Number of cases	Number of absences	County	School enrollment	Number of cases	Number of absences
Decatur	2,435	629	235	Baker	327	92	47
Mitchell	1,928	256	86	Grady	371	50	41
Miller	1,482	273	138	Total	8,090	1,633	701
Early	1,547	333	154				

Based on these figures the incidence of cases of the disease was 20 percent of the school enrollment. Of the 1,633 cases approximately 43 percent were absent from school for longer or shorter periods.

Information on several other points was sought in the questionnaires sent the teachers. They were asked whether in their opinion the

condition was more or less prevalent than in former years. Fifty-one stated that it was more prevalent, and 121 that it was less prevalent. In answer to the question whether it had been observed that the pupils suffered repeated attacks from year to year, 112 replied in the affirmative and 50 in the negative. Treatments in the schools were carried out by 157 teachers, while 45 gave no treatments. Two hundred and two teachers reported that the eye condition ceased with cold weather, and 17 reported that it did not.

DESCRIPTION OF THE DISEASE

The disease presents the appearance of an acute conjunctivitis, varying in severity from a mild type to a very severe type which, in gross appearance, may at times assume a character simulating gonorrheal ophthalmia. However, the chemosis of the conjunctiva seen in the latter disease is not present. The palpebral conjunctiva is inflamed, and the bulbar conjunctiva may be blood-shot often to the extent that the whole of the sclera appears deep red in color. There may be a moderate amount of edema of the lids and a purulent discharge which accumulates so that in the morning the lids are glued together and the eyes can be opened only with considerable difficulty. During the day the discharge may sometimes be seen running down the face. In the very severe cases, the edema is so great that the eyes remain closed, and the discharge is so copious that when the lids are forcibly separated it exudes in a stream. In these severe cases, after the acute condition subsides, the eyelids as well as the surrounding tissues are discolored, the eye presenting an appearance of having been bruised as from a severe blow. Corneal damage does not occur in this locality as a result of this acute eye infection alone.

BACTERIOLOGICAL STUDIES

The unusual severity of some of the cases seemed to warrant a bacteriological investigation of the condition with a view to determining whether any other species of bacteria than those usually concerned in acute conjunctivitis might be encountered.

Epidemics of acute conjunctivitis are usually caused by the Koch-Weeks bacillus, the Morax-Axenfeld bacillus, or the pneumococcus. In the central area of this country the pneumococcus appears to be the chief cause of conjunctivitis. It was found to be the cause of an epidemic studied by the writer in Rolla, Mo. The disease in that locality was much less severe than that seen in Georgia. Gifford observed pneumococcus conjunctivitis very often in Nebraska. An extensive outbreak of conjunctivitis occurring at Camp Sherman during the war was studied by Kershner and was shown to be due to the pneumococcus. Conjunctivitis in the State of New York was first shown by Weeks to be due to the organism which bears his name.

McKee, on the other hand, reports that in many hundreds of examinations extending over a number of years in Montreal, Canada, the Morax-Axenfeld bacillus was found most frequently and the Koch-Weeks bacillus and influenza-like bacilli much less often.

Numerous reports have been published on epidemic conjunctivitis in various other parts of the world. The causative organisms in the epidemics occurring in Egypt and northern Africa are the Koch-Weeks and Morax-Axenfeld bacilli. Wilson regards Morax-Axenfeld conjunctivitis as much less serious than Koch-Weeks conjunctivitis. Koch-Weeks bacilli and gonococci as complicating factors in trachoma are believed to be responsible for at least 75 percent of the blindness in Egypt. Koch-Weeks conjunctivitis is of frequent occurrence in central Europe. In conjunctivitis studied at the eye clinic in Vienna, Pillat found that nearly twice as many cases were due to the Koch-Weeks bacillus as to the pneumococcus.

EXPERIMENTAL INVESTIGATION

A number of consolidated schools and a few 1-teacher schools, 11 in all, as well as some homes, were visited for the purpose of obtaining cultural material. A sterile cotton swab was rubbed over the surface of the conjunctiva of the lower lid, particularly in the neighborhood of the inner canthus, and the material thus collected was streaked lightly over the surface of blood agar plates. This method was found superior to any other as the cotton picked up large numbers of the surface organisms. After streaking the plate, the cotton swab was immersed in a tube of blood broth. Some of the discharge, when abundant, was used for purposes of cultivation. A microscopic examination was made of the discharge in a certain number of cases.

Abundant growth usually appeared along the streaks on the blood agar plates after incubation for one or two days at 37° C., and subcultures were made to tubes of blood agar or blood broth. The use of blood broth for primary cultures was discontinued in the latter part of the work when it was found that its use was of no special advantage.

The organisms most frequently isolated were the Koch-Weeks or a similar organism, the Morax-Axenfeld bacillus, and a pleomorphic streptococcus. In a number of cases the usual staphylococci and *C. xerosis* or other Gram-positive diphtheroids were present. Occasional colonies of other organisms were found from time to time which, on account of their small numbers, were not considered significant. In a few of the cases from homes where the sanitary conditions were particularly bad, a variety of species were present, including forms which were undoubtedly saprophytic. The predominant organism was the Koch-Weeks bacillus, which often occurred in pure culture; and it would seem, therefore, to be the one primarily concerned in the disease.

The organisms present in the 50 cases studied in September 1932 were as follows:

Koch-Weeks bacillus	40 (80 percent)
Morax-Axenfeld bacillus	9 (18 percent)
Pleomorphic streptococcus	12 (24 percent)

The Koch-Weeks bacillus occurred as a rather small Gram-negative rod, though long filamentous forms and swollen and pleomorphic forms were seen frequently. It was considerably larger than the *Bact. granulosis* isolated by Noguchi from trachoma. All the cultures were definitely hemoglobinophilic and required frequent transplanting to maintain viability. This is in marked contrast to *Bact. granulosis*, which grows on media without blood and which remains viable for long periods of time.

In using the term Koch-Weeks bacillus it is recognized that formerly the organism designated as Koch-Weeks was differentiated from Pfeiffer's influenza bacillus on the basis of variation in morphology, pathogenicity for laboratory animals, and growth properties. The present tendency is to consider them as belonging to the same species rather than as distinct species.

A few of the strains tested on guinea pigs and mice were shown to be pathogenic. None of the strains reduced nitrates to nitrites and none produced indol. No change in reaction was produced in a mixture of litmus milk and heated blood broth.

The Morax-Axenfeld organism corresponded with the classical type as described by Morax and Axenfeld. It is a thick Gram-negative bacillus, but at times highly pleomorphic. It produced the characteristic liquefied areas on the surface of Loeffler's serum slants.

The pleomorphic streptococcus was not abundant, although it occurred in a number of cases. Occasional colonies appeared on the plates in the streaks of the numerous closely crowded colonies of Koch-Weeks or Morax-Axenfeld bacilli. The organism was strikingly pleomorphic exhibiting in the same chain small typical coccus forms and very large, swollen lanceolate forms which took the stain more deeply. These cultures all produced a flocculent growth, which was precipitated in the bottom of the tube. The cultures were not bile soluble and did not ferment inulin. Of interest was the property of completely decolorizing cooked blood agar medium. The organism was pathogenic for mice in doses of 1 cc of 24-hour blood broth culture, but not in smaller doses.

Attempts were made to isolate the Koch-Weeks bacillus from gnats collected from the neighborhood of the eyes of children having the disease. On account of the presence of numerous saprophytic organisms which grew on the plate, it was not possible to demonstrate the delicately growing Koch-Weeks organisms. *C. xerosis* was isolated,

however. It is probable that the Koch-Weeks organism could be easily demonstrated if gnats bred under aseptic conditions were used experimentally. It seems likely also that the organism could be demonstrated on gnats associated with suitable cases in which there was a very large amount of purulent discharge. Cases of such severity were not found in the schools, however.

The organisms described in acute conjunctivitis were also encountered in some of 74 cases of trachoma and 6 cases of folliculosis seen in southern Georgia in 1930 and 1931, at which time a special study was being made of trachoma. Probably such cases have had the acute infection above described, and the bacteria associated with it continue to be present on the conjunctiva for longer or shorter periods after the acute condition has subsided.

Preliminary to the selection of suitable cases of trachoma for study by the methods of Noguchi, in which follicular contents or tissue is utilized, the methods described above for the study of the cases of acute conjunctivitis were used. Sterile cotton swabs were rubbed over the surface of the conjunctiva and streaked on blood agar plates. The growth obtained thus corresponded in a number of cases with that obtained in the cases of acute conjunctivitis. The organisms isolated by this method were as follows:

Organism	Trachoma	Folliculosis	Organism	Trachoma	Folliculosis
Koch-Weeks bacillus	23 (31%)	4 (66%)	Pleomorphic streptococcus	26 (35.3%)	2 (33%)
Morax-Axenfeld bacillus	5 (6.8%)	0	Pneumococcus	4 (5.4%)	0

It may be stated incidentally that cases of trachoma in Missouri usually yielded only *C. xerosis* and occasionally staphylococci when the cotton swab method of collecting material was used, and this was true in a few of the Georgia cases.

Twenty-two of the above trachoma cases were studied intensively by the methods of Noguchi for the isolation of *Bact. granulosis*. Follicular contents removed by means of Noyes forceps were planted in Leptospira semisolid media and on horse blood agar carbohydrate plates. *Bact. granulosis* was not cultivated. In a group of 10 cases studied, 2 small Gram-negative rods which were nonhemoglobinophilic were consistently isolated, and one of these resembled Noguchi's organism rather closely but differed in its serological behavior and in other respects. One occurred in 8 cases and the other in 9 cases. Neither of the two produced a granular condition in *Macacus rhesus* monkeys when inoculated subconjunctivally, though repeated attempts were made to accomplish this.

In addition to the above-mentioned organisms, all colonies which might possibly be *Bact. granulosis* were considered, even though only

one or two appeared on a plate. Seven different Gram-negative nonhemoglobinophilic rods were thus obtained which could not be identified definitely with any species described. These were of such rare occurrence that their significance is doubtful.

CONTROL

Control measures may be considered from two angles—that of treatment and of sanitation.

Treatment.—As part of the program for the eradication of trachoma and other communicable eye diseases, the United States Public Health Service, in cooperation with the State and county health officials, maintained treatment clinics at central localities during 1931 and 1932, and treatments were given in the schools by county health officers, special nurses of the Public Health Service, county health nurses, and the teachers. While intended primarily for the treatment of trachoma and suspected trachoma, the treatment used has been helpful in reducing the number of acute eye conditions. The teachers were generally of the opinion that the situation in the schools had improved greatly since treatments were instituted. The routine measures used were irrigations with zinc sulphate boric acid mixture (0.125 gm $ZnSO_4$ and 3 gm boric acid to 100 cc of distilled H_2O).

Sanitary measures.—Suggestions by workers of the United States Bureau of Entomology looking to the control of the gnat pest in the Coachella Valley in California are probably applicable to the situation in other localities. The removal or treatment of substances around human habitations which attract gnats and flies are steps in the problem of control. Adequate garbage disposal, suitable privy facilities, the clearing out of heavy vegetative growths and piles of trash and vegetable wastes are effective means for eliminating or reducing the number of breeding places of the gnats. Personal hygienic measures, including the liberal use of soap and water on the face and hands, are self-evident measures useful for preventing the spread of the disease from one individual to another.

SUMMARY

A seasonal acute conjunctivitis occurs in the summer months in Georgia and also in other parts of the South and in California. The eye gnat *Hippelates pusio* Loew appears responsible to a large extent for the spread of the disease. The incidence of the disease is greatest among young children.

An organism corresponding with the Koch-Weeks bacillus is the principal organism concerned in the disease in Georgia. The Morax-Axenfeld bacillus, the pneumococcus, and a pleomorphic streptococcus were present in some of the cases.

Control measures consist in treatment of cases in the schools as well as in the homes, personal hygiene, and sanitary measures concerned with eradication of the breeding places of the gnats.

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PHYSICAL IMPAIRMENT AND WEIGHT

A Study of Medical Examination Records of 3,037 Men Markedly Under or Over Weight for Height and Age [1]

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I

The relation of health and weight has long been of peculiar interest to the medical profession and the vital statistician. In 1913 the Medico-Actuarial Mortality Investigation made a special report on the effect of weight in relation to the mortality of men and women;[2] and since that time many studies have been conducted in this field, dealing both with mortality and with physical impairment. However, no extended research into the physical condition of the general population in relation to weight has been made. The purpose of this paper is to summarize briefly the results of such a study. To cover so broad a field it will be necessary to omit discussion of the medical implications of the material, and also to consider only rates for impairments where obvious relationships are found.[3]

[1] Studies in the Diseases of Adult Life, No. 10, from the division of research, Milbank Memorial Fund. The study was made in cooperation with the United States Public Health Service. Previous articles in the series will be found listed at the end of this paper.

[2] Medico-Actuarial Mortality Investigation, 1913, vol. 2. Actuarial Society of America and Association of Life Insurance Medical Directors.

[3] The original data are on file for consultation in the offices of the Milbank Memorial Fund, New York City.

Weight changes so rapidly with height and age that a method must be devised to hold these factors constant. A custom has grown up of determining the weight status of the individual by subtracting the average weight of persons of his height and age from his actual weight, and expressing the result in terms of the number or percentage of pounds below or above the average. In view of the fact that in this study the numbers are insufficient to determine the rates of impairment for specific weight-height-age groups, this customary method has also been followed here. It will be realized, of course, that such a calculation makes no allowance for differences in the type of build. No satisfactory means has been found by which the bony structure of a person (as distinguished from his weight) can be objectively determined. This point will be referred to later.

The data available for the present analysis are the records of "health" examinations of life insurance policyholders, which have been reported on in a series of papers on the diseases of adult life. A list of these papers is given at the end of this article. Special reference should be made to the first paper in the series, since it included a detailed discussion of the nature of the material and the necessary qualifications in its interpretation. The group under consideration is composed of policyholders who have accepted the offer of certain life insurance companies for examination without cost by physicians of the Life Extension Institute. The examinations must, of course, be clearly differentiated from those given by the insurance companies' examiners to applicants for insurance. The section of the population under consideration is evidently a socially and physically selected one (i.e., accepted for insurance); but from the point of view of the present investigation this would not seem to be an important factor.

Reference should be made to a previous analysis of a relatively small group of examinations of the same character.[4] Tables were given showing the percentage of men with arterial thickening, varicose veins, and various urinary impairments among persons 20 percent of more overweight and among those of "normal" weight. Distribution of individuals as to blood pressure in relation to weight was also given. The difficulty noted in that and in other studies has been the fact that relatively small deviations from average weight do not appear to have much effect upon the rate of impairment, or, indeed, upon mortality. It therefore seemed desirable in this study to center attention on classes showing more marked deviations from the average. This was possible in view of the fact that selection could be made from 100,000 examinations. The classes used for study were the following: (*a*) 20 percent or more under the standard weight for the individual's

[4] Physical Defects as Revealed by Periodic Health Examinations. By L. I. Dublin, E. L. Fisk, and E. W. Kopf. Am. Jour. Med. Sci., Oct. 1925, no. 4, vol. CLXX, p. 576.

height and age; (*b*) all weights; (*c*) 30 to 39 percent over the standard; and (*d*) 40 percent and more over the standard. About 8 percent fell in the under- and over-weight classes. Because a change in the weight code was made in 1923, it was necessary to discard for this particular study examinations coded prior to that time. The all-weight group covers the whole period, the figures being taken from "Studies in the Diseases of Adult Life, No. 2." In order to compare young and old adults, two age groups, 30 to 39 and 45 to 64, are considered. The study was limited to men, as the number of women available was too small for analysis. Examinations made by physicians outside the "head" offices are utilized, because of the larger number available.

There has recently been published a report of the results of an extensive investigation by insurance companies into the relationship between weight and mortality.[5] The first table is taken from this report and gives, for four age groups, the ratio of actual to expected mortality in different weight classes, as determined at the time of application for life insurance. The expected mortality was derived by applying standard rates of mortality (according to age and length of the policy) to the number of insured persons in the various weight classes. Thus we are really dealing with ratios between annual mortality rates which have been adjusted for age and for duration of the policy.

TABLE 1.—*Ratio of actual to expected mortality according to weight status, in four age groups, 1909–1928. Men* [1]

Weight class	Age group			
	20-9	30-9	40-9	50+
Under—				
25 pounds or more	118	105	83	77
10 to 20 pounds	101	94	76	85
5 pounds under to 5 pounds over	92	84	87	92
Over—				
10 to 20 pounds	99	88	94	90
25 to 45 pounds	113	123	125	119
50 pounds and more	163	143	144	130

[1] From Supplement to Medical Impairment Study. Op. cit.

The ratios in this table will be found to be quite consistent with those published in the investigation of 1913; namely, a great excess of mortality among overweight persons whatever the age and also an excess among young adult underweight persons. By the time that middle age is reached, these figures indicate, it is a definite advantage to be under the average weight for height.

[5] Supplement to Medical Impairment Study, 1929. Actuarial Society of America and the Association of Life Insurance Medical Directors, New York, 1932. See also The Influence of Weight on Certain Causes of Death. By Louis Dublin. Human Biology, vol. II, no. 2, May 1930.

Of more importance in connection with the present study is the mortality from particular causes among people of different weight classes. In table 2 are given the annual death rates in three categories; (a) 25 pounds or more under the average weight for height and age; (b) standard lives; (c) 50 pounds or more over the average. Since in many cases the experience is quite limited, the number of deaths is included in the table. The comparison is confined to 14 major causes of death.

TABLE 2.—*Annual death rates by cause, according to weight, in three age groups at issuance of insurance, 1909–1928.*[1] *Men*

	Weight class[2]	Annual rate per 100,000			No. of deaths		
		10–29	30–44	45 and over	10–29	30–44	45 and over
Tuberculosis of lungs	a	96	94	67	116	83	19
	b	42	30	30	1,121	258	78
	c	19	4	10	13	6	6
Other tuberculosis	a	7	9	21	8	8	6
	b	6	3	4	146	28	9
	c	0	1	0	0	2	0
Cancer and other malignant tumors	a	17	49	175	20	43	50
	b	6	37	152	154	321	392
	c	9	34	176	6	57	109
Pneumonia	a	26	61	102	31	54	29
	b	26	38	83	694	334	213
	c	34	44	64	23	73	40
Typhoid fever	a	5	7	7	6	6	2
	b	8	6	6	218	52	16
	c	7	11	6	5	18	4
Suicide	a	9	18	35	11	16	10
	b	9	21	33	251	184	85
	c	9	16	37	6	26	23
Accident	a	29	55	84	35	49	24
	b	80	55	75	2,107	481	194
	c	56	59	77	38	98	48
Influenza	a	20	27	42	24	24	12
	b	28	31	31	754	269	79
	c	92	47	35	62	79	22
All other causes	a	68	157	399	84	139	114
	b	61	152	451	1,601	1,324	1,160
	c	129	181	473	86	303	293
Organic diseases of the heart	a	10	26	161	12	23	46
	b	7	39	213	180	336	548
	c	10	71	253	7	119	157
Appendicitis, typhlitis	a	12	12	14	15	11	4
	b	14	18	25	379	157	63
	c	33	29	43	22	48	27
Cirrhosis of liver	a	1	2	7	1	2	2
	b	0	4	23	13	39	58
	c	1	16	31	1	26	19
Nephritis and Bright's disease	a	6	25	109	7	22	31
	b	7	33	123	186	289	317
	c	27	63	171	18	105	106
Diabetes	a	3	3	18	4	3	5
	b	4	8	25	104	66	64
	c	15	19	35	10	31	22
Cerebral hemorrhage and apoplexy	a	2	8	67	3	7	19
	b	3	27	118	75	232	303
	c	12	34	156	8	56	97

[1] From Supplement to Medical Impairment Study, 1929. Op. cit.
[2] Weight classes: (a) 25 pounds or more under; (b) standard lives; (c) 50 pounds or more over.

Of the diagnoses under consideration, tuberculosis is the only one showing any marked excess mortality among underweight persons. On the other hand, a large number of causes of death, primarily degenerative in nature, show an excess among overweight persons.

The table will serve as a key to the type of condition which, in our study of impairments, we may expect to find associated with overweight. But it is necessary to note that some of these conditions would not be likely to manifest themselves on the physical examination because of their very nature (for instance, cerebral hemorrhage). Moreover, the examinations being analyzed are those of persons able to be about; therefore, persons suffering from severe degenerative diseases are not likely to appear in the records.

II

Turning now to the results of the present investigation, we give (table 3) the average weights used as a standard in calculating the weight status of the individuals and (table 4) the percentage distribution of the men examined according to this weight status. In the latter case the comparison is limited to one particular, large, occupational group (that referred to in previous articles in this series as "business"). Tabulations for the intermediate weight classes were made for this group only.

TABLE 3.—*Average weight of men for height and age* [1] *(average for 30 years is taken as standard for later years)*

Height		Age			
Feet	Inches	15	20	25	30
5	0	107	117	122	126
	1	109	119	124	128
	2	112	122	126	130
	3	115	125	129	133
	4	118	128	133	136
	5	122	132	137	140
	6	126	136	141	144
	7	130	140	145	148
	8	134	144	149	152
	9	138	148	153	156
	10	142	152	157	161
	11	147	156	162	166
6	0	152	161	167	172
	1	157	166	173	178
	2	162	171	179	184
	3	167	176	184	190
	4	172	181	189	196
	5	177	186	194	201

[1] Medico-Actuarial Morbidity Investigation. Op. cit.

Perhaps the only comment necessary in regard to this table is that the averages at age 30 have been taken as the standard for all later ages. Average weights after 30 years show a gradual increase, which accounts in part for the fact that, in the next table, there is found, with advancing age, an increasing percentage of persons in the overweight groups. In the present analysis, however, since attention is being focused on individuals 30 percent and more overweight, no serious difficulty results from this basis of calculation.

TABLE 4.—*Percentage distribution of men according to weight status, by age. "Business"*

Percent under- and over-weight	Age			
	20-9	30-9	40-9	50-9
Under—				
30	0.1	0.1	0.1	
20 to 29	3.1	2.8	2.0	1.8
10 to 19	21.7	17.2	11.7	9.6
5 to 9	18.4	14.3	11.0	9.9
4 percent under to 4 percent over	29.5	26.2	24.5	22.3
Over—				
5 to 9	9.8	11.7	13.1	13.8
10 to 19	10.7	15.7	19.7	21.8
20 to 29	4.6	7.6	11.5	13.4
30 to 39	1.3	3.1	4.4	4.8
40 and over	.9	1.2	2.0	2.6
Persons	7,256	12,124	7,791	4,164

The examiners attempted to classify persons according to their bony framework or type of build. Three categories were used: Light, medium, and heavy. At first it seemed that this classification would give added meaning to a person's weight status, for it is recognized that bony structure is an important factor in weight status; but the following findings indicate that the physicians were unable to make the necessary distinctions:

(1) The percentage distribution of men according to type of build was not consistent at different ages. Instead, there was a marked increase in those classified as "heavy" as age advanced. This is brought out in table 5.

TABLE 5.—*Percentage distribution of men according to "type of build", by age, for occupational group, "Business"*

Build	Age			
	20-29	30-39	40-49	50-59
Light	10.1	7.9	7.4	5.7
Medium	83.6	82.7	80.8	81.2
Heavy	6.3	9.4	11.8	13.1
Persons	7,287	12,184	7,875	4,181

(2) There was a great excess of persons classified as "heavy" in the overweight groups, and vice versa. This is shown in table 6.

TABLE 6.—*Percentage distribution of men according to weight status by "type of build", age 30-39. "Business"*

Weight status	Type of build		
	Light	Medium	Heavy
Under—			
20 percent+	11.6	2.4	.5
10-19 percent	46.7	16.2	2.7
10 percent under to 19 percent over	39.9	72.3	55.4
Over—			
20-29 percent	1.2	6.6	22.6
30-39 percent	.5	2.2	13.6
40 percent+	.1	.1	5.0
Persons	944	10,049	1,131

(3) Preliminary calculations of the gross impairment rates according to weight status and type of build did not show the internal relations which would be expected if the classification by type of build really depended on bony structure rather than on appearance or on weight itself. For instance, in table 7 are given the number of impairments per person in two classes: (I) Those which show a decrease as weight increases, and (II) those which show an increase with weight.

TABLE 7.—*Impairments* [1] *per person (I) decreasing as weight increases, (II) increasing as weight increases; by type of build and weight status, age 30–39*

Weight status	I			II		
	Light	Medium	Heavy	Light	Medium	Heavy
(a) 20 percent or more under	2.65	2.51	----------	1.80	1.64	----------
(c) 30 to 39 percent over	----------	1.61	1.52	----------	2.34	2.59
(d) 40 percent or more over	----------	1.42	1.60	----------	2.57	2.89

[1] Items included are those given in tables 11 and 12.

If the type of build classification is to be taken as having any meaning apart from weight status, we would expect that, for persons of the same weight status, those impairment rates which decrease as weight increases would be higher in the medium than in the light type of build, and in the heavy than in the medium. In the case of impairments increasing with weight, we would expect the opposite. The table shows clearly that these relations do not hold.

(4) Calculations for systolic blood pressure, which is very sensitively associated with changes in weight status, indicate the same point that has just been brought out. Although it does not seem necessary to present the data in detail, table 8 is given for a particular weight class.

TABLE 8.—*Average* [1] *systolic blood pressure, 20 to 29 percent over average weight, by type of build and age. "Business"*

Type of build	Age		
	20–29	40–49	50+
Medium	125	129	136
Heavy	126	130	141

[1] See text footnote 8.

One factor which tends to invalidate comparisons of the rates of impairment among underweight and overweight persons is the difficulty which the examiner experiences in determining the presence of certain conditions among the latter. A few of these impairments are listed in table 9, which gives the ratio of the rate among persons

30 percent or more over the average weight to that in the group 20 percent or more under the average. Two age groups are shown.

TABLE 9.—*Impairments showing less prevalence among overweight persons due to difficulty in palpation or auscultation*

Impairment	Ratio of rate among persons 20 percent or more over average weight to that in group 20 percent or more under average		
	Mean	Age 30–39	Age 45–64
Spinal curvature	23	29	17
Faulty posture	32	27	38
Organic valvular lesions	41	24	58
Lymphadenitis	43	24	62
Abdominal tenderness [1]	43	35	52
Weak inguinal rings	44	59	29
Visceroptosis	46	34	58
Arterial thickening	55	59	52
Functional heart murmur	70	59	83

[1] Tenderness in region of appendix, liver, or gall bladder.

None of these ratios even approximate 100 (which would mean equal rates in the underweight and overweight persons), even where we would anticipate finding higher rates among overweight persons. Although in some cases it is possible that the relations shown in the table are real, it is evident that we cannot eliminate the factor of difficulty of discovery of impairments in the overweight group. Accordingly, these conditions have been omitted from consideration in this paper.

III

Because of large numbers of insignificant impairments and of conditions very slight in degree in the particular case, it is impossible to establish any impairment rate which is comparable with a mortality from all causes. However, it does seem worth while to present the gross rate of impairments or symptoms per person according to weight. This is done in table 10. The impairments listed in table 9 are omitted. Urinary findings are not included.[6]

TABLE 10.—*Impairments per person according to weight status. Two age groups*

Weight status	Per person		Total number	
	30–39	45–64	30–39	45–64
(*a*) 20 percent or more under	4.4	5.5	2,925	1,672
(*b*) Total group	4.0	4.8	129,680	98,142
(*c*) 30–39 percent over	3.7	4.6	2,290	3,595
(*d*) 40 percent or more over	3.7	4.8	1,009	1,904

[6] Items which are not strictly impairments (such as dietary faults, habitual use of laxatives, etc.) and history of previous illness are also excluded.

In both age groups there is a slight excess of impairments in the underweight class; in neither age group is there any excess in the overweight class. At first glance these rates appear to be inconsistent

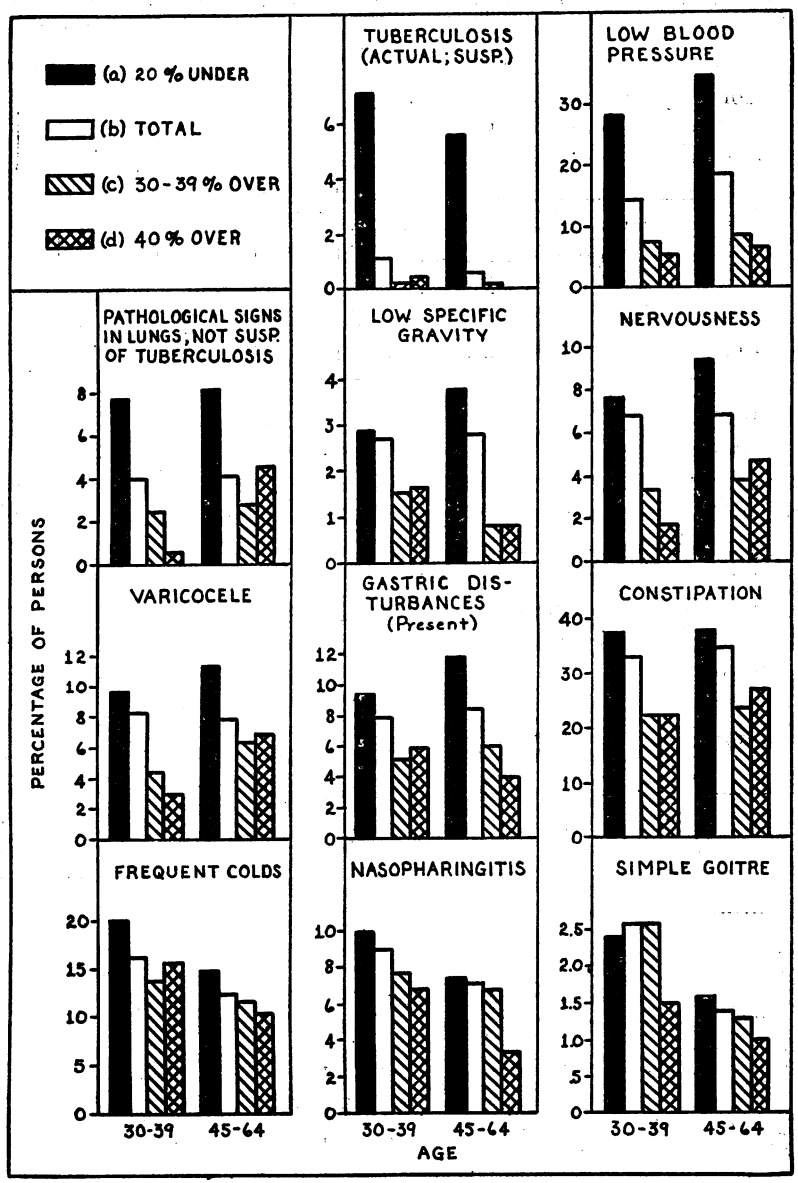

FIGURE 1.—Rate of physical impairment among persons markedly under or over standard weight. Decrease as weight increases.

with the mortality data previously discussed. However, two points should be kept in mind. In the first place, since (unlike the mortality data discussed above) weight and impairment were ascertained at the

same time, these examinations must have been made on many persons whose weight was reduced because they had a specific disease, possibly in an incipient form. Perhaps the recorded impairment amounted only to a vague symptom. That would tend to give an excess of impairments in the underweight class. In the second place, as will be clearer shortly, the major degenerative conditions which are responsible for the excess mortality among overweight people may be overlooked in a physical examination of apparently well people.

Before any conclusion is reached as to the meaning of the gross figures just given, it is necessary to consider the specific impairments. In tables 11 and 12 are given the rate of impairments for different weight classes, together with the ratio of the rate among persons 30 percent and more above the average weight, to that among persons 20 percent and more below the average. For brevity, only conditions are given for which the ratio seems to be significantly different from 100. Two age groups, 30 to 39 and 45 to 64, are used. Figures for the total number of persons examined have been included where available from previous reports in this series. These necessarily include persons in the underweight and overweight groups, but are affected by this factor to only a slight extent.

The first table presents those impairments showing an excess among underweight people. As stated above, physical defects which showed higher rates in this class because of easier palpation and auscultation are omitted from the table. Some of the outstanding relations are shown in figure 1.

TABLE 11.—*Rate of impairments and hygienic errors among men under and over standard weight for height and age, in age groups 30–39 and 45–64. "Field."*

[Rates which decrease as weight increases]

Impairment	Weight group[1]	Ratio[2]			Rate		Cases	
		Average	30–39	45–64	30–39	45–64	30–39	45–64
Tuberculosis, present (actual and suspected)	a	4	6	3	7.1	5.6	47	17
	b				1.2	.70	386	143
	c				.16	.13	1	1
	d				.37		1	0
History	a				1.1	1.6	7	5
	c				.33	.26	2	2
	d						0	0
Low blood pressure (15 mm and more below average for age)	a	23	24	23	28.3	34.9	188	105
	b				14.3	18.6	3,992	3,297
	c				7.5	8.7	46	68
	d				5.5	6.8	15	27
Pathological signs in lungs (not suspicious of tuberculosis)	a	32	24	40	7.8	8.2	52	25
	b				4.0	4.1	1,287	850
	c				2.5	2.8	15	22
	d				.74	4.3	2	17
Neurasthenia	a	33	31	36	3.2	3.6	21	11
	b				1.7	1.6	549	322
	c				1.0	1.1	6	9
	d				1.1	1.5	3	6
Low specific gravity of urine (less than 1.01)	a	37	52	23	2.9	3.8	18	11
	b				2.7	2.8	799	540
	c				1.4	.87	8	6
	d				1.6	.85	4	3

[1] Weight groups: (a) 20 percent or more under average weight for height and age; (b) total group; (c) 30 to 39 percent over average; (d) 40 percent and more over average.

[2] Ratio of the rate in the group 30 percent or more over to that in the group 20 percent or more under.

TABLE 11.—*Rate of impairments and hygienic errors among men under and over standard weight for height and age, in age groups 30–39 and 45–64. "Field."*—Continued

[Rates which decrease as weight increases]

Impairment	Weight group	Ratio			Rate		Cases	
		Average	30–39	45–64	30–39	45–64	30–39	45–64
Nervousness	a	41	38	44	7.7	8.8	51	27
	b				6.9	6.3	2,227	1,303
	c				3.4	3.7	21	29
	d				1.8	4.3	5	17
Varicocele	a	49	42	56	9.6	11.4	64	35
	b				8.2	7.8	2,649	1,593
	c				4.4	6.3	27	49
	d				3.0	6.8	8	27
Gastric disturbances (present)	a	49	56	42	9.6	11.8	64	36
	b				8.0	8.5	2,603	1,747
	c				5.2	6.0	32	47
	d				5.9	4.0	16	16
History (including ulcers)	a				1.2	3.3	8	10
	c				.82	1.4	5	11
	d				------	.50	0	2
Deflected septum (marked degree)	a	54	60	48	4.2	5.2	28	16
	b				3.8	3.4	1,227	707
	c				2.9	2.6	18	20
	d				1.5	2.3	4	9
Constipation	a	61	60	63	37.4	38.2	249	117
	b				33.0	34.1	10,694	7,014
	c				22.4	22.6	137	177
	d				22.9	27.1	62	108
Too little water drunk (less than 6 glasses daily)	a	67	63	71	26.2	25.8	174	79
	c				18.3	19.4	112	152
	d				12.2	15.8	33	63
Vitamin deficiency	a	70	70	70	11.3	11.1	75	34
	c				6.7	6.5	41	51
	d				10.7	10.3	29	41
Frequent colds	a	73	71	76	20.2	14.7	134	45
	b				16.4	12.3	5,291	2,531
	c				13.4	11.5	82	90
	d				16.2	10.5	44	42
Nasopharyngitis	a	73	74	73	10.2	7.5	69	23
	b				8.8	7.0	2,838	1,447
	c				7.8	6.6	48	52
	d				6.6	3.3	18	13
Acid stomach	a	78	80	76	13.2	13.4	88	41
	b				11.2	11.2	3,618	2,293
	c				9.8	10.2	60	80
	d				12.2	10.3	33	41
Habitual use of laxatives	a	79	81	78	28.3	31.4	188	96
	b				25.9	28.3	8,375	5,826
	c				23.1	23.9	141	187
	d				22.9	25.3	62	101
Simple goiter	a	86	96	75	2.4	1.6	16	5
	b				2.6	1.4	856	290
	c				2.6	1.3	16	10
	d				1.5	1.0	4	4

COMMENTS ON DATA PRESENTED IN TABLE 11

1. The finding in the case of tuberculosis is consistent with the mortality data previously discussed. Although loss of weight because of the disease may have been responsible for part of the difference, it is reasonable to conclude that these figures give evidence of a higher susceptibility to tuberculosis among underweight persons.

2. The relationship between blood pressure and weight is well recognized and will be specially discussed later.

3. Some meaning is thrown upon the heading, "Pathological signs in lungs, not suspicious of tuberculosis", since the rates are far higher among underweight persons and lead us to believe that, possibly in

some cases, the condition should have been suspected as being tuberculosis.

4. Neurasthenia and nervousness are very much higher among underweight persons, which is consistent with general ideas on this subject. It is possible that these and other symptoms and findings shown in the table may be early signs of pulmonary tuberculosis.

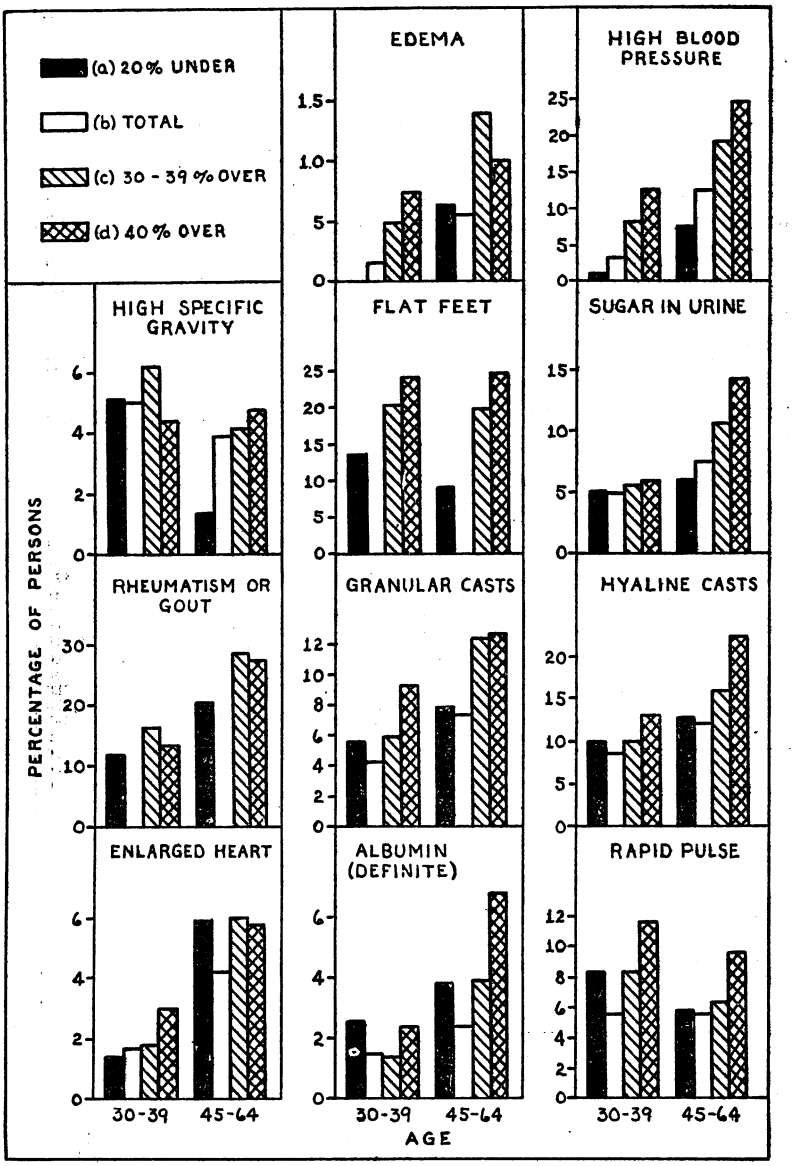

FIGURE 2.—Rate of physical impairment among persons markedly under or over standard weight. Increase as weight increases.

5. Gastric disturbances and constipation are consistently higher in underweight persons. Both are frequently associated with nervousness.

6. The differences for frequent colds and nasopharyngitis are suggestive.

7. The consistency of the results in the two age groups is very definite.

8. It is clear, however, that, although in some cases the higher rates among underweight persons is a real phenomenon, part of these results must be discounted because of the possibility that the impairment itself has affected the weight of the individual. There is, of course, no way of determining the extent of this effect. We do know, however, that the individuals were able to be about, and therefore few of them could have had the particular disease in any advanced stage. At the same time, certain chronic conditions might have existed (with a definite effect on the person's weight) and might have been classified under some vague description, such as "gastric disturbances" or "pathological signs in the lungs."

We turn now to those conditions which showed an excess rate among persons who were over the "standard" weight for height and age. Table 12 gives the data and corresponds in form to the table just presented. Figure 2 shows the relations in a few of the more important cases.

TABLE 12.—*Rate of impairments and hygienic errors among men under and over standard weight for height and age, in age groups 30–39 and 45–64. "Field"*

[Rates which increase as weight increases]

Impairment	Weight group[1]	Ratio[2]			Rate		Cases	
		Average	30–39	45–64	30–39	45–64	30–39	45–64
General dietary excess	a				0.15		1	0
	c		1,667		2.6	2.7	16	21
	d				2.2	3.0	6	12
Oedema	a				0	.65	0	2
	b			200	.17	.55	55	114
	c				.49	1.4	3	11
	d				.74	1.0	2	4
High blood pressure (20 mm and more above average for age).	a				1.5	7.7	10	23
	b	462	647	277	3.4	12.5	962	2,044
	c				8.3	19.4	51	152
	d				12.9	24.8	35	98
High specific gravity (more than 1.030).	a				5.1	1.4	32	4
	b	216	125	307	5.0	3.9	1,466	744
	c				6.2	4.1	35	28
	d				4.4	4.8	17	17
Flat feet	a				13.7	8.8	91	27
	c	200	158	243	20.4	19.7	125	154
	d				24.3	24.8	66	99
Rapid eating	a				23.6	20.3	157	62
	c	195	193	197	44.5	40.2	272	315
	d				47.9	39.6	130	158

[1] Weight groups: (a) 20 percent or more under average weight for height and age; (b) total group; (c) 30 to 39 percent over average; (d) 40 percent and more over average.

[2] Ratio of the rate in the group 30 percent or more over to that in the group 20 percent and more under.

TABLE 12.—*Rate of impairments and hygienic errors among men under and over standard weight for height and age, in age groups 30–39 and 45–64. "Field"*—Continued

[Rates which increase as weight increases]

Impairment	Weight group	Ratio			Rate		Cases	
		Average	30–39	45–64	30–39	45–64	30–39	45–64
Alcohol:								
Temperate	a	185	215	135	6.6	8.8	44	27
	c				15.4	11.4	94	89
	d				11.8	12.8	32	51
Excessive	a				.60	.65	4	2
	c				1.3	.89	8	7
	d				1.1	1.0	3	4
Sugar in urine:								
Trace (less than 0.1 percent)	a	164	114	197	4.9	5.8	31	17
	b				4.8	6.7	1,414	1,272
	c				4.9	8.7	28	60
	d				6.1	11.3	15	40
Definite amount (0.1 percent or more).	a				.16	.34	1	1
	b				.23	.85	68	162
	c				.71	2.0	4	14
	d					3.1	0	11
Miscellaneous dietary errors	a	149	142	156	26.3	20.9	175	64
	c				34.8	29.6	213	232
	d				42.8	38.9	116	155
Hernia:								
Present	a	143	162	124	2.3	8.5	15	26
	b				3.7	9.5	1,203	1,958
	c				3.1	10.3	19	81
	d				3.3	8.8	9	35
Operation	a				1.4	1.0	9	3
	c				2.5	2.3	15	18
	d				3.7	1.5	10	6
Rheumatism or gout (history)	a	133	130	137	11.9	20.6	79	63
	c				16.3	28.6	100	224
	d				13.7	27.6	37	110
Casts in urine:								
Granular	a	133	115	148	5.6	7.9	35	23
	b				4.2	7.4	1,235	1,400
	c				6.0	12.5	34	86
	d				9.3	12.7	23	45
Hyaline	a				9.9	13.0	62	38
	b				7.7	12.1	2,273	2,289
	c				9.9	16.5	56	114
	d				13.4	22.3	33	79
Enlarged or diseased tonsils	a	128	132	124	25.9	20.6	172	63
	b				29.2	20.6	9,433	4,237
	c				36.3	25.3	222	198
	d				29.9	25.8	81	103
Enlarged heart	a	128	157	100	1.4	5.9	9	18
	b				1.7	4.2	558	865
	c				1.8	6.0	11	47
	d				3.0	5.8	8	23
Varicose veins	a	127	91	163	3.5	5.9	23	18
	b				3.0	7.0	969	1,445
	c				3.3	9.1	20	71
	d				3.0	10.8	8	43
Rapid pulse (over 90 per minute)	a	120	113	127	8.4	5.9	56	18
	b				6.1	5.7	1,798	1,170
	c				8.5	6.4	52	50
	d				11.8	9.8	32	39
Albumin in urine:								
Slight	a	117	107	128	17.2	20.6	108	60
	b				12.6	17.5	3,714	3,324
	c				19.2	23.6	109	163
	d				20.2	32.1	50	114
Definite	a				2.6	3.8	16	11
	b				1.5	2.4	432	451
	c				1.4	3.9	8	27
	d				2.4	6.8	6	24

COMMENTS ON DATA PRESENTED IN TABLE 12

1. A number of dietary habits indicating overeating naturally appear in this table.

2. An immense difference is noticed in the case of high blood pressure (to be discussed later).

3. Sugar, casts, and albumin in and high specific gravity of the urine all show some excess in the overweight group, especially in the age group 45–64, where degenerative conditions are so important. Having in mind the fact that serious degenerative impairments are not always revealed by the simple "health examinations" which these persons received, one is not surprised that the differences are not more marked. They are probably the most important findings in the table. They suggest the early presence of conditions which in the end will cause a real excess mortality in the overweight classes.

4. Although these urinary findings seem to indicate such a relation, it is to be noticed that only one specific degenerative impairment appears in the list, viz, enlarged heart. Recorded organic valvular lesions actually were in excess for the underweight persons, but were eliminated from consideration because of the relatively greater ease and accuracy of diagnosis for thin chest walls.

5. Summarizing, we may say that it is primarily through the urinary findings that we are able to trace the consistency of these results with those obtained from life insurance mortality data.

In the opinion of the examiners, excess weight definitely placed the individuals on a lower plane of health, as indicated by the ratings [7] which they gave at the time of the examination. In table 13 the percentage distribution of men according to these ratings is given for the three weight classes.

TABLE 13.—*Percentage distribution of men according to examiner's "rating", by weight status, in two age groups*

Age group and weight status	Rating				Persons
	AB, B, BC	C	CD	D, DE, E	
30-39:					
a 20 percent or more under	39.7	53.6	4.4	2.5	643
c 30 to 39 percent over	22.1	65.9	8.7	3.4	589
d 40 percent or more over	7.0	35.5	23.9	33.6	259
45-64:					
a 20 percent or more under	36.5	53.6	6.5	3.4	293
c 30 to 39 percent over	14.0	64.7	14.5	6.8	747
d 40 percent or more over	3.5	29.4	25.1	42.0	378

[7] The ratings were made on the following basis, consideration being given to both number and degree of severity of the impairments found:

AA=Perfect (never found).
A=Excellent (seldom found).
AB=Very minor physical defects or hygienic errors.
B=Minor physical defects or errors.
BC=Several minor or one moderate defect requiring medical attention.
C=Moderate defects requiring medical correction or supervision.
CD=Between C and D.
D=Advanced physical defect requiring medical or surgical attention.
DE=Between D and E.
E=Very serious physical condition.

The percentages are very much more favorable for the persons in the 20 percent or more underweight group than in the two overweight groups. In a way this may be taken as reflecting the physician's knowledge of the expected relation between weight and health, but it undoubtedly means much more than that. One thing which is of interest is the sharp differentiation in the mind of the examiner between persons 30 to 39 percent overweight and those 40 percent and more overweight.

IV

Much data have been published in regard to the relation between blood pressure and weight. However, in view of the extensiveness of the present material, it appeared advisable to determine whether slight variations in weight status gave significant differences in blood-pressure readings.[8] For this purpose average systolic blood pressures were calculated for a portion of the data (previously referred to as "business"), using a finer grouping as to underweight and overweight than in the previous comparisons. The figures are given in table 14.

TABLE 14.—*Average* [1] *systolic blood pressure by age and weight status. "Business"*

Weight status	Pressure			Persons		
	Age 20–29	Age 40–49	Age 50+	Age 20–29	Age 40–49	Age 50+
10 percent or more under	120.0	122.0	131.2	1,802	1,078	650
9 percent under to 9 percent over	123.0	125.7	135.0	4,155	3,762	2,507
10 to 19 percent over	125.2	129.4	137.7	767	1,524	1,205
20 percent and more over	126.2	132.8	141.3	484	1,373	1,144

[1] See text footnote 8.

The table shows consistent changes in systolic blood pressure with slight differences in weight for height and age. With respect to the group 10 percent or more under the standard weight, it should be pointed out that only a small percentage of people in the group will be very much under the standard. This can be shown by reference to table 4, where for age group 20–29 only 3.2 percent were 20 percent or more under the standard. Thus actually the difference in weight in relation to height and age, in passing from the first line to the fourth, is not more than perhaps 50 to 60 pounds.

The extremes in blood pressure associated with greater differences in weight in relation to height and age are shown clearly in table 15, which (in order to be more explicit) gives the percentage distribution

[8] Blood pressure was coded in the form of deviations from an accepted standard similar to the method used in the case of under and overweight. The groups were rather broad, making it impossible to determine a true mean. However, a median could be obtained by determining the percentage in each blood-pressure group, cumulating these percentages at two points (15 millimeters below the average and 20 millimeters above the average), plotting these on probability paper, connecting the two points with a straight line, and reading off the median deviation at the point where this line crossed 50 percent. This was then added to or subtracted from the "standard" pressure from which the deviations were originally obtained.

of persons as to systolic blood pressure in the three weight classes which have been used in the earlier sections of the report.

TABLE 15.—*Percentage distribution of men as to their blood pressure in relation to average for age, according to weight status. (Age groups 30–39 and 45–64)*

Age group	Weight status	Blood pressure: Under average, 25 mm and more	Under average, 15–24 mm	14 mm under to 19 mm over	Over average, 20–39 mm	Over average, 45 mm and more	Total
		Percentage					
30–9	a	8.6	19.8	70.1	1.3	.2	100
	b	2.8	11.5	82.3	3.0	.4	100
	c	1.1	6.4	84.2	6.9	1.5	100
	d	.4	5.2	81.5	9.6	3.4	100
45–64	a	14.3	20.6	57.6	5.7	2.0	100
	b	5.5	13.1	70.0	8.1	3.4	100
	c	1.5	7.2	71.8	12.2	7.3	100
	d	.8	6.1	68.4	17.4	7.4	100
		Number					
30–9	a	57	131	464	9	1	662
	b	781	3,211	23,016	851	111	27,970
	c	7	39	515	42	9	612
	d	1	14	220	26	9	270
45–64	a	43	62	173	17	6	301
	b	973	2,324	12,420	1,440	604	17,761
	c	12	56	560	95	57	780
	d	3	24	270	69	29	395

The relations are so striking that figure 3 has been prepared to bring them out clearly. A direct connection can be traced between this correlation and the definitely excessive mortality rates among persons with high blood pressure. (See especially Studies in the Diseases of Adult Life, No. 8.)

V

Thus analysis of the rates of impairment in a group of 3,000 men markedly under and over the standard weight for their height and age has shown similar relations to those previously established in the case of mortality. On the underweight side, tuberculosis stands out most clearly; on the overweight side, degenerative conditions, especially as indicated by urinalysis findings and high blood pressure.

STUDIES IN THE DISEASES OF ADULT LIFE

(1) General Results of a Statistical Study of Medical Examinations by the Life Extension Institute of 100,924 White Male Life Insurance Policyholders since 1921; and

(2) Prevalence at different ages, based on medical examinations by the Life Extension Institute of 100,924 White Male Life Insurance Policyholders since 1921. By Edgar Sydenstricker and Rollo H. Britten. Am. Jour. Hyg., Vol. XI, no. 1 (January 1930).

(3) Some Recent Changes in the Mortality Among Adults. By Dorothy G. Wiehl. Jour. Prev. Med., vol. 4, no. 3 (May 1930).
(4) Physical Impairments and Occupational Class. Differential rates based upon medical examinations of 100,924 native-born, adult white insured males. By Edgar Sydenstricker and Rollo H. Britten. Pub. Health Rep., vol. 45, no. 34 (August 22, 1930).

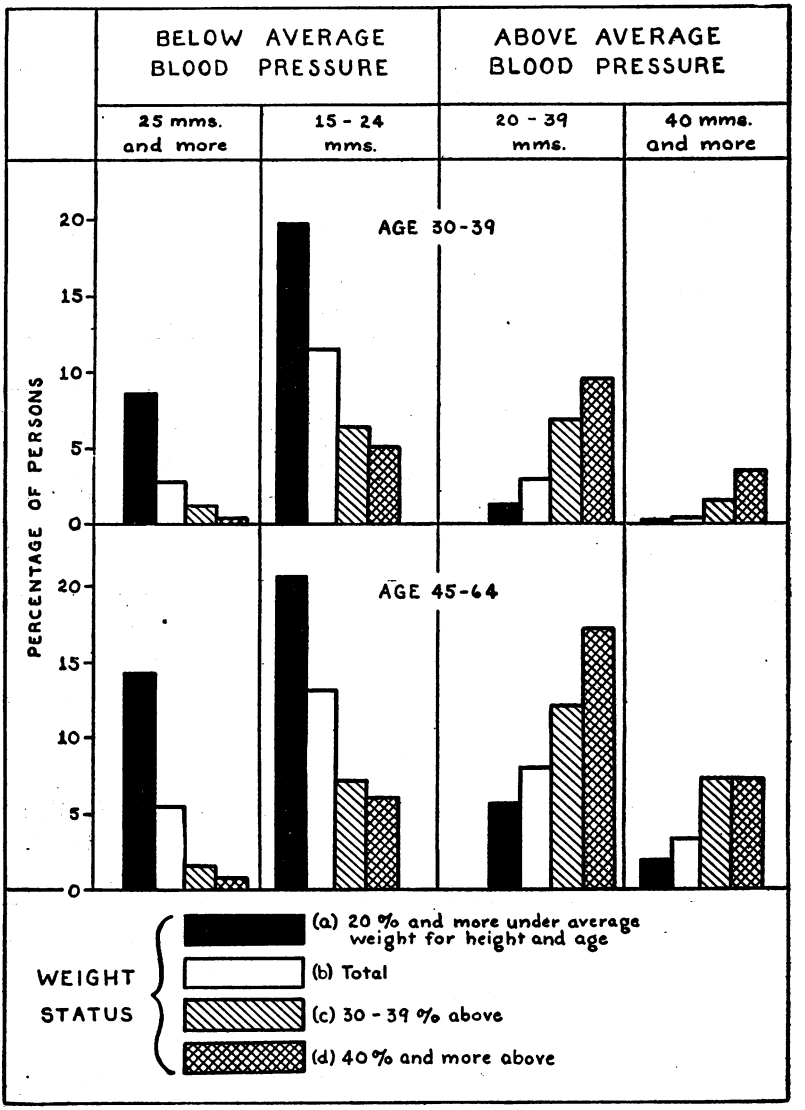

FIGURE 3.—Correlation of systolic blood pressure and weight status.

(5) The Incidence of Illness Among Wage-Earning Adults. By Dean K. Brundage. Jour. Ind. Hyg., Vol. XII, no. 9 (November, 1930).
(6) Rates of Physical Impairments in 28 Occupations Based on 17,294 Medical Examinations. By Rollo H. Britten and Jennie C. Goddard. Pub. Health Rep., vol. 47, no. 1 (January 1, 1932).

(7) Sex Differences in the Physical Impairments of Adult Life. A comparison of rates among men and women, based on 112,618 medical examinations by the Life Extension Institute. By Rollo H. Britten. Am. Jour. Hyg., Vol. XIII, no. 3 (May, 1931).

(8) A New Measure of the People's Health. A critical summary of medical examination records. By Rollo H. Britten and Jennie C. Goddard. Milbank Memorial Fund Quarterly Bulletin, Vol. X, no. 3 (July, 1932).

(9) The Physical Impairments of Adult Life: Association with subsequent rates of mortality. By Rollo H. Britten. Jour. Prev. Med., vol. 6, no. 4 (July 1932).

COURT DECISION RELATING TO PUBLIC HEALTH

Compensation for death from Rocky Mountain spotted fever granted under workmen's compensation act.—(Idaho Supreme Court; *Roe* v. *Boise Grocery Co. et al.*, 21 P. (2d) 910; decided Apr. 24, 1933.) In this case, the supreme court affirmed an award under the workmen's compensation act to a widow for the death of her husband from Rocky Mountain spotted fever. The court took the view that the evidence was sufficient to justify the conclusion that the deceased, a traveling salesman, was bitten by a wood tick while engaged in the performance of his duties.

In the prior case of *Reinoehl* v. *Hamacher Pole and Lumber Co. et al.*,[1] 6 P. (2d) 860, decided by the Idaho Supreme Court on December 8, 1931, it had been held that a swamper for a lumber company, who had died from Rocky Mountain spotted fever contracted through tick bites, had received "a personal injury by accident arising out of and in the course of his employment."

DEATHS DURING WEEK ENDED JULY 15, 1933

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

	Week ended July 15, 1933	Corresponding week, 1932
Data from 85 large cities of the United States:		
Total deaths	6,849	7,060
Deaths per 1,000 population, annual basis	9.6	10.1
Death under 1 year of age	552	576
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	46	47
Deaths per 1,000 population, annual basis, first 28 weeks of year	11.4	11.8
Data from industrial insurance companies:		
Policies in force	67,765,248	71,961,997
Number of death claims	12,824	13,183
Death claims per 1,000 policies in force, annual rate	9.9	9.6
Death claims per 1,000 policies, first 28 weeks of year, annual rate	10.3	10.1

[1] *See* Public Health Reports, vol. 47, No. 13, Mar. 25, 1932, p. 726.

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 July 22, 1933, and July 23, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 22, 1933, and July 23, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932
New England States:								
Maine	1	3	----	----	----	109	0	0
New Hampshire	----	----	----	----	7	21	0	0
Vermont	1	----	----	----	7	66	0	0
Massachusetts	12	29	----	2	191	260	3	1
Rhode Island	7	2	----	----	----	12	0	0
Connecticut	7	1	1	6	40	75	1	2
Middle Atlantic States:								
New York	26	48	[1] 1	[1] 1	367	695	3	1
New Jersey	17	19	1	2	153	233	0	1
Pennsylvania	29	38	----	----	261	232	3	8
East North Central States:								
Ohio [2]	14	13	6	2	41	91	1	5
Indiana	13	9	10	14	24	5	1	7
Illinois [2]	10	26	12	2	89	91	0	2
Michigan	29	17	----	----	64	426	0	1
Wisconsin	4	8	5	8	55	176	0	0
West North Central States:								
Minnesota	8	4	1	1	33	15	1	0
Iowa [4]	5	6	----	----	6	2	1	2
Missouri	22	20	----	----	15	15	1	2
North Dakota	4	4	----	----	16	4	0	0
South Dakota	1	1	----	----	----	2	0	0
Nebraska	4	2	----	----	12	----	0	0
Kansas	4	10	2	1	7	33	1	0
South Atlantic States:								
Delware	1	----	----	----	1	----	0	0
Maryland [2 3 4]	4	4	2	----	9	5	0	1
District of Columbia	----	5	1	1	12	4	1	0
Virginia	11	9	----	----	37	40	1	1
West Virginia	9	19	2	----	3	240	0	0
North Carolina [2 4]	14	14	1	43	82	299	3	1
South Carolina	11	10	79	67	101	7	0	0
Georgia [2]	9	6	----	21	33	6	1	0
Florida [2]	6	9	----	1	46	1	0	0
East South Central States:								
Kentucky	3	----	----	----	9	----	1	1
Tennessee	9	5	11	7	47	2	1	1
Alabama [2]	12	12	2	7	26	----	2	0
Mississippi [3]	9	15	----	----	----	----	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 22, 1933, and July 23, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932
West South Central States:								
Arkansas	6		1		59	1	0	0
Louisiana	13	9	8	2	5		1	1
Oklahoma [3]	4	7			10	4	1	1
Texas [2]	42	34	62	27	113	9	0	0
Mountain States:								
Montana [4]		1			2	7	0	0
Idaho	1		4			1	1	0
Wyoming [4]					1	2	0	0
Colorado		14			13	12	0	0
New Mexico	3	6	1		9		0	0
Arizona	2				16		0	0
Utah [3 4]					24	5	0	0
Pacific States:								
Washington	4	6			27	30	0	0
Oregon	1		17	6	62	14	0	0
California	31	54	12	17	177	65	2	2
Total	423	499	242	238	2,312	3,317	31	41

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932
New England States:								
Maine	0	0	18	10	0	0	2	3
New Hampshire	0	0	8	5	0	0	1	1
Vermont	0	0		14	0	0	0	0
Massachusetts	19	5	108	115	0	0	9	5
Rhode Island	0	0	4	11	0	0	2	1
Connecticut	2	2	25	16	0	0	2	2
Middle Atlantic States:								
New York	27	4	118	196	0	12	43	27
New Jersey	1	2	48	31	0	0	11	1
Pennsylvania	5	5	126	141	0	0	16	45
East North Central States:								
Ohio [2]	6	0	106	57	1	8	26	32
Indiana	0	1	19	16	0	3	24	34
Illinois [2]	7	6	98	60	2	1	30	42
Michigan	6	3	58	110	0	0	4	10
Wisconsin	0	2	25	21	6	0	4	0
West North Central States:								
Minnesota	10	3	17	17	0	0	0	1
Iowa [4]	0	0	8	6	0	9	1	4
Missouri	0	1	15	34	1	2	16	58
North Dakota	1	0	1		0	1	0	1
South Dakota	2	0	3	5	0	0	1	2
Nebraska	0	0	14		1	0	3	2
Kansas	1	0	14	11	0	6	15	20
South Atlantic States:								
Delaware	0	0		5	0	0	2	0
Maryland [2 3 4]	0	1	32	11	0	0	22	23
District of Columbia	0	0	2	3	0	0	0	4
Virginia	1	1	26	15	1	1	59	64
West Virginia	12	1	7	4	0	0	33	39
North Carolina [2 4]	1	0	23	19	0	3	40	61
South Carolina	0	1	5	1	0	0	52	71
Georgia [2]	0	0	5	5	0	0	37	86
Florida [2]	0	0	1	2	0	0	2	7
East South Central States:								
Kentucky	1	1	12	14	1	0	68	192
Tennessee	9	0	8	7	0	1	92	128
Alabama [2]	1	1	15	12	0	1	26	47
Mississippi [3]	0	0	4	1	0	1	16	37

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 22, 1933, and July 23, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932	Week ended July 22, 1933	Week ended July 23, 1932
West South Central States:								
Arkansas	1	0	1	1	1	1	25	51
Louisiana	1	0	5	5	0	0	39	74
Oklahoma [5]	0	0	1	9	0	15	36	62
Texas [2]	1	4	27	13	6	5	61	39
Mountain States:								
Montana [4]	1	0	----	13	0	6	4	4
Idaho	0	0	----	1	2	2	0	0
Wyoming [4]	0	0	5	3	0	0	0	0
Colorado	0	0	10	14	0	3	4	5
New Mexico	0	0	1	2	0	0	9	3
Arizona	0	0	3	3	0	0	4	2
Utah [3] [4]	0	0	6	3	0	0	1	0
Pacific States:								
Washington	1	0	11	10	7	11	4	1
Oregon	0	1	5	3	8	2	2	5
California	5	4	67	44	2	9	8	15
Total	116	49	1,115	1,099	39	103	856	1,311

[1] New York City only.
[2] Typhus fever, week ended July 22, 1933, 97 cases, as follows: Ohio, 9; Illinois, 1; Maryland, 1; North Carolina, 1; Georgia, 25; Florida, 1; Alabama, 39; Texas, 20.
[3] Week ended Friday.
[4] Rocky Mountain spotted fever, week ended July 22, 1933, 17 cases, as follows: Iowa, 2; Maryland, 5; Virginia, 2; North Carolina, 2; Montana, 2; Wyoming, 3; Utah, 1.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
June 1933										
Delaware	----	2	2	----	55	----	0	17	0	0
Florida	----	15	6	27	59	16	0	6	1	14
Illinois	29	87	68	8	1,857	2	8	933	14	60
Indiana	10	52	81	----	587	----	3	214	8	63
Louisiana	3	33	44	68	82	48	2	28	----	107
Maryland	----	28	8	1	141	2	1	211	0	40
Minnesota	6	47	5	----	749	----	7	180	4	5
New Hampshire	----	1	----	----	----	----	0	170	0	1
New Mexico	1	25	1	2	58	1	0	23	1	5
New York	13	202	----	2	6,385	----	13	1,646	0	60
Pennsylvania	11	194	----	1	4,330	----	6	1,645	0	89
Rhode Island	----	12	1	----	13	----	0	76	0	1
South Carolina	----	126	382	889	823	327	1	12	----	115
South Dakota	1	7	----	----	43	----	1	27	0	8
West Virginia	5	13	3	----	262	4	3	59	7	37

June 1933

Anthrax: *Cases*
- New York 1
- Pennsylvania 1

Chicken pox:
- Delaware 9
- Florida 11
- Illinois 960
- Indiana 192
- Louisiana 3
- Maryland 282
- Minnesota 400
- New Mexico 9
- New York 2,302
- Pennsylvania 2,610
- Rhode Island 113
- South Carolina 89
- South Dakota 64
- West Virginia 93

Conjunctivitis:
- New Mexico 1

Dengue: *Cases*
- South Carolina 3

Diarrhea:
- South Carolina 1,771

Dysentery:
- Florida 3
- Illinois (amebic) 3
- Illinois (bacillary) 10
- Louisiana 2
- Maryland 16
- Minnesota (amebic) 1

Dysentery—Continued.	Cases
New Mexico	1
New York	4
West Virginia	25
German measles:	
Illinois	67
Maryland	6
New Mexico	1
New York	103
Pennsylvania	65
Rhode Island	1
Hookworm disease:	
Louisiana	27
South Carolina	123
Impetigo contagiosa:	
Illinois	2
Maryland	9
Lead poisoning:	
Illinois	2
Leprosy:	
Illinois	1
Louisiana	1
West Virginia	1
Lethargic encephalitis:	
Illinois	5
Louisiana	2
Minnesota	2
New York	8
Pennsylvania	4
South Carolina	2
Mumps:	
Delaware	3
Florida	18
Illinois	627
Indiana	96
Louisiana	3
Maryland	289
New Mexico	29
Pennsylvania	825
Rhode Island	19
South Carolina	38
South Dakota	3
Ophthalmia neonatorum:	
Illinois	11
Maryland	2

Ophthalmia neonatorum—Continued.	Cases
Minnesota	1
New York	8
Pennsylvania	6
South Carolina	10
Paratyphoid fever:	
Illinois	1
Indiana	6
Louisiana	3
New York	8
South Carolina	7
Puerperal septicemia:	
Illinois	7
Pennsylvania	10
Rabies in animals:	
Illinois	25
Indiana	36
Louisiana	10
New York [1]	1
South Carolina	14
Rocky Mountain spotted fever:	
Indiana	1
Maryland	21
New York	1
Septic sore throat:	
Illinois	26
New York	18
West Virginia	67
Tetanus:	
Illinois	8
Louisiana	4
Maryland	1
New York	9
Pennsylvania	5
South Carolina	2
Trachoma:	
Illinois	3
Pennsylvania	1
Rhode Island	1
Trichinosis:	
New York	1
Tularaemia:	
Louisiana	4

Tularaemia—Continued.	Cases
Minnesota	10
New Mexico	1
South Carolina	1
Typhus fever:	
Delaware	1
Florida	3
Illinois	1
Louisiana	2
Maryland	6
New York	2
South Carolina	9
West Virginia	1
Undulant fever:	
Illinois	6
Indiana	1
Louisiana	1
Maryland	8
Minnesota	5
New Mexico	2
New York	29
Pennsylvania	3
South Carolina	2
South Dakota	1
Vincent's angina:	
Illinois	45
Maryland	14
New York [1]	64
Whooping cough:	
Delaware	19
Florida	71
Illinois	729
Indiana	325
Louisiana	61
Maryland	320
Minnesota	700
New Mexico	55
New York	1,779
Pennsylvania	993
Rhode Island	146
South Carolina	591
South Dakota	41
West Virginia	110

[1] Exclusive of New York City.

WEEKLY REPORTS FROM CITIES

City reports for week ended July 15, 1933

State and city	Diphtheria cases	Influenza cases	Influenza deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Maine:											
Portland	0	-------	0	1	0	0	0	0	2	2	17
New Hampshire:											
Concord	0	-------	0	0	0	2	0	0	0	0	10
Nashua	0	-------	0	0	0	0	0	0	0	0	0
Vermont:											
Barre	0	-------	0	7	0	0	0	0	0	3	1
Burlington	0	-------	0	0	0	2	0	0	1	0	13
Massachusetts:											
Boston	2	-------	1	83	10	18	0	9	0	52	187
Fall River	1	-------	1	2	0	3	0	1	0	7	19
Springfield	0	-------	0	2	0	1	0	1	0	9	25
Worcester	0	-------	0	40	1	3	0	2	0	0	-------
Rhode Island:											
Pawtucket	1	-------	0	0	0	0	0	0	0	0	8
Providence	1	-------	0	0	2	2	0	0	1	35	41
Connecticut:											
Bridgeport	0	1	0	4	1	3	0	0	0	2	27
Hartford	0	-------	0	1	1	1	0	0	0	0	31
New Haven	1	-------	0	0	1	0	0	0	1	13	32
New York:											
Buffalo	7	-------	0	45	9	10	0	9	0	37	99
New York	46	3	3	127	88	37	0	75	17	100	1,262
Rochester	0	-------	0	0	1	7	0	0	2	21	66
Syracuse	0	-------	0	0	2	4	0	2	0	10	31

City reports for week ended July 15, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
New Jersey:											
Camden	1		0	3	0	3	0	0	1	0	22
Newark	2		0	6	2	5	0	4	1	39	74
Trenton	0		0	11	1	4	0	3	0	6	30
Pennsylvania:											
Philadelphia	3	1	1	132	10	39	0	26	1	14	376
Pittsburgh	6	2	2	4	11	26	0	10	2	119	116
Reading	0		0	1	2	1	0	2	0	14	29
Ohio:											
Cincinnati	1		0	7	3	4	0	10	1	17	117
Cleveland	3	11	0	1	6	17	0	15	6	55	163
Columbus	0	1	1	1	2	12	0	3	0	0	80
Toledo	1		0	19	0	20	0	2	1	17	44
Indiana:											
Fort Wayne	2		0	0	0	0	0	0	0	0	16
Indianapolis	0		1	9	5	2	0	5	0	30	
South Bend	0		0	2	2	0	0	1	0	0	18
Terre Haute	0		0	0	1	2	0	1	1	3	13
Illinois:											
Chicago	1		3	61	24	82	0	43	3	64	595
Springfield	0	2	0	1	0	0	0	0	3	0	26
Michigan:											
Detroit	20	2	0	22	6	23	0	24	2	133	210
Flint	1		0	0	1	4	0	3	0	20	22
Grand Rapids	0		0	1	0	2	0	0	0	7	24
Wisconsin:											
Kenosha	0		0	1	0	0	0	0	0	29	3
Madison	1			0		0	0		0	14	
Milwaukee	0	1	1	2	3	5	0	4	0	111	73
Racine	0		0	0	0	1	0	0	1	34	10
Superior	0		0	0	0	0	0	0	0	18	7
Minnesota:											
Duluth											
Minneapolis	2		0	1	2	2	0	3	0	5	89
St. Paul	0		0	5	2	13	0	0	0	63	44
Iowa:											
Des Moines	0			0		4	0		0	0	
Sioux City	2			0		0	0		0	2	
Waterloo	0			0		0	0		0	0	
Missouri:											
Kansas City	4		0	1	8	1	0	4	0	4	92
St. Joseph	0		0	1	5	1	0	3	0	2	34
St. Louis	10			48	2	2	0	7	5	14	158
North Dakota:											
Fargo	0		0	0	0	0	0	0	0	1	
Grand Forks	0		0	1	0	0	0	0	0	0	
South Dakota:											
Aberdeen	0		0	0	0	0	0	0	0	0	
Nebraska:											
Omaha	2		0	7	1	2	0	1	0	8	54
Kansas:											
Topeka	0		0	0	1	0	0	1	0	3	20
Wichita	0		0	0	2	1	0	1	1	11	23
Delaware:											
Wilmington	0		0	1	1	2	0	2	1	5	26
Maryland:											
Baltimore	4	1	0	2	9	12	0	7	0	54	179
Cumberland	0		0	0	0	0	0	1	0	0	6
Frederick	0		0	0	0	0	0	0	0	0	4
District of Col.:											
Washington	6		0	22	7	6	0	11	0	15	125
Virginia:											
Lynchburg	0		0	11	0	2	0	0	0	23	9
Norfolk	0		0	0	2	1	0	1	3	3	27
Richmond	0		1	0	2	2	0	3	1	13	44
Roanoke	0		0	0	0	0	0	2	0	0	15
West Virginia:											
Charleston	0		0	0	1	0	0	1	0	2	14
Huntington	0		0	0	0	0	0	0	0	0	0
Wheeling	0		0	0	0	0	0	0	0	15	17
North Carolina:											
Raleigh											
Wilmington											
Winston-Salem	0		0	1	0	0	0	1	0	1	14

City reports for week ended July 15, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
South Carolina:											
Charleston	0	3	0	0	1	0	0	3	1	3	21
Columbia	0	------	0	0	2	0	0	0	0	0	18
Greenville	0	------	0	0	0	0	0	0	1	0	7
Georgia:											
Atlanta	5	5	1	5	0	1	0	3	2	14	54
Brunswick	0	------	0	0	0	1	0	0	0	0	1
Savannah	0	3	0	10	1	0	0	0	0	0	27
Florida:											
Miami	0	------	0	0	0	0	0	1	0	2	19
St. Petersburg	------	------	------	------	------	------	------	------	------	------	------
Tampa	0	------	0	0	1	0	0	1	0	0	19
Kentucky:											
Ashland	0	------	0	0	0	0	0	0	0	0	0
Lexington	0	------	0	0	1	0	0	2	0	0	14
Louisville	1	------	0	2	4	3	0	1	1	2	53
Tennessee:											
Memphis	1	------	1	22	2	0	0	4	5	18	85
Nashville	0	------	0	3	0	1	0	1	0	20	49
Alabama:											
Birmingham	1	5	1	0	1	0	0	5	6	2	74
Mobile	0	------	0	11	1	0	0	0	0	0	19
Montgomery	0	------	------	0	------	0	0	------	0	0	------
Arkansas:											
Fort Smith	0	------	------	0	------	0	0	------	0	6	------
Little Rock	0	------	0	1	1	0	0	1	1	0	2
Louisiana:											
New Orleans	2	3	0	3	8	3	0	11	1	0	130
Shreveport	0	------	0	0	3	0	0	0	0	0	------
Oklahoma:											
Tulsa	0	------	------	4	------	0	0	------	0	12	------
Texas:											
Dallas	0	------	0	0	1	3	0	2	1	3	72
Fort Worth	0	------	0	0	4	1	0	3	0	0	32
Galveston	0	------	0	0	1	0	0	0	1	0	16
Houston	5	------	0	0	2	1	0	4	0	1	67
San Antonio	0	------	0	0	5	0	1	7	0	2	59
Montana:											
Billings	0	------	0	0	0	0	0	0	0	0	4
Great Falls	0	------	0	1	0	0	0	0	0	3	4
Helena	0	------	0	0	0	0	0	0	0	0	1
Missoula	0	------	0	0	0	0	0	0	0	0	4
Idaho:											
Boise	------	------	------	------	------	------	------	------	------	------	------
Colorado:											
Denver	1	16	0	1	5	7	0	6	0	7	55
Pueblo	0	------	0	0	0	1	0	0	0	2	5
New Mexico:											
Albuquerque	0	------	0	0	0	0	0	1	0	6	6
Utah:											
Salt Lake City	0	------	2	21	1	4	0	1	0	21	26
Nevada:											
Reno	0	------	0	0	0	0	0	0	0	0	2
Washington:											
Seattle	0	------	------	2	------	4	0	------	1	22	------
Spokane	0	------	------	50	------	1	0	------	0	0	------
Tacoma	0	------	0	0	4	2	1	0	0	0	17
Oregon:											
Portland	1	------	0	3	4	6	3	0	0	3	54
Salem	0	------	0	1	0	0	0	0	0	0	------
California:											
Los Angeles	15	14	0	72	11	21	9	22	1	78	290
Sacramento	0	------	0	0	1	0	0	1	0	11	23
San Francisco	0	------	0	6	4	1	0	7	0	14	133

City reports for week ended July 15, 1933—Continued

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts:			
Boston	2	2	17
Worcester	0	0	2
Connecticut:			
Bridgeport	1	1	1
New York:			
New York	3	0	10
New Jersey:			
Newark	0	0	1
Pennsylvania:			
Pittsburgh	1	1	1
Ohio:			
Toledo	0	0	1
Indiana:			
Indianapolis	4	0	0
Illinois:			
Chicago	4	3	1
Wisconsin:			
Milwaukee	1	0	0
Missouri:			
Kansas City	1	0	0
St. Joseph	1	0	0
Maryland:			
Baltimore	0	0	3
District of Columbia:			
Washington	0	0	1
West Virginia:			
Wheeling	0	0	1
Tennessee:			
Memphis	0	0	1
Texas:			
Dallas	1	1	0
Colorado:			
Denver	0	0	1
California:			
San Francisco	1	1	0

Lethargic encephalitis.—Cases: New York, 1; Minneapolis, 1.
Pellagra.—Cases: Baltimore, 1; Winston-Salem, 1; Miami, 1; Tampa, 1; Birmingham, 3; Montgomery, 1; New Orleans, 1; Dallas, 1; San Francisco, 1.
Rabies (in man).—Nashville, 1 death.
Typhus fever.—Cases: Atlanta, 2; Savannah, 2; Tampa, 2.

FOREIGN AND INSULAR

CUBA

Habana—Communicable diseases—Four weeks ended July 15, 1933.—During the 4 weeks ended July 15, 1933, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	8	5	Scarlet fever	1	
Leprosy	2		Tuberculosis	17	3
Malaria	9		Typhoid fever	9	6

Provinces—Communicable diseases—Four weeks ended June 24, 1933.—During the 4 weeks ended June 24, 1933, cases of certain communicable diseases were reported in the provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Chicken pox			4			10	14
Diphtheria		1	1			1	3
Malaria		24	6	1	12	5	48
Measles			2			14	16
Scarlet feve.			1				1
Tuberculosis	1	75	38	88	64	44	310
Typhoid fever	6	15	5	8	8	19	61

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 July 28, 1933, pp. 896-906. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued August 25, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

China.—During the week ended July 15, 1933, 1 case of cholera with 1 death was reported in Canton, China.

Philippine Islands.—During the week ended July 22, 1933, cholera was reported in the Philippine Islands as follows: Province of Cebu, Opon, 37 cases, 16 deaths; Santa Fe, 1 case, 2 deaths; Toledo, 3 cases, 2 deaths.

Plague

Ceylon.—During the week ended July 8, 1933, 1 case of plague with 1 death was reported in Colombo. During the week ended July 1,

1933, 1 case of plague with 1 death and 2 plague-infected rats were reported in the same place.

Egypt.—During the week ended July 8, 1933, 1 case of plague with 1 death was reported in the Province of Girga.

Iraq.—During the week ended July 1, 1933, 3 cases of plague were reported in Baghdad.

Typhus Fever

Algeria.—During the week ended July 1, 1933, 18 cases of typhus fever were reported in Constantine Department.

Egypt.—During the week ended July 15, 1933, 3 cases of typhus fever with 3 deaths were reported in Alexandria. During the week ended July 8, 1933, 1 case of typhus fever with 1 death was reported in Cairo and 1 case in Port Said.

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