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— Editorial —

CASE FINDING AND THE PRIVATE PRACTITIONER

It was with the greatest interest that we read of the work of Dr. Albert C. Daniels, a private practitioner, who made a routine practice of screening his patients for tuberculosis, regardless of the complaints which directly accounted for their visits to his office. Within a relatively brief period of time, Dr. Daniels discovered a significant amount of tuberculosis among his patients and succeeded in making eminent contribution to the control of tuberculosis in his community. In an article in the December 1947 American Review of Tuberculosis, Dr. Sidney J. Shipman discusses Dr. Daniels' work and states, "It is at once suggested that a modern case-finding program, carried out by general practitioners * * * would go a long way toward the solution of the local tuberculosis problem."

We agree thoroughly with Dr. Shipman when he implies that Dr. Daniels' work is an excellent example of direct service which private practitioners can render in spearheading a total assault upon the problem of tuberculosis within a given community. As long ago as December 6, 1946, Dr. Herman E. Hilleboe, then Assistant Surgeon General, in discussing the role of the general practitioner in tuberculosis control, wrote, "It is well known but not widely appreciated that the private practitioner in his daily work is one of the most important, if not the most important, force in the control of disease * * * The private physician has a vital part to play in the campaign against tuberculosis, and the success of the whole movement may well be determined by the efforts and leadership of general practitioners."

The full potentialities of a program in which doctors' offices become effective and "natural sieves for the collection of tuberculous indi-

*This is the twenty-ninth of a series of special issues of PUBLIC HEALTH REPORTS devoted exclusively to tuberculosis control, which will appear the first week of each month. The series began with the Mar. 1, 1946 issue. The articles in these special issues are reprinted as extracts from the PUBLIC HEALTH REPORTS. Effective with the July 5, 1946 issue, these extracts may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 10 cents a single copy. Subscriptions are obtainable at $1.00 per year; $1.25 foreign.

viduals," as Dr. Shipman so aptly suggests, are so great as to reduce to a minimum much of the general public service which is now necessary in tuberculosis control. One needs only to appreciate that about forty million persons in this country consult a physician at some time during the year to visualize the magnitude of the potential effectiveness of the doctor's office as a tuberculosis case-finding channel. Indeed, if this population could be screened for tuberculosis in routine fashion, we as a Nation should find ourselves very close to the point where virtually every case of tuberculosis shall have come under direct and effective control.

As we have indicated in the past, however, significant success in this direction depends entirely upon the fulfillment of two conditions. First, the population must be adequately conversant with the nature of tuberculosis, so that individuals will regularly seek the services of the private practitioner as a routine preventive measure. Second, the physician to whom a patient reports must be completely equipped with the specific knowledge and the tools necessary for the early diagnosis of tuberculosis. Assuredly, great advances have been made in both these directions within recent years. However, we are forced to acknowledge that in reality we are today a great distance from the realization of these goals. Indeed, the fact that routine radiography so frequently discloses tuberculosis which has previously gone unrecognized gives point to this observation.

The efforts of all groups interested in the ultimate control of tuberculosis must therefore be intensified to accomplish full and effective education, not only of the public, but of the private medical practitioner as well. Only in this fashion can we hope eventually to see the establishment of the medical practitioner's office as a service unit in the campaign against the costly disease of tuberculosis.

This, however, is a long-term objective, the realization of which must require years of intensive application and effort. But, in the meantime, tuberculosis could continue to kill 50,000 Americans each year; in the meantime, too, routine detection efforts will continue to reveal but a fraction of the total amount of tuberculosis which we know exists in every city and town, village and hamlet across the land. These are problems which demand the most immediate and direct attention, awaiting the day when we can rely more fully upon such devices as the private practitioner's vigilance—devices which may ultimately prove more economical than those now at our disposal.

The problem of tuberculosis affects all groups and all localities, and no community is safe until all communities have secured themselves against the havoc of the disease. For the present, then, the control of tuberculosis demands the most extensive application of all practicable techniques—not by one organization, one agency, or one group alone, but by the concerted and well-integrated efforts of the

entire community, local, State, and national. The scattered and uncoordinated efforts of single agencies which have all too frequently marked past practices must be replaced by the community approach, which, in case finding, implies the application of mass radiography to entire population groups.

The vast potentialities of tuberculosis case finding by private medical practitioners render the practice highly worthy of development, exploitation, and extension. In the physician's office, refinements of diagnostic technique, such as the tuberculin test, can be applied in a manner scarcely possible in the conduct of community-wide service programs. More and more, therefore, we must encourage the integral use of case-finding techniques within normal medical practice. The widespread acceptance of this concept cannot fail to result in the more rapid conquest of tuberculosis. However, until such time as this procedure becomes firmly entrenched within the practice of general medicine, it is vital that we seek to consolidate those gains already made and to extend effective control through the use of such supplementary devices as case finding on the community-wide basis.

FRANCIS J. WEBER, *Medical Director,*
Chief, Tuberculosis Control Division.

A LIQUID ASCITIC MEDIUM FOR THE ISOLATION OF *MYCOBACTERIUM TUBERCULOSIS* FROM PATHOLOGICAL MATERIAL [1]

By LADISLAV ŠULA

The development of the liquid ascitic medium herein described was stimulated directly by the shortage of eggs necessary for the preparation of Löwenstein media (*1*), which had been used routinely in the bacteriological diagnosis of tuberculosis. When wartime rationing forced us to dispense with egg media for the isolation of tubercle bacilli from infectious material, we began to experiment with other solid media, e. g., glycerin potato, agar with the addition of brain tissue (*2*), agar according to Hesse (*3*), lecithin agar with liver extract (*4*), Loeffler's glycerinated serum, Patočka's medium with soya-bean flour (*5*). Despite the effectiveness claimed for these media by these authors, however, we obtained only occasional positive results from highly infectious material which contained such large numbers of tubercle bacilli as to give positive findings on direct smears. Such material as pleural effusions, cerebrospinal fluids, and urines, which usually contain only a few tubercle bacilli, not detected microscopically, appeared almost always sterile on the aforementioned media, even in cases where positive growth could be obtained on Löwenstein's medium

[1] From the Tuberculosis Department of the State Institute of Public Health, Prague, Czechoslovakia.

or by guinea-pig inoculation. Moreover, primary cultures of bovine strains were never successful on these media.

In view of our failure with solid media, we turned our attention to possible liquid media. We experimented with various synthetic liquid media to which horse serum, bovine serum, and ascitic liquid were added as a source of native protein. Finally, we developed a liquid medium containing a relatively low concentration of essential mineral salts and organic substances, and which yielded good growths of tubercle bacilli in primary cultures. The low content of salts and small amount of malachite green reduced the possible contamination of the medium to a minimum. As a source of native protein, we employed ascitic liquid sterilized by Seitz filtration.

The ascitic liquid medium was tested by simultaneously inoculating Löwenstein's medium and egg-yolk media of Corper-Cohn (*6*) with the identical material, as well as by animal inoculation. A series of these comparative studies was carried out in the State Serum Institute in Copenhagen (*7*).

From these experiments the following conclusions were reached:

1. The ascitic liquid medium is suitable for primary cultures of human, bovine, and avian types of tubercle bacilli.

2. This medium does not wholly substitute for egg media or animal inoculation.

3. In view of the recommendation of the Committee on Evaluation of Standard Laboratory Procedures, which suggests the employment of at least two different media to obtain reliable cultivation results (*8*), ascitic liquid medium may be considered as a convenient complement to egg media.

METHODS

Preparation of the ascitic liquid medium (*9*).—Composition of the basic solution:

Dibasic sodium phosphate · 12 H_2O	2.5 gm.
Monobasic potassium phosphate	1.5 gm.
Magnesium sulphate · 7 H_2O	0.5 gm.
Sodium citrate (neutral)	1.5 gm.
Ferric ammonium citrate	0.05 gm.
l-Asparagin	2.0 gm.
l-Alanin	0.15 gm.
Glycerin	20 cc.
Water q. s. ad	1,000 cc.
Malachite green (0.15–0.2 percent aqueous solution)	1 cc.

All the chemicals are dissolved together in 1000 ml. distilled water, heated in an Arnold sterilizer, and autoclaved at 120° C. for 20 minutes. After the solution cools to about 56° C., 100 ml. of sterile ascitic liquid are added. The medium is perfectly clear, without sediment, and slightly green in color. Approximately 6 ml. of this medium are then transferred to sterile test tubes. After incubation for 24 hours at 37° C. (as a test for sterility), the medium is ready for use.

Substitution may be made in the preparation of the medium by replacing l-Asparagin and l-Alanin with enzymatic casein digest. To the 1,000 ml. of the basic solution, 50 ml. of enzymatic casein digest prepared according to Cole (*10*), or 2.5 gm. of any similar standardized preparation (such as Protolysate [2]) may be used.

When the demand for media is great, it is advantageous to prepare stock ascitic liquid and bottle it in exactly measured amounts. We usually prepare 10 bottles of basic solution, each containing 1,500 ml. without ascitic liquid, glycerol and malachite green. At the same time, 10 bottles of ascitic liquid, each of 150 ml., containing a tenfold concentration of malachite green and glycerol are prepared. Since ascitic fluid is likely to become contaminated, we find it practical to keep it sterile by the addition of glycerol and malachite green, concentrated 10 times more than in the basic solution. The ascitic medium is therefore prepared with ten times stronger concentrations of salts, glycerol and malachite green than the final medium should contain. This facilitates shipments to other bacteriological laboratories, and simplifies the universal use of a centrally produced medium for the cultivation of tubercle bacilli. Immediately before use, 100 ml. of the ascitic medium concentrate are added to 900 ml. sterile distilled water.

To eliminate difficulty in Seitz-filtering the ascitic fluid-glycerol-malachite green mixture, and to prevent the absorption of a great part of the malachite green in the filter pad, the following method is used.

Preparation of ascitic liquid preserved with glycerol and malachite green.—Two hundred ml. of glycerol and 1 ml. of a 1.5–2 percent aqueous solution of malachite green in a sterile bottle are autoclaved at 120° C. for 20 minutes. One thousand ml. of ascitic liquid are then added through a Seitz filter. The bottle is thoroughly shaken to get an even distribution of glycerol and malachite green in the ascitic fluid. This solution is then dispensed with sterile precautions into 100–150 ml. bottles. Ascitic fluid prepared in this fashion and kept in the refrigerator at 3–5° C. is preserved up to 3 months without loss of efficiency. When required, proportionate amounts of the preserved ascitic fluid basic solution without malachite green and glycerol are mixed. The stimulating effect of ascitic liquid is, as a rule, constant as long as the ascitic liquid contains 3-percent protein, but it is not desirable to use hemorrhagic ascitic fluid to maintain this stimulating effect.

To test the effect of the ascitic liquid on growth, some of the liquid is added to the basic solution in a series of concentrations from 1–20 percent. Efficient ascitic fluid still exerts an obviously stimulating

[2] Mead and Johnson, Evansville, USA.

effect on primary or subcultures of tubercle bacilli in a 1-percent concentration using 6–10 mg. moist weight of the bacillary strain. Raising the concentration of ascitic fluid to 20 percent does not cause any obvious inhibition of growth in the ascitic medium. Another good indication of the efficiency of the ascitic fluid is its ability to convert malachite green into a colorless leucobase if kept at 37° C. for a week. Should the medium remain green for this period, however, the ascitic fluid is unsuitable. The same applies to ascitic fluid that does not produce a cloud of precipitated protein when the medium is boiled.

The ascitic liquid is obtained from patients suffering from hepatic cirrhosis, and collected into a bottle containing 3 gm. of sodium citrate powder per 1,000 ml. of ascitic liquid to prevent precipitation of fibrinogen. Each lot of ascitic fluid, even if sterile on blood agar or meat broth, is passed through a Seitz filter to get rid of any tubercle bacilli that might be present, if by chance cirrhosis has been mistaken for tuberculous exudative peritonitis.

Pleural fluid passed through a Seitz filter can be substituted equally well for ascitic fluid. Bovine fraction V used by Dubos (*11*) in the preparation of Tween-albumin media, can also be employed. Egg-albumin and horse serum are unsuitable.

The preparation of the concentrated ascitic medium.—This medium is but a tenfold concentrate of the medium described above. Since it is rather difficult to avoid a precipitation of the constituent salts, an exact description of the preparation of this concentrate, in which no precipitation occurs, is as follows:

Ascitic fluid	1,000 ml.
Dibasic sodium phosphate · 12 H_2O	25 gm.
Monobasic potassium phosphate	15 gm.
Sodium citrate (neutral)	15 gm.
Magnesium sulphate · 7 H_2O	5 gm.
Ferric ammonium citrate	0.5 gm.
l-Asparagin	20 gm.
l-Alanin	1.5 gm.

The ascitic liquid is brought to 40–50° C. in a water bath and the salts (*2–5*) are added and completely dissolved in the order named. The ferric ammonium citrate is dissolved in 10 ml. H_2O and then added. Since l-Asparagin and l-Alanin are not readily soluble in cold water, these substances are dissolved together in 100–150 ml. of boiling water and are added after cooling to 50–60°. The concentrate is then filtered through a Seitz pad into a sterile bottle containing 200 ml. glycerol and 1 ml. 1.5 to 2 percent sterile solution of malachite green.

After mixing thoroughly, the medium is divided into 100 ml. bottles under sterile conditions using the simple apparatus pictured in figure 1. This concentrate is stable at a temperature of 3–4° C. for 3 months. Routine ascitic medium is then prepared when required by diluting 1 part of concentrate with 9 parts of sterile distilled water.

Since the ascitic medium is easily contaminated and cannot be

sterilized after the addition of ascitic liquid, asceptic care should be exercised when dispensing the medium into the bottles and test tubes. In this laboratory the same apparatus is used for this purpose as for the dispensing of the ascitic fluid concentrate.

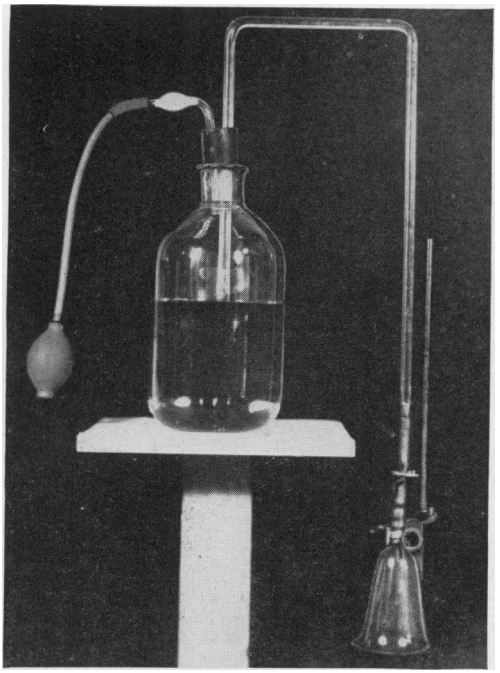

FIGURE 1.—Tube- or flask-filling device.

All glassware used must be scrupulously clean. Traces of soap or other material used for cleaning must be completely removed by rinsing first with running tap-water and then by distilled water, if reliable culture results are to be obtained. As opposed to egg medium, the liquid ascitic medium is impaired by the presence of even small quantities of cleaning residues or other impurities.

CLINICAL MATERIAL

Clinical material was sent to us by hospitals, sanatoria and tuberculosis dispensaries. Except for special cases, only microscopically negative specimens are investigated. We obtained a large proportion of the specimens (mainly laryngeal swabs) at the Bacteriological Tuberculosis Station of the State Hospital in Prague XII. This department forms a part of the Tuberculosis Laboratory of the State Institute of Health in Prague, and collects all specimens for inoculation from patients who do not expectorate. All these patients are controlled by the tuberculosis dispensaries in Prague. Samples of bovine strains of tubercle bacilli were obtained for investigation from the Municipal Abattoire in Prague.

Upon arrival, all samples were immediately stored in the ice-chest and cultured within 24–48 hours. For the comparative studies, only those samples which contained sufficient material were used. A portion of each was simultaneously inoculated into each of two Löwenstein's egg and ascitic liquid media and into one guinea pig. Samples from presumably bovine-strain infections were inoculated into each of two of the following media: Löwenstein's, Corper-Cohn's, ascitic, and Dubos' medium (*11*).

CULTURE TECHNIQUES

The liquid ascitic medium is suitable for growing tubercle bacilli from any routinely prepared tuberculous material. If preliminary culture on blood agar shows the material to be sterile or containing only a few other microbes, we always carry out a direct culture in addition to the indirect culture, i. e., after homogenization with alkali or acid. Even weak acid or alkaline solution depresses the vitality of tubercle bacilli contained in the sample and leads frequently to negative results, particularly with pleural effusions, cerebrospinal fluids, urines, etc., containing few living tubercle bacilli.

For homogenization of sputa and all other materials containing secondary microorganisms 1*N* HCl is used and subsequently neutralized by 2*N* NaOH. Correct neutralization of excess acid with alkali is essential when using liquid media. The pH of the medium must under no condition drop below 6.5, or exceed 7.2, if reliable bacteriological results are to be obtained.

To clear effusions, cerebrospinal fluids and urines, 1–2 drops of colloidal $Al(OH)_3$ are added before centrifuging. The sediment after centrifugation is treated with HCl and alkali; 7 ml. of HCl are added with a pipette to all samples, allowed to act for 15–20 minutes, and then neutralized with 4 ml. 2*N* NaOH. As sodium hydroxide regularly contains traces of sodium carbonate, 0.5 ml. of NaOH in excess of the ordinary titration proportions has to be added. We employ our own method (*12*) for culturing pleural fluid obtained under sterile conditions from cases of so-called idiopathic pleurisy or from clear pneumothorax exudates.

Effusions, especially those from idiopathic pleurisy, usually contain few tubercle bacilli whose presence can be demonstrated by inoculation only if large quantities of fluid are used. Our procedure is as follows: One hundred and fifty to two hundred ml. of the pleural effusion are evacuated under sterile conditions into a sterile Erlenmeyer flask. The flask is then left to stand overnight at room temperature. The fibrin coagulum which forms in the flask contains in its meshes all cellular elements previously suspended in the fluid, I. e., red and white blood cells, and tubercle bacilli, so that bacilli are concentrated in the formed clot. The clot itself usually adheres quite firmly to the sides of

the flask. The fluid is then poured off and 150–200 ml. of ascitic fluid are added.

Pneumothorax exudates usually contain a high number of tubercle bacilli; 20 ml. are therefore inoculated directly into the basic solution without ascitic fluid, using the syringe in which the exudate has been taken. Thus, native protein and tubercle bacilli are added to the basic solution simultaneously. For such cases, 80 ml. of the basic solution are dispensed into 200 ml. Erlenmeyer flasks. After 3–6 weeks (according to the numbers of bacilli present) grain-like colonies of tubercle bacilli can be observed growing in the meshes of the clot.

Laryngeal swabs are treated in the following manner: 7 ml. of 1N HCl are pipetted into the tube containing the swab and allowed to act for 15–20 minutes, after which 4 ml. of 2N NaOH are added. This is allowed to stand for 10 minutes more and the swab is then used to inoculate ascitic media. Since the acid and alkali may not always be completely mixed, the upper third of the cotton-wool swab may give an acid reaction, and the lower two-thirds, alkaline. We, therefore, inoculate the first tube only slightly, thereby neutralizing the swab completely. In the second tube, we shake the swab thoroughly during immersion in order to remove all droplets of sputum from the wool.

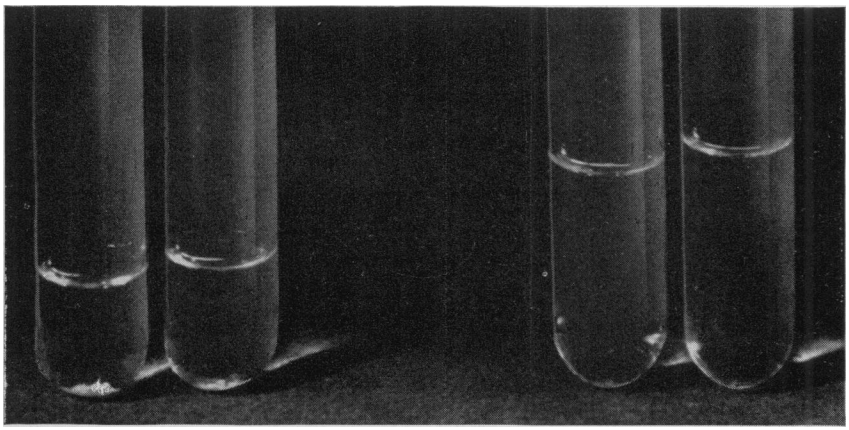

FIGURE 2.—Deep, primary culture of tubercle bacilli (human type) in liquid ascitic medium. Age of culture 6 weeks. Tubercle bacilli form a deposit like grains of sand at the bottom of the test tube. Half the volume of the medium has evaporated during incubation. To the right two test tubes contain the original volume of medium inoculated.

We have also used laryngeal swabs more recently for cultures of sputum, purulent eflusions and gastric contents. The following technique is employed. The sputum is poured into a Petri dish, suitable particles, particularly pus, are picked out and rubbed into two or three swabs. From this point on, the procedure is identical with that described above for laryngeal swabs. This also applies to purulent effusions. Gastric contents are allowed to stand in the refrigerator for 24 hours during which time sedimentation takes place. The superna-

tant fluid is then poured off, and the sediment is rubbed into two or three swabs. We are now attempting to treat clear fluids, cerebrospinal fluids and urines in similar fashion. In the investigation of sputum, gastric contents, and purulent effusions, comparative studies seem to indicate that this method may replace to a considerable extent the usual methods of homogenization by acid and alkali followed by centrifugation and inoculation of the deposit. The simplicity of the method is undoubtedly an advantage compared with the centrifugation method.

After inoculation, tubes are closed with ordinary cellulose stoppers and left unsealed. The cultures are incubated at 37°–37.5° C. for 6 weeks. Large Petri dishes filled with water are put into the incubator to prevent excessive evaporation of the medium. Evaporation up to half of the initial volume of the medium during incubation does not influence the results of cultivation on the medium (figure 2).

The cultures are inspected for the first time after 3 weeks, and for the second time after 6 weeks. Cultures showing growth are examined by staining a smear according to the method of Ziehl-Neelsen, or by subcultures which are inspected after 3 to 5 days to exclude acid-fast saprophytes.

THE GROWTH OF *MYCOBACTERIUM TUBERCULOSIS* IN THE LIQUID ASCITIC MEDIUM

The ascitic medium described above is comparatively poor in providing the nutrient requirements for many saprophytic and pathogenic organisms. It is satisfactory, however, for the growth of all types of tubercle bacilli. The macroscopic aspect of the colonies of tubercle bacilli growing in this media allows one to make a distinction between some contamination and tubercle bacilli, and may give indication as to the type of tubercle bacilli concerned. Thus it may be possible to differentiate the human and bovine types from the avian type or some acid-fast saprophytes. The tubercle bacilli grown in ascitic liquid medium, when transferred to solid egg media or inoculated into animals, produce typical colonies or lesions.

The following describes the growth of the individual types of

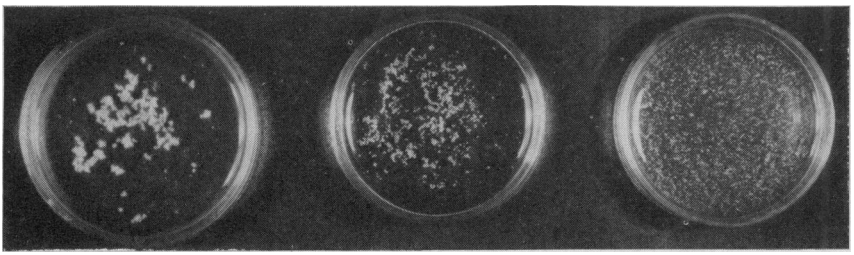

FIGURE 3.—Primary cultures of tubercle bacilli (human type) in liquid ascitic medium. The media in the test tubes were inoculated by laryngeal swabs. The cultures were incubated 1 month at 37° C. and then poured into Petri dishes.

Mycobacterium tuberculosis and of acid-fast saprophytes in liquid ascitic media:

Human type: Grows as a sand-like deposit at the bottom of the tube. Individual colonies form grains of irregular shape of 1–2 mm. diameter (figure 3). The colonies do not adhere to the bottom of the tube. Shaking the tube makes them rise freely in the medium and they drop back to the bottom again quickly. This phenomenon is characteristic and can be observed even with very small colonies, in contrast to colonies of acid-fast saprophytes, which remain suspended for a considerable time when the medium is shaken, and which form a deposit at the tube bottom much later than pathogenic tubercle bacilli. If the material used for inoculation contains large numbers of bacilli, only small colonies about the size of a pinhead, grow at the bottom of the tube, or a contiguous thin frill-

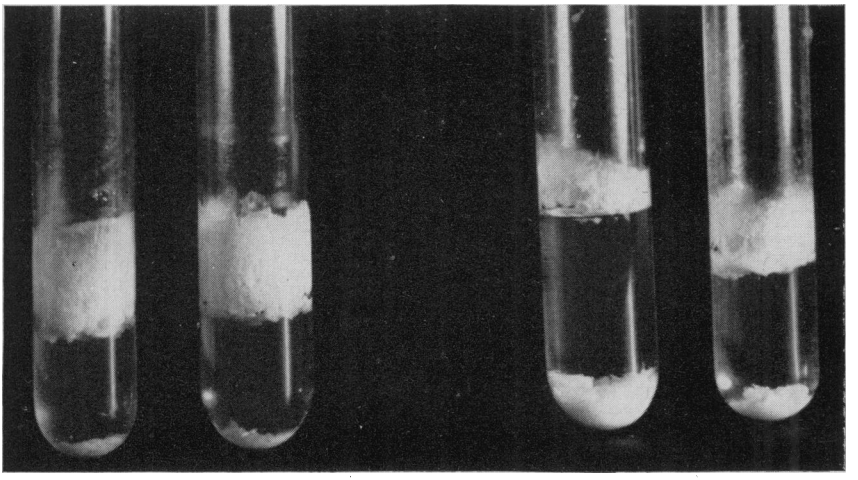

FIGURE 4.—(*Left*) Pure cultures of tubercle bacilli on ascitic medium, 2 months old. After the formation of a surface membrane, growth at the bottom stops. (*Right*) Two tubes containing acid-fast saprophytes, 1 month old. Growth at the bottom continues even after the surface membrane has formed. As opposed to tubercle bacilli, the amount of deposit is considerably larger with acid-fast saprophytes.

like pellicle is formed. In strongly positive cultures, surface pellicles also are formed after 5 to 6 weeks, identical in structure with those on Sauton's or Long's medium (figure 4). These surface membranes are formed even if the culture tubes are undisturbed. If tubes containing a small number of colonies are shaken sufficiently, surface membranes are formed in all of them as a rule within 14 days. After the formation of the surface pellicle the submerged growth ceases (figure 4). The majority of tubercle bacillus cultures of the human type shows macroscopic growth after 14 to 21 days; the maximum growth occurs between the eighteenth and twenty-first day of incubation. In exceptional circumstances growth can be observed as early as the eleventh or twelfth day, but only from material containing very large numbers of bacilli. Material containing only a few bacilli usually gives positive results only after 5 to 6 weeks' incubation.

Bovine type: As opposed to egg media, this type grows in primary deep cultures in identical fashion as the human type (figure 5). It grows more slowly, however, and does not so often form a surface pellicle, even with heavily positive material. The surface pellicles are very fragile and shaking the tube causes them to be easily broken into small particles. A higher glycerol content, even three times as high as that used in the usual medium, does not check its growth.

Avian type: Grows in loose flakes. By shaking the tube, colonies may be broken up with ease, and form an almost homogenous suspension. As a rule, the avian type does not form surface pellicles. All the strains of the avian type, particularly if grown on synthetic media for a long time, lose these characteristics and pass on to typical R-growth, indistinguishable from the human type of *Mycobacterium tuberculosis* (figure 6).

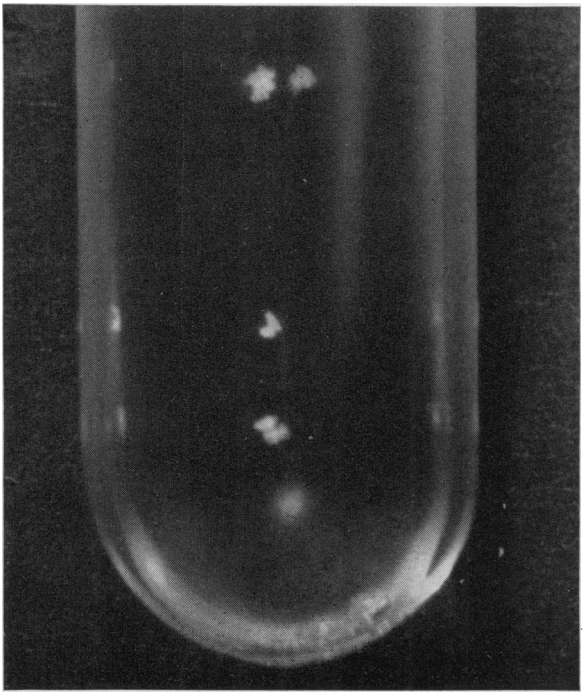

FIGURE 5.—Primary cultures of tubercle bacilli (bovine type) in liquid ascitic medium, 6 weeks old. Colonies of the bovine type resemble the human type on culture (figure 3). (Magnification 2.5×).

Acid-fast saprophytes: Chromogenic saprophytes can be distinguished easily by the characteristic coloring of the colonies. The differentiation of white saprophytes, however, is difficult. They grow either into homogenous clouds like the avian type or into sandlike deposits like the human type. In contrast to the human or bovine types, single isolated colonies are but rarely formed in the primary cultures. They usually form a thick deposit at the bottom of the tube, and consist of tiny colonies of different size, more of the shape of shreds of membrane than of grains of sand. When the tube is shaken they remain suspended for a long time and do not quickly form a deposit at the bottom of the tube (figure 7).

The difference in the growth of acid-fast saprophytes and tubercle bacilli stand out particularly well when colonies are inspected with the magnifying glass. A comparatively constant trait of saprophytes is their rapid growth. All doubtful strains are therefore subcultured routinely and checked 3 to 5 days after inoculation. Inoculation results are controlled by animal experiments; 5 mgs. moist weight of the strain are inoculated intraperitoneally into guinea-pigs and 1 mg. intravenously into rabbits.

Another difference between the acid-fast saprophytes and *Mycobacterium tuberculosis* is the fact that the deep growth continues even after the formation

of the surface pellicle (figure 4). It would appear that the deep growth of cultures of tubercle bacilli in the ascitic liquid medium has characteristics similar to the growth in the human or animal body, owing to the reduced oxygen pressure and the presence of native protein. On solid egg media, tubercle bacilli grow in the presence of denatured protein and atmospheric oxygen. The following observation supports the view that growth in ascitic liquid media is more "physiological" than growth on solid media. Microscopic examination of tubercle

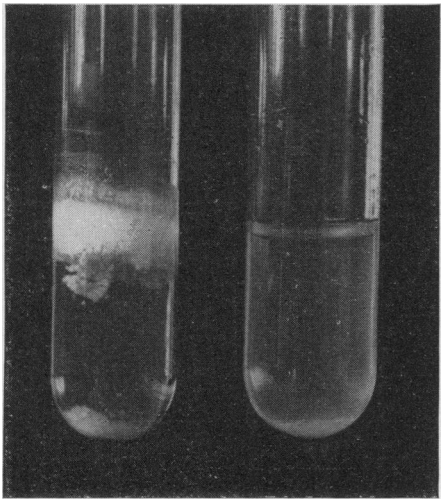

FIGURE 6.—Growth of tubercle bacilli (avian type). (*Left*) an old laboratory strain "Berlin." (*Right*) A primary culture isolated from the liver of a tuberculous chicken.

bacilli grown in the depth culture of liquid ascitic medium reveals long, granulated rods, very similar to the microscopic picture ordinarily observed in smears from tuberculous material. Bacilli from colonies grown on solid egg media are revealed in microscopic examinations as short, nongranular rods. These forms are not usually found in tuberculous material.

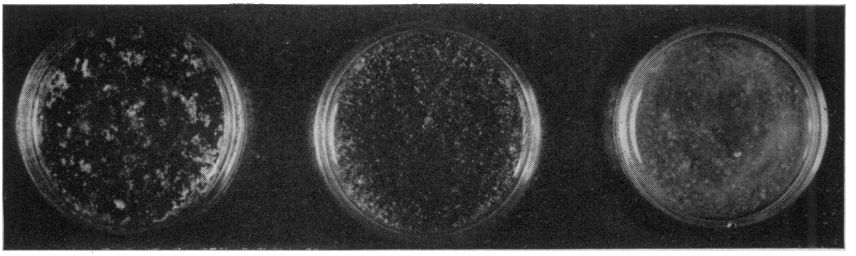

FIGURE 7.—Growth of acid-fast saprophytes in liquid ascitic medium. Age of cultures: 14 days.

RESULTS

A total of 75,159 diagnostic inoculations were carried out at the tuberculosis laboratory of the State Institute of Health in Prague during the years 1944–47. Sputa, gastric contents, effusions, cerebrospinal fluids and urines comprised 8,338 of these, and 66,821 were laryngeal swab cultures. This apparent disproportion between the number of samples from tuberculous material and the number of

laryngeal swabs is a consequence of our experience with laryngeal swabs as a basic bacteriological procedure, even in cases with microscopically negative expectoration. Patients who do not expectorate, as well as children, are investigated by laryngeal swabbing only. Gastric contents are investigated only occasionally. Comparative studies were performed on 2,562 samples during 1945–46, using simultaneous inoculation of liquid, egg-media and guinea-pigs. The results of these studies are summarized in table 1.

TABLE 1.—*Results with 2,562 microscopically negative specimens cultured on ascitic liquid medium, Löwenstein's egg medium, and animal inoculation*

Material	Total number	Ascitic liquid medium			Egg medium			Guinea-pig inoculation		
		Positive	Negative	Contaminated	Positive	Negative	Contaminated	Positive	Negative	"Dead"[1]
Clear exudates	419	78	315	26	75	320	24	79	293	47
Pus	169	32	128	9	36	118	15	43	106	20
Liquors	166	10	148	8	10	146	10	10	141	15
Urines	58	3	49	6	5	46	7	4	49	5
Sputa and gastric washings	1,750	323	1,364	63	275	1,380	95	245	1,369	136
Total	2,562	446	2,004	112	401	2,010	151	381	1,958	223
Percent positive cases		18.2			16.6			16.2		
Percent unsuccessful cultures and animal inoculations				4.3			5.9			8.8

[1] Guinea-pig died of some intercurrent disease within 6 weeks after the inoculation.

Results of laryngeal swab cultures are summarized in table 2, for both children and adults, respectively. The epidemiological importance of culturing tubercle bacilli from laryngeal swabs will be dealt with in a separate publication. We wish to stress here, however, that because of its simplicity, this method is invaluable in tracking down sources of infection, in that it facilitates the investigation of large numbers of tuberculous suspects in a simple and efficient man-

TABLE 2.—*Results with 39,845 laryngeal swabs by culture on ascitic liquid medium, 1942–46*

Material	Total number of patients	Total number of swabs taken	Positive cases	Percent	Cultures contaminated	Percent
Adults	10,768	26,197	2,107	19.5	394	3.65
Children	5,679	13,648	352	6.9	263	4.62
Total	16,447	39,845	2,459	14.9	657	3.99

ner. This reduces to a minimum the troublesome procedure of obtaining material for investigation from stomach-washings, even in the case of children where inoculation of gastric contents was the only method of investigation available.

The strains of tubercle bacilli isolated from specimens mentioned in table 1 showed the typical growth of the human type of tubercle bacilli on egg media. To test the suitability of ascitic media for the isolation of the bovine type, we investigated a total of 116 samples suspected of bovine tuberculosis which were sent to us from the Municipal Abattoire in Prague. There were specimens of lungs, liver, glands, spleen, brain, etc. The results of investigations are given in table 3.

TABLE 3.—*Results with 116 specimens from the Municipal Abattoire in Prague by culture on ascitic liquid medium, Löwenstein's, Corper-Cohn's and Dubos' media*

Specimens	Total	Ascitic liquid medium			Dubos' medium			Egg media					
								Löwenstein's			Corper-Cohn's		
		Positive	Negative	Contaminated	Positive	Negative	Contaminated	Positive	Negative	Contaminated	Positive	Negative	Contaminated
Number	116	88	21	7	20	56	40	84	21	11	74	21	21
Percent	100.0	75.9	18.1	6.0	17.2	48.3	34.5	72.4	18.1	9.5	63.8	18.1	18.1

DISCUSSION

If we compare the results given in tables 1, 2, and 3 as a whole, we see that the liquid ascitic medium fulfills all the requirements of an efficient diagnostic medium for tubercle bacilli. It gives positive culture even from microscopically negative material, and in a greater proportion of cases than does animal inoculation. The proportion of liquid media lost through contamination is about 4 percent, while with egg media the loss is about 6 percent. The liquid ascitic medium fulfills the requirement that the number of cultures lost through contamination be held under 5 percent. The further condition that the growth characteristics of tubercle bacillary colonies differ substantially from the growths of other pathogenic or saprophytic microorganisms is also fulfilled by the ascitic medium. With the exception of acid-fast saprophytes and the avian type of tubercle bacilli, whose growth is also noncharacteristic on egg media, this requirement is met quite satisfactorily by ascitic media.

Specimens of material containing large numbers of tubercle bacilli were as a rule almost equally positive on ascitic and egg media and in guinea-pig inoculations. Material with scanty tubercle bacilli did not, however, always show the same cultivation results. Clinical material proved either positive on ascitic medium while it proved negative on egg medium and guinea pig inoculation, or different varia ations were observed by using the methods mentioned.

These discrepancies in the results obtained can be partly explained by considering the fact that in specimens containing only few bacilli, demonstrable by the growth of a few colonies on egg or liquid media, each particle of the sample, even when divided into three approxi-

mately equal parts, does not contain necessarily living tubercle bacilli.

For positive demonstration of tubercle bacilli by animal inoculation, each specimen, according to Holm (*13*), must contain at least five viable bacilli capable of multiplication before tuberculosis can be induced in the guinea pigs.

Another possibility should also be considered to explain the varying culture results when using different culture media. Our experiments suggest that the nutrient requirements of the individual strains of tubercle bacilli may differ, and the use of one type of egg medium is therefore not always satisfactory. Dubos and Middlebrook (*14*) arrived at a similar conclusion.

The ascitic medium is equally suitable for the isolation of the bovine type of tubercle bacillus. In our experiments, Corper-Cohn's medium (*6*) and Dubos' fluid Tween-albium medium (*11*) did not give satisfactory results because a large number of cultures was originally contaminated by secondary microorganisms which were not destroyed by the hydrochloric acid used in homogenization. The absence of the malachite green as a bacteriostatic dye in Corper-Cohn's and Dubos' media favors the growth of contaminating microbes. Malachite green is added to the liquid ascitic medium in the proportion of 1 ml. of a 0.15–0.2 percent aqueous solution to 1 liter of medium. Originally, twice as much was added. Individual samples of the dye may vary not only in chemical composition but also in bacteriostatic effect. This makes it necessary to titrate every new sample of the dye to test its inhibitory effect on the growth of tubercle bacilli and other bacteria. The concentration employed should not inhibit the growth of tubercle bacilli noticeably, but must limit effectively the growth of the contaminating bacterial flora. We have been attempting recently to replace malachite green with penicillin, which, in low concentration, is said to stimulate the growth of tubercle bacilli (*15*).

Concentrated ascitic media were tried at the University Institute of Pathological Anatomy in Hradec Králové and in Žáry Sanatorium in Silesia. Media used in these tests were sent by mail. Comparative studies using Löwenstein's egg medium and liquid ascitic medium resulted in 360 positive cultures on egg media and 382 on diluted liquid media prepared from the concentrate. At Žáry Sanatorium there were 105 positive cultures on Petragnani's egg medium and 129 on the liquid ascitic medium.

Egg media have to be prepared freshly, using fresh eggs, preferably from hens fed on greens, so that preparation is complicated, especially since its coagulation has to be done very carefully. After inoculation with egg medium, test tubes have to be sealed with paraffin or wax to prevent dehydration of the medium. All these difficulties make the diagnostic cultivation of tubercle bacilli by the use of egg media a complex problem and render results, particularly those from district

tuberculosis laboratories, rather doubtful, except in the case of specially equipped laboratories dealing with hundreds of specimens a day. The usual technique for cultivation, however, is very laborious, especially since the number of specimens sent for investigation is large. Homogenization, centrifugation, neutralization of the material, inoculation with pipettes, sealing of tubes and cleaning the test tubes are all-time-consuming operations.

Thus, the simple ascitic medium enabled us to make a decisive step forward in the bacteriological diagnosis of pulmonary tuberculosis. Until the present time, the diagnosis of specific lung lesions has depended mainly upon the X-ray examination. In 1947 alone, however, 30,000 clinical specimens were investigated at the State Health Institute—nearly as many as in the preceding 3 years.

In view of the high morbidity and mortality rates of tuberculosis in Czechoslovakia, even this number of examinations is far from sufficient. Only the building of a network of bacteriological stations at the periphery, combined with arrangements for mass radiography, can provide the foundation for the reliable examination of all suspicious pulmonary lesions. This scheme, with the addition of mass protective inoculation with BCG for all tuberculin-negative persons, a measure already in operation, will enable us to fight the deadly menace that kills 180 persons out of every 100,000 in Czechoslovakia every year—a rate four times that of the United States.

SUMMARY

1. A liquid ascitic medium has been described that is as suitable for the isolation of tubercle bacilli from pathological materials as are the egg media now in routine use.

2. The ascitic medium can be prepared in a concentrated form and conveniently shipped to variously situated diagnostic laboratories, where the required quantities of media can be prepared at any time by diluting the concentrate in the proportion of 1 to 10 with sterile distilled water.

3. The ascitic medium is suitable for the isolation of both human, bovine, and avian strains of tubercle bacilli. Human and bovine types grow identically in the liquid ascitic medium, while avian strains form a flaky deposit that can be shaken into a nearly homogenous suspension. Old avian strains resemble the human strain in their growth.

4. Acid-fast saprophytes that do not produce diffuse turbidity or pigmentation are distinguished by their rate of growth, best seen in subcultures; results are checked by inoculation into guinea-pigs and rabbits.

5. Comparative studies on 2,562 samples from usual infectious materials gave positive cultural results on egg media in 16.6 percent; on ascitic media in 18.2 percent; and in guinea-pig inoculation in 16.2

percent. Contamination occurred in 5.9 percent of the egg media and 4.3 percent of the ascitic media. Intercurrent disease caused the deaths of 8.8 percent of all guinea-pigs.

6. Corper-Cohn's egg-yolk medium and Dubos' Tween-albumin medium did not give good results for the isolation of tubercle bacilli from pathological materials because of their great tendency to secondary contamination.

7. In the years 1942–47, 66,827 laryngeal swabs taken from adults and children who were not expectorating were examined on liquid ascitic media. An average of 19.5 percent positive results was obtained in adults, and 6.9 percent in children.

ADDENDUM

The Committee on Evaluation of Standard Laboratory Procedures (*16*) does not recommend the use of liquid media for primary isolation of tubercle bacilli. Those media are said to possess two basic disadvantages: they are not selective, that is, they do not suppress the growth of secondary microorganisms; and they do not produce typical colonies of tubercle bacilli. These objections are justified as far as Dubos' medium is concerned. Tubercle bacilli grow in this medium as a noncharacteristic, diffuse opacity, similar to *Bacterium Coli*. Liquid ascitic medium, on the other hand, is selective, effectively suppresses the growth of secondary flora, and produces quite typical colonies, which are not produced by any other organism. Contaminated media can be recognized without difficulty, as the contaminated ascitic medium always exhibits a diffuse turbidity; this is not the case with Dubos' medium. The diagnosis of acid-fast saprophytes, provided they do not produce diffuse turbidity of the medium or pigmentation, is equally difficult on egg as on liquid media.

ACKNOWLEDGMENTS

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EMOTIONAL FACTORS IN TUBERCULOSIS [1]

By Alfred O. Ludwig, M. D., *Assistant Psychiatrist, Massachusetts General Hospital*

Recent progress in medicine has demonstrated the necessity of considering the patient's personality as an important factor in the etiology, course, and eventual prognosis of chronic organic illness. Current studies concerning peptic ulcer, ulcerative colitis, and other organic diseases have utilized modern analytic psychiatric techniques in the evaluation of such personality factors. This approach not only has led to a more thorough appreciation of the type of emotional disturbance prevalent in these patients, but also has given valuable leads as to the necessary therapeutic measures. Excellent results have been obtained by the coincident use of the psychiatric and medical approach to many such problems.

As a chronic disease, tuberculosis differs from the above group in a number of ways. First, it is an infectious disease with a known bacteriological etiology, and presents the danger of contagion. This makes the sufferer a special problem at the outset, in that he is not only himself threatened but is also a threat to his family and to the community. Second, there are still current a surprising number of taboos and superstitions in regard to the disease. There are many who think it to be a sign of weakness or lack of cleanliness. Certainly

[1] Presented at the Institute on the Better Understanding of the Tuberculosis Patient, held under the auspices of the Massachusetts Conference of Tuberculosis Secretaries and the Massachusetts Society for Mental Hygiene, Boston, May 9, 1947. This paper appeared in the June 1947 issue of the *Bulletin* of the Massachusetts Society for Mental Hygiene and is reprinted here with the kind permission of the editors of that journal.

a definite stigma is too often attached by the ignorant laity to the sufferer from the disease. The picture of the rapidly progressive and fatal "consumption" to the past is still in many instances the only one that comes to mind when tuberculosis is mentioned.

The nature of the disease makes segregation desirable both to prevent spread of infection, and also to provide more adequate rest and specialized treatment. The cure may take months or even years to complete. Sanatorium care involves separation from family and friends, the giving up of a job, usually the sole means of economic support, and drastic rearrangement of the family and social life. Added to these factors are those incident to any chronic disease which requires prolonged bed care, namely, the danger of increasing dependency and invalidism.

The egocentricity of the patient with tuberculosis has been mentioned frequently in the literature. It is not peculiar to the disease. We tend to forget how completely we have accepted until very recently the regression of the patient to childhood dependence in all illnesses. This is socially acceptable under the circumstances and indeed is inevitable if illness is sufficiently severe. In disease requiring prolonged care, however, such dependence and helplessness can readily become a severe hazard, prolonging the course of the disease and greatly hampering successful treatment. All of us are familiar with the overtreated case of mild tuberculosis who becomes a chronic neurotic invalid although signs of activity can never again be demonstrated. The responsibility for the prevention of such an outcome lies clearly upon the medical profession.

There is a fairly voluminous literature on the emotional aspects of tuberculosis. Breuer found that in 34 out of 100 cases psychic factors contributed to the outbreak of the disease. He also found a higher percentage of severe involvement in cases in which psychic factors were important. Foster and Shepard found that 30 percent of a group of 100 patients showed abnormal mental states. Muhl found suicidal trends in all of 30 women patients. Most were ambitious beyond their physical ability, very sensitive, and inhibited in self-expression. All of her patients indulged before or during their illness in what she termed "queer respiratory pranks" which included choking or strangling spells, continued sobbing, sighing, holding the breath, or paroxysmal screaming.

Most of these reports have dealt with the obvious external stresses and strains which accompany the disease and its care, but very few studies have attempted to examine the deeper personality traits or changes of patients with tuberculosis. Of the emotions and attitudes displayed by the patients, fear and depression predominated. The cheerfulness so frequently mentioned is in most instances a false front hiding the underlying depression.

Wittkower has done the most thorough and recent work in this field. He is engaged at present in preparing a survey of the psychological aspects of tuberculosis in English sanatoriums. In an interim report he deals with the emotional reactions of patients to their complaint and the factors determining the type of reaction.

He points out the severe initial shock which follows reception of the diagnosis, accompanied usually by dismay or horror. After this follow certain patterns of emotional reaction commonly including resignation, indifference, depression, anxiety, defiance, cheerfulness, resentment, or apathy. He found fear of suffocation and of death occurring in his patients, although fear of death was not readily admitted until one had gained their confidence. Resentment of these chronically ill individuals flared easily against the professional and nursing personnel, the surroundings, and the food. Neither Wittkower nor other modern writers seem much impressed with the role played by toxemia in the production of these disturbances. Wittkower believes that the chronicity, infectiousness, and prolonged hospitalization coincident to the disease are of greater importance.

The previous personality plays a definite part in the type of reaction elaborated. Some individuals actually welcome the disease as an escape from a difficult life situation. Conscientious persons may defy early symptoms and neglect their care until the disease is far advanced. The selfish and egocentric hasten to seek care but are usually not bothered by concern for others. Each needs different handling.

Sanatorium life, designed around the disease and its special treatment, provides a highly artificial atmosphere totally at variance with the patient's previous environment. Here are grouped fellow sufferers isolated from all close ties with family and friends. The disease becomes the center of all interest and the chief topic of thought, and laziness and intellectual deterioration are often fostered. In this country a frequent difficulty is presented by failure of the patients to remain under care in the sanatorium. It is likely that proper care of emotional factors would greatly reduce the incidence of such refusal to accept or continue hospitalization.

With home care, there are a number of vexing problems. Often the ignorant attitude of lay persons imposes ostracism upon the patient. Fear of infection may induce a demand for removal from the house. In his daily life, if he is ambulatory, the patient may be subjected to maudlin sympathy or to an equally destructive patronizing attitude. The reaction to such social ostracism varies according to the sensitivity of the patient. If he is insensitive, he can shrug it off; if sensitive, he may well withdraw completely and become a recluse. The disruption of home and work routine is often highly disturbing, and to the

patient at home his uselessness is emphasized much more than in the sanatorium atmosphere.

Eventually, the occupational situation also becomes a difficult and disturbing problem. In Wittkower's series, only half of a group of patients studied during home treatment were working full or part-time. The rest were unfit, unable, or unwilling to find work. The difficulties attending occupational rehabilitation have also been stressed by American authors. The lowering of the employment status which may result from the disease is resented particularly by insecure and uncertain patients. A small group may become chronically dependent, and like individuals with other chronic illnesses, be completely incapacitated though with minimal residual damage.

With the above facts, it should be obvious that consideration of emotional factors is vital if the patient with tuberculosis is to be treated correctly and efficiently. The application of such total care requires the intelligent cooperation of everyone connected with the treatment of the patient and should include not only the doctor and the nurse, but also the occupational therapist, the vocational counsellor, the social worker, and all others, including especially the family, who are involved in the problem. In a recent article, Seltzer makes a good brief for the increased use of case work in the care of the tuberculosis patient, and there can be no doubt that the trained case worker is excellently equipped to fill a very important need in the problem. The Veterans Bureau in reorganizing its hospitals has given special emphasis to the use of this adjunct in the care of tuberculosis.

Rehabilitation should really begin when the diagnosis of tuberculosis is established. It should become very active just as soon as the acute febrile manifestation of the disease permits. Under this heading must be included education, not only of the patient, but of his family, as to the salient facts of the disease in general, and as to its effect upon the patient in particular. In this connection, it is well to remember that continuing education of the public is still needed to combat popular misconceptions which militate against the intelligent handling of the problem.

Some writers have recommended that quite considerable knowledge of the bacteriology and pathology of the disease be given to the patient Probably this is extreme. However, an attitude of open honesty on the part of the doctor in regard to the progress of the disease, the results of roentgenogram and other examinations, and the evaluation of surgical or other treatment procedure will tend to improve individual morale. The use of medical terminology which cannot be understood by the patient only increases fear and insecurity. The question of telling the truth in regard to prognosis is a moot one and must be decided individually. It should be stressed that the education

of the family is a highly important matter. An attitude of ignorance or overanxiety or lack of regard for the seriousness of the disease on the part of the family or friends when visiting or after discharge, can undo much good medical therapy. Often the family needs more care than the patient from the emotional point of view. They too must learn to accept the disease, and must be urged to treat the patient as objectively and as normally as possible.

The experiences of the war have reemphasized the value of occupational therapy. The more functional, useful, and educational this can be, the better. If possible, it should be coordinated with vocational guidance and re-training with the possibility in view that the patient may be forced by his disease to accept a less strenuous type of work after discharge. When intelligently organized it is invaluable in overcoming deadening inactivity.

From the point of view of psychotherapy, the doctor-patient relationship is of the most vital importance. Whenever possible, the patient should have the same doctor throughout the course of his disease. In an institution, he should regard one man as his counsellor. At the outset, a tactful, considerate, and frank presentation of the diagnosis is the first prerequisite for cooperation. Education and teaching of the patient must begin here, and should continue throughout. It is of equal importance that the clinical history and examination should include at least a rough attempt to evaluate the patient's personality, his previous life situation, and his emotional reactions, insofar as they are pertinent to the disease. Such an approach is not only more thorough but also more human, and reassures the patient that he is still a person and not just an "infiltrated left apex" or another case. A friendly individual rapport with the patient is necessary, and must be fostered during the entire period of treatment. One should individualize the care of the patient. It is well to remember that personal problems cannot well be discussed on ward rounds before large groups of people. Even when time is short it is possible to give the impression that one is unhurried and has sufficient interest to listen to each patient's complaints. Remembering names and small personal details about individual patients adds greatly to their confidence in the doctor and personalizes the professional relationship.

Not infrequently the resentments and complaints of hospitalized patients are badly handled. The doctor or nurse, frequently himself tired and irritable, may react to such outburst emotionally and retaliate in kind. Individual and ward morale may thus be ruined and public health menaced when such "uncooperative" patients are discharged against medical advice as a punitive measure. It is a cardinal rule never to react emotionally to such outbursts. Either they are justified and the doctor or institution owes the patient explanation or

apology, or they are purely emotional and should be understood. It is good practice always to find out why a patient reacts as he does before retaliating. In a chronic disease, the slight trouble and time involved will pay large dividends in increased confidence on the part of the patient.

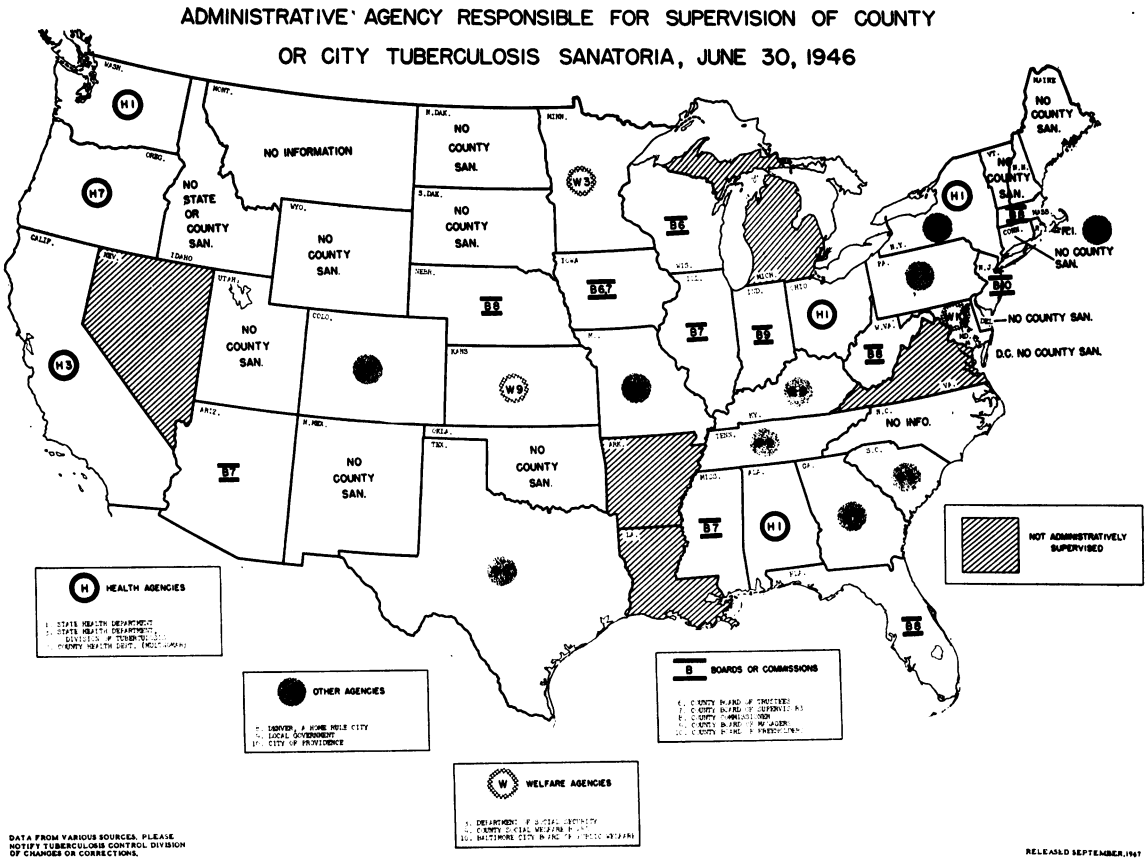
Constant vigilance must prevail to combat dependency and invalidism. In this respect it is well to attempt to seek out for special consideration those whose personality shows marked dependency traits. It is highly likely that they will react very poorly to prolonged bed rest. Special therapeutic measures including psychotherapy may be needed to salvage this group.

Ideally every patient with tuberculosis should be educated to accept his disease as factually as possible, to understand the reason for his treatment, to be rehabilitated so that upon discharge he can operate with maximum efficiency within any limits imposed by his disability, and to be sufficiently secure that he can tolerate the awkward attempts at sympathy to which he will invariably be exposed. If gross neuropsychiatric disease is apparent, specialized psychiatric care is in order.

Whenever indicated, the patient should be given an understanding of how his own personality, personal problems, or conflicts enter into and influence his disease. Consciously or unconsciously he may be using his tuberculosis for a purpose: for escape, for self-punishment, or even for purposes of retaliation toward the family or others. It may serve him as the long sought excuse to sink into helpless dependency. With such problems he needs objective, sympathetic, outside help; and treatment has not been fully efficient if it is not given. The addition of psychiatrists to the staffs of sanatoriums would greatly further the recognition and care of these problems.

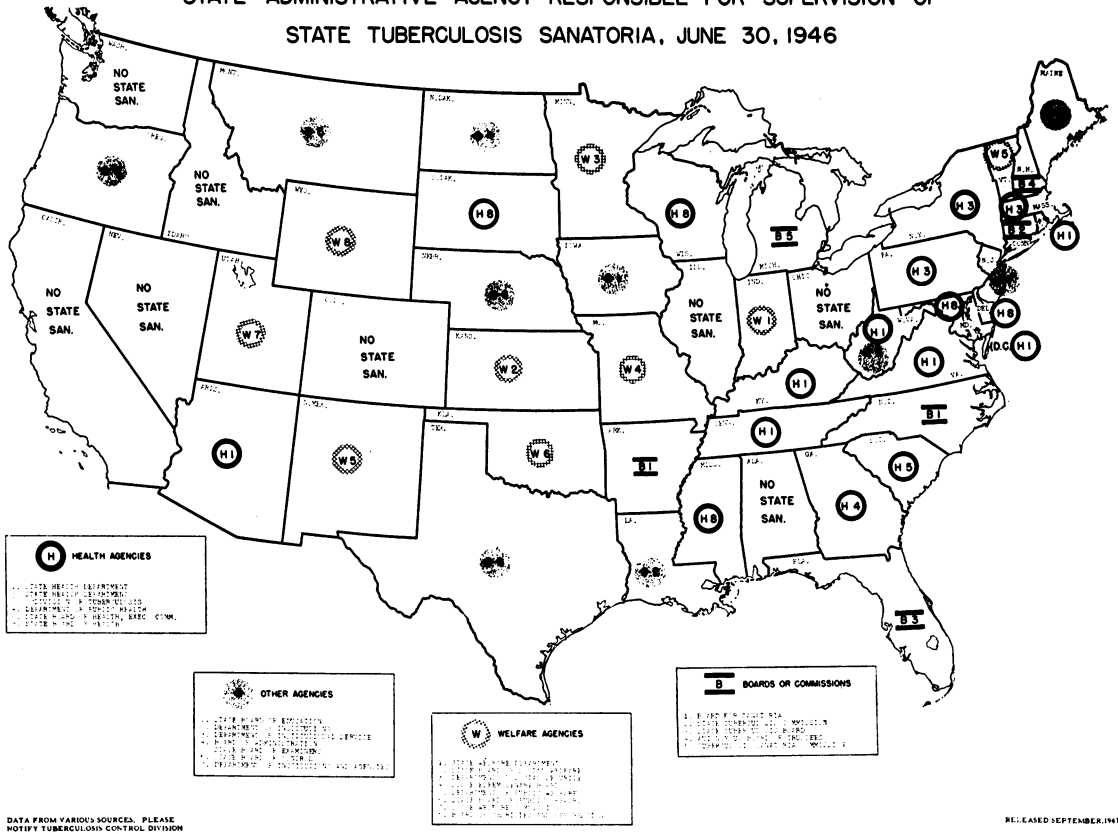
Finally, I would urge that every doctor and nurse who works with tuberculosis, or indeed with any chronic disease, should receive at least rudimentary training in the emotional aspects of illness and the psychology of rehabilitation. Ideally again, one would welcome the incorporation into the body of medicine of a basic core of knowledge and understanding not only of the psychology and personality of the sick, but also of the normal person.

The correlation of the meaning of emotional factors in chronic disease is still a very new field and much detailed psychiatric study is needed of tuberculosis in order to delineate accurately and usefully these inter-relationships. Observations in regard to this aspect of disease can and should be made and recorded by the entire therapeutic team engaged in treating chronic illness if continued progress in improving treatment of the whole patient is to be attained.



NOTE: Michigan actually has B-6 supervision; Idaho now has a State sanatorium.

STATE ADMINISTRATIVE AGENCY RESPONSIBLE FOR SUPERVISION OF STATE TUBERCULOSIS SANATORIA, JUNE 30, 1946



DATA FROM VARIOUS SOURCES. PLEASE NOTIFY TUBERCULOSIS CONTROL DIVISION OF CHANGES OR CORRECTIONS.

RELEASED SEPTEMBER 1947

INCIDENCE OF DISEASE

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

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JUNE 12, 1948

Summary

The incidence of poliomyelitis increased from 149 cases last week to 219 for the current week, as compared with 48 for the corresponding week last year, a 5-year (1943–47) median of 60 cases, and 160, the largest corresponding number of the past 5 years, reported in 1946. The 6 States reporting more than 4 cases each, 5 of which showed a combined increase of 69, are as follows (last week's figures in parentheses): Kansas 5 (1), North Carolina 39 (17), Texas 85 (49), Iowa 6 (15), Utah 6 (0), California 29 (28). The 5 States reporting more than 10 cases each during the past 3 weeks since May 22 (aggregating 372 cases, or 73 percent of the total for the period) are as follows: Texas 194, California 71, North Carolina 70, Iowa 25, and Florida 12. The total for the 12-week period since the average date of seasonal low incidence (week ended March 20) is 1,097, as compared with a 5-year median of 392 (reported last year), 725 for the period in 1946, the highest of the past 5 years, and 323, the lowest, in 1944. The total for the year to date is 1,445, as compared with 1,004 in 1947, 1,193 in 1946, and a 5-year median of 903.

A net increase of 1,695 cases of measles, accounted for chiefly by the increases in Massachusetts, New York, New Jersey, Michigan, Maryland, and California, brought the total for the week to 25,578 cases (more than for any corresponding week of the past 5 years), as compared with a 5-year median of 14,112. The total for the year to date, however, (469,024), is only slightly above the 5-year median.

Of the total of 28 cases of Rocky Mountain spotted fever, 12 were reported in the South Atlantic area, 8 in the Mountain area, 2 each in Indiana and Oregon, and 1 each in New Jersey, Pennsylvania, Missouri, and Oklahoma.

No case of smallpox was reported for the third consecutive week.

Deaths registered during the week in 93 large cities in the United States totaled 8,920, as compared with 8,567 last week, 8,856 and 8,752, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 8,849. The total for the year to date is 233,431, as compared with 233,514 for the same period last year. Infant deaths totaled 612, as compared with 660 last week and a 3-year median of 680. The cumulative figure is 16,348, as compared with 18,702 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended June 12, 1948, and comparison with corresponding week of 1947 and 5-year median

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

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median	Week ended—		Median	Week ended—		Median	Week ended—		Median
	June 12, 1948	June 7, 1947	1943–47	June 12, 1948	June 7, 1947	1943–47	June 12, 1948	June 7, 1947	1943–47	June 12, 1948	June 7, 1947	1943–47
NEW ENGLAND												
Maine	0	4	0				30	50	139	0	0	1
New Hampshire	0	0	0				47	1	3	0	0	0
Vermont	0	0	0				20	143	143	0	0	0
Massachusetts	2	8	2				1,990	371	877	1	1	7
Rhode Island	0	0	0				27	203	81	0	1	1
Connecticut	0	0	1	1			183	1,011	425	0	0	1
MIDDLE ATLANTIC												
New York	8	9	9	[1] 1	[1] 1	[1] 2	2,915	711	1,053	8	7	21
New Jersey	0	5	4	2	5	3	3,001	573	713	0	2	6
Pennsylvania	9	9	11	[2]	[2]	[2]	2,239	285	620	2	4	13
EAST NORTH CENTRAL												
Ohio	9	9	6	2	5	3	681	799	315	4	2	14
Indiana	5	0	2	1	8	3	164	94	94	1	0	1
Illinois	4	3	4		6	7	536	340	401	2	12	12
Michigan [3]	5	5	6				1,856	156	447	2	2	5
Wisconsin	0	0	1	9	9	13	1,574	648	1,431	1	5	5
WEST NORTH CENTRAL												
Minnesota	1	4	2				148	714	324	1	1	1
Iowa	2	1	3				110	381	105	0	0	0
Missouri	1	3	0	1	1	1	102	134	108	2	2	6
North Dakota	1	2	1				25	68	21	0	2	0
South Dakota	2	0	0				35	39	36	0	0	0
Nebraska	0	1	2	1			155	17	105	0	0	0
Kansas	1	4	3	1	8		28	15	133	1	0	1
SOUTH ATLANTIC												
Delaware	1	0	0				14		10	0	0	0
Maryland [3]	0	7	7		2	1	1,120	37	201	0	0	1
District of Columbia	0	0	0		1		102	7	60	0	0	1
Virginia	6	3	3	79	123	71	269	288	280	1	2	3
West Virginia	2	2	1	1	6	1	113	27	33	0	1	2
North Carolina	2	3	4				37	114	167	4	1	2
South Carolina	2	4	4	123	109	109	141	61	77	0	0	1
Georgia	2	1	2	1	1	5	35	62	62	0	1	2
Florida	8	1	1	1	5	2	207	95	93	0	0	1
EAST SOUTH CENTRAL												
Kentucky	4	8	2				364	8	42	2	2	1
Tennessee	1	8	2	13	10	10	92	37	72	0	3	6
Alabama	6	0	2	2	8	9	27	110	110	0	1	1
Mississippi [3]	4	3	4	3			22	11		1	0	3
WEST SOUTH CENTRAL												
Arkansas	3	5	4	13	9	12	160	39	61	0	0	0
Louisiana	2	3	1	1	6	1	47	27	27	0	1	0
Oklahoma	3	3	3	4	69	31	108	2	33	0	0	2
Texas	8	20	24	294	234	287	1,495	205	271	*8	2	3
MOUNTAIN												
Montana	0	0	0			3	32	76	76	0	0	0
Idaho	1	0	0		5	3	53	19	19	0	0	0
Wyoming	0	1	0				19	8	19	0	0	0
Colorado	4	3	7	6	4	12	143	36	103	2	1	1
New Mexico	0	1	1		5	1	60	75	58	0	0	0
Arizona	7	1	1	29	27	33	213	33	33	0	0	1
Utah [3]	6	0	0	1	2		626	107	112	1	0	1
Nevada	0	0	0				9	1	4	0	0	0
PACIFIC												
Washington	1	1	4				525	28	193	0	0	2
Oregon	1	0	1	2	2	3	489	7	105	1	1	1
California	14	7	17	14	20	20	3,187	312	1,458	7	3	11
Total	138	152	178	606	691	691	25,578	8,585	14,112	52	60	143
23 weeks	4,212	5,709	5,709	134,568	297,631	186,516	469,024	150,998	466,940	*1,755	1,942	5,020
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	10,570	13,275	14,525	178,126	330,603	330,606	503,970	173,885	504,953	*2,537	2,914	7,472

[1] New York City only. [2] Philadelphia only. [3] Period ended earlier than Saturday.
[4] Dates between which the approximate low week ends. The specific date will vary from year to year.
*Correction (deducted from cumulative totals): Meningitis, Texas, week ended May 22, 1 case (instead of 5).

Telegraphic morbidity reports from State health officers for the week ended June 12, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47	Week ended—		Median 1943–47
	June 12, 1948	June 7, 1947		June 12, 1948	June 7, 1947		June 12, 1948	June 7, 1947		June 12, 1948	June 7, 1947	
NEW ENGLAND												
Maine	0	0	0	4	10	18	0	0	0	0	0	0
New Hampshire	0	0	0	0	8	8	0	0	0	0	0	0
Vermont	0	0	0	3	1	3	0	0	0	1	0	0
Massachusetts	0	1	0	228	72	251	0	0	0	[6] 1	0	3
Rhode Island	0	0	0	11	14	8	0	0	0	0	1	0
Connecticut	0	0	0	19	31	43	0	0	0	1	0	1
MIDDLE ATLANTIC												
New York	1	4	5	[5] 207	266	344	0	0	0	[6] 2	1	6
New Jersey	0	1	0	41	71	112	0	0	0	0	3	1
Pennsylvania	2	0	0	196	142	209	0	0	0	7	4	5
EAST NORTH CENTRAL												
Ohio	2	0	1	214	179	224	0	0	0	1	1	3
Indiana	3	0	1	25	40	54	0	1	0	0	1	1
Illinois	2	1	2	66	79	146	0	0	0	2	8	2
Michigan [3]	1	0	0	164	77	115	0	0	0	1	3	2
Wisconsin	0	0	0	32	55	151	0	0	0	2	0	0
WEST NORTH CENTRAL												
Minnesota	0	0	0	17	46	46	0	0	0	1	0	0
Iowa	6	1	0	13	8	28	0	0	0	2	0	0
Missouri	0	2	0	23	39	37	0	0	0	0	1	1
North Dakota	0	2	0	2	4	4	0	0	0	0	0	0
South Dakota	0	0	0	0	9	9	0	0	0	0	0	0
Nebraska	4	3	0	11	13	17	0	0	0	0	1	0
Kansas	5	0	0	14	14	24	0	0	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	3	4	3	0	0	0	0	0	0
Maryland [3]	0	1	0	[5] 11	15	68	0	0	0	3	1	1
District of Columbia	0	1	0	4	13	13	0	0	0	0	0	0
Virginia	0	2	0	13	18	32	0	0	0	3	8	3
West Virginia	0	0	0	[5] 11	8	20	0	0	0	1	0	2
North Carolina	*39	0	1	8	16	16	0	0	0	0	3	1
South Carolina	1	0	0	2	0	4	0	0	0	2	2	1
Georgia	2	0	0	0	2	9	0	0	0	[6] 2	3	3
Florida	2	1	1	2	1	2	0	0	0	2	1	2
EAST SOUTH CENTRAL												
Kentucky	4	2	2	2	12	16	0	0	0	4	2	5
Tennessee	3	2	2	10	18	18	0	0	0	3	4	3
Alabama	0	1	2	14	1	10	0	1	0	0	1	1
Mississippi [3]	2	0	0	0	3	5	0	0	0	1	1	0
WEST SOUTH CENTRAL												
Arkansas	4	0	1	1	3	3	0	0	0	2	4	5
Louisiana	3	0	1	2	4	4	0	0	0	1	4	4
Oklahoma	0	0	1	5	3	10	0	0	0	4	0	1
Texas	85	6	10	22	18	26	0	0	0	[6] 7	13	9
MOUNTAIN												
Montana	0	0	0	0	15	10	0	0	0	0	0	0
Idaho	2	0	0	[5] 5	2	7	0	0	0	0	0	0
Wyoming	1	0	0	1	1	10	0	0	0	0	0	0
Colorado	0	1	1	12	31	38	0	0	0	0	1	0
New Mexico	3	0	0	3	9	6	0	0	0	1	0	1
Arizona	0	0	0	2	7	8	0	0	0	0	0	1
Utah [3]	6	0	0	2	11	17	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	4	1	1	21	26	26	0	0	0	1	0	0
Oregon	3	2	0	13	24	24	0	0	0	0	1	1
California	29	13	13	79	112	173	0	0	0	[6] 4	6	6
Total	219	48	60	1,538	1,555	2,294	0	2	4	62	79	88
23 weeks	*1,445	1,004	903	49,776	55,740	87,636	45	136	238	1,201	1,164	1,401
Seasonal low week [4]	(11th) Mar. 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	*1,097	392	392	72,315	82,426	125,957	66	190	314	728	679	793

[3] Period ended earlier than Saturday.
[4] Dates between which the approximate low week ends. The specific date will vary from year to year.
[5] Including cases reported as streptococcal infections and septic sore throat.
[6] Including paratyphoid fever and salmonella infections reported separately, as follows: Massachusetts (salmonella infection) 1; New York (salmonella infection) 1; Georgia 1; Texas 1; California 1.
*Correction (deducted from cumulative totals): Poliomyelitis, North Carolina, week ended May 22, 12 cases (instead of 13).

Telegraphic morbidity reports from State health officers for the week ended June 12, 1948, and comparison with corresponding week of 1947 and 5-year median—Con.

Division and State	Whooping cough			Week ended June 12, 1948							
	Week ended—		Median 1943–47	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	June 12, 1948	June 7, 1947		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	9	20	20								
New Hampshire	2										
Vermont	15	3	7								3
Massachusetts	32	137	132		1		1				1
Rhode Island	2	39	28								
Connecticut	31	57	53								
MIDDLE ATLANTIC											
New York	97	240	210	12							6
New Jersey	57	256	167	2				1			2
Pennsylvania	38	152	152					1			1
EAST NORTH CENTRAL											
Ohio	45	171	128	8							9
Indiana	6	40	40					2	1		3
Illinois	27	89	89	5	2		1				11
Michigan [3]	32	96	81	10							2
Wisconsin	35	134	100								6
WEST NORTH CENTRAL											
Minnesota	7	28	22								2
Iowa	2	126	14								1
Missouri	27	50	29				3	1			1
North Dakota	10	1	1								
South Dakota	8	1									
Nebraska	6	26	2								
Kansas	21	49	31				1				1
SOUTH ATLANTIC											
Delaware		2	1								
Maryland [3]	24	58	58			2		4			1
District of Columbia	3	8	6	1							
Virginia	71	87	87	1		31		3	2		
West Virginia	8	27	23					1			
North Carolina	38	98	124	1				1			
South Carolina	122	130	79	2	19		1	3	1	1	
Georgia	8	39	30	3	2				1	6	2
Florida	14	41	21	2					1	10	2
EAST SOUTH CENTRAL											
Kentucky	19	36	36								
Tennessee	21	65	33	7		1					1
Alabama	95	42	42							9	
Mississippi [3]	11	8		2	2				2	1	1
WEST SOUTH CENTRAL											
Arkansas	24	77	26	6		5			16		3
Louisiana		10	5								2
Oklahoma	19	39	9					1	1		1
Texas	325	689	266	22	589	166			6	4	24
MOUNTAIN											
Montana	6	10	4					1			
Idaho	4	15	9					4			
Wyoming	3	1	1					1	2		1
Colorado	18	36	25					1			3
New Mexico	20	23	7								
Arizona	32	29	17			50					
Utah [3]	10	13	25					1			2
Nevada											
PACIFIC											
Washington	11	15	17			1					
Oregon	12	24	20	2				2			2
California	48	310	310	7	3					2	5
Total	1,475	3,647	2,679	93	618	256	7	28	33	33	99
Same week, 1947	3,647			56	333	315	8	22	28	31	136
Median, 1943–47	2,679			40	385	207	8	18	19	52	[7] 113
23 weeks: 1948	46,339			1,760	7,683	4,455	201	116	446	358	2,124
1947	66,958			1,122	6,861	4,557	152	104	709	835	2,429
Median, 1943–47	57,437			769	6,861	2,690	200	104	400	1,067	[7] 2,662

[3] Period ended earlier than Saturday. [7] 3-year median 1945–47.

Psittacosis: Michigan 2. *Leprosy:* New York 1.

Alaska: Chickenpox 2, pneumonia 1, whooping cough 3.

Territory of Hawaii: Rabies 0, amebic dysentery 2, measles 2, scarlet fever 2, whooping cough 16.

WEEKLY REPORTS FROM CITIES*

City reports for week ended June 5, 1948

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0		0	1	0	0	0	1	0	1	
New Hampshire:												
Concord	0	0		0	3	0	1	0	0	0	0	
Vermont:												
Barre	0	0		0		0	0	0	0	0	0	
Massachusetts:												
Boston	2	0		1	197	0	3	0	127	0	0	13
Fall River	0	0		0	68	0	0	0	2	0	0	
Springfield	0	0		0	8	0	0	0	0	0	0	
Worcester	0	0		0	41	0	4	0	10	0	1	
Rhode Island:												
Providence	1	0		0	11	0	2	0	3	0	0	7
Connecticut:												
Bridgeport	0	0		0	1	0	0	0	1	0	1	
Hartford	1	0		0	8	0	1	0	2	0	0	
New Haven	0	0		1	7	0	0	0	0	0	0	1
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0		0	94	0	3	0	8	0	0	1
New York	6	0	1	0	1,057	4	36	1	60	0	0	27
Rochester	0	0		0	4	1	1	0	5	0	0	
Syracuse	1	0		0	23	0	2	0	3	0	0	6
New Jersey:												
Camden	0	0		0	9	0	2	0	2	0	0	
Newark	0	0		0	468	2	4	0	5	0	0	3
Trenton	0	0		0	7	0	1	0	0	0	0	
Pennsylvania:												
Philadelphia	4	0		0	929	0	13	0	48	0	0	3
Pittsburgh	0	0	1	0	19	3	8	0	57	0	0	8
Reading	0	0		0	10	0	5	0	6	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0		0	84	1	2	0	5	0	0	1
Cleveland	0	0	2	1	25	1	6	1	40	0	0	1
Columbus	1	0		0	5	0	1	0	3	0	1	
Indiana:												
Fort Wayne	0	0		0	6	0	0	0	3	0	0	
Indianapolis	1	0		0	156	1	2	0	8	0	0	6
South Bend	0	0		0		0	0	0	3	0	0	
Terre Haute	0	0		0		0	0	0	0	0	0	
Illinois:												
Chicago	0	0		0	210	2	17	0	37	0	0	8
Springfield	0	0		0		0	3	0	0	0	0	2
Michigan:												
Detroit	0	0		0	696	0	8	0	73	0	1	7
Flint	0	0		0	20	0	1	0	3	0	0	
Grand Rapids	0	0		0	5	0	0	0	4	0	0	2
Wisconsin:												
Kenosha	0	0		0	40	0	0	0	0	0	0	
Milwaukee	0	0		0	228	0	2	0	15	0	0	
Racine	0	0		0	19	0	0	0	1	0	0	
Superior	0	0		0	29	0	1	0	0	0	0	
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0		0	70	0	0	0	2	0	0	1
Minneapolis	1	0		0	13	0	1	0	7	0	0	2
St. Paul	2	0		0	5	0	3	0	1	0	0	4
Missouri:												
Kansas City	0	0	2	0	45	0	3	0	1	0	0	1
St. Joseph	0	0		0	7	2	0	0	1	0	0	
St. Louis	0	0	1	0	16	0	7	0	2	0	0	4

*In some instances the figures include nonresident cases.

City reports for week ended June 5, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0		0	12	0	3	0	0	0	0	--
Kansas:												
Topeka	0	0		0	2	0	0	0	1	0	0	2
Wichita	0	0		0	2	0	3	0	1	0	0	4
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0	5	0	1	0	1	0	0	3
Maryland:												
Baltimore	1	0		0	680	1	4	0	4	0	1	4
Cumberland	0	0		0		0	0	0	4	0	0	
Frederick	0	0		0		0	0	0	0	0	0	
District of Columbia:												
Washington	0	0		0	129	2	3	0	7	0	1	
Virginia:												
Lynchburg	0	0		0	6	0	1	0	0	0	0	
Richmond	1	0		0	7	0	0	0	3	0	0	4
Roanoke	0	0		0		0	0	0	1	0	0	
West Virginia:												
Charleston	0	0		0		0	0	0	0	0	0	
Wheeling	0	0		0	4	0	2	0	0	0	0	
North Carolina:												
Raleigh	0	0		0	1	0	2	0	0	0	0	
Wilmington	0	0		0		0	0	0	0	0	0	
Winston Salem	0	0		0	3	1	0	0	0	0	0	
South Carolina:												
Charleston	0	0	7	0	2	0	0	0	0	0	0	5
Georgia:												
Atlanta	0	0		0	2	0	2	0	0	0	0	
Brunswick	0	0		0		0	0	0	0	0	0	
Savannah	0	0		0		0	2	0	1	0	0	1
Florida:												
Tampa	1	0		0	8	0	1	0	0	0	1	2
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0		0	20	0	3	0	3	0	0	3
Nashville	0	0		0	4	0	3	0	1	0	0	2
Alabama:												
Birmingham	0	0		0		0	1	0	0	0	0	3
Mobile	0	0		0		0	1	0	5	0	0	
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0		0	1	0	0	0	0	0	0	
Louisiana:												
New Orleans	1	0	1	1	3	0	3	0	0	0	0	3
Shreveport	0	0		0		0	5	0	1	0	0	
Oklahoma:												
Oklahoma City	0	1		0	3	0	1	0	0	0	0	1
Texas:												
Dallas	1	0		0	12	0	0	0	2	0	0	
Galveston	0	0		0		0	0	5	0	0	0	
Houston	0	0		0		0	4	14	0	0	0	
San Antonio	3	0		0	7	0	2	2	1	0	0	
MOUNTAIN												
Montana:												
Billings	0	0		0		0	0	0	1	0	0	
Great Falls	0	0		0	1	0	1	0	0	0	0	
Helena	0	0		0		0	0	0	0	0	0	
Missoula	0	0		0	1	0	0	0	0	0	0	
Colorado:												
Denver	2	0		0	44	0	4	0	3	0	0	10
Pueblo	0	0		0	187	0	0	0	3	0	0	
Utah:												
Salt Lake City	9	0		0	211	0	1	0	0	0	0	1

City reports for week ended June 5, 1948—Continued

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	.....	0	258	1	4	0	5	0	0	2
Spokane	0	0	.....	0	14	0	1	0	0	0	0	.....
California:												
Los Angeles	4	0	3	0	274	2	2	8	13	0	0	4
Sacramento	0	0	.....	0	30	0	0	0	3	0	0	6
San Francisco	2	0	2	0	114	1	7	1	8	0	0	2
Total	36	1	20	4	6,689	25	210	32	621	0	8	171
Corresponding week, 1947 [1]	41	.....	25	11	2,325	.....	235	.....	456	0	3	832
Average 1943-47 [1]	58	.....	33	[2] 10	[3] 3,539	.....	[2] 269	.....	1,004	0	13	713

[1] Exclusive of Oklahoma City.
[2] 3-year average, 1945–47.
[3] 5-year median, 1943–47.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (latest available estimated population, 34,451,300

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	10.5	0.0	0.0	5.2	902	0.0	28.8	0.0	382	0.0	7.8	55
Middle Atlantic	5.1	0.0	0.9	0.0	1,213	4.6	34.7	0.5	90	0.0	0.0	23
East North Central	1.2	0.0	1.2	0.5	926	3.0	26.1	0.6	119	0.0	1.2	16
West North Central	6.0	0.0	6.0	0.0	346	4.0	40.2	0.0	32	0.0	0.0	36
South Atlantic	4.9	0.0	11.4	0.0	1,381	6.5	29.4	0.0	34	0.0	4.9	31
East South Central	0.0	0.0	0.0	0.0	142	0.0	47.2	0.0	53	0.0	0.0	47
West South Central	12.7	2.5	2.5	2.5	66	0.0	38.1	53.3	10	0.0	0.0	10
Mountain	16.5	0.0	0.0	0.0	3,667	0.0	49.6	0.0	58	0.0	0.0	91
Pacific	9.9	0.0	8.2	0.0	1,135	6.6	23.0	14.8	48	0.0	0.0	23
Total	5.5	0.2	3.0	0.6	1,015	3.8	31.9	4.9	94	0.0	1.2	26

Dysentery, amebic.—Cases: New York 11; Detroit 4; Winston-Salem 1; Atlanta 1; Tampa 1; Memphis 5; San Francisco 1.
Dysentery, bacillary.—Cases: Worcester 1; New York 1; Chicago 2; Charleston, S. C., 2.
Dysentery, unspecified.—Cases: Baltimore 3; San Antonio 130.
Typhus fever, endemic.—Cases: Savannah 1.

PLAGUE INFECTION IN NEW MEXICO AND WASHINGTON

Under date of June 8, plague infection was reported proved in fleas from rodents in New Mexico and Washington, as follows:

NEW MEXICO

Rio Arriba County.—In a pool of 145 fleas from 1 prairie dog, *Cynomys gunnisoni gunnisoni*, shot May 26 on a ranch 1 mile west of the junction of State Highway No. 95 and U. S. Highway No. 84; also in a pool of 20 fleas from 1 prairie dog, same species, shot May 27 on a ranch 13 miles west of Parkview.

WASHINGTON

Douglas County.—In a pool of 196 fleas from 30 meadow mice, *Microtus* sp., trapped May 5 about 9 miles north of Farmer.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended May 22, 1948.—During the week ended May 22, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		77		198	340	94	18	24	65	816
Diphtheria				7	1				2	10
German measles		2		273	15			4	11	305
Influenza		11			9				1	21
Measles			3	653	1,424	31	3	71	80	2,265
Meningitis, meningococcus					1					1
Mumps		30		190	188	57	60	26	9	560
Poliomyelitis					1			1		2
Scarlet fever			1	63	86	7	1	1	3	162
Tuberculosis (all forms)		11	7	92	44	17	1	26	70	268
Typhoid and paratyphoid fever				4	3		1	1	1	10
Undulant fever				2		1			4	7
Venereal diseases:										
Gonorrhea		5	8	68	71	25	5	45	57	284
Syphilis		6	5	96	47	9	6	10	17	196
Other forms									1	1
Whooping cough		28		68	11	5	8	28	1	149

JAMAICA

Notifiable diseases—4 weeks ended May 1, 1948.—During the 4 weeks ended May 1, 1948, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis		1	Leprosy		1
Chickenpox	15	35	Puerperal sepsis		1
Diphtheria		1	Tuberculosis, pulmonary	43	81
Dysentery, unspecified		2	Typhoid fever	5	84
Erysipelas	1	2	Typhus fever (murine)	2	1

NORWAY

Notifiable diseases—February 1948.—During the month of February 1948, cases of certain notifiable diseases were reported in Norway as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	10	Measles	81
Diphtheria	66	Mumps	3,992
Dysentery, unspecified	48	Paratyphoid fever	5
Encephalitis, epidemic	4	Pneumonia (all forms)	2,698
Erysipelas	378	Poliomyelitis	6
Gastroenteritis	3,299	Rheumatic fever	169
Gonorrhea	477	Scabies	3,032
Hepatitis, epidemic	168	Scarlet fever	143
Impetigo contagiosa	2,539	Syphilis	126
Influenza	3,710	Tuberculosis (all forms)	400
Laryngitis	12,771	Whooping cough	438
Malaria	2		

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

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

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

Cholera

India—Calcutta.—During the week ended May 29, 1948, 334 cases of cholera with 101 deaths were reported in Calcutta, India.

Plague

Peru.—For the period April 1–30, 1948, plague was reported in Peru as follows: In the village of Chulen, Chota Province, Cajamarca Department, 8 cases with 1 death; in Moche, Trujillo Province, Libertad Department, 1 case.

Smallpox

Sudan (Anglo-Egyptian)—Kordofan Province.—For the week ended May 22, 1948, 85 cases of smallpox with 38 deaths, including 33 cases, 4 deaths in El Obeid, were reported in Kordofan Province, Anglo-Egyptian Sudan.

Trinidad.—On May 14, 1948, 7 cases of alastrim arrived in Trinidad from the village of Cedros, Tobago; 3 additional cases developed in Trinidad during the period May 17–June 2.

Typhus Fever

Colombia.—During the period April 1–30, 1948, 287 cases of typhus fever with 10 deaths were reported in Colombia.

Yellow Fever

Colombia—Caldas Department—La Victoria.—For the period April 1–30, 1948, 1 fatal case of yellow fever was reported in La Victoria, Caldas Department, Colombia.

DEATHS DURING WEEK ENDED JUNE 5, 1948

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

	Week ended June 5, 1948	Corresponding week, 1947
Data for 92 large cities of the United States:		
Total deaths	8,510	9,108
Median for 3 prior years	9,108	
Total deaths, first 23 weeks of year	222,985	223,151
Deaths under 1 year of age	665	730
Median for 3 prior years	648	
Deaths under 1 year of age, first 23 weeks of year	15,647	17,851
Data from industrial insurance companies:		
Policies in force	71,068,262	67,294,085
Number of death claims	9,621	11,630
Death claims per 1,000 policies in force, annual rate	7.1	9.0
Death claims per 1,000 policies, first 23 weeks of year, annual rate	9.9	9.8

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ANNOUNCEMENT

Course in Laboratory Diagnosis of Mycotic Diseases

A refresher course for laboratory personnel in the laboratory diagnosis of mycotic diseases will be offered at the Laboratory Division of the Communicable Disease Center, Atlanta, Ga. The first course will be given from August 30 to September 24, 1948.

All grades of employed laboratory personnel may attend. Personnel from laboratories of State and local health departments will be considered first. Other applicants such as those from hospitals and private laboratories will be considered when vacancies occur.

There is no tuition nor laboratory fee. Travel and living expenses, however, must be paid for by the individual or his employer.

Applications should be sent to Seward E. Miller, Senior Surgeon, Chief of the Laboratory Division, at the Communicable Disease Center, 291 Peachtree St., Atlanta, Ga. Early application is advised. Applicants will be advised of acceptance and a list of room and hotel accommodations also will be sent.

The tentative outline for the course calls for the following allocation of time: 3 days on identification of common saprophytes (Aspergillus, Penicillium, Cephalosporium, and Fusarium, etc.); 5 days on the identification and culturing of the dermatophytes (Trichophyton, Microsporum, Epider mophyton, etc.); 6 days on identification and culturing of the subcutaneous fungi (Hormodendron, Phialophora, Sporotrichum, Allescheria, Nocardia, Actinomyces, etc.); and 6 days on identification and culturing the systemic fungi (Coccidioides, Histoplasma, Blastomyces, Cryptococcus, etc.).

The course will stress practical laboratory procedures useful for establishing diagnosis of mycotic infection, including the following: isolation techniques, preparation and use of special culture media, fermentation reaction tests, vaccine preparation, agglutination and complement fixation tests, inoculation of animals, preparation of permanent mounts and slide cultures.