CATALOGUED

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A. I said that we looked at some lands there in case it became necessary. I don't know that I can describe it, sir, but I think it was from where we sat,—this side of the depot, and it was the other side of the railroad; I cannot describe it by metes and bounds.

Q. What depot do you refer to?

A. I refer to the Lackawanna Depot.

Q. In the city of Dover?

A. Yes, sir.

Q. And it was below that on the stream?

A. Yes, below that, that is, this side of it.

Q. And on which side of the steam did you say?

A. Now that I cannot say from memory.

Q. What was the size of the plot?

A. We didn't look at any plot particularly, we looked at a section of country there wherein filtration beds might be placed.

Q. Then it was a disposal plant that you had in mind for filtration beds?

A. Yes, sir.

Q. Did you go with any gentlemen in carriages, ever?

A. Nearly all our trips were taken in carriages of some kind or another.

Q. How many would there be in each carriage?

A. Oh, I don't know, two or three or four.

Q. How many carriages would there be?

A. I cannot answer that, sir.

Q. Eh?

A. I cannot answer that.

Q. Don't remember?

A. Oh, several, but as to the number I don't know, I didn't hire them at that time.

Q. Who furnished the carriages?

A. We paid for them. Mr. Beldon done the hiring, I think, of the carriages.

New Jersey State Library

Q. I suppose you paid for them through Mr. Belden also?

A. Yes, sir.

Q. You don't know whether there were three, four five or six carriages?

A. Some time there were six, depends on how many there were along.

Q. Which carriage did you go in?

A. I wasn't particular as to where I went, changed myself around from time to time whenever we stopped.

Q. Did you arrange it so that one of these gentlemen who represented Mr. Flynn would be in one carriage, and some other gentleman who represented Mr. Flynn, whose names you have mentioned, would be in the other carriage?

A. I think they were divided around in that way.

Q. Senator Edwards would be in one carriage and you in another carriage?

A. Yes, sir.

Q. And Mr. Connelly would be in another carriage?

A. Yes, sir.

Q. And Mr. Beldon would be in the third carriage?

A. And some times we were together.

Q. Some times you four would occupy one carriage?

A. One, two or three of us as the case might be, I saw no reason at that time to charge my mind with that; I know at some times we sat together, in fact the people that came along invariably made their own selections as to where they wanted to ride.

Q. You were treasurer of the Jersey City Water Supply Company when it was formed, were you?

A. Yes, sir.

Q. What was that formed for?

A. For the purpose of building these works.

Q. Was there a contract between them and Mr. Flynn?

A. Yes, sir.

Q. Where is that contract?

A. I presume in the possession of the officers of the company today.

Q. Who owned the stock in that company?

A. How do you mean who owned it. At that time?

Q. Yes.

A. Mr. Flynn.

Q. It was really Mr. Flynn's company, of which he was the owner of the great majority of stock and organized for the purpose of taking this contract which Mr. Flynn had with the City and completing it, is that right?

A. That is right.

Q. Now, at some time in the life of that corporation, the stock that Mr. Flynn owned was transferred to somebody, who was it transferred to?

Mr. EDWARDS: I object on the ground that this is not a proper cross examination.

A. The Jersey City Water Supply Company entered into a contract with Mr. Patrick H. Flynn to build the works, for which they agreed to give him all the stock and some six and a half millions of bonds for the purpose of doing the work, as the work progressed.

By Mr. EDWARDS.

Q. You haven't answered the whole question.

A. Well, as to the transfer, that I cannot say.

FURTHER CROSS.

Q. You said a Mr. Gardner, I think, what did you mean by that—when Mr. Gardner became president?

A. You asked where the contract was and I told you I thought it was in the possession of the officers of the company as now constituted.

Q. When Mr. Gardner became president to whom was the stock of the Jersey City Water Supply Company transferred?

A. I cannot answer that question from knowledge I have no knowledge of it.

Q. Didn't you have charge of the transfer book?

A. I think, my impression is that the stock was transferred to different parties, made out to different parties, however, the book will show what was done with it, I don't know.

Q. You don't remember who those gentlemen were?

A. No, sir.

Q. None of them?

A. No, sir.

Q. They were strangers to you?

A. I don't know who they were.

Q. Cannot remember?

A. I don't know who they were.

Q. Senator Edwards suggests that you resigned at that same time, is that so?

A. Certainly did.

Q. You have no knowledge now to whom the stock of the Jersey City Supply Company was transferred, previous to your resigning as treasurer?

A. No, sir.

Q. Who was Mayor of Jersey City at that time before the contract was entered into and you had these talks with somebody?

A. Edward Hoos was.

Q. Who was Mayor after the bids were submitted?

A. I think he was.

Q. Who was Mayor at the time the contract was signed?

A. I think he was.

Q. Did you know him?

A. Oh, yes.

Q. You say there was some arrangement made about the Power factory; you refer I suppose to the rag mill factory at Powerville?

A. I don't know of any arrangement that was made. I said, I think, that we conceded that that should be removed.

Q. Who did you hear say that?

A. I said it.

Q. To whom did you say it?

A. Well, I don't recall, in conversation, probably, to several people.

Q. Where did you say it?

A. I may have said it several places.

Q. Yes, you may have said it anywhere, but have you any recollection where you did say it?

A. I think I said it in Powerville, I think I said it in Boonton, and I think I said it in Jersey City.

Q. Do you recall now any thing about any intercepting sewer at Boonton?

A. No, sir, I don't think that was considered.

Q. You never heard of that before, eh?

A. No.

Q. None of the City officials ever spoke to you about any intercepting sewer at Boonton?

A. Not that I recall.

Q. Nor did Mr. Flynn or any on your side speak to you about an intercepting sewer at Boonton?

A. Not that I recall, sir.

Q. Do you recall how the sewage of Boonton was to be taken care of?

A. No, sir, I don't know that it was ever considered serious.

Q. Did you build the dam where you agreed to build it.

A.I don't know that we agreed to build it at any particular place, we agreed to build it wherever we found a proper foundation, and we did so.

Q. Your understanding was that there was no agreement as to where the reservoir was to be?

A. My understanding was that we should build a dam where it would be of some use, and I think we made a map showing that we might build it between two certain points, and when we found the foundation there was not satisfactory why of course the most essential thing to do thereafter was to find a place that would be satisfactory for building and constructing a dam.

Q. How long after the contract was entered into did you find you could not build it where you first had shown that you would build it?

A. Maybe a few months.

Q. How deep was the water at the first place?

A. The water?

Q. Yes?

A. There wasn't any depth of water there, probably a couple of feet.

Q. How deep was it to be there, when the dam was built?

A. I don't think that was changed much; the head would be about the same.

Q. You don't recollect any change in the head?

A. It would be about the same.

Q. I am asking whether you recollect any change in the head?

A. Not material.

Q. What do you mean by not material?

A. I think the fact that where we removed the dam to,—where it is placed now, I don't think there was much change between that and the place where we originally contemplated building it.

Q. That is, you think it is as deep now as it was where you contemplated building it, do you?

A. Well, almost so; the figures, of course,—the profiles would show that, and the tracings would show that; I haven't carried that in my memory; I only know it would have been better for the company if they never had changed it, they would have saved four or five hundred thousand dollars in not building the dyke at Parsippany, that was the thing that impressed me.

Q. Your recollection is that it cost four or five hundred thousand dollars to build that dam at the Parsippany dyke?

A. Whatever it cost, that was done by the succeeding company, that is my idea it cost a few hundred thousand dollars.

Q. Your idea is that it would cost that much to build it there?

A. That it did cost that much.

Q. And therefore you think it would have been better to have built it where you first contemplated?

A. Couldn't build it where we first contemplated it, sir.

Q. Well, I understand you to say that you were then the confidential man of Mr. Flynn?

A. On this particular piece of work; yes, sir.

Q. What profession have you?

A. None.

Q. Are you a lawyer?

A. No, sir.

Q. Were you a confidential man of Mr. Flynn in any other contract?

A. Those that I have mentioned, sir; in my direct examination.

Q. Is that all the contracts that you were the confidential man of Mr. Flynn?

A. That is all.

Q. What do you mean by confidential man?

A. Looked after his finances,—expenditure of his money.

Q. Did those two things constitute all that you understand your duty as confidential man required you to do?

A. Anything that he required of me I was always ready and willing and anxious to do, in relation to those contracts,—the contracts mentioned.

Q. When was the building of the subway commenced, in Philadelphia?

A. My best impression is 1896.

Q. When was it finished?

A. Some time around 1899.

Q. Was that a large contract?

A. Quite a large contract.

Q. What do you mean by quite a large contract?

A. Something around one million dollars; I am not clear on the figures just now.

Q. About a million; the East River bridge foundation commenced when?

A. 1896.

Q. When was that finished?

A. About the same time, 1899.

Q. Was that also a large contract?

A. The contract price was $367,000.

Q. You also said at the same time you had others?

A. Yes.

Q. What others did you refer to?

A. We had some quarries in Maine.

Q. Were you his confidential man as to quarries in Maine?

A. Yes, sir.

Q. What else—did you have quarries other places?

A. We worked quarries in connection with some of these jobs; yes, sir.

REDIRECT EXAMINATION:

Q. In your business as a contractor were you familiar with quarry operations?

A. I was.

Q. And where had you handled quarries?

A. Quarries in Friendship, Maine, and in Manchester, Maine, and we had quarries in Saugerities, New York, and quarries out in Chester County, Pennsylvania; the quarries in Maine and New York being the absolute owners of, and the quarry in Pennsylvania paying a royalty for all the stone that was taken out.

Q. Had you also done general contracting business?

A. Yes, sir.

RECROSS EXAMINATION:

Q. Is Mr. Flynn still living?

A. Yes, sir; at least the last I knew of him.

REDIRECT EXAMINATION:

Q. Where does Mr. Flynn now reside?

A. I don't really know the name of the place, but it is in Sullivan County, somewheres around Debose, back on the hill there.

Q. New York State?

A. Yes, sir; New York State.

Q. That is all.

Sworn to before me,
(the signature being waived)
this 24th day of December,
A. D. 1906, at Jersey City,
N. J.

———

Further examination of witnesses, etc., in this matter stands adjourned until Wednesday, December 26, 1906, at the same time and place.

IN CHANCERY OF NEW JERSEY.

Between

THE MAYOR AND ALDERMEN OF JERSEY CITY,

Complainants,

and

THE JERSEY CITY WATER SUPPLY COMPANY,

Defendants.

Examination of witnesses, etc., in the above stated matter, before the subscriber, Walter J. Knight, Master in Chancery of New Jersey, at the hour of ten o'clock in the forenoon of Wednesday, the 26th day of December, A. D. 1906, at the office of Messrs. Collins & Corbin, 243 Washington street, Jersey City, N. J., in the presence of Mr. Vredenburgh and Mr. Record for the complainants, and of Mr. Corbin and Mr. Edwards for the defendants.

Said testimony being taken in shorthand, question and answer in full, and the signatures of the witnesses to the depositions waived.

WALTER J. KNIGHT,
M. C. C., N. J.

Testimony of Andrew Bardner.

ANDREW BARDNER, recalled.

FURTHER CROSS-EXAMINATION by Mr. Vredenburgh:

Q. When we adjourned on Monday we were looking at November 30th, and I want you, if you will, to read from your original notes when and where you put in float No. 4 that day?

A. November 30th, No. 4 was a ten foot float.

Q. What do your notes say; just read your notes?

A. Could I look at that statement?

Q. Just read what you have in your book?

A. Ten foot float; I didn't write down where I put it in, because it was located exactly with the transits.

Q. You have nothing in your book to show where you located it, then?

A. Not in my book; no, sir.

Q. Well, by your book, you mean what you have spoken of,—your original notes?

A. Yes, sir.

Q. When did you enter those notes up—that night?

A. Those notes I took at the time I put the floats in, as I went along.

Q. Then you have no entry at all where you put in No. 4?

A. No, sir.

Q. Just show us on the map where you have indicated it?

A. About sixteen hundred feet from the dam, and that ,according to the measurement which I now make on the map is about sixteen hundred feet from the dam, about right angles to the dam, opposite the gate house.

Q. And No. 5, on the same day, was how many feet from it?

A. Not more than fifty feet.

Q. Well, now, what does your book show about it?

A. I put them all in around about the same place; those are the exact locations where they were put in, as shown on the map; determined by two transits.

Q. What does your book show about it?

A. I merely made a note of the time I put it in.

Q. What does your book say about it?

A. Thirty foot float, No. 5.

Q. Is that all it says?

A. And the depth of the water was eighty feet at that point.

Q. Won't you please read what your book says?

A. That is all my book says.

Q. Read it over again—what does your book show?

A. No. 5, put in at 2:35, a thirty foot float, about eighty feet of water.

Q. The page of the book from which you read is ruled, and it is page 14, 14 being both pages of the book, and that page is ruled, in addition to the blue lines, by right angle red lines?

A. Yes, sir.

Q. And on the top is written: "Boonton Reservoir, Float Experiments, November 30, 1906" and the first column is a number of readings, and the second column is what?

A. Float number.

Q. And the third column?

A. Time.

Q. And the fourth column?

A. Description of float.

Q. And the fifth column?

A. Depth of float.

Q. The sixth column?

A. Depth of water.

Q. Seventh column?

A. Azimuth.

Q. And that takes up the left hand page; that page contains a number of readings from 1 to 23?

A. 24, sir.

Q. A number of floats from 1 to 24, is that right?

A. Twenty-four floats; yes, sir.

Q. You have got the float numbers?

A. Rather twenty-four locations, not twenty-four floats, but twenty-four locations of those three floats.

Q. I am reading from your book; your book says, number of readings, and you have in that column, 24?

A. Yes, sir.

Q. As being the number of readings?

A. Yes, sir.

Q. You also have in the column to the left of that 23?

A. Yes, sir.

Q. What do you mean by that?

A. There was one reading that one transit man did not get.

Q. Which one was that?

A. The twenty-fourth reading.

Q. Who was with you that day?

A. Mr. McIntosh, who is the gate keeper up there, and two of our regular engineering force from Paterson.

Q. Who were they?

A. John Ryle and Louis C. Ellston; John Ryle was one transit man and Frank McIntosh was the other transit man.

Q. You said McIntosh was the gate man?

A. Yes, sir.

Q. Were there two McIntoshes?

A. No, sir.

Q. Then there was one man from the office?

A. I had another man from the office in the boat with me, Louis Sehulster.

Q. In whose employ are they?

A. The Passaic Water Company and the East Jersey Water Company and the Jersey City Water Supply Company.

Q. The Passaic Water Company, and the East Jersey Water Company, and did you also say the Jersey City Water Supply Company?

A. Yes, sir.

Q. Are they in their regular employ?

A. No, sir.

Q. Were they in their employ that day?

A. They were working for the Jersey City Water Supply Company that day.

Q. Who were they paid by, that day?

A. Eventually it was charged up to the Jersey City Water Supply Company.

Q. How do you know?

A. Because the time is turned in at the end of the month, the time that a man works for the different companies.

Q. How do you know that; do you mean that the East Jersey Water Company charges up to the different men the time they spend on the Passaic—

A. The Passaic Water Company charges up to the other companies the time that the men are employed by those other companies, during the month.

Q. And your pay is in the same way, is it not?

A. Yes, sir.

Q. Well, now, going back to the reading from your book of float No. 4; all there is in your book as to float No. 4, is that No. 4 is put down in your book as the sixth reading, is it?

A. Yes, sir.

Q. Sixth reading, No. 4, and then opposite to that in the next column on the right is 2.36?

A. Yes, sir.

Q. That means it started at 2.36?

A. That was the time; yes, sir; that the reading was begun.

Q. Was that the time that the float was put in, from your book?

A. The same time; yes, sir.

Q. Well, what do you mean by reading, then?

A. By reading, I mean reading the angle turned on to the float by the transit.

Q. At 2.36 an angle was turned on there by a transit?

A, Yes, sir; by two transits.

Q. Who did that?

A. McIntosh and Ryle.

Q. Had you anything to do with it?

A. I was in the boat, they were on shore.

Q. You don't know anything about the accuracy of them at all, do you?

A. I had them read both, the angle and the bearing.

Q. They read it to you from something that they took—you didn't know anything about it, did you, you were in the boat?

A. Yes, sir.

Q. You did not see the transit at all?

A. I didn't take readings of the transit myself.

Q. You don't know what they read except what somebody told you?

A. What they entered in the transit books.

Q. They gave you a book afterwards?

A. Yes, sir.

Q. And you took whatever memorandum you had from that?

A. Yes, sir; I plotted it from that.

Q. When you say that the float was placed sixteen hundred feet from the dam, you depend entirely on

what the transit said?

A. Yes, sir.

Q. And when you indicate on the map where No. 5 was put in the water that is also from figures given you by the transit men?

A. Yes, sir.

Q. And so with No. 6?

A. Yes, sir.

Q. Now, were every one of the floats put in that day determined by those transit men?

A. Yes, sir.

Q. When you indicated on the map here where they were, you took their figures?

A. Yes, sir.

Q. Now, you mark here that No. 4 was put in at 2.36, how did you determine the time?

A. By the watch.

Q. Whose watch?

A. We set our watches before commencing work.

Q. And No. 5 was what hour?

A. 2.35.

Q. And No. 6 was what hour?

A. 2.30.

Q. Now, you were then in a boat?

A. Yes, sir.

Q. Who was with you in the boat?

A. Louis C. Ellston.

Q. Who took the depth of the water?

A. I did.

Q. And the depth of the water there in that vicinity was about eighty feet?

A. Yes, sir.

Q. You cannot say whether it was eighty feet at No. 5, or No. 4, or No. 6?

A. Merely in that vicintiy, in that immediate vicinity.

Q. Now, then, did you observe in which direction

those floats started; first take No. 4, did you observe it?

A. I paid no particular attention to them after putting them in, and getting them started off.

Q. And that is true also as to No. 5 and No. 6?

A. Yes, sir.

Q. Now, when did you next see No. 4?

A. It was located 3.01.

Q. At one minute after three?

A. Yes, sir.

Q. How far had it gone then, according to the map you have here?

A. Three hundred feet.

Q. When did you next see it?

A. At 3.40.

Q. How far had it gone, according to the map?

A. From the beginning place, sir?

Q. No, from where you saw it at 3.01?

A. 440 feet.

Q. How do you know it had gone that distance in that time?

A. From the plotting of the transit notes.

Q. Do you mean that when you saw it at 3.40 the transit men on the shore in some way told you how far it had gone?

A. No, sir; I determined that myself, afterwards.

Q. What did the transit men inform you afterwards?

A. He merely recorded the angles and the time of the reading, and the bearing as well.

Q. The angle, the time of the reading and the bearing, will you give those to us?

A. November 30.

Q. What are you reading from now?

A. The notes taken by John Ryle.

Q. Go on?

A. Which float were you asking me about?

Q. No. 4.

A. The time was 2.34; the angle was thirty degrees and thirty minutes; the bearing is north eighty-four, thirty minutes east.

Q. Is there any mark on that book to show what the wind was then?

A. Light southwest wind.

Q. That is also in the handwriting of Mr. Ryle?

A. Yes, sir.

Q. Now, according to your map, No. 4 was put in the water at 2.36, and this observation was made two minutes before that; how do you account for that?

A. Well, they wouldn't probably both get the reading exactly at the same time, and there might be a difference of a minute or half a minute between the two readings.

Q. Well, this is a difference of two minutes?

A. Then the time is the time that I observed, and their time is only of importance to correspond with it, so as to determine which float it was that they took the reading on.

Q. Their time is the time they took the reading?

A. Yes sir.

Q. And your time is the time you put it in the water, is it not?

A. No, sir; it would be the time I gave them the flag to take the reading.

Q. Had you put it in the water at the time you gave the flag?

A. Yes, sir; it was then floating.

Q. When did the transit man—at what hour—locate float No. 5?

A. 2.33.

Q. That was two minutes difference?

A. Yes, sir.

Q. Now, No. 6?

A. 2.31, the transit man.

Q. And you showed him the flag, according to your watch, at 2.30; now, going back to No. 4, you first saw it again at one minute after three o'clock, is that right?

A. Yes, sir.

Q. Now, at what time did the transit man take his transit?

A. 3.01.

Q. How near were you to it at that time, in your boat?

A. At the stern of the boat, close up to the float, and I held the flag above the float.

Q. Now then, No. 5; you saw it again at 3 o'clock?

A. Yes, sir.

Q. Did you go up to that float?

A. Yes, sir.

Q. What time did the transit man see it?

A. Three o'clock.

Q. At the same minute?

A. Yes, sir.

Q. What was the distance between those two points, as you have them on the map?

A. About two hundred feet.

Q. Well, how was it possible for you to be at one of them at 3.01 and the other at three o'clock, only one minute's difference?

A. Well I might vary a minute or two minutes; I might not always just look at my watch at the time they took the reading; I might write it down and perhaps not look at my watch for awhile; the time the transit man observed is merely a check—to check the number of the float.

Q. Well, what I don't understand is, that the boat was at one of these floats at 3.01, and that your boat was at the other float at three, according to your time; do you mean to say it only took you a minute to go that distance?

A. Well, that is the time I have recorded it.

Q. You had oars?

A. I had a man to row the boat.

Q. You had a man to row the boat?

A. Yes, sir.

Q. Who was he?

A. Sehulster.

Q. This same gentleman you spoke about before?

A. Yes, sir.

Q. When did you last see No. 5?

A. At 4.27.

Q. When did you last see No. 4?

A. 4.30.

Q. How far were they apart then?

A. About six hundred feet.

Q. No. 4 being that number of feet nearer the dam than No. 5?

A. Yes, sir.

Q. And No. 6 was how far away at the time that you last saw it?

A. From No. 4?

Q. From No. 5?

A. From No. 5; four hundred feet.

Q. Now, these locations are not made by any investigation made by yourself, but by the transit men that you had with you?

A. Yes, sir; I plotted the transit notes.

Q. Now, you found that the water at the depth of fifty feet was moving how fast?

A. No. 6 was fifty feet float, and traveled 530 feet in one hour and 54 minutes.

Q. And the wind was in what direction then?

A. Light steady breeze all day from the southwest.

Q. Well, the water at thirty feet in depth was moving how fast?

A. 750 feet in one hour and 52 minutes.

Q. And the water on the surface was moving how fast?

A. 1300 feet in one hour and 54 minutes.

Q. How much water was running over the spillway, how many inches?

A. The natural flow of the river was 56 and 5-10 million gallons.

Q. Per day?

A. Per day.

Q. And how much was running over the spillway?

A. That I don't know.

Q. Was the water running over the spillway?

A. Yes, sir.

Q. Do you think that that water that was moving to the extent of fifty feet in depth at the rate of 530 feet in an hour and 52 minutes was all going over the spillway?

A. No, sir.

Q. What part of it do you think was?

A. Only the upper portion.

Q. How much of the upper portion?

A. That I cannot say.

Q. Well, about?

A. I don't know.

Q. Could not have been more than three or four inches going over the spillway, was there?

A. I don't think there was that much.

Q. Don't think there was even that much?

A. No, sir.

Q. Was this rate, from the time you put in your floats until you took them out, substantially the same, so far as you could see?

A. They traveled pretty evenly on that day, nearly uniform.

Q. They traveled in the direction of the wind?

A. The general direction of the wind; No. 4 traveled almost directly with the wind; No. 5 traveled a little further to the north of No. 4, and No. 6 traveled a little to the north of No. 5.

Q. Now, I notice that you put a broken line from

where you took No. 4 out to the spillway?

A. I didn't take them out, I left them in over night.

Q. When did you see them the next morning?

A. About eight o'clock.

Q. What is that tracing from the end of No. 4 to the spillway?

A. This indicates the position I found it in the next morning; the dotted line from the last place the night before is an imaginery line to the point where I found it next morning.

Q. Why didn't you observe them after 4.30 o'clcok that day?

A. I couldn't see any longer, sir.

Q. You mean it was too dark to see?

A. Yes, sir; I couldn't see with the instruments, after that time.

Q. That was the first day that you located with the instruments, wasn't it?

A. No, sir.

Q. Which was the first day?

A. Yes, sir; it was; the 30th was the first day.

Q. Why didn't you locate it after 4.30 o'clock in the same way as you located it at the previous days?

A. The other ones that I located up as late as six o'clock was much earlier in the season, and it didn't get dark then until about six o'clock.

Q. Well, the previous one had been on the 17th of November, only thirteen days before?

A. When I allude to six o'clock, I mean the ones taken in September.

Q. Now, you made twenty-one other locations that day; have you shown all of them on this map?

A. Yes, sir.

Q. The whole 23?

A. Every location that was taken is shown.

Q. Well, now, just show me after 4, 5 and 6?

A. 1, 2, 3 and 4; there were twenty-four readings on that page.

Q. Then there were 24 floats apparently?

A. No sir.

Q. 24 readings?

A. Yes, sir.

Q. And each one of those readings you have put on this?

A. Yes, sir.

Q. How many separate floats did you start that day?

A. Six.

Q. Where were the other three?

A. Those black lines there, sir; in the mouth of the inlet.

Q. Now, on December 5th, what was the wind that day?

A. From 6 A. M. to 11 there was a light breeze from the southwest; from 11 to 2, blowing a heavy gale from the northwest; from 2 to 3 steady breeze from the west, northwest; from 3 to 5 light breeze from the west, southwest.

Q. Now, how did you determine when the wind changed from southwest to northwest?

A. I had the transit men take observations at different times in the day.

Q. Where is the record of the observations of those transits?

A. In this book; in this transit book.

Q. In the transit book?

A. Yes, sir.

Q. Those entries, I understood you to say, were not made by yourself?

A. No, sir.

Q. Then you depend on how the wind blew by some information that the transit men gave to you?

A. Along with my general observations.

Q. Well, how did you, from your general observation, determine when it changed?

A. Being familiar with the points of the compass where I was working.

Q. How do you fix the time when it changed?

A. When I noticed it.

Q. Did you make any mark anywhere on it?

A. Yes, sir; I made an entry of any time I noted a change in the wind.

Q. Look at your entry of December 5th, and see what you have there?

A. Wind, 6 A. M., light breeze from the south southwest. 8 A. M. light breeze from the south southwest, aand here it is at 9:38, light breeze from the south southwest. Wind at 10 o'clock west, light breeze, freshening somewhat.

Q. Go on?

A. Wind, northwest by west, freshening.

Q. You have something that you erased there, what is that?

A. Well, this No. 4 float, I didn't find it the second time; I went back to my reading on it, but I found it later; I thought it had sunk and wrote that down, but after I found it, later on, and I scratched it out. At 11 o'clock the wind was northwest, fresh breeze, increasing in strength. Wind 1:30 P. M. west or northwest, stiff breeze.

Mr. EDWARDS:—

Q. Is that the same date?

A. Yes, sir.

FURTHER CROSS:—

Q. Go on?

A. At 2:30 wind calm, very light from the west northwest at 3:40.

Q. What is this—wind west?

A. That was 3:11.

Q. 3:11 the wind was west?

A. At 3:34 the wind was northwest, light breeze. At 3:40 the wind was west, breeze freshening a little; at 4 o'clock the wind was southwest, steady breeze; at 4:15 the wind was west by southwest, light steady breeze. Wind at 4:40 southwest, light steady breeze. That is all that day.

Q. You didn't notice any gale, then?

A. Yes, sir; I noticed it; I call it a half gale during a portion of the time.

Q. What portion of the time, according to your notes?

A. From about 11 to 1 o'clock, somewhere around there; it was so fresh I couldn't go out in the boat; we had to stay on shore.

Q. How long did you stay on shore?

A. About an hour and a half.

Q. Any memorandum of that in your books?

A. No, I don't know that I have a memorandum of it, sir.

Q. Now where were floats 4, 5 and 7 that day put in the water?

A. Nos. 4, 5 and 7 put in at 9:25 A. M. about center of the reservoir, opposite Inlet.

Q. One 9:25; another 9:23, and another 9:21 apparently; is that right?

A. No. 7 at 9:21—9:23 and 9:25, that is right.

Q. Now they traveled all in an easterly direction, did they not?

A. A little to the south.

Q. When did you last see them?

A. When they came ashore; the double circle represents them going ashore; I took them out.

Q. How soon did you find them after they went ashore?

A. Well, I was on this point here at the time waiting for the wind to go down so that I could go out in the boat again, and as soon as the wind abated sufficiently we went out and located them and took them up from this point here.

Q. You could see them from the land?

A. Yes, sir.

Q. And one apparently landed at 12:07 and the other at 12:15, and the other at 11:30?

A. Yes, sir.

Q. Were those three floats the tin floats that you have spoken of?

A. Yes, sir.

Q. One ten foot, one twenty and one thirty feet?

A. Ten feet, thirty feet and forty feet those were.

Q. No. 4 was ten feet?

A. Yes, sir. No. 5 was thirty feet and No. 7 was forty feet.

Q. Now what did you do with them after you took them up?

A. I collected the six that I had in, I collected the six; they all went aground; I collected the six and distributed them along the front of the dam.

Q. How far from it?

A. About—

Q. Does your book say?

A. I guess it does, sir. From about 700 to 1,000 feet from the dam.

Q. No. 1 is not in front of the dam; you mean in front of the earth dam over towards what you call the south shore?

A. Yes, sir.

Q. And that traveled towards the dam at what rate of speed?

A. I haven't got a note of the rate of speed it traveled at. That traveled about seven hundred feet.

Testimony of Andrew Bardner.

BY MR. EDWARDS:—

Q. From what time to what time?
A. From about 3 o'clock until 4 o'clock.

Mr. VREDENBURGH:—

Q. In about an hour?
A. Yes, sir.
Q. Traveled 700 feet in an hour between three and four o'clock that afternoon?
A. Yes, sir.
Q. And it traveled towards the dam?
A. Yes, sir.
Q. And towards the gate house?
A. Well, at the point of the Rip-rap.
Q. Was that ten feet or twenty feet or thirty feet?
A. Ten feet.
Q. The next one you put in about 200 feet to the north of the first one at 3 o'clock, is that right?
A. About 3 o'clock; yes, sir.
Q. Twenty?
A. Yes, sir.
Q. That traveled towards the gate house at what rate of speed?
A. About 340 feet in an hour and ten minutes.
Q. When did you last see that that night?
A. About 400 feet from the dam?
Q. When?
A. At 4:10.
Q. Between your two observations it was going directly toward the gate house wasn't it?
A. Yes, sir, it was heading in that direction.
Q. Now it is apparent from those two observations that the water to the depth of thirty feet was going directly towards the dam; now what happened, in your judgment when that water struck the dam?

A. It was also going with the wind at the same time.

Q. Was that the direction of the wind?

A. Yes, sir.

Q. What happened when it struck the dam?

A. When the float struck the dam?

Q. When the water struck the dam; this water twenty feet deep running towards that dam?

A. Caused a ripple all along the face of the dam.

Q. Well, what became of the water then?

A. Some of it was drawn through the gate house in pipes; if there was any going over the spillway it goes over the spillway, and the rest of it remains in the reservoir.

Q. Where does it stay in the reservoir? Do you mean to say there is not a back current,—if there is a current twenty feet deep going across towards that dam, must there not be a return current underneath that?

A. I didn't find one.

Q. Did you make any examination?

A. I used the 50 foot float there as well.

Q. Then there was fifty feet of water going at the rate of 700 feet or about, an hour, towards that dam?

A. No, sir; that only traveled 300 feet.

Q. In what?

A. In an hour and ten minutes.

Q. 300 feet in an hour and ten minutes?

A. Yes, sir.

Q. Well, if that continued at that rate any length of time all the water in the reservoir would be up there against the dam, wouldn't it?

A. No, sir.

Q. The upper portion of it was running at the rate of 700 feet—a depth of twenty feet was running at the rate of seven hundred feet an hour, or a little over, and between that and fifty feet it was running at the rate of 300 feet in an hour and ten minutes?

A. 230 feet, sir, on a 50 foot float. That was a 40 foot float.

Q. Forty foot float?

A. Yes, sir.

Q. Then change my question to forty feet. Now when that water struck the dam don't you say there must have been a current underneath taking that water back again?

A. I didn't find one.

Q. Well, in the nature of the thing must there not have been?

A. Not necessarily.

Q. Where did the water go to?

A. Finds its level all over the reservoir.

A. Against the wind—do you say the water was not moving at that rate?

A. I said the float was moving at that rate.

Q. What do you say about the water, wasn't the water moving at that rate?

A. I don't think it was.

Q. At what rate was the water moving then?

A. Somewhat slower than that.

Q. For what purpose, then, was the floats?

A. The wind question was taken in along with it.

Q. You think that the water was running at a less speed than the floats, do you?

A. Yes, sir.

Q. And at what different speed?

A. Well, that I cannot say.

Q. Was the water moving at all?

A. Certainly.

Q. How do you know that?

A. If the water wasn't moving the floats wouldn't move.

Q. I thought you said the wind blew the floats?

A. It had some tendency to move them along.

Q. You cannot tell how much the wind blew the

floats and how much the water made the floats move?

A. No, I cannot.

Q. No proportion?

A. No, I don't know that I can.

Q. Made no observation to find out, did you?

A. No, sir.

Q. What was the purpose of having a bottom float then?

A. Find if the water moved at a different rate than it did on the surface.

Q. The floats didn't tell you whether the water moved or not, did they?

A. The floats all moved.

Q. Of what use is the experiments if the floats don't tell you how fast the water moved?

A. The float would indicate the velocity of the water plus whatever would be allowed for wind resistance.

Q. Well, how was it when it moved against the wind?

A. If it moved against the wind it must have had a current of some kind.

Q. You say that the floats show that the water was moving plus some additional movement from the wind?

A. Yes, sir.

Q. Of which you don't know at all the amount?

A. No, sir.

Q. Now you say that those that moved against the wind showed that there was a current there?

A. There must have been a current there in that particular place or they would not have moved against the wind.

Q. Was there a current anywhere else—can you say there was a current anywhere else in that whole reservoir?

A. No, sir; there was practically no current in the

whole of it; the floats generally traveled with the wind, or very nearly so.

Q. Didn't they always travel with the wind?

A. There were some few exceptions, very few.

Q. Those were the ones where they went up stream?

A. No, I think the ones that went up stream, in the Inlet, traveled with the wind.

Q. Traveled with the wind?

A. Yes, sir.

Q. Those that went up stream did not travel with the current as far as you could tell?

A. I didn't find a current there.

Q. But you did find some current out in the reservoir?

A. In one place—in two places each side of the Island; upper side and lower side.

By Mr. EDWARDS:—

Q. Upper of what, of the reservoir?

A. Upper part of the reservoir.

FURTHER CROSS:—

Q. Assuming that the water was going as rapidly towards the dam as the floats were, where, in your judgment, would it go?

A. Come back again.

Q. Assuming that was the fact it would indicate a back current from the dam substantially as fast, and substantially of the same quantity as the current going towards the dam, wouldn't it?

A. No, I don't think so.

Q. Well, if you remove the amount of water going over the spillway and that going to Jersey City it would?

A. Could not keep continually moving in the one direction.

Q. Well, the current that you speak of then must have been underneath the current you saw assuming that there was a current, the same as the float?

A. There might have been.

Q. Any day that you made this test was there ice covering the water?

A. Not where the floats were.

Q. Well, the effect of the wind upon the water would be lessened if it were covered with ice, wouldn't it?

A. There was no ice on the reservoir at all; the only ice I ever saw up there was one morning above the Long Bridge, up in the Intake, the rest of the reservoir was all clear of ice.

Q. (Question read.)

A. Yes.

Q. If the reservoir was covered with ice, the effect of the wind upon the water of the reservoir would be nothing, wouldn't it?

A. Would be very much lessened.

Q. Would the wind have any effect at all, if the reservoir was covered with ice?

A. No, I don't believe it would.

Q. Do you know that the Government whenever it in its weather bureau predictions or its statement as to the weather speaks of the wind it refers to the true north pole, and not to the magnetic north pole?

A. I believe that is so.

Q. Was there any day, during your experiments, when the wind was from the inlet of the Rockaway river directly towards the gate house?

A. Not when I was running floats there.

Q. The nearest day was on the 14th of December, was it?

A. Not when I was running any float experiment.

Q. Which float experiment was the nearest—which day was the wind nearest directly from the

mouth of the Inlet of the river towards the gate house?

A. On the 5th of December.

Mr. EDWARDS:—

Q. Does the arrow point the way the wind is coming from?

A. Yes sir, same as a weather vane.

MR. VREDENBURGH:—

Q. What is the direction of the mouth of the Inlet from the gate house, according to the magnetic north?

A. About north northwest somewhat.

Q. North northwest?

A. West northwest from the gatehouse.

Q. From the gatehouse to the center of the Inlet?

A. To the center of the Inlet, almost west, a little north of west.

Q. Now the nearest day was on December 5th, when it went, as you have already told us—

Mr. EDWARDS:—

Q. It goes from southwest to northwest on that day?

A. It varied quite a good deal.

MR. VREDENBURGH:—

Q. When it was blowing northwest—were there any floats put in when the wind was blowing that day just north of west on December 5th, at 2 o'clock?

A. Yes, sir.

Q. Which?

A. These ones; 1, 2, 3, 4, 5 and 7.

Q. They went in the direction of the wind, didn't they?

A. Nearly so.

Q. In what respect did they vary?

A. Well the deep floats traveled a little further to the north than the short floats.

Q. Was that further from the wind or nearer to the wind, or cannot you tell because of the varying of the wind?

A. It varied quite a little, and while these floats were running there was very little change; the wind was pretty nearly steady and did not change very much; it changed in the forenoon when I was running these.

Q. And that was light breeze from the southwest I understood you, in the afternoon?

A. From three to five; light breeze from 3 o'clock until 5 from the west southwest.

Q. West southwest; that was not the direction of the gate house from the inlet of the river, that was north of west?

A. It was a little north of west.

Q. Who was present on the 14th?

A. John Ryle, Louis Sehulster, and I forget the other man's name.

Mr. EDWARDS:—

Q. McIntosh?

A. No, sir; he wasn't there that day; I forget the other man's name; he was an employee of the company. Walter Mercer.

Q. Who were the transit men that day?

A. John Ryle and Louis Sehulster.

Q. And Mercer was in the boat with you?

A. Yes, sir.

MR. VREDENBURGH:—

Q. And those experiments are indicated on this map in what color?

A. Green; those three sets for that day.

Q. They were in the upper part of the reservoir?

A. Between the mouth of the Inlet and the Island, and in that vicinity.

Q. And they traveled substantially with the wind?

A. Yes, sir.

Q. Was there a freshet at any time when you were there?

A. No, sir.

RE-DIRECT EXAMINATION:—

Q. Now which day was the day of the heaviest running of water in the river?

A. December 14th.

Q. What was it running, as it appears on your map, at that time?

A. 134 and 1-10 millions.

Q. That was much larger than on the other days, wasn't it?

A. Yes, sir.

Q. And the current and the floats went away from the direction of the Inlet?

Objected to as leading.

(Question withdrawn.)

Q. In which way did the floats go on the day of the second current?

A. Almost westerly.

Q. Away from or towards the gate house?

A. Away from.

Q. Now did you select these days to put these floats in the river on account of the wind blowing any particular direction?

A. No, sir.

Q. How were the days selected?

A. I went up there on a Saturday first of all and remained over a week; there was one or two days that I didn't run any float measurements, I think it was too rough, one day and I was fixing floats another day. Afterwards I went up on several occasions; at that time in the year it is very hard to get a day suitable; if it is too rough you cannot go out in the boat, and I went up at a time when the weather was moderate.

Q. The amount of water running in the river, however, would make no difference on the boat?

A. No, sir.

Q. Or wind?

A. The wind or waves.

Q. Was there any ice in the reservoir itself on any of the days that you made these experiments?

A. Not in the reservoir proper.

Q. Did the ice interfere with or touch any of your floats on any of these days?

A. No, sir.

Q. Why was it difficult to go out in the boat in rough weather?

A. The wind cause quite considerable waves there on the surface of the water, and the boats there are not particularly well adapted to go out in rough weather.

Q. Would it be difficult to take observations also in rough weather?

A. It would not be difficult to take observations no, sir.

Objected to as leading.

Q. Now you have said that this map is made on the magnetic north; what proportion of surveyors' maps are made in the State of New Jersey on the magnetic north?

A. All of them.

Q. Is the true north ordinarily used in surveying in this State?

A. Very seldom.

Q. How near to this dam do you live?

A. How near did I live?

Q. Yes.

A. Not more than a quarter of a mile away.

Q. Have you put on this map all of the floats and measurements that you made during these different days?

A. Yes, sir.

Q. You left none off?

A. With the exception of two that sunk immediately after I put them in; I put them in and kept no record of them.

Q. Now how many of the days were taken with the transit—the distance?

A. The last three days.

Q. And have you told us how you made the measurements on the other days?

A. I think I did, sir.

Q. With lines on the—

A. Intersection points and points from the shore.

Q. Made with the transit?

A. No, sir; I made those alone; I had no one with me.

Q. Just by ranges?

A. By ranges, I set up poles at different places along the dam and at different points too on the Island; I had four poles.

Q. And in this way could you make accurate measurements?

A. Approximately correct; not absolutely accurate; but I could locate where I was approximately.

Q. How near?

A. Well, I would say within 20 or 30 feet.

Q. Now with the transit could you make it more accurate?

A. Absolutely correct.

Q. Who was in charge of these transitmen when you made the last three tests?

A. I was.

Q. They were simply there to assist you?

A. Yes, sir.

Q. Have you their notes here?

A. Yes, sir.

Q. Were your watches set alike that day?

A. Yes, sir.

Q. Could you not, putting the floats in the water and making notes, give the time to a minute?

A. No, not a minute; it might vary somewhat.

Mr. EDWARDS: I offer the notes in evidence made by this witness, and ask that they be marked.

Mr. VREDENBURGH: I object to them because it has not been proven when he made them.

Q. When did you make them?

A. At the time the floats were running.

MR. VREDENBURGH:—

Q. Have you written in that book anything in pencil since—made any mark in it since?

A. Except to enter some of the transit notes to assist me in plotting, because I would not have to look up both notes.

Testimony of Andrew Bardner.

Q. When did you enter those?

A. After I came back to the Paterson office.

Q. You made no mark in that book since with your pencil?

A. In regard to these experiments, no; these were all made on the ground, and most of them in the boat, and some of the notes I would fix up at nights; I plotted all my own experiments the night of the day I took them, while they were fresh in my memory.

Q. Haven't entered anything in that book since?

A. No, I don't believe I put a figure in it except to transfer some transit notes into it.

Mr. EDWARDS: We offer that book in evidence.

Mr. VREDENBURGH: I object to it.

Marked Exhibit D 10, December 26, 1906.

Mr. EDWARDS:—

Q. Have you put upon this map practically the history of each float?

A. Yes, sir.

Q. The day, the hours and sizes?

A. Yes, sir.

Objected to as leading.

Q. I call your attention to the floats on December 5th. I see that you traced—you testified that you traced them down to 3.28.

Mr. VREDENBURGH: I object, because he has not said he traced anything down.

Q. You saw the float last at 3:28, as shown on the map?

A. At four o'clock.

Q. When did you next see that float after 4 o'clock that day?

A. Not that day, not until next morning.

Q. When did you find it then?

A. I found it there.

Q. In what direction was that?

A. That is southwest from where it was the night previous.

Q. Do you also show on this map where you found each of the other floats?

A. Yes, sir.

Q. The next day that was put in motion on December 5th?

A. Yes, sir; it is No. 2, I found up opposite the mouth of the Inlet, in the center of the reservoir.

Q. When?

A. The next morning—the next forenoon.

Q. And the float No. 7?

A. That I didn't find. McIntosh found that two days later.

Q. December 8th, Float No. 5?

A. I found here opposite the point.

Q. In the bed of the river, just over the bed of the river?

A. Yes, over the old river bed.

Q. Float No. 3?

A. No. 3 I found at the dam.

Q. Up against the dam?

A. Yes, sir, next morning.

Q. Near the over-flow or near the gate house?

A. Near the over-flow, within 150 feet of it, or something like that.

Q. Was there any other float put in that day?

A. Yes, sir.

Q. Float No. 4?

A. Yes, sir; the next morning I found it aground in this cove.

Q. As shown on the map?

A. As shown on the map.

Q. Now you were questioned by Mr. Vredenburgh as to a current running against the dam and the necessity of an undercurrent going back. Would it necessarily be an under current going back?

A. Not necessarily; it might diffuse itself along the shores.

Q. Do you have any indications of that from the floats?

A. I haven't from the floats, no.

Q. Now from your study of this question, and from experiments that you made and that were made under your direction what conclusion do you reach as to the existence of currents in this reservoir?

Mr. VREDENBURGH: Objected to because it don't appear that the witness has made any study of it at all, or has had any previous experience in any way that amounts to an experience on those matters of currents.

A. I didn't find any regularly defined current in any portion of the reservoir; the water is kept in circles chiefly by the influence of the wind, the floats; a majority of the floats all travel with the wind in a general way.

Q. What could you say as to the general direction of the water after it came into the reservoir from the river?

A. I found no particular direction until it traveled.

Q. What became of it, in your judgment, as it entered the river, from these experiences?

Mr. VREDENBURGH: Objected to because he has not shown himself to be an expert.

A. I believe it diffuses itself over the area of the reservoir.

Q. Well, what in your opinion, is the water that reaches the gate house from this reservoir?

Mr. VREDENBURGH: Objected to for the same reason.

A. A fair sample of the water as it is in the reservoir in general.

Q. That is to say, you think the average of the water at the gate house is the average of the water through the reservoir?

Same objection.

A. About the same.

Q. Do you think it is the average of the water as it is in the river, that reaches the gate house?

A. No, sir.

Mr. EDWARDS: We offer this map in evidence.

Mr. VREDENBURGH: Objected to as incompetent and not proven.

Marked Exhibit D 11, December 26, 1906.

MR. VREDENBURGH:—

Q. Now, you spoke of float No. 8, of December 5th, which you said McIntosh found on December 8th?

A. That would be float No. 7.

Q. How do you know where McIntosh found it?

A. He described the place for me; I also showed him the plan and asked him afterwards if it was where he picked it up.

Q. Well, did you pursue that same course with respect to other floats being found and put on here, where someone told you?

A. I found the rest of them myself.

Q. No. 4 on December 5th, you spoke of finding that on December 6th, in the cove; you have an imaginary line from that down to the dam, why did you put a line on in a curve like that?

A. Because I thought that was the most probable way the float would travel.

Q. Why would it travel in a curve?

A. Because the wind went around by the south.

Q. How do you know how the wind blew during the night?

A. I looked at the wind the last thing before I went to bed, and the first thing I got up in the morning.

Q. What was it blowing when you went to bed?

A. It hadn't changed from what it was in the afternoon.

Q. Make any memorandum of that thing at all?

A. No, I didn't; I don't believe I did.

Q. You trust to your memory on that?

A. That I am quite sure of.

Q. Then the next morning you looked, you say, to see what the wind was blowing then; did you make any memorandum of that?

A. Yes, sir.

Q. What have you got the next morning, and where?

A. December 6, 6:30 A. M., wind north east, very light, almost calm.

Q. Wind was northeast?

A. Yes, sir.

Q. How was it when you went to bed?

A. It was veering a little to the south from what it had been during afternoon.

Q. What had it been during the afternoon?

A. Southwest by west.

Q. How had it gone around?

A. It went around to the south.

Q. How do you know?

A. I noticed it working around that way, veering around to the south.

Q. So you say that this dotted mark with this curve in it, shows the way it probably went?

A. Only probably.

Q. I know, probably; did the wind you think make it go that way, or the current?

A. I think the wind would have more effect on it than anything else.

Q. You think the wind going around by the south would blow that float in the direction you have shown on this map?

A. That is my opinion.

Q. What time in the night?

A. I concluded that the floats would reach the dam at a given time that night, as the weather conditions had not changed.

Q. What time did you conclude they would reach the dam?

A. About eight o'clock; I don't know that they did.

Q. When did you go to bed?

A. About ten o'clock.

Q. Reached it then before you went to bed?

A. Yes, sir.

Q. What was your next conclusion?

A. That the wind went around by the south, and by the time I found it up here it would work around in the way it has shown by that dotted line.

Q. Now, looking on the same day at float No. 1, I notice that you have an imaginary direction for that float to travel; why didn't you continue that down to the dam?

A. I didn't think it would go any further than the point of the Rip-rap.

Q. Why not?

A. Because it would go aground.

Q. Why didn't you carry it out to the gate house?

A. I didn't think it would go to the gate house.

Q. Why not?

A. Because I believed if it had gone to the gate house it would have stayed there.

Q. That is the reason. Well, Why did you think that a float of the same day, No. 2, would take such a different course from float No. 7?

A. I determined that, or thought so, from the position I found the float the next morning.

Q. You found the float, you say?

A. In the center of the reservoir.

Q. Almost due west?

A. The next noon, yes, sir.

Q. What do you mean by current; you spoke of currents quite often; what do you mean by currents?

A. A body of water moving in a certain given direction.

Q. You say a given direction; what do you mean by given direction?

A. Same as the flow in the river; the current would in all probability go down stream.

Q. What do you mean by defined current?

A. I would say a defined current was a current that was almost constantly running in the same direction.

Q. When you speak of defined current in your testimony, you mean water at ten or twenty feet or thirty feet in that reservoir is almost constantly running in the same direction?

A. That was my answer to a question of a defined current, I believe.

Q. Now I want to know when you used that language in your testimony—you referred to a current of that character in the reservoir?

A. Yes, sir,—not in the reservoir—yes, sir, in the reservoir.

Q. Which do you mean, not in the reservoir or in the reservoir?

A. The currents I have reference to are in the reservoir; they were governed chiefly by the wind.

Q. When you say diffused, what do you mean by that?

A. The fresh water coming into the river would mingle with the water in the reservoir.

Q. And that is what you meant when you used the word diffused?

A. Yes, sir.

Q. Water coming down the stream would mingle with the water in the reservoir?

A. Yes, sir.

RE-DIRECT EXAMINATION:—

Q. Did you find any currents of water running through the other water in the reservoir?

A. No, sir.

RE-CROSS EXAMINATION:—

Q. Those floats that you put in on December 14th you put none of them between the Inlet and the gate house, did you?

A. No, sir.

Q. That day?

A. No, sir.

Q. And yet on that day the wind was the nearest in the direction of the gate house of any day in which you put the floats in?

A. No, sir; to the contrary I believe; the wind was blowing almost directly from the gate house up the reservoir.

Q. Well, you put no floats any nearer the gate-house that day?

A. No, sir.

Q. Nor anywhere between the gate house and the Inlet?

A. Not that day.

Q. Why not?

A. Because I hadn't covered that territory previously and I wished to do it; that is the only reason.

Q. The day that the wind did blow nearest from the inlet to the gate-house you put no floats in between the inlet and the gate-house, did you?

A. Yes, sir.

Q. Where?

A. There and here (indicating).

Q. You point to?

A. To the blue.

Q. And they went in the direction of the wind?

A. In the direction of the wind.

Mr. EDWARDS: I offer for identification the transit notes.

Marked D 12 and D 13 for identification, December 26, 1906.

RE-DIRECT:—

Q. What was the object of having the angle and the bearing both taken by the transit men?

A. So that I would have a check of every reading.

Q. Then it would be pretty difficult for a man to make a mistake, wouldn't it, without being discovered?

A. Yes, sir; almost impossible.

Q. And did you find any mistakes in the readings of Mr. Sehulster?

A. I think I found only one, and that was about ten degrees even, he had the bearing correct.

Q. You could check them very easily if there was any mistake?

A. Yes, sir.

Q. That is all.

Sworn to before me, (the signature being waived) this 26th day of December, 1906, at Jersey City, N. J.

E. L. B. GARDNER, sworn on behalf of defendants.

DIRECT EXAMINATION by Mr. Edwards:—

Mr. VREDENBURGH: I object to counsel recalling Mr. Gardner without permission of the Court.

Q. Mr. Gardner, were you present at a meeting in the Mayor's office in the City Hall on September 30, 1905?

Mr. VREDENBURGH: Objected to as having been already examined upon the same subject.

A. I was.

Q. And who else was present there, if you recall?

A. Representing the company?

Q. The Jersey City Company?

A. Representing the Company was William H. Corbin, W. D. Edwards, Mr. Smith from Mr. Edwards' office, Edlow W. Harrison, the treasurer of the Company, Mr. Counant and myself.

Q. And who was there on behalf of the city?

A. The Mayor, the Corporation Counsel, Mr. Record, Mr. Vredenburgh; I don't know that there may not have been someone else.

Q. What was the purpose of that meeting?

Mr. VREDENBURGH: Objected to as illegal, incompetent and immaterial.

Q. What were you there for?

A. To tender—

Mr. VREDENBURGH: Objected to as repetition.

A.—to tender to the city the works represented by a deed for the property, the abstracts of title and a policy of insurance in the Title Guarantee Co.

Q. Do you remember what day of the week this was?

A. It was on Saturday the 30th of September.

Q. Why did you make the tender on that day?

A. Because according to the contract, the deed upon which the option to purchase the works for the sum of $7,595,000 expired upon the first day of October, and that being on Sunday we made the tender on Saturday, pursuant to a notice served on the city a few days before that we would so pay; and the tender was made also on Monday, the day following.

Mr. VREDENBURGH: Answer objected to for the same reason, and because the witness's answer is a conclusion instead of facts.

Q. Now, will you tell us what you tendered to the City at that time,—have you got the deed here?

A. We tendered to the City the deed of the works, being a deed of all the real estate and water rights, in accordance with the contract.

New Jersey State Library

Q. And is this the deed?

A. That is the deed and the policy of insurance is attached thereto.

Q. And by whom is this deed executed?

A. Executed by myself as president of the Company, and attested by the secretary, Mr. Counant, with the seal of the Company.

Q. And proved September 30th, before whom?

A. Before Charles H. Hughes, Master in Chancery of New Jersey.

Q. Was the description in this deed made up under your direction?

A. It was.

Q. And does it accurately describe all of the property?

Mr. VREDENBURGH: Objected to as illegal and incompetent.

Q. What does it cover?

A. It covers all the real estate owned by the Company which is called for under the terms of the contract with the City.

Mr. VREDENBURGH: Answer is objected to as giving conclusions instead of facts.

Mr. EDWARDS: We offer the deed and guarantee in evidence. The deed bears date September 30, 1905, and is made by the Jersey City Water Supply Company, to the Mayor and Aldermen of Jersey City, covering in detail a large amount of property and is executed by the Jersey City Water Supply Company by Edward Libby Gardner, president, under the seal of the Water Company, attested by Whitney Counant, secretary, and proved before Charles B. Hughes, Master in Chancery of New Jersey.

Mr. VREDENBURGH: The deed is objected to because it does not describe the property required by the contract to be conveyed by Patrick H. Flynn to the Mayor and Alderman of Jersey City, and also because on the date of the deed the Water Company was not the owner of lands described within it and also for the reason set forth in the bill of chancery filed in this cause.

Mr. EDWARDS: Mr. Edwards calls upon Mr. Vredenburgh to state in what respect the deed does not comply with the terms of the contract.

Mr. VREDENBURGH: In answer to the question of Mr. Edwards counsel states that the city have never been able to see this deed; the description covers many pages, apparently looking at it, perhaps forty pages; that it would require a surveyor to run it out for the purpose of ascertaining accurately what is there described; that no copy of this deed was served upon the City, and that therefore the City has been unable to ascertain in any way whether this deed contains all the land required by the contract, but from information received indirectly counsel now charges that it does not contain sixty feet outside of the flow line throughout the reservoir for the whole distance; and secondly, that in places where the City is entitled to more than sixty feet under the contract, and in those places this deed does not give the City those sixty feet; that a large amount of land not contained in this deed was condemned by the City at the suggestion of the attorney of Mr. Flynn, for reservoir purposes.

Mr. EDWARDS: Mr. Edwards calls upon Mr. Vredenburgh to state what lands there are that were acquired by the Water Company under condemnation for the use of the City, and not included in this deed, giving the names of the owners.

Mr. VREDENBURGH: There was no intimation that this line of testimony would be pursued this morning. Mr. Ferris has the map, and if the witness will wait, Mr. Ferris will go up and get the map, and Mr. Vredenburgh will then indicate what land it is.

Mr. EDWARDS: We should like to have this information from Mr. Ferris as soon as possible. Mr. Edwards also asks Mr. Vredenburgh to state at what points he insists that the City is entitled to more than sixty feet outside of the flow line.

Mr. VREDENBURGH: I would be very glad to do that when Mr. Ferris, who has gone after the map comes back.

Mr. EDWARDS: I offer the deed.

Mr. VREDENBURGH: I object to it, and I demand now that the Water Company gives us a copy of that deed so that we may find out by a survey.

Mr. EDWARDS: A copy of this deed has been prepared for Mr. Vredenburgh and will be handed to him as a copy of this exhibit.

Marked Exhibit D 1 of December 26, 1906.

Testimony of E. L. B. Gardner.

Mr. EDWARDS: We also offer the guarantee of title of the New Jersey Guarantee & Title Company, to the Mayor & Aldermen of Jersey City, attached to the deed, bearing date September 30, 1905 signed by the New Jersey Title Guarantee & Trust Company, William H. Corbin, president, under the seal of the Company, and attested by the secretary.

It is admitted that it is signed by the president and secretary of the Company under its seal, and we now offer the guarantee.

Marked Exhibit D 2, December 26, 1906.

Mr. VREDENBURGH: I object to the guarantee, because it is not the absolute guarantee which the contract requires, and especially this clause,—"In case of defect in the title of any parcel of the premises, this company's obligation is to be limited to the price which said parcel cost, to the Jersey City Water Supply Company."

Mr. VREDENBURGH: The map has arrived, and I show you, Mr. Edwards, two places, but there are more places here which I can show you if you are willing to take the time, but I think probably it would be better that I should give you them by a written statement, if you are willing.

Mr. EDWARDS: As to those two points you call our attention to, we are sure a survey will show you the sixty feet. Will you show us the other point, as soon as you can?

Mr. VREDENBURGH: Yes, sir. Now we have the deed and can tell with more accuracy as to all the points, in which you have not given us sixty feet, and this we will serve you with in writing.

Now as to the other objection that you have not given us the amount of land in addition to the sixty feet, which the contract fairly calls for, I call your attention to the plot opposite to the dam and near the mouth of the inlet, on the north side of the inlet, or what is called by the witness the east side of the reservoir, near the inlet of the Rockaway and the City insists that Mr. Flynn or the Water Company should give to it, title to land to the road which crosses near the head of the promitory, being a small plot, a little less than an acre there, under this requirement of the contract, namely "That there shall be a clear space around the water line of the reservoirs not less than sixty feet in width, and additional space where it may be needed, which is to be included in the conveyance of the reservoir sites to the city."

Mr. EDWARDS: What is the end at that point, as you claim it?

Mr. FERRIS: The line appears to follow this road around here (indicating) to here. I have not made any definite investigation of the land, I think the line should be continued along the road in here. (Indicating).

Mr. EDWARDS: We insist, under the contract that we are not required to deliver this property. We also state that no notice of any such demand has ever been made on the company.

Testimony of E. L. B. Gardner.

Mr. EDWARDS: I now offer in evidence a letter from Collins & Corbin, attorney for the Jersey City Water Supply Company, dated September 27, 1905, addressed to Robert Carey, corporation attorney of Jersey City service whereof is acknowledged by Mr. Carey on September 28, 1905, at 5:30.

Marked Exhibit D 3, December 26, 1906.

The signature of Collins & Corbin to the letter and of Robert Carey, corporation attorney, are admitted.

Mr. EDWARDS: I also offer in evidence the Abstracts of Title prepared by the firms of which I was a member, for these properties, and they are in four volumns.

Maked Exhibits D 4, D 5, D 6 and D 7, December 26, 1906.

Mr. VREDENBURGH: I object to them as not in accordance with the contract and too voluminous to point out.

Mr. EDWARDS: I also offer a letter of September 20, 1905, signed by Collins & Corbin, addressed to the Mayor & Aldermen of Jersey City, and Robert Carey Esq, duplicate original of which was served upon Robert Carey, corporation attorney, September 21, 1905; further proof of signatures and service waived.

Marked Exhibit D 8, December 26, 1906.

Mr. VREDENBURGH: I object to this paper because it refers to another paper, without which this cannot be understood.

Q. Have you, Mr. Gardner, the letter from the Mayor & Aldermen of Jersey City to Robert Carey, referred to in this letter?

A. I have?

Q. Will you produce it?

A. (Witness produces same).

Mr. EDWARDS: We offer the letter from Robert Carey, corporation attorney, to Patrick H. Flynn, and the Jersey City Water Supply Company, service of which was made upon the Jersey City Water Supply Company August 26th, 1905.

Marked Exhibit D 9, December 26, 1906.

Q. Now, Mr. Gardner, when you tendered this deed to the City officials, did you make any demand for payment, and if so what demand?

A. William H. Corbin, acting for the company, tendered the deed.

Q. In your presence?

A. In my presence.

Q. Well what did he ask for?

A. He asked for the payment.

Q. For how much?

A. Of the purchase price of the works less $500.-000 which by supplemental contract with the City was to be retained until either the abandonment of the canal or a legal right to draw seventy million gallons as against the canal, or the decision of a competent court of jurisdiction that the canal company had no prior rights in the Rockaway.

Q. That is what is known as the modifying contract of July 8, 1901?

A. Yes, sir.

Q. How much did that amount to,—net payment to you of how much?

A. That made a net payment of $7,095,000.

Q. Well, did the City officials make such payment?

A. They did not.

Q. What reply did they make?

A. The corporation counsel stated that they objected to the deed; that the company did not own the properties therein deeded?

Q. Well?

A. To that, Mr. Edwards, in replying for the company, said that they did own the properties therein deeded?

Q. Was any reference made to the bill that had been filed in the Chancery Court?

A. The corporation attorney said that they would be willing to take the property, under the terms of a bill which had been filed in Chancery under which bill it was claimed that an allowance or deduction should be made for the specific performance of the contract.

Q. Well, was any demand made upon the City officials as to what deductions they claimed?

A. Mr. Corbin asked them what the deduction was that they demanded; to that the corporation counsel replied that $1,000,000 was the amount.

Q. Can you give his words. I should think $1,000,000, is what he said.

A. Yes, those were about his words, he said $1,000,000 was about the amount.

Q. What did Mr. Corbin then say?

A. Mr. Corbin then said, are you prepared to pay for these works if we will accept the deduction of $1,000,000.

Q. Did Mr. Corbin make any inquiry as to whether any preparation had been made for paying anything on this deed?

A. To which they made no reply, and Mr. Corbin said, are you prepared to make a payment on this

amount of $6,095,000, if so we will quickly tell you whether we will accept it or not.

Q. What did Mr. Record say as to that?

A. Said they were not ready to do so, and requested to see the policies of insurance, and Mr. Vredenburgh took the policy of insurance, and in examining it said that the City objected to the form of it.

Q. Did he state in what particular?

A. He did not.

Q. Was any money paid you?

A. No money was paid.

Q. Now, what was said, if anything, as to making another tender after the first day of October?

A. Mr. Corbin said that the tender had been made on the 30th of September, in accordance with a notice given the City, a few days before, because the first of October was on Sunday, and that we would make the formal tender upon the second of October on Monday, at the same time, if it was necessary that it should be, and we would all be there if it was necessary, to which the corporation attorney replied that it would not be necessary, that if Mr. Corbin would come up personally the Mayor, or some one would be there, and it would be merely a formal matter.

Q. And Mr. Corbin did make the same tender on Monday?

A. Yes, sir.

Q. And have you up to this time received the money or any part of it, required by your contract?

A. We have not,—any part of the purchase price?

Q. I mean not part of the purchase price but any moneys outside of the moneys for the use of water per million gallons?

A. We have never received any other moneys, no, sir.

CROSS EXAMINATION by Mr. Vredenburgh.

Q. At that time had the Water Company filed an answer to the Bill of complaint, about which you speak?

A. I cannot definitely say whether they had.

Q. You cannot recollect?

A. No, sir, I wouldn't be likely to know that, unless it was specially brought to my attention.

Q. When Mr. Corbin asked if the City was willing to pay for the works this $6,095,000 about which you have spoken, did not those representing the City ask Mr. Corbin if he was prepared to say that the company would take the sum mentioned for the works?

A. They did.

Q. And then Mr. Corbin—

A. And then Mr. Corbin said that if they would make the payment, tender the money, he would quickly tell them whether he would take it.

Q. That is all.

Sworn to before me,
(the signature being waived)
this 26th day of December,
A. D. 1906, at Jersey City,
N. J.

RECESS.

Testimony of John Ryle.

JOHN RYLE, sworn on behalf of the defendants.

DIRECT EXAMINATION by Mr. Edwards:

Q. Where do you live?

A. Paterson, N. J.

Q. What is your occupation?

A. I am one of the members of the Engineering Force of the Passaic Water Company.

Q. Your father was for many years superintendent of that company?

A. That was my uncle.

Q. Well now, were you present with Mr. Bardner, on November 30th, December 5th and December 14th in making some observations on the dam at Boonton?

A. Yes, sir.

Q. What instrument did you have charge of?

A. The transit.

Q. You were accustomed to its use?

A. Yes, sir.

Q. Will you just tell us what you did on that day,, generally?

A. Set up the transit and sighted the point across the other side of the reservoir, and then when Mr. Bardner would find a float and hold up a flag we would sight on that flag with the instrument, and read the angle on the base line to the line that ran from the instrument to the float.

Q. What lines would you read?

A. We would read the bearing of that line.

Q. You would read the compass of that line?

A. Yes, sir.

Q. What was the object of reading both?

A. The object of reading the compass was to have a check on the reading of the angle.

Q. Did you make notes of that?

A. I did.

Q. Are the notes here?

A. Yes, sir.

Q. Just show us your notes.

A. (Witness produces same).

Q. This contains your transit notes?

A. Yes, sir.

Q. They were entered by you at the time?

A. At the time, yes, sir.

Q. And the dates are here?

A. The dates and the time of reading are taken.

Q. I see there are a number of columns; take December 14th, the first column is what?

A. The first column is the number.

Q. The number of the—

A. Reading.

Q. And the second column?

A. That is the time that the reading was taken.

Q. You took it by your watch?

A. Yes, sir.

Q. Did you take the time every time you made a reading?

A. Yes, sir.

Q. What was the next column?

A. That is the angle which I read and placed down.

Q. And the next?

A. That is the bearing.

Q. And what under "Remarks"?

A. Under remarks we would put down the way the wind was blowing at the time.

Q. Will you just read one of those as an example of what you did. Take No. 21?

A. 21 was the number of the reading. Time 11.56, 251 degrees 20 minutes was the angle, the bearing is south 43 degrees 30 minutes west.

Q. And the remarks?

A. Fresh east wind.

Q. Were those measurements made accurately by you?

A. Yes, sir.

Q. And you turned over the results of them to Mr. Bardner?

A. Handed my note book to Mr. Bardner.

Q. From this note book a surveyor could calculate all these facts, could he not?

A. Yes, sir.

Mr. EDWARDS: I offer in evidence the note book.

Marked Exhibit D 12.

CROSS EXAMINATION.

Q. The name on the book, "Boonton Reservoir Float Experiments, Transit note" was written by whom?

A. Mr. Bardner I believe.

Q. Is Mr. Bardner a draftsman?

A. Yes, sir.

Q. I notice on the first page the date November 30, 1906; that was the first day you were there?

A. That is the first day.

Q. At whose request did you go there?

A. Why the order came into the office, and I was told by Mr. Bardner to go out there the next morning.

Q. Some order came into the office?

A. Mr. Bardner told me I was to go out there the next morning.

Q. On November 30th you have under your Remarks,—Light southwest wind,—light S. W. wind—that means light southwest wind, I suppose?

A. Yes, sir.

Q. What do you mean by a light wind?

A. Why a wind that you could notice that there was a wind.

Q. What velocity?

A. I don't know what velocity.

Q. If you could notice it was a wind you would call a light wind?

A. Yes, sir.

Q. Now the 2.48 you have a remark, Fresh S. W. wind—that means fresh south west wind,—what do you mean by fresh?

A. A little bit stronger than light.

Q. What velocity?

A. I don't know the velocity.

Q. At 4:15 you have light S. W. wind—do you know when it changed from fresh S. W. wind to light S. W. wind?

A. I don't know the exact minute.

Q. How would you determine when to mark in your book the change?

A. After each reading I would see if the wind was blowing strong or not; if there was any difference I would note it down on the book.

Q. Well, on the next day, December 1st, you also have some remarks— did you take any memoranda there of floats on December 1st?

A. Yes, sir.

Q. You were there?

A. Yes, sir.

Q. At 11.07. At 8.45 A. M. very light S. W. wind, what is that—what distinction is there between light southwest wind and very light southwest wind?

A. Hardly perceptible.

Q. You were there on December 5th again?

A. Yes, sir.

Q. Fresh W. what does that mean?

A. West.

Q. What is the difference between a fresh and light wind?

A. Little bit stronger.

Q. Have you any idea what velocity you mean when you call it a fresh wind?

A. No, sir.

Q. Strong north wind, do you know what velocity you mean when you put down strong north west wind?

A. No, sir.

Q. At 10.39, December 5th, there was a strong N. wind, and at 10.57 you have a strong W. wind, that means west wind, does it?

A. Yes, sir.

Q. Then at one o'clock you have strong N. W. that means northwest ?

A. Yes, sir.

Q. So that the wind varied that day from north to west, and then back to north again in the afternoon?

A. Yes, sir.

Q. Now how do you mark a heavy gale wind; would you mark that in your book, if there was such a thing?

A. Yes, sir.

Q. How would you mark it?

A. Very strong wind.

Q. I find that the only time when you have marked strong wind is at 2.42 on December 14th, when you have strong N. E. E. wind, what do you mean by that, N. E. E.

A. North east by east, a little nearer the east.

Q. North east by east wind?

A. Yes, sir.

Q. And strong?

A. Yes, sir.

Q. What do you mean by strong?

A. Grass and bushes which were growing near by swayed from side to side, and that could only be done by strong winds.

Q. You don't know what velocity you meant by that word strong when you wrote it down here?

A. No, sir.

Q. The three entries you have on December 1st, represents three floats that were found up in the inlet on December 1st.

A. Yes, sir.

Mr. EDWARDS:—

Q. And you locate them?

A. I locate them in this book, yes, sir.

Q. That is all.

Sworn to before me,
(the signature being waived)
this 26th day of December,
A. D. 1906, at Jersey City,
N. J.

Testimony of John L. C. Schulster.

JOHN L. C. SCHULSTER, sworn on behalf of the defendants.

DIRECT EXAMINATION by Mr. Edwards.

Q. Where do you reside?

A. Paterson.

Q. What is your occupation?

A. Meter reader, Passaic Water Company.

Q. Do you understand the use of transits?

A. I assist engineers when they go out to work.

Q. Are you accustomed to reading a transit?

A. Well, I never read it only on that day when I went up.

Q. By whom were you instructed, as to reading it?

A. Mr. Bardner.

Q. What day were you there?

A. I think it is the 14th of December.

Q. And have you the notes that you made on that day?

A. I think they are in the book here.

Q. Did you make them in your own handwriting?

A. Yes, sir.

Q. As you went along?

A. Yes, sir.

Q. What observation did you make with the transit?

A. I located the floats and took the time and the reading and the bearing.

Q. You had been out with surveying parties many times before?

Objected to as leading.

A. For the last 12 or 14 years, as rodman and chain man.

Q. But you had never used the transit before?

A. No, sir.

Testimony of John L. C. Schulster.

Q. What did you do with the transit?

A. I located—I put my transit on and Mr. Bardner whenever he put the flag up where the float was, I would take the time first, and the reading and the bearing and put it down in the book.

Q. You knew how to do that?

A. Yes, sir.

Q. You took them down accurately?

A. I am sure I did; he came out once with the boat and said I was doing all right, everything was right.

Q. You put them down in your book?

A. Yes, sir.

Q. That was when—the 14th you took them?

A. I think it was the 14th of December.

Q. You made no memorandum as to the wind?

A. No, sir.

Mr. EDWARDS: I offer this book in evidence.

Marked Exhibit D 13.

CROSS EXAMINATION by Mr. Vredenburgh.

Q. You were Meter reader of the—

A. Passaic Water Company, Paterson.

Q. What do you read there?

A. Water meters, gauges of the water that goes through the houses.

Q. Different houses?

A. Yes, sir.

Q. You go around and find out how much water has been used?

A. Yes, sir.

Q. Put that down and from that they make out the bills for the water?

A. Yes, sir.

Q. Who was in your place that day, the day you went out?

A. Well, we didn't read those meters only every three months.

Q. You were at leisure and went out there?

A. When I am not reading meters I go out inspecting for leaks, etc.

Q. Who requested you to go out with Mr. Bardner?

A. I think word was left with my helper; the assistant superintendent I worked for in No. 4 room, and I was told Mr. Bardner wanted me to go with him.

Q. Where did you go to?

A. To Boonton.

Q. With Mr. Bardner?

A. Yes, sir, and drove up in a wagon to the Lackawanna depot and took a train from there up.

Q. Did you go out in the boat with him?

A. No, sir.

Q. He was in the boat?

A. He was in the boat.

Q. Alone?

A. He was in the boat with a fellow named Mr. Mercer.

Q. You were on shore?

A. Yes, sir.

Q. Alone?

A. Yes, sir.

Q. Where did you get the transit from?

A. Where did I get the transit from?

Q. Yes.

A. Passaic Water Company's office, upstairs.

Q. Had you ever been alone with a transit before?

A. No, sir.

Q. Where did you put the transit up?

A. Put it up on the shore, on the base line.

Q. On what shore?

A. On the shore towards the dam.

Q. Did you move the transit at all?

A. I had to move the transit when I followed him up, when he took the floats, when he went with the boat on to the float I took the transit and kept on with him.

Q. Along the shore?

A. On the water.

Q. You would walk along the shore?

A. No, sir.

Q. What were you in?

A. I stayed by the transit.

Q. The transit remained in the same place all the time?

A. Why naturally it would, and we would have to move the transit, the top part of it, the tri-pod was stationery.

Q. Who set that up?

A. Mr. Bardner.

Q. What did he do?

A. In the boat, went out and put the floats out, and then he would go around with the boat after the floats and put up a flag when he would go by them, and as I told you before I would take time of the reading and the bearing of them.

Q. You looked for the flag?

A. Yes, sir.

Q. When you saw the flag going up you attempted to write down in your book what you saw on the transit?

A. Yes, sir, he was supposed to be with the stearn of the boat in by the float.

Q. Which page in this exhibit D 13 is the page that you wrote?

A. There is my writing there (indicating).

Q. It is the last page in the book?

A. The last two pages.

Q. The last two pages are yours?

A. Yes, sir.

Q. Who wrote in "base line 865 degrees, 45 minutes east?"

A. I don't know.

Q. That wasn't there when you gave—

A. I didn't put it there; I cannot say.

Q. Can you read what that is?

A. That says base line.

Q. What is under that?

A. Knoll and point.

Q. What is this?

A. T rod.

Q. You didn't put that in?

A. No, sir.

Q. Now I notice at No. 12, reading, you have 10.-56, 40 seconds?

A. Yes, sir.

Q. You put in the seconds also?

A. Yes, sir.

Q. Now what does that mean?

A. Why ten o'clock and 56 minutes and 40 seconds.

Q. What happened then?

A. That is when I took the reading; the time onto that bearing.

Q. On to the flag?

A. Yes, sir, on to the flag.

Q. And at 10.56 40 seconds, what is the next—344 1-2?

A. Yes, sir, 344 1-2.

Q. What does that mean?

A. That is the reading.

Q. What does it mean—344 1-2 what?

A. I think that is 344 1-2 degrees, I should say.

Q. 344 1-2 degrees?

A. Yes, sir.

Q. Degrees of what?

A. That was degrees on to the flag.

Q. On the flag?

A. Yes, sir.

Q. There was a certain number of degrees marked on flag, were there?

A. No, sir.

Q. What do you mean by that?

A. That is where the float was located.

Q. 334 1-2 degrees from what? **10**

A. It would be from the transit.

Q. 334 1-2 degrees from the transit?

A. What the transit read.

Q. Was the location of the float?

A. Location of the float, yes, sir.

Q. How far would that be—334 1-2 degrees—how far would that be, in feet?

A. I don't know exactly.

Q. But whatever it was, it was 334 degrees from **20** the transit to the flag?

A. That was the reading on the transit.

Q. Wasn't there a good deal more reading on the transit than 334 1-2?

A. That is what this was, and I had the transit set on to the flag at the time.

Q. That is when you had the transit so it pointed at the flag, you saw somewhere on there, the 334 1-2 degrees?

A. Yes, sir, when I took the reading off the tran- **30** sit, where I had set it on to the flag at the time.

Q. Now you have west 88 1-3, what do you mean by that?

A. 3-4th.

Q. 88 3-4th, what do you mean by that?

A. That is west, southwest.

Q. 88 degrees?

A. Yes, sir.

Q. Southwest 88 degrees and a quarter?

A. Yes, sir, 3-4. **40**

Q. A. W. what does that mean?
A. West southwest.
Q. That is west 88 1-3 degrees, southwest?
A. Yes, sir.
Q. Where did you get that from?
A. Off the transit.
Q. That was on the transit too?
A. Yes, sir.
Q. Both those were on the transit?
A. Yes, sir.

REDIRECT EXAMINATION.

Q. Then when you put the glass upon the boat why you read the degrees and the bearing?
A. Yes, sir.
Q. And put them down?
A. Yes, sir, and the time also.
Q. And the transit itself on the tri-pod was stationary?
A. Yes, sir.
Q. And these figures would vary as the boat varied and might move the telescope too, might it?
A. Yes, sir.

Mr. EDWARDS: I offer that book so far as his observations are concerned.

Sworn to before me
(the signature being waived)
this 26th day of December,
A. D. 1906, at Jersey City,
N. J.

Testimony of Frank McIntosh.

FRANK McINTOSH, recalled by defendants.

FURTHER DIRECT EXAMINATION by Mr. Edwards.

Q. You have been already sworn?

A. Yes, sir.

Q. And you are an engineer by profession?

A. Yes, sir.

Q. Do you understand the use of the transit?

A. Yes, sir.

Q. Did you accompany Mr. Bardner in his party on this float expedition?

A. Yes, sir.

Q. What days were you there do you remember?

A. I don't remember.

Q. I will give you the book and that will probably tell you.

A. On November 30th and December 5th.

Q. Now, what did you do that day?

A. Took observations on the floats, placed by Mr. Bardner.

Q. Who set up the transit?

A. I did.

Q. Who fixed the point of setting it up?

A. I located it under Mr. Bardner's direction.

Q. And where he told you to?

A. Yes, sir.

Q. Then what would you do about making these observations?

A. I took my fore-sight on the base line that he provided, to take observations on the float, as he indicated.

Q. What readings would you make on the transit?

A. Take the angle and also the bearing and time.

Q. Which is the angle as it appears in your book; which appears first, the angle or the bearing?

A. The angle appears first.

Q. You call that under the head of azimuth?
A. Yes, sir.
Q. The bearing is what?
A. Direction.
Q. What is this angle, take any example that you please there and explain to us exactly what you mean by that—take November 30th, No. 7?
A. Angle was 29 degrees 45 minutes.

Mr. VREDENBURGH:

Q. Is that in your writing?
A. Yes, sir.

Mr. EDWARDS:

Q. What was the bearing?
A. North 36 degrees, 15 minutes west.
Q. What is that bearing between?
A. Between transit point and the float.
Q. That was accurately taken?
A. Yes, sir.
Q. And the angle was also taken?
A. Yes, sir.
Q. You turned these notes into—
A. Mr. Bardner.
Q. Did the engineer have any difficulty in reading those notes?
A. Not that I know of.
Q. Or parceling them?
A. No, sir.

Mr. EDWARDS: I offer that in evidence.

Marked Exhibit D-14, December 26, 1906.

CROSS-EXAMINATION by Mr. Vredenburgh:

Q. What is the reading of November 30, No. 12, 59 degrees and 19 minutes west?

A. It means the angle between the base line and the line of observation of the float is 59 degrees and 19 minutes.

Q. That was the angle which the base line bore to a line drawn from the tri-pod to the flag in the boat?

A. Yes, sir.

Q. That is all.

Sworn to before me, (the signature being waived) this 26th day of December, A. D. 1906, at Jersey City, N. J.

JOHN H. COOK, recalled on behalf of the defendants.

DIRECT EXAMINATION by Mr. Edwards:

Q. You are familiar with this map, Exhibit D-11, that you have seen here to-day?

A. Yes, sir; reasonably so.

Q. They say that some of the information on this map came from you; I refer particularly to the fact of the flow of the river on the various dates that appear on this map; did you give that flow of the river to Mr. Bardner?

A. I gave the flow of the river to Mr. Bardner for certain days, which he named to me, and I will give you those dates, if you want me to.

Q. Give me the days?

A. September 22, 23, 25, 26, 28 and 29th; November 17th, 30th, and December 5th and 14th.

Q. Will you give us the amount of flow and also whether there was any water going over the spillway for those days, and if you tell us, how you arrive at that?

Mr. VREDENBURGH: Objected to, until we find out what Mr. Cook is reading from.

Q. What are you reading from?

A. I am reading from my computation book, which I keep in the office, and in which I make all small computations, so that I may have a record of them at any time; I am reading from that book, and this flow which I have was computed from observations or height of the water in the reservoir, which were made by McIntosh, who is the gate man there; Mr. McIntosh assisted me in computing the quantity on these days.

Q. And you took his record that he keeps?

A. I took his record of the elevation of the water in the reservoir.

Q. What other record of his?

A. That is the record which I took; he keeps that from day to day.

Q. Does he also keep a record of the amount of the water sent through the gates?

A. No, sir; I got that from the computation which I make of the quantity of water delivered to Jersey City through the 72-inch Venturi meter at the Bergen reservoir.

Q. Who reads that Venturi meter?

A. A man named Herold, another gateman whose name is Herold; there are two Heroldes there.

Q. They turn their figures into you?

A. Into me every day, and I check them up, by comparing them with the record, which they make.

Q. Well, now, then, what was the information that you got as to the state of the reservoirs on those days?

A. On September 22nd there was no water wasting over the spillway.

Q. What about the flow of the river?

A. And the flow of the river was 26 and 1-10 million gallons.

Objected to.

Q. Where did you get that from?

A. The quantity of water delivered to Jersey City was 38 and 9-10 million gallons.

Q. That is by the meter?

A. That is by the meter and the reservoir dropped forty-four thousandths of a foot; now, then, the difference between the quantity of water was the difference between the quantity of water delivered to Jersey City and the drop in the reservoir; given quantity of water which came in from the river.

Q. What was that?

A. That was 26 and 1-10 million gallons was the flow of the river on that day.

Q. Now, then, will you tell us what was the amount—whether there was any water flowing over the spillway September 23rd, and what was the amount of water in the river?

A. There was no water flowing over the spillway September 23rd, and the quantity of water flowing in the river was 65 and 2-10 million gallons.

Q. What were your basis for that?

A. Well, there were 39 and 1-10 million gallons went to Jersey City, as measured through the Venturi meter, and the reservoir raised nine-tenths of a foot.

Q. Calculated from that?

A. Calculated from that, I find that the flow of the river was 65 and 2-10 million gallons.

Q. Do you keep the flow of the river every day of the year?

A. No, sir; we have several observations, so that we may compute the flow of the Rockaway every day in the year, but we do not compute it each day;

when this was called for I computed it for certain days.

Q. You could compute it now for any other days?

A. Provided the data was given me in time I could compute it for any number.

Q. Give us September 25th, was there any water going over the spillway?

A. There was at 6 P. M. twenty-two thousandths of a foot on the spillway, according to the reading which McIntosh gave me.

Q. What other readings did you have?

A. We had the quantity of water being delivered to Jersey City and the flow, which was 38 and 8-10 million gallons, and the flow of the river therefor was 47 and 9-10 million gallons.

Q. September 26th?

A. There was no water going over that day, and the quantity going to Jersey City was 37 and 9-10 millions, and the quantity flowing in the river was 37 and 6-10 millions.

Q. What was the height?

A. The reservoir rises in elevation one one-hundredth of a foot that day; September 28th—shall I continue?

Q. How much water went to Jersey City?

A. 37 and 9-10; those observations that I give you were taken at 6 P. M. in the morning and 6 P. M.; now, then, when the water comes up to the crest there—comes up to it from below or down to it from above, there is part of the day when there is no water wasting, and there is part of the day when there is a trifle of water wasted.

Q. Take September 28th?

A. There was no water wasted over the spillway that day, and the quantity of water going to Jersey City was 34 and 6-10 millions by the meter, and the flow of the river was 19 and 6-10 millions.

Q. And the height?

A. And the water in the reservoir dropped that day.

Q. How much?

A. Well, it lost—the reservoir in those two observations lost a hundredth of a foot.

Q. September 29th?

A. September 29th there was no water wasting, and the flow to Jersey City was 34 and 8-10; and the reservoir gained four hundredths of a foot, making the total flow of the river 49 and 3-10 million gallons; November 17th, there was water wasting over all day, it was flowing at six o'clock in the morning, 33 millions; at 6 o'clock at night thirty millions, and the average rate was 31 and 5-10 millions, added to 35 and 7-10, which was the quantity measured through the meter at Jersey City and gave the flow of the river as 67 and 2-10 millions.

Q. What was the height of the water?

A. Six o'clock in the morning it was 152,000; six o'clock in the evening 142,000.

Q. Above the spillway?

A. Yes, sir. On November 30th there was water running over it all day. The rate of flow at six o'clock in the morning was 21 and 5-10 millions, and at six o'clock in the evening, 20 millions, average rate 20 and 7-10 millions, added to 35 and 8-10 millions quantity that went through the meter at Jersey City is a total of 56 and 8-10 millions. On December 5th water wasting over all day that day; the rate of flow, six o'clock in the morning was 10 millions; six o'clock at night was 10 millions, making an average rate of 10 millions, added to 37 millions, the quantity which went to Jersey City through the meter gives a total of 47 million gallons flow of the river that day.

Q. You mean by 10 millions, 10 millions going over the spillway?

A. Yes, sir.

Q. Now, up to this time—up to December 5th what was the greatest amount that the water had been drawn below the spillway?

A. You mean taken to Jersey City?

Q. No, I mean what day did the water stand lowest in the reservoir and about how much below the spillway?

Mr. VREDENBURGH: Objected to because this witness has already been examined about that and testified to it.

Q. At those particular days, which were the lowest?

A. The lowest observation which I have here was on September 22d, at 6 o'clock P. M., when the water was sixteen hundredths of a foot below the spillway; that is equal to about two inches.

Q. So, practically during all of those observations the reservoir was either full or spilling—practically full or spilling?

A. Full or spilling slightly.

Q. Now, then, on December 14th?

A. The rate of flow, 6 o'clock in the morning was 98 millions. Six o'clock at night, 94,000, 000; average rate 96 millions, which added to 38 and 1-10 millions, which was delivered to Jersey City through the meter, and the total was 134 and 1-10 million gallons in the reservoir that day; that was the largest flow which was obtained on any of those days about which Mr. Bardner asked me.

Q. When did you make up this statement?

A. Made up this statement—let me see.

Q. All made up at once?

A. Yes, sir.

Q. After December 14th?

A. Yes, sir.

Q. And these days, were they chosen by you?

A. No, sir; Mr. Bardner had given me a list of those days, and asked me to give him the flow of the river on those days, so that he might put it on that map.

CROSS EXAMINATION by Mr. Vredenburgh:

Q. When was it?

A. It was some time after December 14th, I can look at my diary if necessary and find out just what day it was.

Q. A week?

A. I would think it was. As I remember it it was a week ago Monday.

Q. Mr. Cook, your first figure is the amount of water that is passing over the spillway, is it?

A. Well, in this computation I have a little tabulation here, and the first reading, which I think is of course the date, then I have the elevation of the water in the reservoir, as measured by McIntosh.

Q. How does he measure the elevation of the water in the reservoir?

A. I have already described it to you in my former testimony, by means of a hooked guage which is in the gate house.

Q. Then how do you determine how much water is going over the spillway?

A. If the elevation of the water in the reservoir is higher than the top of the spillway, I compute the quantity that is flowing over the spillway by means of what is called by some hydraulic men—formula, and this formula—shall I give it?

Q. Yes.

A. This formula is Q, which means the quantity in cubic feet per second, and is equal to 3.01208, mul-

tiplied by the length, multiplied by the height of the one and 53-100 power; the length is 300 feet.

Q. What day did the greatest number of inches precipitate over the spillway?

A. In these days which we are speaking about?

Q. Yes.

A. On the 14th of December—

Q. How many inches then were wasted?

A. The water was then about—well, in the morning it was 31 and 1-100 of a foot deep, and at night it was 30 and 1-100 of a foot in depth.

Q. In inches?

A. About three and a half inches in the morning.

Q. And three inches in the afternoon?

A. About three and seven-tenths inches in the morning and three and a half inches in the afternoon.

Q. And the amount of water that went over the dam then was how many million gallons?

A. Was ninety-six.

Q. Ninety-six million gallons?

A. Would go over in twenty-four hours, if the depths were on a three hundred foot over-flow.

Q. Now, when the water did not waste over the spillway, how did you determine how much the reservoir was increased in the quantity of waer by the rise of an inch in the reservoir?

A. I have a diagram at the office which was not made by me, but was made by the engineering corps, which was formerly employed by the Jersey City Water Supply Company, which shows the capacity of the reservoir at different elevations, and from that diagram I figure the quantity of water which would be in the reservoir at each inch in depth, at the elevation of the spillway or about there, as the case might be.

Q. That is, you calculate from that diagram how much water would come in the reservoir if the water

in the reservoir—the elevation of the water in the reservoir was increased one inch and nothing going over the spillway?

A. That is it, yes, sir.

Q. Now, how much did you compute the water which came in the reservoir from other sources than the Rockaway pipe?

A. Well, as a matter of fact the figure which I give is the quantity of water which came into the reservoir from any source.

Q. How much of that came in from the river?

A. I have no means of distinguishing those things; if any came from any other source I don't know it.

Q. Have you any information that any quantity does come from any other source than the Rockaway, any substantial quantity?

A. Not that I know of.

Q. Never heard of that before?

A. Never heard of any that came from anywhere inside the Rockaway in to that reservoir; of course, some quantity must come from the natural water shed of that reservoir.

Q. Now the least water which came in that reservoir was when there was no wasting of these several tests?

A. Yes, that is it; the least water that was flowing in the river was on a day when there was no water wasting over the spillway.

Q. When you say flowing in the river, you refer to water coming in that reservoir from any source whatever?

A. That is it.

Q. Mr. Cook, assuming that all the water that comes into the reservoir comes from the Rockaway, how near, in your judgment is your computation to the actual amount of water which comes in?

A. Well, that would depend on the accuracy of the

diagram, which showed the capacity of the reservoir at different elevations, but I would say that it ought to be within—oh, five per cent. either way.

Q. Well, you belive it is?

A. I should think it might be, yes, sir; I guess that is just as good as anything else, for your purpose, isn't it?

By Mr. EDWARDS:

Q. Have you got the chart?

A. No, sir, it is a blue print, in the office; I have the data here written out which I wrote down when I made some figures on the reservoir, and I can tell you the capacity, six feet between the spillway and a foot below.

Q. Then, upon your own knowledge, it is correct?

A. That is what I base my figures on.

Q. Then you do know of it for a foot below the spillway?

A. Not of my own knowledge; I got this from the diagram.

By Mr. VREDENBURGH:

Q. If the wind is blowing towards the dam does not that pile the water up on the dam so that it affects very substantially your computations?

A. I believe that when the water was very close to the top of the spillway with the wind high, that the wind might affect the elevation of the water on that spillway, and therefore that a computation based upon the depth of water on that spillway there might be an error, which was caused by the wind, yes, sir.

Q. The water in a light wind comes towards that dam at the rate of 1300 feet in one hour and 52 minutes; would not that pile the water up there?

A. I have absolutely no idea whether it would or not.

Q. 1300 feet in an hour and 52 minutes?

A. 1300 feet in an hour and 52 minutes. You want me to concede that the water is moving towards the spillway at that speed?

Q. I want you to concede that if you can.

A. I cannot concede any such thing as that.

Mr. EDWARDS:

Q. There is no way in which this can be more accurate, is there?

A. No, sir.

Mr. VREDENBURGH:

Q. Would not the wind this day, in which you say there was this large amount coming down the river, would not the wind that day have accounted for at least a tenth of an inch?

A. The wind blows toward the point of the arrow; it possibly might.

Q. What difference would a tenth of an inch make?

A. It would have made that day—in the morning there were 31-100 parts of a foot, and a hundredth is about equal to an eighth of an inch. At night there were 30-100, therefore there was an eighth of an inch between those two observations. In the morning the flow was at the rate of 98 millions, and at night at the rate of 94 millions, so therefore if either one of those depths had obtained throughout the twenty-four hours, the difference between those two depths of an eighth of an inch would have been equal to about 4 million gallons, which is about four per cent. of the flow at that particular dam.

Q. So that if it only piled the water up an eighth of an inch it would make a difference, in your calculation, of four million gallons a day?

A. Yes, if all day long the difference of an eighth of an inch would make 4 millions; at a greater depth it would not make so much difference.

Q. About at that depth?

A. Yes, sir, at that depth.

Q. At a greater depth it would make a little more or less depth?

A. No, sir; at a greater depth it would be less, but at a less depth it would make a little more difference.

By Mr. EDWARDS:

Q. Then if the wind was blowing away from the dam?

A. It would reduce it in the same way.

Q. Would reduce the over-flow in the same way?

A. Whatever the depth was reduced the flow would be reduced.

By Mr. VREDENBURGH:

Q. If the wind was blowing from the Parsippany dyke, would there not be at least an inch difference between the water at the dam on such a day and the water at the dam on a day when it was quiet?

A. I haven't made any observations whatever at that place to determine such a thing.

Q. You don't know?

A. I don't.

By Mr. EDWARDS:

Q. These variations would cure themselves; the more cases you had with the wind blowing in different directions as it did on these days?

A. You don't make yourself clear to me; what do you mean by that?

Q. It is hardly fair to take one particular day to make a calculation of this kind, is it?

A. I am attempting to show the flow for each of those days, a slight difference like that is not material, and any computation like that cannot be made so closely as half a per cent. or anything like that.

Q. You think it would not, under any consideration, vary five per cent. at the most?

A. When I said five per cent. he asked me an entirely different thing from that; he asked me when there was no water going over the spillway, how closely I could figure the quantity of water flowing in the river, from the quantity discharged in Jersey City; I think perhaps five per cent.

Q. When the water was going over the spillway how would it be?

A. The depth of water on the spillway would be increased more or less as the strength of the wind increased, and the length of time that the wind had been blowing.

Q. How much would you say that percentage would be there?

A. I have absolutely no idea; never made any observations, and I think no other man has ever made observations to determine what that was, and I believe it would have no value, because it is only for a brief time.

Mr. VREDENBURGH:

Q. You mean the length of the time the wind blows in that direction?

A. Would have a decided bearing on the amount of piling up which there would be.

Q. Then when you say brief time you refer to the length of time which the wind blows from the same point of the compass?

A. That is it.

Mr. EDWARDS: I desire to offer in evidence minutes of the Board of Street and Water Commissioners, and communications therein contained, of which I have made copies, and instead of offering them from the minute book I offer them in bulk.

Mr. VREDENBURGH: I object to them.

Mr. EDWARDS: You don't object to the manner of proof, do you?

Mr. VREDENBURGH: I object to these minutes until I am able to know what they are, so that I can object to them as to their materiality.

Mr. EDWARDS: We have no objection to your making your objections when you have looked them over, but we offer them now.

I offer the minutes of the Board.

Mr. VREDENBURGH: I except to them as not the original minutes and as not material.

Mr. EDWARDS: I offer the minutes of the Board of August 30th, 1899, page 176, a communication from the corporation counsel, as follows: "Jersey City, August 3, 1899. The Honorable Board of Street and Water Commissioners: Gentlemen—The Supreme Court has this day filed an opinion denying the writ of certiorari applied for to take up the contract with Patrick H. Flynn to supply Jersey City with water. Respectfully, Allan McDermott, Corporation Counsel."

Mr. VREDENBURGH: Objected to as immaterial, illegal and incompetent.

Mr. EDWARDS: Now I offer the minutes of October 7, page 236, a letter dated Brooklyn, N. Y., October 7, 1899, addressed to Garwood Ferris, Esq., Supervising Engineer, Jersey City N. J., from P. H. Flynn and the Jersey City Water Supply Company.

(See minutes of Board of Street and Water Commissioners, of Jersey City, hereafter printed as exhibits.)

Mr. VREDENBURGH: That letter is objected to for the same reason.

Mr. EDWARDS: Letter of October 23, 1899, page 235 of the minutes, being a letter from Garwood Ferris, Engineer in charge, to the Board of Street and Water Commissioners of Jersey City transmitting the letter of Flynn above referred to.

(See minutes of Board of Street and Water Commissioners, of Jersey City, hereafter printed as exhibits.)

Mr. VREDENBURGH: Objected to for the same reason.

Mr. EDWARDS: And page 251, resolution of the Board of Street and Water Commissioners authorizing the change of dam site.

Mr. VREDENBURGH: Objected to for the same reason.

Mr. EDWARDS: That extends over page 251 and 252; December 12, 1899, page 298, annual report of the Committee of the old Board of Street and Water Commissioners to the Street and Water Board dealing with the water supply.

(See minutes of Board of Street and Water Commissioners, of Jersey City, hereafter printed as exhibits.)

Mr. VREDENBURGH: Objected to as immaterial and irrelevant.

Mr. EDWARDS: I offer that part of page 298. Now on page 319, resolution by the city directing the company to increase the water works to seventy million gallons, not concurred in by the Board of Finance.

(See minutes of Board of Street and Water Commissioners, of Jersey City, hereafter printed as exhibits.)

Mr. VREDENBURGH: I object to that as immaterial.

Mr. EDWARDS: January 9, 1900, page 327, resolution to submit to the people the purchase of the seventy million gallon supply; not concurred in.

(See minutes of Board of Street and Water Commissioners, of Jersey City, hereafter printed as exhibits.)

Mr. VREDENBURGH: Objected to for the same reason.

Mr. EDWARDS: April 17, 1900, page 409, report of Garwood Ferris as to cost of construction.

(See minutes of Board of Street and Water Commissioners, of Jersey City, hereafter printed as exhibits.)

Mr. VREDENBURGH: Same objection.

Mr. EDWARDS: Which was received and referred to the Committee on New Water Works; page 410 the report and resolution of the Board thereon—410 and 411.

(See minutes of Board of Street and Water Commissioners, of Jersey City, hereafter printed as exhibits.)

Mr. VREDENBURGH: Objected to for the same reason.

Mr. EDWARDS: Now I offer in evidence the following deeds comprising all the properties in the reservoir and in the pipe line from Boonton to Jersey City, numbering in all 194, as they appear in the following schedule:

LIST OF DEEDS OF PROPERTIES IN THE RESERVOIR OF THE JERSEY CITY WATER SUPPLY COMPANY NEAR BOONTON, MORRIS COUNTY, NEW JERSEY.

(1) Deed—Giles E. Miller and wife to J. C. W. S. Co., dated Nov. 1, 1902; Liber C. 17, page 64, Morris County.

Deed—Giles E. Miller and wife to J. C. W. S. Co., dated May 5, 1904; Liber Q. 17, page 357, &c., Morris County.

(2) Deed—Edward Simms and wife to J. C. W. S. Co., dated March 1, 1903; Liber E. 17, page 406, &c., Morris County.

(3) Deed—Edwin W. Goeller and wife to J. C. W. S. Co., dated April 10, 1903; Liber F. 17, page 553, &c., Morris County.

(4) Deed—Samuel L. Hopkins to J. C. W. S. Co., dated March 16, 1903; Liber E. 17, page 415, &c., Morris County.

(5) Deed—Benjamin F. Howell and wife to J. C. W. S. Co., dated Oct. 15, 1903; Liber K. 17, page 578, &c., Morris County.

(6) Deed—William A. Elliott and wife to J. C. W. S. Co., dated June 5, 1903; Liber G. 17, page 470, &c., Morris County.

(7) Deed—John Dolan and wife to J. C. W. S. Co., dated March 7, 1903; Liber E. 18, page 330, &c., Morris County.

(8) Deed—James D. Kingsland and wife to J. C. W. S. Co., dated Nov. 1, 1902; Liber C. 17, page 68, &c., Morris County.

(9) Deed—Elizabeth Jacobus, widow, to J. C. W. S. Co., dated Oct. 6, 1903; Liber K. 17, page 503, &c., Morris County.

(10) Deed—John H. Peer and wife to J. C. W. S. Co., dated Oct. 13, 1903; Liber L. 17, page 216, &c., Morris County.

(11) Deed—Edwin W. Kimball and wife to J. C. W. S. Co., dated Jan. 2, 1903; Liber D. 17, page 334, &c., Morris County.

(12) Deed—Rachel Mandeville, et als., to Michael J. Kennedy, dated April 4, 1900; Liber D. 17, page 17, &c., Morris County.

Deed—Horace N. Van Duyne and wife to M. J. Kennedy, dated Dec. 7, 1899; Liber C. 16, page 273, &c., Morris County.

(13) Deed—Patrick Cunningham and wife to J. C. W. S. Co., dated Nov. 1, 1902; Liber C. 17, page 72, &c., Morris County.

(14) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply of lands of Patterson T. Winney, et als.

(15) Deed—James J. Bergen, Trustee, &c., to J. C. W. S. Co., dated Nov. 25, 1904; Liber V. 17, page 146, &c., Morris County.

Deed—Annie E. Fitzgibbon and husband to J. C. W. S. Co., dated Nov. 21, 1904; Liber U. 17, page 408, &c., Morris County.

(16) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply of lands of Stephen H. Condit, et als.

(17) Deed—J. Voorhis Banta and wife to J. C. W. S. Co., dated April 1, 1903; Liber F. 17, page 379, &c., Morris County.

(18) Deed—Hilbert D. Crane et als., to J. C. W. S. Co., dated March 25, 1905; Liber Y. 17, page 422, &c., Morris County.

(19) Deed—Benjamin F. Howell and wife to J. C. W. S. Co., dated August 31, 1903; Liber K. 17, page 258, &c., Morris County.

(20) Deed—Walter Hawkins and wife to M. J. Kennedy, dated Oct. 13, 1899; Liber B. 16, page 280, &c., Morris County.

(21) Deed—John Banta and wife to M. J. Kennedy, dated September 25, 1899; Liber G. 16, page 144, &c., Morris County.

(22) Deed—Jeremiah Banta to M. J. Kennedy, dated Oct. 6, 1899; Liber B. 16, page 236, &c., Morris County.

(23) Deed—Edward Banta and wife to M. J. Kennedy, dated Sept. 25, 1899; Liber B. 16, page 193, &c., Morris County.

(24) Deed—Tunis D. Peer to Michael J. Kennedy, dated Oct. 13, 1899; Liber A. 16, page 464, &c., Morris County.

(25) Deed—John Henry Peer and wife to Michael J. Kennedy, dated Oct. 13, 1899; Liber A. 16, of deeds, page 467, &c., Morris County.

(26) Deed—Amzi L. Crane and wife to J. C. W. S. Co., dated Oct. 8, 1900; Liber W. 17, page 576, &c., Morris County.

(27) Deed—Fred Weigand and wife to M. J. Kennedy, dated Nov. 1, 1899; Liber G. 16, page 71, &c., Morris County.

(28) Deed—Electa Tuttle, widow, et als., to M. J. Kennedy, dated June 28, 1900; Liber H. 16, page 447, &c., Morris County.

(29) Deed—Frances E. Ogden to J. C. W. S. Co., dated Oct. 22, 1902; Liber B. 17, page 346, &c., Morris County.

(30) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply of lands of Garret B. Jacobus, et als.

(31) Deed—Andrew L. Cobb and wife to J. C. W. S. Co., dated Oct. 31, 1902; Liber C. 17, page 131, &c., Morris County.

(32) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply of lands of Andrew B. Cobb, deceased.

(33) Deed—Mary Jane Van Buskirk and husband to M. J. Kennedy, dated Dec. 22, 1899; Liber C. 16, page 311, &c., Morris County.

(34) Deed—The Board of Chosen Freeholders of the County of Morris to M. J. Kennedy, dated April 10, 1899; Liber W. 15, page 276, &c., Morris County.

(35) Deed—Elizabeth M. Kitchell to J. C. W. S. Co., dated August 1, 1903; Liber K. 17, page 235, &c., Morris County.

(36) Deed—Morris and Essex R. R. Co. to J. C. W. S. Co., dated Sept. 12, 1905; recorded Liber G. 16, page 163, Morris County.

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LIST OF DEEDS FOR PROPERTIES ON THE PIPE LINE FROM THE RESERVOIR IN MORRIS COUNTY OF THE JERSEY CITY WATER SUPPLY COMPANY TO RESERVOIR IN JERSEY CITY.

(37) Deed—Horace N. Van Duyne and wife to J. C. W. S. Co., dated Jan. 9, 1905; Liber W. 17, page 328, &c., Morris County.

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(38) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply of lands of Jacob Nelson Peer.

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(39) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply of lands of Augustus Peer, et al.

(40) Deed—Elizabeth Meldrum and husband to J. C. W. S. Co., dated Nov. 30, 1900; Liber L. 16, page 385, &c., Morris County.

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(41) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply of lands of George A. Romine, et al.

(42) Deed—Adelaide P. Beach, et al., to Jersey City Water Supply Co., dated June 1, 1900; Liber G. 16, page 568, &c., Morris County.

Deed—Charles A. Hitchcock, Special Guardian of Edwin E. Beach, and infant, to J. C. W. S. Co., dated Nov. 2, 1905; Liber F. 18, page 363, &c., Morris County.

(43) Deed—Albert Z. Duryea, et ux., to J. C. W. S. Co., dated June 25, 1900; Liber I. 16, page 224, &c., Morris County.

(44) Deed—Hezekiah Davenport and wife to J. C. W. S. Co., dated Nov. 28, 1900; Liber L. 16, page 392, &c., Morris County.

(45) Deed—Frank C. Magie and wife to J. C. W. S. Co., dated Dec. 14, 1900; Liber E. 16, page 123, &c., Morris County.

(46) Deed—James G. Jacobus, et als., to J. C. W. S. Co., dated Dec. 29, 1900; Liber A. 17, page 68, &c., Morris County.

(47) Deed—Walter A. Young and wife to J. C. W. S. Co., dated Jan. 7, 1901; Liber A. 17, page 64, &c., Morris County.

(48) Deed—Sarah A. Crane, et als., to J. C. W. S. Co., dated June 21, 1900; Liber Z. 17, page 392, &c., Morris County.

(49) Deed—Solomon Blum, et ux., et al., to J. C. W. S. Co., dated July 27, 1900; Liber H. 16, page 356, &c., Morris County.

(50) Deed—Gilbert D. Crane and wife to J. C. W. S. Co., dated June 21, 1900; Liber L. 16, page 389, &c., Morris County.

(51) Deed—Solomon Blum, et ux., et al., to J. C. W. S. Co., dated July 27, 1900; Liber H. 16, page 356, &c., Morris County.

(52) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply of lands of Margaret Brophy, et al.

(53) Deed—Fannie Cole and husband to J. C. W. S. Co., dated March 19, 1900; Liber E. 16, page 466, &c., Morris County.

(54) Same as 52.

(55) Same as 52.

(56) Deed—Abbie J. Hennion, et al., to J. C. W. S. Co., dated August 1, 1900; Liber D. 39, page 102, &c., Essex County.

(56a) Deed—Edgar I. Jacobus to J. C. W. S. Co., dated Sept. 7, 1905; Liber D. 39. page 107, &c., Essex County.

(57) Deed—Joseph H. M. Cook and others to J. C. W. S. Co., dated July 21, 1900; Liber Q. 33, page 59, &c., Essex County.

(58) Deed—Judson S. Van Ness to J. C. W. S. Co., dated July 9, 1900; Liber P. 33, page 225, &c., Essex County.

(59) Deed—Same as 56 and 56a.

(60) Deed—Richard Husk and wife to J. C. W. S. Co., dated August 15, 1900; Liber P. 33, page 504, &c., Essex County.

(61) Deed—Wilhelm Maass to J. C. W. S. Co., dated August 15, 1900; Liber P. 33, page 507, &c., Essex County.

(62) Deed—Sarah A. Riker and husband to J. C. W. S. Co., dated August 30, 1900; Liber M. 33, page 503, &c., Essex County.

(63) Deed—Sarah M. Van Ness and husband to J. C. W. S. Co., dated August 30, 1900; Liber T. 33, page 180, &c., Essex County.

(64) Deed—John H. Pier and wife to J. C. W. S. Co., dated Oct. 21, 1902; Liber X. 35, page 274, &c., Essex County.

(65) Deed—Garret Vanderhoof (single) to J. C. W. S. Co., dated August 18, 1900; Liber P. 33, page 500, &c., Essex County.

(66) Deed—Same as 64.

(67) Deed—William H. Speer, et ux., to J. C. W. S. Co., dated August 18, 1900; Liber P. 33, page 502, &c., Essex County.

(68) Deed—Gilbert Van Ness, Exr., &c., to J. C. W. S. Co., dated August 20, 1900; Liber M. 33, page 501, &c., Essex County.

(69) Deed—Susannah J. Fortune and husband to J. C. W. S. Co., dated Oct. 14, 1902; Liber X. 35, page 287, &c., Essex County.

(70) Deed—Gilbert Van Ness and wife to J. C. W. S. Co., dated August 20, 1900; Liber M. 33, page 499, &c., Essex County.

(71) Deed—Jane Mulford (widow) to J. C. W. S. Co., dated Sept. 23, 1901; Liber R. 34, page 285, &c., Essex County.

(72) Deed—Elijah Pearce and wife to J. C. W. S. Co., dated Nov. 26, 1900; Liber V. 33, page 407, &c., Essex County.

(73) Deed—Abram V. Collerd and wife to J. C. W. S. Co., dated July 10, 1901; Liber S. 35, page 439, &c., Essex County.

(74) Deed—Horatio Mahon and wife to J. C. W. S. Co., dated Nov. 26, 1900; Liber V. 33, page 410, &c., Essex County.

(75) Deed—Ira H. Condit to J. C. W. S. Co., dated Oct. 20, 1900; Liber R. 33, page 240, &c., Essex County.

(76) Deed—Joseph D. Roberts and wife to J. C. W. S. Co., dated Oct. 29, 1900; Liber V. 33, page 405, &c., Essex County.

(77) Deed—William H. Riddler and wife to J. C. W. S. Co., dated Nov. 3, 1900; Liber V. 33, page 270, &c., Essex County.

(78) Deed—John W. De Baun and wife to J. C. W. S. Co., dated Nov. 1, 1900; Liber V. 33, page 270, &c., Essex County.

(79) Deed—Fairfield Dairy Company of New Jersey to J. C. W. S. Co., dated Dec. 11, 1900; Liber A. 34, page 70, &c., Essex County.

(80) Deed—William Pier and wife to J. C. W. S. Co., dated Nov. 13, 1900; Liber V. 33, page 323, &c., Essex County.

(81) Deed—Nathan Goldstein and wife to J. C. W. S. Co., dated Nov. 14, 1900; Liber V. 33, page 327, &c., Essex County.

(82) Deed—Willard Pier and wife to J. C. W. S. Co., dated Nov. 13, 1900; Liber V. 33, page 320, &c., Essex County.

(83) Deed—Frank Lawrence and wife to J. C. W. S. Co., dated Nov. 13, 1900; Liber V. 33, page 325, &c., Essex County.

(84) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply of lands of John Riker, et al.

(85) Deed—Ira H. Condit to J. C. W. S. Co., dated January 31, 1901; Liber O. 35, page 344, &c., Essex County.

(86) Deed—Lucas R. Van Ness, Exr., to J. C. W. S. Co., dated August 19, 1905; Liber E. 39, page 53, &c., Essex County.

Deed—Lucas R. Van Ness, Exr., to J. C. W. S. Co., dated June 17, 1901; Liber O. 33, page 342, &c., Essex County.

(87) Deed—Max Shire and wife to J. C. W. S. Co., dated January 15, 1903; Liber D. 36, page 173, &c., Essex County.

(88) Deed—Henry D. Fleigh and wife to J. C. W. S. Co., dated January 13, 1903; Liber D. 36, page 169, &c., Essex County.

(89) Deed—Eliza Parsonage to J. C. W. S. Co., dated May 28, 1903; Liber Q. 36, page 221, &c., Essex County.

(90) Deed—Frank Stanley and others to J. C. W. S. Co., dated March 31, 1903; Liber K. 36, &c., Essex County.

Deed—Ralph Shaw, Special Guardian, and Eva Stanley, to J. C. W. S. Co., dated March 31, 1903; Liber K. 36, page 30, &c., Essex County.

(91) Deed—William E. Smith, single, to J. C. W. S. Co., dated Dec. 18, 1902; Liber X. 35, page 567, &c., Essex County.

(92) Deed—John Smith and wife to J. C. W. S. Co., dated March 2, 1903; Liber G. 36, page 326, &c., Essex County.

(93) Deed—Elias Schoonmaker to J. C. W. S. Co., dated March 30, 1903; Liber K. 36, page 32, &c., Essex County.

(94) Deed—Emiline Schoonmaker to J. C. W. S. Co., dated April 1, 1903; Liber K. 36, page 92, &c., Essex County.

(95) Deed—Charles Schoonmaker to J. C. W. S. Co., dated April 1, 1903; Liber K. 36, page 97, &c., Essex County.

(96) Deed—Hester Schoonmaker to J. C. W. S. Co., dated April 1, 1903; Liber K. 36, page 94, &c., Essex County.

(97) Deed—Beattie Manufacturing Company to J. C. W. S. Co., dated Jan. 6, 1905; Liber F. 38, page 187, &c., Essex County.

(98) Deed—Jennie L. Cooke and husband to J. C. W. S. Co., dated March 2, 1903; Liber G. 36, page 324, &c., Essex County.

(99) Deed—Robert Beattie and wife to J. C. W. S. Co., dated July 28, 1903; Liber S. 36, page 313, &c., Essex County.

(100) Deed—Francis J. Marley and wife to J. C. W. S. Co., dated Dec. 15, 1902; Liber V. 35, page 518, &c., Essex County.

Deed—Whitney Conant and wife to J. C. W. S. Co., dated Jan. 13, 1905; Liber W. 38, page 7, &c., Essex County.

(101) Deed—Peter Wood and wife to J. C. W. S. Co., dated March 1, 1903; Liber F. 36, page 545, &c., Essex County.

(102) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply of lands of Annie E. Stevens, now Annie E. McEwen, et al.

(103) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply of lands of Augustus C. Corby, et als.

(104) Deed—Erie Railroad Company to J. C. W. S. Co., dated ————————; Liber ————, page ———, ———— County.

(105) Deed—Peter Allen Canfield and wife to J. C. W. S. Co., dated Nov. 20, 1902; Liber P. 35, page 479, &c., Essex County.

(106) Deed—Anthony Bowden and wife to J. C. W. S. Co., dated Oct. 17, 1902; Liber T. 15, page 215, &c., Passaic County.

(107) Deed—John H. De Graw and wife to J. C. W. S. Co., dated Dec. 12, 1902; Liber V. 15, page 498, Passaic County.

(108) Deed—Francis J. Marley and wife to J. C. W. S. Co., dated Dec. 15, 1902; Liber V. 15, page 493, Passaic County.

(109) In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply of lands of Austin L. Stanley, et als., commissioners report and award.

(110) Deed—Same as 105.

(111) Deed—Same as 108, and 109.

(112) Same as 109.

(113) Deed—Cornelius M. Stanley, et ux., to M. J. Kennedy, dated June 20, 1900; Liber I. 14, page 389, &c., Passaic County.

Deed—Michael J. Kennedy and wife to J. C. W. S. Co., dated Feb. 14, 1902.

(114) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply of lands of Austin L. Stanley, et als.

(115) Deed—Erie Railroad Company to J. C. W. S. Co., dated ————————; Liber ————, page ————, ———— County.

(116)a Deed—Mary E. Francisco, widow, to J. C. W. S. Co., dated Oct. 30, 1900; Liber V. 14, page 73, &c., Passaic County.

(116)b Deed—Sherman G. Francisco to J. C. W. S. Co., dated Oct. 30, 1900; Liber V. 14, page 62, &c., Passaic County.

(116)c Deed—James H. Francisco, et ux., to J. C. W. S. Co., dated Oct. 30, 1900; Liber V. 14, page 67, &c., Passaic County.

(117) Deed—Erie Railroad Company to J. C. W. S. Co., dated ————————; Liber ————, page ————, ———— County.

(118) Deed—Ebenezer Augustus Smith and wife to J. C. W. S. Co., dated Nov. 4, 1903; Liber H. 16, page 137, &c., Passaic County.

(119) Deed—Mary Van Winkle, widow, to J. C. W. S. Co., dated Jan. 2, 1903; Liber X. 15, page 234, &c., Passaic County.

(120) Deed—Leah Ferguson and husband to J. C. W. S. Co., dated Jan. 2, 1903; Liber X. 15, page 240, &c., Passaic County.

(121) Deed—Same as 119.

(122) Deed—Carrie M. Provost to J. C. W. S. Co., dated Jan. 2, 1903; Liber X. 15, page 237, &c., Passaic County.

(123) Deed—Erie Railroad Company to J. C. W. S. Co., dated ————————; Liber ————, page ——, ———— County.

(124) Deed—William Sigler and wife to J. C. W. S. Co., dated August 17, 1902; Liber E. 16, page 224, &c., Passaic County.

(125) Deed—Same as 124.

(126) Deed—William Edward Speer, et als., to J. C. W. S. Co., dated June 1, 1904; Liber R. 16, page 161, &c., Passaic County.

(127) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply of lands of the North Jersey Land Company.

(128) Deed—Georgiana C. Moore and husband to J. C. W. S. Co., dated August 24, 1900; Liber R. 14, page 605, &c., Passaic County.

(128) Deed—Georgiana C. Moore and husband and Rosita Birkbeck, single, to J. C. W. S. Co., dated July 31, 1905; Liber B. 17, page 546, &c. Passaic County.

(129) Deed—Anton Geigges and wife to J. C. W. S. Co., dated February 25, 1903; Liber X. 15, page 189, &c., Passaic County.

(130) Deed—Daniel Hepburn and wife to J. C. W. S. Co., dated February 20, 1903; Liber X. 15, page 192, &c. Passaic County.

(131) Deed—Mary L. Armstrong and husband to J. C. W. S. Co., dated February 25, 1903, Liber X. 15, page 196, &c., Passaic County.

(132) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water suply, of lands of William H. Hamilton, et als.

(133) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply, of lands of Catharine A. Hamilton, et als.

(134) Same as 132.

(135) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply, of lands of Philip Van Riper et als.

(136) Deed—Andrew Harris and wife to J. C. W. S. Co., dated May 2, 1902; Liber P. 15, page 529, &c., Passaic County.

(137) Same as 135.

(138) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply, of lands of Henry Hepburn, Jr., et als.

(139) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply, of lands of Henry Hepburn, et als.

(140) Same as 138.

(141) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply, of lands of Henry Hepburn, Jr., et als.

(142) Same as 136.

(143) Same as 139.

(144) Deed—Morris Canal and Banking Company and Lehigh Valley R. R. Co., its lessee, to J. C. W. S. Co., dated August 26, 1902; Liber V. 15, page 175.

(145) Deed—Garret H. Kenter and wife to J. C. W. S. Co., dated May 6, 1902; Liber P. 15, page 553, &c., Passaic County.

(146) Deed—Henry C. Berlin, et ux., et al., to J. C. W. S. Co., dated May 2, 1902; Liber P. 15, page 543, &c., Passaic County.

(147) Deed—James Henry Speer and wife to J. C. W. S. Co., dated May 5, 1902; Liber P. 15, page 557, &c., Passaic County.

(148) Deed—Eben B. Thomas, individually and as trustee, and L. Gertrude, his wife, to J. C. W. S. Co., dated July 15, 1902; Liber X. 15, page 612, &c., Passaic County.

(149) Deed—Erie Railroad Co. to J. C. W. S. Co., dated ————————; Liber————, page ———, ———— County.

(150) Deed—Same as 148.

(151) Deed—Mercedes R. de Martinez Ybor and others, Exrs. to J. C. W. S. Co., dated May 31, 1902; Liber V. 15, page 455, &c., Passaic County.

(152) Deed—Jose Agramotte and wife to J. C. W. S. Co., dated June 16, 1902; Liber P. 15, page 548, &c., Passaic County.

(153) Deed—Wilson S. Frederick, et ux. et al. to J. C.W. S. Co., dated May 12, 1902; Liber V. 15, page 233, Passaic County.

Deed—Jeremiah Frederick to J. C. W. S. Co., dated May 12, 1902; Liber V. 15, page 240, Passaic County.

(154) Deed—Harry Weatherby to J. C. W. S. Co., dated June 23, 1902; Liber P. 15, page 511, &c., Passaic County.

(155) Deed—Frederick A. Horton, et ux. to J. C. W. S. Co., dated June 23, 1902; Liber K. 15, page 62, &c., Passaic County.

(156) Deed—Franciska Kuch and husband to J. C. W. S. Co., dated June 23, 1902; Liber K. 15, page 64, &c., Passaic County.

(157) Deed—William D. Batchelor et ux., et al. to J. C. W. S. Co., dated June 6, 1902; Liber P. 15, page 504, &c., Passaic County.

(158) Deed—Mary Dodd, et al. to J. C. W. S. Co., dated June 30, 1902; Liber P. 15, page 519, &c., Passaic County.

Deed—Francis M. Tichenor, et al., executors, to J. C. W. S. Co., dated June 30, 1902; Liber P. 15, page 515, &c. Passaic County.

(159) Deed—Meers Artificial Leather Company to J. C. W. S. Co., dated September 27, 1905; Liber G. 17, page 246, &c., Passaic County.

(160) Deed—Mary G. Kingsland and husband to J. C. W. S. Co., dated June 9, 1902; Liber P. 15, page 524, &c., Passaic County.

(161) Deed—Mary G. Kingsland and husband to J. C. W. S. Co. dated June 9, 1902; Liber V. 15, page 228, &c., Passaic County.

(162) Deed—Otto W. Scholz and wife to J. C. W. S. Co., dated July 31, 1902; Liber F. 16, page 54, &c., Passaic County.

(163) Deed—Albert P. Fischer and wife to J. C. W. S. Co. dated July 7, 1902; Liber S. 15, page 293, Passaic County.

(164) Deed—Caroline Felder, et als.to J. C. W. S. Co., dated November 5, 1902; Liber X. 35, page 285, Essex County.

(165) Deed—Maria L. Pimley and husband to J. C. W. S. Co., dated June 26, 1902; Liber O. 35, page 339, Essex County.

(166) Deed—Theodore Sanford, et als. to J. C. W. S. Co., dated July 29, 1902; Liber X. 35, page 279, Essex County.

(167) Deed—Arthur E. Sanford and wife to J. C. W. S. Co., dated October 1, 1902; Liber X. 35, page 277, Essex County.

(168) Deed—John P. Searle and wife to J. C. W. S. Co., dated June 23, 1902; Liber O. 35, page 346, Essex County.

(169) Deed—Charles T. Barney and wife to J. C. W. S. Co., dated November 8, 1902; Liber P. 35, page 477, Essex County.

(170) Deed—Elodie Van Zandt Wheeler, widow to J. C. W. S. Co., dated July 10, 1902; Liber O. 35, page 337, Essex County.

(171) Riparian Grant for crossing Passaic River.

(172) Commissioners' Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply, of lands of the estate of Maria L. Travers, et als.

(173) Deed—John C. Post to J. C. W. S. Co., dated June 20, 1902; Liber 548, page 10, Bergen County.

(174) Deed—Morris & Essex Railroad Company to J. C. W. S. Co., dated November 10, 1902; recorded Liber 623, page 613, Bergen County.

(175) Commissioners Report and Award; In the matter of the application of The Mayor and Aldermen of Jersey City, for the condemnation, for its new water supply, of lands of Marion Tobolewski, et als.

(176) Deed—Agreement Morris & Essex R. R. Co., et al. to J. C. W. S. Co., dated November 10, 1902; recorded Liber 623 page 617, Bergen County.

(177) Deed—Morris & Essex R. R. Co., et al. to J. C. W. S. Co., dated November 10, 1902; Liber 623, page 613, Bergen County. Same as 174.

(178) Deed—William R. Travers, et als. to J. C. W. S. Co., dated March 1, 1901; Liber 543, page 634, Bergen County.

(179) Deed—Morris & Essex R. R. Co., et al. to J. C. W. S. Co., dated November 10, 1902; Liber 623, page 613, Bergen County. Same as 174.

(180) Deed—Jeanette P. Goin and husband to J. C. W. S. Co., dated July 14, 1902; Liber 634, page 24, &c., Bergen County.

(181) Deed—Morris & Essex R. R. Co., et al. to J. C. W. S. Co., dated July 10, 1902; Liber 623, page 610, Bergen County.

(182) Riparian Grant for the crossing of the Hackensack River.

(183) Deed—Phoebe A. Watson, widow, to J. C. W. S. Co., dated June 4, 1902; recorded Liber 803, page 383, Hudson County.

(184) Deed—Henry Traphagen and wife to J. C. W. S. Co., dated July 1, 1902; Liber 809, page 301, Hudson County.

(185) Deed—Hackensack Meadows Company to J. C. W, S. Co., dated July 1, 1902; Liber 809, page 403, Hudson County.

(186) Deed—Morris & Essex R. R. Co., et al. to J. C. W. S. Co., dated July 10, 1902; recorded Liber 935, page 301, Hudson County.

(187) Deed—Abel I. Smith and wife, et als. to J. C. W. S. Co., dated September 1, 1904; recorded Liber 928, page 127, Hudson County.

(188) Deed—See 185.

(189) Deed—Hudson Realty Co., et al to J. C. W. S. Co., dated October 31, 1902; recorded Liber————, page ———, ————County.

(190) Deed—Erie R. R. Co. to J. C. W. S. Co., railroad crossing.

(191) Deed—Erie Land & Improvement Company to J. C. W. S. Co., dated October 31, 1902; recorded Liber————, page———, ————————County.

(192) Deed—T. A. Gillespie Co. to J. C. W. S. Co., dated June 24, 1902; recorded Liber 816, page 71, &c., Hudson County.

(193) Hudson County Board of Freeholders to J. C. W. S. Co., consent to lay pipes in county road.

(194) Deed—Daniel Comyn Moran, et als. to The Mayor and Aldermen of Jersey City, dated December 31, 1902; Liber 822, page 496, Hudson County.

Mr. VREDENBURGH: I object to these deeds because they don't cover all the property in question.

Mr. EDWARDS: Which property do you refer to as not covered; can you tell us now?

Mr. VREDENBURGH: I cannot tell you now.

Mr. EDWARDS: The foregoing is a list of the deeds; the deeds themselves are produced and if called for by the complainant will be at their examination.

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ADJOURNED.

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IN CHANCERY OF NEW JERSEY.

Between

THE MAYOR AND ALDERMEN OF JERSEY CITY,

Complainants,

and

THE JERSEY CITY WATER SUPPLY COMPANY,

Defendants.

Mr. Vrdenburgh and Mr. Record for Complainants.

Mr. Corbin and Mr. Edwards for Defendants.

Transcript of testimony taken in the above stated case before Honorable Frederick W. Stevens, Vice Chancellor, on Thursday, December 27th, 1906.

By Mr. VREDENBURGH: This happened, sir, since the adjournment of the case before your Honor, and I think I ought to bring it to the attention of the Court at once. Your Honor will recollect that when you so kindly opened the case on my request, to let me prove certain facts in regard to the fear of an epidemic by some of the officers in Jersey City and some action on their part. That gave rise to a great deal of discussion in Jersey City

and a committee was appointed by the Board of Trade and that gave rise to this. The Board known as the County Board of Health and Vital Statistics who are referred to in the contract, as your Honor will recollect, acted and served upon the city their action, which was to the effect that this water supply was polluted, and that the city must stop the pollution. Now that certificate, unfortunately in my haste, I did not bring with me, but I mean to have the certificate here. That certificate was served upon the city, and I suppose also was served upon the Water Company.

By Mr. EDWARDS: No, sir.

By Mr. VREDENBURGH: It was not. Well, it ought to have been, but it is not in line with my theory of the case; I never have thought that whatever the Board of Health and Vital Statistics of the County should do, had any bearing upon this case after we had agreed to purchase. If your Honor will recollect the language of that section—I don't know whether you recall it now or not—but my theory of the case was that after we had voted to purchase this supply, we were a purchaser within the meaning of the specification, and, therefore, the Board of Health and Vital Statistics of the County had nothing further to do with the matter. The other side apparently took a different view of it. The situation now is that they have served this certificate upon the city, and I supposed also upon the other side, and I felt it ought to be brought to the attention of the Court, although it is not in my view of the case relevant, and I should not urge very earnestly that it was material, but I take the first opportuni-

ty I have to make this statement to the Court with respect to that certificate, and the Court and the other side will, of course, deal with it as they may see fit. When it comes to my turn for rebuttal perhaps I may offer it and I may not.

By Mr. EDWARDS: That action was taken without any notice, and we think it was taken on the initiative of the city.

By Mr. VREDENBURGH: We deny that.

By Mr. EDWARDS: But inasmuch as Mr. Corbin is not here today and he has had that particular matter in his charge—he has been quite ill the past few days, although he expected to be here this morning to take part in this cause. I am very much in doubt whether it is a proper thing, but before any action is taken upon that question I should like that Mr. Corbin should be here.

By Mr. VREDENBURGH: That is perfectly satisfactory. I only thought that I ought to bring it to the attention of the Court the first opportunity I had.

By Mr. EDWARDS: Mr. Cook, have you got that chart here?

(Mr. Cook produces a paper).

By Mr. VREDENBURGH: Mr. Edwards had Mr. Cook upon the stand during the interval, before Mr. Knight, and Mr. Cook gave us some results of computations which he made but which depended upon some facts within the knowledge of others; for instance the reading of the heighth of the water in the reservoir for these five or six or seven days

was read by some man, I think by Mr. McIntosh, who was at the dam at the time, and I said it was not necessary to produce him, that I would take it for granted he read it correctly; it also depended upon the reading of the ventura meter at Jersey City, and I said as to that I would take it for granted that he did it correctly and we may not produce him. Another fact which was not within the knowledge of Mr. Cook when he gave his testimony I would prefer should be shown: for instance there was a diagram which showed the water entering the reservoir from which he calculated the amount of water which came in from the Rockaway river. That diagram I wanted to see and examine about, or at least to see it, and then if there was any question after I saw it I would like to ask Mr. Cook about it. There was another matter which I don't wish to escape me, I desire to call the Court's attention today to the fact that a gentleman named Mr. Sherred was on the witness stand at the adjournment of this case one day before I had quite completed his cross examination, but Mr. Sherrerd had to go to Albany the next day on some appointment, and it was suggested that he return to Court some day when it was convenient to him, to which I submitted. I have, however, served a notice on the other side that I desire to ask Mr. Sherrerd some more questions.

By Mr. EDWARDS: As to that I will say--(interrupted.)

By Mr. VREDENBURGH: I don't care to go on with him now, but whenever he is ready. I am ready now if you are; I don't want that to be overlooked.

Testimony of John H. Cook.

JOHN H. COOK, recalled on behalf of the Defendants.

DIRECT EXAMINATION by Mr. Edwards:

Mr. VREDENBURGH: Now, if the Court please, I objected to them recalling Mr. Cook before Mr. Knight, without your Honor's permission, because it seems to me that as the case lengthens out they cannot continually call a witness and put him on the stand, get through with him and then call him again, without your Honor's consent.

Mr. EDWARDS: We have recalled him on entirely different matters, and have exhausted him on each matter, and we thought that it would be very much easier for your Honor to understand the testimony if it was taken seriatum as to each question.

The COURT: You may proceed.

Q. Mr. Cook, have you made up a diagram showing the comparison of the number of bacteria with flow of the Rockaway river from November 1, 1905 to November 1, 1906 from data furnished to you?

A. Yes, sir, I have.

Q. And is this the diagram?

A. To December 1, 1906.

Q. Yes.

A. This is the diagram.

Q. Will you now please explain to the Court what the various data on this diagram is, and from whom you obtained it. You simply acted, I suppose, as the draftsman?

A. I made certain computations and received certain things from Dr. Leal. The doctor told me the number of bacteria per cubic centi-meter for each of

these days, which are here noted. You see, November 1, 8, 15, 22 and 29th, and the days are marked as they continued throughout this year. The diagram ends on the first of December, 1906.

Q. What day of each week?

A. The dates were the dates which the doctor gave to me, on which the samples were taken, so he said.

Q. And they are generally about a week apart?

A. They are about a week apart. Now the flow is computed for the day previous to which the sample was taken. I did that according to the instructions of the doctor.

Q. For instance, you took the first date furnished you by the doctor, November 1st?

A. November 1st.

Q. What date did you give the flow for?

A. For the day previous to that, which was October 31st.

Q. October 31st?

A. Yes, sir.

Q. And the flow at what point?

A. This flow which I computed was the flow of the Rockaway river.

Q. Oh, the Rockaway?

A. Yes, sir.

Q. Into the reservoir?

A. As deduced from the flow over the spillway at Boonton, together with the delivery of water at Jersey City.

Q. And do you obtain that data of the flow of the Rockaway river in the same manner that you give the flow upon the map of Mr. Bardner's?

A. Yes, sir, the same way.

By the COURT:

Q. Now, the flow of the Rockaway river at what point?

A. Into the reservoir at Boonton.

New Jersey State Library

By Mr. EDWARDS:

Q. That is the flow of the river; now this map shows that, does it?

A. On this scale here which is marked million gallons per twenty-four hours these flows are plotted as they come along, for each day. For instance, the flow on the 31st of October was at the rate of about seventy-three million gallons.

Q. Then each line between the naught and the hundred represents?

A. Two million gallons.

Q. Then the black line running across the map—

A. Across this space here?

Q. In zig-zag shape—

A. Is simply to give some width so that the line can be readily traced.

Q. Can you trace from this the flow of the Rockaway river on any date?

A. This is the line of flow; this is the regular black line here which I follow with my finger on the diagram; this blue line here is the quantity of water which was delivered through the venturi meter.

By the COURT:

Q. When you speak of the blue line say the blue line that runs parallel—

A. This blue line which has comparatively little variation and runs across the map and in approximately a straight line, shows the quantity of water which was delivered through the venturi meter at Jersey City on each of these days which are marked on the sheet.

Q. Then the zig-zag line is the flow of the river the day before the date mentioned at the bottom of the map?

A. Yes, sir.

Q. And the blue line?

A. Is the flow on that same day.

Q. Into the reservoir at Jersey City?

A. Reservoir at Jersey City, yes, sir.

Q. Now will you tell us from your map how much does the delivery to Jersey City vary?

A. Well, it doesn't vary very much; it is from about thirty-three millions at the start to about thirty-seven millions at the end, with some slight differences from day to day between.

Q. It does not vary over four millions either way from that, does it?

A. It did not during this period.

Q. Now, then, will you tell us, during this period for illustration, on the map, what was the smallest flow of the Rockaway river during this period?

A. As it is marked, on the 22d of September, 1906, when the flow was about 26,000,000 gallons.

Q. Was that the day before the 22d of September?

A. That was the day before the 22d of September.

Q. What was the highest flow?

A. The greatest flow was on the day before April 11th, 1906, when the flow was about 622,000,000 gallons, as I compute it.

Q. Now, then, what other data appears on this diagram?

A. The red line at the bottom of the diagram shows the number of bacteria plotted in accordance with the scale that is marked in red, so that the numbers of bacteria may be compared with the flow on those days.

Q. The numbers of bacteria where, as you understand it?

A. Why, the doctor gave me the number of these bacteria, and I believe—but perhaps it is just as well that I should let—

Q. (Interrupted) Gave you the number of bacteria?

A. Gave me a list of the number of bacteria.

Q. How did they run; from what to what?

A. Well, the highest number of bacteria was on the seventh day of March, 1906, when there were about 320.

Q. 320 to the centi-meter?

A. 320 to the cubic centi-meter; and the lowest day was the 18th day of June, 1906, when there were about 10 bacteria per cubic centi-meter.

Mr. EDWARDS: May it please the Court, we offer this diagram in evidence, subject, of course, to the further proof of the facts.

Mr. VREDENBURGH: I object to it as not being properly proved.

WITNESS: I was going to say that I can tell how I computed these different days.

Q. You computed it accurately?

A. Presumably. I computed it.

The COURT: Of course, it is competent so far as it is an exhibition of the work of this witness. It is not competent as a whole because it is the work also of others.

Q. I mean, so far as your work is concerned, it was computed accurately?

A. Oh, yes.

CROSS EXAMINATION by Mr. Vredenburgh:

Q. Mr. Cook, these figures given you by the doctor were given you when?

A. At different times. The greater part were given me at the time I made this computation, which was about November, 1906. I have a date here, November 2d, 1906, when I made a computation of

flow, and it was for this purpose; so it must have been about that time. But he gave me the record for the last three or four days on that diagram only a few days ago.

Q. What he gave you was a statement of number of bacteria?

A. Yes, sir.

Q. Is there anything on that map which he gave you except the number of bacteria?

A. No, sir.

Q. The first date of that map is November 5th, 1905, is it?

A. I think it is November 1st, but the map will show for itself.

Mr. EDWARDS: November 1st.

Q. 1905?

A. Yes, sir.

Q. Does this map show in any way whether the year from November 1st, 1905 to November 1st, 1906 was an unusually wet year or an unusually dry year?

A. It is not supposed to show anything of the sort.

Q. Is it supposed to show when the storms occured if any during the year 1905?

A. Only in so far as you may assume that a large flow of the river at certain seasons must have been produced by some storm which took place previously.

The COURT: Or by melting snow? This flow was in March.

WITNESS: April, I think. April was the largest flow, if you please.

The COURT: Yes. The number of bacteria was the largest in March. Yes.

Q. Have you indicated on this map how much water came in the reservoir from the springs and ditch that ran down from the Parsippany dam and united with the Rockaway river in what is now the bed of the reservoir?

A. I know nothing about such springs, and I have not taken any such springs into account.

Q. That is to say, if there were any such springs and any such river, that should be deducted in order to find how much water came in from the Rockaway river?

A. Very likely.

Q. Isn't that so? You ascertained the flow of the Rockaway river from these facts? You in some way ascertained how much the elevation or depression of the water in the reservoir was on a particular day; and from that you computed the amount of water which came into the reservoir—

A. (Interrupting) Yes.

Q. And from that you deducted whatever ran over the spillway and whatever ran through the conduit to Jersey City, and the remainder you say is the water that came in the Rockaway river?

A. I don't think I did it just like that. I took the quantity of water that went over the spillway, and as it happened I believe the water ran over the spillway every day but one in this computation I have made.

By the COURT:

Q. Can you compute the water that runs over the spillway?

A. Yes, within reasonable limits. I don't claim it is absolutely accurate, but it is as accurate as it is necessary to be for such a purpose as this.

By Mr. VREDENBURGH:

Q. You computed the amount of water than ran over the spillway, and you also obtained from the

reading of the meter in Jersey City the amount of the water that ran through the conduit?

A. Yes, sir. Those two added together are the quantity that presumably came down the river.

By the COURT:

Q. Would the wind make any difference?

A. Not for such a purpose as this. The difference the wind would make—(interrupted.)

By Mr. EDWARDS:

Would practically equalize it?

By the COURT:

Q. Would it if the wind had been very strong from the east, say?

By Mr. EDWARDS: Those two things would equalize each other in such a long computation as this, that is what I mean to say.

FURTHER DIRECT:

Q. Now, Mr. Cook, have you allowed anything for evaporation?

A. No, sir.

Q. You made no computation of the amount of water in the reservoir for this purpose?

A. No, sir; the reservoir was full, as I say, on all the days which I have given except one.

Q. As to the number of bacteria on these particular dates and as to the flows would depend entirely upon the correctness of the information you received from the doctor?

A. Yes, sir.

Q. Nor do you indicate in any way what kind of bacteria they are?

A. No, sir.

Q. But you have stated on this diagram this: "Diagram showing comparison of number of bacteria and flow of Rockaway river from November 1, 1905 to November 1, 1906?"

A. That I put on months afterwards, at the doctor's suggestion, and the title was not changed.

Q. Then you have here block line?

A. Black line.

Q. Black line. Where is December on this diagram, Mr. Cook?

A. December, 1905 is there, but, of course, December 1906 is not there because it is not yet passed.

Q. I understand you to say the title of the diagram is incorrect because it says from November 1, 1905 to November 1, 1906, and that you had added December?

A. No, sir; I added a month, I said, which is not the month of December but the month of November because this ends November 1, 1906.

Q. You refer to this, November, 1906, 5, 12, 19 and 25th?

A. Yes, sir.

Q. You also have on this "black line flow of Rockaway river for 24 hour period one day previous to date upon which sample was taken." I don't know when the sample was taken, do you?

A. Only by what was said by the doctor.

Q. You mean by that that it was the day before the day on which the doctor told you it was taken?

A. Exactly.

Q. You also have here "red line number of bacteria in sample taken from high surface in Jersey City" that you know nothing about at all?

A. Only from what the Doctor told me, sir.

Q. Then you have blue line daily draft of Jersey City; how did you obtain that?

A. That was from the meter readings.

Q. When you say on the diagram "Flow from November 1, 1905, to November 1, 1906"; that is not true, is it?

A. It would be perhaps more proper to say the flow on certain days between those dates, yes, sir, I guess that is more correct.

Q. It don't purport to be continuous daily taking?

A. No, sir.

Q. Or on regular days?

A. No, sir; only on these dates given.

Q. Only upon certain dates picked out by Dr. Leal?

A. Yes, sir.

Q. Only upon certain dates picked out by Dr. Leal?

A. Yes, sir.

Q. Having the flow of the Rockaway River, and having been told how many bacteria were found on a certain day in a cubic centi-meter of water, you compute how many bacteria there would be in the whole flow of the Rockaway river if each cubic centi-meter of the Rockaway river contained the same number of bacteria that you found—that was told you was in this cubic centi-meter?

A. No, sir; nothing of the kind.

Q. Well, please explain what you mean?

A. I have said that this is not a comparison of bacteria in the Rockaway river and a comparison of the bacteria in the water of Jersey City at all. This is a diagram which shows the flow of the river, and on the same days shows the number, or at least in a day later than the flow of the river, the number of bacteria in the sample taken in the tap in Jersey City.

Q. Then it was upon the assumption that it took a certain time to get to Jersey City?

A. That was the assumption. The doctor told me to do it in that way and I did it in that way.

Q. This is not to compare the bacteria in amount at all, but it is to show something that the Doctor wishes to illustrate in his testimony?

Q. And he will explain to us about that?

A. Yes, sir; I am only proving the diagram.

Q. How long does it take, as a matter of fact, for the water to flow from the dam to the Jersey City reservoir?

A. At this time—the influence of the increased draft made at the dam is felt at Jersey City in about I believe a day, something like 18 to 24 hours, or something like that. Exactly how long it takes for the water which is introduced in the conduit to get down to Jersey City I don't know; I could compute it, perhaps, by taking a little trouble, but I don't know offhand.

Q. I believe it would be greater at some points than others?

A. I don't think I would like to say without making a computation.

Q. You don't know what the rate of flow is in that aqueduct?

A. I don't know offhand; it would depend, of course, upon the quantity they were drawing; it varies from time to time.

Q. What difference would it make whether they drew 34 million gallons or 38 million gallons; what difference would it make in the time it took the water to flow from the gatehouse to the reservoir in Jersey City?

A. I don't know, I haven't computed it. I can compute it. I don't like to talk about these things offhand because some fellow will go on the stand and

say it does not take that length of time. If you would like to have me compute it I will do so, but I don't know offhand.

Q. You never have computed it?

A. No, sir; strange as it may seem I have not computed it; I can compute it, but I have not computed it.

By the COURT:—

Q. Before we leave that subject, what do you mean when you say that the influence of the flow of the river would be felt at Jersey City?

A. The demand at the Jersey City reservoir regulates the quantity of water which goes down the conduit for the necessities of Jersey City, and the man in charge telephones and asks the man at Boonton, to give him two million gallons more or a million and a half more if need be that day, and the man at Boonton increases the quantity and there is a meter at Jersey City which registers the amount coming in every 15 minutes, and he observes the run or the flow of the water, and it takes about, well—about as I say, 18 hours or something like that before he would notice that the quantity of water delivered to Jersey City had been increased.

Q. In other words, he would not get any increase in the delivery until about 18 hours after he had telephoned?

A. Something like that; I am not speaking very accurately about it.

Q. Then he opens the gate—the water gate—so that that result may be produced immediately?

A. The man at Boonton?

Q. Yes?

A. Yes, sir.

Q. Doesn't that indicate that it takes 18 hours or so to get to Jersey City?

A. Well, I don't think it would be an absolute indication of it.

By Mr. EDWARDS.

Q. But it would be an approximate indication?

A. It would be an indication; I don't know how close it would be.

FURTHER CROSS:—

Q. Now what relation has the flow of the Rockaway river to the number of bacteria on this diagram?

A. It is just what the diagram is intended to show.

Q. What?

A. Well, I cannot say what the picture intended it to show; he told me about what he intended it to show, and asked me to make it and I have made it.

Q. Well, I would like to know from you, when you say here November 1, with a black line above it, what does that black line mean?

A. On that day, November 1, there were about 100 bacteria in Jersey City?

Q. How is that indicated on this map?

A. Right there. My line has a little division which means 100 bacteria, and then the thousands are in red so that they can be easily distinguished.

Q. On November 1, up to the red line, there was 100 bacterna in Jersey City?

A. Yes, sir.

Q. In one cubic centi-meter of water?

A. Yes, sir, and on that same day Jersey City was drawing about 33 million gallons of water, and on the day previous the flow of the Rockaway river was about 73 million of gallons.

Q. Now then you said something about the proportion of bacteria that would be in the flow of the Rockaway river?

A. I don't think I said anything of the kind.

Q. Well, is that all you have on this diagram what you have stated just now, the date, the number of bacteria in a cubic centi-meter of water, the draft in Jersey City and the flow in the Rockaway river?

A. Yes, sir.

By Mr. VREDENBURGH: This examination of mine about the diagram is because it was put in without any explanation, and I objected to it.

By the COURT: It is not offered yet.

RE-DIRECT:—

Q. If you had figured the vibration would that have raised or lowered the flow of the water?

A. It would have added slightly, very slightly, to the flow, and there are possible errors in computation, which in my opinion would make it unnecessary to consider such a trifle as that.

Q. What do you mean when you say the days were picked out by Dr. Leal?

A. Did I say that?

Q. In answer to Mr. Vredenburgh's question; he asked you whether Dr. Leal had picked out the days?

A. The Doctor gave me a list of days, and from those days I computed the flow and gave him the data on this diagram, as he requested it. I don't know anything about it beyond that.

Testimony of Dr. John L. Leal.

DR. JOHN L. LEAL, sworn on behalf of the defendants.

DIRECT EXAMINATION by Mr. Edwards:—

Q. You are connected with the Jersey City Water Supply Company?

A. Yes, sir.

Q. And in what capacity?

A. Sanitary Adviser.

Q. I call your attention to the diagram just spoken of by Mr. Cook, did you furnish any of the information upon which that diagram was based, and if so what information did you furnish?

A. I requested Mr. Cook to prepare the map giving the flow of the Rockaway river, on the days preceding the dates of my bacteriological examinations; I gave him a list of the dates and asked him to compute the flows for those dates, and I also gave him the figures of the count.

Q. Have you those figures here?

A. Yes, sir; these are the original reports; I have here a blue print from these originals.

Q. From whom did you get the report?

A. Doctor McLoughlin.

Q. And is this the blue print that you gave Mr. Cook?

A. No, I gave no blue print to Mr. Cook; I simply gave him a list of the days taken from those original reports.

Q. Giving him the bacteria?

A. Giving him the number of bacteria.

Q. From whom did you get the number of bacteria?

A. Every week I received from Doctor McLoughlin a report like those, which gives, with other information, the number of the bacterial count.

Q. Did you accurately give the bacterial count for those days to Mr. Cook?

A. I did. My idea was to make it the last preceding year.

Mr. VREDENBURGH: I object to what his idea was.

The COURT: Well, this is an explanation of the table that has been offered in evidence.

The WITNESS: This map was prepared at the time of the last hearing before your Honor, and I think that was November, and at that time it was brought up to November 1st. As it wasn't used at that time I requested Mr. Cook to extend it another month, so that now the map, I believe, runs to December 1, 1906, and the figures of the bacterial count are those taken from the reports of Doctor McLaughlin, the originals of which are here.

Q. Will you give us the reports for those days?

Mr. VREDENBURGH: Objected to, because Dr. McLaughlin is not here. Let him go on the stand and prove it; that is the right way to do it, and I object to doing it in any other way.

The COURT: Those papers cannot be offered in evidence now.

Mr. EDWARDS: I don't offer them; I ask him to give them to us for those dates.

The COURT: I think, strictly speaking, Dr. McLoughlin should be called first.

Mr. EDWARDS: I will have him identify the papers and then we will have Mr. McLoughlin.

Mr. VREDENBURGH: I object.

The COURT: Undoubtedly you can identify these papers as being those from which the data on that map was made.

Q. Will you give us the date?
A. November 1, 1905.

Mr. VREDENBURGH: That identifies it, doesn't it?

The COURT: This is mere identification, unless you waive that.

Mr. VREDENBURGH: I don't waive anything, but November 1st, identified it. I think it is to the benefit of my case that Dr. McLoughlin should go on first before Doctor Leal; I only say that to explain why I am a little persistent about this thing.

The COURT: None of the figures that the witness is now referring to will enter in the case until they are verified by Doctor McLoughlin, but for the purpose of identification they are competent.

Q. November 8, November 15, November 22, November 29, December 6, December 14, December 20, December 28,—have you them all down to November 25th?
A. Yes, these are all in order.

Mr. EDWARDS: I ask that those be considered in for identification only.

CROSS EXAMINATION by Mr. Vredenburgh:—

Q. Doctor, have you reports before that date?

A. Yes, sir.

Q. What is the date of the report before that date, November 1, 1905?

A. 25th of October.

Q. What is the date of the report previous to October 25, 1905?

A. The 18th of October. I have them for every week, sir, if that is what you wish.

Q. Substantially every week?

A. Yes, sir.

Q. From what date?

A. From the time we went into the Jersey City Water Supply Company.

Q. When is that, about when?

A. 1902, the Spring of 1902.

Q. Have you them from the date on which the water was turned on from Boonton?

A. Yes, sir.

Q. And that was what date?

A. 23rd of May, 1904.

Q. In the afternoon of the 23rd of May, 1904?

A. Yes, sir.

Q. That is all.

Testimony of Dr. George E. McLoughlin.

DR. GEORGE E. McLOUGHLIN, sworn on behalf of the defendants.

DIRECT EXAMINATION by Mr. EDWARDS:

Q. Where do you reside?

A. Jersey City.

Q. How old are you?

A. 37.

Q. What is your occupation?

A. Bacteriologist and physician.

Q. Are you a doctor of medicine?

A. Yes, sir.

Q. And from what schools are you a graduate of?

A. Graduate of the University in New York.

Q. Medical department?

A. Yes, sir.

Q. Have you, in the course of your profession, taken up any specialty?

A. Yes, I have taken up the study of bacteriology.

Q. How long have you pursued that study specially?

A. Since 1896, or 1897, I don't just remember.

Q. Where have you pursued those studies?

A. I pursued them in New York.

Q. Where?

A. In New York, at Post-graduate medical school, in the laboratory.

Q. How long?

A. Oh, about two years, I should say, there at odd times.

Q. Where thereafter?

A. In Hamburg and in Berlin.

Q. Under who in Hamburg and in Berlin?

A. The work in Hamburg and Berlin was more following out lines of work that was being done at those places than under any one special man; more

getting their lines of technique, you might say, than studying under any special man.

Q. How long were you there?

A. I was in Hamburg about three weeks and Berlin about seven weeks, I should say.

Q. Did you go there especially for this purpose?

A. Yes, sir.

Q. Under invitation from whom?

A. In Berlin I was under invitation from Professor Hontsman.

Q. Well, what experience have you had in Jersey City in making bacteriological examinations?

A. You mean the length of time?

Q. Yes, and what you have done, and for whom you do it, and how frequently you do it?

A. Well, as to frequency I should say I do it about every day of my life, several times, different kinds of examinations.

Q. And examinations of what?

A. Examinations of water, examinations of spitum for tuberculosis, examinations of cultures from the throat of individuals who are ill, for suspected diphtheria, examinations of blood for typhoid fever, and various clinic microscopical examinations.

Q. For whom do you do that?

A. I should say I do it for nearly all the physicians of Hudson County. I am also connected with two of our Hospitals in Jersey City, on the staff as bacteriologist, and one in Bayonne.

Q. Do you practically devote your whole time to this question?

A. Very nearly, practically I should say.

Q. What societies do you belong to that are connected with this work?

A. I belong to the American Public Health Association. I belong to the American Society for the Advancement of Science. I belong to the New

York Pathological Society; the New York Academy of Medicine; am a member of the New England Water Works Association, and possibly one or two others that I don't just recall.

Q. And the New Jersey State Sanitary Association?

A. Yes, sir.

Q. Then you practically do a great bulk of the bacteriological work in Hudson County, don't you?

A. I should say I do, yes.

Q. Now then, doctor, what experience have you had in making bacteriological examinations of water for drinking purposes?

A. I have been making such examinations since about 1898 or 1899.

Q. For whom?

A. For different people. I was trying to recall the date of the first case in which I was associated, and that was a case I think in these very chambers; it was a case of the Marcus Byrne against the City of Newark, as regards the putting in of a large sewer here in the Passaic—

Q. Marcus Sayre?

A. Yes, that is it; that was, I should say, along the latter part of the nineties, somewhere about 1897 or 1898.

Q. Since that time what experience have you had in the bacteriological examinations of water?

A. Since that time I have made a special study of it in 1900, as I testified I was studying it in Hamburg and in Berlin, and then I have been studying it by keeping track of the different publications, by research work of my own and by attending the meetings of the different societies that are devoted to this work.

Q. Do you have a laboratory in your house?

A. Yes, sir, I have a private laboratory, as well as the hospital laboratory.

Q. Well, have you acted in the examinations of water supply for any municipality?

A. I have made some examinations for Jersey City, yes.

Q. When did you first begin to examine the water from the Rockaway water shed?

A. As I recollect, the date was 1902; Doctor Leal possibly could tell exactly. 1900.

Q. That was while the Flynn party was still in controll?

A. Yes, sir.

Q. Have you continued that work ever since?

A. I have.

Q. Now just tell us what examinations you have made from time to time in connection with keeping track of the water to be furnished to Jersey City?

A. What do you mean, Mr. Edwards, by what examinations I have made?

Q. What bacteriological examinations have you made?

A. How often I have made them?

Q. Yes.

A. I should say for the last three or four years I have made them weekly, on an average of weekly examinations.

Q. Have you made examinations of the water at the tap in Jersey City?

A. Yes, sir.

Q. And did you furnish the results of those examinations to Dr. Leal?

A. I did.

Q. Weekly?

A. Approximately, yes.

Q. Are these the reports that you so furnished?

A. I would have to look them all over. Yes, those are my reports.

Q. Are they in your handwriting?

A. They are.

Q. And upon a blank made up by you?

A. Yes.

Q. Do these reports show the number of bacteria in the water, per cubic centimeter, as taken from the tap in Jersey City?

A. Yes.

Q. And did you furnish these reports to Doctor Leal?

A. Yes; furnished them to Doctor Leal—to the Jersey City Water Supply Company, and the Jersey City Water Supply Company furnished them to Dr. Leal.

Q. Which column shows the bacteria per cubic centimeter for each day?

A. The column in the center of the report. It has a heading: "Number of bacteria per c. c., 2 days incubation, at 20 degrees Centigrade."

Q. What does that mean? How do you arrive at those figures?

A. A certain amount of water is taken. This is introduced into a tube containing a nutrient media which is sterilized; and it is then poured from that tube into small glass dishes which are also sterile. The medium, or the culture jelly, is poured into the dish so that it fills or completely covers the bottom of the dish. They are then placed in an incubator, which is then kept at 20 degrees Centigrade.

Q. 20 degrees Centigrade. What would that correspond to in Fahrenheit?

A. What we call room temperature. About 72. And at the end of two days a count is made of the colonies that are growing in the culture jelly.

Q. Is that the usual way of ascertaining bacteria in water?

A. That is the usual way; yes, sir.

Q. Why don't you count the bacteria the moment you take it from the tube?

A. Well, they are very small, Mr. Edwards, and many of them have a motion; and it would be practically impossible. We have of late been doing some direct counting work with sewage bacteria, but that is only where they are in exceedingly large numbers, up in the millions. And then we only approximate them within may be a hundred thousand of the number present.

Q. Is this method more exact?

A. It is the only exact method, I should say.

Q. Does this culture increase or decrease the bacteria?

A. Well, there may be some that do not grow, but it is the nearest approach that we can obtain to a count of the numbers.

Q. Then you don't increase the number of bacteria? You simply fatten them up?

A. We don't increase the number of bacteria.

Q. You simply make them so that you can count them?

A. Yes, so that they will grow. Each individual bacteria in growing produces a family around itself, propagates, and in that way it makes a small spot in the culture jelly that we can see.

Mr. VREDENBURGH: You don't count him then because he is fat?

WITNESS: No. I don't understand.

Q. And you gave these data to Dr. Leal?

A. These reports were sent to Doctor Leal.

Mr. EDWARDS: We offer these reports, so far as they show this column. We don't offer them for anything else.

Mr. VREDENBURGH: I object to that. One ground is that there is nothing in the contract which says anything about a tap, and nobody knows where it is.

The COURT: Can't they show how many bacteria this water contains at different points?

Mr. VREDENBURGH: If they take it somewhere else and try to show it there, that shows the number of bacteria that have been reduced from the point in which we deliver the water to the point where they count it.

Mr. EDWARDS: The question is what the water is when it gets to the people of Jersey City.

The COURT: What do you mean by the term tap?

Q. What do you mean by that, Doctor?

A. I mean by the tap the spigot or hydrant in a room over a basin, the tap which you turn on to obtain some degree of water—the faucet, in plain English.

The COURT: Well, of course, this evidence will hardly contradict the evidence on the other side as to the purity or impurity of the water at other points. The question is, of course, what the contract says. But I will let this evidence go in, if that is the only objection to it.

Mr. VREDENBURGH: This tap may be over in New York so far as your Honor knows.

Testimony of Dr. George E. McLoughlin.

Q. Where is the tap?

A. The tap that these samples were taken from is in the laboratory at Christ Hospital. The laboratory is on a direct line, I am informed, from the intake—(Interrupted).

The COURT: Of course, that is a matter for cross examination. As I say, if the contract calls for pure water at some other point, why this will be no proof that the water is being delivered pure at that point. But, still I think it is a very proper thing to ascertain its purity at different points That has been the plan pursued by the complainant in this case, and I see no reason why it should not be pursued by the defendant. But it has not been shown as yet how this water was taken from the tap, where it came from in fact. You will have to show that.

Q. Where was this tap that you took the water from?

A. In the laboratory at Christ Hospital at Jersey City.

Q. Any filter connected with that tap?

A. There is not.

Q. Do you know, as a matter of fact, where the pipe that connects with that tap runs from?

A. I have been informed by—(Interrupted).

Objected to.

Q. You don't know of your own knowledge?

A. I don't know of my own knowledge.

Mr. VREDENBURGH: And I think the doctor can't say whether there is any filter there, really.

WITNESS: Yes I can.

Mr. EDWARDS: We offer that, your Honor, and propose to connect that—

Q. That is Jersey City water?
A. That is Jersey City water.

By the COURT:—

Q. Who took the water out of this tap?
A. I did.
Q. And did you personally conduct all the operations from the time that it was taken out up to the time when the number of bacteria were ascertained?
A. I just want to get my dates here and be positive of that. There was a time during this last summer that I was away, that I did not personally.

By Mr. EDWARDS:—

Q. What was that time?
A. That time was part of July, and August.
Q. And who did it for you then?
A. It was done for me by a man who assists me in the laboratory.
Q. A man that you have under your supervision the rest of the year?
A. Yes. He has been with me for several years.
Q. Who understands this work?
A. Understands it.

(Question objected to as leading.)

Q. And what is his name?
A. James Eggleson.
Q. Is he a doctor?
A. He is not a doctor.
Q. Is he a bacteriologist?
A. He has worked with me in the laboratory for some four years, I should say, every day; and he has

had training with me to a certain extent. He can do the routine work. From his work the conclusions were drawn by myself.

Q. And that covers only the period of part of June and some of July?

A. Part of July, and August, of this year.

Q. Now, can you tell us the date that you went away? Then we will be able to tell.

A. I went away on the 7th of July, 1906, and returned the early part of September. I can't tell you the exact date.

Q. Then he made the examinations for July 11th, 18th, 25th, August 1st, 8th, 15th 22d and 29th, and September 5th?

A. Yes.

Q. What day did you get back in September?

A. I think it was during the second week.

Q. All the rest you did yourself?

A. The rest I did myself.

Mr. VREDENBURGH: I want to cross examine about these tables. They are not admitted yet, are they?

The COURT: I will hear what the cross examination develops.

CROSS EXAMINATION by Mr. Vredenburgh:—

Q. Doctor, you said you took this from a tap, and by a tap you mean the faucet in Christ Hospital, I suppose?

A. Yes, sir.

Q. What kind of a faucet was it, brass, lead or what?

A. Well, it was a mixed metal, I think a mixture of copper and brass, the usual faucet for such purposes with a top screwed on it.

Q. And that faucet was connected with a pipe in the wall?

A. Yes, sir; a pipe that goes through the wall.

Q. Where does it run? From the wall, do you know of your own knowledge?

A. Yes, sir; from the wall it runs down alongside of the elevator shaft to the basement.

Q. What part of the basement?

A. Right by the elevator shaft.

Q. Then how near does the warm water pipe go toward the cold water pipe there?

A. Oh, they are within a foot of each other, I should say.

Q. Have you measured to see how near they are to each other at the nearest point where they run up the elevator shaft to the place where the water is delivered to the faucet in the room from which you took this water?

A. I have not measured it exactly, but I judge from what I saw.

Q. How are they in the elevator shaft, concealed or open?

A. No, sir; they are exposed; they show alongside of the elevator as you go up and down.

Q. How near are they to the elevator?

A. Just at the side of the elevator shaft.

Q. Do they run down the elevator shaft?

A. Yes, sir.

Q. Then how near are they together, are they exposed as they run down the elevator shaft or are they concealed?

A. They are about that distance I spoke of where they can be seen as they start down a short distance from the top.

Q. Well, the rest of the way you don't know how they are, do you?

A. The rest of the way I could not say positively about.

Q. Now that hot water pipe is of what size?

A. I did not measure it, Mr Vredenburgh.

By the COURT:—

Q. Is it in a box or all open from where it leaves the faucet down to the place where it strikes the ground?

A. They seem to have a plaster covering over it.

Q. Covered by plaster?

A. They seem to be covered by plaster, or at least is continued from it, and when the pipes are once inside of course they cannot be seen and they seem to be covered by the plaster there.

FURTHER CROSS:—

Q. Does that pipe furnish hot water for the whole of the hospital?

A. That pipe that goes to the upper floor or to the floor on which the water is located simply furnishes hot water for my laboratory.

Q. For what distance is it that it only furnishes water to your laboratory?

A. Well, I don't know whether that pipe on the floor above furnishes hot water for that floor or not.

Q. There is only one hot water pipe for the whole hospital, is there not?

A. No, sir; there are several; each line of basins has its own riser and pipe.

Q. This tap you speak of is in the third story of the hospital?

A. Yes, sir; the top story.

Q. Where is the hospital?

A. 176 Palisade avenue, Jersey City.

Q. You have no knowledge of your own, I mean personal knowledge, which way the pipes run after they leave the hospital?

A. No personal knowledge, no, sir.

Q. Now, Doctor, you say you examined this water for the number of bacteria in it, and you took from that faucet the amount of water you wanted to analyze; how much water did you take each time?

A. I took more than I wished to analyze, and from that amount of water we took what we required for analysis.

Q. How much did you take from the faucet?

A. Do you mean for taking account of bacteria?

Q. Yes.

A. Approximately 100 cubic centimeters.

Q. When you say that, what do you mean?

A. I mean cases when I took it myself, or in case I was away or the water was taken when I was away, the same amount was taken.

Q. And when you say you took the water from the faucet do you mean that you did it actually yourself or told your assistant to take it?

A. No, sir; I mean actually myself.

Q. You actually took it?

A. Yes, sir.

Q. And when you took the water, you took water of a certain amount?

A. Certain amount yes, sir.

Q. And from that you took a smaller portion to ascertain how many bacteria there were in that smaller portion?

A. Yes, sir

Q. And what time of the day did you take the larger portion?

A. What time of day did I sample it?

Q. No; what time of day did you take that larger portion from the tap?

A. No especial time of day, but it was usually, I should say, before noon, late in the morning as a rule.

Q. What time did you take the smaller sample from the large sample?

A. Immediately afterwards.

Q. Having taken that sample, in what sort of a vessel did you put it?

A. The sample from the tap you are speaking of?

Q. I mean the sample for the bacterial count?

A. The sample for the count was taken in a bottle holding 125 cubic centimeters or about that. That was taken and placed in a bottle taken from a brass cylinder that had a closely fitting top over the cork, and the bottle which had a mushroom stopper of glass, over which was placed a piece of gauze, and as I said, this bottle with brass container and the gauze over the stopper of the bottle had all been previously sterilized. The bottle was removed from this case and the required amount of water taken (interrupted).

Q. Well, hold on, Doctor, I would rather have you follow my questions. You say you took a sample from the tap of a certain large quantity of water sometime in the day, usually in the forenoon, that you took it yourself, and then from that large sample you took a smaller sample for the purpose of counting the number of bacteria in a cubic centimeter?

A. Yes, sir.

Q. Now that smaller portion you put in what kind of a vessel?

A. You are speaking of the count now for the bacteria?

Q. Yes.

A. That smaller portion was immediately put in a tube, a sterilized tube with a culture jelly which was liquidified; then from there it was put in an incubator and allowed to stay for two days.

Q. When you were putting that in a smaller bottle, did you mingle the water so as to have any particular portion of it the same as any other portion of it; did you do anything in that line?

A. I don't quite understand your question.

Q. (Question read.)

A. Yes, this water at the time it was drawn from the tap, at the time I drew some of it from the bottle into which it was originally taken, I doubt if it was over one minute of time before it was put into the culture jelly to be counted, so I necessarily did not do anything to it.

Q. You did nothing to it; when you put it in the culture to be counted, what did you do with that water?

A. I did not do anything to the water; I added the water to the culture jelly.

Q. What?

A. To the culture jelly.

Q. What was the culture jelly?

A. The culture jelly was a sterilized jelly composed of bouillon of standard strength and agararba.

Q. Where did you get the different ingredients from, the bouillon and the agararba; where did you get them from?

A. The ingredients themselves in the rough, do you mean?

Q. Yes.

A. Purchased them from the supply house in New York, that is, I got the ingredients for making them up, you understand—they were obtained by me in my laboratory. The material was purchased.

Q. And the agararba and bouillion were obtained by you, were they?

A. The bouillon was made by me.

Q. And the agararba was purchased and mixed with the bouillon?

A. Yes, sir.

Q. And at what temperature were they mixed?

A. Are you speaking of the proportion of culture jelly when the water was added?

Q. The water was added at what temperature—at what temperature was the water added to the mixture?

A. The water was of the temperature that had come from the tap because it was immediately added to the mixture; the mixture is solid and had to be heated up to blood heat to melt it, and then it is cooled down by adding this cold water; it cools down from a temperature of 40 degrees centigrade.

Q. Won't you tell us what temperature blood heat is by fahrenheit?

A. 98 1-2 or it may be 6-10 degrees.

Q. What is 40 degrees centigrade?

A. 40 degrees centigrade is approximately blood heat.

Q. Then the water was at whatever temperature it might come from the tap, and the mixture was at blood heat temperature?

A. You mean the culture jelly?

Q. Yes.

A. Yes, sir.

Q. But adding the two together, what temperature would that produce?

A. Well, that cooled the jelly, of course it cools immediately after the water is added to it.

Q. To what temperature is it reduced?

A. I could not say but it cools it sufficiently to harden it, it cools it down to a lower temperature in a very few minutes.

Q. Does that end the plating of it?

A. Yes, sir.

Q. Then I suppose you incubate it?

A. Those are put in incubators.

Q. And to this mixture of agararba and bouillon, a small quantity of water had been added, I suppose of one cubic centi-meter?

A. Varying amounts, sometimes I would not take as much as one cubic centi-meter, but the amounts

were always equal to bring it up to the proportion.

Q. To bring it up to proportion?

A. Yes, sir.

Q. Then you put it in the incubator?

A. Yes, sir.

Q. And heated it up to what temperature in the incubator?

A. Frequently it was not heated up to any temperature, I frequently cooled down the temperature; it was kept at a temperature of 20 degrees centigrade.

Q. Then you kept your incubator at a temperature of 20 degrees?

A. Yes, sir, centigrade.

Q. The purpose of putting that water in the agar-arba and bouillon and the purpose of putting this result in the incubator was to force bacteria to throw off what is called colonies?

A. It was to give them a chance to grow colonies.

Q. And not to give the individual bacillus a chance to grow or to give the number a chance to grow?

A. It was to give the individual a chance to reproduce so that the colonies might be counted easily.

Q. It wasn't to fatten one?

A. Well, I think that is closer to the idea of it, Mr. Vredenburgh, fattening the one, because in my view if you want me to demonstrate it as plainly as I can, fattening the one makes us able to count them, and we are in a way, you might say, fattening each one. If we have 20 bacteria we fatten each one of those 20, so that instead of being a small bacteria it becomes of a size that we can count under the glass.

Q. Then you use a magnifying glass to count them?

A. Yes, sir.

Q. Why do you call them colonies, if there is only one?

A. Because each one will have grown a colony around itself.

Q. Well, do you count the number of families?

A. No, we count each single bacteria which produces a family around itself, that family having started from one.

Q. When you look at it through a microscope, do you see the one you have fattened or a colony of them?

A. A colony.

Q. A number of colonies?

A. Yes, sir.

Q. You don't pretend to count the colonies, do you?

A. Yes, sir, that is what we do count, each colony.

Q. You don't pretend to count the number in each colony?

A. No, sir, that would not be fair, that would not give us any kind of results.

Q. When you say that there are so many bacteria you mean there were so many thousand, depending upon the number in each colony?

A. We speak of the number of bacteria in the original sample of water, not the number that are found after they have been incubated, but we count each original bacteria as producing one colony.

Q. What is the size of the plate which is covered by this one cubic centi-meter of water on which these colonies grow?

A. The plate is approximately 10 cubic centimeters in diameter.

Q. Do you count the number of colonies on the whole plate, or do you count the number of colonies on a portion of the plate, and then multiply it?

A. We count the number of colonies on the whole plate, or at least we endeavor to. We sometimes take a proportion of a cubic centi-meter instead of

the whole cubic centi-meter, and then multiply it so as to bring it up to a cubic centi-meter.

Q. Now, Doctor, the number of bacteria that will live at 20 degrees or 40 degrees—say 20 degrees centigrade, is rather more than you can find alive if you incubate them at blood heat are they not?

A. They are.

Q. Is it always so?

A. In dealing with potable water I should say yes.

Q. Well, those that are at blood heat are at a heat which is natural to bacteria that are injurious to the human organism, are they not?

A. Those at blood heat are at the temperature of pathogenic bacteria that grow in the human body.

Q. Well, by pathogenic you mean those that are injurious to human beings?

A. Yes, sir, although that does not necessarily prove because one grows it at that temperature that it is pathogenic it is impossible to say that.

Q. If you grow them at a low temperature you may grow a great many bacteria that are injurious to human organism, might you not?

A. Do you mean if they are injurious?

Q. Yes.

A. I should hardly say so.

Q. Well, that is not their natural temperature at which they would grow, is it, blood heat is the natural temperature at which they grow?

A. Well, you said blood heat, didn't you?

Q. No, sir, I said at 20 degrees centigrade?

A. Oh, I beg your pardon.

Q. If you attempt to obtain a number of bacteria at 20 degrees centigrade, you would kill those that only grow at blood heat, wouldn't you?

A. No, sir, I should not say that because blood heat is a favorable temperature, but they will grow at lower temperatures.

Q. How do you know?

A. By experience.

Q. What?

A. By experience.

Q. Did you ever grow any bacteria, to your knowledge, in water, that were injurious to human organism?

A. If that were the case we would not have any infection from typhoid fever in water.

Q. When did you make those experiments?

A. I could not tell you the exact time, it was sometime in 1906.

Q. Of what bacteria?

A. Typhoid bacillus.

Q. Isolated or in water?

A. I put it in water and grew it.

Q. Well, I mean isolated?

A. No, sir, I did not isolate it.

Q. In 1906 you took typhoid bacillus and grew it in water?

A. Yes, sir.

By Mr. EDWARDS.

Q. What is the difference between typhoid bacillus and typhus, if there is such a thing?

A. We ordinarily call typhoid bacillus, in applying a latin name to it bacillus typhosa. Then there is typhus fever, which is distinct from typhoid fever, so that I don't want to get them mixed up.

Q. Is it a germ disease?

A. What, typhus fever?

Q. Yes.

A. Well, that is rather uncertain what the cause of it is, it is what was called ship fever.

Testimony of Dr. George E. McLoughlin.

FURTHER CROSS.

Q. Well, typhoid is the proper name to apply to this?

A. Yes, sir, unless you speak of it in the Latin name.

By the COURT.

Q. What is the temperature at which this bacillus are killed, have you ever experimented on that?

A. Well, we have a standard temperature at which we sterilize our laboratory instruments and the articles used for cultures,&c and that temperature is 150 degrees centigrade of heat continued from half an hour to one hour.

Q. And that is necessary to kill them or that is the heat that is sure to kill them?

A. That is the heat that is sure to kill them.

Q. What is the heat that will kill them?

A. It is rather uncertain as to that; it varies a good deal I should say with the possible period of applying the heat with the bacillus in question. It is very likely that the heat of boiling water will do it, in fact it is positive that the heat of boiling water will kill them; a temperature of 100 degrees centigrade will kill them.

Q. And possibly a somewhat lower degree of heat?

A. Possibly somewhat lower.

Q. Is there any temperature which is known to arrest the growth of baccillus, short of killing them?

A. Yes, sir, I should say there was.

By Mr. EDWARDS: Is your Honor speaking of low or high temperature?

By the COURT: I am speaking of low temperature.

Testimony of Dr. George E. McLoughlin.

By the COURT.

Q. That is what you understood by my question, didn't you?

A. Yes, sir.

Q. How cold must it be to kill them, won't you tell us at what low temperature it will kill baccillus of the character you are speaking of, not necessarily typhoid but baccillus which is found in this water. My question referred rather to that. I suppose there are different kinds of bacillus in the water, but as the witness has only been telling us about bacillus that is found in this water, I would like to know as to the that, what would be the low temperature that would kill them?

A. Well, many of the ordinary water bacteria would live in a temperature at freezing point.

Q. How about typhoid?

A. I should say the same about that, that is for a time of course.

FURTHER CROSS.

Q. Now Doctor, if you had incubated this culture at 15 degrees centigrade you could have found as many bacteria or as many colonies, that is, colonies of another kind of bacteria?

A. I don't believe so.

Q. Well, if you reduced the temperature 5 degrees further or 10 degrees centigrade, you would find colonies of bacteria, would not you?

A. You would find some.

Q. And they would be a different kind of bacteria from those you found at a temperature of 20 degrees, would not you?

A. I should not say so.

Q. If Doctor you cultivated a cubic centi-meter of water which contains bacteria at a temperature you

would say of freezing point—incubated at that, you would obtain a certain number of colonies from that water which would not appear on the plate at all, if you cultivated it at blood heat, is not that so?

A. Which would not appear on the plate if cultivated at blood heat?

Q. Yes.

A. I should say that is not so; you would obtain colonies or they might be obtained at blood heat, assuming that blood heat was the temperature which it could be successfully cultivated at?

A. At 20 degrees centigrade.

Q. If you cultivate it at 20 degrees, as you did, why some might be killed that were in the water and you would not discover them at all?

A. 20 degrees is the best temperature for their growth—general growth.

Q. All you mean to say is that they mostly grow at that temperature, but there may be a great many in the water killed by that temperature, which you won't find at all?

A. Well, that is the temperature approximately at which the water is—you see it is nearer the temperature of the water, 20 degrees.

Q. Well, the water where it started might be at freezing point?

A. Well, freezing point would be ice or very near it.

Q. Well, there are, you say, bacteria that grow at that temperature or survive at that temperature?

A. Yes, sir.

Q. And will grow at that temperature?

A. Well, some might.

Q. That is, they will not freeze. Now these would be killed when you increase the temperature up to 20 degrees centigrade or they might be so far as you know?

A. Some might be, some of them probably would not be.

Q. So that when you give us the number of bacteria at twenty degrees centigrade—incubate at that you don't mean to tell us you have given all the bacteria in the water, you only intend to tell us that you give the number that will grow at that particular temperature, don't you?

A. We do, and we find that is the temperature producing the largest number.

Q. The point is this, you give us a certain number of bacteria, now you say or you assume that is all the bacteria in the water when in point of fact there had been more in the water?

A. I don't assume that but that is the generally accepted method, Mr. Vredenburgh we believe some are killed.

Q. And because some are killed, therefore you count them as you do?

A. Well, generally speaking you may say that possibly that was a fair count.

Q. Well now there is another. The character and species of bacteria in these colonies depend on the kind of food you give them, the culture medium, when they are incubated at 20?

A. They retain their own species.

Q. If you use other cultures don't you find other species in the water?

A. No, most of them grow in the different cultures.

Q. Most of them?

A. Yes, sir.

Q. Don't you usually get more when you use gelatine than when you use agar?

A. Yes, get some more.

Q. And are they not a different species?

A. The excess numbers that you get?

Q. Yes.

A. Not necessarily.

Q. Now why is it if you get more when you use gellatine then agar that you didn't use agar?

A. You mean the reverse.

Q. Yes, that you didn't use gellatine. You say you get more when you use gellatine than when you use agar. What you did use was agar, why didn't you use gellatine?

A. Because I find that many times in the warm weather on the gellatine we would get the liquifying colonies and so lose the whole plate, that is, the whole gellatine would become liquified, or a large portion of it, and that would interfere very much with our count, and that plate would be wasted. We were enabled to take a more uniform line, using the agar. That was one reason, and there were some other reasons.

Q. Well now, since you speak of that, when you use that agar in warm weather doesn't that liquify and run over the colonies so that you cannot judge with any certainty whether the colonies are killed or not?

A. Don't it spread?

A. It does not.

Q. It doesn't spread at all?

A. No, sir.

Q. Don't the colonies spread over the agar?

A. The colonies may under certain conditions.

Q. And in that way—

A. But they don't if you use certain precautions.

Q. Obscure the others?

A. No, sir, you could see it on others, you could see the small colony through the halo of the other one; that has been my experience.

Q. Well, the gellatine is the standard method, isn't it?

A. Gellatine is used by many people.

Q. Well, what is used?

A. The gellatine I believe is the standard method. I have found in my experience though that many of my counts, I frequently duplicate them, and they are very close, the two counts; that is my experience with the Rockaway river.

Q. Did you ever have any one else take water from the same faucet, anyone else take water at the same time from the same faucet and try to ascertain how many bacteria there were in the same amount of water, with the same culture that you used?

A. No, I never have.

Q. Well, cannot you say that no two men could ever get the same number of bacteria from the same amount of water with the same culture?

A. Well, I should say it is possible but not likely to do it any time to any amounts.

Q. Very improbable.

Mr. VREDENBURGH: Now Mr. Edwards which one of these reports did you wish to have identified?

Mr. EDWARDS: They were all identified, all of the reports for those dates. I have only got those dates. You can take any one of them.

Q. Well now, here is one that I show you, that Senator Edwards produced from this bundle, this one seems to be dated the 14th of December, 1905. Now in looking at that I see that you have number of bacteria incubation at twenty degrees centigrade, 2700, what does that mean?

A. It means the number of bacteria reading along this line. Sample taken from the Rockaway river at entrance to reservoir at 11 A. M. Temperature of the water 1 and 6-10 centigrade, 2700 bacteria by one cubic centi-meter.

Q. That is in some way you obtain a cubic centimeter of water in the Rockaway river where it flows into the reservoir?

A. In the running water of the river as it enters the reservoir.

Q. Somebody told you that when it was gotten out the temperature was one and 6-10 degrees of centigrade?

A. Exactly.

Q. You have no knowledge of that except as somebody told you?

A. His record was a sample.

Q. You took a sample of that water and counted the number of bacteria in a cubic centi-meter in the manner in which you have already stated?

A. I did.

Q. And you found that there were 2700 colonies in a cubic centi-meter of that water?

A. 2700 bacteria, as we termed it.

Q. Well, colony is bacteria?

A. Well, we will get mixed.

Q. Yes, each colony represented one in the original water?

A. Yes, sir.

Q. 2700?

A. 2700 bacteria.

Q. Then you found taken from the gate house inlet to conduit at 9:45 A. M. temperature 3 degrees 8-10—was that the lower gate house?

A. That is gate house No. 2.

Q. Do you know whether gate house No. 2 is the lower gate house or the upper gate house?

A. I believe that is the lower one.

Q. And at that point there were one thousand cubic centi-meters?

A. One thousand bacteria.

Q. One thousand bacteria in one cubic centimeter?

A. Yes, sir.

Q. Do I understand you to say that you counted that 2700 colonies or did you compute it?

A. In that case the 2700 colonies were not counted, a fraction of the centi-meter was taken.

Q. And so with the one thousand, you did not count those, you took a portion of the plate and multiplied that by the remander of the plate and said that was the number in the whole plate?

A. Exactly.

Q. And then on the same day you took a cubic centi-meter of water from the tap at Christ Hospital at 3 P. M. and there you found to be a bacteria of 7 and 8-10 degrees centigrade, and in that you found 200 bacteria, is that right?

A. That is right.

By the COURT.

Q. It wasn't the next day?

A. No, sir, the same day.

FURTHER CROSS.

Q. The fact that you state the number of bacteria as you found them in this water from the Rockaway river, at its mouth of the reservoir, and from the lower gate house and from the tap at Christ Hospital, has no relation, one to the other, it was not the same water?

A. It couldn't have been the same water. In the abstract it has a relation.

The COURT: The trouble is that it would take three or four days, I suppose, at least, for the water to get from the mouth of the river to this particular faucet, because it

would first go into the reservoir and probably remain there, so that there would not be any relation at all.

WITNESS: This count at the gate house being so much lower shows you that it was not the same water going into the reservoir, otherwise we would have practically the same number of bacteria at the gate house as you have at the running water of the river.

Q. If it was the same water you would have the same amount at the gate house as you would where it entered the river?

A. Approximately the same.

Q. Now the next you have, the Rockaway river, an ascertainment of the species.

A. The coli test.

Q. That is an ascertainment of the coli, of the number of coli?

A. Yes, sir.

Q. You call it coli comunis bacillus, what do you mean by the word "communis?"

A. B. coli will cover it.

Q. Communis is an unnecessary word?

A. Yes, sir, we have been calling it here B. coli.

Q. There is only one kind of coli?

A. Yes, sir.

Q. And when you add the word "Communis" it don't mean anything, because there is only one kind. Now then on the right of this same paper you have what you call miscroscopical examination, number of standard units per cubic centi-meter, what do you mean by that?

A. That is the examination organisms that are lodged in the bacteria, the miscroscopical organisms.

Q. What do you mean by standard unit?

A. We take a certain amount of surface as a standard unit.

Q. Do you mean you take it, or the profession takes it?

A. Such examination is taken as a standard.

Q. What is the unit?

A. A unit is very small, it is a fraction of a square milli-meter about, I should say, offhand.

Q. Put it in inches?

A. I couldn't, it is too small for that.

Q. Is it as large as the point of a needle?

A. Possibly.

Q. Now on that very small point you found, in addition, as I understand it, to the number of bacteria, you found organisms, thirty microscopical organisms in the water at the Rockaway river, and then you found 109, that is, at the gate house?

A. Yes, sir; as it came out of the reservoir.

Q. Then you found in Jersey City 218 of them?

A. 218, yes, sir.

Q. Were they alive or dead?

A. That is not the number of those, that is the number of standard units that they occupied, that is the way we estimated them, sometimes one organism will occupy a number of standard units, but so as to get it down to a comparative basis we take the standard units.

Q. Can you give us an idea of how many of those organisms would be on 218 units?

A. Well, here for example, you see one species of organism was present, and here a second, and in the last column a third; that is the number that they occupied again in standard units.

Q. You cannot tell us how many there are, there may be more or less?

A. There are less than that number, because the great majority are over one standard unit. That is the only way we have of making comparison of how much species they occupy in a given amount of water.

Q. Well, they occupied a little over seven times as much species in this water taken from the tap as they did, where the water entered into the reservoir?

A. Yes, sir.

Q. And I notice opposite that 218, is figure 116 entitled amorphous matter. I suppose that means something without form, amorphous, that means dead bacteria, don't it, waste?

A. Waste of different kinds, silt might be amorphous matter.

By the COURT.

Do you mean mineral matter?

Mr. VREDENBURGH: No, he means dead bacteria.

The COURT: I would like to know whether silt, or whatever it is means inorganic matter or organic matter or both?

WITNESS: It might mean possibly organic matter, vegetable organic matter, it might mean possibly that.

The COURT: What do you think it is, you are an expert, now what do you say it is.

WITNESS: I cannot say exactly in this particular examination, your Honor, but there is often deposits in the pipes of scalings off from the pipes, etc, that would be amorphous matter. This fall our pipes became quite clogged up with large accumulation of moss matter, and afterwards on examination the amorphous may drop considerable in quantity

Q. They draw it off.

A. We had more in our pipes in Jersey City than we had in the water coming from the reservoir.

Q. Now then this coelospharium, it seems that there were 72 at the Boonton reservoir?

A. Occupying 72 standard units.

Q. But when they got down to Jersey City they occupied 144, just twice as much? 10

A. Yes, sir.

Q. Was that because there was twice as many or twice as big?

A. They were all one size, there was twice as many practically, the one size varied a little.

Q. You found those with a microscope?

A. They are found by filtering a given amount of water through a certain amount of sand, and this sand is then washed and these organisms are caught 20 on that sand.

Q. How do you see them?

A. With a microscope, certain of the larger ones are almost like a little shrimp.

Q. Are those vegetable or animal?

A. They are many of them belonging to the family of detris and some of them belong to the algea family.

Q. They grow in reservoirs?

A. They grow on rivers or reservoirs, some forms 30 grow in pipes, in the darkness. They come into the water species.

Q. And this asterioneli, what is that?

A. That is a diatom.

A. Let me return to this coelospharium, do they grow in the reservoir or not?

A. Yes.

Q. How far from the surface of the water do they grow?

A. They grow towards the surface. 40

Q. Towards the surface, would you say within four or five feet of the surface?

A. Yes, sir.

Q. You found those alive, did you,—those were alive were they, when you looked at them?

A. I couldn't say they were alive or dead, but they were there, I couldn't say possibly that they were alive, if they were dead they hadn't been dead very long.

Q. Is it your judgment that some of them were alive?

A. Some I would say was alive.

Q. Or hadn't been dead long if they were dead at all?

A. No, sir.

Q. Well, is this particular form coelospharium the ones that always do grow in reservoirs or in Lakes?

A. Most any of those that are mentioned there.

Q. I am talking about that one?

A. Coelospharium would grow in most any Lake, any body of water, I am speaking of fresh waters

Q. And they furnish food for the other bacteria, do they not?

A. Many of these micro organisms destroy the bacteria, the bacteria furnish food for them, bacteria are their food.

Q. And the reverse is also so, isn't it; a great many of the bacteria live on vegetables, don't they?

A. Yes, possibly.

Q. And their dead bodies are the waste upon which the bacteria live?

A. Well, by the time their dead bodies settle—when they die they seem to settle down, and the bacteria, as they die they settle down too.

Q. They both settle down together?

A. Yes, sir.

Q. And live on each other?

A. No, they disintegrate then.

Mr. VREDENBURGH: Now I don't see how you can put these in.

Mr. EDWARDS: I am going to go into all of this in another way, but I don't want to do it now.

The COURT: You need not do it now, take your own time about it.

Mr. EDWARDS: I am only calling him to prove what the data was we got on that diagram.

The COURT: Have you any more question Mr. Vredenburgh?

Mr. VREDENBURGH: I have several other questions.

The COURT: I think the better plan would be for Senator Edwards to state now what part of that paper he offers.

Mr. EDWARDS: November 1, 1905, 100. November 8, 130. November 15, 110. November 22, 40. November 29, 80. December 6, 250. December 14, 200. December 20, 200. December 28, 275. January 4, 150. January 12, 50. January 18, 30. January 24, 140. February 1, 50. February 7, 50. February 15, 60. February 22, 40. February 27, 210. March 7, 325. March 15, 50. March 22—

Mr. VREDENBURGH: I think you are giving some times the date of the report.

Mr. EDWARDS: I am giving in every instance the date of the report, and that is the date these are furnished on, and therefore I am giving the date of the report, because that is the figure that figures on the diagram.

March 22, 40. March 28, 110. April 4, 160. April 11, 60. April 18, 70. April 26, 90. May 3, 120. May 9, 130. May 17, 150. May 24, 30. May 30, 70. June 6, 80. June 14, 40. June 8, 10. June 27, 40. July 5, 40. July 1— Do you want me to call that other man. Mr. Vredenburgh, they are made in the same way. We will simply have to drop the diagram out for that distance, if you insist on our calling him.

Mr. VREDENBURGH: Well, you remember that you kept out part of our work—same kind exactly, because the boy—some boy was not produced, we could not find the boy. Now I am perfectly willing to do the same with you if you do the same with me, if you if you will let that in, I will allow you to put this in.

Mr. EDWARDS: I will consider it, I don't know much about that, Mr. Corbin had to do with that.

We will offer this subject to its being stricken out if Mr. Vredenburgh gives us notice, or in case he does not produce the young man. July 11,50. July 18, 80. July 25, 30. August 1, 80. August 8, 60. August 15, 30. August 22, 40. August 29, 20. September 5, 70. September 12, 20. September 22, 50. September 26, 44. October 4, 75. October 10, 65. October 21, 120.

October 24, 140. October 31, 65. November 7, 120. November 14, 80. November 22, 20. November 27, 230.

Mr. VREDENBURGH: Now, I don't understand in what position these reports are now that you have not produced that man.

Mr. EDWARDS: If you tell me you desire us to produce him we will, and if you tell us to produce him and we don't do it, then you may be at liberty to strike out this.

The COURT: I will not receive figures so far as they are the figures of the other man, but with that exception the figures are offered in evidence and admitted.

By Mr. VREDENBURGH.

Q. Doctor, you say that you have been working for the Water Company since 1900, what Water Company did you work for in 1900?

A. As I recollect it I believe I said I had made examinations of this water since about 1900, at that time they were for Mr. Flynn.

Q. Who employed you?

A. Mr. Flynn.

Q. Did he personally employ you?

A. Well, through Mr. Flynn I was employed. Mr. Flynn paid for my work, I believe.

Q. Who personally employed you?

A. I think Mr. Harrison spoke to me about it at that time, as I recollect it.

Q. Then had you made any examinations of water for any other water company previous to that?

A. Not for a water company, I made a number for private individuals.

Q. Well, your study in Berlin and in Hamburg was with reference to those bacteria that are injurious to human organisms?

A. That was with reference to water supplies, examinations of water supplies.

Q. Did you make any analysis of bacteria in any water supply in Newark?

A. Yes, I was doing that work several times.

Q. What water supply.

A. Berlin water.

Q. That is filtered water, isn't it?

A. Yes, filtered water.

Q. Then you made analysis of filtered water?

A. Yes. I was studying more or less filtration of water. Berlin and Hamburg are both filtered water.

Q. So that the only examination you made of water was the examination of filtered water.

A. Yes, of the filtered water there.

Q. Then, in this country, the only examination of water you have ever made for any water company is for this Jersey City Water Supply Company, with the exception of some examination that you made in 1900 for Mr. Flynn?

A. No, I have made examinations for small concerns. These concerns that sell bottled waters in cities. I have made examinations of some of those supplies. Of course, they are not water companies to supply the entire water of municipalities, if that is what you mean.

Q. Your study of the water problem was from a pathological standpoint almost entirely, wasn't it, to aid you as a physician?

A. Oh! no. I said examination of the water supplies, as a water supply.

Q. Well, did you ever make any examination of any other water supply than this one?

A. I have stated that I have made examinations in

Berlin of their supply. In Hamburg I was going over the work of other men.

Q. Those were filtered waters?

A. Those were filtered waters, but they were the water supply.

Q. That is not a water supply in the sense of the examination you have made here. I want to know whether you have made any examination of any water supply except this of the Rockaway.

A. I have made examinations of our water in Jersey City when we were taking Pequanock water.

Q. Who employed you to do that?

A. And also examinations, I believe, for a time when we had partly Passaic water.

Q. Who employed you to do that?

A. I was then under the employ of Mr. Flynn.

Q. Well, no Passaic water has been taken by Jersey City since 1894, has there?

A. I am not sure about that. I think at one time there was some Passaic mixed for a certain period in Jersey City. I think there was some Passaic mixed. I am not quite positive.

Q. That was the East Jersey Water Supply Company?

A. It might be; I am not positive.

Q. Then, with that exception, your examination of water supply has been this Rockaway water supply?

A. And the large so-called "pure water" supplies that are sold in cities.

Q. Which ones of those have you examined?

A. I have examined the Kanouse water, and made some examinations of the Great Bear.

Q. For what length of time did you examine the Kanouse water?

A. Not for any continuous time; it was examined at different periods of time, but not examined continuously.

Q. Well, how many times?

A. I can't recollect positively just off-hand; possibly five times.

Q. And the Great Bear water; how many times did you?

A. The Great Bear water about the same number, I should say.

Q. In the examination of the Rockaway water since it has been turned on in Jersey City, have you ever used gelatine?

A. Yes, several times.

Q. Did any of these numbers that you have offered in evidence here represent the gelatine count?

A. Well, in our November sample I happened to use gelatine again, as I sometimes have in comparing numbers.

Q. What number was it that you used gelatine?

A. I used gelatine in making a count of the Rockaway river water as it enters the reservoir.

Q. It has not been offered in evidence?

A. No, I didn't give the gelatine count, because I have been giving the agar counts.

Q. I asked you whether, in any of these numbers that have been given in evidence, you used gelatine?

A. In this particular number, the gelatine count was exactly the same as the other.

Q. Which one was that?

A. That was November, 1906; that was November 19th, 1906; and the count was 5100; that was the same in the gelatine as the agar.

Q. That has not been offered in evidence, as I understand?

A. You just asked me.

Q. I am only allowed to ask you about the number that was offered in evidence.

A. I simply told you that that number applies to either agar or gelatine; I have applied it here to agar.

Q. I asked you whether, in any of these numbers that have been offered, in how many you used gelatine?

A. There is one number that has been offered in evidence.

Mr. EDWARDS: No, it hasn't; only the examinations made at the tap in Christ Hospital; were any of those made in the gelatine?

(Witness, continuing). Several of them were, Mr. Vredenburgh; I couldn't tell you which ones were; I didn't offer any of them in gelatine; some were made, but not that ones that were offered; those that were offered were all in agar.

Q. Then the answer is that all of those that were offered were made with a culture of agar?

A. Yes.

Q. Those, however, that you made in gelatine were of these numbers from the tap; those are all I am referring to; were those counts larger or smaller than the counts made from the use of agar?

A. They approximated very closely the agar; the greatest difference in the count I have ever had in a number of examinations which I made would be, say, eighty-five per cent. of the bacteria of the other; that is, the agar would be eighty-five per cent. of the bacteria of the gelatine; that was the greatest difference; from that I have had them up to exactly the same amount.

Q. The gelatine, in other words, you found fifteen per cent.—

A. (Interrupting.) The greatest difference was fifteen per cent.

Q. Fifteen per cent. more when you used gelatine than you did when you used agar at the time you found the greatest?

A. Yes, in the taps examination.

Testimony of Dr. George E. McLoughlin.

Mr. VREDENBURGH: Now, I renew my objection, that the examination of this water after it leaves the place where we deliver it, and is subjected to hot water and difference of temperature, that the number of bacteria counted there has no materiality in this suit, and I object to these papers on that account.

The COURT: I will let it go in; of course, those things tend to modify the result, or possibly may modify the result.

Mr. EDWARDS: Can I ask him a few questions?

By Mr. EDWARDS:

Q. Doctor, did you find bacteria in filtered water?
A. Yes, sir.
Q. Doctor, in your opinion, did the hot water pipes in the hospital, running near the water in the tap, affect the result?

Objected to by Mr. Vredenburgh.

The COURT: The doctor is not in a position to speak as to that, because he does not know how the hot water pipes, he says, affect the cold water pipes, if they run close together.

Q. Did you take the temperature of the sample?
A. Yes.
Q. In every instance?
A. In every instance.
Q. And is it given on your reports?
A. It is given on my reports; I allowed the tap to run for twenty to thirty minutes before taking such sample.

Testimony of Dr. George E. McLoughlin.

Q. Would hot water then in the building affect such samples?

Mr. VREDENBURGH: Objected to; are you going into the temperature now?

Mr. EDWARDS: If you object to it on that ground I think I shall have to offer it.

Mr. VREDENBURGH: I do certainly object to that on that ground.

Q. Will you tell us how you let the water run before you took it?

A. Turned on the tap, and simply let it run to waste twenty to thirty minutes, and then took a sample.

Q. What was your object in doing that?

Objected to by Mr. Vredenburgh.

The COURT: That is proper.

A. The object was to get a supply as fresh and direct from the mains as possible; not to draw any water that had been standing in the pipes.

Q. In your judgment, from the temperature of the water as it came from the pipe, was it affected materially by this hot water adjoining?

Objected to by Mr. Vredenburgh.

A. It was not.

The COURT: The probability is—I might make a guess—the probability is that if the faucet were allowed to run for half an hour, it would not be much affected by the hot water pipes, even if these hot water pipes were in close proximity; but I don't know

anything about the construction, and the witness says he cannot tell, because they were ceiled by plaster; but you can show the temperature of the water as it came out of the faucet, and that will tend to show whether or not it was affected by the hot water pipes.

Q. Doctor, can you tell us what you know of the weather and of the temperature of the water coming out of the faucet, as to whether it had been affected by the proximity?

Objected to by Mr. Vredenburgh.

The COURT: No; you can show the temperature of the water as it came out of the pipes, but the doctor is not competent to speak as to the other, because he doesn't know the facts.

Q. Was the temperature of the water affected—(interrupted)

Objected to by Mr. Vredenburgh.

Mr. EDWARDS reads (from the reports) dates and degrees (Centigrade) of the temperature of the water, as follows:

Testimony of Dr. George E. McLoughlin.

Date.	Temperature. (Centigrade.)
1905.	
November 1	14.5 degrees
November 8	13 degrees
November 15	11.3 degrees
November 22	10.5 degrees
November 29	9.3 degrees
December 6	8.5 degrees
December 14	7.8 degrees
December 20	7.5 degrees
December 28	5.5 degrees
1906.	
January 4	4.5 degrees
January 12	4.5 degrees
January 18	4.5 degrees
January 24	5 degrees
February 1	5 degrees
February 7	6 degrees
February 15	4.3 degrees
February 22	4 degrees
February 27	4.8 degrees
March 7	5 degrees
March 15	6.3 degrees
March 22	4.5 degrees
March 28	5 degrees
April 4	6 degrees
April 11	6.5 degrees
April 18	8.5 degrees
April 26	9.5 degrees

Date. 1906.	Temperature. (Centigrade.)
May 3	12 degrees
May 9	12 degrees
May 17	12.5 degrees
May 24	13 degrees
May 30	13.5 degrees
June 6	14 degrees
June 14	14.5 degrees
June 18	15 degrees
June 27	15 degrees
July 5	17 degrees
July 11	17 degrees
July 18	17 degrees
July 25	17 degrees
August 1	17 degrees
August 8	18 degrees
August 15	18 degrees
August 22	18 degrees
August 29	19 degrees
September 5	18 degrees
September 12	19 degrees
September 22	19 degrees
September 26	19 degrees
October 4	18 degrees
October 10	18 degrees
October 21	15.8 degrees
October 24	15.5 degrees
October 31	15.5 degrees
November 7	13 degrees
November 14	14 degrees
November 22	10.5 degrees
November 27	9.3 degrees

Testimony of Dr. George E. McLoughlin.

By Mr. EDWARDS:

Q. How does the temperature of the water seem to vary, according to this?

The COURT: It varies with the season; that is evident.

Q. How does the water seem to vary, according to these degrees?

The COURT: Yes, the doctor can answer.

A. I should say it varies with the temperature of the water in the reservoir—varies with the season.

Mr. EDWARDS: I offer in evidence the temperature statement.

The COURT: I think you had better go on with your examination.

Q. Now, what was your object in sterilizing the utensils; the bouillon and agar?

A. So as to obtain true counts of the bacteria in the water examined.

Q. What effect did that have on the bouillon and the agar and the instruments?

A. Only has the effect in rendering them free from any organisms that might be counted in as having been in the water to be examined.

Q. So all the organisms came from the water, and not from the instruments?

A. Not from the materials used.

Q. After you take the sample in the first bottle from the tap, is the bottle shaken up at all?

A. Well, no; it is immediately used, Mr. Edwards; if it had stood any length of time it would be shaken, but it is immediately used.

Q. Do you consider it necessary to shake it?
A. Not in that case; no, sir.

Objected to by Mr. Vredenburgh.

The COURT: I think that is proper.

Q. Do you need to shake it?
A. Not in examining tap water, because it is immediately used.
Q. And why don't you shake it?
A. Because there is no sedimentation; no sedimentation has time to take place.
Q. Does the pouring of the water into the bottle shake it?
A. Of course that stirs it up.
Q. Now, are the methods that you have described in doing this work those most approved by scientific men?
A. I should say yes.
Q. Now, you say that growth is not destroyed at certain low temperatures; is it arrested at low temperature?
A. Yes, it might be.
Q. Life not destroyed?
A. It might be.

Mr. VREDENBURGH: Do you understand the witness to say that life is not destroyed?

Mr. EDWARDS: He said at certain temperatures it is destroyed, and at others it is arrested.

CROSS-EXAMINATION by Mr. Vredenburgh:

Q. Doctor, as to this degree of temperature in November; I think it was November 27th; what was that?

A. There was one 22d and one 29th of November, 1905; there was 22d and 29th.

Q. What was the 22d?

A. The top temperature?

Q. Yes?

A. 10½ degrees Centigrade.

Q. What was it on the 29th?

A. 9.3 degrees on the 29th of November, 1905.

Q. I noticed on the 30th of October it was 14½ degrees Centigrade?

A. He calls this the 1st of November; he has taken the date the report was made.

Q. That report being dated November 1st, 1905; what is that temperature at Fahrenheit?

The COURT: Hadn't you better give the general question, how many degrees Fahrenheit—

A. (Interrupting.) There is a rule for working that, your Honor; this particular case—if you haven't any objection, I might work out this particular case, and it would apply to any.

By the COURT:

Q. Work it any way you please.

A. It would be 57.9 degrees Fahrenheit.

Q. Well, the boiling point is 100.

A. Is 100 in Centigrade.

Q. And the boiling point in Fahrenheit is 210?

A. Yes.

Q. Then subtract 32 from 210 and you have got—

A. (Interrupting.) You want the rule of Centigrade to Fahrenheit; multiply by 9, divide by 5 and add 32.

Q. It is nearly 2; it isn't quite 2.

A. It isn't quite 2.

Mr. EDWARDS: It is a varying percentage; one way is to take off 10 per cent. and add 32.

RECESS.

AFTER RECESS.

Mr. EDWARDS: I now offer, may it please the court, this diagram.

Mr. VREDENBURGH: I object for several reasons:

In the first place, it is taken not from where the contract requires, but from the tap.

In the second place, the date on which the samples are said to have been taken is not the date of the taking of the samples, but the date of the report, which is at least two days after the samples were taken.

Third, it seems to me the diagram is unfair because it shows a continuous dark line as if the thing was continuous from one end of the diagram to the other; whereas it is only, as I have said, the sample taken at one day, and the height of the water taken at another day—days apart.

Fourth, the title is wrong; the title states that this is the bacteria "taken from the high service in Jersey City." It is taken from the hospital.

Fifth, I ought also to add that these do not pretend to show all the bacteria; they only show a particular kind of bacteria that will grow at a certain temperature; there are millions of bacteria in the water that do not appear in the count because they cannot be cultivated in this way.

The COURT: The title ought to be corrected.

Mr. EDWARDS: We will correct that; and this date ought to be December 1st, 1906.

The COURT: Well, there is no connection shown between the different times on the paper; the lines have no proper relation to each other; but each line, I take it, is an indication appealing to the eye and showing what the figures show; but you have got to take each line by itself; you can't correlate.

Mr. VREDENBURGH: It ought not to be a continuous line; isn't that deceptive?

The COURT: It is to a certain extent deceptive, but I think that, for the purpose that I have indicated—a mere exhibition to the eye of what appears in the figures—and with the explanation that the witness gave of it, and with the statements that you have made about it and that I have made to-day, we won't be misled by it; these diagrams do certainly serve a useful purpose; take the ordinary engineer's diagram, which is except to a practiced eye very misleading, where he gives you a distance and then he gives you the elevations, and they are compressed within the same space; they are absolutely misleading to the eye, and still they are constantly received because we understand that they have no proper relation to each other in that particular form.

Mr. EDWARDS: I want to be frank; I understand there was a mistake made by Mr. Cook in the dates; he took the dates from the bottom of the report instead of taking the upper date at which it was actually taken;

that was not Mr. Cook's fault; it was given to him that way; I propose to have Mr. Cook make up another diagram on this same theory giving the correct date.

The COURT: Why doesn't he correct it in those other respects.

Mr. EDWARDS: That is the only respect he can correct it in; I will have the date put in, and so on.

The COURT: I think that Mr. Vredenburgh's criticism with respect to the carrying out of the lines as continuous lines is a proper one; why not make a break between the lines—a very slight break between the lines—to indicate that there is no continuity in respect to the lines—as to the delivery of water, I mean.

Mr. VREDENURGH: The bacteria, too, your Honor; they are not continuous.

The COURT: Oh, no; but the dates are there; it is not misleading with respect to the bacteria; it is misleading with respect to the water actually delivered; but it is misleading with respect to those top lines; it can be marked and the new one can be substituted for that with the same mark, if you like; I don't see why you want it in; it will have to be corrected now, if it goes in.

Mr. EDWARDS: I have corrected it.

The COURT: You ought to state that the dates are wrong; it better appear on the map.

Mr. EDWARDS writes on diagram: "The dates are those of the bacteriological reports and not the dates of samples; the reports are at least two days later than the samples."

Diagram marked Exhibit D-14.

The COURT: I don't think it is of much value as it is now; Mr. Cook swore it was the date previous to the sample; he didn't mean that, because it turns out it is not; let Mr. Cook be recalled, and he can correct his statement.

JOHN H. COOK, recalled on the part of the defendants.

FURTHER DIRECT EXAMINATION by Mr. Edwards:

Q. Mr. Cook, your attention is now called to Exhibit D-14, the diagram made by you; the bottom dates that you have given, are they the dates of the reports of the dates of the samples?

A. I don't know; those are the dates that the doctor gave me, and said they were the dates on which the sample was taken.

The COURT: Have you not now found out?

Q. You have now found out?

A. I have been told, but I don't know anything more about it than I did before.

The COURT: Let the doctor be called, then.

DR. JOHN L. LEAL, recalled on the part of the defendants.

FURTHER DIRECT EXAMINATION by Mr. Edwards:

Q. Doctor, you have examined this map, have you not?

A. I have.

Q. Now, the red line at the bottom; what is that; the date of the taking of the sample, or the date of the report?

A. Why, it seems to be the date of the report; it was my understanding that the flow line was taken the day before the sample was taken; actually, for our purpose, it makes no difference whatever; the day afterwards is just as good as the day before; it simply shows the flow of the river within twenty-four hours of the date of the sample.

By Mr. VREDENBURGH:

Q. The date in red on this diagram; is that the date when the sample was taken or the date of the report?

A. The date of the report.

Q. And the line which shows the flow of the Rockaway river. Is that shown on the day before the sample was taken, or the day before the report?

A. Why, the day before the report, according to what Mr. Cook tells me now.

By Mr. EDWARDS:—

Q. And if the report is two days later than the sample, then the line of flow is the day after the sample was taken?

A. Nearly all reports are dated two days after the taking of the sample. That being true, the flow line represents the day after the taking of the sample.

By the COURT:—

Q. And not the day before?
A. Not the day before.

By Mr. VREDENBURGH:—

Q. If there were three days, it would be the second day after the sample?

A. Yes, sir. With very few exceptions it is two days before—very few exceptions.

Mr. VREDENBURGH: I do not waive any of my objections to the diagram. There is this remark I desire to make about this plan. We do not understand what its purpose is yet, but we do object to taking part of the time and showing that, when they have the reports as to the balance of the time. I am speaking now of this map.

Mr. EDWARDS: We desire now to take up a different line of the examination. We think, if your Honor please, it would be advisable to have all of the witnesses called upon each case of pollution or non-pollution. In other words, instead of examining Dr. Leal as to everything all at once, our idea was to examine him, for instance, as to the Mansion House, and then take the other witnesses to the Mansion House, so that your Honor would have the testimony all together and we would all be thinking of the same thing at the same time.

Mr. VREDENBURGH: So far as taking each nuisance by itself, I think it is a poor way, but at the same time I am not controlling their case. I think it tends to lengthen out the case interminably.

The COURT: I will let counsel pursue their own course about that. We can try this plan, and if it don't work we can go back to the other.

DR. JOHN L. LEAL, recalled on the part of the defendants.

FURTHER DIRECT EXAMINATION by Mr. Edwards:—

Q. Doctor, where do you reside?

A. Paterson, New Jersey.

Q. And what is your profession?

A. Physician and surgeon.

Q. And how long have you practiced that profession?

A. Twenty-three years.

Q. And of what institute are you a graduate?

A. Columbia University.

Q. And of the College of Physicians and surgeons?

A. Yes.

Q. And where have you practiced your profession?

A. In Paterson.

Q. And have you devoted yourself to any specialty?

A. Sanitation.

Q. And how long have you devoted yourself to that?

A. Why, specially, since about '86.

Q. And in which connection did you begin that work?

A. Why, in Princeton I studied biology, special course; chemistry, special course; and botany. And I received a degree of A. M. in 1880 and in 1883 the

degree of M. A. And then I took a special course in Princeton afterwards in bacteriology, or at least a course under Dr. Brockett, and also a special course at the Post Graduate School in New York.

Q. When did you enter upon the work of sanitation?

A. Why, about the year 1886, when I became health officer of Paterson.

Q. And how long did you hold that position as health officer?

A. About eleven years—about thirteen years.

Q. And what were your duties in that respect?

A. Why, I had charge of the health of the citizens of Paterson. It was my duty to protect their health in every way possible under the law. Ordinary duties of a health officer.

Q. And, doctor, when did you take up the question of sanitation of water supplies?

A. I took that up about 1896, that is, special study in that line. I had been studying in that line from 1886.

Q. And for whom did you take it up?

A. Why, originally I took it up for Mr. Hobart, Mr. Garrett A. Hobart.

Q. And in connection with what?

A. With the different water interests in which he was engaged.

Q. And for what companies have you worked in that regard since?

A. Why, first for the East Jersey Water Company from about '98, I think.

Q. Down to date?

A. Down to date.

Q. And in connection with the supplies of what cities?

A. — and the Jersey City Water Supply Company since the spring of 1902. Why, in connection with

the supplies of Paterson, Passaic, Newark, Bayonne, Montclair, Glen Ridge, Bloomfield, Kearny, East Newark, Harrison, Jersey City—all the places supplied by the Jersey City Water Supply Company.

Q. Well, now, have you had charge for the Jersey City Water Supply Company since 1902 of the question of the condition of the water-shed?

A. I have.

Q. And will you please tell us generally what you have done toward preserving the condition of the water-shed?

A. Why, a certain amount of work—a great deal of work—had been done in behalf of the East Jersey Water Company, to whose supply the Rockaway was tributary, before the building of the dam; and the general plan of work was to remove water-closets and cesspools back from the stream; cut off pipes running into the stream directly, or branches or tributaries of it; and to educate the people as far as possible to a realization of their responsibility in the matter. I would state that I think every outhouse now along the bank of the Rockaway river, when I first went there originally were directly over the river, that is, overhanging the river bank—I think every one, without exception, of those along the bank of the river.

Q. Were there many of them?

A. There were many of them, yes.

Q. And in what place?

A. All along the bank of the river.

Q. Dover, Rockaway and other places?

A. Oh, yes; but specially in Dover I am speaking of. There were others in other places, too.

Q. Well, in order to aid you in this matter, did you make application to the legislature for the passage of laws?

A. Yes, I drew the law which the legislature passed—at least, with legal assistance, I drew it—which

the legislature passed in 1896.

Q. 1897?

A. 1897. The first law for the protection of the water supplies in the State.

Q. Now then, doctor, will you give us somewhat in detail what you did toward the purification of the water-shed at Dover—when you started and what you did?

A. I started for the Jersey City Water Supply Company in the Spring of 1902. I have just gone over generally what the work has been. Do you want me to take up individual cases?

Q. I want you to tell us what you have already accomplished.

A. It has been testified to in this trial.

Q. What have you accomplished?

A. What we have accomplished is this. We have cut off many connections with the river through pipes. We have removed many privies from overhanging the river and its tributaries. That has been the bulk of the work. We have prevented new ones from being built.

Q. And have you done that in other places than Dover.

A. All through the water-shed.

Q. Were you familiar with the water-shed generally before you were employed to do this work in 1902 by the Jersey City Water Supply Company?

A. Yes, I had been working in the water-shed since about 1898.

Q. Doctor, have you been present when testimony has been given as to certain sources of pollution now existing in the water-shed?

A. I have.

Q. And have you taken up those cases seriatim to ascertain what the facts are?

A. I have taken up every case which has been testified to as a source of pollution in this suit.

Q. Now, will you begin and tell us what you have done in each of those cases?

A. Well, I suppose we have heard as much about the Mansion House as any one place. I will take that up first.

Q. The Mansion House in Dover?

A. In Dover.

Q. Just describe that property?

A. Why, the Mansion House is a large hotel situated—by the way, I would like to have the map up, and that will make it plainer.

Map is produced entitled "Map of Dover, Morris County, N. J."

Q. I show you a map, Dr. Leal. Does that show generally the outline of the town of Dover?

A. Yes. That is simply a tracing of a regular atlas of Dover.

Q. Shows the streets?

A. Yes, sir.

Q. And the Rockaway river?

A. Yes, sir.

Q. And the ponds?

A. Yes, sir.

Q. With general accuracy?

A. Yes.

Q. Now, then, will you go on and testify as to the cases?

A. (Indicating on map.) Number 2. This is the building—

The COURT: (Interrupting.) Now, that won't mean anything on the notes.

WITNESS: The Mansion House is on the corner of East Blackwell and Sussex streets.

Mr. EDWARDS: Marked with figure "2."

(WITNESS.) I would state that I have tested the Mansion House with color repeatedly, and always failed to get any result whatever.

Q. Where did you test it, and how?

A. I have tested the different water-closets and sinks.

Q. With what kind of color?

A. Various kinds. Bluing, analine red, uranine, and another analine dye the name of which I forget, black. I always failed to get a result. Of course, the charge has been made that it was connected with the old drain pipe with which it was originally connected, running down Morris street. I say that I have done that alone with my assistant and with the health officer of Dover. And in connection with this suit I made a test of it on Monday, May 7th, accompanied by Dr. Herold, Health Officer Chandler and my assistant, Mr. Gibson.

Q. Was that after Mr. Griffin and the others had testified in this case as to the Mansion House?

A. I am not sure whether Mr. Griffin had testified.

Q. There had been testimony as to pollution of the Mansion House?

A. Oh, yes, there had been testimony.

Mr. VREDENBURGH: Do I understand you to say there had been testimony with respect to the Mansion House prior to May 7th, 1906?

WITNESS: Yes, sir.

Q. Go on.

A. Color was introduced into all closets on the first, second and third floors, six of them, at 1:55 P. M. No result at 3 P. M. Color was obtained

immediately in the cesspool in the yard. The cesspool was entered and the flow from each fixture in the whole building was obtained as it entered that cesspool. That is one of the party or two of the party would pull each fixture in the building separately. Others in the party in the cesspool would find the flow from that fixture coming into that cesspool. Then I tested again on December 14th last, accompanied by the same parties. Coloring matter was put into all the closets of the Mansion House at 9:15. No result appeared whatever at 12:30. And we know that there was no result until an hour after that.

Q. Now, is this uranine that you put in a powerful coloring matter?

A. The most powerful color known.

Q. And can you illustrate what a small quantity of uranine going into water will do with a stream?

A. I haven't any here.

Q. Can you tell us, I mean?

A. Why, it colors the stream very much, indeed. A very small quantity will cover a very large volume of water. It is reddish in color before it is exposed to water, and then becomes greenish.

Q. What would be the effect of a tablespoonful of uranine put into a stream of water running ten or fifteen million gallons a day?

A. Why, it would discolor practically the entire stream. After a little time, of course, with a running stream, it would gradually disappear. In a cesspool it will last for a long time.

Q. In order to test with uranine, how much do you have to put into a cesspool?

A. Oh, of course we always want to be on the safe side. We wouldn't have to put very much in.

Q. About what do you put in?

A. A tablespoonful, or three tablespoonfuls if a large cesspool. But a much smaller quantity would

answer the purpose. A teaspoonful or less than that would color the contents of an ordinary cesspool.

Q. So that it could be easily distinguished?

A. There is no question about finding it, if you get it.

Q. Now, doctor, tell us in regard to the Mansion House, what its condition was before you went up into the valley for the purpose of sanitation?

A. Why, every fixture in the building drained directly into this old Morris street drain, and then through that into the river.

Q. When was that cut off?

A. As near as I can recollect, that was cut off, well, a short time before Mr. George Richards died. I am not sure of the year. I should say it was about 1900, as near as I can recollect.

Q. And at whose request and demand?

A. Why, at our request and demand; it was done by Mr. Richards, the owner.

Q. George Richards?

A. Yes.

Q. Well, now, when you made these tests at these times that you have testified, with the uranine, did you test each and every connection?

A. Each and every one.

Q. In the whole building?

A. Yes, sir.

Q. And were you familiar with them?

A. Except in these two. We didn't test the laundry.

Q. What was done by Mr. Richards, other than you have told us, for the purpose of cutting off the sewage connection between the hotel and the stream?

A. When we were interrupted I was just making a statement which I want to finish. You asked me

if we tested in these two tests I have described—when I was accompanied by these gentlemen—if we tested every fixture. We did every fixture except the laundry. We tested every sink, closet, &c.

Q. Why not the laundry?

A. Because the laundry, we knew, was connected with that pipe. The laundry of the hotel was connected with the Morris street drain.

Q. Is it now connected?

A. It is not.

Q. When was it disconnected with the Morris street drain?

A. It was disconnected originally about, I should say, two years ago—no, it is more than that, three years ago.

Q. Well?

A. Then either by accident or design (I can't say which) it was connected again. And it was disconnected finally—well, October 30th of this last year we tested and found it was disconnected. It was disconnected, maybe, a month before that.

Q. And how does the laundry empty now?

A. It now empties into the second of the series of cesspools.

Q. What is the nature of the cesspools in conjunction with the Mansion House?

A. Why, I have a plan. There is another gentleman that can explain it better than I can. Won't the gentleman who made it do that?

Q. Are there a number?

A. There are three cesspools. One is the reception cesspool into which every fixture in the Mansion House, with the exception of the laundry, empties. From that there is an overflow to another and from that to another. In the second one of these two overflow cesspools the laundry enters.

Q. What is the purpose of the overflow cesspool?

A. The solids remain in the first cesspool and can be removed if necessary. The fluid matter rises and goes first in the middle one and when that is full over into the last one.

Q. Then what becomes of it?

A. Sinks into the ground, and is pumped out if it is overdone.

By Mr. VREDENBURGH:—

Q. What did you say about pumping out?

A. If they become full before it soaks away they are pumped out. Most of the water soaks away. If it is crowded too much they have to pump it out. They are opened easily. Walled sides, and the top just covered over with earth.

By Mr. EDWARDS:—

Q. From a sanitary standpoint, are they in your judgment properly built?

A. Yes, sir, I think they are.

Q. How far are they located from the river?

A. Oh, they are certainly 300 to 350 feet I should say. It is more than a block, considerably more than a block. There is a whole block, and a part of two others. You can see it on here (indicating on map). Here is the Mansion House. Now the cesspools are right in here. And here is the river. You can give us that exact distance.

Q. It is over a couple of hundred feet, anyway?

A. Oh, it is 300 feet anyway—I think more.

Q. Well, now, doctor, what effect would these cesspools have upon the sewage emptying into them?

A. Why, as I say, the solid matter is received into the first cesspool. That must be removed. There is some asceptic action and destruction of the contents, just as in an asceptic tank, but the bulk of it

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must be removed. Then the fluid soaks into the ground, and it becomes part of the groundwater of the city.

Q. In your judgment does any deleterious matter from these cesspools get into the river?

A. No, sir.

Q. Does any of it get into the river?

A. No, sir.

Q. Is there anything further you want to say about the Mansion House?

A. No, I think that is all.

By Mr. EDWARDS: You may cross examine on that.

CROSS EXAMINATION by Mr. Vredenburgh:—

Q. Doctor, are you employed by the East Jersey Water Company or the Jersey City Water Supply Company?

A. By both.

Q. What is your salary with the Jersey City Water Company?

Objected to as immaterial.

By the COURT: What is the object of this?

Mr. VREDENBURGH: Only to show his connection with these two companies.

By Mr. EDWARDS: He gets a good salary.

By the WITNESS: Not near as much as I ought to have, Mr. Vredenburgh.

By the COURT: I do not think that will throw any light upon the question.

Q. Then you are paid by both companies?

A. Yes, sir.

Q. And you commenced work for the Jersey City Water Supply Company at what time?

A. Why when we went into the company and that was in the Spring of 1902, I think.

Q. What do you mean by we?

A. Well, when Mr. Gardiner became president.

Q. By we you mean Mr. Gardiner?

A. Yes.

Q. Now you say you had previous to that time removed the outhouses from the privies over the stream. When did you commence to remove the privies from over the stream?

A. That was about in 1898 on.

Q. When?

A. About from 1898 on.

Q. 1898?

A. Yes, sir; I can't give you the exact date.

Q. In whose employ were you then?

A. East Jersey Water Company.

Q. Why did you do this?

A. Because our intake was at Little Falls; we used that water and we had no filter plant at that time. I had charge of all the water sheds of the East River Water Company and the Rockaway was part of that water-shed.

Q. They had a pumping plant at Little Falls at that time, did they not?

A. Yes, sir; well, in 1898, when I first started the plant was not in operation. It was being built; it started, I think, about 1899, but the intake then was at Great Falls.

Q. Your work in 1898 was for the East Jersey Water Company in order to purify their works at Little Falls, is that the idea?

A. To purify the water, which came to Little Falls and also the water which came to the inlet—the Macopin Inlet of the Newark supply. The Newark supply at that time was owned by the East Jersey Water Company.

Q. How did the water from the Rockaway river get to that supply?

A. It did not get into the Newark supply.

Q. But you said you removed the closets and privies over the water at Dover in 1898?

A. Yes, sir. Well, that was for the protection of the East Jersey Water Company's water taken from the river at Paterson.

Q. Paterson?

A. Yes, sir; first the Great Falls and afterwards at the Little Falls.

Q. Why were these closets hanging over the stream at Dover any danger to the water works at Paterson?

A. Because we had no reservoir. The river simply flowed right down to our pumping station and was taken directly in; if we had had a reservoir such as Jersey City has to-day we would not have considered it material.

Q. The Rockaway river enters the Passaic?

A. Yes, sir.

Q. And had to flow down the Rockaway river from Dover?

A. Yes, sir.

Q. And down the Passaic to Paterson?

A. Yes, sir.

Q. And you in 1898, in order to protect the water supply in Paterson had some privies removed from the Rockaway river at Dover?

A. Yes, sir.

Q. Which privies were these?

A. Well, nearly every one.

Q. That is a little too general; I want you to tell me which ones you had removed?

A. Well, I could tell you if I was on the ground; nearly every one of those marked along the river here.

Q. Please give me the name of one that you had removed in 1898.

A. Well, the one at the stable of Thomas Fanning—in the year 1898.

Q. Yes, 1898.

A. Oh, I can't do that; that is impossible to specify the year; I can't do it.

Q. Then you don't know of any you did remove in 1898?

A. No sir.

Q. Cannot state one?

A. No, sir; but I will state that many were removed between 1898 and 1902.

Q. Mention one that you removed in 1899?

A. I cannot do that.

Q. Did you remove any in 1899?

A. Yes, sir; there was some removed every year.

Q. Where were they?

A. I don't know.

Q. In Dover were they?

A. Yes, sir; and in other parts of the water-shed as well.

Q. Where, in Dover?

A. Yes, sir; in Dover.

Q. You cannot tell where they were?

A. No, sir; not by name.

Q. Or whose it was?

A. No, sir; but I could tell you if I was on the ground; but I cannot tell you the year they were removed.

Q. Tell me of any you removed in 1900.

A. I cannot tell the year.

Q. Tell me any you removed in 1901?

A. I cannot give you the year.

Q. Tell me of any you removed in 1902?

A. Before 1902?

Q. Yes, in Dover?

A. Well, it is very hard to remember those names; I cannot do it, but I will mention one, that of Thomas Fanning which I remember.

Q. Who was that?

A. Thomas Fanning.

Q. Well now, let's see about him first; where was his privy?

A. It was overhanging the river and the building is there yet.

Q. The Rockaway river?

A. Yes, sir; there are a number of those buildings still standing there but used for other purposes which originally and at that time were privies.

Q. Now Thomas Fanning, you say you had him removed prior to 1902 some time?

A. And Mr. Jenkins.

Q. Well, one minute; let's stop at Thomas Fanning's.

A. I understand you to say before 1902.

Q. I said prior to 1902.

A. Yes, sir; prior to 1902.

Q. Did you remove the privy?

A. Yes, sir.

Q. I just understood you to say that the building was still overhanging the river?

A. The building is there but it is not a privy any more.

Q. How do you know?

A. Well, I have been in it.

Q. Did they take the seat out?

A. Yes, sir, and if I remember correctly that is a harness closet; either that is or the one next to it,

and I think that is used for a harness closet.

Q. What is the one next to it?

A. Well that's the next property and that is used for a storage place, or else that is the harness closet and Fanning's is the storage place, I forget which.

Q. Has that got a seat in it?

A. Neither one is used or could be used for any such purpose.

Q. Has either one of those places a seat in it at the present time?

A. Not a seat, no, sir.

Q. And cannot be used?

A. No, sir; not any more than any building that is on the river could be used for that purpose.

Q. What is there to prevent any one going in there and using it now?

A. Why it is not used for that purpose; it is not what it is for; it is used for some other purpose; it is out of commission and has been for years.

Q. Who else did you mention, Jenkins?

A. Yes, sir; Jenkins.

Q. Where was that?

A. I can't tell you where it was.

Q. Was it prior to 1902?

A. Yes, sir; prior to 1902.

Q. Where was his closet?

A. It was on East Blackwell street.

Q. Which Jenkins is that?

A. Edward, I think it is.

Q. Which house?

A. No. 370 and 372 I think.

Q. How far back did you remove it?

A. If I remember right about thirty feet.

Q. Doctor, I think that is not more than nine feet, is it; what is your recollection about that. My understanding is that it is only 9 feet from the river.

A. Why, I won't say positively, Mr. Vredenburgh, I think it is 20; I won't be positive about that.

Q. Who else?

A. Why, No. 6, 8 and 10.

Q. Well, give us the names of the people at No. 6. What do you mean by No. 6.

A. East Blackwell street. 6, 8, 10, 12, 14 and 16, the houses immediately in the rear of Morris street is No. 16.

Q. Were they all removed prior to 1902?

A. Yes sir.

Q. Were they outside or inside closets?

A. They went into the Morris street pipe.

Q. Now Doctor, who is No. 16?

A. That is the Richards property.

Q. No. 16 is?

A. Yes, sir.

Q. When was that removed?

A. That was removed prior to 1902.

Q. Didn't they testify—did not witnesses testify that there was a connection there last year that was removed?

A. There has been testimony that that was connected with the Morris street drain—testimony on the part of the city to that effect. I am now swearing that it was not connected.

Q. And has not been connected since 1902?

A. No, sir.

Q. You swear that?

A. Yes, sir.

Q. How do you know it, Doctor?

A. Well, I have seen in the cesspool and had men down in it.

Q. When did you have men down in it?

A. That will be testified to very shortly; it was last spring.

Q. How do you know there is no pipe from the closet that does not go in the cesspool?

A. Well, I had the whole plumbing system dug up in the yard and back alley where I saw the pipe—

flow pipe from the house—that comes from the house down into the trench below the flow pipe, and I sent a man into the cesspool and I can give you every detail in connection with those premises.

Q. Now go on with the next one.

A. 14 Blackwell street.

Q. You gave us 12, 14 and 16, but we have been talking about 16?

A. Yes, sir.

Q. Now what other prior to 1902 did you remove?

A. It is very hard to remember those places; if I was going over the ground with you I could point them all out to you very easily. Maze property, which includes the famous office of Dr. Hunter—that originally went into that drain.

Q. Was that removed prior to 1902?

A. I think it was but I will not swear to it; I think it was.

Q. Doctor, where are the closets of 8, 10 and 12 Blackwell street now?

A. 6, 8 and 10—6 is inside and 8 and 10 are in the back yard.

Q. Weren't they always out there, six, eight and ten?

A. Yes.

Q. What change did you have made in them, then?

A. They were originally connected with that drain. I would state it is in the City's testimony that there are water closets in those houses.

Q. Whose testimony is that, Doctor, that you speak of?

A. Why, I think Mr. Pierson's.

Q. Mr. Pierson's?

A. I think so, or Mr. Bouton, I am not sure which.

Q. Now which have you had removed. You have given us all you had prior to 1902 that you can remember?

A. That I can remember, yes.

Q. Give us those since 1902 that you can remember?

A. Well, it has been testified in this suit that the Schwarz building was connected. I do not know that it was. I know it is not to-day, and the Mansion House laundry; it has been testified to in this case that the Sweedish Church outhouse drained into the river; it certainly does not to-day.

Mr. EDWARDS: I object to this because it is not cross examination as to any particular place.

The COURT: The Doctor necessarily states that he has done everything in his power to abate all the nuisances in this stream, now having made that statement Mr. Vredenburgh must necessarily have the right to cross examine. I don't see how this cross examination can be prevented.

WITNESS: I would like to make my meaning clear in one respect. I do not claim that everything is in as good condition as it possibly could be in the Rockaway watershed; I make no such claim as that; but I do claim that a great deal is done and a great deal is being done right now, and a great deal will always have to be done, under all conditions and circumstances; that is my claim. There are places there that I am trying to-day to get remedied, get improved.

Q. I am referring now to the privies which you said were hanging over the stream, and that you removed?

A. You mean only those hanging over the stream?

Q. Yes, since 1902?

A. As far as I can recollect they were all removed.

Q. I ask you which ones were done?

A. I cannot enumerate them.

Q. Have you removed any since 1902?

A. Over-hanging the stream?

Q. Yes.

A. I doubt if there was any left since 1902.

Q. You say you caused the Sweedish Church privy to be removed; when was that?

A. I didn't say so, sir; I said it didn't drain into the river.

Q. When was that changed. It did drain into the river?

A. I never thought so.

Q. Well, was it changed?

A. It was changed, yes.

Q. At whose request?

A. Nobody's request that I know of.

Q. You had nothing to do with that?

A. I did it, yes. You mean who requested me to have it done?

Q. No, sir; who did you request to have it done?

A. I didn't request anybody; I had it done.

Q. When was that?

A. That must have been about October 31st or 30th.

Q. This year?

A. Yes, sir; according to the best of my recollection.

Q. Did you pay for the removal?

A. I did, or the company did.

Q. Why did you pay for the removal if it didn't go into the river?

A. Because it was claimed it did go into the river, and I was tired of bothering with it. The reason that I paid for it was that it was too poor a church,

and it was impossible to get permission, no one seemed to have any authority, so I simply had it removed.

Q. The Schwarz case,—did you remove anything there or cause anything to be removed?

A. Why, we brought a suit in Chancery, based on the testimony given by representatives of Jersey City in this trial.

Q. When was that brought—it was since the testimony of the complainants in this case?

A. Yes; I think after the first hearing. They made certain changes,—whether it did actually drain into the river I don't know. I know that away back some years ago we made them put in a cesspool; they originally did drain directly into the river, and we made them put in a cesspool; to the best of our knowledge and belief that cesspool is in no way connected with the river, and the representatives of the City claimed to have tested against that cesspool, and we brought suit against it at once, and I saw the cesspool exposed and a new one built; we tested the cesspool afterwards and found no connection.

Q. Did you test it before?

A. No, sir; he wouldn't allow it.

Q. Who wouldn't allow it?

A. Mr. Schwarz.

Q. Did he deny it was connected with the river?

A. He denied it positively.

Q. But notwithstanding that you compelled him to build a new cesspool?

A. He did build a new cesspool.

Q. Do you know how that is built?

A. Yes, sir.

Q. How?

A. Why it is built in the regular way of building cesspools; it has an open bottom with stone walls.

Q. Dry wall?

A. Yes, sir, dry wall.

Q. And the ordinary stones?

A. Yes, sir.

Q. Ordinary different size stones?

A. Yes, sir.

Q. Any round stone?

A. Oh, well, any stone that will make a wall.

Q. How near is that to the river?

A. That is about 25 feet.

Q. Do you know whether any connection between the cesspool and the river was removed?

A. I don't. If there was a connection it was removed, that I know, but as I tell you I was refused opportunity to test the place and he did the work.

Q. But you knew it was removed because of the fact that when you tested it—

A. No, sir, I saw the open cesspool, sir, and was down in it.—No, I wasn't down in that one but it was open and I saw it, I stood on the bank of it.

Q. You don't know whether there is any connection now, of your knowledge between that cesspool and the river?

A. Yes, I know there is not.

Q. How do you know?

A. I know it from the evidence given me by my eye sight, and I also know it because we tested it very cerefully, and failed to get any result whatever.

Q. Schwarz allowed you to test it, after the new one was built?

A. Yes, sir.

Q. Now, doctor, just one other question before we go to the Mansion House; with regard to these various companies of which you are the health officer; I think you mentioned one in Bayonne?

A. Oh no.

Q. What company supplies Bayonne?

A. Why the New York and New Jersey Water Company, I believe is the name of it.

Q. How are you connected with that?

A. No way whatever.

Q. Which company supplies Kearny?

A. Why the Inter-Urban Water Company, or some such name.

Mr. EDWARDS: New Jersey Suburban Water Company I think it is.

WITNESS: I didn't say that I had any connection with these places, except with our water companies there, and I think the question was over what Cities—over the water supplies of what Cities I had any supervision, —something of that sort was the question. Our water from Little Falls goes to Bayonne and goes to Kearny and Montclair and Glen Ridge, and so on.

Q. Are all the Cities you mentioned supplied with water from Little Falls?

A. Yes, sir, except Jersey City, which I mentioned.

Q. Now you have a filter in at Little Falls, have you not?

A. Yes, sir.

Q. A big fllter?

A. Yes, sir.

Q. Notwithstanding you had taken all the closets off of the stream in Dover, you still felt it necessary to build a filter plant there?

A. By all means. The taking of drinking water directly from a running stream in this age is utterly unjustifiable and unsafe.

Q. Why?

A. Water taken from the Rockaway above the Boonton reservoir would be unsafe.

Q. Why is it unsafe?

A. It is necessarily so.

Q. Why?

A. Why the opinion otherwise was based on the old idea of running water purifying itself, which has exploded entirely; running water does not purify itself; still water is the water that purifies itself.

Q. Why is it necessary to filter water from the Rockaway water shed that goes down to Little Falls?

A. Why is it necessary?

Q. Yes.

A. It would not be necessary to filter that that would pass through the Boonton reservoir.

Q. You do filter the water do you not?

A. What comes over the dam of course and reaches us goes through our filter, but we cannot exclude that from the rest of the water which needs filtration.

Q. You said it was necessary now to filter the water that came down the river to Little Falls?

A. Yes.

Q. I asked you whether since the water closets had been removed it was still necessary to filter it, and you said of course it was, and now I ask you why, and I haven't any answer to that yet?

A. Because the simple removal of a water closet is not going to keep the pollution out of a river, it is utterly impossible to keep dangerous pollution out of any river in a populated water shed, such a proposition is utterly ridiculous, as long as there is population there, there is a certain amount of pollution going to get in.

Q. What do you mean by pollution?

A. Germs coming from animals.

Q. Germs coming from animals?

A. That is the important pollution.

Q. Is that serious to human beings?

A. Some of them are.

Q. Which?

A. The germ of typhoid fever is the one that we are interested in.

Q. Does that come from animals?

A. Yes, sir, only from animals, human animals, in that case.

Q. Do you confine yourself when you say animals to human animals?

A. No, I said animals.

Q. That means more than human animals?

A. But I say the Typhoid Fever germ comes from human animals.

Q. What other germ do you refer to?

A. That is the only one we are interested in.

Q. I am not asking you what you are interested in, I am asking you about this pollution of the water, you said it was necessary to have this filter because of the pollution of the water, and I ask you why,—what pollution?

A. Why the washing of streets, the draining of manure fields, the accumulation of barn yards, and so on, washing into the river.

Q. What is there in barn yards that is dangerous?

A. Nothing dangerous to health, but it is pollution to a certain extent. It is not dangerous to health.

Q. Then you consider water in which there are barn yard sewage is a pollution, do you?

A. It is pollution to that extent, yes.

Q. Is it polluted water?

A. It is polluted water, yes; pollution is that which contains anything left from the process of life.

Q. Either human or animal?

A. Yes, but pollution and infections are too entirely different things.

Q. You take no account of the germs of dysentary which passes up and down the water?

A. Well, we know very little about the germ of dysentary, and had so little experience with it in this region, that we don't need to think much about it, or speak much about it.

Q. You say it does not travel with the water from its patient to its victim, just as the Typhoid germ does?

A. The germ of one form of dysentary is supposed to be carried by water, there is very little known about it, very few epidemics, and those of very small size reported. The tropical dysentary we know nothing of, and that is carried in water.

Q. How about the bacillus of diarrhoea?

A. I know of no such bacillus.

Q. Never heard of any?

A. Never did, except through ignorance.

Q. Never read of it in the medical works?

A. No, sir, no work deserving of the name. Diarrhoea may be caused by bad water just the same as it may be caused by bad food, but there is no specific germ of diarrhoea.

Q. There is no germ which produces diarrhoea, and which travels by water?

A. Any number of germs may produce diarrhoea which can travel by water, but they must be in very large qnantities, they must be in certain peculiar conditions, and the patient must also be in a susceptible condition. In all the bacteria, the germs of decomposition under cetain conditions can cause diarrhoea. Any of the germs of putrifaction in water, just the same as in milk or in food. The diarrhoea caused by water is a form of ptomaine

poisoning, just the same as the diarrhoea caused by tainted meat.

Q. Now coming to the Mansion House, do you know where the cesspool in the stable drains?

A. I am aware of no cesspool in the stable at all, there is nothing in the stable at all to drain, in the first place.

Q. Any manure in the stable?

A. Manure pile, yes, sir.

Q. The stable is occupied by horses?

A. Yes, sir. I mean there are no plumbing fixtures.

Q. Is not there water in it?

A. Yes a hydrant.

Q. And the wash from the stable is carried from the cesspool, in the stable, isn't it?

A. I would state that I have tested the stable and got no result whatever, and the wash water used in washing wagons, etc, goes to an old well, what was formerly an old well. As I say there are no plumbing fixtures there whatever.

Q. Is not the hydrant a plumbing fixture?

A. Yes, I suppose that is right, but that is the only thing.

Q. Well, there is also on that property the harness shop?

A. Yes, sir, and photograph gallery.

Q. And the barbers?

A. That is in the hotel.

Q. Is that part of the hotel?

A. Those houses are all part of the hotel. No the harness shop is not.

Q. Where do the waters from these drain if you know?

A. Why the only fixture there is in the photograph gallery, and that goes to the old well that I have just described, in connection with the stable

that is the only one. Well, the barber shop and that goes in the Mansion house, that is part of the Mansion House system.

Q. Did you say there were bath rooms in this hotel?

A. Yes, sir.

Q. How many bath rooms?

A. Why another gentleman will tell you positively; my recollection is that there are four bath rooms. Yes, I think four.

Q. All in the second story?

A. No, there are three on the second story I think and one on the top story.

Q. One in the third story?

A. Yes, sir, but that can be told you positively by another witness.

Q. Didn't you make an error as to the number of cesspools. Are there not four there?

A. Why according to the testimony which has been given here there should be four, but one of them is shut off entirely and is not in use.

Q. As I understand it, Mr. Richards built it?

A. Yes, sir.

Q. One was for solid matter and one was for liquid?

A. The over-flow Mr. Richards testified to, has been cut right off, as we will show you later on, that is not in use today.

Q. When was it cut off?

A. That I don't know.

Q. When did you find it cut off?

A. Why just the other day; last week.

Q. Cut off last week?

A. No, we sent a man down there last week and he found that there was no connection between those cesspools, I don't know that it was ever cut off, all I know is that there is no connection, no connection from the original large reception cesspool

built by Mr. Richards,—there is no connection between that with anything, except the two new overflow cesspools built by the present proprietor. Now either Mr. Richards is wrong in his testimony or he never connected that.

Q. When did you last test that cesspool, doctor?

A. Of the Mansion House?

Q. Yes.

A. Why December 14th.

Q. What time?

A. We put the color in at 9:15.

Q. A. M.

A. Yes and there was no result at 12:30 and then—

By Mr. EDWARDS.

Q. You mean by 12.30?

A. Yes. Then at 12:30 we put some coloring matter in the leader in the yard there is a leader coming right down from the house, and somebody had knocked in a part of that leader just above a joint leaving a opening, and there was Mr. Chandler and myself and we put some coloring matter in there and put some water in; that was at 12:30 and that color appeared at the mouth of the pipe in the river at 1:30; that was a different color from what we used in the Mansion House.

Q. What was the color used in the Mansion House?

A. Urinine.

Q. What was the color you used in the pipe?

A. Analytical red.

Q. How near was the pipe to the Mansion House?

A. Right in the Mansion House.

Q. Did it go underneath the ground?

A. Yes, sir.

Q. Did you dig up to see where it went to?

A. No, sir, I know where it goes to, it goes to that old drain—all the rain water leaders do.

Q. All the rain water leaders from the Mansion House goes to a drain?

A. Yes, and all the other houses in that neighborhood.

Q. How do you know?

A. I have tested them and everybody knows they go there. That is what the pipe was put in for, originally, to carry off the rain water from these houses.

Q. How do you know?

A. I was told so by the man who put it in, Mr. Richards, and he didn't connect his sewage with it when he first put it in, that came along afterwards but as I say—

Q. Do you know at all where they were connected?

A. What do you mean?

Q. Sewage with the water from the house?

A. Do I know where the leaders connect with this pipe?

Q. No where the sewage did connect with the pipe?

A. Yes, sir, I did know.

Q. How do you know?

A. It has been shown me.

Q. Is it under ground?

A. Yes, sir.

Q. Was it dug up?

A. Yes, sir.

Q. You saw where it was connected?

A. Well, I did see when it was dug up, yes.

Q. When was that?

A. I think the joint was covered but Mr. Richards has sworn on the stand that he saw it all done with his own eyes.

Q. When did you see it dug up?

A. Why that must have been somewhere around 1900 I cannot tell you exactly. I don't think that I saw the disconnection made, I think when I got there that they had filled in part way, that is my recollection. I won't be sure of that, but I remember perfectly well when the work was done.

Q. Does this pipe run from the Mansion House down the street?

A. Why we have a map here which will show the whole thing. The gentleman who made this map is here.

(Mr. Edwards produces map).

Q. The question is whether the old drain that you speak of ran down the street or over private property?

A. Why it runs through the alley way in the rear of the brick buildings, on Blackwell street, that is No. 16, 14, 12 and so on, up to about the Mansion house; it is in the yard of the Mansion House, the beginning is in the yard of the Mansion house, it then runs in the alleyway in the rear of those brick buildings to Morris street, and then down Morris street to the river.

Q. Is it covered all that distance?

A. Covered the whole distance.

Q. Do you know to what depth?

A. Why it is not very deep.

Q. Is the street over it a paved street?

A. It is deep at the end.

Q. Is it a paved street?

A. Macadamized street.

Q. Trolley on it?

A. Yes, sir.

Q. Trolley tracks over it?

A. Crosses under the trolley tracks.

Q. How near the center of the street is it?

A. Pretty nearly the center of the street. The pipe is deep where it goes into the river.

Q. What size pipe is it?

A. I guess it is 12 inches.

Q. 12 inch pipe?

A. Yes, sir, that is at the mouth up in the alley-way, in the yard it is not over,—six to eight inch pipe, I think.

Q. You are satisfied that the rain water from that building ran into that pipe?

A. Yes, sir.

Q. No doubt about that?

A. No doubt at all. As I tell you, I on this very day put this red coloring matter in that hole in the leader in the yard and got it in the river.

Q. The red coloring matter is less distinct dye than the green you put in?

A. It is not as powerful but it is very distinct coloring.

Q. How long did it take the red to go from where you put it in to the river?

A. Just an hour.

Q. Took an hour to run down?

A. Yes, but if it had been running it would have gone very quickly with just a very little water.

Q. How much water did you use, a pail full?

A. Mr. Chandler can tell you better than I, I think we used two pitcherfulls of water, if I remember rightly, two small pitchers, that is my recollection.

Q. Got them from the Mansion House?

A. Yes, sir.

Q. Was the Mansion House proprietor there with you?

A. No, sir, I think not, not at that time.

Q. Did you obtain permission to do this?

A. Yes, sir; I will state that I never tested any man's house without his permission, or gone on his property without his permission.

Q. Your opinion is that if you used more water you would have got that test quicker?

A. Yes I have done it in other places and got it more quickly.

REDIRECT EXAMINATION.

Q. Doctor when you built your filter at Little Falls, had the dam at Rockaway been completed?

A. No, sir, it hadn't been built at all.

Q. What streams fed your filter at Little Falls?

A. Well, it is on the Passaic river, there is the Ramapo, the Wyanock and the Newark stream, the Pequannock, and there is of course the Pompton, which is formed by the junction of those three, that comes into the Passaic, Two Bridges, and then the Rockaway and the Whippany come in the upper Passaic. The Rockaway empties in to the Whippany, I think, and then into the Passaic.

Q. Now if you had your intake for this pumping plant on the Rockaway alone, just below the dam of the Jersey City Water Supply Company, would you need to put in any filter plant?

Objected to.

A. Not at all.

Q. Why not?

A. Below the dam of the Rockaway?

Q. Yes.

A. No, because the reservoir is put there for just exactly the same purpose as our filter is put at Little Falls. You understand at Little Falls we have no storage, we pump directly from the river; now to supply that water to municipalities it would be a

crime and it is the same way on the Rockaway, you cannot draw water from any point on the Rockaway river below Port Oram or Wharton and supply directly to the consumer with safety. You have to have that intermediate process of sedimentation or some artificial means of purification.

Mr. VREDENBURGH: I object to that part of his answer in which he says for what object this reservoir is built.

The COURT: This is an expert testifying and he is giving us expert evidence.

WITNESS: I had to do with the building of this reservoir, and after that I was thoroughly conversant with the plans of the engineers, we discussed this matter over and over again. We didn't have to follow on that plan when we went in in 1902, we went over everything and considered everything.

Q. How in your judgment does the water filter in the Rockaway river compare with the sand filter at Little Falls as to efficiency?

Mr. VREDENBURGH: Objected to on the ground that this witness is not said to be an expert on such matters.

Q. How does the sedimentation basin compare, in the reservoir of the Rockaway, with the filter at Little Falls?

Objected to for the same reason.

A. It is not a sand filter; of course we do use sand but is not what is commonly called a sand filter. I can answer that in this way that from the results

which we obtained we found that practically as good results was obtained from sedimentation process at Boonton as we got from our filter at Little Falls.

The COURT: That opens up a very wide subject of course.

Mr. EDWARDS: I don't want to open that subject now. If your Honor will permit me I will withdraw that for the present, because we will go into it at another time.

The COURT: You may withdraw it. Let the question and answer be stricken from the record.

RECROSS.

Q. Doctor, you said it would be a crime to furnish water from Passaic river that was not fitted, I understood you to say, did you mean that?

A. I won't say it would be a crime, but it would be a great mistake and should not be done. If I used the word crime I meant sanitary crime, a violation of the sanitary law.

Q. Didn't you furnish Jersey City with water from this Passaic Falls for some years that wasn't filtered?

A. But we got our filter as soon as we could in operation.

Q. You never furnished Jersey City with any filter?

A. No sir. Another thing we built a very large reservoir, and got sedimentation in that water which came to Jersey City from Little Falls. Of course the reservoir wasn't anything like as large as the Boonton reservoir; but we got very good results from it, just the same, and that reservoir was at the Notch, the water was never pumped by us directly to Jersey City, it was pumped to the Notch, and then

went to Jersey City by gravity. Another thing you must remember that these ideas are comparatively new, the ideas of water supply have changed a good deal in the last ten years.

Q. Well, the water supply that you furnished Bayonne, or that the company furnishes to Bayonne is filtered water, is it not?

A. Yes sir.

Q. And it is also stored in the Notch?

A. We don't store—we don't use the Notch reservoir now in the same way that we use to. We don't like to store filtered water, and we don't keep any more filtered water in the Notch reservoir than necessary but we simply use it now as a distribution reservoir.

Q. Does the water which you furnish now to these cities pass through the filter and also through this reservoir that you speak of?

A. The water which we supply to Bayonne does, and to Kearny, but that is not a sedimentation reservoir now; I tell you it is simply a distribution reservoir.

Q. Have you changed the reservoir any since?

A. We haven't we have often thought about it, but we don't fill it as we use to.

Q. Do you filter it before it goes into the reservoir and after it goes out?

A. Yes, sir, pumped directly from the river, runs in by gravity, filtered, is then pumped to the Notch reservoir and from there distributed.

By the COURT:

Q. Before the filter plant was completed how many millions of gallons did you store in that reservoir?

A. Why I ought to know but really Mr. Gardner here could tell you better than I, or Mr. Cook, I would not like to make a guess at it.

Q. How many do you store now, using it as a distribution reservoir?

A. I don't know what is in it today, because I haven't paid any special attention to it, and haven't been there in a long while, but my idea is that they store about quarter as much as they use to; we did discuss at the time of building a new reservoir instead of that and using it simply for the filtered water, cutting it off from the big reservoir, but that has never been done. Now to Paterson and Passaic the supply is direct, it don't go there at all.

FURTHER CROSS.

Q. Don't go where at all?

A. Don't go to the Notch reservoir at all, it is pumped directly to the City.

Q. Pumped directly from the river to the City?

A. After filtration; some of it don't go through any reservoir.

Q. Do you say that you did not furnish water to Jersey City without filtration after you furnished Bayonne with water that was filtered?

A. I didn't say so, I said without sedimentation, that we had never furnished water to Jersey City without sedimentation.

Q. When was the reservoir at the Great Notch completed?

A. Oh, I think 1900 or 1899.

Q. I understood you to say that no filtered water was ever supplied to Jersey City?

A. No filtered water was ever supplied to Jersey City.

Q. Doctor, you didn't make this map that is on the wall?

A. I didn't make it, no sir,—all I used that for is just a guide that is all, there is no particular point about it, I would use your map just as readily.

Testimony of David D. Chandler.

By the COURT.

Q. That is generally correct?
A. Yes, sir, is a print made from an old Atlas of Dover.

By Mr. VREDENBURGH.

Q. Made by someone in your employ?
A. Yes, sir, Mr. Byrne, the man who made it, is right here.

Mr. EDWARDS: We offer it for that purpose.

Marked Exhibit D 15.

DAVID D. CHANDLER, sworn on behalf of the defendants.

DIRECT EXAMINATION, by Mr. Edwards.

Q. Mr. Chandler where do you reside?
A. This City.
Q. Newark?
A. Yes, sir.
Q. And what is your age?
A. Past 50—52.
Q. What is your occupation?
A. I am the Health officer of the City of Newark, Secretary of the Board of Health.
Q. How long have you been Health officer of Newark?
A. Ten years.
Q. Previous to that what was your occupation?
A. Sanitary Superintendent of the Board of Health.

Q. How long were you Sanitary Superintendent?

A. Ten years.

Q. Previous to that?

A. Collector of the Health officer.

Q. You have been connected with the Health Department of Newark for how many years?

A. 22 years.

Q. Do you belong to any of the sanitary socities?

A. Yes, sir; the American Public Health of Canada and Mexico, the New Jersey Sanitary Association and a member of the State Sanitary Inspecting Board.

Q. Are you a member of the examining Board in this State, for health officers?

A. Yes, sir.

Q. Appointed by whom?

A. State Board of Health.

Q. Have you been assisting Dr. Leal in the investigation and purification of the Rockaway water shed?

A. I have.

Q. How did you come into the matter?

A. At his request.

Q. When?

A. I think it was in May, last.

Q. What were you asked to do?

A. To go over this water shed and to point out, if possible any source of pollution; I was to be absolutely my own judge in regard to the matter.

Mr. VREDENBURGH: I object.

The COURT: You can show his instructions.

WITNESS: I was to go over and find all the possible source of pollution I possibly could, and point them out, as I was told by him that they would be rectified.

Testimony of David D. Chandler.

The COURT: That is not evidence; you may state your instructions.

Q. Your instruction was to get everything?
A. Yes, sir.

Mr. VREDENBURGH: That part of it is stricken out?

The COURT: Yes.

Q. When did you start in with the work?
A. The absolute date you want to know?
Q. About.
A. I think it was May 3rd.
Q. Have you given very much of your time to the work since that?
A. Yes, sir; considerable.
Q. Had you had any experience in like work on other streams?
A. Yes, sir.
Q. On what streams?
A. Our own water supply, the Pequannock.
Q. Did you make an investigation at any time of what is known as the Mansion House?
A. Yes, sir.
Q. On Wednesday, May 9th, I understand, you visited it; what did you do on that day?
A. I think it is the 7th.
Q. What was the first investigation you made at the Mansion House?
A. May 7th.
Q. What did you find, and what did you do?

The COURT: In whose company were you; don't you want to identify the time?

Q. In whose company?
A. Mr. James Gibson.

Q. Who else was in the party?

A. Dr. Herold and Dr. Leal.

Q. When did you first visit it, I understand it was May 9th?

A. No, that was on May 8th.

Q. Then did you again visit it on May 9th?

A. Yes, sir.

Q. At what hour, and what did you do?

A. At 1.40 P. M., we made a test of two private water closets on second floor, two water closets in rear of bar room, water closet in bath room No. 17 on second floor; a water closet in bath room No. 35 on third floor.

Q. Were there any other fixtures in the house?

A. Those are all the fixtures there are in the house outside of the laundry tubs.

Q. What did you do?

A. We tested them with tests.

Q. What sort of tests?

A. Urinine and letting the closets or the water run—the faucets wherever we could for several seconds or minutes.

Q. Did you use sufficient water?

A. Yes, sir.

Q. Then what did you do?

A. Then, of course, that was the end of the inspection.

Q. What did you look for?

A. We had nothing to look for there, we would test simply putting in the coloring matter in each fixture.

Q. Where did you go after that?

A. Went to —if you go right along with each test, why, we left the Mansion House then—

Q. I know, but when did you look for the result of that test?

A. We weren't on that end of it.

Q. You were not at that end of it?

A. No, sir.

Q. Who was at the other end?

A. Dr. Herold and Dr. Leal.

Q. Then you were putting in the urinine?

A. Yes, sir.

Q. They were waiting for the result?

A. Yes, sir; we immediately returned and reported the time we placed it in.

Mr. VREDENBURGH: I object then; it seems that one was at one end and this gentleman thinks that the others was at the other end, but there is no certainty but what they were in the hotel having a drink at that time.

Q. Did you notice where these gentlemen were?

A. Always found them at their post even in the rain.

Q. Did you see the results of that urinine that day?

A. I did not in all cases, that wasn't my part of it.

Q. Not your part of it?

A. No, sir.

Q. Who was with you?

A. James Gibson.

Q. Did you make any further test at the Mansion House,—the laundry?

A. Yes, at 3.10 P. M.; we tested the laundry tubs on the first floor.

Q. Yes; what was the result?

A. That, of course, I don't know; I wasn't on that end.

Q. Who put the urinine in?

A. We put the coloring matter in.

Q. Who was at the other end?

A. Dr. Leal and Dr. Herold.

Q. Now, then, did you make another test at the Mansion House?

A. Yes, sir.

Q. What was the date; I have it here October 31st?

Mr. VREDENBURGH: May I ask what the witness is reading from?

WITNESS: My notes taken at that time.

By Mr. VREDENBURGH:

Q. Are they not type-written?

A. Yes, sir.

Q. Did you type-write them at that time?

A. No, sir; a copy of what I took at that time, more correctly speaking.

Q. When did you have it type-written?

A. The very next day.

Q. Why did you have it type-written?

A. Because I took them down in sort of shorthand and could not read them as nicely, perhaps.

By Mr. EDWARDS:

Q. And dictated them to the type-writer?

A. Yes, sir.

Q. And compared them afterwards?

A. Yes, sir; always with my book.

By Mr. VREDENBURGH:

Q. Have you got your book here with you?

A. No, sir.

The COURT: Well, the evidence on the other side was given in exactly the same way; all the witnesses had type-written notes, and it was very proper, because it is difficult to decipher lead pencil notes made on the ground.

Testimony of David D. Chandler.

By the COURT:

Q. You have got your original notes?
A. Yes, sir; I have my original notes.

By Mr. VREDENBURGH:

Q. Did you furnish Dr. Leal with a copy of your notes?
A. Yes, sir.
Q. At the time?
A. Very soon after.

Mr. EDWARDS:

Q. Look at October 31st what test did you make on that day, and when?
A. That is the Mansion House you are speaking of?
Q. Yes.
A. In the laundry rooms?
Q. Yes, what time was that test?
A. 3.35 P. M.
Q. What did you do?
A. Tubs were not connected, the waste was just coming even with the floor, the tubs hadn't been set; we took a funnel from the kitchen and placed a funnel in the pipe and then poured several buckets of water in it.
Q. What result did you get?
A. Result? I don't know.
Q. Who was at the other end?
A. Dr. Herold and Dr. Leal?
Q. Now, again on December 14, 1906?
A. Those are the ones I haven't got with me.

Adjourned until Friday, December 28, 1906.

IN CHANCERY OF NEW JERSEY.

Between

THE MAYOR AND ALDERMEN OF JERSEY CITY,

Complainants,

and

THE JERSEY CITY WATER SUPPLY COMPANY,

Defendants.

Before His Honor, Vice Chancellor Stevens.

Mr. Vredenburgh and Mr. Record, for the complainants.

Mr. Corbin and Mr. Edwards, for the defendants.

Transcript of shorthand report of the evidence given upon the trial of the above stated matter, on Friday, December 28, 1906, at the Chancery Chambers, Newark, N. J.

DAVID D. CHANDLER, recalled:

FURTHER DIRECT EXAMINATION by Mr. Edwards:

Q. Have you the notes of your test of December 14th?

A. Yes, sir.

Q. As to the Mansion House?

A. As to the Mansion House.

Q. What did you do December 14th?

A. Made the test of two water closets in the rear of the bar, or cafe, at 9:15.

Q. And in what method did you make them?

A. By putting sufficient of the coloring matter in the closets and emptying the tanks that hold from four to eight gallons of water, several times.

Q. That was with what coloring matter?

A. That was with the urinine,—green.

Q. How much of the urinine did you put in?

A. Well, we used a pocket knife, and as much as we could hold on the large blade in every case.

Q. Was that sufficient to show?

A. More than enough in any case, a great deal more than enough.

Q. Who was at the other end?

A. Dr. Herold and Dr. Leal.

Q. Did you afterwards go to the other end?

A. Reported to them the time we placed it in.

Q. Did you see the coloring matter yourself, or, did you see whether or not there was any coloring matter come?

A. No, sir.

Q. Was there any when you went there?

A. No, we reported immediately.

Q. You reported immediately the hour?

A. Probably in every case we were back there within five or ten minutes after placing it in.

Q. Did you make all your tests that you are going to testify to, in this way?

A. Yes, sir.

Q. Who deposited the urinine?

A. Mr. Gibson.

Q. And yourself?

A. No, sir; he placed it in and it was my duty to take the time it was plced in, see that it was placed in and see that it was properly flushed.

Q. You waited until it was put in?

A. In every instance saw it dropped, saw the coloring matter in the different fixtures.

Q. Did you go through all the fixtures?

A. At that time, no; we only tested the two closets on the morning of the 14th.

Q. But the other time you went to every fixture?

A. Yes, sir.

Q. Who was, in each case, at the other end of the line?

A. Dr. Herold and Dr. Leal.

Q. When you deposited the mixture what did you do, after flushing?

A. Well, we would clean up the places some times a little, because it makes a kind of a dirty mess all over the fixtures, but as soon as possible, within five or ten minutes we were at the other end where the others were stationed.

Q. At the river?

A. Yes, sir.

Q. What did you report?

A. The time we place it in, what we placed in it, and what fixtures we flushed.

Q. You kept a note of it?

A. Yes, sir.

Q. And they would keep a note of it?

A. Yes, sir; they know what they did.

Q. What say?

A. I was going to say they put the time I gave them,—

Q. Oh, yes; I understand that; this was done for the purpose of seeing whether you could get any result?

A. Any result from those two closets; yes, sir.

Q. In the other cases, from the other fixtures?

A. Same thing.

Mr. EDWARDS: I think that is all we have on that investigation.

CROSS-EXAMINATION by Mr. Vredenburgh:

Q. Are you a physician?

A. No, sir.

Q. Up to thirty years of age what was your profession?

A. I was in the insurance business.

Q. Where?

A. In the Metropolitan in New York.

Q. In what capacity?

A. Well, I was what they call a Lapsing Clerk at that time.

Q. Your work was in the insurance building?

A. Yes, sir; inside.

Q. And you had been at that all your life up to that time?

A. No, sir; I hadn't been at it all my life, I had been there I think about five or six years.

Q. Now, when you came to Newark at whose suggestion did you come here?

A. I have always lived in Newark.

Q. Yes, but when you came to Newark to take up this—to be connected with the Sanitary Board here?

A. You asked me why I did.

Q. I ask you at whose suggestion?

A. At whose suggestion?

Q. Yes.

A. Well, it was really at the suggestion at that time of Alderman Currier.

Q. And what position did you take?

A. Clerk to the Health officer.

Q. Who was health officer?

A. Doctor D. L. Wallace.

Q And your duties as clerk was to be in the office?

A. At that time the Board of Health was small, and we were in and out.

Q. How long did you remain clerk there?

A. Two years.

The COURT: You see, Mr. Vredenburgh, this witness is only testifying to what any person could testify to, he has not testified to any matter of opinion.

Mr. EDWARDS: We have not asked him as to opinion, but he is a man that is skilled in doing this kind of work.

The COURT: The same work might have been done in the same way by anybody else, and so it seems to me that his qualifications as a Health officer are quite unimportant.

Mr. EDWARDS: We think they are, for this reason, we have taken an experienced man to do this work, a man who has done it on a number of occasions before, and who was accustomed to testing, and who was accustomed to looking after nuisances of various kinds; in other words, we did not pick up the average man in the street.

The COURT: No, of course, that is apparent.

Mr. EDWARDS: That is the only thing; I would not want it to appear we hadn't taken a man that was expert.

The COURT: If this man had gone and given his opinion as to the subject, then a minute cross-examination into his qualifications would be desirable, but as he has not, it seems to me that the only question is as to whether this particular examination was made carefully, and that the results are to be depended upon; I merely suggest that for the purpose of shortening the examination.

Q. I understood you to say that you had had experience in like work on the Pequannock?

A. Yes, sir; I don't know the way it was put, but that was about what I meant; that I had had experience in water shed inspection.

Q. You said, "In our water supply at Pequannock?"

A. Yes, sir.

Q. What part of the Pequannock did you investigate personally?

A. Well, as far as names and dates go, it would be utterly impossible to give them, as it was some years ago, but it wasn't the closets alone that we inspected, it was going over the whole water shed; it wasn't the closets alone that it was necessary to inspect in that kind of work.

Q. Now, my question is, give us the water closets which you inspected?

A. By names, hardly.

Q. Mr. Hardly?

A. No, sir; I mean I could hardly give you the names.

Q. You could give one name of one water closet?

A. No, sir; as far as names go, I don't think I can.

Q. Can you locate any?

A. They were located at—

Q. No, no; one particular one?

A. At Charlottesburg.

Q. When did you investigate that?

A. That must have been five or six years ago.

Q. What did you do there?

A. Made an inspection of them.

Q. What do you mean made an inspection of them, did you put in any urinine?

A. No, sir.

Q. What did you put in?

A. We did not make any tests of them, they were too far away to warrant a test being made.

Q. I am speaking of this one, the only one you can mention, and that was too far away in order to justify making a test?

A. Yes, sir; I am mentioning the one now at Charlottesburg.

Q. Mention one where you made tests?

A. We did not make any tests in there.

Q. Did you ever make tests on the Pequannock water shed?

A. Yes, sir.

Q. Where?

A. One at Booth's knife factory, at Stockholm.

Q. Where was that?

A. That was situated in Stockholm, I think a little south of the village.

Q. What is it?

A. A knife factory.

Q. Where they manufacture knives?

A. Pen knives; yes, sir.

Q. How many men were employed there?

A. I think about 40.

Q. Did you investigate the closets there?

A. Yes, sir.

Q. How near was the closet to the stream?

A. About 15 or 20 feet.

Q. When did you investigate that?

A. I say those were about—

Q. No, not those; this particular one?

A. Probably 3 or 4 years ago.

Q. What stream was that near?

A. That was near a pond dammed up for water power for the factory.

Q. What investigation did you make, or what test did you make of that water closet?

A. Put bluing in it.

Q. Who put it in?

A. I did, myself, and an inspector.

Q. You put bluing in the water closet, when did you put that in?

A. Well, it is some time; as I said, 3 or 4 years ago.

Q. What time in the day?

A. Well, it was probably in the afternoon.

Q. How much did you put in?

A. A package containing probably two tablespoonsful.

Q. Who put it in, you or the inspector?

A. Well, probably the inspector, but I was by with him.

Q. You don't recollect who it was put it in?

A. Well, no; but the chances are that it was he.

Q. When you put that package in did you flush it?

A. Yes, sir.

Q. Where did you get the water from that you flushed it with?

A. From an old well nearby.

Q. You pulled it out of the well?

A. No, sir; we drew it up in a bucket.

Q. And put this package in the water?

A. No, sir; we put the package in the first pail of water, first bucketful.

Q. And then poured that water into the closet?

A. Yes, sir.

Q. What did you discover from that?

A. Nothing.

Q. Nothing?

A. No results.

Q. What was done about the water closet?

A. Well, finally the water closet was bought by Newark and removed; the property was bought by Newark and the closet was removed.

Q. Bought by Newark city?

A. Yes, sir.

Q. For the purpose of removing that closet?

A. No, sir.

Q. What then?

A. For the purpose of removing the factory.

Q. What was the trouble with the factory?

A. There wasn't any, but there might be because there were 40 people employed there.

Q. And you thought it was better to remove that factory?

A. The city thought it was better.

Q. Did you advise the removal of that factory?

A. No, sir.

Q. Who did?

A. I suppose the Board of Works; they had control of it.

Q. Did you report?

A. I was with the party.

Q. You were with the party, what party do you refer to?

A. The party who went there to investigate the plant.

Q. Was it at this particular time you went there and tested it?

A. No, sir; this was afterwards.

Q. Then you went up there with a party?

A. Yes, sir.

Q. How did you happen to go there?

A. Why, some representative of the Board of Works was always invited as a rule—or of the Board of Health, was always invited as a rule to go with the Board of Works on those inspections.

Q. And that was the reason you went, because you were invited by the Board of Works to go?

A. Yes, sir.

Q. You were then a health officer?

A. Yes, sir.

Q. And in a way, in charge of this water supply?

A. To a certain extent; yes, sir.

Q. The initiative of this movement was made by the Board of Works; you were invited to go, and you went up to the factory; now, did you make any tests then?

A. No tests were made then.

Q. Then very shortly after that Newark bought that place because of the danger to the water supply?

A. No, sir—it might be.

Q. Well, I say danger to it?

A. Well, it might be.

Q. Might be danger?

A. Yes, sir.

Q. What danger?

A. There were 40 men working in that factory.

Q. What danger is that?

A. The danger of a populated water supply.

Q. Did 40 men make it populated?

A. Certainly would.

Q. It certainly would?

A. Probably.

Q. What do you mean as a health officer in saying it certainly would, probably?

A. Why, you could not control 40 men and see what they did in a factory right alongside of a stream.

Q. But you tested that water closet and said it was 40 feet away?

A. Yes, sir.

Q. And nothing had come from it?

A. No, sir.

Q. What was the danger then?

A. They might not all use that water closet.

Q. The danger to the water supply of Newark was that they all might not use the water closets, is that it?

A. Yes, sir; it might be.

Q. Might be, yes.

A. Yes.

Q. How much did they give for that?

A. I don't know.

Q. Don't know at all?

A. No, sir.

Q. What, you didn't hear?

A. No, sir.

Q. Do you swear you don't know what they gave?

A. I swear I don't know.

Q. Never heard?

A. I have read it.

Q. What did you read they gave?

A. I have forgotten.

Q. Was it ten thousand dollars?

Objected to by Mr. Edwards as immaterial.

The COURT: If this witness knew of the fact, had been a party to the negotiations and to the consummation of the negotiations, so that he knew what was paid, he could speak; but I don't think this witness can speak with

reference to that fact; I think you have got all that is material in regard to this; the trouble is that the witness says he don't know; if the witness had been a party to the negotiations, that would be a different thing; I understand that he was not.

WITNESS: Your Honor, it was not purchased at that time; we simply went up at that trip to talk it over.

By the COURT:

Q. Did you have any hand in the purchase of that property?

A. Not the slightest; not even a suggestion.

The COURT: Then the witness doesn't know anything about it.

By Mr. VREDENBURGH:

Q. Now, you said a minute ago, in answer to my question whether the closet was forty feet from some stream or other—

Mr. EDWARDS (Interrupting): He said it was about fifteen feet.

Q. You said in answer to my question whether it was forty feet, that it was forty feet; did you mean that?

A. I don't remember the forty feet at all.

Q. You don't remember my saying that?

A. You might have said it, but I was answering the question.

Q. You didn't mean forty feet?

A. I was answering what I thought it was.

Q. How far was it, in your judgment?

A. Fifteen or twenty feet, I think.

Q. From some pond, or from some street?

A. From the edge of that water held back.

Q. From the edge of a pond?

A. Yes.

Q. And what was the size of the pond, about?

A. Oh, I should say, an acre and a half; now, I might be wrong in that; I am a very poor judge—

Q. You haven't very much judgment as to size?

A. As to size; no, sir.

Q. Never had much experience in that direction; now, what stream was it?

A. It was no stream; it was water held back for power purposes.

Q. Didn't a stream run into it?

A. Oh, yes.

Q. What stream?

A. That would be the Canastea stream, I think.

Q. Canastea Creek; there was water running out of it?

A. Yes.

Q. Where did that run to?

A. That went down, I think, to Oak Ridge Reservoir, after passing the—

Q. (Interrupting). After passing through the pond?

A. After passing the pond.

Q. There was a stream that went down to what reservoir?

A. To the Oak Ridge.

Q. Oak Ridge Reservoir?

A. Yes.

Q. How far was that stream from the Oak Ridge Reservoir?

A. From the knife factory?

Q. Yes.

A. I should say that was about three miles and a half.

Q. And what was the character of the country through which it ran?

A. Depopulated.

Q. Populated?

A. Depopulated.

Q. Depopulated?

A. Yes.

Q. Woods?

A. Woods and farms.

The COURT: You don't mean depopulated, do you; you mean unpopulated?

Mr. VREDENBURGH: He may mean depopulated.

Mr. EDWARDS: Had it ever been populated?

WITNESS: Oh, I see what you mean; unpopulated.

Q. Newark hadn't depopulated it?

A. Yes, I understand; unpopulated.

Q. Now, that Oak Ridge Reservoir is one of the reservoirs of the Newark water supply?

A. Yes, sir.

Q. And what is the size of that?

A. I can't tell you how many gallons that holds.

Q. How far is that above Newfoundland?

A. That is about a mile, I should say, above the town of Newfoundland.

Q. Is there any reservoir between that and Newfoundland?

A. No, sir.

Q. Where is the other reservoir that is above Newfoundland?

A. That is Clinton.

Q. Eh?

A. Clinton Reservoir.

Q. And that is on another stream, isn't it?

A. I couldn't tell you whether any of the surrounding streams run into it or not; I don't pay so much attention to the streams as I do to looking over shores to see what is on them.

Q. Don't you know whether the Clinton reservoir takes the water from the Oak Ridge Reservoir, or not?

A. Why, I don't think it does; I don't think Clinton runs into Oak Ridge, but I am not positive about that; I don't make much af a study where they go.

Mr. EDWARDS: No, they do not.

Q. Don't you make study enough to know of your own water supply, whether one reservoir enters into the other or not?

A. Oh, no; that wouldn't make any particular difference to me.

Q. You don't make any study of that?

A. Another Board has charge of that, and an engineer.

Q. Don't you know it as a fact, Mr. Chandler, that they let out the water of one reservoir at one time, and then of another reservoir at another time, not letting them both run at the same time?

A. I know they hold some sometimes for months, and only use one; yes, sir.

Q. Only use one?

A. Yes. But I wouldn't know which one they were using It wouldn't be of interest to me.

Q. And in fact whether they can have as much storage of the water as they see fit in either reservoir?

The COURT: What do you mean by storage?

Q. May have the water remain in either reservoir as they think it best for the city?

Mr. EDWARDS: No, that would depend on the supply.

Mr. VREDENBURGH: I am asking the question.

A. That would be entirely to the opinion of the engineer.

Q. Or of the Health Board, wouldn't it?

A. No sir.

Q. Does the engineer determine those questions?

A. The water sheds are entirely under the control of the Board of Works of the city of Newark.

Q. Has the Health Board something to say about the health of the people of Newark?

A. Yes, when we notice anything that would warrant looking over it.

Q. The engineer wouldn't remove a water closet, would he?

A. Oh yes, they do.

Q. Without consulting—

A. (Interrupting) yes.

Q. Why?

A. Why, if he saw what was wrong, it is removed.

Q. Why?

A. Any man would know it.

Q. Any man would know what?

A. Know what was dangerous or not.

Q. Any man would know, from seeing a water closet, whether it was dangerous or not?

A. Anybody would know whether it was in close proximity to the stream or whether it was advisable to move it or it was not.

Q. Then, you think that an engineer is just as competent to pass on nuisances of that sort in a water-shed as a health officer?

A. Oh! no. I didn't say so.

Q. What do you mean?

A. It would be a very easy matter for anybody with ordinary common sense to know whether it ought to be removed or not.

Q. You think anybody going in a water-shed would know whether a water-closet should be removed or not, do you?

A. To a certain extent. He would have to do some guessing unless he tested it, of course.

Q. What do you mean by "a certain extent"? I am asking you about two men—one an engineer and one a health officer. And you think that the question of the purity of the supply from danger from a water closet as open to an engineer as a health officer?

A. I am speaking of our own. We have a very experienced engineer that knows a good deal about these things.

Q. Then, your engineer's judgment is the same as the health officer's, you think? Is that it?

A. I wouldn't say that. No. Hardly.

Q. Hardly?

A. He might think so.

Q. But now your judgment is that it is because of the ability of your engineer?

A. Yes.

Q. Now, do you recollect any other time that you put bluing in any water closet before you came to examine this one?

A. Why, yes, in the city of Newark, frequently.

Q. Well, now, please tell us why you put it in a water closet in the city of Newark.

A. Why?

Q. Yes.

A. Why, to find out the drainage where we hadn't sewers. There are plenty of streets where there are no sewers.

Q. Now, for the purpose of finding out sewers, you sometimes put in bluing in the water closet?

A. No, I will explain that. Where we have had new sewers put in streets, and closets have been disconnected—water closets in the yard—and there are no other indications, we have sometimes tested those closets to see whether they have disconnected with the cesspool and connected with the sewer. For that purpose it is done.

Q. Well, does it require any special ability to put in bluing in a water closet?

A. No sir.

Q. You don't claim that your experience in that direction has fitted you better than anybody else?

A. Not the slightest. A good pair of eyes is all that is necessary.

Q. You don't even have to have a good pair of eyes, do you, with this green stuff?

A. Oh, yes.

Q. Why do you want to have a good pair of eyes?

A. You want to see the color. Some people are color blind, and they couldn't see it. I mean a good pair of eyes.

Q. It does require a good pair of eyes to see it, in your judgment. Is that it?

A. Yes, sir.

Q. Now, I understand you to say that your directions were to go over this whole water-shed, that you were employed in May to go over this whole water shed and find if possible any source of pollution.

A. Yes, sir.

Q. And you have been employed since May for that purpose?

A. Not steadily.

Q. Were you given a salary?

A. No, sir.

Q. What do you mean by saying that you were employed to go over the whole water shed?

A. Just what I said. I was to go over the whole water shed.

Q. Did you go over the whole water shed?

A. Yes, practically the whole water shed.

Q. What do you mean by "practically"?

A. Riding around it where there was not any possible source of danger to get out and look after it.

Q. Then you went to every practical source so far as you saw it in this water shed?

A. I think I did. I think I covered everything.

Q. Let us commence. On Cooper-Lord. Did you go to the Cooper-Lord factory in Boonton?

A. Yes, sir.

Q. How many men did you find employed there?

A. That was what day? No, we didn't go in the factory.

Q. What?

A. We didn't go in the factory?

Q. I thought you said you went to every source of pollution?

A. We looked over that.

Q. How many men were there in the factory?

A. I don't know how many men there are in the factory.

Q. Wasn't that a very important question, how many men are gathered there?

A. I didn't go into it.

Q. Wasn't that a very important question, how many men were gathered in that?

A. I don't know. I wasn't in there.

Q. Do you know whether it was an important question or not?

A. No.

Q. Why? You said forty men way up on the Canastea Creek was important. And here, the nearest source of pollution was a tremendous factory, and you didn't inquire the number of men that were there.

A. Why, I supposed there was a system of closets in the Cooper-Lord which there wasn't in the Booth knife factory.

Q. You supposed so?

A. I was told there was.

Q. That is the way you investigated? You took whatever was told you?

A. Oh, no sir.

Q. You did, as to this one?

A. I wasn't in that factory.

Q. Did you take the information given you as to that factory?

A. I wasn't taken in that factory by the people I went with.

Q. Will you answer the question?

A. I wasn't in the factory, and I say I know nothing about it.

Q. You know nothing about that factory at all?

A. The inside, no sir.

Q. Do you know anything about the outside?

A. Looking over it.

Q. How many buildings were there?

A. I didn't count them?

Q. Weren't you investigating the sources of pollution?

A. Yes.

Q. Isn't that the nearest pollution to this water supply?

A. I don't know as it is.

Q. Which is nearer?

A. There are several of them nearer than that?

Q. Give us one that is nearer?

WITNESS: Have you got the date of that Cooper-Lord, Doctor?

Dr. JOHN L. LEAL: You didn't see that at all.

Q. Did you see it at all?

A. I saw the factory.

Q. Where is it, now?

A. The Cooper-Lord factory? It is this side of the track, I think.

Q. This side of that?

A. This side of the plane, the Canal, I think it is.

Q. What do you mean by "this side"?

A. On this side of the Canal.

Q. What is "this side"?

A. As you go down, on the right hand side.

Q. North, west, east or south?

A. That would be south.

Q. On the south side?

A. Yes sir.

Q. You think the Cooper factory is on the south side of the Rockaway river?

A. Of the Canal there.

Q. It isn't on the Rockaway river at all?

A. Yes, I think it is this side of the Rockaway river. I am speaking of the canal.

Q. This side?

A. I think it is between the River and the Canal, on the south side of the Canal coming east.

Q. And which side of the River?

A. This side.

Q. Nobody knows what "this side" means.

A. North side.

Q. On the north side of the River and south side of the canal?

A I think it is.

Q. And whereabouts?

A. Whereabouts?

Q. Yes.

Mr. EDWARDS: Do you mean, at what place?

Mr. VREDENBURGH: I am asking him.

A. At Boonton, I have said.

Q. You have said, at Boonton?

A. Yes, sir.

Q. How near to the Reservoir?

A. Now, that must be about two miles; I should think, two miles and a half.

Q. Does the river run through it?

A. Run through it?

Q. Through the factory.

A. I don't think so.

Q. Do you think they use the river water for power?

A. I don't know that.

Q. What investigation did you make of any portion of that work?

A. Doctor Leal says we didn't go there.

Q. Doctor Leal now tells you you didn't go there?

A. Yes, sir. If you will let me go along with my notes, I might be able to tell you where we had gone.

Q. I don't want to know where you did go. I want to know about this source of pollution.

A. The Cooper-Lord? I got that mixed up with another place.

Q. You got that mixed up?

A. I say, I have got the name mixed up.

Q. Got the name mixed?

A. But I remember now.

Q. You were looking for sources of pollution?

A. Yes, sir.

Q. Suppose I should tell you there were 1000 men working there on the level, a few feet above the river—the river runs right through that factory, would not you say that was a very important source of pollution?

A. Not until I had investigated it.

Q. Not until you had investigated it?

A. Not from hear say.

Q. Then as Health Officer of the city of Newark, you say that it is of no importance how many men are working on this river near this reservoir, until you investigate it, is that right?

A. Yes, sir.

Q. When you found that a water closet at a mill only employing 40 men and which did not connect with the pond, you still thought that it was important enough to have it bought by the city, the whole factory bought by the city rather than have these 40 men so near to the water, didn't you say so?

A. I said it was safer.

Q. Safer?

A. Yes, sir.

Q. You said the 40 men employed there might not go to the water closet?

A. Yes, sir.

Q. Now if there was 1000 men there, is not that still more likely?

A. Not if they had a system of water closets in the factory, they would go inside rather than go out.

Q. Then you think if they had a system of water closets they would go to them?

A. Yes, sir.

Q. But if they have privies they won't go to them?

A. Frequently that is so if the privies are outdoors.

Q. Therefore you think the 40 men up above this dam are less dangerous than 1000 upon the river?

A. I certainly do.

Q. You certainly do think that 40 men gathered together are less dangerous than 1000?

A. Yes, sir.

Q. And that is your judgment. Why didn't you investigate that source of pollution to the city—investigate all of that?

A. Well, I wasn't taken there.

Q. Then you only went and investigated those you were taken to investigate?

A. We were taken to a good many places.

Q. Did you investigate any you were not taken to?

A. I think not.

Q. Who took you up there?

A. I went up with Dr. Leal and (Interrupted)

Q. Did Doctor Leal take you?

By Mr. EDWARDS: Let him complete his answer.

By the WITNESS: And Mr. Gibson and Dr. Herold were with us on two occassions, and I think on one occasion, Mr. Sherrerd.

Q. You were employed by somebody, as you say, to investigate all possible sources of pollution, and what you did so was to go with Dr. Herold, Dr. Leal, and Dr. Gibson to this place where they told you to go to?

A. We had to go where we were taken, certainly.

Q. That is what you mean when you say you investigated the sources of pollution on that water shed?

A. Yes, sir.

Q. All possible sources?

A. Yes, sir.

Q. Now Mr. Chandler, you say you went to this Mansion house to investigate that house; when did you first go?

A. I think it is May 7th; I will refer to my notes.

Q. Did you investigate it then?

A. Yes, sir.

Q. Did you find that it had any connection with the river?

A. That wasn't my part of the work, Mr. Vredenburgh, I only made the tests there.

Q. Well, you don't know then at all whether the Mansion house had any connection with the river or not so far as your end of it was concerned?

A. As far as my end of it was concerned I don't know.

Q. Your end of it consisted of seeing Mr. Gibson put a knife in a package of urinine?

A. Yes, sir.

Q. And the knife blade taken out, and what remained on the knife blade put into the water closet?

A. In all the fixtures.

Q. In all your investigations, that was so, was it?

A. Yes, sir.

Q. And you took down the time he did it?

A. Yes, sir.

Q. That is all you did?

A. In that case, yes, sir.

Q. In any case?

A. Yes, sir.

Q. That is the way you did, speaking generally in every case?

A. In the Mansion house case I made mention that I went through the plumbing system there, and saw distinctly that all the lines went to one outlet, and to be sure of it we tested every fixture.

Q. In the presence of Mr. Herbert the proprietor of the hotel?

A. No, sir.

Q. He knew of it?

A. He knew we went in there.

Q. You investigated the plumbing work you say, did you dig up any ground to see where it went?

A. Not in the building.

Q. Outside of the building?

A. The pipes were all hung plain to be seen.

Q. In the building?

A. In that system, yes,sir.

Q. Then it goes out of the building into a cesspool, doesn't it?

A. Yes, sir.

Q. Did you make any investigation other than those tests of plumbing to see whether there was any connection between those cesspools and the sewer system of the town?

A. That was made by an inspector who is here.

Q. Did you do it?

A. No, sir.

Q. Did you see it done?

A. No, sir.

Q. You don't know anything about that?

A. No, sir.

Q. How many water closets were there in that house?

A. I think there are six.

Q. Did you test the laundry?

A. Yes, sir.

Q. Did you test the stables?

A. There are no stables on that property that I recollect.

Q. No stables on the property?

A. Not on the Mansion house property.

Q. You did not test them if there were none there?

A. No, sir.

Q. Did you test the building or the property occupied by the tenant who runs the harness store there?

A. What street is that on?

Q. I don't know.

A. I don't know of any harness store there.

Q. How about the barber shop?

A. There is nothing there.

Q. Did you test there at all?

A. No, sir.

Q. The photographers place, did you test that?

A. No, sir.

Q. I understood you, in answer to Mr. Edwards, to say this morning that on December 4th you tested two closets?

A. December 14th.

Q. You tested two of the closets in the Mansion House?

A. Yes, sir.

Q. Then you said before that you tested all of them?

A. Yes, sir.

Q. And on what date did you test all of them?

A. On May 7th.

Q. Was that the only day you tested all of them?

A. No, sir, we tested them again.

Q. Give us the second day you tested them all?

A. On May 8th, the next day.

Q. And on what other occasion did you test them all?

A. I don't understand the question, on what occasion.

Q. Yes, on what other occasion did you again test all of them; now, I am asking you to say when you tested all of them; I want to ask you about that in a minute; I merely want you to give us the dates now on which you tested them all?

A. On the 7th I tested them all—let me see— on the 8th.

Q. You told us that, you said May 7 and May 8th; now, I am looking for the next day you tested them all?

A. The next day?

Q. Yes, when you tested all of them, not when you tested some of them; my question is confined to when you tested all of them?

A. On the 9th we tested all of them.

Q. On May 9th?

A. Yes, sir.

Q. Then the occasions you give us are May 7, 8 and 9th?

A. Yes, sir.

Q. What is the next?

A. That is the only one of them.

Q. On May 7th, just state the number of water closets that you found in that house?

A. Six.

Q. Where were they?

A. There was one private one on the top, one private one on the second floor,—no, one public one on the top floor, one public one on the next floor, and two baths.

Q. Yes, that makes four?

A. Four; and two in the rear of the cafe.

Q. Did you test the urinals?

A. Yes, sir.

Q. How many were there of those?

A. There were two private, two baths and two urinals; no, two urinals, two closets and two baths.

Q. Then what you did test was two closets, two urinals and two baths?

A. Yes, sir.

Q. That is all you tested, was it?

A. Why, no; we tested all the closets.

Q. Well, you said there were two closets?

A. You are speaking now, on the floors; I haven't gotten down to the closets in the cafe, which I have told you of.

Q. Then the two closets, and the four urinals, and two bath tubs were on the upper stories, were they, on the building?

A. No; one public closet, bath and urinal on the top floor.

Q. Did you test them?

A. All of them—the fixtures.

Q. Were they separate, the urinals?

A. They were all in the same room, on the top floor.

Q. But were they separate?

A. Yes, separate.

Q. Was there bluing put in each?

A. Yes, sir; on the top floor—coloring matter.

Q. You saw Mr. Gibson put, as you said, in both the urinals and the closet, did you?

A. And the bath tub.

Q. Now, you have mentioned those on the upper floor; how many were there on the lower floor?

The COURT: Well, on the lower, next below?

Q. Next below; yes.

A. There is the same; public bath, urinal and closet, two private.

Q. What do you mean by two private?

A. The boarders have them in their rooms, I think Mr. Richards, and I think the Postmaster has a room with a private bath in.

Q. Private bath and private bloset and private urnial?

A. Yes, sir.

Q. And you went in their room?

A. Yes, sir.

Q. And Mr. Gibson put this coloring matter in those?

A. Yes, sir.

Q. Now, down stairs; how many are there?

A. Two in the rear of the bar.

Q. Two closets in the rear of the bar?

A. Yes, sir.

Q. Isn't there urinals there also?

A. Yes, sir.

Q. Separate from the closets?

A. Yes, sir.

Q. And that opens into the bar room, does it?

A. Yes, opens into the bar room.

Q. It faces on the street?

A. Well, the room is next to the street.

Q. It is lighted from windows on the street?

A. Yes, sir.

Q. What street is that?

A. That is Essex, I guess; or Sussex; Essex, I guess it is.

Q. The main street?

A. One of the main streets.

Q. Trolley cars on it?

A. No, the trolley goes on Blackwell street; that runs east and west.

Q. On the other side of the hotel?

A. Yes, sir.

Q. Well, this bar room, that you speak of, is one of the main places of resort of that kind in the City of Dover, isn't it?

A. I think it must be.

REDIRECT EXAMINATION:

Q. This knife factory you say is on Canister brook, or creek?

A. Yes, I think it is.

Testimony of David D. Chandler.

Q. Is it below the Canister reservoir?

A. Below it; yes, sir.

Q. And between the Canister reservoir and the Oak Ridge reservoir?

A. Yes, sir.

Q. Neither the Canister reservoir or the Oak Ridge reservoir are anything comparable in size to the Boonton reservoir?

Objected to.

Q. Which is the largest?

Objection withdrawn.

A. I should say that the Boonton is almost as large as all of our three.

Q. Have you any water closets connected with cesspools in the Pequannock water shed?

Objected to.

Q. In the Pequannock water shed are there places having water closets connected with cesspools, as with the Mansion House and other places in the Rockaway water shed; in other words, is that an ordinary way of disposing of the fecal matter in the Pequannock water shed?

The COURT: By means of cesspools?

Mr. EDWARDS: Yes.

The COURT: That depends entirely upon their distance.

Mr. EDWARDS: But I am asking him if they do that in the water shed; I think the cross-examination has made that proper.

Q. Is that a common method in the water shed?

Objected to.

A. We have them.

Q. Hotels—

The COURT: That don't mean anything; the evidence on the part of the complainant in this case is that cesspools must stand a certain distance away from the stream, bearing, as I understand it, with the character of the soil; if the soil is porous, they must be further away from the stream in order to be safe than if the soil is clay; if there were water closets in the Pequannock water shed, which are a hundred feet away or two hundred feet away, why they would be, under ordinary circumstances, I suppose, within the limits of safety, so that the mere fact that there are closets on the shed does not indicate anything; the point that we are investigating is whether or not the closets are so near the stream as to become dangerous.

Q. I call your attention to a specific case in the water shed; do you know Brown's Hotel, in New Foundland?

A. Yes, sir.

Q. Have they a system there of water closets and cesspools?

A. Certainly.

Q. How near are the cesspools to the stream?

A. About—

Q. I mean to the stream connecting with the Pequannock river?

A. About 15 or 20 feet.

Testimony of David D. Chandler.

Q. Do you apprehend any difficulty from them?
A. No, sir.

Objected to.

Q. Has any attempt been made by Newark to remove those water closets?
A. No, sir.
Q. Now, you say that all the plumbing in the Mansion House seemed to lead to some particular point?
A. Yes, sir.
Q. To what point?
A. One out-let.
Q. Where was that?
A. That went out apparently in the rear of the house to, of course, I don't know where.
Q. But all in one out-let?
A. One direction, yes; we could have tested, in our opinion, one fixture and get the same results as testing them all.
Q. But you did test them all?
A. We tested them all.

RE-CROSS EXAMINATION:

Q. Did you test the laundry on May 7th?
A. I think we did; I will look and see; yes, sir.
Q. And found the results from the laundry on May 7th?
A. I wasn't on that end.
Q. Well, did you find out where the plumbing from the laundry went; you said you did of the whole house; I suppose you meant the laundry, too?
A. Yes, sir.
Q. That went in this same pipe on that day?
A. Seemed to go in the same direction.
Q. Well, it went in this same one out-let that left the house?

A. Seemed to be in the same direction.

Q. You examined it?

A. Yes, sir.

Q. You said it was all open at the side?

A. Apparently the same out-let.

Q. Why do you say apparently, if you saw the pipes?

A. We couldn't follow it any further than the wall.

Q. But to the wall did it go into the same pipe?

A. Yes, sir.

Q. The laundry did?

A. Yes, sir.

Q. You swear to that, do you?

A. Oh, the laundry?

Q. Yes.

A. No, all but the laundry.

Q. But you said all did, a moment ago?

A. All but the laundry.

Q. Now, you except the laundry; why didn't you examine the laundry?

A. That was examined later.

Q. By you?

A. Not by me.

Q. When you looked at the plumbing why didn't you look at the plumbing of the laundry?

A. There wasn't much to look at, it was right close to the outer wall; there wasn't much pipe there; it went right straight out to the earth, right out to the ground.

Q. You didn't look at it, because there wasn't much of it?

A. There wasn't anything to see, wasn't much exposed; that went directly out to the wall.

Q. Why didn't you tell us about that before?

A. I don't know that I was asked particularly about that point.

Q. You said you looked at all the plumbing, is not that part of the plumbing?

A. There is very little plumbing there; it is simply a pipe going out through the foundation wall.

Q. What do you mean by plumbing?

A. A plumbing system is a whole system of pipes, waste, soil and vents.

Q. One pipe don't constitute plumbing, but half a dozen does, is that what you mean?

A. Not exactly.

Q. What do you mean, then?

A. This connection might have been made without a plumber.

Q. Well, then, you mean plumbing work is only such as can be done by a plumber, is that the idea?

A. Plumbing work is supposed to be done by a plumber; yes, sir,—wiping a joint and connecting, etc., is supposed to be done by a practical man, but putting a pipe from a house to a cesspool might be done by a laborer.

Q. Well, the laundry work you say was not done by a plumber?

A. I don't know; I said might not have been done.

Q. Well, that was the reason you didn't examine it, wasn't it?

A. There wasn't much to examine.

Q. Then, whatever there wasn't much to examine you didn't examine it, is that the idea?

A. No, sir.

Q. What do you mean?

A. We examined everything that looked important to examine.

Q. You didn't think the laundry was important, then?

A. We had some idea of the laundry not going into that system.

By Mr. EDWARDS:

Q. Not going into what?

A. Into the cesspool; we hadn't paid much attention to it, because we were told that went direct to the river.

Mr. VREDENBURGH:

Q. Your idea was that you only examine what they told you went to the cesspool?

A. Didn't examine what we thought was unnecessary.

Q. You say you didn't examine the laundry because they told you it didn't go to the cesspool?

A. That was one of the reasons, because we could get a result from that without it; we would get a result without the laundry.

Q. So you tested it?

A. Yes, we tested it; I don't know what the result was.

Q. Knowing you would get the result you tested it?

A. Well, we had to prove it.

Q. Now, as to the cesspool on this particular hotel,—whose hotel is that?

A. Well, Bennett is the proprietor, I think.

Q. Brown's hotel; now, have you ever examined Brown's hotel?

A. Well, the whole hotel?

Q. The cesspools in the hotel?

A. I have seen the cesspools open; yes, sir.

Q. When?

A. On several occasions, not within the last two years.

Q. Have you seen them since two years?

A. No, sir.

Q. About two years ago you saw them?

A. On several occasions before that I saw them open; yes, sir.

Q. Where is that hotel?

A. New Foundland.

Q. What is the size of New Foundland?

A. I cannot tell you.

Q. Have no idea?

A. 400, perhaps.

Q. And this hotel is the main hotel in New Foundland?

A. Yes, sir.

Q. How far is that hotel from the river?

A. About a thousand feet, I should think, from the stream,—from the main stream.

Q. What are these cesspools made of?

A. Made of?

Q. Yes.

A. Built up.

Q. Of what?

A. Brick, partly.

Q. Brick cesspools?

A. Partly brick, laid up on the side with brick, open bottom.

Q. What is the rest of them, part brick and open bottom,—what is the rest?

A. Brick and mortar.

Q. It is all brick and mortar except the bottom?

A. Yes, sir.

Q. What is the bottom?

A. That is open,—that is the natural—

Q. Natural what?

A. Earth.

Q. What kind of earth?

A. Well, I don't know the nature of it very well.

Q. Don't know the nature of it?

A. No, sir.

Q. Here is a cesspool on your water shed, about the bottom of which you don't know?

A. The nature of it; no, sir.

Q. Don't know the nature of it?

A. No, sir.

Q. How do you know the bottom is open?

A. By trying it.

Q. What did you try it with?

A. A pole.

Q. Was it full at the time?

A. Partly.

Q. So that you could not see the bottom?

A. No, sir.

Q. But you stuck a pole down?

A. Yes, sir.

Q. What did you stick the pole down for?

A. Sound it.

Q. Sound what?

A. See whether it was open or not at the bottom.

Q. Did you use the pole?

A. Yes, sir; I have used it.

Q. Did you use the pole at that time?

A. Yes, sir.

Q. And your feeling with that pole was that the bottom was open then?

A. Yes, sir.

Q. How far did the pole penetrate?

A. Oh, I can't recall how much, but I could feel the sounding; it wasn't solid bottom; it was soft; probably an inch or two.

Q. Was it a water cesspool, or for the whole house?

A. That took the waste from the closets.

Q. How many closets were there?

A. Cannot recall how many closets; I think there must be five, or six, or seven; probably more.

Q. Cannot recall how many there are?

A. In Brown's hotel? No, sir; not accurately.

Q. Where does the water go from the cesspool?

A. Why, there are beds there; built right beyond the cesspool.

Q. What kind of beds?

A. Filtration beds.

Q. Who put in the filtration beds?

A. The Water Company.

Q. At what expense?

A. I don't know; before we owned it.

Q. Filtration beds?

A. Yes, sir.

Q. How far is that from the cesspool?

A. Probably ten feet.

Q. What is the character of those filtration beds?

A. I have never seen them.

Q. Don't know the size of them?

A. No, sir; they were put in before.

Q. Don't know the contents of them?

A. No, sir.

Q. How do you know that the water from this cesspool goes through these filtration beds?

A. I don't know it; we haven't seen it.

Q. Well, you said it did?

A. I said supposed to.

Q. You don't know how it is connected?

A. No, sir.

Q. Now, the solid matter goes out how?

A. That is cleaned.

Q. How do you know?

A. By having been told by the proprietor.

Q. How often?

A. I don't know.

Q. Don't give any attention to that, do you?

A. No, sir.

Q. As a health officer; you let the engineer attend to that, too?

A. No, sir; we have an inspector there most of the time, and he keeps us in touch with what is going on there.

Q. What is his name?

A. Andrew J. Brady.

Q. Is he in the employ of the city?

A. Yes, sir.

Q. Under you?

A. On that work specially; yes, sir.

Q. Under you?

A. Yes, sir.

Q. Now, give us any other cesspool?

The COURT: How far do you say this is from the stream?

Mr. VREDENBURGH: 1,000 feet, he said.

WITNESS: No, sir; from the main stream I said a thousand feet.

Mr. EDWARDS: How far from this little stream?

WITNESS: 15 or 20 feet from the little brook.

Q. What little brook is that?

A. A little brook that comes around the meadows and comes down.

Q. What is it called; has it any name?

A. I cannot recall its name; it is dry most of the time.

Q. It is dry?

A. Most of the time.

Q. What it is, is where the rain water runs when there is a rain, is it?

A. No, sir; in certain times of the year when the brooks are full, that brook has some water in it, but only at certain times of the year, probably find it dry now.

Q. Find it dry now?

A. Probably find it dry.

Q. Well, it is not a brook at all, then, is it?

A. Yes, sir.

Q. Why do you call a brook a thing that only has water in it once in a while?

A. Well, it carries off water at certain seasons of the year; quite an abundance of it.

By the COURT:

Q. Well, any gulley would do that?

A. This is a natural brook.

Q. Is it fed by springs?

A. Well, there are springs coming into it, but it is not always full, but we cannot do away with it very well unless we redirect it.

Q. What proportion of the time is there water in it, and what proportion of the time is there not?

A. Probably water running in that brook about four months in the year.

Mr. VREDENBURGH:

Q. What investigations have you made to find out how long the water runs in that brook; you, personally?

A. Well, I have seen it in there, and again I have seen it when it has been dry, at different seasons of the year; as I say, I have seen it mostly dry.

Q. Have you ever seen any water in it?

A. I have seen water in it several times; I mean by that, five or six times, or a dozen times, perhaps;

I didn't take any particular note; when I saw it, I simply went over to the brook and saw if it was dry or not; but the inspector reports frequently whether that brook is running or not.

Q. Well, why does the inspector report upon that brook?

A. Not particularly that brook; he reports on the whole shed.

Q. But why does he report whether that brook is running or not; what importance is it to the city to know whether that brook is running or not?

A. It is important we should know everything?

Q. Well, why that fact?

A. For ordinary knowledge.

Q. Does he report you every brook that is dry?

A. Yes, sir.

Q. Now, mention any other brook that is dry six months in the year, that he reported?

A. I don't recall any.

Q. Don't you know that he didn't report any other except one?

A. I know that he does.

Q. Which one?

A. I cannot recall it.

Q. How many brooks are there up there that are dry six months in the year that the inspector reports to you when they are dry and when there is water in them?

A. Why, in our shed, not to exaggerate it, are 50 little streams that are dry some seasons of the year.

Q. Which one does your inspector report to you when it is dry?

A. No particular one, all of them.

Q. Well, he reports this one?

A. Yes, sir.

Q. Does he report any other?

A. Because this one is right in the town where he sleeps.

Q. Is that the only one?

A. No, sir.

Q. Well, what other one does he report?

A. Several of them.

Q. Mention one, if you can?

A. I can just recall the one on a man's place by the name of Furgeson.

Q. He reports that to the Board of Health, does he?

A. Yes, sir.

Q. Why does he report to the Board of Health that this stream is dry, running somewhere near Brown's hotel; why does he report that when it is dry?

A. He does not report it when it is dry; he simply notes it when he goes by and speaks of it when he comes down, and we have a general talk as to the condition of the shed; he don't make any particular note of any one brook.

Q. You said he had told you many times that it was dry?

A. Yes, sir; has mentioned that particular one because it is within 30 feet, or at least right near the hotel where he is stopping, and he sees it.

Q. And he reports that because it is so near the hotel, doesn't he?

A. No, sir; that is not the reason; not from the standpoint as you take it, but because he is there to investigate all streams; not because it is in the hotel.

Q. What do you mean by that?

A. Why, it is close to his home, and he can see it and report it quickly.

Q. And he mentions this because he can see it quickly?

A. He sees it as he goes from the hotel to the station.

Q. Why does he report that one in particular?

A. There is no significance particularly attached to it.

Q. Why do you remember it then, if it has no significance?

A. Well, I can remember it easily enough; I can remember all these matters.

Q. Do you mean to say, Mr. Chandler, that as your testimony, that the man had reported that brook when it is dry, and the fact that you remember it, was of no importance at all?

A. Why, Mr. Vredenburgh, perhaps it would be better if that brook wasn't there; while we do not consider it dangerous at all, we could just as well remove all those things as far away as possible.

Q. Is not that the reason he reports it?

A. No, sir; we don't consider it dangerous.

Q. Then why does he report it?

A. Well, that is part of his duty to report those places; I tell you there are 50 of them perhaps.

Q. Is it his duty to report every stream that is dry part of the year?

A. No, sir; there is no regular routine of a report to be made out, but he tells me about them when we are talking over these matters.

Q. Wasn't it his duty to report these streams?

A. It is his duty to report everything that is of interest to the city of Newark.

Q. Is that of interest to the city of Newark?

A. It was to a certain extent.

Q. What is that?

A. It has some bearing upon the water supply, as to how it is running, and whether we have got plenty of it or not, because when that brook is full, as I tell you, there is lots of water over the meadows.

Q. Now, Mr. Chandler, do you say he reports that in order that the Health Board may know

whether there is enough water for the city or not?

A. No, sir; not for that purpose.

Q. Why do you say that?

A. He reports it for my own information.

Q. How are you so interested in that question?

A. I am interested in the water that comes to Newark, of course, at all times.

Q. Isn't that because of the fact that there may be danger to the water of the city of Newark?

A. No, sir; never.

Q. Then, why is it?

A. Just as I tell you, I want simply to know it, not from a danger standpoint at all.

Q. You want to know whenever that brook is dry?

A. Not that one in particular; no, sir.

Q. But you do want to know about that one?

A. Yes, sir; I want to know about them all.

Q. And you want to know about that one?

A. That is one of them; yes, sir.

Q. Which is another one you want to know about whenever it is dry?

A. I want to know about all of them, Mr. Vredenburgh, and I cannot recall their names.

Q. Why do you want to know about all of them?

A. Why?

Q. Yes.

A. Simply to be kept informed as to the condition of the water shed.

Q. From a health standpoint, is it?

A. I might say so; certainly; from a watchful standpoint; we were watching it, of course, all the time.

Q. What danger is there in the flow of the brooks, or what danger is there to the health of the city of Newark when the flow of the brooks is dry?

A. None.

Q. What danger is it to the city of Newark when this one is dry?

A. None.

Q. Then why do you want to know about it?

A. For information.

Q. As a citizen, or as a health officer?

A. As a health officer.

Q. What importance is it to you as a health officer to know?

A. I considered it of some importance.

Q. Now, that is what I am trying to find out; what is its importance?

A. From a health officer's standpoint, I consider it important to have a knowledge of the condition of the water shed at all times.

Q. Well, of this particular stream?

A. No, sir; not of that particular stream, but of any stream.

Q. Don't you know that I am speaking of this particular stream?

A. Well, I mean any stream.

Q. Then your answer to that—why it is important for you to know, as a health officer whether this stream is dry or not, is what?

A. It is not important, but I want to know it; that is all.

Q. Why do you want to know it if it is not important?

A. For my own knowledge.

Q. What good is that knowledge to you?

A. There are lots of these little things in our business that are important that a layman would not understand.

Q. Well, now, I am a layman, trying to find out what importance it is for you to know, and that is just what I am asking these questions for?

A. Well, I have tried to tell you that it is in order

to have a knowledge of whether the streams are running or not.

Q. And the importance of that knowledge to you as a health officer you say a layman cannot see unless he is told; now, I want you to tell me what it is?

A. I cannot tell you any more than I have told you.

Q. You have not told me at all yet?

A. I say we simply want to know it for knowledge; I want to know it for my own knowledge.

Q. Knowledge of what?

A. Whether there is any water running, what the condition of the stream is, how much water there is, and so on.

Q. And this particular stream, recollect, that is all I am asking about now; this particular little stream?

A. Well, there are 50 streams that I am just as much interested in as this one.

Q. Well, now, this one; why is it important to you as a health officer to know why this stream is dry a part of the year?

A. For my own knowledge that is all.

Q. Did you ever go up on the other water sheds to see what streams are dry?

A. No, sir,—what other water shed do you mean?

Q. Why, in the Rockaway water shed?

A. No, sir.

Q. Now, please tell us what number of cesspools the city of Newark has bought in the Pequannock water shed?

A. I could not tell you that.

Q. You can tell us some of them?

A. No, sir; I could not.

Q. You told us as to this one, that they hadn't bought it?

A. Which?

Q. This one at Brown's?

A. They had not?

Q. You said in answer to Senator Edward's question that cesspools were used in the Pequannock water shed, or something to that effect; did you mean that?

A. No, he did not put it that way; he asked me if there was any connection with the cesspools there; you ask me what others we had bought?

Q. Yes, what others than the one you mentioned at the knive works?

A. Well, I think the Snyder propeity is one.

Q. When did they buy that?

A. About a year ago, I think; we did not buy it, you understand, the Board of Works bought it about a year ago, I think.

Q. Well, you said it was bought?

By Mr. EDWARDS: By the Board of Works.

Q. What was the trouble with the Snyder property?

A. There wasn't any trouble there.

Q. Was there any cesspool there?

A. No, sir.

Q. Why did you buy it?

A. Because we thought it would be safer to get it.

Q. Why safer?

A. For many reasons; it might be a possible source of danger—it was a boarding house.

Q. Snyder's was a boarding house?

A. Yes, sir.

Q. And has cesspools?

A. Yes, sir.

Q. How near was the cesspool to the river?

A. 100 feet, I guess.

Q. What kind of cesspool was it?

A. An open cesspool.

Q. What do you mean by that?

A. Not built up at all; open sides to it; not bricked.

Q. What was it, stoned?

A. No, sir; it was just brought out so as to hold it, and the sides and bottom open; it was just bricked enough to hold it.

Q. Then there were bricks to hold it?

A. Yes, sir; just to hold the structure.

Q. Was there a privy over it?

A. Yes, sir; closets went to it.

Q. Closets in the house?

A. Yes, sir.

Q. Did they have a public water supply or a private water supply?

A. They probably had a well up there in the country.

Q. How could they flush the water in closets without a water supply?

A. They could not.

Q. How could they get water from the well to flush it with?

A. They probably forced it up there.

Q. Do you mean pumped it up?

A. Yes, sir.

Q. You say that water closet was how many feet from the river?

A. About 100 feet, I should judge.

Q. Near what water?

A. Canister reservoir.

Q. Was it above the dam?

A. Yes, sir.

Q. How far above the dam?

A. It was at the extreme head of the Canisteer reservoir.

Q. How far is that above the dam, 5000, 6000 or 7000 feet?

A. Well, the entire length of the reservoir, I should say.

Q. Well, how far?

A. Well, I should say it was that far.

Q. A couple of miles?

A. Hardly; about a mile and a half.

Q. A mile and a half?

A. Well, I would not say exactly.

Q. How much did the city pay for that?

A. I don't know.

Q. You don't know?

A. I don't know now.

Q. Have you never heard?

A. I did hear how much it was but I did not pay any attention to it. The fact that they bought it was enough for us, we have business troubles of our own and we don't bother so very much with the business of the Board of Works. The fact that they were going to buy it I may have read about in the newspapers, but I would not pay any attention to the price paid for it.

Q. What was there on Snyder's property?

A. A boarding house, a large house.

Q. Stable?

A. The stable was across the street.

Q. Did they buy the stable, too?

A. They bought the whole tract.

Q. How many acres were there in that tract?

A. I could not tell you; I don't know how far he went.

Q. And it was all because this cesspool was there?

By Mr. EDWARDS: I object.

A. No.

By Mr. EDWARDS: I will withdraw the objection.

Q. Why did they buy it?

A. As I told you before, it might possibly be a menace, it was a large boarding house and the same conditions might exist there as existed at the factory.

Q. What kind of a boarding house was it?

A. It was a summer boarding house.

Q. Well, I suppose the Board of Health recommended the purchase of it?

A. I don't think so.

Q. Didn't Dr. Herold recommend it?

A. I don't know.

Q. Didn't you yourself, Mr. Chandler, and are you not on record as urging the purchase of that property?

A. I urge the purchase of it, no, sir.

Q. Well, suggesting the purchase of it?

By Mr. EDWARDS: I object. If it is on record, the record will speak for itself.

Q. Well, advising the purchase of it?

A. Not officially.

Q. Unofficially?

A. Certainly I probably thought the city did a good thing to take it. I think it would be a good thing if the city would take everything on the line of the water shed, if it is possible to get it.

Q. Would you advise the purchase of every acre of land along a water shed?

A. No, sir; I would not advise it.

Q. Do you think they ought to have every acre of land in a water shed?

A. It would be very much better if you could depopulate every water shed.

Q. Have you depopulated any part of that water shed?

A. I have already spoken of two places.

Q. Are there any others?

A. Yes, sir; I think there was a case of a Mr. Mead purchase.

Q. Where was that?

A. Stockholm, going on towards Newfoundland.

Q. What is the size of Stockholm?

A. I don't think they have over 300 people there.

Q. Not over 300?

A. I don't believe there are 300.

Q. Well, how many houses?

A. Well, I guess 50.

Q. Any factories?

A. I don't know as there is any factory there now, there is a dairy.

Q. There was a factory there?

A. Yes, sir; but that wasn't right in the town of Stockholm; it was a little below it.

Q. Where was that?

A. That was the Booth factory that I have spoken of.

Q. Is there any factory at Newfoundland?

A. Not hardly a factory; there is a sawmill.

Q. How many men are there employed in that sawmill?

A. I don't know how many.

Q. One sawyer and one man to handle the logs?

A. I guess that is about all; there is not much business done there.

Q. Now this Mead property, where was that?

A. That is south of Stoskholm going towards Canisteer; I mean going towards Oak Ridge.

Q. Does it lie between two reservoirs?

A. Yes, sir.

Q. Between Canisteer and Oak Ridge?

A. Yes, sir.

Q. What did that consist of?

A. Well, it was a house way back from the street and a little old barn 10 or 15 feet from the street; it wasn't any great source of danger at that place, and I remember at the time that we could get it very cheap, and they decided to buy it.

Q. How much did they pay for it?

A. I don't know.

Q. You say it was very cheap; cannot you give some idea?

A. No, sir.

Q. Why not, you say it was cheap?

A. Well, they considered it cheap.

Q. I thought you said you considered it cheap?

A. I am repeating what they said to me that they thought it was cheap; I am reporting what they thought and they purchased it.

Q. Did you advise the purchase of that?

A. No, sir.

Q. Didn't Dr. Herold advise it?

A. I don't know.

Q. You have no knowledge of that?

A. No, sir.

Q. Well, now, was there a water closet at that place or a cesspool?

A. No, sir, there was a water closet way back. The house was perhaps 200 feet from the stream.

Q. What was there in the yard?

A. An old dilapidated closet in the yard.

Q. Between the house and the barn?

A. Behind the house; the barn was directly in front of the house; the barn was on one side of the street and the house on the other.

Q. Did you buy both sides of the street?

A. Yes, sir; bought the whole tract.

Q. How many feet were in that tract?

A. I don't know.

Q. How many feet fronting on the street?

A. I don't know how much he had there at all.

Q. Do you know whether there were 2 or 3 acres?

A. No, sir.

Q. I understood you to say that one reason was that this barn was near the stream?

A. That was the only thing that was near it.

Q. Was there a horse kept in that barn?

A. A horse was only kept there during part of the year.

Q. Was there a closet in the barn?

A. No, sir.

Q. Was there a cow kept there?

A. No, sir

Q. Was there a manure heap?

A. Well, very little.

Q. How near was that to the stream?

A. 15 to 20, probably 10 to 15 feet.

Q. From the river?

A. From the stream.

Q. Above the stream or about on a level?

A. Above it.

Q. Little above it?

A. I recollect he was a very poor man and that was the reason he sold out his property; he wanted to sell it and offered to sell it at a reasonable price.

Q. Now Mr. Chandler, you tell us the price was a very reasonable one; tell us what that price was?

A. I cannot tell you what it was.

Q. How can you swear that it was very reasonable if you don't know what it was?

A. Only from what I heard them saying.

Q. You heard somebody say that it was a very reasonable price?

A. I heard others say so.

Q. And you think he was a poor man, and so the Jersey City people bought it?

A. No, sir.

Q. The Newark people bought him out as sort of a charitable thing?

A. I know that Mr. Sherrerd told me on two or three occasions that Mr. Mead had been down to see him again and told him he wanted to sell his property in the worst way.

Q. Who told you that?

A. Mr. Sherrerd.

Q. Did Mr. Sherrerd want to sell it?

A. No, sir; he said that Mr. Mead had been down two or three times talking to him about it, and he wanted to sell that property very badly, and he believed he could buy it very low.

Q. Who is Mr. Sherrerd?

A. Engineer.

Q. What engineer?

A. City engineer—engineer of the Board of Works.

Q. And you heard Mr. Sherrerd say that to Dr. Herold?

A. No, sir; I say Mr. Sherrerd came to me and said this.

Q. Said what?

A. Said that Mr. Mead had been down to see him two or three times, said he was very poor—a poor man and wanted to sell his property, and Mr. Sherrerd said, "I think we can buy it very cheap." That was the conversation.

Q. Why did he tell you?

A. Why wouldn't he, I don't know.

Q. Is it because you were a member of the Board of Health?

A. He and I were very close together; we saw each other most every day.

Q. Was it mere gossip or because of some duty?

A. We will call it mere gossip.

Q. He told you this in his mere gossip?

A. Yes, sir.

Q. You asked him as mere gossip, and he said that Mr. Mead was a poor man, and it could be bought cheap; now did you agree with him?

A. No, sir; he didn't say ought to be bought.

Q. He said it could be bought cheap?

A. Yes, sir.

Q. Did you agree with him?

A. Yes, sir.

Q. You thought it was proper to buy that property, by the City of Newark?

A. I said as I said before all property should be purchased, if possible, it would be safer.

Q. And you advised him to purchase?

A. I had no right to advise nor he to hear it. I did not at that time or any other time advise it.

Q. You did not advise it?

A. No, sir.

Q. Did you agree with him?

A. I may have said, well of course, we ought to buy it.

Q. You mean the city when you say "we"?

A. Yes, sir.

Q. What you want us to understand now, Mr. Chandler, is that you only bought that property because the city ought to own all the property in the Pequannock water shed?

A. Yes, sir.

Q. Is that the idea?

A. Yes, sir.

Q. That is the only reason you bought it?

A. Yes, sir; if you can buy it cheap enough; yes, sir.

Q. That is the reason you bought this because it is cheap, and at the same rate you would advise the purchase by the city of all other land in the Pequannock water shed?

A. I have not said that.

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Q. Now, Mr. Chandler, just one more question; I understood you to say that you intended to convey the idea that the fact that the stable was near this stream was the reason why you thought the property ought to be bought by the city; did you intend to convey that impression to me or not?

A. It did not look good, Mr. Vredenburgh; those things don't look good on a water shed.

Q. Are they not a source of danger?

A. Very little.

Q. Now, what is the next property?

A. I think you have exhaused me; I think that is all I can recollect.

Q. Now what other properties have the city bought?

By Mr. EDWARDS: It does not appear that they have bought any.

Q. Then I understand you those are the only three properties, Snyder's, Fergeson and Booth's?

A. Yes, sir.

Q. The only three properties in the whole water shed?

A. That I can recall.

Q. Is that what you mean to say?

A. Yes, sir.

Q. Can you recall any closet or cesspool nearer than 100 feet from the Pequannock river, or any of its tributaries at the present time, except this one of Mr. Brown?

A. Yes, sir.

Q. Give them to us, now you have got something you can give us?

A. I can recall one at Stockholm.

By Mr. EDWARDS: I object to this as incompetent and not cross examination, on my redirect.

Objection overruled.

Q. Now, Mr. Chandler, tell us what closets there are, commencing with the one nearest?

A. I will tell you all I can think of. J. Kincard's at Stockholm.

Q. Whose?

A. The hotel at Stockholm.

Q. What is there there?

A. There are closets.

Q. Any cesspool?

A. No, sir; it is a closet. What was your question about, Mr. Vredenburgh?

Q. I want to know of any privies or cesspools that are nearer than 100 feet from the Pequannock river, or any of its branches?

A. This is not over 10 or 12.

Q. What is it?

A. A tight vault.

Q. Privy vault?

A. Privy vault.

Q. Outside of the hotel?

A. A double privy vault; yes, sir.

Q. And underneath it there is a vault?

A. There is a privy immediately over it. It is a combination vault and cesspool because they have closets in the house that run to it also.

Q. What is the character of that privy and cesspool?

A. That is bricked up, mortar and brick.

Q. Brick sides?

A. Yes, sir.

Q. How deep is it?

A. Well, they generally dig those from 8 to 10 feet deep.

Q. Then you don't know anything about it except that they generally do?

A. Yes, sir.

Q. What is in the bottom?

A. That is open.

Q. How do you know?

A. I tried it.

Q. When did you try it?

A. A year ago probably.

Q. Why did you try it?

A. Just for information—to get information.

Q. Did you have it removed?

A. No, sir.

Q. Why not?

A. I did not consider it a menance to health.

Q. Why not?

A. Because nothing could get through into the river from it.

Q. You say the bottom is open?

A. Yes, sir; but the bottom is below the stream; it is not near the river; it is near a little stream that runs behind the vault.

Q. What stream is it?

A. I don't know the name of it.

Q. Is that dry part of the year, too?

A. Sometimes.

Q. How much of the year is it dry?

A. Not as much as the other, but it is very dry in a very dry summer time; it will be dry three months in the year.

A. How do you know as to its dryness, from report?

A. Yes, sir.

Q. Report of your inspectors?

A. Yes, sir; and I have seen it myself.

Q. Seen it dry?

A. Yes, sir; and seen it running, too.

Q. How far is it from the river?

A. It is a good ways from the river.

Q. 3 or 4 miles?

A. No, sir, probably that stream is not—I shall

have to recall that place so as to place that stream—half a mile, I should judge.

Q. Does that stream run into a reservoir?

A. It runs into a larger stream which goes into the reservoir.

Q. Which reservoir?

A. Oak Ridge.

Q. Why do you say that it is not a menace, Mr. Chandler?

By Mr. EDWARDS: I object to that as not cross examination.

Objection overruled.

A. Why you could not get it in the river very well.

Q. Why not?

A. The bottom of it is a great deal below the bed of the stream, in the first place.

Q. The bottom of the cesspool is below the bed of the stream?

A. Yes, sir; considerably below it.

Q. Well, how far is it from the nearest stream that it could get into?

A. This is the nearest.

Q. But you say it could not get into that?

A. No, sir; it could not.

Q. How far is it away from the nearest stream that it could get?

A. 100 feet away.

Q. Now could anything from that cesspool get into any stream less than 100 feet away?

A. No, sir.

Q. Well, I am asking you about cesspools that could get into streams within 100 feet away, and I want you to mention those?

A. Then I misunderstood your question; I do not know of any that we have got on our sheds that would get in. I have answered your question fully.

Q. Then you know of no cesspool or privy in the whole Pequannock water shed or its branches or streams that are flowing streams, that are within 100 feet of any of these streams, and that could get in them?

A. I don't think there are any.

Q. I think that is all.

EDWARD P. COULSTON, sworn for defendant.

DIRECT EXAMINATION by Mr. Edwards:—

Q. Where do you live?

A. Newark.

Q. What is your business?

A. Inspector of plumbing for the Newark Board of Health.

Q. Are you a practical plumber?

A. Yes, sir.

Q. Of how long experience?

A. Well, I worked as a plumber for about 15 or 16 years before I was employed by the Board.

Q. How long have you been with the Board of Health?

A. A little over four years.

Q. What are your duties in the Board of Health?

A. To inspect the plumbing work throughout the city.

Q. Are you accustomed to making investigations of plumbing work?

A. Yes, sir.

Q. To see what becomes of the house drainage?

A. Yes, sir.

Q. Did you make any investigation of the plumbing work at the Mansion House in Dover?

A. Yes, sir.

Q. When did you make that investigation?

A. My first investigation was on May 9th.

Q. Did you make any subsequent investigations?

A. Yes, sir, I went there since.

Q. What was the purpose of your investigation?

A. To find if there was any connection from these cesspools to the river.

Q. Now just tell us if you made a map or a diagram showing the plumbing system of the Mansion House?

A. Yes, sir.

Q. Do you produce it?

A. Yes, sir.

Q. Is this the diagram?

A. Yes, sir.

Q. How much of the diagram relates to the Mansion House?

A. This part (indicating).

Q. Left one-half?

A. Yes, sir.

Q. Looking at the title of the map?

A. Yes, sir.

Q. What does the other relate to?

A. The other refers to No. 14 and 16 Blackwell street.

Q. What did you find in this Mansion House in May, 1906, as far as the plumbing was concerned?

A. I found a private bathroom on the second floor, on the Sussex street side.

Q. What did that contain?

A. A bathroom and water closet in each one. At room 35, on the third floor, I found another bathroom—one water closet, bath-tub and basin. At room 17 on the second floor, I found one water closet, bath tub and basin. On the second floor in the rear in the room adjoining No. 24 I found one sink. Underneath that in the laundry in the first

floor I found a set of three wash trays. On the first floor behind or back of the bar room I found 2 urinal, 2 water closets and one wash basin; I found the bar connections connected to the cesspool and 3 basins in the wash room in front of the bar that were not connected.

Q. Where were they connected to?

A. They were connected with an old well. Those were the wash basins in the wash room. In the kitchen I found one kitchen sink and a pantry sink in the room adjoining.

Q. How were those various fixtures connected, how did you trace them?

A. I traced all the lines into the basins; I traced them to the outside wall.

Q. When you got into the outside wall, how many pipes were there?

A. Only one for all the fixtures in the laundry.

Q. All the fixtures, then, connected with that pipe?

A. Yes, sir.

Q. Did they connect with any other line?

A. They connected then to the cesspool.

Q. Did they connect with any other line except this pipe?

A. No, sir.

Q. Did you investigate the cesspool?

A. Yes, sir.

Q. Where is the cesspool?

A. The cesspool at that time was just about 28 feet from the rear of the Mansion House. That was the main cesspool from which there was one 18 inch pipe ran into that. Now since that there has been a new laundry built there. A few days ago, a week or so ago, I was over to the main cesspool—the cesspool that had been emptied to a certain extent and I

got into it and found out how many pipes were there.

Q. How many were there?

A. At the present time there are 6 pipes in the main cesspool.

Q. Where do they come from?

A. The 8 inch pipe comes from the hotel. The 4 inch pipe comes from the bathroom which is built in this new part.

Q. Since last May?

A. Since last May. And there are 2 pipes, one leading in and one leading out which are plugged up and which have been plugged up for sometime to all appearances, and also another pipe coming in there.

Q. Where does this plugged up pipe lead to?

A. One was supposed to lead to the overflow cesspool on the opposite corner.

Q. Where was the other?

A. The other (interrupted).

By Mr. VREDENBURGH: I object to his stating what it is supposed to be.

Q. Do you know where they lead to?

A. Lead from one cesspool to another.

Q. You knew that?

A. Yes, sir.

By Mr. VREDENBURGH:—

Q. How did you know that; did you take it up and see?

A. No, sir; but I saw it in the cesspool.

Q. How could you see from one cesspool to another?

A. I did not, but I had a party at the other cesspool and we could talk through that part, and some we ran water through.

Q. This one that was plugged up I am speaking of?

A. We did not plug it up.

By Mr. VREDENBURGH: You said it was supposed to run somewhere, and I object to that part of your answer.

Q. Was it plugged up?

A. Yes, sir.

Q. Tight?

A. Yes, sir.

Q. Running in or out?

A. One outlet and one inlet.

Q. And they are no longer in use?

A. They are no longer in use.

Q. Did you make any investigation to see whether these cesspools connected in any way with the river?

A. Yes, sir.

Q. What did you find?

A. I could not find any connection between the drain and the river; I could not find any pipes leading from the cesspool or from the hotel to the river.

Q. Will you describe the cesspool, how it was built, &c.?

A. The main cesspool was built of stone and with an arch of brick and mortar, with an iron cover on the top.

Q. Now can you say as to whether every fixture in the Mansion House discharged into the cesspool?

A. Yes, sir; into the main cesspool.

Q. That is what I mean.

A. Every one but the laundry tubs at the present time.

Q. What was the size of the cesspool?

A. I should say about ten feet square.

Q. How deep?

A. 8 or 10 feet.

Q. Below the surface of what?

A. Below the surface of the ground.

Q. Where does the laundry discharge?

A. The laundry discharges into cesspool No. 2 at the rear end of the new building.

Q. Where did it discharge in May last?

A. Well, in making the test on that I found no results in the main cesspool but I did in the river.

Q. Now did you make tests recently as to this drainage from the laundry?

A. I did, yes, sir.

Q. What did you find?

A. I found it emptied into cesspool No. 2.

Q. Did you make any inquiry to see whether it was connected with the river?

A. Well, in letting the water run at the tap, it came right directly into the cesspool—it was only a second after you turned the water on and you had the water there, and that was proof that it did not go to any other place.

Q. Who made this diagram?

A. I did.

Q. Does it correctly delineate the condition of the Mansion House?

A. Yes, sir, with the exception of the measurements; it is not drawn exactly to a scale.

Q. Have you been in any of the cesspools?

A. I have been in all except No. 2.

Q. Why were you not in No. 2?

A. The opening in No. 2 was not very much, and the party that was with me was the lighter man and so we let him down with a rope.

Q. He went in?

A. Yes, sir.

Q. What condition did you find the two cesspools you went into?

A. There was no connection with any sort of overflow.

Q. What do you mean by overflow, one to another?

A. Yes, sir.

Q. Was the Mansion House or any of the fixtures therein connected at the time of your last visit, with the river?

A. No, sir.

By Mr. EDWARDS: I offer the diagram in evidence so far as it relates to the Mansion House, and would ask that it be marked Exhibit 16.

By Mr. VREDENBURGH: Well, I object to it,

CROSS EXAMINATION by Mr. Vredenburgh:—

Q. When was your last visit, Mr. Coulston?

A. My last visit was on December 20th.

Q. Of this year?

A. Yes, sir.

Q. What is the distance on your map from the side of the house to the cesspool in which you supposed the contents from the Mansion House went?

A. Do you mean from the old building or the new building?

Q. What is the distance on your map from the side of the house to the cesspool in which you supposed the contents from the Mansion House are deposited.

A. Well, it is about 28 feet from the rear of the old building—the original building.

Q. Well, do the pipes when they leave the Mansion House pass through the wall at the rear end of the building?

A. No, sir; not the rear end; they pass through the side.

Q. How far is it from the point where they pass through the building to the first cesspool?

A. I should judge where they pass through would be about 20 feet.

Q. How near are they there to the drain that runs to the street?

A. Well, I guess it crosses over that drain.

Q. The pipes from the Mansion House, in your judgment, crosses from that drain that leads from the sewer into the street?

A. Yes, sir.

Q. And are they above them or below them?

A. Well, I could not tell you that.

Q. Did you take up the earth to see?

A. Not at that time.

Q. So that you don't know whether the pipes from the Mansion House are above the drain or below it?

A. No, sir.

Q. Do you know how deep the drain is there?

A. Which drain?

Q. The drains which formerly led from the Mansion House to the sewer in the street?

A. No, sir.

Q. Did you mention how far it was from where these pipes pass through the wall to the first cesspool?

A. About 30 feet I said.

Q. Now that cesspool receives, as I understand it, the solid portion which comes down from the hotel?

A. Yes, sir.

Q. Did you go into that cesspool?

A. Yes, sir.

Q. Was it empty on that day?

A. On the 20th it was so that I could get in with rubber boots on.

Q. Had you ever been in it before?

A. Yes, sir.

Q. When?

A. May 9th.

Q. Had it been cleaned out on May 9th?

A. No, sir; it wasn't cleaned out then.

Q. How deep was it?

A. Well, it was pretty well filled up; it was pretty well up to the 8 inch tile pipe that came in from the hotel.

Q. Could you see below that level then?

A. Not below the level of the water.

Q. Could you stand on it?

A. I had a ladder down there and stood on the rungs of the ladder.

Q. You say 8 inches below the surface of the ground?

A. No, sir; below the pipe.

Q. Well, how much would that be below the surface of the ground?

A. 3½ to 4 feet.

By the COURT:—

Q. When this vault was filled with solid matter, is the water supposed to pass through the pipes in the other cesspool?

A. Yes, sir.

FURTHER CROSS:—

Q. Were these cesspools empty when you saw them on December 20th?

A. Yes, sir.

Q. Both of them?

A. All 3 of them were emptied within 18 or 20 inches or 2 feet, and we had rubber boots on.

Q. Mr. Herbert has sworn there was four of them, did you see the 4th cesspool?

A. Yes, sir—I beg pardon, I did not see the fourth, but I was told there were four there.

Q. You only looked at three?

A. I only looked at three of them.

Q. What are the contents of a bathtub full of water?

By the COURT: He has given us the dimensions of the first cesspool, 10 feet in diameter and 10 feet deep; can he give us the dimensions of the other?

A. The main cesspool is a square cesspool; No. 2 is a round cesspool; also No. 3.

Q. Give us the diameter of those?

A. Well, they are about 8x10 feet.

Q. 8 to 10 feet deep?

A. No, sir; they are deeper than that.

FURTHER CROSS:—

Q. Now the bathtubs you saw in this hotel hold about how much water when they are full?

A. I have no idea; I don't know the size of them.

Q. Are they the ordinary bathtubs?

A. Yes, sir; the ordinary roll rim bathtubs.

Q. How much do they hold or how much would go out of them when they are emptied?

A. Oh, I suppose about a barrel of water.

Q. Could you take a bath in a barrel of water?

A. Yes, sir.

Q. And you think they hold about a barrel of water?

A. Yes, sir.

Q. And by a barrel I suppose you mean a whiskey barrel?

A. About that size.

Q. How much water do the laundry tubs hold?

A. Well, they hold about 4 or 5 pails full.

Q. How many tubs were there?
A. Three pairs of tubs.
Q. Each holding how much?
A. They hold about the same.
Q. That is all.

FURTHER DIRECT:—

Q. Did you find the fourth cesspool?
A. I found (interrupted).

By Mr. VREDENBURGH:—

Q. Oh, just one minute. About this well, where is this well?

A. On the Sussex street side and under the foundation wall we found a well there.

Q. You show us here on your diagram of Sussex street, a round place partly on Sussex street, a round circle, which you have marked "old well"; is that what you refer to?

A. Yes, sir.
Q. Why do you call it an old well?
A. I was told it was an old well.
Q. Somebody told you that?
A. Yes, sir.
Q. Did you investigate how deep that was?
A. No, sir, I did not investigate the depth of it.
Q. Did you investigate the size of it?
A. Well, it is about $3\frac{1}{2}$ or 4 feet in diameter.
Q. Did you measure it yourself?
A. Yes, sir; it is about the size of an ordinary well.
Q. Did you go into it in any way?

A. Well, it was right on a level with the cellar bottom.

Q. Did you see whether any pipes came from that or not?

A. Yes, sir; that is where I discovered the pipes were from the wash room.

Q. Did you see any pipes running out of it?

A. I did not see any overflow pipe out of it at all.

Q. Well, it was partly out in the street, wasn't it?

A. No, sir; it was just under the foundation wall of the hotel; the foundation wall of the hotel ran about through the center of the well.

Q. Well, you have shown a part of it out in the street, on this diagram; is that wrong or right?

A. That is about right as I have shown it.

Q. Do you mean to say that the bottoms of any of these cesspools were brick and mortar tight?

A. I could not testify to that, no, sir.

RE-DIRECT:—

Q. Could you tell how deep this well was?

A. No, I could not tell you the depth.

Q. How much lower than the cesspools?

By Mr. VREDENBURGH: He says he don't know.

By the WITNESS: Well, it is on the opposite side of the building from the cesspool and the top of the wall is on a level with the cellar bottom, so that it would be on a line as far as the level was concerned, with the cesspools.

Q. Tell how far the cesspools are, about, from the river?

A. Well, I should judge about 300 feet.

Q. And this old well?

A. Well, the old well would be about the same.

Q. Well, now then, you tell us you found, or at least Mr. Herbert has said, there was a fourth cesspool, whereas you found but three?

A. Yes, sir.

Q. Were these three that you were into connected in any way with a fourth cesspool?

A. No, sir; not at the present time.

Q. Or the house fixtures connected with it?

A. No, sir.

Q. They connect with the other three?

A. Yes, sir, with the three.

FURTHER CROSS:—

Q. If you did not see the fourth cesspool, how do you know whether there wasn't a pipe which connected the pipes with the house and that you saw in the house, with the cesspool?

A. Because every fixture that was in the house was tried while I was in the cesspool.

Q. But you were not in the fourth cesspool?

A. No, I wasn't in the fourth cesspool, but the water came into the main cesspool and could not get into two places at the same time.

Q. Why not?

A. It would follow the one pipe, the pipe being so large it could not branch off and flow into any other cesspool.

Q. Not if the pipe was opened?

A. Well, I could judge by the amount of water that came in when the closets were full.

Q. You could not tell whether at any time that pipe could not be closed into the cesspool of the house so that another pipe could be used, could you?

A. Well—

Q. If it was done intentionally. You did not make any examination in order to find that out?

A. I examined the premises as far as I went and found nothing that showed that there could be a gate valve there in any way.

By Mr. EDWARDS: Now we offer the map.

RE-DIRECT:—

Q. Who was it that pulled the water closet when you were in the cesspool?

A. I sent Mr. Chandler and Mr. Gibson. I sent them up to pull the water closet, and directed them to which line they were to go when I staid in the cesspool.

Q. And you immediately got the results?

A. Yes, sir; I could hear the tank being pulled.

FURTHER CROSS:—

Q. Just one more question; you say there was no connection with this cesspool and the fourth cesspool that you did not go in. Did you say that?

A. I don't understand the question.

Q. You say there was no connection with this cesspool with the one you didn't go in, which was the fourth cesspool; did you say that?

A. No connection.

Q. Never had been?

A. Yes, sir.

Q. There had been?

A. Yes, sir.

Q. Whereabouts?

A. In No. 1 cesspool.

Q. There had been a connection from No. 1 cesspool to this other?

A. To this other one.

Q. You don't see that on your map, do you?

A. Yes, sir.

Q. How?

A. Right here (indicating).

Q. You are pointing now to something in red what does it read?

A. That there is a 4 inch soil pipe to the second floor bath room on the second floor of this building,

but it is not in that corner but in this corner(indicating) I have got that on wrong so I have made a pencil mark there.

Q. I want you to point out again between these 3 cesspools, the one of them which was called the fourth cesspool that you did not find or go into?

A. Right in this corner.

Q. In the corner with the lead pencil mark on it?

A. Yes, sir.

Q. When did you make that lead pencil mark?

A. After I found out the location of the pipe.

Q. When?

A. I made this on the 20th day of December.

Q. How did you find out the location of the pipe?

A. By being in the cesspool and seeing it.

Q. That is one that don't connect now?

A. Yes, sir; the pipe is plugged up.

Q. How is it plugged?

A. I don't know, but we put some cement on it to make sure of it.

Q. You plugged it?

A. No, sir; we tried it with a stick the first time and found it plugged up about 2 feet away from the end; that is where we found it, and we had the plumber working there and we got him to put some cement in and cement it up flush.

Q. How did you strike this plug in the pipe, with a stick?

A. Yes, sir.

Q. What kind of a plug was it?

A. I could not tell you; it was something that was solid; it was a hard substance.

Q. Have you any way of telling whether it was a valve or not?

A. It was not a valve; it sounded like cement by sounding it.

Q. Why didn't you show the pipe from the cesspool which you say it was connected with, to this cesspool you didn't go into?

A. I will explain that to you; when I first drew this diagram, this building was not here.

Q. Which building?

A. The laundry building. They added that afterwards. You will notice that there is a red line there (indicating). The black line was the original work; the blue line was the hotel and cesspools. Now this building I added on afterwards and I so had it when I wrote this cesspool down underneath the building as the old pencil mark shows. This cesspool should be under that corner where the old pencil mark shows, but in not scaling this map, of course I did not get it exactly as it should be. You see I crossed that cesspool out because it threw it outside of the building.

Q. In ink you have the cesspool marked cesspool No. 4?

A. Yes, sir.

Q. That is not there at all?

A. That is under the building.

Q. Well, that is not where you have got it on this map?

A. It was at the time.

Q. Was the cesspool where you have got it marked on your map at any time?

A. It was 35 feet from this one and it has not been moved. Of course if I had made my line over here a little further it would have been all right.

Q. And you crossed it out on this map to indicate that it was not the proper location?

A. Well, that is the location according to the plan.

By the COURT: It was made without a scale and he has put it there; when he came to indicate the line of the building, then the

line of the building did not go to the cesspool as he had first drawn it on the map, so he drew the cesspool very properly with reference to the line of the new building, that is the way I understand it. Is that right?

By the WITNESS: Yes, sir.

FURTHER CROSS:—

Q. May I repeat my question; why didn't you show on your map the line of the pipe leading from cesspool No. 1 to cesspool No. 4?

A. I did not show any line leading from any of the cesspools to any of the others.

Q. That was the reason?

A. That was only an overflow pipe. I did not show the overflow pipes.

Q. Do you know whether there is any outlet from pipe No. 4?

A. No, sir; I do not.

Mr. EDWARDS:—

Q. Then the over flows no longer cross the drains to the river?

A. No, sir.

Mr. VREDENBURGH:—

Q. The pipe leading from No. 1 to No. 4 all cross the drain to the river?

A. That is a dead pipe.

Q. I didn't ask you that?

A. Yes, that crosses.

Q. And that is the one that you had some man put cement in, isn't it?

A. After I found the end plugged up.

Q. I didn't ask you that. I ask you whether that was the pipe you put the cement in, was it?

A. That was one of them, yes.

Q. Did you put cement in any other pipe?

A. No, sir.

Q. What do you mean by saying that was one of the pipes you put it in?

A. Well, that was a slip, that is all. That is the only pipe I cemented.

Q. And that was done on December 20th?

A. Yes.

Q. Of this year?

A. Yes.

Mr. EDWARDS:—

Q. Would it be possible, after that cementing, for any over-flow to get from No. 1 to No. 4?

A. No, sir; the pipe was plugged before I went into it.

Q. Why did you put the extra cement in?

A. Because it was back about two feet from the face of the wall and I just merely plugged it up so that anything at all could not get into it.

Q. The plugging up was done in the pipe a little distance in the pipe?

A. It was in about two feet.

Q. You put cement in to make it up flush with the wall?

A. Yes, sir.

Q. To make a workmanlike job of it?

A. Yes, sir.

By the COURT:—

Q. What was the diameter of that pipe?

A. Five inch tile.

Q. How could they get cement in so far on a small pipe like that, if it was cemented?

A. They could force it in there with a stick.
Q. What would be the object of that?
A. Well that I cannot say.

By Mr. EDWARDS.

Q. Did you put cement in all the way back to this?
A. It was cemented up flush; not all the way back to the other, no, sir, just on the flush.
Q. What was that, Portland cement?
A. Yes, sir.

Mr. EDWARDS: We offer the map in evidence.

Marked Exhibit D 16.

Mr. VREDENBURGH: That map seems to be not strictly proven, because he has changed around, he left these marks on, and nobody but your Honor, having heard it, can ever understand it.

Mr. EDWARDS: The testimony explains it.

Mr. VREDENBURGH: No, it doesn't, it is deceptive to anyone else except your Honor. In other words, it pretends to show things in two ways and nobody can tell which is which.

The COURT: I think if Senator Edwards would draw a cross through that cesspool, that would obviate that difficulty.

Mr. EDWARDS: I mark the correct location of the fourth cesspool in pencil with a cross and the words "Four" and "C" on either side, and the cesspool as originally located is stricken out with pencil.

CHARLES A. HALLGRINZ, sworn on behalf of the defendants.

DIRECT EXAMINATION by Mr. Edwards.

Q. What is your business?

A. Plumbing inspector.

Q. Are you also a practical plumber?

A. Yes, sir.

Q. You say you are plumbing inspector,—to whom?

A. For the Board of Health of the city of Newark.

Q. You were, were you, with the preceding witness at Dover, in going over the plumbing of the Mansion house?

A. Yes, sir.

Q. Did you go into any of the cesspools about which he has testified?

A. Yes sir.

Q. Into which one?

A. First, second and third.

Q. And you have seen this map?

A. Yes, sir.

Q. Which one of the cesspools was it that the former witness did not go in the second or third?

A. The second one.

Q. Now what did you do, so far as that was concerned—that cesspool was concerned?

A. I went in that cesspool; I was the smaller and the lighter and they let me down in it on a rope and when I got in there I asked to have this water from the present location of the laundry tubs turned on, until I could see if those tubs were connected to that cesspool.

Q. Who did you give that word to?

A. To I believe Mr. Fanning, or probably the proprietor of the place.

Q. About how soon after did you get a response?

A. Immediately, almost immediately.

Q. Could you tell where it came from?

A. Yes I could tell it came from the laundry tubs.

Q. What would tell you that?

A. Why the sound through the pipe, I could hear it as soon as the water hit the tub, and when he stopped running it ran right down through the pipe.

Q. Was it coming from only a short distance?

A. Probably ten feet.

Q. And you could tell by the sound where it came from?

A. Yes, sir.

Q. Do you know whether there was connection between cesspool number 1 and cesspool number 2?

A. Yes, sir.

Q. How could you tell that?

A. I could see the pipe, and I talked to Mr. Colson, who was in cesspool number 2 at the time.

Q. Through this pipe?

A. Through this pipe.

Q. How about 2 to 3?

A. From 2 to 3 we put a hose in and ran water through, and talked through as well.

Q. Well, now, has cesspool number 1 any connection outwardly now except to cesspool number 2?

A. No, sir.

Q. And has cesspool number 2 any connection outwardly except to number 3?

A. You mean the overflow?

Q. Yes.

A. None. Only the one to number three, of course.

Q. And what becomes of the water at number 3?

A. The water in number 3, of course, is supposed to settle in the ground. Of course, that will for a time; and in time it will fill up and have to be cleaned all of them.

Q. You mean the solid matters. Now, is there any connection from number 1 to the location number 4?

A. Well, there was a pipe which was apparently an overflow from 1 to 4.

Q. Yes.

A. But that pipe when I was down in the cesspool on the 20th of December, that pipe had evidently been out of commission or not in use. It wasn't fit for use for at least, I should judge, six months.

Q. You could tell that by the appearance?

A. I could tell by the appearance. The accumulation of solids around that pipe.

Q. Did you try to see whether water could be forced through?

A. I forced a stick, from the mouth of that pipe—probably the stick was four feet long—and I forced it in until I struck solid.

Q. About how far in?

A. That was probably two feet in.

Q. Was there any hole in this solid?

A. No, I had to force pretty hard to get it through to the two feet. I simply pounded the stick until I gradually worked it in to two feet.

Q. How large a pipe?

A. About four or five inch pipe.

Q. And did you pound it in all the way around on the pipe?

A. Just where it would go through.

Q. Was there any indication of water having passed through there?

A. No, not in a long while. The stuff was, you might say, practically dry, that is, dry as could be expected when the end was opening into a damp cesspool.

Q. What did you do with that opening?

A. We had a man cement that opening up.

Q. What did you cement it with?

A. Portland cement.

Q. Were you present also when the fixtures were flushed in the hotel?

A. At this particular day?

Q. At any day.

A. On the 9th of May I was there.

Q. And what result did you get in cesspool number 1?

A. In cesspool number 1 we got color from every fixture in the house but the laundry trays and a slop sink upstairs on the same line with the laundry trays.

Q. Different colors or the same colors?

A. Same colors that were put in. Blue was the color that they used on that day.

Q. How far apart were these colors put in?

A. Oh, the connection to the cesspool. I believe there was not less than half an hour on each group of fixtures if I can remember properly.

Q. Who would give the order as to which fixtures was to be tried?

A. Mr. Colson was in the cesspool at the mouth of the pipe. I stood on the bank, that is, on the side of the Manson House that was nearest Morris Street. I was on the bank, and saw either Mr. Gibson or Mr. Chandler both, and waived my hand for them to put the color in the closet and pull the string and notified Mr. Colson that it had been done. The same way on the second floor. But on the other side I walked over to them and told them, one of them, to come, I believe, to the bath room across the hall. And when we would signal him he would walk back and give the signal for them to turn the stuff into the closet. That was on May 9th.

Q. And how soon after these various signals would you get results?

A. Why, from two to five seconds, I should judge. Probably a little more. Probably ten seconds. The further away they were the longer it would take to come.

CROSS-EXAMINATION by Mr. Vredenburgh.

Q. This pipe that led from cesspool number 1 to cesspool number 4, entered cesspool number 1 how far?

A. What do you mean? "How far"? From the top, side, bottom or where?

(Question read by stenographer.)

Q. Isn't that question plain to you?

A. No, sir.

Q. Try it again, then. How much of the pipe which led from cesspool number 1 to cesspool number 4 was inside of the interior surface of cesspool number 1?

A. Probably six inches.

Q. Was that turned up or turned down?

A. The fall of that pipe going through this cesspool pointed from the cesspool.

Q. Was the six inches of the pipe that you saw, turned up or turned down?

A. Turned up.

Q. It was turned up, was it?

A. An angle of probably forty-five degrees. Probably not so much.

Q. And, then, so far as you could see, the pipe, the pipe was running at an angle of forty-five degrees?

A. (Interrupting) Probably.

Q. From cesspool number 1 to cesspool number 4?

A. Probably. Not so much as forty-five degrees. Not so much. Half of that.

Q. Half of that?

A. I would say it was enough so as I could see that that had been an overflow pipe. It had a grade.

Q. Then you want to just divide your statement by 2. Instead of a forty-five degree angle, it is one-half of that? Is that what you mean?

A. No, it wasn't probably half. It had a fall.

Q. Now, as you ran in the stick, was the pipe straight as far as you ran it in?

A. Yes, sir.

Q. You are positive of that? You ran in this stick yourself?

A. I ran the stick in myself.

Q. And you are positive that the pipe was straight.

A. I am positive it was straight.

Q. Mr. Richards swore it was bent. Mr. Richards put it in. What do you say as to that?

A. I don't know. As far as I went it is straight. I will swear it was.

Q. You will swear the pipe was straight as far as you put in the stick?

A. As far as I put in the stick.

Q. It was filled with something. What was it filled with before you struck anything solid?

A. It was apparently grease and solid matter.

Q. What do you mean by solid matter?

A. I don't know just the name they give it. Animal refuse or excreta.

Q. Animal or human?

A. Human excreta.

Q. It was very solid in there?

A. Yes.

Q. How far was the top of that pipe—the top of the six inches—from the surface of the top of the cesspool?

A. From the ground, would you say?

Q. Not from the ground, but from the lower part—

A. (Interrupting) from the top of the cesspool?

Q. Yes, from the ceiling of the cesspool.

A. That was probably a foot. The top of that overflow was probably a foot from the top—probably a little more.

Q. And so far as you know, it was running straight at an angle of one-half of forty-five degrees?

A. I wouldn't swear to the angle.

Q. Yes. Well, how was it that you ascertained that the solid stuff that you struck was not an elbow there?

A. I didn't say I didn't know it was an elbow.

Q. You understand that question, don't you?

A. No, I don't.

Q. You say that you put in a stick, which you supposed was about four feet long, and you put it in about two feet, and then, after pressing it through something that was quite solid which you now say was grease and human excreta you struck something that was solid. I want to know how much you know that that solid that you struck was not the side of the elbow?

A. I don't know that it was.

Q. Then, of course, you don't know whether it was a plug or not. Is that so?

A. I don't know whether it was a plug?

Q. Yes.

A. What sort of a plug?

By the COURT.

Q. What do you think it was? What was your judgment?

A. I thought that that pipe had been apparently probably cut off, or probably cemented up. And when I struck, I struck something hard as if it might

be cement. If it were an elbow it would give the same result.

By. Mr. EDWARDS.

Q. Except it would be on an angle, a slant?

A. In that elbow here I could get the side of the angle.

By Mr. VREDENBURGH.

Q. How did you know that that pipe in which you put that stick was running to cesspool number 4?

A. I don't know, any more than I was told.

Q. The direction it was running was towards the drain that led down to the river?

A. The direction it was running was towards cesspool number 4.

Q. Well, it was towards the drain, too? Wasn't it? The drain was between you?

A. I don't know where the drain was.

Q. The map shows. Then you don't know anything about this map whatever.

Mr. EDWARDS: His attention has not been called to that.

Q. I thought you said you understood that map.

A. I do understand that map so far as relates to the Mansion House.

(Witness is shown map).

Q. There is the drain, shown on there.

A. This is the drain.

Q. Isn't that the drain?

A. I don't know whether that drain runs in here or not. I didn't see it. The nearest I saw was a leader coming in here.

Q. A leader from the top of the building?

A. A leader from the Mansion House, which ran down at an angle.

Q. Not to split hairs about it. The map shows that the direction in which your stick ran was towards the drain which leads down to the river.

A. Exactly.

Q. So it wasn't a fair inference from what you saw there that that pipe led to the drain?

A. No, sir.

Q. Why not?

A. Because it couldn't.

Q. Why not?

A. It couldn't lead to the drain and be effective.

Q. Why not?

A. Because it was impossible

Q. Why not?

A. For the simple reason that if that cesspool should be filled up to the height of two feet, this eight inch drain from this cesspool to the Mansion House would plug up, and stop all the fixtures in the house.

Q. Do you mean to say that they couldn't connect a five inch pipe from a cesspool to a ten inch drain?

A. I don't mean it, no sir.

Q. Why couldn't they do it?

A. I didn't say they couldn't.

Q. Well, wasn't this a five inch drain that you had your stick in?

A. Yes, sir.

Q. And wasn't it a ten inch drain towards which it was going?

A. I don't know the size of the other drain.

Q. Assume it was ten inches.

A. Well, assume it was ten inches.

Q. Then why couldn't that five inch drain connect practically with that ten inch drain?

A. There is nothing to prevent it, if they connect it.

Q. And you can't tell whether it was connected or not, can you?

A. No, sir.

Q. That is what I said.

By Mr. EDWARDS.

Q. But would it work, if connected?

A. No, sir.

Q. What would be the effect if it were connected?

A. If that drain were connected?

Q. Yes.

A. The inlet from the hotel being about three or four feet—say three feet below this overflow, this inlet would be plugged by the soil matters and would simply back up this line into the fixtures in the hotel.

Q. Now, did the leaders from the house go into this drain?

A. They did—in fact, I know that one leader did, for the simple reason that when I was there on May 9th, I dropped a stone in the hole of the leader pipe to try and judge the depth of that sewer that ran through there.

Q. That drain?

A. That drain.

Q. And did you find any holes in that leader?

A. At that time there were. It was an old leader and pretty well rusty.

Q. And it carried the rain water from the roof?

A. From the roof.

Q. It was not connected in anywise with the fixtures in the house?

A. No, sir.

Testimony of Charles A. Hallgrinz.

By Mr. VREDENBURGH:

Q. What was the depth of that drain?

A. That drain as near as I could judge was probably—well, I don't know the depth.

Q. Don't know? What was the depth of the opening from cesspool number 1 which yau plugged?

A. I didn't plug it.

Mr. EDWARDS: It was plugged?

WITNESS: It was plugged.

Q. You didn't plug it then? But you know whether it was plugged?

A. I know.

Q. That is the one I refer to, if you know it was plugged. That one; how much was that below the surface?

A. You asked before if it was below the top of the cesspool. I said about a foot below the top of the cesspool. Now, the inside of the cesspool, the ceiling, was probably a foot below the surface of the surrounding ground. That would bring it about two feet below the surface of the ground.

By the COURT.

Q. How far below the top of the cesspool was the inlet into that cesspool from the house?

A. From the Mansion House, you mean, your Honor?

Q. Yes.

A. How low from the top of the ground?

Q. Well, the top of the ground or the top of the cesspool, either one.

A. About between three and four feet from the top of the cesspool.

Testimony of Charles A. Hallgrinz.

Q. So that it would be about two feet below the outlet?

A. Below this outlet, or three.

By Mr. EDWARDS.

Q. The idea being only to have the water rise and go out?

Objected to by Mr. Vredenburgh.

The COURT: I don't understand the witness in the way you seem to understand him, Senator; the way I understand him to say was that the effect of having the inlet two feet below the outlet would be to back up the water in the pipe leading from the house and make trouble there, because solid matter wouldn't come down.

Mr. EDWARDS: Oh, I understand; let me ask him one other question.

Mr. VREDENBURGH: You are interrupting my cross-examination; you sit there, and whenever you want to pop a question, you do it.

Q. The overflow from cesspool number 1, is that above or below the inlet?

A. It is above the inlet.

Q. Of cesspool number 2?

A. You mean to cesspool number 2; well, the overflow from cesspool number 1 to cesspool number 2 is probably six inches lower than the inlet from the house to number 1.

Q. Why is that lower than the inlet; why is it put lower than the inlet?

A. So that the water can flow off below the inlet.

Q. Is that true also from No. 2 to No. 3?

A. The same from No. 2 to No. 3, probably six inches, probably less; but it is a trifle below.

CROSS-EXAMINATION by Mr. Vredenburgh:

Q. You found that there was a connection between the house and cesspool No. 1, and that connection was about four feet below the surface of the ground there, is that right?

A. Yes, sir.

Q. Then you also found a pipe which was running at the angle of one-half of forty-five degrees, descending grade, the top of which was about two feet from the top of the ground, is that right?

A. No, sir; from the top of the ground; yes, sir; I beg your pardon.

Q. Now, you say that the water from cesspool No. 1 could not pass into the drain that leads down to the river, if it had a connection with it, do you?

A. No, sir.

Q. What difference would it make whether that pipe connected with a drain or connected with another cesspool, in that respect?

A. No difference.

Q. So that if they had another cesspool there the effect of that pipe would be to stop it up very soon, or force the water—

The COURT: That is on the assumption that the pipe from the cesspool No. 1 to cesspool No. 2 was higher than the inlet.

Mr. VREDENBURGH: No. 4 I am asking about.

The COURT: No, you are asking him about No. 1 and No. 2.

Mr. VREDENBURGH.: No, sir; the pipe which starts out, and which he has found was four feet deep ran, he thinks, from that cesspool to cesspool No. 4; but I asked him whether it was not running directly towards the drain; he says yes, it is; but it don't run into the drain, otherwise it would force the stuff in the hotel, and I am trying to find out why it would force any stuff in the hotel.

The COURT: He has explained it by saying because it has first to flow through a pipe which is two feet higher than the inlet pipe, and it is because of that situation of things that he thinks that the system would not work; when you come to the pipe between cesspool No. 1 and No. 2 that difficulty is remedied by making the outlet in the cesspool No. 2 a little lower,—six inches, he says, below the inlet to cesspool No. 1.

Mr. VREDENBURGH: That cesspool, No. 4, we have proved here was worked for years with no trouble at all.

The COURT: I don't understand this witness to attribute the difficulty to the drain pipe under ground, but he attributes the difficulty to the thing that I have mentioned.

Mr. VREDENBURGH: Now, as I understand, the same result would be, in his judgment, if the pipe ran to cesspool No. 4, instead of the drain.

The COURT: Undoubtedly.

Q. If you found out by experience that that pipe did work for years to cesspool No. 4, that would change your mind about that, wouldn't it?

A. It would change my mind this far—it will work to-day if there is only water from the distance of that inlet to the distance of this outlet; if it was only water it would work, but once the solids get above this mouth, why, then it cannot work.

Q. Then, the only thing you would say is that they must be careful so that the solids shall not get above that mouth, is that the idea?

A. Exactly.

Q. Now, cesspool No. 2, I will go to that; you said that the pipe leading from cesspool No. 1 to cesspool No. 2 was lower by six inches than the pipe that you stopped up, did you say that?

Mr. EDWARDS: He didn't give any estimate.

Q. What is the difference in height between the pipe that you ran the stick in and the pipe which leads from cesspool No. 1 to cesspool No. 2?

A. About two feet or a trifle over.

Q. That is two feet lower?

A. That is the over-flow from cesspool No. 1 to No. 2 is about two feet lower than this over-flow that was supposed to have gone on No. 4.

Q. Now, does the solid stuff pass through that?

A. No, sir; not to a very large extent.

Q. Why not?

A. Because the water rises; the solids settle and the water rises.

Q. And so it would, still more, with the pipe that you supposed goes to No. 4?

A. What is that—I don't understand your question?

Q. (Question read).

A. I don't understand that.

Testimony of Charles A. Hallgrinz.

Q. Well, now, in order to have cesspool No. 2 work you have got to keep the solid stuff two feet further down in the cesspool No. 1, haven't you?

A. Not necessarily.

Q. Why?

A. For the simple reason that the solid as it would come to the top would be much lighter at six inches below the mouth than it would be at two feet below the mouth.

Q. That would make the higher pipe more useful than the lower pipe, in that respect?

A. No, sir.

Q. Why not?

A. Because you are below your level with your inlet in the case of the higher pipe, and on the other hand you are above your pipe with the over-flow from one to two.

Q. What difference does that make, whether the outlet from the sewer is above the inlet or below the inlet?

A. What difference does it make?

Q. Yes, what difference does it make?

A. The difference I explained before in taking up on the other end and taking up on the side it is coming from.

Q. Do you say now that that pipe—that there is any reason why that pipe that you put your stick in, could not connect with the drain which you have shown on the map, about half way between cesspool No. 1 and cesspool No. 4?

A. There is no reason why it could not be if anyone wanted to connect it.

By the COURT:

Q. The water would flow in the drain just as easily as it would flow in cesspool No. 4, wouldn't it?

A. Yes, sir.

Testimony of Charles A. Hallgrinz.

FURTHER CROSS:

Q. It would not make any difference whether it emptied into the drain or the cesspool?

A. Not the slightest.

Q. In how many years do you think it would collect in that cesspool so as to stop the connection between that and the drain?

A. In No. 1, how many years?

Q. Yes, if that pipe that you saw went to the drain?

A. If that were the only outlet?

Q. If that were the only outlet, except that care should be taken to keep the cesspool clean whenever it was full?

A. Now, I don't understand your question at all.

Q. (Question read).

A. Well, it could never collect if they kept the cesspool clean, until it got up to that height, when it got full or pretty nearly full; if they kept it cleaned it would never stop up.

Q. Have you any idea how long it would take to fill this cesspool No. 1 with solid matter, from what you saw?

A. Of course, I don't know; I wouldn't be prepared to say a thing like that; I don't know how many guests they would have in their hotel; that would depend entirely upon how much the closets and the fixtures in the hotel were used.

Q. Do you think six months?

A. I don't know.

Q. Did you find any indications that the cesspool had ever been full, No. 2?

A. The only indication that I found—No. 2?

Q. Yes.

A. None; not on No. 2.

Q. Was there any indication that it had ever been above the pipe that led to cesspool No. 2?

A. No, sir; I don't think so.

Q. Did you testify how deep that cesspool, No. 2, was?

A. I haven't testified; no.

Q. How deep was it?

A. I should judge that cesspool No. 2 was about 12 feet deep; probably a little more.

Q. Then about how much below the over-flow?

A. How much below the over-flow?

Q. Yes.

A. About seven feet and a couple of inches; probably four or six.

Q. From which over-flow?

A. From the over-flow to No. 3; from No. 2 to No. 3.

Q. I am talking about No. 1?

A. Well, about between 7 feet six,—about seven feet six or eight,—or seven feet, we will say.

Q. About seven foot six below the outlet?

A. Below the outlet pipe from No. 1 to No. 2.

Q. We are talking about No. 2?

A. You ask me about No. 2?

Q. How deep was No. 1?

A. Why, No. 1 was somewhere in the neighborhood of ten feet deep.

Q. And this pipe that led from No. 1 to No. 2, the opening to it was how much above the bottom of that No. 1 cesspool?

A. From No. 1 to No. 2?

Q. No. 2?

A. The over-flow from No. 1 to No. 2 was how much from the bottom of No 1?

Q. No. 1?

A. How much that was from the bottom of No. 1?

Q. Yes.

A. Probably about 5 feet, something in the neighborhood of five feet; I didn't measure the distances; I am judging it.

Q. Then, as you understand it, the outlet that you put the stick in would work all right until the solid matter in cesspool No. 1 reached a distance to about one foot from the ceiling of the cesspool?

A. No, sir; I didn't say that.

Q. You said the top of this pipe that you put the stick in, the opening, was about a foot from the ceiling?

A. Exactly.

Q. Wouldn't it work all right until the solid matter got up to that point?

A. No, sir.

Q. Why not?

A. I don't believe it would.

Q. Why not?

A. For the simple reason that if that solid got above the outlet the water and solids could not find their level.

Q. Well, as it is, then, if that pipe which you put the stick in led to the drain, it would drain the cesspool whenever cesspool 2 and 3 got full with liquid matter?

A. It depends on how full.

Q. Well, full is full, isn't it; you cannot have—

A. Full; yes, sir.

Q. Work all right, wouldn't it?

A. It would work for a very short time.

Q. What do you mean by a short time?

A. I mean the same as I have said repeatedly, as long as the solid matter in No. 1 did not go above the inlet of No. 1, that is the pipe from the Mansion House, and if there was water from the inlet from the Mansion House up to this outlet, towards this No. 4 cesspool, why then it would work.

REDIRECT EXAMINATION:

Q. Now, as long as the outlet to No. 2 was working, of course the outlet to No. 4 would not work?

A. No, sir.

Q. No. 2 being the lower?

A. Yes, sir.

Q. And what is the tendency of the outlet?

The COURT: I don't think it is worth while to go into that.

Q. Now, how much solid matter was there in No. 1, when you went down there into it?

A. About 18 inches, I should judge.

Q. From the bottom?

A. Yes, sir.

Q. How much below the inlet pipe was that?

A. Below the inlet pipe—the top of this, did you say?

Q. Yes.

A. Well, that was probably about five and a half —five or five and a half feet; something like that.

Q. What was this matter in the mouth of pipe No. 4, was that fecal matter, excrement?

A. Yes, it seemed to be—some grease, probably.

Q. Did it seem to be quite hard?

A. Yes, sir.

RE-CROSS EXAMINATION:

Q. Did you say you used the stick?

A. To push in No. 4?

Q. Yes.

A. Yes, sir.

Q. Did any of the others use a stick?

A. No one there; they were along side of me; there were two others in the cesspool at my elbow when I was there.

Q. You were standing on a ladder?

A. No, sir.

Q. What were you standing on?

A. On the side of the cesspool, or on the bottom of the cesspool.

Q. You were in cesspool No. 1?

A. Exactly.

Q. Wasn't that full of stuff at that time?

A. No, sir; there were about eighteen inches of stuff in there.

Q. You were standing on the bottom?

A. Yes, sir.

Q. When you were pushing this stick in?

A. Yes, sir.

Q. And that was nine feet above where you were standing; how tall are you?

A. I beg your pardon, I made a mistake.

Q. You were pushing a stick—you were the one that did it?

A. Yes, sir.

Q. How tall are you?

A. I made a mistake in saying that; I wasn't standing on the bottom at this time.

Q. Well, I don't ask you that; I ask you how tall you are?

A. I am five foot six.

Q. What were you standing on?

A. I was standing on—there were some girders, or not girders exactly, but some up-rights in that cesspool that had probably been put in there to strengthen the roof or the ceiling, and there were cross pieces that reached across, and I stood on that cross piece, and besides that the solid on the side of the cesspool seemed hard, whether it was earth or not I don't know, but I had one foot on each of those places and reached up—to raise up.

Q. How much was it above your head?

A. From this position?

Q. How much was the top of the pipe above your head?

A. From this position?

Q. I don't care where you were standing?

A. About seven feet.

Q. It was seven feet above your head?

A. No, sir.

Q. No, it was about two feet above your head, and not seven feet?

A. Yes, two feet above.

Q. Now, disregarding solid matter entirely, and assuming that all the stuff that enters the cesspool No. 1 is water, under such circumstances the water would run out of this pipe in which you put the pole, —that would be the only exit for all three of the cesspools, wouldn't it?

A. Yes, sir.

Q. That is all.

DR. HERMAN C. H. HEROLD, sworn on behalf of the defendants.

DIRECT EXAMINATION by Mr. Edwards:

Q. Where do you reside?

A. Newark.

Q. How long have you resided in Newark?

A. About fifty years.

Q. What is your occupation?

A. Physician and surgeon.

Q. How long have you practiced your profession?

A. Since 1878.

Q. Do you hold any position in the city of Newark?

A. Member of the Board of Health.

Q. What position in the Board of Health?

A. President at present.

Q. How long have you been President of the Board of Health?

A. 11 years.

Q. How long have you been connected with the Board of Health?

A. Since 1883.

Testimony of Dr. Herman C. H. Herold.

Q. Have you made a study of sanitary matters?

A. Yes, sir.

Q. Did you, in connection with Dr. Leal, visit the Rockaway water shed in the month of May, 1906?

A. Yes, sir.

Q. Who went with you?

A. Doctor Leal, Mr. Chandler and Mr. Gibson.

Q. And what was your purpose in going?

A. Of looking over the water shed and ascertaining—or to aid in making the water shed pure, if possible.

Q. What were your instructions in that regard, and from whom did you receive them?

A. To accompany Dr. Leal, and to advise and recommend anything that was shown me to make it sanitary.

Q. When did you start out on this investigation, doctor?

A. I believe it was the 3rd of May.

Q. When did you first go up into the water shed, —on what day?

A. The 3rd of May.

Q. And will you now tell us, doctor, what you did at the various points in the water shed?

A. I will have to refer to my notes in that matter.

Q. Were you present on May 7, 1906, when a test was made upon a building known as the Schwarz building?

A. Yes, sir.

Q. What day was that?

A. That was on Monday, May 7th.

Q. Was a test made of that building?

A. Yes, sir; at 9:30.

Q. And how was that test made?

A. By Mr. Chandler and Mr. Gibson entering the premises; Dr. Leal and myself were located at the river.

Q. How far is the river from the premises?

A. Right next to it.

Q. Can you show us the property on the map?

A. I believe I could.

Q. Now, tell us, if you please, where the Schwarz building is on the map?

A. I am trying to recognize it from the lay of the land; it was on Sussex street, just across the bridge.

Q. Yes.

A. I should say it was located about here (indicating on map).

Q. At No. 8, as shown on the map.

A. Yes, sir.

Q. Now, doctor, how long did you wait for the result, after Mr. Chandler and the others went in the building?

A. Until 10:02 A. M.

Q. How soon did you know that the test had been made?

A. Mr. Chandler and Mr. Gibson reported to Dr. Leal and myself, who were waiting at the river.

Q. How soon after 9:30 did they report?

A. 10:02.

Q. How soon after 9:30 did they report to you?

A. As soon as they had finished their work in the house.

Q. About how long before 10:02 was that?

A. 9:30 they made their report.

Q. How soon after 9:30 did they make their report, or did they make it at 9:30?

A. No, it was after 9:30, they had finished their work at 9:30; that was their report to me, and it was after that time that they came to where we were located.

Q. How soon after that did they come?

A. I didn't keep track of the exact time, five or eight minutes, probably.

Q. What was the result of the test, so far as you could see, at the river?

A. No result at all.

Q. Where did you look at the river for the results?

A. On the bank of the property of Mr. Schwarz.

Q. So far as you could ascertain, was the Schwarz building connected with the river?

A. I should judge not.

Q. Now, did you then make a test on the same day at the Sweedish church?

A. Yes, sir.

Q. At what hour?

A. 11:30.

Q. Was that a color test also?

A. Yes, sir.

Q. By whom was the color introduced?

A. Same gentlemen.

Q. Where were you?

A. On the banks of the river, alongside of the church.

Q. And above or below the church?

A. Right at the bank where the vault is located.

Mr. VREDENBURGH: Objected to as going into a dead issue.

The COURT: I will over-rule it on that ground, it is no longer an issue in this case.

Mr. EDWARDS: I understand your Honor has over-ruled the question?

The COURT: I over-rule that inquiry.

Q. Now, No. 27, East Blackwell street; what building is that?

A. Post office building.

Q. Did you make a test there?
A. Same gentlemen made the test.
Q. Who did the watching?
A. I did the watching.
Q. What time was the test made?
A. The test was reported to me at 12:34 A. M.
Q. How long—
A. No color appeared in 45 minutes.

RECESS.

AFTER RECESS.

DR. HERMAN C. H. HEROLD on the stand.

FURTHER DIRECT EXAMINATION by Mr. Edwards:

Q. Doctor, as I remember your testimony, you said that you finished the test at 27 East Blackwell street at 12:34 A. M.; were you working all night at that?

A. No; it is a mistake.

Q. What should that be?

A. It should be 12:34 P. M.; it was introduced in A. M.

Q. That is, just between noon and 1 o'clock; now, then, doctor, did you on that day make a test, in conjunction with your colleagues, of the fixtures in the Mansion House?

A. Yes, sir.

Q. And what time did that test start?

A. That test started from 10:05 A. M. to 10:50 A. M.

Q. And what did you test at that time?

A. The report was brought to me that all fixtures in the Mansion House, number 6 Blackwell street, number 12 Blackwell street, number 14 Blackwell street, number 16 Blackwell street, were tested.

Q. That is, color was put in?

A. Yes; in all that row of which the Mansion House is a part.

Q. Did you get any result?

A. Yes; the color appeared at the mouth of the Morris street drain at 11 A. M.

Q. Well, could you tell from that color which one of these particular buildings it came from?

A. No, sir; they were tested separately, later.

Q. On the same day?

A. No, sir.

Q. Not that same day?

A. No, sir; couldn't do it.

Q. Weren't some of them tested that day?

A. No, sir; no more tested that day?

Q. Wasn't 16 East Blackwell street?

A. Oh, yes; I mean the Mansion House wasn't; at 16 and 14 Blackwell street we tested again the same day.

Q. Tell us about the test at 16 East Blackwell street; you had to tell where the color came from?

A. 16 East Blackwell street; color introduced in closet, top floor, at 2:15, as reported to me.

Q. Yes.

A. Introduced in closet on second floor at 2:30.

Q. And how long did you wait?

A. We got no results at 2:55 P. M.

Mr. VREDENBURGH: What day was that?

WITNESS: May 7th.

Q. Did sufficient time elapse to get results?

A. Yes, sir; judge so, from the other experiments.

Q. What did you do that day as to 14 East Blackwell street?

A. 14 East Blackwell street; the color was introduced in closet on second floor at 2:55 P. M., in closet on ground floor at 3 P. M.; the color appeared at the foot of Morris street drain at 3:20 P. M.

Q. You found color, then, at 14 East Blackwell street?

A. Yes, sir.

Q. Did you make another test at 16 East Blackwell street?

A. Color test of both closets at 3:59 P. M.; no results at 5 P. M.

Q. In your judgment, did that eliminate 16 East Blackwell street?

A. Yes, sir.

Q. Did you make another test of East Blackwell street?

A. Yes, sir; an aniline red was introduced in closet at 5:10 P. M.; no results at 6:30 P. M.

Q. To summarize it, you found something from the Mansion House and something from 14 East Blackwell street, that day; you found it from some other place?

A. Some other place, but positively from 14 East Blackwell street.

Q. And possibly from some part of the Mansion House?

A. Couldn't say, because there are other houses on that block.

Q. Did that finish the tests for the day?

A. That finished the work for that day.

Q. When did you go at it again?

A. On May 8th, 1906; on a Tuesday.

Q. And whose property did you go to first?

A. The property I tested on that day was Dr. Hunter's office on Blackwell street.

Q. Is that the dentist's office?

A. That is the dentist's office; color was introduced at 9:15—reported to me after introduced by Mr. Chandler and Mr. Gibson; no results at 10 A. M.

Q. Did you try to find out where the color had gone?

A. Yes, sir; found color within a few minutes after its introduction; we ascertained that by opening the vent pipe of the cesspool and introducing a bottle attached to a string, and bringing some of the contents of the cesspool up to the surface, and found it had the color.

Q. Now, then, doctor, what did you conclude by that?

A. That there was no connection between Dr. Hunter's office and the pipe line on Morris street.

Q. Where did you wait for the color to appear?

A. At the pipe line, foot of Morris street.

Q. On the river?

A. Yes, sir.

Q. And did you wait a sufficient time, in case there had been a connecton?

A. Yes; no results at 10 A. M., forty-five mnutes.

Q. Where dd you go from there?

A. They reported that they had been to John Moller's, corner of Dickerson street and Morris street.

Q. Where was color introduced, according to the report?

A. Color introduced in closet, wash-basin, on first floor; in the rear east end of apartment on the second floor; closet fronting rear east end of apartment on third floor; at 10:30 A. M.

Q. And how long did you wait for results?

A. No results at 11:15 A. M.

Q. Where was this?

A. At the same pipe line; supposed to be connected with that; but it showed it was not.

Q. Then where did you go?

A. Herman D. Moller's, 16 North Sussex street; I didn't go there, but the other gentlemen did; I was at the pipe line all the time.

Q. What report was made to you as to that?

A. Color introduced at 11:15 A. M. into all fixtures except bar-waste sink, which takes in drip from ice-box and pressure pump; no color at 12 noon.

Q. Now, then, was color afterwards introduced, after 12 o'clock?

A. Color was then applied at 12 o'clock to bar-waste sink and appeared at once at corner.

Q. That was simply water?

A. Water from the bar-waste; nothing else.

Q. Would that be injurious to health?

A. Not without something was put in.

Q. I mean the ordinary—

A. (Interrupting). Not in the ordinary use.

By the COURT:

Q. What do you call bar-waste?

A. Washings of glasses behind the bar—saloon.

By Mr. EDWARDS:

Q. Now, then, doctor, did you make any investigation that day in the Mansion House, and if so, when?

A. Yes, sir; in the Mansion House, color was introduced in the laundry tubs, slop sink, two closets on first floor; closet on second floor; closet on third floor; at 12:30 P. M.

Q. What result?

A. Color appeared at foot of Morris street drain at 1:15 P. M.

Q. What did you conclude from that?

A. That there was some sort of connection between the Mansion House and the pipe line at Morris street.

Q. But you couldn't tell where?

A. No, sir.

Q. Do you know whether that has been remedied or not since?

A. Yes, sir.

Q. Did you find out later on what it was?

A. Yes, sir.

Q. What was it?

A. The laundry—the old laundry.

Q. Has that been torn down since?

A. Yes, sir; new ones constructed.

Q. Where did you go then?

A. To number 6 Blackwell street.

Q. You hadn't tested that before, had you?

A. That was in the first test.

Q. That was in the first day's elimination test?

A. We were trying then to eliminate those that were safe and those that were not.

Q. What did you find; when was that tested?

A. That was tested at 2:45 P. M.; no results at 3:45 P. M.

Q. What other elimination test did you make that day?

A. Number 12 East Blackwell street.

Q. And when did you test that?

A. Tested at 3:50 P. M.

Q. How long did you wait?

A. No results at 4:50 P. M.

Q. Well, now, doctor, when the results came, was there any trouble in seeing them?

A. Not at all.

Q. Would it be possible to have results in these cases that you couldn't see?

Objected to by Mr. Vredenburgh:

A. No, sir.

Mr. VREDENBURGH: That is impossible for him to answer; I object to the question, anyhow.

The COURT: The doctor is answering as an expert.

WITNESS: No question about finding the color.

Q. Now, then, doctor, did you have another test made at Dr. Hunter's that day?

A. Yes, sir.

Q. Was that of the fixtures, or what?

A. That was made of the leader, on the roof of an extension; Dr. Hunter's office water-closet and sink was right next to this window opening out on the leader; and the report made was that color was introduced at 4:45 P. M.

Q. Into this leader?

A. Yes, sir; about five pails of water were introduced into the leader; this was the report made to me at the time; and the color appeared at the foot of Morris street at 4:50, five minutes.

Q. That leader was for what purpose?

A. Carrying off the rainwater of the roof.

Q. No danger of pollution from that, was there?

A. No, sir.

Q. Now, doctor, did you have any more examination on that day?

A. No, sir; that was all on that day.

Q. Now, then, when did you go up into the water shed next?

A. Wednesday, the 9th.

Q. And where did you proceed first?

A. We took in number 10 Blackwell street.

Q. Had that been tested before?

A. Only in the block at the time; the original block.

Q. This was another elimination test?

A. Another elimination test.

Q. Well, what did you find?

A. Color introduced into slop sink of second floor; wash-basin on third floor; at 12:10 P. M.

Q. And what did you notice?

A. Appeared at Morris street drain at 12:17 P. M.

Q. What did you conclude from that?

A. That that place was connected.

Q. And would that be a deleterious connection, in your opinion?

A. Not necessarily.

Q. Do you know whether it has been remedied or not?

A. Yes, sir.

Q. Has it?

A. It was afterwards remedied.

Q. Now, then, did you make any further elimination tests on the Mansion House that day?

A. That same day; yes, sir; color was introduced into all closets on the first, second and third floors.

Q. About what time?

A. At 1:55 P. M. No results at 3 P. M.

Q. No results where?

A. At the Morris street pipe.

Q. The river?

A. The river.

Q. Now, did you make any investigation to see if you could get results at any other point from that?

A. Color was obtained immediately at cesspool in yard.

Q. Which cesspool? You remember there are—

A. (Interrupting.) The one situated—

Q. (Interrupting). The first, second or third cesspool?

A. Back of number 14, I think. No. This was the report made: Color introduced at closet on first, second and third floors at 1:55. No results at the pipe at 3. But the report was that color was obtained immediately at the cesspool in the yard.

Q. You don't know about that yourself?

A. No, sir, I don't; but the cesspool was entered and the flow of pipe obtained.

Q. Who was there?

A. The plumbers.

Q. The plumbers obtained that?

A. I don't know anything about the cesspool. I didn't see any of the Mansion House cesspools.

Q. Now, then, did you make any further test of the Mansion House that day?

A. Yes, sir. The laundry tubs were tested at 3:10 P. M. Color appeared at foot of Morris street drain at 3:25.

Q. Did that then tell you what was the trouble with the Mansion House?

A. Yes, sir. That was the first knowledge we had that the connection was with the Mansion House.

Q. Where was it located?

A. In the old laundry.

Q. Auywhere else?

A .Not in the Mansion House, no, sir. We had eliminated all others.

Q. Now then, did you make any further test as to 14 Blackwell street that day?

A. Yes, sir.

Q. That had not yet been eliminated?

A. No, sir. We found it there. Tested 14 Blackwell street closet on the third floor at 4:20. Color appeared at the foot of Morris street drain at 4:37. Color appeared at foot of Morris street at 4:37 that was introduced at 4:20.

Q. What did you assume from that?

A. That there was a connection between No. 14 Blackwell streeet and the drain foot of Morris street.

Q. From a closet?

A. The closet, yes.

Q. Has that been since remedied?

A. That has been since remedied.

Q. Well, now then, was anything done that day about the cesspools at 14 and 16 Blackwell street?

A. Yes. They were stripped—opened up.

Q. In your presence?

A. I saw them after they were stripped.

Q. What did they do with the material?

A. It had first been removed, and the plumber went into the cesspool and traced it, the color coming from the tested closet on the third floor, a connection that had not been severed.

Q. What did you get? Did you get a test also from this closet or not? Did it enter from No. 14 into the cesspool in that test?

A. The closet on the third floor was tested, and it appeared at Morris street.

Q. Was tested to see if it appeared in the closet—in the cesspool?

A. In the cesspool, yes, sir.

Q. Did it appear?

A. It didn't appear once, and that showed there was a connection between that water-closet and the pipe on Morris street.

Mr. VREDENBURGH: What place was that, Doctor?

WITNESS: 14 Blackwell street.

Q. Did you make a test as to the sink in No. 14?
A. That ran into the cesspool.
Q. And not into the river?
A. No, sir.
Q. How about No. 16?
A. No connection between that and the river.
Q. Was there a connection between it and the cesspool?
A. Yes, sir; shown there complete.
Q. How about the over-flow?
A. There was no over-flow found in the cesspool; I wasn't in it myself, but the plumber's report that was in it, while I was present on the ground.
Q. Did you make any test as to the sewage from the Lindsley house, across the alley?
A. Yes, sir.
Q. What did you find from that test?
A. It appeared in the same cesspool.
Q. Did it appear in the river?
A. No, sir.
Q. And tests were made?
A. Yes, sir.
Q. Did that complete the test for that day?
A. That completed the test for that day, yes, sir.
Q. What was the next day that you were present?
A. May 12th.
Q. Were you there May 12th?
A. No, sir; I was not.
Q. When was the next day you were there?
A. 19th.
Q. What did you do on the 19th; what place did you test?

A. No, I wasn't there on the 19th either. The next time that I was present was on the 26th of May. I have the report here of what was done there, and it shows that 16 had been connected.

Q. Wasn't May 19th the day Mr. Sherred was there; weren't you there that day at 14 East Blackwell street; the day you went to the rag mill in Mt. Tabor?

A. I will tell you in a minute from my direct notes. I cannot recall that I was there on May 19th.

Q. Well, now, were you there at any time when 14 East Blackwell street was tested, and found not connected with the river?

A. No, sir; I can't recall that.

Q. When was the next day you were present?

A. On the 26th of May.

Q. 1906?

A. Yes, sir.

Q. Where did you go that day?

A. Ross' silk mill.

Q. Where was that situated?

A. At Wharton.

Q. And what did you do there?

A. The place was gone over with; we were there twice; I cannot recall the first trip that we made.

Q. May be I can aid you about these dates?

A. I can recall the fact now.

Q. That was at Port Oram, wasn't it?

A. Yes, sir.

Q. Who were you taken through the factory by?

A. By the superintendent.

Q. Mr. Mockridge?

A. Yes, sir.

Q. In what condition did you find the water closet there?

A. Sealed up.

Q. Nailed up?

A. Nailed up; there was a board fence before the closets in the building.

Q. Was it in use?

A. No, sir.

Q. From there where did you go?

A. We made no test there, by the way, because it wasn't used, and that is the reason I only have a note of it.

Q. Was it substantially nailed up?

A. Yes, sir. From there we went to the Richardson & Boynton Stove works.

Q. Will you just tell us what you saw there, briefly?

A. We saw the privy vault in the yard, with an excavation between in which there was a wagon and the excretia from the vault was dripping into this wagon; the ground surrounding it was wet from the urine that flowed there, and there was a pipe that we found at one side of this excavation, that they claimed that the place was not in any way connected with the drain on the premises.

Q. Well, what did you do to assure that?

A. But to assure that we closed that pipe with a bag of Portland cement; it was a pipe, I should judge, ten inch pipe.

Q. Yes, how did you seal it up?

A. Packed in the Portland cement into the pipe and then moistened it and closed it up tightly.

Q. Put in any stone with the cement?

A. No, sir; just poured the cement and some few stones that were lying there were forced in with it, but it was almost all pure cement.

Q. Did that make it tight?

A. Yes, sir.

Q. You don't know of your own knowledge where that old drain went to?

A. No, sir, I have no knowledge; but the information given was that it did not connect with the drain on the premises.

Q. Were you ever present when water went through that drain?

A. Yes, sir, that was later; that was on our second visit.

Q. Where next did you go?

A. Swiss Knitting Mill.

Q. Where is that?

A. I don't know what street it is located on, but it is in Dover.

Q. What test did you make there?

A. The closets were tested; two on top floor, one on first floor, at 10:30 A. M. Color appeared in the stream next to the premises at 10:32. Cesspool was tested at 10:40. Color appeared at 10:45.

Q. What did you conclude from that test?

A. From that we concluded there was a connection between that stream and the cesspool.

Q. And the house, too?

A. No; over-flow probably from the cesspool.

Q. Has that been remedied since?

A. That has been remedied since; it has been tested since. I would like to state there is quite a distance down the stream where the color appeared as though it had drained through the soil, and in that way—it didn't seem to be a direct connection, it came out in a volume, some, I should judge, twenty or thirty feet.

Q. Percolating out?

A. Percolating through the stone; we couldn't see any connection there.

Q. Didn't seem to have any direct stream?

A. No, sir.

Q. Then where did you go to?

A. Sampson's slaughter house; just inspected that from the outside and got no test there.

Testimony of Dr. Herman C. H. Herold.

Q. Well, just describe the slaughter house at that point?

A. It is a building in which the slaughtering of cattle takes place and there is a stream that—there are two slaughter houses; I cannot place this one. I haven't on my notes where it is located.

Q. But you made an inspection of the surroundings?

A. Yes, sir; we made an inspection.

Mr. VREDENBURGH: What are you showing him now?

Mr. EDWARDS: Other notes made at the same time.

Mr. VREDENBURGH: Somebody else's notes?

WITNESS: Notes made at the time; they were all made at the time. All on here is the same as on the other; we made inspection of the surroundings and it in no way connected with the river or any stream in it.

Q. Where did you go then?

A. 301 Richards avenue.

Q. What was that?

A. Tested the sink; that is a residence, nothing but a sink there; tested that at 12 o'clock and there were no results in twenty minutes.

Q. Where was that sink located, do you remember?

A. I don't, no, sir, I never went inside the house; the test was made to me by Mr. Chandler and Gibson, that was reported to me.

Q. Did you go into the cellar of that house?

A. No, sir; Mr. Chandler did, and Mr. Gibson.

Q. Then where did you go?

A. From there to 12, 16 and 20 Hoey street.

Q. What was tested there?

A. Kitchen sinks were tested at 12:20; no results at 12:45.

Q. Any reports made to you as to whether there were other fixtures in the house?

A. No, sir, no other fixtures in that house; the 2 vaults were located in the yard.

By Mr. VREDENBURGH:—

Q. How do you know that, no other fixtures in the house?

A. That was reported.

By Mr. EDWARDS:—

Q. Now Doctor, did you see the vaults in the yard?

A. Yes, sir.

Q. It has been testified here that the vaults in the yard were over a brook leading into the river; is that so?

A. No, sir; the brook at that point is covered, but the vaults was at least 15 feet back of the line of that brook.

Q. And what were the character of those vaults?

A. Regular privy vaults.

Q. Is there, in your opinion, any danger of pollution from them as they now exist?

A. I should not judge there was.

Q. Where next did you go?

A. 321 East Blackwell street.

Q. What was tested there?

A. Sink was tested at 12:50.

Q. What report was given to you as to the other fixtures?

A. There was nothing else in that house reported; the kitchen sink.

Q. Where did that color appear?

A. In the drain back of the yard.

Q. At what time?

A. 12:59, nine minutes after it was introduced.

Q. Did that go to the river?

A. No evidence of it going to the river?

Q. In your judgment did it go to the river?

A. No, sir.

Q. How far is that from the river?

A. Quite a distance; I cannot estimate it.

Q. Several hundred feet?

A. In fact, I cannot see the river from there; there are houses obstructing the view.

Q. Did you go down to the river?

A. At 321?

Q. Yes.

A. I have no record of that. I would like to ask the name of the parties, and I could place them a little better.

Q. Jenkins.

A. That color appeared in the drain in the yard and there it was lost.

Q. Lost where?

A. Soaked away.

Q. Into the river?

A. We followed the drain to a place where it was heaped with stone, and there was no connection with a little drain from the railroad back of that, but we could not in any way detect any color in that drain along the side of the railroad; that might possibly have got into the Hoey street brook.

Q. What then is your opinion as to any possible pollution from that point?

A. Couldn't say it was possible to get there.

Q. Now the next place?

A. 180 Richards avenue.

Q. Where is that located?

A. Kitchen sink was tested and no results, as the pipe from the kitchen sink does not go into the drain 180 Richards avenue is located—I state here Richards avenue, and the kitchen sink goes into the ground.

Q. Go to the river?

A. No, sir, because there is no connection with the drain. I am a little confused on that particular place.

Q. Where is the next place you went to?

A. But my notes here are that the pipe did not go from this house, did not go to the drain. The next place is 158.

Mr. VREDENBURGH:

Q. Do you recollect anything about it; you are reading from notes there; do you recollect anything about it?

A. No, sir; those are notes made at the time.

Q. Do you recollect anything about it?

A. No, sir; I cannot locate that exactly now; I will probably later.

Mr. EDWARDS:—

Q. That particular place?

A. Yes, sir.

Q. Where next did you go?

A. 158 Richards avenue.

Q. Yes.

A. Sink was tested at 1:25 and color appeared in a stream at 1:40.

Q. Where did it appear, in what stream?

A. A brook that ran some little distance from the house on Richards avenue.

Q. Has that been remedied?

A. Yes, sir; we have tested it since. I can recall that 180 Richards avenue now, it is a place where the sink disappeared in the cellar and there was a little brook running along the side, but in no way did that get any connection with that brook. I think that is the one in which the cellar was investigated by Mr. Chandler and Mr. Gibson.

Q. Did you have any trouble in getting into that house, the first time?

A. Yes, sir.

Q. And had to go back?

A. Yes, sir; they locked themselves in, and afterwards they appeared, an old lady, and after a great deal of persuasion they would allow us in.

Mr. VREDENBURGH:—

Q. That is from the report, I suppose?

A. No, sir; that is from my memory; that is not on my report.

Mr. EDWARDS:—

Q, Where next did you go?

A. David Glass, on Viaduct place. We found there was a trecnh at the back door of the house, and in this their slops were thrown, and it got into the canal at that point. That has been remedied since.

Q. That wasn't any fecal matter?

A. No, sir.

Q. But that has been remedied, has it?

A. Yes, sir, a cesspool has been built since.

Mr. VREDENBURGH:—

Q. You mean what you saw or what you did not see?

A. It was nothing but the slops from the kitchen.

Q. How do you know; you mean not what you saw?

A. What we saw, yes, sir.

Q. Did you see anything at all?

A. Saw slop water, yes, sir.

Mr. EDWARDS:—

Q. Where next did you go?

A. 87 Blackwell street.

Q. What did you test there?

A. Report was made, the water closet on the second floor was tested at 3:50.

Q. What happened?

A. Color appeared in the canal at 4:06.

Q. Did you consider that a source of pollution?

A. Yes, sir; found there was a connection there; supposed there was a connection between that house and the canal; the color showed at the canal.

Q. Well, has that been remedied?

A. That has been remedied since, yes, sir; we made that test since and could not find any color.

Q. Do you know how it has been remedied?

A. By a new cesspool being built for those houses.

Q. What was the next?

A. 99½ East Blackwell street, tested water closet on second floor; no results in thirty minutes.

Q. What did you conclude from that?

A. That there was no connection between that house and the river.

Q. Now the next place you went to that day?

A. 78 Richards avenue.

Q. What did you find there, what did you test?

A. Tested water closet at 5:25; no results at 6:40.

Q. What did you conclude from that?

A. That there was no connection between that closet and the river.

Q. Where next did you go?

A. John W. Bickley's property, northwest corner of Myrtle avenue and Union street, 29 and 31 Myrtle avenue.

Q. What kind of house is that?

A. Double house?

Q. What was tested?

A. Water closet, sink and wash basin on second floor, tested at 5:55; no results at 6:40.

Q. Why did you test those particularly, water closet, sink and wash basin?

A. I think it was due to testimony that was brought here.

Q. Now what did you conclude from that test?

A. There were no results at 6:40, that there was no connection.

Q. Will you tell us where you went next, and when?

A. On the 29th of October, 1906.

Q. Had there been work done up there between those dates?

A. Yes, sir.

Mr. VREDENBURGH: —

Q. How do you know?

A. Only the results will show.

Q. From the results?

A. Yes, sir.

Mr. EDWARDS:—

Q. You are simply using this to refresh your memory?

A. Yes, sir.

Q. On the 29th of October, 1906?

A. Yes, sir.

Q. Where did you go first?

A. Ross' Silk Mill.

Q. What did you test there?

A. We tested every fixture in the place.

Q. What result did you get?

A. At 10 o'clock we got no results in the tail race of that property.

Q. Is that mill in any wise connected with the river?

A. No, sir.

Q. Where does the sewage of that mill go to?

A. Mr. Mockridge informed us it went into an old mine, that was the place where the mine was located, —the shaft of a mine, and it was fenced in with trees growing all around, and one of our men ventured to cross the fence, and see what the cesspool looked like, and came very near going down that nine hundred foot mine just covered with debris and beams that had rotted out; I think it was Mr. Gibson that had the narrow escape, and if it hadn't been for Mr. Chandler he would have gone into that mine.

Q. What was the next?

A. Richardson & Boynton's. The drain was entered by plumbing inspector Colston and Health Officer Chandler.

Q. Where did they enter—the drain?

A. On the premises above the closet that I spoke of before.

Q. The privies?

A. Yes, the privies.

Q. And where did they come out?

A. I didn't see them come out; they had an electric light, and I saw them come along past the first manhole, knowing that they were in the drain, and they can make their report themselves of what they saw there.

Q. Did you take a look at the old pipe you had cemented up on your former visit?

A. Yes, sir.

Q. What condition did you find it in?

A. All removed.

Q. The pipe was out entirely?

A. Pipe out entirely.

Q. Could you find any connection between the place where the wagon stood, under the privy vaults and the drain of the river?

A. None at all that was visible.

Q. Did you look?

A. Yes, sir; we looked and made special efforts to see.

Q. In your judgment do those privies connect in any wise with the river?

A. Not to my knowledge, no, sir.

Q. How about your judgment?

A. Or in my judgment, no, sir.

Q. Where did you go then?

A. Electric light works; the same two gentlemen tested the water closet and sink on the first floor, that is, Mr. Chandler and Mr. Gibson.

Q. What time?

A. 11:25, and in the electric light works brook as they called it we watched for results, Dr. Leal and myself, at 12:20 there was no result.

Q. Was that a sufficient time to look?

A. Yes, sir.

Q. Where did you go then?

A. No. 9 Essex street.

Q. What was done there?

A. Kitchen sink was tested at 11:35; no results at 12:20.

Q. What did you conclude from that?

A. No connection.

Q. Then, Doctor, what next did you do that day?

A. We made a trip to Hibernia.

Q. Will you please describe the conditions there, fully?

A. We found, in going over that Town, no connections with the stream, with the exception of the water that came from the mine; there were privy vaults in the place, but none of them connected in any way with the stream.

Q. Do you know what kind of water it is that comes from the mines?

A. Mine water, they call it; it was condensed when we saw it.

Q. What was its temperature, would you say?

A. Could not say what the temperature was, but it showed that steam was emanating from it.

Q. Hot water, then?

A. Yes, sir.

Q. Were any closets over or connected with the stream at that point?

A. No, sir.

Q. How did they dispose of their house drainage there?

A. I know of no system only throwing it out on the soil; I didn't see any cesspools there; I believe there are some cesspools, but I didn't see any.

Q. Did you find any source of pollution there?

A. No, sir.

Q. Where did you go then?

A. Richards abattoir.

Q. Where is that located?

A. In Dover.

Q. The owner of that property was here on the stand; wasn't he?

A. Yes, sir.

Q. What did you find there?

A. That there was a stream of water running under the building of the abattoir, but no connection in any wise with that stream by any of the offal of the abattoir.

Q. Or any privy connection?

A. No, sir.

Q. How was the stream covered over, with what?

A. With large stone and earth.

Q. Making an arch over the stream?

A. No, flat stone; the drainage all was carried off to the one side of the abattoir, and a drain dug out in the field to some extent.

Q. How far out?

A. I should judge three or four hundred feet.

Q. Away from or toward the stream?

A. Towards the river, but away from the stream.

Q. How far was the river from it?

A. Well, I should judge it was fully half a mile.

Q. Would, in your judgment, any pollution be possible at that point?

A. There was no place that I could see; there was no connection with that stream.

Q. You think everything had been done there?

A. Yes, sir.

Q. Would you recommend anything further to be done there?

A. No, sir.

Q. Does this statement now recall to you the other slaughter house that we were talking about?

A. Yes, sir.

Q. That was known as Sampson's slaughter house?

A. Yes, sir.

Q. Where was that located?

A. In the outskirts of Dover; cannot tell the exact location, but I can recall the facts now that I have cleared this one. There was no possible connection in any way with the river or any stream that ran into the river.

Q. How was the drainage taken care of?

A. Soaked away.

Q. How far was that from the river?

A. I should judge that was even further than the Richards establishment.

Q. How far from any stream entering into it?

A. There was a stream at the end of the property which I should judge was fully five hundred feet.

Q. In your judgment is anything necessary to further protect that point?

A. No, sir; I cannot see anything that could be recommended.

Q. Now then, Doctor, that brings us down to the evening of October 29th; when next did you visit the water shed?

A. That was the end of October 29th.

Q. When did you visit the water shed again?

A. October 31st.

Q. In company with the same people?

A. Same people.

Q. Where did you go first?

A. To Wharton.

Q. What houses did you inspect there?

A. The Oram house in Canal street at Wharton; a double house with sink in each.

Q. Where does that sink go?

A. The pipes are connected with the canal direct.

Q. Is there a privy there?

A. Yes, sir.

Q. Was that privy tested?

A. Yes, sir.

Q. Where did you get results?

A. The privy was full and was tested at 9:30. We got results in a very few minutes coming out of the stone wall of the privy and spreading over the surface back of the privy, in which ashes had been dumped; it was a dumping place for ashes.

Q. Sort of filtration bed?

A. I wouldn't call it that; it was to get rid of it I guess.

Q. Did it go to the canal?

A. No, sir.

Q. Go in the direction of the canal?

A. Yes, sir.

Q. How far was this privy from the canal?

A. I should judge it was about ten feet.

Q. Would that privy drain into the canal?

A. If there was sufficient coming out of it it might at that time.

Q. Would that, in your judgment, ever happen?

A. No, sir; it could not have happened without water was poured in.

Q. Would rain cause it?

A. No, sir.

Q. Would that, in your judgment, constitute a pollution?

A. It might constitute a pollution.

Q. Has it since been cleaned and fixed?

A. Yes, sir, and remedied.

Q. Is it now satisfactory?

A. Very satisfactory.

Q. But it wasn't on October 30th?

A. No, sir; it wasn't.

Q. Well, what is the proper thing to do to render that always satisfactory?

A. Cementing it.

Q. Has it been cemented?

A. Yes, sir.

Q. And in addition to that, Doctor, must any supervision be taken to see that it does not get too full?

A. Yes, sir; it ought always to be watched.

Q. I suppose that is true of practically all the privies in the water shed?

A. Yes, sir, any privy.

Q. Whether it is on the river or where it is?

A. Anywheres to be able to reach the river by any drain, if it was over-flowing the tendency would be that way.

Q. Has a cesspool been built in connection with the privy now?

A. Yes, sir.

Q. With the sink waste?

A. The waste from both sinks go to that new cesspool.

Q. Would you think the waste in the sink itself deleterious?

A. No, sir.

Q. But all question is avoided by putting it into the cesspool?

A. Yes, sir.

Q. Where did you visit next?

A. Singleton Silk Mill.

Q. What investigation did you make there?

A. Investigated the premises; I did not go in, the investigation was outside; we saw the new cesspool and a privy vault that is located alongside of the stream.

Q. Would any pollution reach the stream from that cesspool?

A. In no way possible.

Q. Or from the mill?

A. No, sir.

Q. What is the condition of the privy vault on the outside of the mill?

A. That is located very near to the stream, but it is lower than the stream itself; if it wasn't cared for it might over-flow, and in that way get into the the stream, but in no otherway.

Q. Is it safe as it is now?

A. Yes, sir.

Q. Then as I understand it the only thing required there would be inspection from time to time?

A. Yes, sir.

Q. And is that apt to get out of order suddenly?

A. No, sir.

Q. Where was the next place that you went to?

A. David Glass' house at the Viaduct.

Q. This you had already visited on your former visit?

A. Yes, sir; the trough was taken out and a cesspool had been built.

Q. When you visited it in May, the slops ran through the trench into the canal?

A. Yes, sir; direct.

Q. Do they now?

A. No, sir.

Q. What becomes of them?

A. Soak away in the cesspool.

Q. How near to the canal is that cesspool?

A. About 15 or 20 feet; I would not say exactly.

Q. Any change from that cesspool?

A. Only in over-flowing.

Q. How can it be avoided?

A. By care.

Q. Would that cesspool over-flow in case of freshets?

A. I should think not.

Q. What was the next you visited?

A. Piers' brick row, 79, 85, 87 and 89 West Blackwell street.

Q. Had you visited them before?

A. Yes, sir.

Q. Now what test did you make there, and when?

A. All fixtures tested at 11:05.

Q. How long did you wait for results?

A. That is at 81 and 83 all fixtures were tested at 11:05, then the rest of the fixtures of the other two houses were tested at 11:58. We had difficulty in getting in; there were no results in the canal at 12:40.

Q. From any of the houses?

A. Yes, sir.

Q. Had you had results from those houses before?

A. Yes, sir; the result appeared before in 18 minutes.

Q. How had the matter been remedied?

A. Building of a cesspool.

Q. Where?

A. On the premises back of the row of houses, between that and the canal.

Q. How far from the canal?

A. Well, the canal at that point is higher than the yard, where the cesspools are located, but the outlet was below the lock, which was lower, and the only way that it could get to the canal would be below the lock, which would be a thousand feet, pretty nearly a thousand feet or eight hundred.

Q. Did you find any danger from a sanitary point, there?

A. No, sir; not now.

Q. Where next did you go?

A. We again tested 321 East Blackwell street.

Q. What did you test?

A. Sink in kitchen, that is the Jenkins house, tested that at 2:30, color appeared in the drain in the yard just the same as it did before, and it laid there, but does not in any way reach the creek nor the river.

Q. What would you say as to that, as a source of pollution now?

A. Perfectly safe.

Q. Where did you next go?

A. 158 Richards avenue.

Q. Visit that before did you not?

A. Yes, sir, and found connection with the brook.

Q. On your former visit, that was in May, 1906?

A. Yes, sir.

Q. What did you do this time?

A. We again tested the sink in the kitchen at 2:55 —had no results at 3:20.

Q. Was that long enough time to wait?

A. Yes, sir, it came very quickly before; they had built a cesspool.

Q. What had been done in the meantime?

A. The ground showed that it had been opened up and a cesspool was supposed to have been built there.

Q. It didn't go into the river?

A. No, sir; it didn't go into the river or stream.

Q. Did you visit 12 Myrtle avenue?

A. Yes, sir; 10, 12 and 14.

Q. Had you ever visited them before?

A. Yes, sir; they were visited before.

Q. What did you find at No. 12?

A. They were tested by the same gentlemen, all fixtures tested in No. 12 at 3:33.

Q. How long did you watch for results?

A. About 3:45 No. 10 Myrtle avenue tested and 14 Myrtle avenue tested at 3:50; there were no results at 4:48 in any of them.

Q. Had you visited them before, didn't find it on your notes. 29 and 31 Myrtle avenue you visited before?

A. Yes, sir; that is right; that is the only one we had on Myrtle avenue.

Q. Hadn't been there before?

A. I didn't visit any of those houses at all; that was left to the other gentlemen; I only watched for the result, and that was the number that was given me, 10, 12, and 14 were the one that were tested, I watched for result and found none at 4:48.

Q. Did you find any connection between those as a result of this experiment, with the river?

A. No, sir.

Q. What next did you examine?

A. 72 Richards avenue.

Q. When was that done and what result?

A. All fixtures were tested at 4:03; no result at 4:48.

Q. And the next?

A. 57 Passaic street.

Q. What was tested there?

A. And 59 Passaic street. Sink in each kitchen; one tested at 4:55 and the other at 5 o'clock; no results at 5:30.

Q. Now then, do you find any danger of pollution at the present time from any of the properties visited by you on October 30th?

A. No, sir.

Q. What was the next day of your visit to the water shed?

A. October 31, 1906.

Q. Where did you go that day?

A. 68 and 70 Richards avenue.

Q. What did you do?

A. All fixtures tested at 9:10—no results at 10:10.

Q. Was that connected in any wise with the river?

A. No, sir.

Q. Any danger of pollution from that point?

A. No, sir.

Q. Where next did you go?

A. 34 and 36 Bergen street.

Q. What did you do there?

A. All fixtures tested at 10:05; no result at 11:05.

Q. Are those properties at Bergen street near or far from the river?

A. They are quite a distance from the river; not a great distance; they run in on the electric light stream which runs into the river.

Q. What was the result at 34 and 36 Bergen street?

A. No result at 11:05.

Q. Did they pollute the river in anywise?

A. No, sir.

Q. Take 158 Richards avenue, was that the next place you visited?

A. Yes, sir; sink tested at 10:25; no results at 2:15.

Q. Was that the same sink that you had tested on May 26, and obtained results?

A. Yes, sir.

Q. How do you account for it that at one time you obtained them and the other time you didn't?

A. Had been remedied.

Q. On October 31, 1906, was there any danger of pollution from that?

A. No, sir.

Q. Where next did you visit?

A. 46 McDevitt place.

Q. What was tested there?

A. Kitchen and sink.

Q. At what hour?

A. At 11:30 color appeared in the little ditch back of the house and the ditch disappears, no way of possibly getting into the river.

Q. How far from the river is this place?

A. 500 or 600 feet if not more; quite a distance from the river.

Q. This is not a privy; just the slops?

A. Yes, sir.

Q. Would you consider that dangerous even if it did reach the river?

A. No, sir; it could not reach the river.

Q. What was the next property you visited?

A. The Ely property.

Q. What did you do there?

A. The sinks were tested in the upper house and three privy vaults, at 11:50; no results at 2:20.

Q. Why did you wait so long at that point?

A. We didn't wait there so long, but we went away and came back.

Q. Well, would the coloring still appear if it had been put in?

A. Yes, if any got in there we would have had it.

Q. Were you in the immediate neighborhood?

A. Yes, sir; we made these others around there and came back in a very little while, but the end of the test was at 2:20.

Q. Does the Ely property in any wise pollute the river?

A. In no wise that I could see.

Q. Did you try to find out if it did?

A. Yes, sir; was very anxious to find out.

Q. Did you make still another visit to the Swiss Knitting mill?

A. Yes, sir.

Q. When was that?

A. Same date, 31st of October.

Q. What did you test?

A. All fixtures, at 2:50, and we got no result for forty-five minutes.

Q. You had tested them before, had you not?

A. Yes, sir, and got results.

Q. On the 26th of May, as I remember your testimony,—how do you account for it that you got no result in October when you had results in May?

A. They had corrected the condition.

Q. Can you tell us how?

A. No, I cannot tell you how, because I don't know; I know they changed something about the cesspool, but I don't know personally.

Q. Did you make still any further investigation that day?

A. Yes, sir.

Q. What did you test?

A. The Mansion House, the new laundry.

Q. Had that existed in May?

A. No, sir.

Q. But you had found pollution in the old laundry?

A. Yes, sir.

Q. Was that torn down?

A. It was torn down and a new building put up, new connection.

Q. Tell us about the test of the new laundry?

A. Tested it at 3:35; no result at 4:50.

Q. Get any color anywhere from that?

A. No, sir.

Q. Did you look into the cesspools?

A. No, sir.

Q. It never reached the river?

A. Never reached the river.

Q. In your opinion is there any pollution from the new laundry at the Mansion House?

A. No, sir.

Q. Now we have had a number of examinations made as to the Mansion House; what would you say as to the condition of the Mansion House, so far as pollution is concerned, at this date?

Mr. VREDENBURGH: I object to this.

Q. Assuming, of course, that your colleague put the coloring in, as you have testified to, in the Mansion House, do you now find, or did you find October 31, 1906, any indication of pollution from that source?

A. No, sir.

Q. What next place did you visit?

A. No. 10 East Blackwell street, sink on second floor; tested, got no results at 5:33.

Q. Had you examined that on May 9, 1906-

A. Yes, sir.

Q. What did you get on May 9, 1906?

A. We got the color.

Q. How had that been remedied, do you know?

A. The sink had been cut off, but I don't know that myself, but was so informed; the tests show that it was.

Q. Now then, Doctor, as health officer, or president of the Board of Health of the City of Newark, have you had to do with investigations as to typhoid cases?

A. Yes, sir.

Q. In the City of Newark?

A. Yes, sir.

Q. Have you had any experience with typhoid epidemics?

A. Out-breaks.

Q. Out-breaks rather than epidemics, yes. Where?

A. In Newark.

Q. Have you made a study of such matters?

A. Yes, sir.

Q. Did you investigate the typhoid cases at Dover that have been referred to in this case?

A. The one case, yes, sir.

Q. And which case was that?

A. The Barton case.

Q. Did you visit the Barton house?

A. Yes, sir.

Q. Will you please tell us how that is located?

A. We visited it in company with Dr. Leal on Wednesday October 31st, we visited the Barton house; it is located at the upper end of the highest point of Morris street.

Q. In Dover?

A. In Dover, in conjunction with another street that I cannot recall the name of.

Q. Milbrook avenue?

A. Milbrook avenue, yes, sir.

Q. You have heard the testimony, haven't you, as

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to where the stool from this patient was buried?

A. Yes, sir.

Q. Where was it?

A. In the yard adjacent to the house.

Q. Did you see where that was when you visited there?

A. It was pointed out to me by the lady of the house.

Q. You also heard the testimony here?

A. Yes, sir.

Q. What is the drainage from that point?

A. Drainage is down hill, quite a steep hill.

Q. Well, does it run into a ditch alongside of the road?

A. No, sir.

Q. Does it reach that ditch?

A. No way that I could see.

Q. Did you see the drainage map of that?

A. Yes, sir.

Q. Now can you say as to whether it would be possible for the drainage to go from the point of the burial of the stools down to this ditch?

A. It would be impossible.

Q. Would it be possible from the privy to this ditch?

A. Impossible.

Q. Why?

A. The drainage is entirely straight down the hill, there is no way for it to go to the road, which is some 30 or 40 or 50 feet to the left of the lot where the privy vault is located.

Q. What is the character of the ground between the place of the privy and the burial of the stools and the brook?

A. That is grass and sloping down the hill.

Q. What was the character of the ground between these places and the ditch?

A. You mean the ditch along side of the road?

Q. Yes.

A. Abrupt descent; the road had been dug away to allow—I mean the ground had been dug away to allow building that road.

Q. Now what kind of a day was it you visited there?

A. Raining very hard.

Q. Did you watch the result of the surface drainage that day? 10

A. Yes, sir.

Q. Did it flow from the privies, the vicinity of the privies to the burial of the stools, towards this ditch in the road?

A. No, sir.

Q. Where did it flow to?

A. Didn't flow at all, it soaked away in the grass, no stream there at all. 20

Q. In your judgment, considering the character of the ground, what you have seen there and testified to, could any drainage from the privies or the place where the stools were buried, reach the brook?

A. I cannot conceive of a possibility.

Q. What would become of it before it would reach the brook?

A. Soak away in the grass and soil.

Q. In your judgment would a case of typhoid 30 fever, occurring in that house, with the stool buried in the place as you have described it, and as has been described by the other witnesses, and with the privy located where you have described it and as described by the other witnesses, would it be possible to be communicated to anybody living further down on the Rockaway?

A. No, sir.

Q. Through the water shed?

A. No, sir. 40

Q. Assuming the same conditions, would it in your judgment be possible for any germ of typhoid fever to reach Jersey City through the Boonton reservoir from this point?

A. No, sir.

Q. What would you say as to a claim made to that effect, to wit, that typhoid could be communicated from this point to Jersey City, under certain conditions.?

Objected to.

(Question withdrawn).

Q. When did you next make a visit to the water shed?

A. December 14, 1906.

Q. And what place did you first visit?

A. The Mansion house, the closets on the first floor.

Q. At what hour?

A. At 9:15 A. M.

Q. How long did you wait for result?

A. 12:30.

Q. Did any result appear?

A. No result.

Q. What would you say then as to the connection between those closets and the river?

A. Couldn't conceive of such a connection.

Q. Do you recall the leader from the Mansion house?

A. Yes, sir.

Q. Was any test made of that?

A. It was reported that the leader in the yard of the Mansion house was tested at 12:30.

Q. You were watching for results?

A. Yes, sir.

Q. Did results appear?

A. 1:30.

Q. Where?

A. In the river, at the pipe.

Q. Then, doctor, if urinine is put in the leader there, there is no difficulty of its getting to the river, is there?

A. Not the slightest.

Q. Would it take very much urinine in the leader to show in the river?

A. I think not.

Q. Tell us about how much urinine is a fair man for a test?

A. Very small quantity would go a great ways; a half a tea spoonful would be sufficient for any test.

Q. What you would take on the end of a knife, would that be sufficient for a closet?

A. Yes, sir.

Q. An ordinary pocket knife?

A. Yes, sir.

Q. Where next did you visit that day?

A. The electric light plant.

Q. What did you test there?

A. The closets were tested at 10.20, no result at 11:20.

Q. Was any other test made there?

A. Yes, sir.

Q. Where and how?

A. Color was placed in this stream that disappears after it gets under the conduit, disappears and is covered, but color was placed above the culvert that crosses the street.

Q. That is in the open air?

A. Yes, sir; that is open and it appeared below the culvert in 5 or 6 minutes.

Q. That wasn't any test of sewage of course?

A. No, sir.

Q. Did you do that more than once?

A. Yes, sir.

Q. Who placed the color in there, from the reports that were given to you?

A. Mr. Chandler, Mr. Gibson—you mean in the closets?

Q. Yes.

A. Yes.

Q. Is the Electric light plant connected in any way in your judgment with the river?

A. No, sir; I tested that twice and never found it.

Q. Where next did you visit?

A. 270 East Blackwell street.

Q. What property was that?

A. Farley property.

Q. What did you test?

A. The privy was tested at 2:30, eight pails of water was used; no results.

Q. That is the report that was made to you?

A. No, sir, I was present when they put the water in.

Q. Were you?

A. Yes, sir; I was right next to the stream.

By Mr. VREDENBURGH.

Q. As to the electric light plant where were you when they put the water in?

A. Watching at the same time.

Q. You didn't see where they put it?

A. Only saw when they put it in the culvert.

Q. When you put it in the electric light—you spoke as if you put it in there?

A. No, sir, every case is reported.

Mr. VREDENBURGH: That was true of the electric light, that someone else put it in.

Mr. EDWARDS: I think that is true in most of the cases.

Mr. VREDENBURGH: I thought he said in all cases.

WITNESS: Saw them in all.

Q. In some few you saw them put in?

A. Yes, sir; I was right at hand.

Q. But generally speaking you didn't see the stuff put in?

A. No, sir.

Q. It was put in by the man chosen by you to do it, under your direction?

A. Yes, sir.

Q. What was the result of the Farley property?

A. No result at 4:30.

Q. Does the Farley property, in your judgment, pollute the river?

A. Does not.

Q. Where was the next property?

A. 296 East Blackwell street.

Q. What property is that?

A. Mary Morris property.

Q. When was that privy tested?

A. Tested at 2:50, a slight color appeared in the river, some little distance below the closets at 4:30.

Q. What did you attribute that to?

A. Soakage through the soil.

Q. In your judgment is that a source of pollution?

A. Not necessarily.

Q. What would you recommend as to that?

A. The building up of the cesspool and making it water tight.

Q. There is a cesspool there now?

A. There is a vault there, yes, sir.

Q. You think that ought to be put in better condition?

A. Yes, sir.

Q. Do you know whether any directions were given at once as to that fact?

A. Yes, sir.

Q. By whom?

A. Dr. Leal.

Q. To whom?

A. To Mr. Gibson, to have it done.

Q. What is the next place?

A. Jenkins property at 370 and 372 Blackwell street.

Q. What property is that?

A. Jenkins property.

Q. What was tested there?

A. Double privy vault tested there.

Q. With what, as reported to you?

A. When we made that test there was evidence of urinine along the shore.

Q. What did that come from do you suppose?

A. No, the Jenkins property.

Q. This was before you did anything?

A. Yes, sir.

Q. When could you say that urinine had been put in?

A. It must have been there for some time, it had been laying there; the color was there at least.

Q. Came from the vaults?

A. I don't know.

Q. Now then how did you try to test it?

A. We used some analyine red in consequence.

Q. Why did you use the red?

A. So as to be able to detect whether we got any results on our own investigation.

Q. How many pails of water were used?

A. Six.

Q. How long did you wait?

A. 4:15 from 3:05 to 4:15, there was no result.

Q. Was that long enough to wait?

A. Yes, sir.

Testimony of Dr. Herman C. H. Herold.

Q. In your judgment, does the Jenkins property at this privy pollute the river?

A. No, sir.

Q. What was the next property you visited?

By the COURT:

Q. How do you account for the urinine you saw there?

A. Couldn't account for it; may have been put there.

By Mr. EDWARDS:

Q. May have been dropped there.

Mr. VREDENBURGH: Couldn't have been dropped there.

Q. If it had been dropped shortly above the stream, would it appear there?

A. The young man that we got the pail from said that it had been there for pretty nearly a week.

By Mr. VREDENBURGH:

Q. Some of the studd you put in there before?

A. Never tested that before.

By Mr. VREDENBURGH.

Q. Did you test any in that vicinity?

A. No, sir.

By Mr. VREDENBURGH.

Q. You tested the one right above, you swore, doctor?

A. Yes, sir.

Q. The same day?

A. Yes, sir, 296 East Blackwell street, this is 370, 372 East Blackwell, quite a distance.

By Mr. EDWARDS.

Q. What was the next?

A. The next was 44 and 46 Samus avenue.

Q. What property is that known as?

A. Peterson property; sink discharged into a cesspool, privy cleaned and does not drain into brook.

Q. How do you know that?

A. Saw it.

Q. Any test made there?

A. No sir.

Q. Why not?

A. No reason to make it, couldn't make it.

Q. Well, how does the bottom of the privey compare with the brook?

A. Why, below the brook.

Q. So that it would not be possible there?

A. No, sir.

Q. Does the privies or the cesspools pollute the brook at that point, or the river?

A. No, sir; I saw the evidence of a cesspool being built on a pipe leading to it.

Q. What was the next place you investigated?

A. 48, 50, 52 Samus avenue.

Q. What property is that known as?

A. Baker property.

Q. In what condition did you find that?

A. Found number of privies in the back of the yard near a small brook that runs back of this property.

Q. Do they drain into the brook?

A. No, sir.

Q. Why not?

A. They are deeper than the brook.

Q. Is there any source of pollution possible from that point?

A. Only in an over-flow or neglect of the privy vaults.

Testimony of Dr. Herman C. H. Herold.

By the COURT:

Q. Take the case of a freshet?
A. Yes, sir; that would do it.

By Mr. EDWARDS:

Q. How far is that from the river?
A. Quite a distance from the river, it is a small stream that runs towards the river, runs into the Gas House brook and that makes quite a circuit and crosses before it gets into the river.

By the COURT:

Q. Would you think that the river was sufficiently guarded if the situation were such that it might carry any fecal matter into the river?
A. No, the river would not be guarded at all, within the line of water that would rise to it, because it would all rise up to that and be flooded in the river.
Q. Would you regard that as a satisfactory condition of affairs, if such a thing were decided, in case of ordinary freshets,—a freshet such as might occur once or twice in the course of a year, or suppose once in the course of two years?
A. Must be an extra-ordinary freshet to carry that out.

By Mr. EDWARDS:

Q. When would you say we have had such a freshet, in your recollection?
A. I don't recall any up in that section, because I have never been up there before.
Q. You know about the Pequannock?
A. We don't have any such freshets in the Pequannock.

Testimony of Dr. Herman C. H. Herold.

Q. In your judgment would it reach the river in case of a freshet?

A. Well, there is a good deal of surface.

By the COURT.

Q. If the freshet was sufficiently great to overflow such a vault, why the water either would or might be carried into the stream; there is no question about that. The stream is the lowest point in the valley?

A. It might go there.

Q. It is not likely that it would, but it might?

A. Yes, sir.

By Mr. EDWARDS.

Q. Do you think there is any great probability of that, in your judgment?

A. In this particular case?

Q. Yes?

A. I hardly think so.

By the COURT:

Q. It would depend entirely on how high the water rises there at times?

A. Yes, sir, and how much would be diffused over the surface, because it would precipitate.

By Mr. EDWARDS:

Q. If diffused over the surface and percipitated it would go to the river then?

A. Some might, yes, sir.

Q. What is the next place you visited—that was 48, 50 and 52 Samus avenue?

A. The property on Lee place, the privies were in a very bad and dilapidated condition, drained into a blind ditch, which we followed very close, and I

can see no way outside of a freshet that it could ever reach the river.

Q. Well, does this run into the Gas house brook?

A. No, sir this doesn't.

Q. Where does this blind ditch end, so far as you could see?

A. We followed it and found no outlet from it at all, just disappears.

Q. Into the ground?

A. And it was perfectly dry when we were there, on this particular day, the 14th of December.

Q. Well now, privies draining into that ditch would they be deleterious?

A. Couldn't say that they would reach the river under ordinary circumstances; extraordinary conditions might.

Q. By extraordinary conditions you mean?

A. Freshets.

Q. Not the freshets we have every year?

A. No, sir.

By Mr. VREDENBURGH.

Q. What freshet do you mean we have every year?

A. Rain storm.

By Mr. EDWARDS.

Q. The ordinary spring freshet we have?

A. Yes, sir; heavy rain storm, it would not be carried there with rain, and there is no indication that there was any provision made for a large amount of water coming there, it is just a drain, and it is the over-flow from these dilapidated privy vaults that go into it.

Q. Did you find any evidence on the ground of past freshets at that point?

A. No, sir.

Q. Tell us what the next property was you visited?

A. The property on the left side of Samus avenue, 63, etc., privies there drained into a blind ditch which does not reach the river.

Q. Did you follow this blind ditch?

A. Yes, sir.

Q. How long a distance?

A. At this particular point it did not go any further than the street; we could see the water stand there, but there was no outlet to it.

Q. Did you make a careful examination for that?

A. Yes, sir; spent quite a time.

Q. Does it enter into any brook leading to the river?

A. No, the privies are all in a very bad condition, not cared for at all; it is the over-flow that reaches the blind ditch.

Q. In your judgment does any pollution reach or is liable to reach the river from this source?

A. No, sir.

Q. What was the next day you went?

A. 15th of December.

Q. What property did you visit first?

A. Reinspected the Barton property with Mr. Chandler; he was not there the first time.

Q. Did you find anything there that would change your testimony?

A. Not at all, found even the grass growing in this drain along side of the road, which we saw when it was raining very hard, that was in a dry state, perfectly dry, no indications of drainage through that abrupt bank there.

Q. What was the next property?

A. The Cooper property.

Q. Where was that situated?

A. That is situated near a tributary that runs into Ford's pond.

Q. Did you inspect it before?

A. Yes, sir, we were there on a visit; no inspection particularly, just looking it over near we drove up there.

Q. What did you find on the 15th day of December?

A. The privies were cleaned and did not drain into the ditch, they are lower than the ditch.

Q. What becomes of the water from them?

A. Soaks away, and they only could reach the ditch in any way by being over-flowed.

Q. How many are there of them?

A. There are three sets.

Q. Three of them?

A. Yes, sir, each one a double privy.

Q. Three double cesspools?

A. Not cesspools, privies.

Q. What have you to say as to their safety?

A. If properly cared for, there is no danger from them at all.

Q. Could any of them reach the ditch?

A. Not without its over-flowing.

Q. And could they all reach the ditch in that event?

A. One alone, the third one, that is the lowest one, might if over-flowed be apt to reach there, but the other two I don't think, under any conditions could even with the over-flowing reach the ditch, such a space between.

Q. What was the next property you visited?

A. The Park property.

Q. Where was that located?

A. I don't know the name of the street; it was also near the stream that leads to Ford's pond.

Q. Had you inspected that before?

A. No, sir; that was the first time.

Q. What was being done there?

A. The privy was removed from its former place, and a new place selected, and the cesspool had been built; that was on the ground where it had been built, and the sinks were to be run into the cesspool, and the work was under way.

Q. Did you think in its old condition—

A. I didr't know the old condition, this is based on the testimony that was given here.

Q. In the new condition what would be the result?

A. I don't think it is possible to drain into the ditch.

Q. What next property did you examine?

A. Lawrence property.

Q. Where is that?

A. On the same stream a little further down.

Q. What did you find as to that?

A. That is perfectly safe, there is no possible—in case of freshet even it is high up on the bank and far enough away, and in no way dangerous.

Q. Where did you go then?

A. Then we went to Wharton, to the Oram property.

Q. You had already inspected that?

A. Yes, that was a reinspection.

Q. What did you find, any change in the condition from your former inspection?

A. I stated that before that the new cesspool was being built it was almost complete, and the drains of the sinks were to be led into that, the ditch was open and the privy had been cemented and built up with cement.

Q. When you were there before, on October 30th, you got a result, but it did not reach the canal?

A. Yes, sir.

Q. After this change had been made what would be the result?

A. No possibility of reaching it without it ran over the top.

Q. And that may be guarded against how?

A. By its removal, removal of the contents.

Q. How would you guard against its over-flowing?

A. By watching it and caring for it.

Q. Do you know who does that inspection for the Jersey City Water Supply Company?

A. Mr. Gibson, I believe, and the health inspectors of the town do that also.

Q. What was the next place you visited; does the town itself do that also?

A. Yes, sir.

Q. What was the next place you visited?

A. 99 1-2 East Blackwell street.

Q. What was the occasion of going there?

A. We had inspected that before and found no results; the closet was tested on this occasion at great difficulty,— we had great difficulty in getting in, and urinine was used at 10:45 it was a very rainy day, and we got a slight color at the base of the wall at water level at 11:18.

Q. How near to the river was that?

A. About 20 feet, I should say.

Q. You say that indicated no danger?

A. It would indicate on the ground that it was palpably a cesspool over-flowing which we could not see; it was covered and soaked through the soil. It was not a clean bright color.

Q. Doctor, in your opinion is it a fair test as to whether pollution runs from a cesspool—from any given cesspool, if you throw the coloring matter—urinine into that cesspool and then throw large quantities—pails full of water into the cesspool on top of it?

A. Do you mean cesspools?

Q. Privy vaults,—not cesspools?

Testimony of Dr. Herman C. H. Herold.

By the COURT:

Q. What do you understand by the word cesspool?

A. A privy vault is a place that is used for the deposit of human excreta and urine; a cesspool is a receptacle that receives the drainage of the house as well as other things.

FURTHER DIRECT.

Q. In which are the contents the more liquid?

A. A cesspool. The other is usually—unless water flows into it—is usually dry in character; and the addition of a large quantity of water in a privy vault is not a normal condition, it is an abnormal condition; the liquid usually soaks away.

By the COURT:

Q. I should think the character of the soil as to its being porous or otherwise would have something to do with it?

A. Yes, sir.

(The Court announced its adjournment of the case until Thursday, April 4, 1907, testimony in the mean time to be taken before the Master.)

Mr. VREDENBURGH: I understand the Court's order is that either party may take testimony before the Master in the mean time?

Mr. EDWARDS: I understand you have closed your testimony, except in rebuttal.

ADJOURNED: Until Thursday, April 4, 1907, at Chancery Chambers, Newark, N. J., and from thence forward (except Motion days) until the case is closed on both sides.

IN CHANCERY OF NEW JERSEY.

Between

THE MAYOR AND ALDERMEN OF JERSEY CITY,

Complainants,

and

THE JERSEY CITY WATER SUPPLY COMPANY,

Defendants.

Taking of depositions in the above stated matter, before the subscriber, a Master in Chancery of New Jersey, pursuant to the adjournment last had, at the hour of ten o'clock in the forenoon of Wednesday, March 27, 1907, at the office of Messrs. Collins & Corbin, 243 Washington street, Jersey City, N. J., in the presence of Mr. James B. Vredenburgh and Mr. George L. Record, counsel for the complainants, and Mr. William H. Corbin and Mr. William D. Edwards, counsel for the defendants.

Said examination being taken in shorthand, question and answer in full, and the signatures of the witnesses to their depositions waived.

Mr. CORBIN: I offer in evidence the minutes of the Board of Street and Water Commissioners of Jersey City, for the years 1898 to 1905 inclusive, and I hand to Mr. Vredenburgh, counsel for the complainants, a copy extracted therefrom of the portions which I intend to print and which I intend to use; I have the books of minutes here which I offer.

Testimony of Dr. Herman C. H. Herold.

It is stipulated that the books need not be actually marked.

Mr. VREDENBURGH: I cannot now, unless the examination is stopped, read these alleged extracts; I therefore object, in so far as it may be hereafter ascertained that they are not true copies from the minutes.

The Abstract presented by Mr. Corbin is marked Defendant's Exhibit Minutes of Board of Street and Water Commissioners.

HERMAN C. H. HEROLD examination continued on behalf of the defendant.

FURTHER DIRECT EXAMINATION by Mr. Corbin:

Q. Doctor, do you recall making a test at No. 14 Blackwell street, Dover, on May 19, 1906?

A. Yes, sir.

Q. State who was with you and what you did and what you found?

A. 14 East Blackwell street made the test at 8.25 A. M. The color was put in by Mr. Gibson. Mr. Chandler and I waited at the pipe foot of Morris street. No results at 9.30 A. M. Doctor Leal was with me at the time that we watched the pipe.

Q. Doctor Leal and you were at the end of the pipe and the other two gentlemen named—

A. Introduced the color.

Q. What is that building 14 Blackwell street?

A. It has a store downstairs; it is the row upon which the Mansion House is located, on the block of the Mansion House, in which we had found, prior to that that there was a connection with the closet and the pipe.

Q. What had been done with that connection and pipe?

A. It had been corrected.

Q. How corrected?

A. Cut off.

Q. Into what was it led then when it was cut off?

A. Into the cesspool that it was supposed to have been led into before.

Q. Did you examine the police station in Dover, and if so, state what conditions you found and what you saw, and the date of your examination?

A. That was on May 3d.

Q. Give the year?

A. 1906. Examined the interior and the exterior. The interior had cemented floor, and a place for like a bunk for a person to sleep in; there were two cells really, to sleep in, and the front part of the building had a stove in it, but the whole floor was cemented; there was a groove made in the cemented floor leading towards the river.

Q. Well, what did you observe outside?

A. No connection on the outside at all.

Q. Were there any fixtures inside of any kind?

A. Yes, sir, there was a fixture for the use of water in the outer room, not in the cells, in the outer room.

Q. Where did the effluent from that lead to?

A. On the floor.

Q. Any water closet in the building, or anything of that sort?

A. No, sir.

Q. You spoke of a groove, was that connected with anything which led outside?

A. No, sir.

Q. What did you observe outside?

A. No indication of anything coming from the place.

Q. Did you find anything there which was contaminating the Rockaway river, or was in any way

likely to contaminate it?

A. No, sir.

Q. In your judgment is there anything objectionable or threatening there, in the way of contamination?

A. No, sir.

Q. Take the washing of the floor, can that go to the river bank?

A. I cannot see there was any way of it getting there.

Q. Who was with you when you examined the police station?

A. Doctor Leal, Mr. Chandler, and I would like to say since that time I have examined it also and the groove is removed.

Q. When?

A. I cannot tell you the date, but it has been since that time.

Q. The groove in the bottom is removed?

A. Yes, sir.

Q. How was it then, the floor flat?

A. The floor is now flat. There is a little concavity towards the center, but there is no groove there.

Q. In your judgment is there any menace to the water supply from that building?

A. I cannot say that there is any possibility.

Q. Doctor, did you make examination of privy vaults in residences along the Rockaway river and its tributaries in and about Dover and the other towns?

A. Yes, sir.

Q. Did you in your examination include others besides those that you have specifically mentioned in your testimony?

A. Well, we made a gross examination of the privy vaults all along the river.

Q. What do you mean by gross?

A. Not making any direct test, but looking them over.

Q. Did you examine the gas works?

A. Yes, sir.

Q. In Dover?

A. Dover.

Q. What did you find there?

A. I found some water coming out of the place that ran into a creek or brook, as they called it; that ran quite a distance until it emptied into the Rockaway river; there was nothing in the water that would indicate contamination but it ran through a soil that had been permeated and saturated with oily products, so that there was an oily scum on the water.

Q. Was there anything in the way of fecal or other dangerous matter in that stream?

A. No, sir.

Q. Did you find any connection or any such thing that day?

A. No, sir.

Q. How is the refuse now disposed of, or at least when you last saw it?

A. I don't know what disposal they have, but it is taken care of; it doesn't get into that stream.

Q. Doesn't get into the stream?

A. No, sir.

Q. Is there anything then in the stream now which pollutes or menaces the river?

A. No, sir.

Q. Did you examine the drain at the Blackwell street bridge in Dover, near the police station?

A. On Sussex street?

Q. Blackwell street bridge it is called, near the police station, there is a drain there, did you examine that?

A. Sussex street bridge?

Q. Yes.

A. Yes sir, I examined that drain.

Q. What did you find there?

A. I found water coming out of it, and the appearance of the outlet was a mass of fungus deposit that would come from water.

Q. Where did you see the fungus?

A. On the outside of the drain, between that and the river.

Q. Was there any evidence from that drain of any fecal matter or sewage that would pollute the water?

A. No, sir.

Q. What is connected with that drain?

A. The test was made there—the sink—the bar sink and the waste water from the ice box entered into the drain.

Q. Bar of what place?

A. Of Herman Muller's saloon.

Q. Was any water closet connected with it or anything of that sort?

A. No, sir.

Q. You say tests were made there; by whom?

A. By Mr. Chandler.

Q. Did you inspect Ford's pond, and the drainage area of that pond in Dover?

A. Yes, sir.

Q. What did you find at Ford's pond?

A. Found two streams that fed the pond.

Q. Where did they come from?

A. They came from the surrounding section there, the hills.

Q. Did you find any sewers or drains or water closets emptying into that pond?

A. No, sir.

Q. There are some houses, are there not, on the west bank of the pond?

A. Yes sir.

Q. How is their house drainage taken care of?

A. Cesspools, and there were some closets there that evidently were being removed because there were new holes dug, the other side of the house, so that the house was between the water closets and the pond.

Q. Did you afterwards see that they had been removed?

A. Yes, sir.

Q. The last time you saw them was there any house there that the drainage whereof leads towards or into the pond?

A. No, sir.

Q. Did you find any evidence of contamination of that pond?

A. None at all, the only possible evidence there might be in a rain storm some of the washings of the shore of the pond getting into it.

Q. Upon one of these brooks which fed this pond was there not a knitting mill?

A. Yes, sir.

Q. Did you examine conditions there?

A. Yes, sir.

Q. How did you find them?

A. The first time we examined them in making the test we found the coloring matter that was introduced in the closets of the knitting mill entering the brook at some little distance below the knitting mill. The next time we examined it that had been remedied, and the test revealed nothing.

Q. Whose mill was that?

A. Called the Swiss Knitting Mill; I don't know the owner.

Q. Where are the closets at that knitting mill?

A. Situated inside of the building; there was a large cesspool on the outside where they empty, but there had been some connection between the cesspool and an old stream that had been covered over.

Q. That was what you found the first time?

A. Yes, sir, and the second time that had been remedied and we found no evidence in making the test.

Q. When was it you made your later visit to these places when you found the conditions remedied, as you have stated?

A. That was October 31st.

Q. Did you look into the system of disposal of fecal matter and mill refuse at that Swiss mill.

A. Yes, sir; the test was made there at 2.30 on the 31st of October. Water closet and sink in the south of the building, second floor. Water closet and sink in the north of building, second floor. Water closet and sink in the north of building, first floor, and water closet and sink in the south of building first floor; the last fixtures were tested at 2.50.

Q. Did you test them all?

A. Mr. Chandler and Mr. Gibson put the color in.

Q. What did you do?

A. And we watched the stream.

Q. Was there any evidence of connection from any of them on that last occasion?

A. No results in 45 minutes.

Q. Did you make an examination of the conditions existing at the print works at Rockaway?

A. Yes sir.

Q. When and with whom?

A. That was made on May 4th, with Mr. Chandler and Doctor Leal and Mr. Gibson.

Q. Did you see the system of disposal there of fecal matter and mill waste?

A. We were shown the cesspool, where a cesspool had been built, and we saw the stand pipe that came out of the cesspool.

Q. Did you make tests there?

A. I think not.

Q. Where was the cesspool?

A. The cesspool was situated about, I should judge, seventy feet from the stream.

Q. What have you to say as to the provisions made there for the fecal matter and mill waste?

A. I think that is perfect; there is no sign of any entrance into the stream.

By Mr. VREDENBURGH:

Q. Where was that?

A. Rockaway Bleaching and Dye Works; the name I think is Lyondale Print Works.

FURTHER DIRECT:

Q. Doctor, at those Print Works, there is an open canal, is there not, through which some of the mill wastes run?

A. Yes, sir.

Q. Did you observe the arrangements made there for the disposal of that mill waste?

A. Yes, sir.

Q. Describe it.

A. It was entered into this mill race, and at its entrance there was a pipe extending across the mill race that carried a solution of sulphate of aluminum that dripped on out of the small openings in the pipe into the mill race.

Q. What is the object of that?

A. Precipitation of any material that is in the water.

Q. Then what?

A. Then it runs a distance and there were obstructions placed in the stream of a number of stones.

Q. Loose stones?

A. Loose stones across the stream, and ultimately, after passing three or four or five of those piles of stone it got into the river. We followed that for

about a quarter of a mile, may be a little further, and noted the coloring until we got a little inside of Beaver Brook, place they call Beaver Brook, and there the color entirely disappeared.

Q. That mill waste does carry some color into the stream?

A. Yes.

Q. Is that coloring matter at all harmful or dangerous to the water supply?

A. Would not appear so to me.

Q. In your judgment is there any contamination of the water supply, or menace to it from that mill, as its arrangements are now made?

A. I should judge not; no fecal matter enters it.

Q. Did you state the distance to the point where you say that the coloring matter had disappeared?

A. Beaver Brook.

Q. How far is that?

A. A little over a quarter of a mile, I should judge.

Q. Did you visit Camp Tabor?

A. Yes, sir.

Q. That is a Methodist camp meeting ground, isn't it?

A. Yes, sir.

Q. Did you observe the conditions there for disposing of fecal matter and sewage and waste?

A. Yes, sir.

Q. What did you find them to be?

A. They were carted off back of the barns where the manure was kept and there dumped.

Q. What is the arrangements for the privies there, —vaults or pipes or what?

A. They have cesspools.

Q. What have you to say as to the arrangements there as to whether they are proper or not?

A. There is no possibility of that material getting into the stream.

Q. How about this that is dumped behind the barn?

A. The tendency would not be to go towards the stream, in an opposite direction, but the difference between that and the stream is so great that I cannot see any possiblility of contamination from that source; there is a little knoll of land, a little hill from the point where the dumping took place, and the little stream that ultimately ran into the river.

Q. How far is that stream from the dumping place?

A. I should judge about 400 feet.

Q. What is the nature of the soil of this dumping place?

A. Sandy soil, I should judge; dirt.

Q. In your judgment, is there any contamination of the water supply or any menace to it from the conditions as they now exist, at Camp Tabor?

A. I cannot conceive of such a thing.

Q. Did you go to the rag mill at Powerville?

A. Yes, sir.

Q. Were you admitted?

A. No, sir.

Q. Refused admittance?

A. Yes, sir.

Q. Did you observe the conditions there, so far as you could from the outside of the mill?

A. Not along the river bank, only what you see from the other side, which gave you no idea what the condition was there; saw no pipe entering or water flowing into it.

Q. Did you see anything outside of the buildings?

A. Yes, sir.

Q. Did you see anything there?

A. Storage of rags.

Q. Was there anything in that which you would say menaced the water supply or contaminated it?

A. Well, the washings of the surroundings there would naturally go into the river; couldn't prevent that, and there might be a possibility of such a thing from the washings, but it is very remote.

Q. In your examinations have you been over how much of the entire water shed of the Rockaway?

A. I think we covered the entire water shed wherever it was accessible, or wherever there was any habitation,—particularly the inhabited part of the water shed.

Q. Wherever you went did you look at the houses and outbuildings?

A. Yes, sir.

Q. What have you to say as to the conditions generally in that water shed, with respect to care of the fecal matter and house drainage and possibility of contamination or menace of the water supply?

A. I saw no evidence of direct contamination there of a vault or house drainage; the chief drainage would come from the fields and there might be in that way.

Q. You mean manured fields?

A. Yes, sir; or from the yards of places, but no direct connection.

Q. Is there much farm land in that water shed?

A. Yes, sir.

Q. Did you examine the flap-gates put in at the lower level of the canal at Boonton?

A. Yes, sir.

Q. Did you observe the working of that arrangement that has been made there?

A. Yes, sir.

Q. What have you to say of it, doctor?

A. I would say that that was a contrivance that might, under conditions, not work; one of those would be an obstruction between the flap gate and the structure that holds it, so that they would remain open when the water in the canal was higher

than the water in the flume, but even then it would be a question whether it would be carried in from the canal into the flume, because there is a little reservoir, so to speak, or a head water, from the opening of the flume up to these gates, and the pressure, if it was continued towards the flume, would prevent any water going into the flume.

Q. Suppose that those flap gates were in the charge of a proper caretaker and such obstruction as you have mentioned, were promptly removed, what have you to say then as to the propriety of the gates?

A. It would work all right.

Q. You think it is a sufficient safeguard?

A. Yes, sir.

Q. How often should it be visited by a caretaker, in your judgment?

A. It ought to be watched at all times.

Q. You mean every moment, night and day?

A. No, I mean every day, or a number of times a day, it ought to be watched.

By Mr. EDWARDS:

Q. Once or twice a day?

A. Yes, sir.

FURTHER DIRECT:

Q. Did you visit the Cooper-Lord works at Boonton?

A. No, sir; we saw it, but didn't visit it.

Q. Did you try to go in?

A. We were told it would be impossible to go into the place.

Mr. VREDENBURGH: I object to what he was told, unless he specifies who told him.

Q. By whom were you told?

A. Dr. Leal.

Q. Did you inspect the Pilgram and Meyer silk mill at Boonton?

A. Yes, sir.

Q. What did you do, and what did you find there?

A. Doctor Leal and I stayed on the outside, and Mr. Chandler and Mr. Gibson went in the interior and inspected the water closet, and we saw the cesspools on the outside; one was located back of the building away from the stream, and the other was between the building and the stream; that was situated in a high bank of ashes, and that cesspool there also took the water from the gas machine that they have; there was no indication of any contamination of the stream, nor could I see—the ashes created an excellent foundation, if there was such a thing as percolation; we went down the entire bank of these ashes to the edge of the stream, and there was no indication of any percolation through the banks.

Q. Did you see any evidence of any pollution reaching the river from Pilgram & Meyer's mill?

A. No, sir.

Q. What do you say as to the arrangements that they have there as to taking care of the fecal matter?

A. I think they are proper.

Q. Did you examine the stream through the Town of Boonton—through the city of Boonton?

A. Yes, sir.

Q. Did you find any evidence of pollution reaching the river anywhere in Boonton?

A. Not any.

Q. Did you inspect the Water Company's reservoir just below Boonton?

A. Yes, sir.

Q. Any evidence of any contamination or pollution reaching the river?

A. No, sir.

Testimony of Dr. Herman C. H. Herold.

Q. Does the presence of fecal matter in a stream of water at one place necessarily indicate that it would be present at other points below in the water?

A. No, sir; it may disappear.

Q. How?

A. By sedimentation and oxygenation.

Q. And suppose there are bacteria in the water at one place, do you necessarily find them lower down in the same stream,—the same bacteria?

A. Not necessarily, they can disappear in the same manner, by sedimentation.

Q. What is the tendency, as they are carried along by the water, do they increase or diminish in water?

A. They don't grow, they diminish; they are lost in the water.

Q. They are not propogated in water, then?

A. No, sir.

Q. I refer to pathogenoc bacteria, of course?

A. I understand that.

Q. What are the germs which live and are carried in water, with which sanitarians have to do?

A. In this part of the country chiefly typhoid.

Q. Is there any other disease—germ—practically, that is carried by water in this part of the country?

A. No, sir; not without we have a visitation of cholera.

Q. Cholera germs are likewise carried?

A. Yes, sir; and some of the dysentery germs are carried, but they don't exist in this part of the country; that is, the tropical country.

Q. Practically, then, in this climate the typhoid fever germ is the one which you watch for?

A. Yes, sir.

Q. How long have you been engaged in the work of sanitation, in an official way?

A. Since 1880; I became a member of the Board of Health in 1883.

Q. Have you had occasion to study typhoid death rates?

A. Yes, sir.

Q. What rate of deaths, per hundred thousand persons per year, would indicate to you an infected water supply in this climate?

Mr. VREDENBURGH: Objected to as incompetent, immaterial and leading.

A. We would consider a death rate of twenty-five per hundred thousand a very good rate; if we got it below that it would be all right; it can be between twenty-five and thirty before we would be suspicious of our water supply.

Q. There are some deaths from typhoid fever in every large community, are there?

A. Yes, sir; all the time.

Q. And I infer from what you saw that there are other causes than germs received from water?

A. Yes, sir, foreign causes, people coming in with diseases, that have been away during the summer and generally bring it in the Fall of the year.

Q. Are they brought in by other things than water?

A. Yes, sir.

Q. What?

A. Vegetables.

Q. How about milk?

A. Milk is one of the greatest menaces that we have to deal with .

Q. And oysters?

A. Oysters also.

Q. How about ice?

A. Ice, yes.

Q. How about fruits?

A. Not so much.

Q. After typhoid germs get into water will they live longer if the water is pure or longer if it is polluted water?

A. Live longer in pure water.

Q. Has the water supply anything to do, doctor, that breeding children's diseases, such as scarlet fever, dyphtheria, membraneous croup, measels, diarrhoea, etc.

A. No, sir, diarrhoea might be influenced by impure water, but the other diseases are in no way connected with water supply.

Q. Then as a sanitarian and physician you would differ from the testimony of Mr. Kichling in that respect, as to this?

Mr. VREDENBURGH: I object, in the first place it does not appear that this man has heard Mr. Kichling's testimony.

A. Yes, sir, decidedly.

Q. Did you hear what he said in this case?

A. I did, sir.

Q. Do any of these diseases that I have mentioned arise from sewer gas so called?

A. No, sir.

Q. Do you know whether it was formerly supposed that these diseases were more or less effected by impure water?

A. Yes, sir.

Q. But the learning of this day is not so, is it?

A. No, sir.

Q. What is the fact, doctor, with regard to the learning on this subject of germ disaeses, and how they are transmitted—has that made rapid advance in the last few years?

A. No, those diseases you mention are by contact or by exposure to cases, but they do not generate in the sewer gases.

Q. But I say with regard to the matter of germ diseases, has not the learning on that subject developed very rapidly in the last few years?

A. Yes, sir.

Q. In what way is diarrhoea caused, by impure water—is it by any specific diarrhoea germ or by other action?

A. Usually ptomaines, the products of decomposition or other mechanical conditions of the water.

Q. Suppose a child took bad food,—stale food, would that have a similiar effect?

A. Yes, sir.

Q. Rather mechanical action?

A. Yes sir.

Q. Poisonous?

A. Poisonous material.

Q. Is there any specific germ of the diarrhoea?

A. No, sir.

Q. Doctor, in your judgment would it be safe to draw water from the Rockaway river at any point between Dover and the Boonton reservoir and send it directly to the consumer from the river?

A. No, sir, it would not be safe.

Q. Why not?

A. It is not pure enough for that purpose, and in fact no stream is, with few exceptions.

Q. Would it be feasible to make it so by anything that could be done?

A. Yes, sir, three methods.

Q. What are they?

A. Sedimentation, filtration and distillation .

Q. What is the method that is applied to the waste water supply, if there is any?

A. Sedimentation?

Q. What is sedimentation?

A. By means of conveying the water into a large reservoir in which it may settle; the matter of heavier gravity than water settling to the bottom.

Q. Precipitates it?

A. Precipitation, and bacteria are of a heavier gravity, and consequently do settle to the bottom.

Q. You are familiar with the Boonton reservoir, are you not?

A. Yes, sir.

Q. And with the water shed behind it?

A. Yes, sir.

Q. Assuming that river has a capacity of seven thousand millions of gallons and about one hundred and eighteen square miles of water shed behind it to supply it, and affording the supply for the City of not exceeding fifty million gallons a day, with the present storage; what have you to say of those works as an agency for the purification of that water so as to be suitable for the City?

Mr. VREDENBURGH: Objected to as incompetent and immaterial.

A. I would consider it a safe method.

Q. Have you examined the bacteriological reports made and kept by Doctor McLoughlin since this reservoir was put in use?

A. Yes, sir.

Q. I show you these reports all signed George E. McLoughlin, M. D., and not yet in evidence, but which I will ask to have marked for identification, running from May 24, 1904 down to November 27, 1906; are these the reports that you have examined?

A. Yes, sir.

Mr. VREDENBURGH: Do I understand that you put in every report that Dr. McLoughlin has given you?

Testimony of Dr. Herman C. H. Herold.

Mr. CORBIN: These are Dr. McLoughlin's analyses of water drawn from the taps in Jersey City, from May, 1904, to the end of November, 1906, and I will so prove by him.

Mr. VREDENBURGH: I object to the offer because all the reports are not put in and because the tap is not the place where the water was to be delivered in Jersey City, but some distance from that place. It don't appear that they are all the reports made by Doctor McLoughlin during that time.

Mr. CORBIN: These are analyses of samples of water taken from the taps in Jersey City.

Q. Doctor, what quality of water do these analysis indicate and show?

A. Good quality.

Q. Suitable for domestic and potable uses in the city?

A. Yes, sir.

Q. Is it a safe water supply?

A. Yes, sir.

Q. Is there any indication in it, so far as these analysis show, of any contamination of typhoid fever germs?

A. No, sir.

Q. Or of any other menacing germs?

A. No, sir.

Q. If at any time in the future the water supply to Jersey City from the Boonton reservoir should become too contaminated for use, or unfit what would be the practical or feasible measure to be taken to make it safe?

Mr. VREDENBURGH: Objected to as incompetent, immaterial and irrelevant.

A. Filtration in addition to the sedimentation.

Q. Because ground water is polluted at one point does it necessarily follow that you will find it so polluted at some other point where it enters the river?

A. Not necessarily.

Q. Why not?

A. Because the ground acts as a filter.

Q. Natural filter?

A. Natural filter, yes, and removed the material.

Q. What effect has percolation through the soil?

A. Purification.

Q. And that is the real protection that we have is it not, in the use of surface water?

A. Yes, sir, the only thing that keeps us alive.

Q. Is it possible for ground water which you find in the soil near a river, to flow for any considerable distance before it will actually get into the river?

A. Yes, sir, many times flows under the river some times.

Q. You find it has flowed in the soil parallel with the flow of the river?

A. Yes, sir, as a rule.

Q. If you found color which was placed in a privy vault, appearing in a neighboring river or brook, does it necessarily follow that the water which carries that color is contaminated by the contents of the privy, if it carries the color, does it necessarily carry contamination from the privy?

A. No, sir, color will go through where contamination does not.

Q. Color will exist longer in the water than the germs would?

A. Yes, and would even be lost in going through the soil.

Q. You mean by that that the color may appear after the germs have been left behind?

A. Yes, sir.

Q. In your opinion would the building of a sewage disposal system in the east of the Rockaway water shed prevent a pollution, or make the waters of the river safe for potable purposes before entering the reservoir?

Mr. VREDENBURGH: I object to this as immaterial, illegal and incompetent.

A. I wouldn't think it would be safe to depend upon that, because the filtrate would get back into the river somewhere. The methods employed by removing the fecal matter which is really the dangerous feature, the pollution could be done a great deal easier by contaminating a large quantity of water with that, and depending upon having a pure filtrate, the filtration would depend upon the soil.

Q. A disposal plant involves the concentration of the fecal matter of the whole town into one place, doesn't it, for treatment?

A. Yes, sir.

Q. And the effluent, after treatment, goes back into the stream again?

A. Would naturally go there again.

Q. As it now is, with privy vaults in the earth, is it a small or large proportion of the fecal matter that ever gets into the river at all?

A. Very small.

Q. In your judgment, with a properly supervised system, privies in the earth throughout the water shed and the disposal of the fecal matter thereby, is that method less likely to pollute the water supply or more likely than the method which would concentrate it into one place for disposal works?

A. Less likely.

Q. Then do you mean that the present method of individual disposal by privy vaults in the earth, if properly supervised and cared for, is safer than the concentration method?

Mr. VREDENBURGH: Objected to as leading.

A. Yes, sir.

Q. Have you observed some of these disposal plants, have you seen them?

A. Yes, sir; quite a number; I was on the Passaic Sewage commission from 1896 to 1898.

Q. Well, does not the personal elements of the degree of care that is given to them and the skill that is given to them, have something to do with the success?

A. A great deal.

Q. What are the dangers?

A. The dangers of carelessness and not proper care in the beds.

Q. How about the soil?

A. And the soil, a good deal depends upon the character of soil. I have seen a sewer disposal plant intermediate filtration on one side of the road work admirably, and the other side of the road, the soil being different, it didn't work so well.

Q. Suppose they are not carefully and successfully handled, is the risk to the water supply greater or less than if it did not exist?

A. Greater.

Q. That is multiplied by the existence of the plant if it is not properly handled?

A. Yes, sir.

Q. What is the experience, if you know it, with the filtrate of sewage disposal works of this kind in this country, is it satisfactory or is it unsatisfactory?

Mr. VREDENBURGH: Objected to as incompetent illegal and immaterial.

A. It is satisfactory where the soil is proper; unsatisfactory where it is not, or where proper care is given it is satisfactory to a degree, and where there is no care it is very unsatisfactory.

Q. What percentage of purification of the water is obtained ordinarily by these disposal works,—is it over ninety per cent. usually?

Mr. VREDENBURGH: Objected to as leading.

A. It is not over ninety per cent. usually.

Q. Suppose carelessness should take place in the handling of filtration disposal works where sewage is taken care of by that method, suppose carelessness should take place in the inspection and care of private privy vaults such as exist in the Rockaway water shed, which in your judgment would be more likely to lead to trouble with the water supply?

Mr. VREDENBURGH: Objected to as incompetent, illegal and immaterial.

A. The disposal plant would be more menace?

Q. Why, doctor?

A. Well, has a larger quantity to handle and the mixture would be of a greater percentage.

Q. If there are any typhoid germs in any part of the territory you are pretty sure to get them in your disposal beds?

A. Yes, sir

Q. Is it possible to prevent pollution and infection of the water of the river except by actual depopulation of the water shed of its animals, to humans and others?

A. No, sir.

Q. Suppose you depopulated the water shed completely, except that you left one man, or one family living on the stream, would that still be a possible menace to the water shed?

A. Yes, sir.

Q. Now you have spoken of pollution from water flowing over the surface in menured fields and roads is the water which is so polluted necessarily polluted after it reaches the river, after its flow down into the river?

A. Somewhat, yes, sir; deposit some on the way to the river.

Q. But on the ordinary surface of the ground, through fields, would that still be polluted when it reached the stream?

A. To a degree, yes, sir.

Q. In your opinion where does the bulk of the pollution of the Rockaway river come from?

A. Cities, that would be the greatest danger from pollution, but it comes from the fields and the roads of Cities—washings of the surface of the cities.

Q. Is polluted water, after it percolates through the soil, necessarily polluted after it reaches the river?

A. Not necessarily, it depends upon the soil.

Q. That is, the percolation through the soil would act as a filter, more or less?

A. Yes, sir.

Q. Did you observe whether there are many manured fields in that water shed?

A. Yes, quite a number.

Q. Good deal of cultivated land?

A. Yes, sir.

Q. What do you say to that as a source of the pollution which exists in the river, above Boonton?

A. Yes, that was one of the sources.

Q. Doctor, in your opinion, what method or safe guards should be followed in the Rockaway water shed, as used for a water supply for Jersey City?—

Mr. VREDENBURGH: Objected to as immaterial, incompetent and illegal.

Q. —to keep it up to safe conditions?

Mr. VREDENBURGH: Objection repeated.

A. Thorough inspection and the removal of surfacedrainage, as much as possible.

Q. Explain more fully what you mean by thorough inspection?

A. I mean that it must be policed, there must be someone go over the shed at all times and see that there are no privy vaults that are flowing—no cesspools that are over-flowing, and the condition of the property on the banks of the river must be kept free of polluting organic material.

Q. Will that inspection or policing be continually necessary in the future?

A. Yes, sir.

Q. Is that so of the Rockaway or all water sheds?

A. All water sheds require some attention.

Q. Do you know whether in practice that is the method adopted or not?

A. Yes, sir.

Q. Do you practice that in Newark?

A. Yes, sir.

Q With proper inspection and policing, such as you have indicated, and the use of the sedimentation reservoir at Boonton, in your opinion is this water supply safe, and can it be kept safe?

Mr. VREDENBURGH: Objected to for the same reasons.

A. Yes, sir.

Q. In going through this water shed did you observe evidences of policing and corrections that had been made through it, doctor?

A. Yes, sir.

Q. Things that had been done in that line?

A. Yes, sir.

Q. In any one place or other?

A. In the city of Dover; more in the city of Dover than anywhere else. The removal of the closets from the banks as far away as they could get them.

Q. What is your opinion of the water as now supplied from those works to Jersey City, as to its safety and potability and suitability to domestic use?

Mr. VREDENBURGH: Objected to for the same reasons.

A. I think it is a good water supply.

Q. Do you remember the Fall of 1906, the agitation in this case, and in the public press of the question of an alleged increased number of typhoid fever cases in Jersey City?

A. Yes, sir.

Q. Did you have any increased number of cases in the city of Newark at that time?

A. Yes, sir.

Mr. VREDENBURGH: Objected to for the same reasons.

Q. Did you set on foot investigations to trace the source of it?

A. We did.

Q. Did you find out?

A. We did.

Q. Where was it?

Testimony of Dr. Herman C. H. Herold.

Mr. VREDENBURGH: Objected to for the same reasons.

A. Milk coming from a certain section supplied to the city of Newark.

Q. Through a certain milk company?

A. Through a certain milk company that supplied a certain section of the city.

Q. Did you know that milk company was sending from the same section milk to Jersey City, at the same time?

Mr. VREDENBURGH: I object and move that this be stricken out.

A. I was so informed, yes, sir.

Q. This milk came in in cars or how—railroad cars?

A. Railroad cars, yes, sir.

CROSS EXAMINATION by Mr. Vredenburgh:

Q. Doctor, what examination did you make of the milk to which you have referred in your previous question?

A. You mean chemical examination?

Q. I mean any examination you made personally?

A. Made examination of the reports that were submitted to the Board of Health as to cases existing in Newark, where they secured their water supply, their milk supply and ice supply from, and from that we made our deductions.

Q. I am talking of you, not we, but you.

A. I did, as president of the Board.

Q. You made a deduction?

A. Yes, sir.

Q. Now I will ask you please, to confine your answers to what you know personally, because that is all I am asking you about. You read over, did you,

the reports made to the Board of Health by certain reporters as to the water and the milk, and the vegetables used in these houses, in which the typhoid fever showed itself?

A. Yes, sir.

Q. What water did they use?

A. City water.

Q. What vegetables did the patient who had the typhoid fever to whom you refer, eat?

A. I don't think the vegetable was mentioned.

Q. What milk did they use?

A. The name of the party that supplied the milk.

Q. What reason had you for thinking that that milk was the cause of it?

A. Because seventy-five per cent. of the individuals that used that milk were those infected with typhoid fever, that is, seventy-five per cent. of those cases reported were people who used that milk from that particular dealer.

Q. How many cases were there?

A. I cannot give you that off hand, but up in the hundreds.

Q. Up in the hundreds?

A. Yes, sir.

Q. By that you mean between two and three hundred or more than two hundred?

A. Over a hundred.

Q. Over a hundred?

A. Yes, sir.

Q. Between one and two hundred?

A. Yes, sir.

Q. And seventy-five per cent. of those used this milk?

A. Yes, sir.

Q. Between what dates was that?

A. It was about the middle of November until I think, for a month or over, I cannot draw that from

memory, but I know it is the middle of November that we had the cases.

Q. What year?

A. 1906.

Q. And for a month after the middle of November you had in Newark over one hundred cases of typhoid fever?

A. Yes, sir.

Q. And of those one hundred cases seventy-five per cent., as shown by these reports to the Board of Health, purchased their milk from the same source?

A. Yes, sir.

Q. And what was that source?

A. What they call the B—company.

Q. Did you ascertain where the milk came from?

A. From a place called Oxford.

Q. In New Jersey?

A. No, sir; in New York State.

Q. How did you ascertain that?

A. From the company's official.

Q. Some official of the company told you that it came from Oxford, did he?

A. That that supply was from Oxford; yes, sir; that came to Newark.

Q. Which official told you, what was his name?

A. I cannot give you his name.

Q. Where was he when he told you?

A. In the Health Board of Newark.

Q. Some official from this company came to the Health Board of Newark, and told you that some milk came from Oxford?

A. This particular milk that was being supplied to that section of the city.

Q. Which particular milk?

A. This milk that came from Oxford.

Q. Well, how did he determine, or how did you determine that the milk that came from Oxford was supplied to this particular part of the city?

A. He informed me so.

Q. That is all you knew about it?

A. Yes, sir.

Q. You cannot tell his name?

A. No, sir; if I heard it I could tell it.

Q. Do you know what—

A. He is the manager in Newark.

Q. A manager in Newark?

A. Yes, sir.

Q. Mr. Smathers?

A. Yes, sir.

Q. Now, how did the typhoid bacillus get in the milk?

A. I do not know.

Q. Have you any theory about it?

A. Only what the inspector told me, that went over the ground.

Q. What did he tell you?

A. That the milk was from a few dairies that were supplied from Oxford and had typhoid fever patients on the premises.

Q. Then you think that these typhoid bacilli got some how from those patients into the milk?

A. Yes, sir.

Q. How?

A. That I don't know, because I haven't been over the ground and didn't see it.

Q. What is your theory about it, as a sanitary expert,—what is your theory of how that germ got—or that bacilli got from that patient into the milk?

A. The handling of the utensils by a patient infected by it, impure water that might be used containing typhoid bacillus, and the washing of those utensils; the addition of water to milk, which is frequently done, the water containing the typhoid germ.

Q. Then those are the three sources which you think the germ could have gotten into the milk from?

A. Yes, sir.

Q. Any other way?

A. No.

Q. Did you ever know, from your personal experience, of any typhoid bacillus getting into the milk from the washing of the implements?

A. I have heard of such things; yes.

Q. What do you mean by heard?

A. I heard that statement made, where the inspection had been made and water found that was used for the purpose of washing utensils and upon analysis proven that it contained typhoid bacilli.

Q. Where was that, where did you hear that?

A. I heard that report of our health officer in Newark.

Q. Who was it made the analysis of the water—of that particular water?

A. Doctor Connolly, the bacteriologist of the Board of Health.

Q. Then one of your inspectors got water from this Oxford source which was used to wash some of the implements, connected with the milk, and took it up to Doctor Connolly, and had it analysed, and he found typhoid bacilli in it, did he?

A. I didn't say that was the Oxford case; I told you that occurred in the city of Newark.

Q. What case was it when it occurred in the city of Newark?

A. That is some time ago; I cannot give you the name.

Q. How long ago?

A. I cannot even estimate the time.

Q. Do you believe, doctor, that any man ever found the bacillus of typhoid in water?

A. Yes, sir.

Q. Who ever found it?

A. It is a disputed fact, but I think Doctor Connolly told me that he has found it.

Q. Doctor who?

A. Doctor Connolly, our bacteriologist.

Q. What do you mean, by saying it is a disputed fact?

A. The bacteriologists, as a rule, claim it is not to be found.

Q. Found where?

A. In the water, by an analysis.

Q. But you think Doctor Connolly, some years ago, did find it in water?

A. Yes, sir.

Q. And you believe it?

A. Yes, sir.

Q. Have you ever found it in water?

A. No, sir; I haven't.

Q. Now, the other way, you said, was by the pouring of water into the milk—dilluting the milk?

A. Yes, sir.

Q. Was that done in this case?

A. I don't know.

Q. Did you ever isolate a typhoid bacillus from any substance whatever?

A. No, sir; I have not.

Q. Have you the instruments for that purpose?

A. Yes, sir; in the laboratory at Newark.

Q. Have you ever tried to?

A. No, sir.

Q. Why not?

A. It is not my work to do it, I hadn't time to do it.

Q. Did you ever see a typhoid bacillus?

A. Yes, sir.

Q. Where was it when you saw it?

A. In the laboratory.

Q. In what laboratory?

A. Newark City laboratory.

Q. What was that isolated from?

A. Well, I cannot tell you.

Q. Was it alive or dead?

A. It was alive.

Q. How could you tell it was alive?

A. Actively motile under the microscope.

Q. What was it motile with?

A. The whole body.

Q. How did it move, did it have a tail?

A. No, sir; it was longer than it was wide.

Q. Didn't it have hairs with which it moved back and forth in the water?

A. No, sir; I didn't see that.

Q. Does it, or don't it?

A. It does move.

Q. How does it move?

A. By action of the body.

Q. What action of the body?

A. A wiggling sensation it goes through.

Q. A wiggling sensation?

A. Yes, sir.

Q. What does it wiggle?

A. The body.

Q. The whole body wiggles?

A. Yes, shoots around.

Q. Oh, shoots, does it?

A. Skips around.

Q. Well, you don't actually mean it shoots; it don't shoot anything?

A. No, it goes around in a wiggling way.

Q. Don't it move by flippers, little hair like things that are fastened to the body?

A. I didn't see it.

Q. You didn't see that?

A. No, sir.

Q. What did the examination of the books tell you with regard to that?

A. That they have the motion, that is all they tell me.

Q. Books don't tell you how they do it?

A. No, I guess they don't.

Q. And you cannot see it with a microscope?

A. I don't know that you can see that part of it, I know I haven't seen it.

Q. How long was that one you saw?

A. I should judge from the measurement about one-twelfth of fifteenth thousandth of an inch in length.

Q. By what measurement?

A. The eye.

Q. You judge by the eye?

A. And the glass I was using.

Q. You judged by your eye that this bacillus that you saw was one-twelfth thousandth part of an inch in length, did you?

A. Yes, sir.

Q. Did you measure it?

A. No, sir, not this particular one.

Q. Did you measure any one; did you ever measure one, alive or dead?

A. No, I never measured typhoid; I knew the kind of glass that I was using and—

By Mr. EDWARDS:

Q. You knew the power of the glass?

A. Yes, sir; from the other things that I did measure, I should judge, I am not saying this accurately, it is about one fifteenth thousandth of an inch in length, and I should judge about a forty or fifty thousandth part of an inch in width.

FURTHER CROSS:

Q. How often did you see that bacillus?

A. Well, I was examining it for quite a time, and quite a number of times.

Q. For what length of time?

A. For three weeks I was working at it.

Q. On this one bacillus?

A. No, sir, on the typhoid bacilli.

Q. Well, I am asking you how long you saw that one altogether; you said you saw it several times?

A. I didn't see it very long, that same one, because it flitted across the field and others with it, and I could not tell one from the other, it was so rapid.

Q. Then you saw more than one typhoid bacilli?

A. Yes.

Q. What was it in?

A. It was on a slide.

Q. Where was it taken from?

A. This particular one was taken from a specimen that Dr. Connolly had grown in the laboratory culture.

Q. From what source was it obtained the day you saw it?

A. I cannot tell you that.

Q. Was it in a bottle, or what?

A. I cannot tell you that, where it came from.

Q. Did you ever see any other?

A. No, I think that was the only time that I worked on that question.

Q. You say that you saw more than one bacillus that day, typhoid bacillus, did you?

A. Yes, sir.

Q. How did you distinguish that bacillus from b. coli or colon bacillus?

A. They are not so actively motile.

Q. Is that the only difference?

A. Yes, sir; they have a similar appearance.

Q. How many kinds of b. coli are there?

A. I don't know; quite a number.

Q. There are fifty of them, are there not?

A. Varieties?

Q. Yes.

A. I cannot say as many as that, but I know there is quite a number.

Q. Well, which particular kind of coli was it that you distinguished from this particular typhoid bacillus that day?

A. Variety, I cannot say.

Q. Can you distinguish the variety yourself?

A. I cannot, no, sir.

Q. Do you mean to say you can tell a typhoid bacillus from a colon bacillus?

A. Only in its activity, that is all.

Q. Then if you see what looks like a b. coli particularly active you say that is a typhoid bacillus?

A. That might be.

Q. Well, what other way have you, or how would you determine it was a typhoid bacillus this day when you saw it?

A. Well, it was given to me as a typhoid bacillus and it was put under the microscope.

Q. Now you said it came on vegetables; what vegetables does it come on?

A. Supposed to come on lettuce and celery.

Q. How does it get on lettuce?

A. Through fecal matter used as fertilizer.

Q. Do you mean to say that the fecal matter that is put on celery contains these typhoid bacillus?

A. If it came from a typhoid patient it could, yes, sir.

Q. Well, that is the theory, is it not?

A. Yes, sir.

Q. That is your theory now, that it gets on celery by reason of the use of the fecal matter of some typhoid patient?

A. Yes, sir, in the soil.

Q. And it remains on the celery until it ripens and is taken to the city and eaten by the person who is attacked with the typhoid; is that the idea?

A. That is the theory.

Q. Do you believe that theory?

A. I have no direct evidence that that is the cause; I know of no such particular case.

Q. Why did you say it came on vegetables then?

A. Because the authorities speak of it; I have had no experience in that.

Q. In order for that typhoid germ to have caused disease, it must have been months between the time it left the sick person until it was taken in to the person it was made sick by?

A. That might be.

Q. Well, is not that reasonable?

A. Well, the soil might contain it, and the dust of the soil might get in it when it is ripe and ready for use.

Q. You think this typhoid bacillus will live in the soil then, do you?

A. For a certain time.

Q. Will it propagate in the soil?

A. I believe not; I don't know.

Q. Eh?

A. I don't know that.

Q. Of course you don't know it, nobody knows much about it, do they?

A. No sir.

Q. It is only a mere guess on your part?

A. Supposition.

Q. And you rather think it more reasonable to think that it don't propagate than that it does, in the soil?

A. Yes, sir; I know that they die in the soil, as a rule.

Q. You just said they live in this celery soil?

A. I didn't say they lived in it; I said it might be brought there on to the plant by the germ being in the dust of the soil, and in that way get into the celery or the lettuce when it is ready for distribution.

Q. Blown on it you mean then, do you?

A. Yes, sir.

Q. You think it could dry—it could live although it would become sufficiently dry to blow, do you; is that your theory?

A. I don't understand that.

Q. I understood you to say that it would blow on with the winds?

A. It could be done that way.

Q. Then it must be dry by that time in order to blow, is not that so?

A. Yes, sir.

Q. Then your theory is that it could dry and become a sort of dust that could be blown by the winds on to the celery?

A. That is only supposition.

Q. It is all supposition?

A. Yes.

Q. That is as good supposition as the other, isn't it?

A. Pretty near.

Q. Being dusted and being blown on the celery it would remain on the celery until it was eaten, is that the supposition?

A. Liable to be; the washing of the celery might remove it, and it might get into the crevices of the celery plant and stay even after the washing.

Q. In the shape of dust there, is that right?

A. Yes, sir.

Q. How long is it in your judgment it would live in this celery plant, in the shape of dust in the crevices?

A. I haven't any knowledge of how long it would; this is no knowledge that I am giving you that I

have; it might be possible for it, but that is the theory that might be advocated.

Q. I understand you are giving us, as a sanitary expert, the results of your reading, are you not?

A. Yes, sir, and observation.

Q. That is one of the results of your reading and observation?

A. Yes, sir; the deduction I have made is results I have been thinking out while you put the proposition, that is all; I have no knowledge of it.

Q. Is it your idea that this dust may be considered dust that blows on the celery from the street dust that has the typhoid bacillus in it?

A. No, sir; I said that I thought it might possibly come from the soil that had been manured with fecal matter, containing the typhoid germs.

Q. I understood you to say it was blown on?

A. I said that could be possible if the soil were dry, and in that way could be brought in contact with it.

Q. Then your idea is that this fecal matter from some sick person has been brought and put upon the soil near the growing celery?

A. Yes, sir.

Q. And in time it became dry and was blown from where it was put on to the celery?

A. Yes, sir.

Q. And subsequently eaten by the person who is made sick?

A. Yes, sir.

Q. You said oysters; how does it get into the oyster? In the first place is it born there?

A. No, sir.

Q. How does it get there?

A. Fed from polluted water.

Q. And by polluted water you mean what?

A. Sewage emptying into a stream where the oysters grow or are fed or drink.

Q. And gets into the oyster?

A. Yes, sir.

Q. And lives in the oyster until the oyster is caught?

A. I should judge so.

Q. And after the oyster is caught and brought up to the city somebody eats that oyster?

A. Liable to be infected.

Q. And catches the disease from eating that oyster?

A. Yes, sir.

Q. Well, that involves a series of months, doesn't it?

A. Not necessarily.

Q. Not necessarily?

A. No; they drink the water just before they are brought to the market; they are put out to drink, and if they put them in a polluted stream that would affect the oyster, I should judge. I have nevr seen it and I don't think anybody else has.

Q. What is the doctrine of the books on that subject?

A. That that can take place.

Q. What can take place?

A. That it be infected by it, to drink any pollutetd water containing typhoid germs.

Q. That is that the oyster can get typhoid bacillus in its shell?

A. Yes, sir

Q. And hold it there until it is eaten by some human being, and then give them the typhoid fever, is that right?

A. Yes, sir

Q. Do you say that they propagate in the oyster?

A. No, sir, I do not.

Q. They don't propagate in the oyster, your understanding is?

A. I don't say that, I don't know.

Q. Now you said ice; what do you mean by saying in ice?

A. In a polluted stream ice may contain it, if there is typhoid bacillus in the water from which the ice is made.

Q. Do you say the typhoid bacillus is frozen into the ice?

A. Yes, sir, can be.

Q. Well, it must be if it makes somebody sick, must it not?

A. Yes, sir

Q. Then it must be frozen into the ice?

A. Yes, sir

Q. How long will it live in the ice—frozen in the ice?

A. I have no knowledge of that; freezing does not destroy them.

Q. You can freeze them and not destroy them?

A. Yes, sir

Q. That you know?

A. That I have heard.

Q. Well, that you believe?

A. I believe it, yes, sir.

Q. How long will they stay frozen without losing their life?

A. That I have no knowledge of.

Q. No judgment about that at all?

A. No, sir.

Q. Maybe a year?

A. No, I should judge not.

Q. Why not; what grounds have you for judging not?

A. Because the ice cannot be kept a year without you stored it away, and then it might.

Q. Suppose you stored it away?

A. Then it might.

Q. They might live a year that way?

A. I should judge so; nothing positive about that.

Q. Well, you are not positive about anything of this sort, are you?

A. No, sir.

Q. You don't know anything about it at all?

A. No, sir

Q. You have read something about it, and got some judgment as a reasonable man, about it?

A. Yes, sir

Q. Can you give a case in which typhoid fever was ever produced from the use of ice?

A. No, I cannot.

Q. Can you give a case when typhoid fever was ever produced from water, of your own knowledge?

A. Yes, sir

Q. When was that; what case was produced from water?

A. That I got myself.

Q. You had typhoid fever once, did you?

A. Yes, sir.

Q. How old were you?

A. About 15 or 16 years old.

Q. Where were you living then?

A. In Newark.

Q. How did you know that you got it from drinking the water?

A. Because the water was polluted.

Q. How do you know it was polluted?

A. Ascertained by an examination of the water; direct connection between the privy vault in the yard and the water supply, which was a well, and there were a number that were using that water that were all taken down the same way with typhoid fever.

Q. Not all that used the water, but some of them?

A. Some of them.

Q. And you therefore think that your germ came from the water?

A. Yes, sir, that was my supposition.

Q. And it is on somewhat the same sort of reasoning that you think it comes from the milk?

A. Yes, sir.

Q. But you have no—

A. Positive knowledge, no, sir. I know of another case where I had seven patients that were using water from one well, and the well was lower than the main sewer of the city that ran past in the street, about thirty feet from it, and we had to close that well because everyone that was using it was gradually being effected with typhoid fever.

Q. You don't mean everyone, do you; you mean a number were?

A. A number were, but they were increasing and consequently we closed the well.

Q. Where was that well?

A. In Newark.

Q. Whereabouts in Newark?

A. Jackson street is the name.

Q. In the back yard?

A. Yes, sir.

Q. And how much below the sewer was it?

A. It must have been twenty feet below that sewer.

Q. Where was the sewer, in the middle of the street?

A. Yes, sir.

Q. What kind of sewer was it?

A. Open bottom sewer.

Q. What do you mean by open bottom sewer?

A. Not cemented.

Q. Bricked?

A. Bricked.

Q. Brick sewer?

A. Yes, sir, not cemented.

Q. And the size of the sewer was what?

A. Brick.

Q. Size?

A. The sides were brick too, all around.

Q. I say what was the size of the sewer?

A. Oh, I should judge it was a four foot sewer.

Q. What was the width of the street?

A. The width of the street was—it was a narrow street—about fifty feet.

Q. Fifty foot street?

A. Yes, sir.

Q. From house line to house line? 10

A. Yes, from the property line.

Q. And how far was the well back from the street?

A. Right next to the fence.

Q. Right next to what fence?

A. Fence of the property.

Q. Next to the fence?

A. Yes, sir.

Q. How was the well built up; what was the sides of the well? 20

A. Loose stones, just as ordinary wells were built; I didn't see the building of it.

Q. You never examined the well to see how it was built, did you?

A. No, sir.

Q. Was there any connection between the sewer and the well?

A. Not that we know of.

Q. Was that on a hill?

A. No, sir, flat land. 30

Q. Meadow land or firm land?

A. Street.

Q. How many feet above the meadows in Newark was the surface of the street?

A. It wasn't situated in that part of the town; it was situated near the river—Passaic River; I should judge it must have been about three feet above the river.

Q. Three feet above the river?

A. Yes, sir. 40

Q. What was three feet above the river?

A. The sewer.

Q. Above the surface of the water of the river?

A. Yes, sir.

Q. The sewer was about three feet above the surface of the water of the river?

A. Yes, sir, at low tide.

Q. At low tide?

Q. It ran into the river at that point, some little distance from there it entered the river.

Q. What was the fall in the sewer—the grade of the sewer?

A. The lower entrance of the sewer where it entered the river was about equal with low water.

Q. And at this point where it passes the well, the bottom of the sewer was about three feet above the level of the sewer, where it entered the river, was it?

A. Yes, sir.

Q. So, the fall in that distance was about three feet?

A. I think it was less than that, in all probability; I cannot tell you exact, but the well was situated about three hundred feet from the river, or four hundred feet from the river.

Q. The well was four hundred feet from the river?

A. Yes, sir.

Q. Then the sewer must have been, at that point, four hundred feet from the river?

A. Yes, sir.

Q. And the fall then, in four hundred feet was about three feet, less than three feet?

A. Yes, sir.

Q. The theory of the bacillus in ice is, as you understand it, doctor, that the ice in which this typhoid bacillus has been frozen is placed in the glass, or becomes part, in some way of the drinking water of the person who catches the typhoid fever?

A. Yes, sir.

Q. When it melts the bacillus is let loose, as it were, and regains its vitality and strength and makes the person swallowing it sick and produces the typhoid fever?

A. That is the way I think it would happen.

Q. How does the sewer stuff get into the ice?

A. Process of freezing.

Q. That is, the contents from the sewer or from the cesspool or from the water closet is frozen or does it flow on the ice and is frozen or how?

A. Well, there are different ways. If the typhoid bacillus was in fecal matter it might be caught up in the process of freezing and get into the cake of ice, but usually the injurious method is to expel those things in the process of freezing in a particle that might be caught; that is not a regular thing or usual thing, but it is liable to happen.

Q. It does not necessarily freeze the fecal matter but does freeze the bacillus?

A. Yes, sir; fecal matter floats on the surface and might be caught in the process of freezing or might be caught on the surface and freezed in that way.

Q. Would you think it a sanitary crime to use the water of the Rockaway river where it enters the Boonton reservoir at all times for children and human beings?

A. You mean the raw water without any process?

Q. Yes.

A. I don't think it would be a right thing to do.

Q. Why not?

A. The liability of containing some germs of a pathogenic germ like typhoid.

Q. Is water that is liable to contain pathogenic germs pure and wholesome water?

A. No, sir.

Q. Well, what possible pathogenic germ could this water contain?

A. Typhoid.

Q. Any other?

A. Cholera, if it was prevalent.

Q. Well, I understood you to say that the washing of fields would pollute this stream?

A. Yes, sir.

Q. What did you mean by that?

A. b. coli, which would be an indication of animal excreta of some kind would be found present; that is pollution.

Q. Does that pollute the water?

A. That pollutes the water.

Q. If there is any b. coli in the water that water is polluted, is it?

A. Yes, sir.

Q. You think that b. coli would come from the washing of fields?

A. Possibly from that, and street washings, wherever animals are found to exist, or animal excretia is used.

Q. You think that typhoid bacillus would come from animal excretia too?

A. No, sir.

Q. Then what harm is there in b. coli?

A. Only an indication of the possibility of being contaminated with typhoid germs; cannot distinguish that from human excreta—animal excreta.

Q. Are the fields full of typhoid bacilli too?

A. No, sir.

Q. What is the danger from the fields then?

A. Human excreta might be used on the fields.

Q. That is the danger?

A. That is the danger.

Q. Well, then, it is pretty important to see that human excreta is not put on the fields?

A. Very important.

Q. Do you know what effort has been made to

prevent, in Dover, the spreading of the cleaning of cesspools on the fields?

A. No, sir, I do not.

Q. Did you make any such effort?

A. No, sir.

Q. Did you examine where it was put?

A. No, sir.

Q. Did you find out the man who took it?

A. No, sir.

Q. You don't know where he put it?

A. No, sir.

Q. You don't know whether he didn't dump it in the river, do you?

A. I don't sir.

Q. You said you did not know about the gas house; you said that was not dumped in the river, didn't you; you swore to that?

A. The gas house?

Q. Yes.

A. The gas house; I found no privy vault.

Q. You swore that there was a cesspool there, didn't you?

A. At the gas house?

Q. Yes.

A. No, sir.

Q. You swore there was refuse there that was not taken to the river?

A. There was water there that ran into the river.

Q. Where was the refuse from the gas house; where did that go?

A. Into the brook and ran into the river.

Q. Does yet, does it?

A. Yes, sir.

Q. Any water closet there?

A. No, sir, not that I know of.

Q. Do you mean to say there is none there?

A. Not running into that water.

Q. How do you know it don't run into that water, if it is there?

A. I understand they have a cesspool where they run it.

Q. Who told you?

A. Doctor Leal told me that.

Q. Doctor Leal told you they had a cesspool?

A. Yes, sir.

Q. Did he tell you what kind of a cesspool it was?

A. No, sir.

Q. Where it was?

A. No, sir.

Q. Did he explain to you how it could not get into the river?

A. Yes, sir.

Q. That is what you have been swearing to with regard to that—what Doctor Leal told you?

A. In this particular instance.

Q. You don't know anything about it yourself at all?

A. No, sir.

Q. I understood you first went to Dover on May 3d, 1906?

A. Yes, sir.

Q. Did you at that time examine any cesspool?

A. On that day?

Q. Yes; did you go there on May 3d or was it May 7th that you commenced your examination?

A. May 3d.

RECESS.

Testimony of Dr. Herman C. H. Herold.

Q. What did you visit May 3d?

A. The buildings and surroundings known as Schwartz Block, police station and foot of Morris street, pipe at the foot of Morris street.

Q. Well, if the notes taken by the stenographer say that was May 7th, that is a mistake, it should be May 3d?

A. Yes, sir.

Q. Were you there on May 7th, too, or not until May 8th?

A. Yes, sir, I was there May 7th.

Q. Also?

A. Yes, sir.

Q. What cesspool did you personally examine on May 3d?

A. None.

Q. What cesspool did you personally examine on May 7th?

A. None.

Q. What cesspool did you examine on May 8th?

A. Doctor Hunter's, Blackwell street.

Q. Where was that?

A. Situated in the rear of Dr. Hunter's office.

Q. And how far from the river was that?

A. I should judge about fifty feet.

Q. How far from Dr. Hunter's office was it?

A. Right in the rear.

Q. Well, how many feet?

A. Not more than fifteen feet or twenty feet.

Q. What was its size in diameter?

A. I have no knowledge of the size.

Q. You have no knowledge of the size?

A. No, sir.

Q. What was its depth?

A. I have no knowledge of its depth.

Q. Did you look inside of it?

A. Only through the vent pipe.

Q. Could you see what the sides were made of?

A. No, sir.

Q. Could you see what the bottom was made of?

A. No, sir.

Q. Could you see what was in it?

A. No, sir.

Q. What other cesspool did you examine that day?

A. None other.

Q. When were you there next?

A. May 9th.

Q. May 9th or 19th?

A. May 9th.

Q. What did you examine that day?

A. 10 Blackwell street, Mansion House, 14 Blackwell street, 16 Blackwell street, Lindsley House on Morris avenue, and the Richards Abattoir.

Q. Did you examine any cesspool that day?

A. Yes, sir.

Q. Which one?

A. The one connected with 14 and 16 Blackwell street.

Q. Did you do it personally?

A. I was on the ground, yes, sir.

Q. Did you examine the cesspool personally?

A. No, sir.

Q. You then don't know of what material it was, except by hearsay?

A. That is all.

Q. You don't know how deep it was except by hearsay?

A. Yes, I looked into it.

Q. Well, how deep was it?

A. I should judge about eight feet.

Q. Where was it?

A. Situated in the rear, on the alley of 14 and 16 Blackwell street.

Q. How far from the house?

A. Located on the alley, I should judge, about fifteen or twenty feet from the house.

Q. You are sure you saw it fifteen or twenty feet from the house?

A. I won't say sure fifteen or twenty feet, but I saw it.

Q. How far from the house, if you saw it?

A. On the alley.

Q. Well, you have that written down, you are reading from your book there?

A. No, sir; that is from memory.

Q. Doctor, you have been reading from two typewritten papers here?

A. Yes, sir.

Q. All during the examination, haven't you?

A. Yes, sir.

Q. And those two typewritten papers were made by who?

A. One was made by the gentleman that put the coloring in, and the other was made by Dr. Leal and myself.

Q. Well, did you typewrite it?

A. No, sir.

Q. Who did typewrite it?

A. They were typewritten, but I have compared it with the original notes.

Q. Who typewrote it?

A. I don't know.

Q. Did you employ anybody to do it?

A. No, sir.

Q. Who did employ the person to typewrite it?

A. The original copies I had typewritten.

Q. Who employed this person to typewrite this, doctor?

A. This particular one Dr. Leal prepared.

Q. Dr. Leal prepared that particular one?

A. He had it typewritten.

Q. Had it typewritten?

A. Yes, sir.

Q. Who prepared the other one that you have there and had it typewritten?

A. I don't know; that is Mr. Chandler's report, he had it typewritten himself.

Q. You have been reading from that, have you?

A. Yes, sir.

Q. When did he prepare that, do you know?

A. I don't, no, sir.

Q. Where did he prepare it, do you know?

A. I don't.

Q. Who typewrote it, do you know?

A. I don't.

Q. When was it typewritten, do you know?

A. I don't.

Q. But somebody handed it to you some time or other, just before your examination; do you know who it was handed it to you?

A. No, sir; that has been all gone over before.

Q. I didn't ask you that, I asked you who handed it to you before the examination—just before the examination?

A. I have had this for some time, these copies for some time.

Q. Who handed it to you?

A. Dr. Leal.

Q. When did he hand it to you; when did he hand you the paper you are reading from?

A. This last one?

Q. Yes.

A. This one here was handed to me before my last examination.

Q. How long before your last examination?

A. A week before.

Q. When was the other handed to you?

A. The other was handed to me this morning.

Q. Now you said that you did examine one cesspool, that is you looked into one cesspool on May 19; did you look into any more than one cesspool on May 19th?

A. That was May 9th that I looked into the cesspool.

Q. Well, on May 9th did you look into any other cesspool?

A. No, sir.

Q. When did you next go there?

A. Where?

Q. To Dover.

A. To Dover?

Q. Yes.

A. 19th.

Mr. EDWARDS:

Q. Weren't you there May 12th?

A. No, sir.

FURTHER CROSS:

Q. Did you examine any cesspool on May 19th, the next time you were there?

A. I did not examine the cesspool; we tried a test on 14 Blackwell street.

Q. I didn't ask you that; I asked you whether you examined any cesspool?

A. No, sir, not on May 19th.

Q. Did you examine any on the 26th of May?

A. The one at the knitting mill.

Q. Where was that situated?

A. That was situated in the yard, and all we could do there was to see the vent pipe that went into the cesspool; it wasn't open.

Q. Therefore you did not see that cesspool at all, did you?

A. The interior of it, no, sir.

Q. Don't know what it was composed of?

A. No, sir.

Q. Don't know what the bottom was?

A. No, sir.

Q. Don't know whether it had any bottom other than the natural earth?

A. Don't, no, sir.

Q. Was that the only one you examined on May 26th?

A. That is all.

Q. Were you there between May 19th and May 26th?

A. No, sir.

Q. Which paper did you read from when you stated that you were there on May 19th; from the paper furnished you just before today, or the paper furnished you just before your former examination?

A. I think they are on both papers; I know they are.

Q. On both papers?

A. Yes, sir.

Q. You read from both papers then?

A. Yes, sir.

Q. You were not there again until October 29, were you, to make an examination?

A. From the 26th?

Q. From May 26th to October 29th?

A. October 29th, yes, sir.

Q. That was the first time you were there after May 26th?

A. Yes, sir.

Q. Did you examine any cesspool on October 29th?

A. No, sir.

Q. When were you there after October 29th?

A. October 30th.

Q. 30th or 31st?

A. 30th.

Q. Did you examine any cesspool on October 30?

A. Examined the cesspools at Singleton Silk Mills on the 30th; David Gless—

Q. One moment; let me ask you about the Singleton Silk Mill. Where was that cesspool?

A. The cesspool was situated in the yard of the property.

Q. How far from the buildings?

A. Very close to the buildings.

Q. How far from the river?

A. Within fifteen feet of the building; about, I should judge, fifty feet from the stream.

Q. What size was it?

A. I don't know from personal knowledge, because all I saw was the vent pipe.

Q. All you saw of that cesspool was the vent pipe?

A. Yes, sir.

Q. Did you examine any other cesspool that day?

A. David Gless, Viaduct Place.

Q. You examined that cesspool?

A. Yes, sir.

Q. What was the size of that?

A. I should judge four feet across, and I don't know the depth; it was an open cesspool.

Q. What do you mean by an open cesspool?

A. No top to it; it was open.

Q. What was the size of it?

A. I should judge from the appearance about four feet across and about up to the fluid that was in it, about four or five feet.

Q. Four or five feet?

A. That is the depth, five feet.

Q. Four feet square and five feet deep?

A. Yes, sir.

Q. Of what material?

A. Built up of stone.

Q. Cemented?

A. No, sir.

Q. Loose stone?

A. Loose stone.

Q. What thickness was the stone?

A. I don't know.

Q. What was the bottom?

A. I don't know, there was fluid in the bottom.

Q. You cannot tell what the bottom was?

A. No, sir.

Q. Did you examine any other cesspool that day?

A. Examined the house that was connected with a new cesspool that had been built on Mr. Pierson's property.

Q. Did you examine the cesspool?

A. No, sir, it was covered; I had seen it in construction before.

Q. Well, did you see the size of it when you saw it in construction?

A. No, only the opening; dug the hole, dug where it was to be located.

Q. Can you tell what size the cesspool is?

A. No, sir.

Q. What depth it is?

A. No, sir.

Q. What it was made out of?

A. No, sir.

Q. Can you tell what the bottom was?

A. No, sir.

Q. What other cesspool did you examine that day?

A. That is all.

Q. When were you there next, October 31st?

A. October 31st.

Q. Did you examine any cesspool that day?

A. No, sir.

Q. When were you there the next time?

A. December 14th.

Q. Did you examine any cesspool that day?
A. Yes, sir, Peterson property.
Q. Where was that cesspool?
A. 40 and 46 Samiss avenue.
Q. Where was the cesspool, how near the building?
A. Situated in the yard about twenty-five feet, I should judge, from the building.
Q. What was the size of it?
A. I don't know, it was covered.
Q. Did you look inside of it?
A. No, sir.
Q. What was its construction?
A. I don't know.
Q. Do you know anything about its bottom?
A. No, sir.
Q. Have you been there since to make any examination?
A. Of that same cesspool?
Q. No; have you been in Dover since to make an examination?
A. December 15th.
Q. Did you examine any cesspool on December 15th?
A. Yes, sir.
Q. What?
A. Saw a new cesspool in construction at Canal street, in Wharton.
Q. What was the size of that?
A. That I should judge was about six feet across.
Q. How deep?
A. About ten feet in depth.
Q. What was the bottom?
A. Open.
Q. What was the sides?
A. Stone.
Q. Cement?
A. Loose stone.

Q. How thick were they?

A. I should judge about a foot.

Q. How high was that above the river?

A. That wasn't near the river, that was near the canal.

Q. Do you know the elevation of the river there?

A. No, I do not.

Q. Do you know the elevation of this cesspool above tide water?

A. I do not, no, sir.

Q. Do you know the elevation of this cesspool above the river?

A. No, sir; the river is not anywhere near there. There is a canal right back of the property.

Q. Do you know the elevation of this cesspool above the canal?

A. The bottom is below the surface of the canal.

Q. How much below the surface of the canal?

A. I should say a couple of feet—two or three feet.

Q. How much is the canal above the river at that point?

A. I don't know; the river is not near there.

Q. There is a lock, is there not, below that on the canal?

A. Some distance from it.

Q. How far?

A. I cannot say.

Q. Within a half a mile?

A. I didn't go near the lock of the canal at all.

Q. You don't know how far the river is from the canal at that point?

A. Not at that point.

Q. You don't know how much above the river the canal is?

A. No, sir.

Q. Now, did you examine any other cesspool that day?

A. That is all.

Q. Have you been there since?

A. No, I haven't been there since.

Q. Haven't been up in Dover since December 15th?

A. Yes, sir, I have been in Dover since December 15th.

Q. When?

A. On March 17th.

Q. Did you examine any cesspools then?

A. No, sir.

Q. March 17th; that is this month?

A. Yes, sir.

Q. During these times that I have mentioned, did you examine any privy vault?

A. During all this time?

Q. Yes.

A. Yes, sir.

Q. Which privy vault did you examine?

A. On May 3d examined the privy vault back of the Swedish Church.

Q. What other privy vault did you examine except the Swedish Church, that having been ruled out by the Court?

A. We saw eleven privy vaults between Bergen and Union streets, on the 3d of May and about twenty-seven privy vaults between Union street and the White Bridge.

Q. How many of those did you examine?

A. We looked at all of them.

Q. What was the character, generally speaking?

A. They seemed to be in good condition.

Q. No, what were they built of?

A. Well, the construction was mostly of stone.

Q. And what was the bottom?

A. I didn't see the bottom.

Q. Of any of them?

A. I didn't see the bottom of any of them.

Q. When you say of stone, do you mean loose stone?

A. Loose stone, yes, sir; some were cemented.

Q. Which one was cemented?

A. Cannot recall them; some along that block between Bergen and Union, and some between Union and the White Bridge.

Q. How far down were they cemented?

A. That I cannot tell; there was some contents in it and I cannot tell.

Q. How near were they to the river; the nearest one?

A. They varied from fifteen to forty feet.

Q. Now, did you examine any other privy vaults than those?

A. Five privy vaults between White Bridge and Salem street.

Q. What were they?

A. Same character.

Q. Were all the privy vaults of the same character that you examined?

A. Yes; some were cemented and the rest were not—the majority were not.

Q. You didn't know what the bottom of any of them were?

A. No, sir.

Q. Nor do you know whether they were cemented down to the bottom or not?

A. No, sir.

Q. And they were all about this distance from the river, were they?

A. Varied from 15 to 40 feet.

Q. Now doctor, please tell us what study you made of the currents of the ground water at Dover?

A. None at all.

Q. You said that there were some currents—ground currents that ran under the river, where were they?

A. I said they were possible; I didn't say there were.

Q. Are there any such that you know of in Dover?

A. No, sir.

Q. Where are there any such in this water shed?

A. I don't know of any in this water shed; I spoke of that in a general term.

Q. What is a ground current, doctor?

A. It is the soakage of water from the surface into the soil, and the water finding its level.

Q. It is sometimes called an underground river?

A. Sometimes that title is used.

Q. It means a flow of water that is concealed from view?

A. Yes, sir.

Q. By the natural earth?

A. Yes, sir.

Q. You made no examination at all to ascertain whether there were any such in Dover, I understand you to say?

A. Yes, sir.

Q. Or anywhere else in the water shed?

A. No, sir.

Q. Doctor, you said that when you went to Barton's house the lady pointed out to you where they had placed the fecal matter?

A. Yes, sir.

Q. Did you ask her how deep she had buried it?

A. No, sir.

Q. Was not that important, to know how deep she buried it?

A. Not necessarily.

Q. Is it better to bury it deep or near the surface?

A. Near the surface.

Q. Why?

A. Because there are germs that are supposed to be in the soil that have a disposition to destroy typhoid germs.

Q. Then the nearer the surface the more likely you think the typhoid—

A. Destruction takes place.

Q. You spoke of typhoid germ, do you mean spores, when you say typhoid germs?

A. I mean the germ.

Q. You mean the bacillus itself?

A. Yes, sir.

Q. Well, the typhoid bacillus propagates by multiplication, doesn't it?

A. Yes, sir.

Q. It also propagates by spores?

A. No, I don't think it does.

Q. Do you know of any animal or plant that will multiply by division that don't also have spores?

A. Some do multiply by division and others multiply by spores.

Q. Don't those that multiply by division also multiply by spores, so far as you know personally?

A. As far as I know personally, I cannot answer that question. From my reading I believe that those that multiply by spores are independent of those that multiply by division.

Q. Don't a worm multiply by division, an ordinary angle worm?

A. I don't know.

Q. Haven't you seen an angle worm cut in two?

A. And both ends grow, yes.

Q. They do multiply by division, don't they?

A. Yes, by forcible division.

Q. Don't they also multiply by spores or eggs?

A. They certainly do, the worm.

Q Well, do you know of any vegetable or animal that does not multiply by spores or by reproduction? A potatoe will multiply by a species of division and it will also have seeds?

A. I cannot answer that question

Q. Can you say that the typhoid bacillus does not also, under certain circumstances, have spores?

A. I cannot say because I don't know.

Q. Don't it strike you as extremely probable that the explanation that this bacillus apparently lives so long under certain circumstances is because it does have spores?

A. Not necessarily.

Q. Doctor, you spoke of filtration as one way of purifying water. What is the first process in every filtering plant?

A. What do you mean by the first process?

Q. The first thing that is done with the water, isn't it sedimentation first?

A. It is stored, yes, sir.

Q. Sedimentation, isn't it—the first process in every filtering plant is sedimentation, isn't it?

A. To a degree, yes, sir; the suspended matter is removed.

A. No, sir.

Q. Now I understood you to say that sedimentation means something in a reservoir; it is not necessary to have a reservoir to have sedimentation, is it?

A. Not necessarily; you can store water anywheres and have sedimentation take place; it takes place in the running stream, but to a very small degree.

Q. The sedimentation occurs everywhere where the water is impeded at all?

A. Yes, sir.

Q. Running down stream where it runs faster there would be less deposit than where it runs slower?

A. Yes, sir.

Q. When it reaches any place where it is still—more quiet, there is more sedimentation?

A. Yes, sir.

Q. Now, there is a sedimentation then, however small the reservoir is. Do you think that polluted water, such as you say the water of the Rockaway river is, where it enters the Boonton reservoir—

Mr. EDWARDS: I object; he doesn't say it is polluted water. I object to your putting those words into the mouth of the witness.

Q. Did you say the water was polluted where it entered the Boonton reservoir.

A. I said that all waters are polluted.

Q. Then this is, isn't it?

A. In a degree, yes, sir.

Q. Now then, what I ask you now is, what is the size of the reservoir that it would be safe to trust to sedimentation in case of polluted water; would a reservoir of ten millions of gallons be large enough for the water entering from the Rockaway river?

A. You mean to depend upon that for sedimentation?

Q. Yes.

A. I should not think so.

Q. Would twenty millions?

A. It all depends on how much you would draw from it.

Q. It does; so that if you had a reservoir only twenty millions—if you drew as much as came in it would not be safe?

A. No, sir.

Q. But if you didn't draw as much as came in it would be safe?

A. Yes, sir.

Q. How much would you have to draw to keep it safe; what would be the limit in a twenty million gallon reservoir?

A. You mean withdrawal of so much per day?

Q. Yes.

A. Well, I should say that to make it perfectly safe you ought to have a supply sufficient to last you at least one hundred days.

Q. Well, I am talking about a twenty million gallon, if you had a twenty million gallon reservoir, and there was sufficient running into it so that it would supply the demand for one hundred days that would be large enough would it?

A. To draw off what quantity?

Q. Well, that is what I ask you. Draw off sufficient to keep one hundred days' supply as I understood you?

Q. Yes, but the supply coming in as fast as it is going out, and you would have one hundred days' supply there all the time, and you don't draw the water from the bottom, I should judge that you had plenty of sedimentation.

Q. If the reservoir was only sufficient to hold twenty millions of gallons?

A. It all depends on the amount that you draw off. If the supply was equal to the coming in of that water I don't think that the twenty million gallons reservoir would be sufficient.

Q. Well, what size reservoir would be—

A. You would have to have the quantity going out less than the quantity that goes in.

Q. Going out would have to be less than the quantity coming in?

A. I mean the quantity going out would be less than the quantity coming in.

Q. It don't depend on the size of the reservoir; it depends on the fact that the water goes out from the reservoir at a less rapid rate that it comes in?

A. Gives it a chance for being used.

Q. So that a twenty million gallon reservoir, under those circumstances, is safe?

A. Well, I don't know as I would say that.

Testimony of Dr. Herman C. H. Herold.

Q. Well, what do you mean; I want to know whether a twenty million reservoir is, in your judgment, safe for polluted water to enter, when the amount withdrawn from it is less than the amount which enters it?

Mr. EDWARDS: Objected to on the ground that it is not fair to compare a twenty million gallon reservoir in the hypothetical question of Mr. Vredenburgh's with a vast reservoir such as we have in this case of seven thousand five hundred million gallons.

A. I say that there would be some sedimentation in a small reservoir, and more sedimentation in a larger body of water.

Q. I want to find out from you whether a twenty million gallon reservoir is safe, where polluted water enters it and less is drawn out than comes in?

Mr. EDWARDS: I object because you don't define it. If you mean water polluted as the Rockaway river is, why that is one question.

Mr. VREDENBURGH: I object to Senator Edwards sitting here to prompt the witness by these objections, and there is no other point to the objection.

Mr. EDWARDS: I protest that there is a point to every one of the objections. The questions don't fairly state the proposition and are not proper cross examination.

A. I would not consider it sufficient for to have perfect sedimentation.

Q. Would a thirty million gallon reservoir be sufficient?

A. Same answer.

Q. Would forty millions be sufficient?

A. Same answer.

Q. Fifty millions?

A. Same answer.

Q. Sixty millions?

A. Now you are getting nearer to the mark. I would say that there would be some sedimentation, but not sufficient sedimentation to make it a safe supply. It is the large volume—the stillness of the water over the large area that allows the sedimentation.

Q. How do you draw the limit as to safety?

A. The opportunity for the sedimentation to take place by the stillness of the water.

Q. How still must the water be?

A. That depends upon the amount that is drawn out, and the distance from the point of outlet and the volume that the reservoir contains.

Q. How still must the water be?

A. It must not be agitated much.

Q. How still must it be; must it be entirely free from agitation?

A. No, sir; agitation of the waves from the wind would not influence it any,—very slightly.

Q. Well, you have said opportunity for sedimentation, what do you refer to by that answer, "opportunity," what do you mean by "opportunity"?

Q. Opportunity for the particles to settle that are in the suspended matter.

Q. How long?

A. As I said it ought to take at least one hundred days, and it would be better if it were more than that.

Q. You would want one hundred days for water which comes into the reservoir to settle before it is safe to get it; is that it?

A. No, it would be better for it to have one hundred days.

Q. What do you mean by better for it?

A. The longer it rests the more sure of deposit; it may deposit in one day, as far as that goes.

Q. What do you say is the safe time for it to remain, for the purpose of deposit, in order that it may be safely used for drinking water?

A. I don't get your idea at all; I cannot understand what you mean.

Q. What time is it necessary that that water should remain for sedimentation, in order that it is safe to use the water for drinking purposes, polluted water?

A. The limit of time that the bacteria have an opportunity to settle.

Q. What is that time?

A. And the destruction of the pathogenic germs that might be present.

Q. What is that time?

A. I should judge about twenty days. fifteen or twenty days.

Q. What are the facts from which you fix the time?

A. Nothing only the length of life of the pathogenic germ; it might be safe after twenty-four hours' rest, if there is no pathogenic germs present.

Q. What do you mean by pathogenic germs?

A. Disease producing germ, typhoid germ.

Q. You are referring entirely to typhoid germs?

A. Yes, sir.

Q. Do you say the life of the typhoid germ is only twenty four hours?

A. I didn't say that; I say they can if there were no pathogenic germs present, it might be perfectly safe to have sedimentation in 24 hours, but where the pathogenic germs are present you want to allow

sufficient time for the destruction of those germs, which is about 15 or 20 days.

Q. Do you say typhoid germs die in twenty days?

A. The majority of them die before that time.

Q. I didn't ask for the majority?

A. They do die in water.

Q. Do you say in twenty days?

A. In twenty days.

Q. You say they will die in twenty days?

A. Yes, sir.

Q. Where do you find any such thing as that?

A. I found that from my readings, and I think I heard Mr. Whipple say that in this case.

Q. You depend on what Mr. Whipple said in this case.

A. In that particular respect.

Q. He said they would live at least three months, under certain circumstances?

A. Well, but he didn't say they did that in water.

Q. Your idea is that they won't live in water three months?

A. No, sir.

Q. You say they would live longer in pure water?

A. Yes, sir.

Q. What do they live more than three months in; —live more than three months in milk?

A. Yes, sir, multiply in milk, as I understand it.

Q. Then water that is polluted, or water that is mixed with milk would be better than pure water?

A. For them to live in.

Q. They would live longer in water mixed with milk than pure water?

A. I don't know whether they would live with the milk diluted with water sufficient to not act as a media for them, they need a media to grow in, multiply, and water does not seem to be the media.

Q. Is sewage in water media?

A. No, sir.

New Jersey State Library

Q. How do you know?

A. Well, because they don't live as long.

Q. How do you know?

A. From my readings.

Q. What readings; will you please tell us a book which shows that typhoid germs won't live twenty days in pure water?

A. I don't know as I can give you any particular book.

Q. There is no such book, is there?

A. My readings have been in periodicals that from time to time publish experiments that have been made.

Q. I undestood you to say you trusted to what Dr. Whipple said?

A. Only in that one particular instance. I have read Mr. Whipple's book, so I know something about what he said, and I heard that testimony given.

Q. In this case?

A. Yes, sir.

Q. If water contained typhoid germs would it be safe to use it if it had not been in the reservoir twenty days?

A. I would not consider it as such.

Q. Then you certainly would not consider it such if it had only been there ten days?

A. Not if I knew it contained it; the danger is less certain the longer the time continues for sedimentation.

Q. Well, do you say that typhoid germs sink to the bottom?

A. The gravity is heavier than water.

Q. Did you ever measure them?

A. No, sir.

Q. How do you know that it is?

A. I should judge so from the character of the liquor.

Q. You said they shot throught the water, when you watched them?

A. They wriggled.

Q. Well, do you want to change that about shoot, —they don't shoot through the water?

A. Pretty rapid motion in their wriggling process.

Q. Why wouldn't they wriggle up to the top of the surface; why would they settle down to the bottom?

A. Natural disposition to drop down.

Q. You think it is the natural disposition of this particular animal or vegetable to settle down, do you?

A. Yes, sir.

Q. Why?

A. They don't require the air to breathe and the result would be they would be down at the bottom where there wasn't any agitation.

Q. What is that?

A. Their natural disposition would be to go where there is no agitation.

Q. What do you know about the natural disposition of typhoid bacilli,—anything?

A. No, I haven't been one, and don't know anybody that has been.

Q. You don't know anything,—that is a mere guess of yours, that it would sink to the bottom?

A. Yes, sir.

Q. When they have motion you would think they would like to be near the air?

A. Not necessarily.

Q. Why not; they are an air breeding animal, or vegetable?

A. Vegetable.

Q. Well, they are air breeding, are they not?

A. Not necessarily; I don't think they require oxygen.

Q. They live in the human intestines?

A. Yes,—they don't get any oxygen there.

Q. Don't get any air there?

A. Get more carbonic acid.

Q. I understood you to say they live longer in water that contained oxygen?

A. I don't say they live longer on account of the pure oxygen, but I said they would live longer in water that was not polluted than that that was?

Q. Why?

A. I don't know.

Q. Isn't it because there is more oxygen in it?

A. I don't know that that is it?

Q. Do you know that it is not it?

A. Probably the gases that form from polluted water is not beneficial to their health.

Q. Can you give any reason why these little bacilli should sink to the bottom?

A. No reason only what I have ascertained from reading, and experiments of other men; I have never made any myself

Q. What book have you ever read that says that a typhoid bacillus would sink to the bottom of the water?

A. I haven't read any book that distinctly said that the typhoid bacilli do, but I have read a book that said that the process of sedimentation is a process whereby they do sink to the bottom.

Q. What book was that?

A. That is a book,—article published by Mason.

Q. By a man by the name of Mason?

A. Yes, sir.

Q. Where was that published?

A. He is connected with the Troy school there, Troy Polytechnic school.

Q. What was it?

A. An article that I read.

Q. In what paper?
A. In a medical work.
Q. Was he a bacteriologist,—this Mason?
A. He evidently is.
Q. Did you ever hear of him before?
A. Yes, sir.
Q. What is his first name?
A. William P., I think.
Q. When was this article published?
A. I cannot say.
Q. Within a year?
A. Yes; I am only drawing from memory now; I don't know when I read it, but I know I read it.
Q. Well, that is the only reason you have for saying that the typhoid bacilli is heavier than water?
A. I didn't say that; I said that he said that the bacteria in sediment got to the bottom.
Q. Bacteria do?
A. All bacteria.
Q. Did he say all bacteria?
A. All bacteria.
Q. You don't mean that, do you?
A. I certainly do, when I say it.
Q. Don't the algea, the bacteria known as the algea, float on the surface?
A. No, they go on the bottom.
Q. Don't any of the bacteria come to the surface?
A. Yes, the algea comes to the surface.
Q. Then some bacteria do come to the surface?
A. Yes, they grow there.
Q. Are they not lighter than the water?
A. They grow there—

Mr. EDWARDS: I object.

Q. You said that all bacteria sank, do you mean that?

A. I mean it in the sense that it is not a growth of the water it is of a bacteria that grows in the water.

Mr. EDWARDS: I object; it don't appear that algea is a bacteria at all.

Q. Are algea a bacteria?

A. I don't think they are classified as bacteria.

Q. I understand you to say that all bacteria do sink to the bottom by sedimentation?

A. So I understand.

Q. Can you tell us whether a reservoir which had the capacity of one hundred millions of gallons would accomplish enough sedimentation to cause polluted water to be fit to drink, if what left the reservoir was less than what entered it?

Mr. EDWARDS: Objected to; it don't appear from this question where this water left the reservoir; if it left from the bottom, middle or top.

A. It always depends upon the amount of pollution and the character of the pollution whether it would be safe.

Q. How much pollution would not be safe in a hundred million gallon reservoir of the character I have mentioned?

A. I cannot answer that; I made no experiments.

Q. How can you say it would depend on the quantity, if you cannot tell the quantity?

A. If the pollution was so much in quantity that it would not have a chance to thoroughly settle why there would be some that would go there.

Q. I understand you the only danger of pollution is from these typhoid bacilli?

A. That is all.

Q. Then you also say that the more polluted it is the less likely they are to live; now then you say it depends, as I understand you, on the amount of pollution, the more pollution there is the more water you need; is that what you mean to say?

A. The more pollution you have the more apt it is that some would escape, being precipitated in the process of sedimentation; that is what I say.

Q. And that would render a larger quantity of water necessary in order to make that water safe to drink; is that the idea?

A. Yes, sir.

Q. You cannot tell how much pollution would be safe in a hundred millions?

A. No, sir; I don't think anyone can make that statement.

Q. Can you say how much it would be in two hundred million gallon reservoir?

A. No, sir.

Q. Would any amount of pollution be safe in a two hundred million gallon reservoir?

A. You mean any water from that be safe?

Q. Yes.

A. If the quantity of pollution was very small I should say it would be.

Q. Will you say what you mean by very small?

A. That is if there were very few bacilli present, the chances are that there would be a few that might escape, and would not amount to anything, but if there was a large quantity present, and in the process of sedimentation that some should get out, why the proportion would be greater in that water that got away.

Q. How many bacilli is necessary to pass into a human being to cause typhoid fever?

A. I don't know.

Q. You don't know at all, do you?

A. No, sir.

Q. Whether one will do it or fifty?

A. No, sir.

Q. Does not sedimentation depend upon the velocity of the currents in the reservoir?

A. I don't know anything about that mechanical problem.

Q. Don't know anything?

A. No, sir.

Q. Do you know anything about the velocity of the currents in the Boonton reservoir?

A. No, sir, I do not.

Q. Don't the amount of sedimentation depend upon the velocity of the currents?

A. I don't know.

Q. Don't the sedimentation depend, to some extent, upon the velocity of the wind that hits the reservoir, that is over the reservoir?

A. No, sir, I don't think so.

Q. What reason have you for saying you don't think so, doctor?

A. I don't think that enters into it—after the water gets into the reservoir the sedimentation takes place, and the rough surface would not interfere with the process of sedimentation.

Q. Do you know whether there is any sedimentation in the Boonton reservoir at all?

A. Not from personal knowledge, no, sir.

Q. Now, you were shown for identification certain analysis which it was said were signed by George E. McLoughlin, bacteriologist; did you understand that those analysis showed the number of bacteria in the water at the tap?

A. The bacteria count is shown there, yes, sir.

Q. Of the water at the tap?

A. Yes, sir.

Q. I show you one of the fourth of January, 1906, does that show the number of bacteria?

A. Yes, sir.

Q. Where?

A. Per cubic c. c.

Q. 150?

A. Yes, sir.

Q. What bacteria do you understand that to be?

A. All bacteria that is present.

Q. All kinds?

A. Yes, sir.

Q. You understand that there were only 150 bacteria in that water?

A. In that cubic centimeter.

Q. At any temperature?

A. At the time of the examination.

Q. At any temperature?

A. Yes, sir; I don't know what temperature that was made at.

Q. It don't make any difference; I say that is all there was there?

A. On that examination that is all there was there.

Q. And what kind of bacteria were they?

A. Bacteria that you find generally in water.

Q. Well, what?

A. Some coli evidently from some of the reports here, and the others are ordinary bacteria that you find in water bacteria decomposition.

Q. What bacteria?

A. I don't know the name, cannot give you the name.

Q. Can you give the name of any other bacteria except the one you see there b. coli on the paper before you?

A. There is nothing mentioned here,—b. coli only if they are present. I would like to state that I am not a working bacteriologist and you are asking me questions that are entirely out of my province.

Q. You said there was b. coli present?

A. Yes, sir.

Q. In this particular one that you examined, how many b. coli were present.

A. Not mentioned.

Q. Then you cannot tell?

A. No, sir; not the number.

Q. Were there any typhoid bacilli present?

A. Not so stated.

Q. Is it stated whether there was or not?

A. No, sir.

Q. Well, how do you know whether there was any bacteria,—such bacteria as you speak of as typhoid bacilli, do you know whether any was present or not there?

A. Evidently not.

Q. Why?

A. Because he would have mentioned it.

Q. He would mention it if they were present?

A. Yes, sir.

Q. Do you understand this analysis to be an attempt to find out whether any typhoid bacilli is present or not?

A. No, sir.

Q. Well, then, why do you say that he would say it was present?

A. If he had found it he probably would have mentioned it.

Q. Was he looking for it?

A. I don't think he was.

Q. Could he have found it?

A. No, sir.

Q. If it was present would he have found it?

A. No, sir.

Q. Then why do you say it was not present there on that day?

A. Because he couldn't find it.

Q. He wasn't looking for it?

A. Certainly not.

Q. Well then, why should you say he could not find it if he wasn't looking for it?

A. Why should you ask me the question when you know he couldn't be looking for it?

Q. I want to know whether you know from that paper whether there was any typhoid bacilli there that day?

A. No, sir; I don't know, or anybody else.

Q. Then if there was typhoid bacillus present in that water that day it was polluted water, wasn't it?

A. Polluted by human excreta, yes, sir.

Q. You cannot tell whether it was present or not that day?

A. No, sir.

Q. Why do you say that those analysis—that from an examination of those analysis you pronounced this water pure at the tap in Jersey City?

A. That I pronounced it pure?

Q. Did you?

A. No, sir; I said it was a good water supply.

Q. Why did you say it is good water supply, if you didn't know whether there was any typhoid bacillus there or not?

A. On account of the few number of bacteria present is the chief reason, and that the fermentation test made here shows there was only coli present, manifested themselves in 10 c. c. of water, which was tested for fermentation. If there was any possibility of much contamination you would find it in one-tenth of a cubic centimeter of water; you would find the fermentation test and find the indications of the coli bacillus.

Q. Your first system is the number of bacteria—how many bacteria is it necessary to be present in order that the water shall not be safe to drink?

A. Why I have seen water that was considered clear water, about three thousand cubic centimeter, with no indication of coli.

Q. I didn't ask you that. Leaving out all about coli, what difference does it make how many bacteria there are in it, leaving out the question of coli?

A. It doesn't make any difference only that it shows that there are some polluting materials get into the water.

Q. Does bacteria come from polluted material?

A. They grow in it; yes, sir.

Q. Is that the only source from which they come, as you understand?

A. Anything that washes into streams is apt to bring with it some bacteria.

Q. Suppose there were very few bacteria and a number of coli, what would you say as to that?

A. Then I would say it would be polluted with human or animal excreta.

Q. Would the number of bacteria have anything to do with it at all?

A. Not on that score, no, sir.

Q. At any time would the number of bacteria have anything to do with it?

A. No, sir, not as to its healthfulness.

Q. So that your statement that it is a good quality of water had nothing to do with the number of bacteria?

A. No, sir.

Q. It has to do with the coli?

A. It has to do somewhat with the number of bacteria, because when there is only 150 present it shows they had been removed if there had been; it is seldom you find water without any bacteria in it.

Q. Well, the bacteria that are not diseased bacteria, in other words, all the bacteria except typhoid bacillus, don't injure you from drinking it—don't effect the water?

A. No, sir.

Q. Then what difference would it make how many there are?

A. It only leads up to the other points of the investigation.

Q. Now as to the b. coli, you say—what does this paper show as to b. coli?

A. That they were present here where these crosses are, and they were not present in those samples

Q. The first cross says reaction, what do you mean by that, what has that got to do with coli?

A. That is the carbonic acid gas.

Q. This reaction I am talking about?

A. Yes.

Q. What has that to do with coli?

A. Well, if coli are present that is one of the tests of their presence.

Q. What?

A. The carbonic acid gas.

Q. Reaction means the amount of carbonic acid gas?

A. They react. It says here, gas production in one c. c. lactose bouillon sugar free, containing one-tenth of a gram of neutral red per liter; the reaction was not present in these three specimens that contained a small quantity of water, but were present in the larger quantity of water. In ten and one hundred they show re-action, but don't show it in one c. c.

Q. Does that depend entirely on the coli present?

A. Yes, sir.

Q. No other bacillus?

A. That is one of the numerous tests that are made here.

Q. Does that depend on the coli present or not?

A. No, there are other bacillus that would give that re-action also, but it is chiefly the coli.

Q. Do you say that all these analysis show that the coli is not present at any time in a tenth of a cubic centimeter of water?

A. No, sometimes it is present.

Q. Then the water is not pure, is it?

A. Then it is not pure.

Q. Were you shown at the time Doctor McLoughlin's analysis of the water of the Rockaway river where it enters the reservoir?

Mr. EDWARDS: I object on the ground that this is not a proper cross examination; we did not ask him anything, Mr. Vredenburgh, on that score.

Mr. VREDENBURGH: I think it is and I am going to object to these papers because you don't show them.

Mr. EDWARDS: We did not examine this witness as to anything except the tap test.

Q. How did you find out as to the quality of the water of the river; you testified as to that?

A. I did not.

Q. You did not testify as to that?

A. No, sir.

Q. You never saw any analysis of the water?

A. No, sir.

Q. None by Doctor McLoughlin?

A. No, sir.

Q. No part of the river?

A. No, sir.

Q. Never asked for it?

A. No, sir.

Q. Don't know anything about that?

A. Don't know anything about that; no, sir.

Q. Did you have any analysis of the water in the reservoir?

A. These are all the analysis that I have knowledge of.

Q. And by these you refer to the ones Mr. Corbin showed you and are here before you?

A. Yes, sir.

Q. You said in your direct examination something to this effect, that when it became a menace—the water became a menace to Jersey City, that the proper remedy was by a filtration plant below the reservoir; do you remember swearing to that?

A. Yes, sir.

Q. How would you discover that the water had become a menace to Jersey City?

A. When the analysis taken at the tap would reveal the large amount of coli present, and that the death rate of Jersey City should exceed, from typhoid fever, 25 per hundred thousand per annum.

Q. Then those two things together would convince you that the water was a menace?

A. That I would consider as an indication.

Q. Substantially, then, you would wait until there was an epidemic before you could really say that the water was a menace?

A. Not necessarily,—could ascertain that very soon when the death rate would increase.

Q. You would want these people killed in order to be sure that it was really—

A. We would have no other way of ascertaining it.

Q. An epidemic is a pretty good evidence that the water is impure and not wholesome?

A. Providing you can exclude other causes; we had an outbreak that wasn't due to our water; we got it from the milk.

Q. That is the conclusion you arrived at; you didn't know that at all?

A. Yes, sir; we are positive of that.

Q. You are?

A. Yes, sir.

Q. You asked somebody where they got milk from?

A. No, sir; we discontinued the supply, and in a short time our outbreak ceased.

Q. That is the way you determined it?

A. That is the only way you can determine anything in the typhoid line; science is not accurate enough in that.

Q. You say you have made a study of this question of epidemics, or you made some study of it?

A. Have to do that in our regular routine of work.

Q. I suppose you heard of the epidemic at Scranton?

A. Yes, sir.

Q. Did you go up there to examine it?

A. No, sir.

Q. Do you know that there was a water supply there taken from reservoirs to the City of Scranton?

A. Yes, I heard of that.

Q. You heard that the pipe line was about 21 miles long?

A. Yes, sir.

Q. And that the reservoir was a large reservoir?

A. Yes, sir.

Q. Do you know how many millions of gallons the reservoir was?

A. I don't; no, sir.

Q. Do you recall that they had to clean out the pipes in order to get rid of the typhoid bacillus?

A. I didn't read about that, but I read that they thought the cause of this infection of the water supply was the trains going over the water shed, and that the toilets in the trains being used at that time by a typhoid patient would pollute the supply, and probably did; that was their contention.

Q. Do you think that was a reasonable one?

A. Reasonable enough for us to ask the trains that

go over the Newark water shed to lock their doors of their toilets in making the trip through the water shed.

Q. Who did that; who asked them?

A. The Engineer of the Board of Works of Newark.

Q. Did he do it by your direction?

A. No, sir, by his own; they have jurisdiction over the water shed.

Q. He has jurisdiction?

A. Yes, sir.

Q. And he notified the Susquehanna & Western Railroad?

A. Yes, sir.

Q. To fasten the doors of their water closets when their train was passing over the water shed?

A. Yes, sir; the water shed of Newark.

Q. Because you were afraid that one man who was just getting or just recovering from typhoid fever, traveling on that train might, by one discharge, impregnate the water of the Pequannock water shed?

A. Yes, sir.

Q. Well, now, as I understand it then, one reservoir 21 miles from Scranton caused an epidemic in Scranton by reason of one discharge by some traveling person on the Delaware, Lackawanna & Western Railroad; it was supposed so?

A. The supposition was, yes, sir.

Q. It wasn't supposed there was more than one discharge, was it?

A. That is only supposition; they don't know whether that played any part in it or not; but that is one of the statements that were made.

Q. You didn't see the statement that they attributed it to a man stopping at the hotel at Muscow, above the reservoir, did you?

A. No, sir.

Q. You didn't read that part of it?

A. Didn't come across it; I only read this in the public press.

Q. Didn't read of the fact that they had to clean the pipes?

A. I should judge they ought to after they had an outbreak of that kind.

Q. Why?

A. The pipes would be filled if there was much entered in it.

Q. Well, filled with what?

A. With the germ.

Q. Typhoid germs?

A. Yes, sir.

Q. How many deaths were there in Scranton, or how many sick?

A. I don't know; I didn't look into the cases at all.

Q. I thought you said you did follow these cases?

A. I didn't follow that particular case.

Q. That was a very important case?

A. I follow particular things that happen in Newark.

Q. Scranton I am talking about.

A. I don't know anything about that, only what I read in the public press.

Q. Didn't think it important enough for you to examine the cause of that?

A. No, sir, that wasn't the reason; I didn't have the time to do it.

Q. Well, you didn't; but you did read it in the public press, and you say that you think it would be important to clean out that 21 miles of pipe. Isn't it a fact that these typhoid germs multiply in innumerable quantities from that one discharge until they had filled the whole of the reservoir for months?

A. I don't know anything of the kind.

Q. Do you think that one discharge without any growth and multiplication of those discharges caused all that sickness?

A. That is possible.

Q. It is possible—sickness running through six weeks?

Mr. EDWARDS: There is no proof it ran through six weeks.

A. We know of one case that the discharge of one individual did that.

Q. Did what?

A. Almost annihilated a town in Pennsylvania.

Q. When was that?

A. The town of Plymouth, about six years ago, I think.

Q. How many reservoirs did that go through?

A. Only a storage.

Q. It went through three, didn't it?

A. No, sir.

Q. Three reservoirs?

A. No, sir, that went through one.

Q. Do you know that?

A. That is my belief of the matter; that is my knowledge of it.

Q. You didn't go up there to examine it?

A. No, sir.

Q. Your idea is that it went only through one?

A. Yes, sir.

Q. Is it your idea that that caused the destruction of this town of Plymouth, without those germs multiplying in any way in the water?

A. Yes, sir; the discharges were washed down to a brook and went into this reservoir and spread throughout the city.

Q. How could one discharge spread throughout the city unless they increased in number?

A. I didn't say one discharge; I said if one person

who was sick on the mountain side, it was in the winter time, and the fecal matter was thrown out in the snow, and when the snow melted it was carried out through the stream into the reservoir.

Q. I understood you to say that you believed it reasonable that one discharge on the Delaware, Lackawanna Railroad, by going into the reservoir of the Scranton Water Works, caused the epidemic in Scranton, is that so?

A. I don't know, but I believe that that could happen.

Q. Well, could it happen without multiplication; that one discharge would make the water so filled with typhoid germs that for six weeks new cases would be continually arising in the city of Scranton?

A. Possible.

Q. How?

A. The germ being present in the water.

Q. Well, how could the germ stay in the water six weeks; you said it only lived twenty days?

A. It is not said that the disease was continued by this one case for six weeks.

Q. It was continued by the water, it came from the water, didn't it?

A. So they thought: I don't think that that is positive.

Q. How do you explain, doctor, if these typhoid bacilli will not multiply in the water and will not live more than twenty days, that this typhoid fever in Scranton from the use of that water continued for six weeks to attack persons?

A. I cannot explain it; if it was just that one defection, but I say that is the supposition. There may be another cause besides that, and that may not be the cause at all.

Q. But if that is the cause you cannot explain it?

A. No, sir; I would like to explain to you why it

was important to us to prevent any defection getting into our stream.

Q. If you want to say anything, of course you are at liberty to say it.

A. We have no process of sedimentation, but we are depending upon an unpolluted water shed, and the defection there would be almost directly into our pipe line; but we had that experience in Newark some years ago, I think it was in 1889 or 1899, when ice closed up our intake, the pipe line at the intake, and the city of Newark was in fear of a water famine, couldn't get any water from the Pequannock, and for five days they pumped water out of the Passaic river through the old method of supplying it into a reservoir; that distributed the water to a particular section of Newark, and we had over eight hundred cases of typhoid fever, with about eighty deaths, and only in that section where the people used the water from this river, and it was only in five days, but it continued longer than five days after they were effected, because of the retention of the germ in the pipe.

Q. In the pipe?

A. Yes, sir.

Q. How long was the pipe, doctor?

A. That was a pipe about, well, it came from Belleville to Newark.

Q. About five miles?

A. About five miles.

Q. How long did that continue?

A. That continued about, I should judge, a month.

Q. A month?

A. Yes, sir.

Q. About thirty days?

A. About thirty days.

Q. Thirty days after you ceased to pump the water from the river?

A. No, the outbreak took place about four weeks

from the time of the introduction of the water; the first case we had was four weeks after the introduction of the water.

Q. After you first pumped the water, and how long did you continue to pump the water in from the river?

A. Five days.

Q. About a month after that the epidemic broke out?

A. Yes, sir.

Q. And lasted for how long?

A. About four weeks.

Q. And there were eight hundred taken?

A. Yes, sir.

Q. Not all the same day?

A. No, sir; different days.

Q. During the four weeks.

A. Yes, sir.

Q. And of that there were about eighty deaths?

A. Yes, sir.

Q. You attributed that all to this water that came from the Passaic river?

A. Yes, sir.

Q. How do you explain that the germs lived in the pipe; that was pure water in the pipe, wasn't it?

A. That was pure water in the pipe.

Q. How do you explain they lived there?

A. Well, they probably did not live there more than 14 days, but the outbreak with the people was different; it does not take place exactly on the time in some instances it is three weeks and some instances four and five weeks after, before the outbreak; sometimes it is not recognized right away, the outbreak of the individual being mild, so that covered that period without any growth of bacteria in the pipe.

Q. That is, as you state it now, I understand you to mean that a person may be sick with typhoid fever and not show itself so that you would know it was typhoid fever, for a month?

A. Yes, sir.

Q. Or several weeks?

A. From two weeks to a month.

Q. I understood you to say that these people that broke out with it a month after it commenced, which was a month after the water was pumped in the pipe, could have caught it from only 14 days—could have drank the water only 14 days, after you ceased to pump from the river?

A. Yes, sir.

Q. That is what you mean us to understand?

A. Yes, sir.

Q. Have you any reason, doctor, any fact or any reason founded on fact for that belief that you can tell us about?

A. Nothing, only what I observed at the time.

Q. You observed that some got sick at the last—you say five weeks it lasted?

A. No, sir, four weeks.

Q. You say some got sick the last day of that four weeks?

A. Yes, sir; I wouldn't say the last week, but I would say it covered a period of four weeks; they may have been sick for two weeks prior to that and not manifest the disease.

Q. How did they live in the pipe; you said that they ought to clean the pipe out at Scranton, you said you hadn't seen that they done that, but still it ought tobe done?

A. In most of these water pipes there are butt ends, and it is in those pockets that the water might stay and not be removed by the daily supply, and it is the only way that I could explain it continued;

that some of the water was retained in the butt ends, and afterwards mingled in with the water again.

Q. Is not the belief of the bacteriologist that you have read, that the inside of a water pipe is a place where the typhoid bacillus will grow and increase if there is food there for them; they have the same light, substantially, the same temperature, as they do in the human body?

A. Yes, sir.

Q. And if they have the food there isn't it extremely likely in your judgment that they would propagate there?

A. It is possible, if they have the proper media.

Q. Do you know at all what this typhoid bacilli live upon—what they eat?

A. No, I do not.

Q. Do you know whether they live on other similar bacilli or bacteria?

A. I believe not, but I don't know.

Q. Do you know whether they live on living tissue or dead tissue?

A. I don't know.

Q. Do you know of such a disease as winter cholera?

A. No, I have never met with it.

Q. You have heard of it?

A. Never did.

Q. Never heard of it breaking out in New York State?

A. No, sir.

Q. Winter cholera?

A. No, sir.

Q. Why do they disinfect clothes that have been around a typhoid patient's bed— bed sheets and such things?

A. Possibility of the excreta getting on it.

Q. Do you think there is any possibility of it?

A. Very easily.

Q. Well, how could that affect and make sick any person?

A. By the handling of the clothes there is danger of getting it on the hands; we have had cases where nurses have been affected.

Q. That is, handling the clothes?

A. Or the patients themselves, and getting soiled with the excreta and the urine also containing the bacillus.

Q. How do you disinfect it, what do you do?

A. Usually using disinfecting material, such as chlorides, and carbolic acid.

Q. Then it is the belief among medical men that the mere washing of it, laundering of it, won't do it?

A. No, sir; it requires antiseptics.

Q. Some germicide?

A. Yes, sir; boiling would destroy it.

Q. But anything up to boiling point won't destroy it?

A. No, sir.

Q. It is also apparent that it is dangerous from the fact that it may remain there in a sort of a dry state?

A. Yes, sir.

Q. If it is not washed at all it would remain there —nobody knows how long, do they?

A. No, sir.

Q. Then, in your judgment, it is not safe to use linnen or bed clothing of that character until it is disinfected?

A. Either that or boiled; you could never depend upon time.

Q. Now, doctor, I understood you to say in answer to Mr. Corbin's question, that if you depopulated the water shed completely, except you left one man living on the stream, that man would be a menace to the water shed?

A. Yes, sir.

Q. You answer yes, as to that?

A. Yes, sir.

Q. Do you mean to say that a man anywhere in that water shed would be a menace there merely on the stream?

A. On the stream.

Q. How near the stream must he be?

A. His fecal matter get into the stream, if he had typhoid fever, that is the only menace.

Q. How near to the stream would that have to be?

A. Have to be right in, right at the stream, or go into the stream direct.

Q. Wouldn't it anywhere in the water shed get in the stream?

A. Not necessarily.

Q. Would it be a danger, would it be a menace,—or the man be a menace if he was anywhere in the water shed?

A. No, sir; he could be in the water shed and not be a menace.

Q. How far would he have to be from the stream to not be a menace?

A. The menace would be removed by having the fecal matter deposited in the earth.

Q. Suppose it was not deposited in the earth, you are supposing one man—

A. It may be washed from the surface into the stream.

Q. How near the stream would that man have to be—how far from the stream would that man have to be, under all circumstances, frozen water and rains and everything, in order not to be a menace?

A. So that he would not get any of the fecal discharge directly in the stream.

Q. How far would that be?

A. If he was on any of the tributaries of that stream, that the fecal matter would get directly in,

no matter how far it would be it would be influenced—if there wasn't some process of filtration or sedimentation employed.

Q. The whole theory is on the idea that there isn't any sedimentation?

A. If the fecal matter got in the raw water it would be a menace.

Q. You say one man would be a menace, but you say on the stream; I want to know whether one man in the whole water shed, under all the circumstances you mentioned, would be a menace?

A. No, sir.

Q. Why not?

A. As long as the fecal matter was not admitted to the stream he would not be a menace.

Q. Suppose it was?

A. Then he would be.

Q. Isn't it liable any man in the water shed to have that happen?

A. Well, as long as it doesn't get in the stream it would not be a menace.

Q. But one man in the whole water shed would be a menace if by any possibility his fecal matter could get in the stream?

A. If he had typhoid fever, not otherwise.

Q. You said one man would be, that was upon the theory that he would have typhoid fever?

A. Yes, sir.

Q. Wouldn't be a menace if he didn't have typhoid fever?

A. No, sir.

Q. If you had a million men in that water shed, if they had no typhoid fever, wouldn't it be a menace?

A. Not at all.

Q. The menace comes from the fact that he may have typhoid fever?

A. Yes, sir.

Q. If there was one man in there it would be a menace?

A. Yes, sir.

Q. Anywhere in the water shed, provided it was anywhere, practically, under any circumstances?

A. No, not under any circumstances, if it was so that his fecal matter would get into the stream.

Q. Under any circumstances?

A. Not if he was away from the stream, and the fecal matter put into the soil that would not be a menace, if he had typhoid fever.

Q. But if he didn't put it into the soil?

A. Put it on the surface?

Q. Yes.

A. That would depend how far away from the stream, whether the water would go in there direct, if it had to go through the soil.

Q. If it didn't have to go through the soil?

A. There would be a question as to the nearness of it; I cannot say he was a menace if he was located anywheres in the water shed.

Q. Under the same circumstances that one man would be a menace, would two men be twice as much of a menace?

A. That all depends on the same cause again.

Q. I say under the same circumstances, would two men be twice as much of a menace?

A. Be more of a menace than the one would.

Q. Would be twice as much?

A. I should say so.

Q. Then, if there were fifty men in the same way it would be fifty times as dangerous?

A. Certainly would, if it got into the stream.

Q. What is the population of the Pequannock water shed per square mile?

A. I cannot give you that off hand.

Q. What is the population of the Rockaway water shed per square mile?

A. I don't know.

Q. If you don't know the number of people on the water shed, and have not seen any analysis of the water, how is it that you say that the water which enters the Boonton reservoir from the Rockaway river is not pure and wholesome water?

Mr. EDWARDS: He didn't say that; he said it was polluted.

A. I never said that.

Q. You didn't say that?

A. No, sir.

Q. Is it pure and wholesome water?

A. No, sir; I said that water would be unsafe to use.

Q. Is water that is unsafe to use pure and wholesome water?

A. Not to use direct.

Q. Pure and wholesome water for drinking purposes?

A. No, sir; no water would be pure and wholesome,—safe to use without some process of artificial purification that ran through any city or any stretch of country where there was any pollution.

Q. Is the water which enters the Boonton reservoir, as you say the water, pure and wholesome water for drinking purposes?

A. No, sir.

Q. You say that?

A. Yes, sir; I say that.

Q. That it is not; now, I want to know if you say that, how is it that you reach that conclusion when you don't know how many people there are to the square mile in the Rockaway water shed, and you

have had no analysis of the water made or seen any such?

A. How it is that I make that statement?

Q. Yes.

A. Because in my opinion no water shed that is polluted is safe without some process of purification.

Q. Why isn't it safe?

A. The danger of possible serious contamination from typhoid.

Q. Because of the danger from drinking that water, of its making the person who drinks it sick with typhoid fever?

A. Possibility of someone in the water sheds having typhoid, and it going into the water.

Q. Then that is the reason that you say that in your judgment the water now, as it enters the Boonton reservoir, from the Rockaway river is not pure and wholesome?

A. That or any other water that comes from a polluted section ought not to be used for drinking purposes.

Q. Is that the general opinion, as you understand it, of water experts?

A. I believe it is; I know in Germany they will not allow it now without a process of purification to be used.

Q. Have you visited Germany?

A. Yes, sir.

Q. And examined this question?

A. The question came to my knowledge through reading.

Q. Since you have been there?

A. Since I have been there; yes, sir.

Q. You don't know that they have storage reservoirs and also filtration, do you?

A. Yes, sir.

Q. They do have?

A. Yes, sir.

Q. You said there was no reservoirs on the Pequannock water shed, what did you mean by that, there are two reservoirs there?

A. No sedimentation plant.

Q. What is the size of the reservoirs on the Pequannock water shed?

A. Oak Ridge is one.

Q. What is the size of that, how many gallons?

A. That is about a billion and a half.

Q. What is the other?

A. Clinton.

Q. What is the size of that?

A. That is about two billion.

Q. And they are so situated that you can let the water run out of one at one time and out of the other at another time?

A. No, sir.

Q. So that you can have as much storage almost as you desire?

A. Yes, sir.

Q. Now, there is another reservoir?

A. Yes, sir.

Q. Cedar Grove?

A. This reservoir went in operation since the latter part of 1905; we have a Canister above the Oak Ridge.

Q. What is the size of that?

A. I should judge a million and a half.

Q. Million and a half gallons?

A. Gallons.

Q. Isn't there a fourth reservoir near the outlet?

A. Macopin Intake, that is a small one.

Q. What is the size of that?

A. Fifty million gallons, one day's supply.

Q. Fifty million gallons is one day's supply of the City of Newark at the present time?

A. Between thirty-five and forty, now it holds about fifty millions.

Q. You told us the size of Cedar Grove?

A. That is, I think, about over two millions.

Q. Between two and three millions, do you think?

A. I think it is over two millions; I won't say that accurate, because I haven't figured it up very close; I mean two billions.

Q. And that is above where, above which of the reservoirs?

A. That is below this, between the Intake, between Macopin Intake and the City of Newark.

Q. It is below the Intake?

A. Yes, sir.

Q. And it is a two billion reservoir?

A. Yes, sir.

Q. For the present supply of Newark, that is one hundred days?

A. No, sir; about 60 days supply.

Q. You only have thirty-five million gallons a day?

A. That is the statement of the engineer, sixty days supply, as we are using it now.

Q. Were you of the same opinion as Mr. Sherred about the closing of the toilets on the trains?

A. Yes, sir; I thought that was a precautionary measure that ought to be taken,—anything to prevent—

Q. Where does the Susquehanna train cross the Pequannock water shed?

A. From Macopin Intake to above Stockholm.

Q. Stockholm is above Oak Ridge?

A. Yes, sir.

Q. Does it cross the stream above Oak Ridge—the railroad?

A. Yes, runs along.

Q. You thought, notwithstanding you had this Cedar Grove reservoir of sixty days storage, that it

was good judgment to have the doors of the closet of a railroad train locked?

A. Yes, sir.

REDIRECT EXAMINATION:

Q. When did you build the Cedar Grove reservoir for Newark?

A. It was finished in 1905.

Q. And why did you build it?

A. It was originally built for the purpose of preventing the same occurrence that occurred in 1899, freezing of the pipe line at the Intake.

Q. And for what other purpose was it constructed?

A. It has acted since in the shape of a sedimentation plant.

Q. Did you consider the Pequannock water shed safe, as originally planned, with the small intake at Macopin?

A. We did, originally.

Q. Do you now?

A. No, sir.

Q. Why?

A. Because we were using the water direct, or the raw water directly into our pipe line, and distributing it to Newark.

Q. How far above Macopin is the Clinton reservoir?

A. About seven miles.

Q. And how far above Macopin is the Oak Ridge reservoir?

A. That is a few miles below.

Q. And the Canister?

A. No, Clinton is in a different direction, the tributaries of those join just above New Foundland.

Q. Didn't a large proportion of the water come into Macopin without going through either of those reservoirs?

A. Not a large quantity, some quantity.

Q. And it flowed as an open river, didn't it, from Clinton and Oak Ridge to Macopin?

A. About seven miles ran an open river.

Q. Wasn't that the most thickly inhabited portion of your water shed?

A. Yes, sir.

Q. Then you didn't consider Macopin—the water from Macopin directly to the City of Newark safe, without Cedar Grove?

A. No, sir; we never felt safe with it.

Q. Does Cedar Grove give you as good sedimentation for the Newark supply as Boonton does for the Rockaway?

A. I should not think so.

Q. It is not as large?

A. Not as large.

Q. Not as deep?

A. Not as deep either.

Q. You made the reservoir at Cedar Grove as large as you could, didn't you?

Mr. VREDENBURGH: Objected to as leading.

A. Yes, sir.

Q. What is the temperature of the human body?

A. Ninety-eight and a half.

Q. Do you think the temperature in any of the water pipes get as high as that?

A. I think not.

Q. What is the temperature in the water pipes, about?

A. That depends on the time of the year

Q. Well. take it in the fall?

A. About sixty or fifty.

Q. And how high does it get in the summer?

A. About eighty.

Q. And very much lower, of course, in the winter?

A. Yes, sir.

Q. Then the temperature in the water pipe does not approach the temperature of the human body, does it?

A. No, sir.

Q. For the propagation of the bacillus coli?

A. No, sir; it is not the temperature of the body.

Q. Do you think that one case of typhoid fever in the Rockaway river, with the sedimentation that we have at Boonton, would be communicated to Jersey City, in your judgment?

Mr. VREDENBURGH: Objected to as incompetent and illegal.

A. In my judgment, I think not?

Q. Did that also apply to one hundred cases; in your opinion would one hundred cases—

A. I think not.

Q. Now, you were asked about the Scranton trouble, and what you read in the papers; did you not read that the cause of the trouble at Scranton was that they had abandoned the reservoirs for cleaning purposes, and were taking the water directly from the river?

Objected to.

A. I didn't know it; no, sir.

Q. Do they close the doors of the closets on the Susquehanna road through the water shed?

A. The last report I heard, they hadn't done so.

Q. When did you first request them to do that?

A. I didn't, but Mr. Sherred did.

Q. When?

A. Soon after the information was received from the public press that Scranton thought that that might be a possible source of infection.

Q. Why do you say that there is some pollution in the Rockaway river above the reservoir, if you haven't seen the analysis?

A. Well, from the lay of the land, the natural drainage into that valley, where the river is located.

Q. Is that true of all such rivers?

A. Yes, sir.

Q. How many days supply have you at Cedar Grove,—at Newark?

A. Sixty days.

Q. And that is about one-third of the size, is it not, of the Boonton reservoir?

A. Well, I understand the Boonton is about between seven and eight thousand millions—between a third and fourth.

Q. Does the successive sedimentation depend upon the number of days that the water remains still in the reservoir?

Mr. VREDENBURGH: Objected to because the witness has said that he does not know about it, and made no study of it.

A. In my judgment it does as I said.

Mr. VREDENBURGH: Answer objected to because it is not based on any knowledge that the witness has.

Q. Does it not depend wholly upon that?

A. No, sir.

Q. Now, you have testified to the construction of cesspools, and stated that some of them were built with loose stone and open bottom, is that a proper method of construction?

A. That is the usual method to allow the contents to drain in the soil.

Q. Is it a proper method?

A. In some instances we insist upon cementing the side and the bottom open.

Q. Is it the general method?

A. That is the general method.

Q. In vogue all through the country?

A. Yes, sir.

Q. And the open bottom, I suppose, is important?

A. To allow the contents to disappear in the soil.

Q. Now, you were examined about the refuse from the gas works; I don't know whether I got that exactly right or not; does not of the refuse coming now out of the gas house run into the river?

A. No, sir; none of the refuse—it used to run in where the brook is located.

Q. Does it now run that way?

A. No, sir.

Q. Then, in your cross-examination as I understood it, you said that it did run into the river?

A. That was a mistake; I said before that that the soil was saturated with the refuse of the former method, but it is now run into a place back of the building, in a depressed part of the ground there that in no way connects with the stream.

Q. And dissipated there in the soil?

A. It sinks away in the soil.

Q. Doctor, you were asked about the Plymouth case; was there any storage in that case, or did they take water directly from the stream?

A. They had the river dammed up, and that supplied the town from the mountain streams.

Q. No sedimentation there?

A. No, sir.

Q. Practically direct from the river, then?

A. Yes, sir.

Mr. VREDENBURGH: I object to the examination as leading all the way through.

Q. Does it, or not, require a boiling temperature to kill typhoid bacteria?

A. Yes, sir.

RECROSS EXAMINATION:

Q. Did you go to Plymouth?

A. No, sir.

Q. What do you know, then, about the reservoirs at Plymouth?

A. Only what I read in the medical reports at that time.

Q. When you swore there was no sedimentation, what did you mean by that?

A. I said I didn't know that there was any sedimentation from my reading.

Q. When you said there was no sedimentation, you meant you didn't know of any, is that the idea?

A. That is right.

Q. That is the way you answered a great many of these questions, when you swore the thing is not so, you mean you don't know that it is not so?

A. When I say it is not so, it is my opinion that it is not so from what I have read.

Q. Just as you say about this sedimentation; you say there was no sedimentation; you don't know anything about it, but you think there wasn't from your reading?

A. From my reading of the case; yes, sir.

Mr. EDWARDS:

Q. From the history of the case as you know it?

A. Yes, sir.

RECROSS EXAMINATION:

Q. You said to Mr. Edwards that the cedimentation depended wholly upon the number of days that