obtained with B. sporogenes was 45 minutes at 105° and with B. tetani was 24 minutes at the same temperature. No spores survived 48 or 27 minutes respectively.

SUMMARY

1. The heat resistance of 112 strains of B. botulinus including 81 Type A, 30 Type B and one non-toxic varies from three to 75 minutes at 105° C. The spores are produced in pea-peptic-digest pH 8.0 and heated in a phosphate solution of approximately pH 7.0. The strains originated from 29 outbreaks of human botulism and 16 outbreaks of animal botulism, in addition to numerous other sources such as suspected canned foods, raw plant products, soil specimens and material from forage poisoning cases.

2. The heat resistance of 81 Type A strains varies from three to 75 minutes at 105° C. with an average resistance of 41.1 minutes. The resistance of 30 Type B strains varies from three to 60 minutes at the same temperature with an average of 23.8 minutes. The resistance of one non-toxic strain is 30 minutes.

3. The maximum heat resistance of B. botulinus spores produced under optimum conditions of growth is 330 minutes at 100° C.; 110 at 105° C.; 33 at 110° C.; 11 at 115° C., and 4 at 120° C., when heated in a phosphate solution of pH 7.0. These figures represent the time in minutes at which no spores have survived. The longest survival time at the same temperatures and under identical conditions is as follows: 320, 100, 30, 10 and 4 minutes respectively.

4. Spores of B. botulinus are more heat-resistant than those of the other anaerobes thus far tested.

5. The heat resistance of different strains of B. botulinus varies irrespective of the numbers of spores produced in the same medium. Few spores of certain strains may be far more heat resistant than large numbers of other strains.

6. The heat resistance of the same strain is markedly influenced by the number of spores heated. The larger the number present in a suspension, the greater the resistance.

REFERENCES.

1. Journal of the A. M. A., Vol. 72, page 88—92, Jan., 1919.
2. Journal of Infectious Diseases, Vol. 28, No. 1, Jan., 1921.
3. Journal of the A. M. A., Vol. 79, Oct. 15, 1922.

□

LAW ENFORCEMENT IN THE CONTROL OF TUBERCULOSIS

EDGAR A. JONAS, L.L.B., J.D.,
President Board of Directors, Municipal Tuberculosis Sanatorium, Chicago, Ill.

Read before the Public Health Administration Section of the American Public Health Association at the Fifty-first Annual Meeting, Cleveland, October 18, 1922.

AS a student in law school, I had for an instructor a doctor of medicine who taught us that medical jurisprudence was the branch of science which applies principles and practice of medicine to the settlement of doubtful questions which may arise in courts of law. For that reason the physician and the lawyer are equally necessary for the proper interpretation of medical questions in our courts.

The great requisite is for a mutual understanding between law and medicine. Judges and lawyers, physicians and health officers must make it a duty to become familiar with one another's every day principles and assumptions. Perhaps nothing is needed more in public-health work today than the welding together of the two great professional bodies concerned—the medical profession and the legal profession.

The health officer goes to the city council, the state legislature, or to Congress with his plea for legislation necessary to secure authority to proceed in a lawful manner to accomplish desired results for the welfare of his community.

The health laws of today are a product of modern times. Modern medical science has vastly enlarged the scope of these laws. Health laws bring in the phase of conflict between individual liberty and general welfare, between executive discretion (here the health officer seems to have a wide field) and fixed law, the extent and liability of officers in the use of their powers, and the right and power to restrict individual liberty.

The judiciary, in interpreting these laws, has decided their constitutionality time and time again. A perusal of the Supreme Court decisions of various states indicates clearly not only that the text of these laws must be reasonable, but also that the officer who is enforcing them must do so in a reasonable manner. In recent years, thanks to you modern health crusaders, the courts have been taking a broader and broader view, and many decisions have been made in favor of the health officer on the point of public policy and public protection, even when the text of the law itself would barely support the decision.

In other words, most of the judges of our Supreme Courts today have heard your message and are willing to permit the health officer to retain the great power he now has, and to interpret new legislation favorably when it is in the interest and the welfare of the people of the community. Consequently, the health officer can do now what he could not have done ten years ago. This does not mean that the health officer can use ruthlessly the great power which the courts have given him. Just as the greatest lawyers keep their clients out of lawsuits, so it is that the most successful health officer has a minimum of court battles to enforce the laws and ordinances in his community.

During the seven years that Dr. John Dill Robertson was Commissioner of Health of Chicago, he sued but two physicians; and, as I shall hereafter relate, no health officer in Chicago ever succeeded in getting as large a measure of compliances with the health laws.

As president and executive officer of the City of Chicago Municipal Tuberculosis Sanatorium, I, as a lawyer, do not feel out of place or in a wrong position. During the past five to seven years, this institution has been completely reorganized along new lines, under new rules for the control of pulmonary tuberculosis, and has been paid a compliment by no less a public health authority than Dr. C. E. A. Winslow, of Yale University, who says that it has the best plan yet devised for the control of tuberculosis.

It is well known among physicians that the pre-requisite to the remedying or improving of any condition is first of all a correct survey. A proper survey means the solution of the health officer's problem and assures the complete reporting of contagious diseases.

To make a diagnosis of the tuberculosis situation in Chicago, Dr. Robertson in 1915 instituted a survey of eight square miles of the most congested area of Chicago. In this survey, a chest examination was made on 165,000 people, 14,000 of whom were found tuberculous. Ninety-six per cent of these cases were unknown and unreported.

A study and analysis of why they were unknown and why they were unreported revealed the fact that the great majority of physicians waited until a positive sputum analysis was obtained before reporting the case as tuberculosis. This revelation brought the realization that thousands of early cases would be overlooked, unknown and unsupervised, and go on to advanced stages before the health officer could have any knowledge of them.

These facts were presented to the Illinois State Director of Public Health, with the recommendation that a rule be

made requiring physicians to report *suspect* cases of tuberculosis, and accordingly, in 1917, Rule 1 was made effective. This rule reads:

"Rule 1. Reports. Every physician, attendant, parent, householder, or other person having knowledge of a known or suspected case of pulmonary tuberculosis or consumption, must immediately report same to the local health authorities."

The next step was to acquaint physicians with the new rules, and so every physician in the city of Chicago was circularized twice with a copy of the rules, accompanied by a letter from the Health Commissioner calling their attention to the new regulation. Nevertheless, our statistics showed that this did not increase the reporting of cases of tuberculosis, that more forceful methods would be necessary to acquaint physicians with the requirements of the law and compel their compliance with it. It was evident, and I believe health officers will agree with me, that we could not rely upon the doctors' great humanitarian ideas of duty and community service. We had to have laws; it must be made more troublesome *not* to report than to report.

For that reason a Hearing Board was instituted by the Municipal Tuberculosis Sanatorium in October, 1918, consisting of the head of the Contagious Disease Division of the Health Department, the Medical Director of the Municipal Tuberculosis Sanatorium dispensaries, and the lawyer for the board, who happened to be myself. All moderate and far advanced cases coming to the attention of the dispensary physicians were checked up to find out if the physician who had them under care at any time during the previous three months had reported the case. If not, he was called before the Hearing Board to explain why.

While the Hearing Board had no legal status, the letter requesting a physician to make his visit to our board was couched in such terms that he knew it would be followed by court proceedings.

The following is a copy of the letter which we sent to such doctors:

"Dear Doctor:

An examination of our records discloses the fact that you have not complied with the State laws, rules and regulations governing the reporting of cases of tuberculosis in that you have failed to report the case of ——— (here was inserted the name and address of the patient).

I believe that better results can be obtained through cooperation than by compulsion, therefore, as a part of the proceedings in this investigation I have appointed a Hearing Board consisting of Mr. L. W. Reinecker, the Attorney for the Municipal Tuberculosis Sanatorium and its Board of Directors, and Dr. Grace S. Wightman of the Municipal Tuberculosis Sanatorium. This Board will be in session for the purpose of giving you every opportunity to present your statement of facts in person concerning the case of the above mentioned patient.

It is my desire to give every person a fair hearing whenever he is charged with failure to comply with the State laws regarding the reporting of cases of tuberculosis. Before turning the matter over to the Commissioner of Health for action you are notified that you may appear on the — day of ——, 1922, at the hour of —— P. M., in the office of the Municipal Tuberculosis Sanatorium, Room 309, 952 North Michigan Avenue, and present your case before the Board who will, after hearing the facts, then determine whether any further proceedings shall be taken in this matter.

Very truly yours,
President, Board of Directors."

You will note by this letter, our requests were really orders.

During the time I served as attorney for this Hearing Board we interviewed 1,100 doctors. As these doctors sat across the table from me, I received a great deal of information. Much of it was reluctantly given, but it was received with interest.

It was our custom, when the time came to say good-bye to our visitors, to assure them that we had confidence in them, and that in the future they never would fail to report their cases. The percentage that did so fail was negligible.

When this work was first instituted, it was necessary to have a meeting of the Hearing Board every week on the unreported cases, at which time about 30 doctors were called in. The object of the Hearing Board was not to prosecute and fine the physician for failure but to acquaint him with the requirements of the law, to show him where, and if possible, why he had failed in his recognition of the case. The dispensary doctors were present with the dispensary medical reports. In other words, it was desired to make it more troublesome to a physician not to report a case than it was to report it in the city of Chicago. Some of these doctors who wasted a half day's time and lost money and business through absence from their private offices, were no

doubt more careful after that experience.

Gradually the number of physicians failing to report cases became less and less, so that it became necessary to hold a Hearing Board only once a month, and at present they are held about once in three months.

In 1915, 12,709 cases of tuberculosis were reported to the Health Department, although no statistics were kept of the number reported by private physicians alone. In 1921 there were 10,593 reported, of which number 5,645 were reported by private physicians. More than 1,000 duplicate reports were received in 1921. While this does not show a great increase in the actual number of cases reported in the city of Chicago, we have received so many reports from different doctors that it has enabled us to keep in touch with nearly all cases of tuberculosis, and we know from the survey that this represents actual conditions. In 1916 when the first survey was made, 14,282 cases of tuberculosis were found, 96 per cent of which were not reported; while a survey in 1921 revealed eight-tenths of one per cent tuberculous. This is certainly additional evidence that tuberculosis is on the decrease in Chicago, which fact is indicated by the death rate. I believe if this campaign had been started in 1910 there probably would have been four or five times as many patients reported.

We believe ours is the only organization which has instituted such a procedure as I have outlined to compel the reporting of tuberculosis. Ours is one of the few cities which gives sanitary supervision to private physicians' cases.

At the Hearing Board, physicians are required to read these rules to the officers of the Hearing Board. They are required to promise that they will advise all their tuberculosis patients that they have tuberculosis, and inform them that a health officer must call to give instruction regarding sanitary rules and regulations, as covered by the rules, for the protection of healthy persons. The physician is made conversant with the rule relative to sputum examinations, which requires that the health officer must submit and have examined at certain intervals in a *public laboratory* a specimen of sputum in all cases of pulmonary tuberculosis.

In our handling of tuberculosis, Rule 5 of the Illinois state law in regard to open cases has been made the basis of an active campaign to remove children from contact with a contagious case of tuberculosis. The term "open case" is applied to all cases showing active evidence of the disease and who have tubercle bacilli in the sputum. While the state law says they shall not occupy the same room with other persons, we have interpreted that to be the same dwelling or apartment where there are young children.

Acting under the ordinance for the control of contagious diseases the Commissioner of Health made a ruling to the effect that no child under sixteen years of age should live in the same home with a positive sputum case of tuberculosis. In the enforcement of this rule the dispensary physician first attempts to isolate the patient in a sanatorium, or to persuade him to go willingly to a hospital or sanatorium. Many times the children are removed from contact by being placed with relatives or friends. Failing in this, the dispensary physician has the right to recommend forcible isolation, and the case is turned over to the Contagious Disease Division of the Health Department for such procedure.

The greatest value of this procedure is in the effect of the power for such enforcement. When the doctor informs the patient that he has such power, it makes it much easier to get him to go willingly to a hospital. During the year 1921, out of 793 open cases it was necessary to resort to force in only 71 cases. When this proceeding was instituted we had something like 1,000 open cases in contact with children. Throughout the year 1921 this number was about 30.

In Chicago, treating tuberculosis as a contagious disease, the Health Commissioner, upon the recommendation of the dispensary physician, may placard a non-cooperating and suspect case of tuberculosis, until the suspect case places himself under the care of a private physician or of a dispensary physician and the diagnosis is cleared up. Our statistics show that about 75 per cent of the cases reported as suspect prove to be actual cases of tuberculosis. Patients who refuse to submit specimen of sputum at the intervals required by law may have placards posted on their homes until they comply. It is a rule of the Municipal Tuberculosis Sanatorium that after a case has had positive sputum it shall be regarded as open and another sputum not collected for at least three months. Even then a case is not dismissed from the open case list unless the dispensary physician is satisfied that the other signs of activity of the disease have subsided.

At the present time, Fate has decreed that I should be a law enforcement officer, as a State's Attorney of Cook County, charged with the enforcement of the laws, and at the same time president of the Municipal Tuberculosis Sanatorium. The fact that I am a State's Attorney does not in any way detract from our ability to get prompt reports in compliance with the state law requiring the reporting of tuberculosis. While we have the power in Chicago, I hope I shall be able to use it in a friendly cooperative way, and paraphrasing the words of Theodore Roosevelt, to speak softly even though I do carry a big stick.

One of the more recent activities in regard to tuberculosis concerns itself with those cases of which the first report is that received on the death certificate filed by the physician. When, in the past, physicians have been called before our Hearing Board under circumstances of this kind to explain their failure to report previously, the usual explanation is that the patient had been under the care of some practitioner other than a licensed medical practitioner; that the case had not been reported, and that a physician had been called in only 24 hours before the death of the patient in order to sign the death certificate.

In order to correct this evil, we are sending a letter to all physicians in Chicago stating that these certificates will not be accepted in future without investigation. I will read a copy of this letter.

"Dear Doctor:

This letter is to notify you that on and after (date) the Vital Statistics Bureau of the Health Department will refuse to issue burial permits for persons reported as having died of tuberculosis who had not been previously reported as a case of tuberculosis. Upon the recommendation of the Health Department, the Cook County Coroner will be notified to make a thorough investigation of all such cases in order to ascertain and establish the cause of death.

Tuberculosis is a chronic, contagious, preventable disease, but it cannot be prevented if cases are hidden away in contact with young children until they are removed by death.

Of the deaths from tuberculosis during the year 1921 in too large a number of cases the death certificates constituted the first report. These physicians were called before our Hearing Board, and the explanation usually given was that they were called in to a case at its termination in order that the family might obtain a death certificate from a physician and thus a burial permit.

These cases bring about a great deal of trouble to the physician. Is it always possible for a physician to determine tuberculosis as a cause of death in a terminal case? No doubt some obscure causes of death are put in under the name of tuberculosis, as has come to light in a few investigations by the Coroner's office. There should be no reason why a doctor should feel that he must sign a death certificate on a case which has not been under his care and treatment ,but has been treated by some "cultist" who under the law has no power to sign a death certificate. Why should the doctor assume this responsibility?

These cases are not a personal matter between the physician and the family, but a matter of public-health concern. We believe this plan will serve to bring about the earlier reporting of cases of tuberculosis, which is a first step in the solution of any contagious disease problem."

Referring again to my statement that a better understanding must be brought about between lawyers and doctors, physicians need not only to be made acquainted with the requirements of their health laws, but also to feel they are being enforced. I can think of no better plan by which physicians could be made acquainted with the law than by such an institution as the Hearing Board. I believe the same plan should be applied to contagious diseases all over the country as it is in Chicago. The courts of the United States have been almost uniform in their decisions supporting the public health officer on a bare showing of public welfare. In nearly every instance

where the activity of the officer was attacked under some statute which enabled a person to appeal to the court under the guise of "personal liberty," the court has held that public welfare is paramount.

For the reason that the public-health officer has little or nothing to fear, so long as he is ruled by the desire to protect public health, he is justified in feeling that the people and the courts will support him. We have had cases in Chicago where persons found to be suffering with active tuberculosis have resisted isolation to the point of making it necessary for the health officers to carry out their edict with armed policemen. The result has been newspaper notoriety and court action with the health officer in a favorable light at every turn.

What has happened in Chicago will happen in nearly every city in the Union if the health officer decides to take the situation firmly in hand. The courts will not tolerate a person making his sickness a menace to every other human being in the community—because that is what really happens when isolation is not enforced. Those with whom the patient comes in contact not only are placed in grave danger, but they also carry the danger of contagion with them to others with whom they associate.

I believe it will not be long until, in Chicago, through the propaganda carried on by the health officers, the courts, public officials and the newspapers, that the public will have thrown off their callousness in regard to tuberculosis. They will have learned to regard it as one of the dread diseases, to be feared as they have been taught to fear smallpox and scarlet fever.

We may not perhaps be able to wipe it out as thoroughly as medical science has wiped out typhoid, where an active warfare has resulted in a condition where many practicing physicians, I am told, have not treated a case in ten years. But we can at least hope with an assurance strengthened by results clearly attained that tuberculosis will be relegated to a back seat among the diseases inimical to humanity.

History has shown that where a lack of coordination has existed between law enforcing bodies and the world of medical science, where disease has been allowed to take its toll, rampant and unchecked, not only have certain classes of society been wiped out, but nations, empires, have been swept from the face of the earth. My limited experience has borne out the fact that this need of cooperation is being realized. The lawyer of today acknowledges the necessity of the scientific laboratory and the research bureau, and calls upon them to aid him. In a like manner the doctor calls upon the lawyer to explain to him his rights under the law in enforcing those safeguards which have been established to control and eradicate disease.

The health officer and the lawyer alike owe a duty and their allegiance to the coming generations. They must act together in carrying out that allegiance. If the conditions that make for crime and poverty are due to something that the health officer can prevent or eliminate, rest assured that the law will support him in his endeavors.

The Local Wassermann in the Early Diagnosis of Primary Syphilis.—The Wassermann reaction carried out on the chancre sera was positive in all cases. Of the 34 cases giving positive local Wassermann reactions the of 34 demonstrated cases of primary chancre majority showed negative blood reactions and no secondary manifestations. Treatment of the lesions locally with antiseptics appears to have no effect upon the complement-fixing antibodies, although the spirochetes may disappear.—D. Stern and Harold Rypins, *Jour. Lab. Clin. Med.* 8, 86 (1922).