

history of the---early operation of the structure.

Q You say that would not occur, perhaps, for about six months?

A No, I think I said it ought to occur, major portion of it in probably the first month of its use.

Q You think then that there will be as much of a change in your opinion in one month of the time this flume was first used as there would be in four years of dis-use and lack of care afterwards?

A It is common experience those settlements occur early.

Q Where have you had experience of that kind?

A I have had experience in a number of instances.

Q I am talking about a condition such as I have described.

A In the construction of dams.

Q No, in determining the amount of settlement that would occur in the first month of a flume of this kind, as against four years of dis-use later on.

A It is a matter which pertains to construction in general.

Q In other words, that is your guess, is it?

A No, it is not a guess entirely.

Q What is it?

A Because I have had occasion to check up elevations of dams as well as flume structure, and have found that after the first settlement the settlement became very much less and gradually stopped.

Q Do you know anything about the history of this flume from the intake down to the Olmstead station?

A No, sir.

Q Do you mean to tell, or would it be in your opinion--strike that. Would, in your opinion, the principal settlement in that flume occur within thirty days after water was first put in it in 1902?

A Yes, sir, that would be my judgment.

Q And wouldn't think it would change much since then?

A Not so much.

Q Would it change any particular amount?

- A Oh, probably would change some.
- Q If, as a matter of fact, the history of the flume has been that it is constantly changing and that they constantly have to keep men, a crew of men engaged in putting it back on grade, would your opinion change?
- A Certainly.
- Q I am speaking, however--I thought you understood me---my last question related to the long flume.
- A The 1902 flume.
- Q The 1902 flume, and I understood you to say that you thought that the settlement, practically all the settlement would occur within thirty days after its construction.
- A I misunderstood you. I thought you were referring still to the temporary flume.
- Q Now, that you understand me, what would you say about that?
- A I would say that would be possibly changing.
- Q Why would you say there is so much difference between that and the other one?
- A Because it is built on a loose foundation. The flume rests directly upon sills that are not founded on solid material, and there is considerable leakage in the flume. Besides the lateral alignment, the crookedness of the flume causes the flume itself when the water is in motion in that flume, to oscillate more or less, naturally tend to cause difference in the vertical elevation, vertical alignment constantly.
- Q You say, I believe, that you know nothing about the history of this flume, or the temporary ~~xxx~~ flume for the last four years?
- A No, I don't know anything about the history of either one of them.
- Q If, as a matter of fact, during those four years that flume had been more or less filled with ice, and the water was leaking into it from the dam and there had been no attempt made at all to keep it on grade, would you say those

conditions would change the grade of that flume, or that the grade would change during that period?

A The temporary flume you are speaking of?

Q Yes.

A It would tend to change the alignment.

Q So that you, yourself, in making your computation, have simply assumed the condition as it is at the present time without reference to what it might have been in 1912?

A Yes, so far as the alignment is concerned, not with reference to the---

Q Now, I believe you assumed the free board in your calculation of what amount?

A Eight tenths of a foot.

Q And it was seventy-six hundredths at that point below grade, was it?

A Yes, sir.

Q That would make a free board in the rest of the flume of 1.56 feet, would it?

A No, I allowed a free board of eight tenths of a foot.

Q And you took that at the point of minimum capacity?

A Yes, sir.

Q You allowed eight tenths of one foot at that point of minimum capacity, I understand it?

A Yes, sir.

Q So that when that was seventy-six hundredths below grade at that point, it would give you a free board in the rest of the flume of 1.56, wouldn't it?

A Yes, sir.

Q If, as a matter of fact, the flume was constructed on a constant grade, it would have had a very much larger capacity than that you have given while it was on grade, would it not?

A Yes, sir.

Q Do you know how much larger?

A I have not computed it, but very nearly in proportion to the

added area of the cross section.

Q Why did you assume a free board of eight tenths?

A To provide for the oscillations of the water surface.

Q Do you know anything about the oscillations of the water surface in that flume?

A No, sir, not from observation.

Q Are you acquainted with any flume where they use less free board than eight tenths of a foot?

A Yes, sir.

Q Where?

A Any flume run on a lower grade, perfect alignment, may have a less free board.

Q One tenth to a hundred feet is not an especially high grade, is it, for a flume?

A Gives a high velocity to the flume, yes, sir.

Q Not such a high velocity that it makes a turbulent condition unless there is something else to vary the condition, is there?

A Yes, sir, it does it.

Q Always?

A Yes, sir.

Q Even in perfect alignment ~~is~~ gives a turbulent condition for a calm this side.

Q It is not an unusual condition, is it?

A This turbulent water surface?

Q No, the grade is not an unusual grade, is it?

A Oh, no, not for flumes.

Q How high a waves will just the grade itself, flume that size, create?

A Assuming now a flume in--on a straight alignment?

Q I am talking about I will refer to that particular flume, for instance.

Q I observed oscillations which I estimated to be about seven

or eight tenths per foot.

Q Where did you make these observations?

A At various places up and down the flume.

Q Where did you observe the greatest oscillation?

A Well, I could not say that, because I did not attempt to make any accurate measurement of them. As I stated, I noted the difference between this rim of ice that was frozen to the side of the flume and the trough of the oscillation.

Q Where was that point that you noticed the ice with reference to the sand box?

A Oh, it was all along the flume, from one end to the other.

Q How near was it to the top?

A Varied different places.

Q You made no accurate measurement, however, of the height of the turbulences?

A No, sir, I estimated the distance by the width of the sideboards only.

Q You did that entirely with your eye, did you?

A Yes, sir.

Q Assuming that the water in the flume at a point a thousand feet below the sand box was running within three inches of the top of the flume, and not overflowing at all, would, in your opinion, the water below that point, overflow in the canal?

A That would depend upon the conditions of the flume.

Q I am talking about its present condition.

A No, I don't think it would.

Q If it would not overflow, then it is safe to carry it to that point, is it not?

A That depends on what you mean by the surface of the water. If you mean by that the extreme height of the oscillations, then my answer ~~is~~ will stand as I stated. If you mean the

depth of the sill well I referred to, then I will say it will slop over.

Q Did you hear Mr. Parker's testimony yesterday, in regard to the conditions which prevailed at the time he made his measurements?

A Yes, sir.

Q Assuming the conditions which he described in his testimony would the water overflow in the canal?

A I don't think Mr. Parker obtained the true elevation of the water surface at the point of measurement.

Q Regardless of whether he did or did not, obtain the true elevation, assuming the conditions which he has described and concerning which he testified, would in your opinion there be an overflow in the canal below that point?

A I will have to qualify that, my answer to that. If that three inches meant the true elevation of the water, I will assume it would slop over.

Q Then your sole basis for that opinion is his measurement was wrong, was it?

A In that respect; he referred to the free board as being the true distance from the top of the flume to the true elevation of the water surface.

Q Just answer my question. Your assumption, your opinion it would overflow is based upon the assumption that his measurement is wrong, is it not?

A In that particular.

Q You say you observed a stream in the temporary flume?

A Yes, sir.

Q That was down in the regular flume section?

A Portions of the screen, it wasn't intact.

Q You don't know what its original condition was?

A No, sir.

Q Did you measure the flume at that point

A Right at the screen?

Q Yes.

A I cannot say that I measured exactly at that point.

Q Was the screen, was the part of the screen which was left a part of the screen that was originally installed and at the point of original installation?

A I could not say that.

Q You don't know whether it had been moved or not?

A Oh, no; it showed the screen had been placed there.

Q But you didn't measure the flume at that point?

A I cannot say that because I did not note the exact position of the flume, from 12 point.

Q Do you know whether the flume as a matter of fact had a larger cross section at that point than other points?

A It had no greater depth than the average, I did measure the width at every station; I did measure the depth every station.

Q I understand it, the screen was ~~left~~ ^{laying} down at the bottom of the flume?

A No, it was standing up on an elbow.

Q You say it had been installed at that point?

A Where were cleats on the side of the flume which showed the screen had been installed there and part of the screen was still in the flume.

Q Do you know whether that was the point of original installation, or whether it had been changed, for instance by some subsequent user?

A No, sir.

Q Do you know whether Mr. Donan at the present time is using that old flume?

A There was some water running down the flume. I understood someone was using it for a small power plant.

Q That was Mr. Donan, was it not?

A I think so.

Q Do you know his place?

A Yes, sir, I stopped at the place they called "Donan's"

There was no one there at the time.

Q You are speaking of the coefficient which you used in calculating the capacity of that temporary flume; in assuming that coefficient, did you assume it with reference to the present grade concerning which you have testified or described?

A Yes, sir.

Q You didn't assume it with reference to a constant grade of one to one hundred from the head to the head-works, to the end of the flume?

A The coefficient was not selected with reference to the grade of the flume.

Q What is?

A The coefficient is not selected with reference to the grade of the flume, the coefficient of rugosity.

Q That is true, but nevertheless you did assume a coefficient in this case?

A Yes, sir.

Q And I believe you assumed it in arriving at your coefficient, on the basis of a certain grade?

A No, sir, the coefficient is one of the elements of calculation. The grade is another element and both have to do with the velocity and consequently the discharge of the flume, but one is not dependent upon the other. I speak now of the coefficient of rugosity, not the coefficient C as we usually term it.

Q And you in assuming your free board of eight tenths, you based it principally upon the variation in the vertical alignment, as I understood your testimony?

A And the curves which occur below the present remains of the old flume. Part of the flume has been taken down, but part of the sub-structure is there which showed it curved around to join the present flume.

Q But you assume the eight tenths free board, because of the

variation in the vertical section?

A And the variation in the lateral alignment.

Q What did you determine to be the velocity, the initial velocity of the water in the section having a slope of .15?

A I found no such velocity, no such slope in the temporary flume.

Q Was there not in the temporary flume--

A There is a steep section at the head, the slope is not .15.

Q What was the slope of that steep section?

A It is very nearly a foot in a hundred feet, one in a hundred instead of one in a thousand.

Q What velocity did you determine the water would have at the end of that steep section?

A I did not calculate the velocity there.

Q Doesn't the velocity at that point have a good deal to do with the subsequent velocity of the water in the lower section of the flume?

A For some distance below that, yes, sir.

Q Doesn't the velocity with which the water flows into the regular--into a flume of regular size and having a constant grade have a great deal to do with the velocity of the water as it goes through the flume?

A For some distance below the fall.

Q If a flume has a grade of one tenth to a hundred and it enters the head of the flume with a large velocity, isn't the grade of one tenth sufficient to carry that velocity through, and if not, where would the change take place?

A Change is gradual, the water surface from that point would not be a straight line, but a curve, and the length of that curve will depend very largely upon the conditions of the flume, and alignment and size of stream. There is no fixed rule to determine what the length of that curve is.

Q Suppose the original velocity was enough to do that, what would be the effect?

A

- A If it was enough it would carry the water through.
- Q Carry it through?
- A Certainly.
- Q It would carry more water through, would it not, through the flume?
- A If it was a short flume, it would.
- Q Would it not in a long flume, if the slope of that long flume were sufficient to maintain the initial velocity?
- A Certainly, if the slope was sufficient to maintain it.
- Q Then the velocity with which water enters the flume has a great deal to do with the carrying capacity of that flume, hasn't it?
- A If the slope is sufficient ~~sufficient~~ to carry it at that velocity, yes, sir.
- Q You say you could get an exact calculation of the carrying capacity of that flume without determining first the velocity with which the water entered the flume?
- A If there was a stretch of considerable length that becomes a controlling stretch for the capacity of the flume, and any falls above that will not affect it. It will affect it very short distance, but not very considerable distance.
- Q That is true, but you say the velocity ~~xxx~~ with which water enters the velocity does have a material part in the carrying capacity of the flume, or the water that may go through?
- A For some distance below.
- Q But assuming the grade below that point is sufficient to maintain that velocity, then it would have to do with the amount that would go through the entire flume, would it not?
- A Certainly.
- Q Then how can you determine the total carrying capacity of that flume without determining those two factors, first the velocity with which the water went into the head of the flume, and second whether or not the grade on which it was constructed was sufficient to maintain that velocity?

- A Because I have assumed the stretch of flume here is sufficient to be a controlling length of the flume, capacity of the flume.
- Q In other words, it is a mere assumption on your part without a determination of those two factors or either one of them is it?
- A Well, depend on what you mean by pure assumption. I assumed the section was long enough to be a controlling section, yes, sir.
- Q And you have determined your capacity here without reference to either of those two factors, did you?
- A Yes, sir.
- Q I don't know that I got your data on which you base your calculation of the capacity of the 1902 flume, correctly; give me the elevations at the intake place.
- A Elevation of the second flash board 514.87; surface of the water below the stream 512.99; bottom of the intake, bottom of the flume at the intake 508.27.
- Q You had a factor of 4.72 feet in it as I remember; what is that?
- A That is the depth of the water below the screen.
- Q Depth of the water below the screen?
- A Yes, sir.
- Q On what did you base that assumption it was 4.72 below the screen?
- A That is merely the difference between 512.99 and 508.27, elevation of the water.
- Q From what data did you get the 512.99?
- A From some notes handed me.
- Q The crest of the dam is 512.89 and we are unable to tell where you got the data of 512.99. Mr. Buckler testified the crest of the dam was 512.99, bottom of the flume 508.27, top of the flash board 514.87, as I have it. You made the depth of the water in the dam or the reservoir--

THE COURT: Water level; that is the way I have it, I don't know what he meant by it.

MR. STORY: He testified as to the correctness of these exhibits, and the crest of the dam as given by the exhibits introduced in evidence is 512.89.

THE COURT: That is what I have it.

MR. STORY: And the elevation at the top of the first flash board 515.80, and top of the second 514.80.

THE COURT: .87.

MR. STORY: 514.87. If he gave it as 512.99 I presume it must have been at some particular time, because that would be above the dam and below the first flash board, even.

THE COURT: He testified to another flash board having been put on which raised the water a foot, later.

Q But in making your computation then, you used the elevation of 512.99 as the height of the water?

A Yes, sir, below the screen.

Q If there, as a matter of fact, the water elevation had been increased to 514.89, there would have been considerable more depth below the screen, would there not?

A Undoubtedly.

Q What effect would that have?

A Increase the capacity of the intake.

Q It would increase the capacity of the flume?

A The capacity of the flume, in my opinion. My calculation is not based upon these figures, merely the capacity of the intake.

Q What?

A The capacity of the flume, my calculations were not based

upon these figures. I took these figures simply to figure the capacity of the intake.

Q What effect did the intake have upon the capacity of the flume?

A Intake may have a much greater capacity than the flume, and overload the flume.

Q The object in constructing the intake as it was, was to get a velocity, increase of head and get as much velocity as possible for the water as it enters the flume, is it not?

A I should say not in this instance. Before it reaches the flume it is built on a level that would not tend to increase the velocity the first reach.

Q What do you mean by "reach"?

A The first distance along the canal.

Q How long?

A Fifty feet.

Q You are speaking of the temporary--

A I am speaking of the original head of the 1902 flume.

Q Why do you say that the fact that was on a level did not make any particular difference; if you heaped the water up in that flume it would make a difference, would it not?

A There is no opportunity to heap--

Q The greater depth of water you get in that flume would give you a greater head and greater velocity, would it not?

A Certainly.

Q Then, as the water was increased in depth in that section of the flume, you would get a larger head, would you not?

A Yes, sir.

Q If, as a matter of fact, the height of the water was more than 4.70, as you assumed in your calculation, you would have a greater depth?

A Certainly.

Q And, consequently, greater velocity of water come out of that section, would you not?

A No, I don't think the velocity would be any greater.

Q Why not?

A Because I have calculated the velocity as the velocity of the flume, which is in excess of what the velocity would be in this level reach of the flume.

Q Please explain what you mean by the "velocity of the flume."

A Velocity of the regular section of the flume on the slope.

Q And without reference to the velocity with which the water enters the flume, is that the case?

A There is no data on which to figure that, but I assumed the velocity of the water as determined in the flume.

Q In your calculation then, you have omitted entirely the velocity at which the water entered the flume, have you?

A I have assumed it to be not as the velocity in the flume.

Q How did you determine the velocity in the flume?

A By the ordinary calculation in Cutter's formula.

Q What coefficient did you use?

A I used coefficient of thirteen.

Q Where did you get that?

A That is my judgment.

Q. Based on experience that you have described before?

A Experience and study.

Q What free board did you use?

A In this flume?

Q Yes.

A Eight tenths.

Q Why did you use that?

A For the reasons I have stated, to provide for the oscillation of the water surface in the flume, to prevent slopping over.

Q Did you see it slop over?

A No, sir.

Q What?

A No, sir.

Q In arriving at your cross section of the flume what figure did you use?

A I used the depth of the flume less eight tenths of a foot.

Q With reference to the minimum section?

A No, sir, I assumed the constant depth.

Q You assumed that was a constant depth?

A Yes, sir, that was according to the evidence.

Q Then, I take it, you ascribed the difference in your calculation between the--between your calculation and that given by Mr. Parker to two things; first, the amount of free board which you allowed, and the coefficient, is that the case?

A Yes, sir.

Q You think that makes the difference?

A Yes, sir.

Q And by that, by your figures you arrive at a carrying capacity of the flume assuming the coefficient of 0.13 to be two hundred and fifty-seven second feet?

A Yes, sir.

Q Could your opinion as to the carrying capacity of that flume--vary or be changed, if as a matter of fact you ran the flume to full to within three inches of the top and it did not overflow anywhere below that point, but on the contrary increased to its free board by four tenths of a foot?

A Certainly, if you can prove by experiment more water can go through the flume, I will change my opinion, no question about that.

Q If, as a matter of fact, you measured three hundred and two second feet of water flowing in that flume at the point a thousand feet below the sand box, and if there at a free board of three tenths of a foot or rather twenty-five hundredths of a foot, and continued to increase its free board, for the first thousand feet and then maintained a virtually constant free board, from there to the end of

the flume, of sixty-five one hundredths; your opinion would change as to the carrying capacity of that flume, wouldn't it?

A No, you would have to demonstrate those ~~facts~~ conditions held throughout the entire length of the flume.

Q I am assuming that has been testified to by Mr. Parker they did continue.

A I beg your pardon.

Q Assuming they do continue throughout the flume, wouldn't your opinion be changed as to the carrying capacity?

A I don't know I quite understand your question, like to have it.

Q You say in your opinion the carrying capacity of that flume is two hundred and fifty-seven second feet?

A Yes, sir, with a free board of eight tenths.

Q I am asking you if you would change your opinion in that respect if, as a matter of fact, you measured the flume running full of water or within three inches--twenty-five one hundredths of a foot in fact, of the top at a point one thousand feet below the sand box? and that in going down the flume the free board increased constantly for the first thousand feet from three inches to sixty-five one hundredths of a foot, and from that point on down to the end of the flume, continued at practically a constant level of sixty-five one hundredths free board, wouldn't your opinion under those circumstances be changed as to the carrying capacity of that flume?

A No, sir, I would say the flume was overcrowded.

Q Regardless of the fact it did not slop over?

A From the fact you are running within three inches of the top of the flume, allowing no factor of safety to be counted upon.

Q If it did not overflow at that point, I presume---

A A structure may be overloaded and yet not full.

- Q As a matter of fact if there had been a larger velocity at that particular point, a greater velocity, there would have been more free board, would there not?
- A Certainly, for the same discharge.
- Q You notice some tributaries coming into the flume as you went down it?
- A I saw a small stream come in from the pipe line from Bridal Veil Falls.
- Q Is that the only one you noticed?
- A That is the only one I saw; I didn't go below.
- Q Didn't go below that point?
- A No, sir.
- Q I believe you testified that having a velocity ^{and} ~~at~~ a cross section of a flume, the co-efficient can be accurately determined. Did you not so testify?
- A In the case of uniform flow, yes, sir.
- Q If, as a matter of fact, you actually measured the flume full of water and you get---you knew the cross section and you knew the velocity of that water, you could get the actual co-efficient could you not, mathematically?
- A Yes, sir.
- Q And that determination, whatever it was, will be more accurate than any assumption you or anybody else could make, would it not?
- A Certainly.

REDIRECT EXAMINATION by Mr. A. C. Hatch.

- Q Mr. Jenson you answered Mr. Story that you made your calculation as to the temporary flume without taking into consideration either of the two factors, the flow at the intake or whether or not the grade below was sufficient to maintain the velocity at the intake; is that a fact, or did you take into consideration the grade of the flume

as it actually existed and that it was not sufficient to maintain the velocity at the entrance?

A I had in mind two elements, the intake and the velocity at the end of what you might call the racing stretch of the flume, this portion with the heavy grade. I did certainly take into account the slope of the flume in the distance marked by the red line, which I considered was the controlling section of the flume, controlling stretch of the flume.

Q And that was the controlling element in your determination, was it not?

A Yes, sir.

Q And was the place of measurement sufficient distance below the entrance to be beyond the curve of entrance velocity?

A Yes, I think the length was sufficient to overcome the curves due to entrance velocity.

RECROSS EXAMINATION by Mr. Story.

Q How can you tell whether that grade is sufficient to maintain the velocity unless you know what the velocity is?

A You cannot tell definitely.

REDIRECT EXAMINATION by Mr. A. C. Hatch.

Q Have you the data as to the wheels used by the Utah Power Company at the Olmstead plant?

A I have no notes on that, Mr. Hatch. I have seen the notes of the testimony given; I have no notes on it myself.

Q The testimony shows they are the standard Allis-Chalmers turbine wheels, operating under a head of about three hundred and thirty feet. The evidence---I have forgotten the witness, I think it was Mr. Brundige, was that those wheels were guaranteed as eighty per cent efficiency

when put in, and that at the end of one year by reason of wear by grit in the water and otherwise they became reduced to an efficiency of only sixty-five, and that occurred by reason of the sand in the water getting between the runners and the casing, and that they then continued to run for several years under the same conditions and were not reduced as to efficiency; have you read Brundige's testimony in regard to those wheels?

A Yes, sir.

Q Now, you are acquainted with that class of wheel, are you?

A Yes, I have seen them in operation, tested some of them.

Q Can you state whether or not the wheel would lose fifteen per cent of its efficiency for one year and then remain at that condition of efficiency for several years thereafter?

A A wear of that kind would in the first instance be a very extra-ordinary condition of wear, and if it did continue after the first year then the causes which caused the wear in the first year must also dis-continue. In other words, there must be only one period of muddy water, because as long as there is muddy water and sand passing through the wheel the wheel will wear and gradually decrease in efficiency.

Q What would be the effect upon the wheel of the wearing such as I have described as to its efficiency when would it be most inefficient, right during the time when it was--- the wearing was occurring or afterwards?

A If there was a sufficient amount of sand going through the wheel to wear it in the way it has been indicated, the extra work turning the runner of the wheels with this sand grinding between the runner and the casing would ~~ga~~ cut down the efficiency of the wheel immediately and would be very noticeable and probably would reach a much lower efficiency than after the muddy water had discontinued and it was operated with clear water.

Q Explain why that is so.

A Because the grit is crowded in between the vanes of the casing of the wheel; that very fact, grinding will tend to retard the runner and work is being done there in addition to the work being done driving the machinery.

Q Can you explain by diagram or otherwise the working of these wheels?

A If I had a piece of chalk I could. That is supposed to be concentric, the outer portion of this represents what is known as the guide of the turbine. In a section--this is really a double line here,--these lines represent the vane of the runner of the wheel. The water enters in a direction indicated by the arrow and impinge upon the vane of the wheel, driving the wheel around in the direction indicated by this arrow marked "B". When there is sand and grit in the water the first wear occurs against the concave face of the guide. Then, as it strikes the vane of the wheel it also wears on the concave side of the vane. This vane travels usually at a speed somewhere about four tenths of the spouting velocity of the water at the entrance to the wheel, and that velocity which is turned by virtue of this guide/^{which} produces the energy in the wheel, causes it to rotate. The leakage between the vane and casing usually occurs between these rims and the wear which produces a loss of efficiency is the wear at that point. We may have a considerable amount of wear on the face of both of these curved surfaces without materially decreasing the efficiency of the wheel. It is only when this opening between the vanes and the guides decrease sufficiently to allow a considerable portion of the water to not only escape the working function of the water, but get in between the vanes and actually act as an interference to the wheel itself, so that any leakage that occurs there acts as a double retardment of the wheel, not only that it loses its force as a propelling

power, but becomes an obstruction to the wheel itself, and this is where the leakage must occur to diminish the efficiency of the wheel, until the vanes become worn so thin they break through, of course. Then, of course, the wheel is practically out of commission.

Q When those openings become large enough to allow twenty-per cent of the water to escape what would be the effect upon the efficiency of the wheel?

A The efficiency of the wheel must then be decreased very much in excess of the twenty per cent, probably twice that much.

Q Or forty per cent?

A Yes, probably forty per cent.

Q Then a wheel when first installed having a capacity and efficiency of eight per cent, having lost forty per cent by reason of the escape of twenty per cent of the water, would become practically useless, would it not?

A Yes, I should say so.

Q And you may state whether or not in order to do the work it would be necessary to put in new wheels?

A Certainly require new wheels if it is worn until twenty per cent of the water leaks through between the vanes and guides of the wheel.

MR. STORY: I don't remember any testimony, Judge Hatch, there was twenty per cent going through.

MR. A. C. HATCH: Mr. Brundige testified.

MR. STORY: I don't remember his testimony that twenty per cent of the water escaped. Does Your Honor remember that?

THE COURT: I don't recall it.

MR. STORY: He testified the efficiency was about sixty-five per cent, the plant, he did not testify any twenty per cent of the water going through the pipe escaping between the vanes

and the guides.

MR. A. C. HATCH: That is all.

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H. F. THOMAS, called by the plaintiff,
being first duly sworn, testified as follows:

DIRECT EXAMINATION by Mr. A. C. Hatch.

Q You are the party who was water commissioner appointed by the Fourth District Court and testified before in this case, are you not?

A Yes, sir.

Q Did you at any time make a measurement of the water flowing in the flume of the Utah Power & Light Company, or the former Telluride Power Transmission Company, in connection with one Mr. Pharis who was the engineer in charge of the work at the Olmstead plant? and with one Mr. Jarvis, an engineer for the Provo Reservoir Company?

A Yes, sir.

Q When was that?

A On the 28th of July, 1911.

Q What was the quantity of water flowing in the flume at that time?

A My measurement was 221.2 feet.

Q Have you official notes or memorandum of what you did at that time?

A Yes, sir.

Q Have you them with you?

A Yes, sir.

Q You may produce them and read them.

A Before measuring I had a statement by the engineer about what he had measured in in July 1910.

Q What engineer?

A Mr. Pharis.

Q The engineer of the Power Company?

A Yes, sir.

Q And do you know whether it was the same man, Pharis, who was here and testified in this case?

A I don't know whether he has testified here or not.

MR. JACOB EVANS: It is the same man, is it not?

MR. STORY: Only Pharis I know.

THE WITNESS: Lives in Salt Lake City now I believe. Before we measured that he informed Mr. Jarvis and myself---

MR. STORY: I object, Your Honor, to it as being hearsay. Mr. Pharis can be called.

THE COURT: Objection is sustained.

THE WITNESS: Then I will just see the notes of my measurement.

Q Such notes as you made as to what was done by the three of you at the time you were there together measuring that water.

A July 28, 1911. Measurement taken of the Telluride flume at Donan's, or the Upper Falls; measured it in four sections, eight feet wide, and at a depth of five feet of sixty inches. Measured each cross section. I have the revolutions and velocities, depths and widths of each section, if you want it.

Q You need not give that.

A Just the total, total reads 221.2 cubic feet.

Q How did you come to go there?

A How is that?

Q Why did you go there at that time to make these measurements?

A Well, we did it to know what water was passing through the flume at that time, because I had communications with their company nearly every day, about the volume of water in the river above them, the readings they were taking.

Q The readings that who were taking?

A Their company had some agent on the river taking readings of the river every day at a station above that point somewhere.

Q Did you at any time make any other measurements than this of the water flowing in the river?

A No, this is the only measurement I ever made.

Q You say you measured it at four different places?

A No, measured four cross sections of it every two feet across the stream.

Q Did you at the time make a note of the free board; that is the height and sides of the flume above the water?

A No, sir.

Q That is, the depth of the water?

A That is the actual depth of the water on that day.

Q How was that determined?

A By measurements that we made ourselves, by placing a rod down the canal and measuring the rod.

Q Was the water running pretty level or was the flow such it ran up on your rod when you put it into the water?

A Well, running so swift as it is there, hardly able to get it exactly level, but good as we can generally get streams of that kind.

Q They have no sill well or anything to determine the actual depth at their measuring point on the canal or the flume, have they?

A Not that I know of, I didn't see any there.

Q I will ask you whether the measurement, that is the measurement determined by all three of you, or whether it was only your measurement?

A That is my own measurement.

Q Did the others make any different measurement?

A Mr. Pharis measured it also same day, same time.

Q What was ~~the~~ Mr. Pharis' quantity determined at that time?

A He had a little less than I did, 218.5.

Q And what did Mr. Jarvis determine?

A I don't think he made any measurement at all. He was just an assistant to the two of us.

Q In checking up the two of you, you and Pharis?

A Yes, sir.

Q Have you any judgment as to the free board at the point of measurement?

A No, sir.

Q How nearly full was the flume at the time you measured it?

A Only just from the notes I took on the day previous, what depths they had taken the water at. I did not make those measurements myself.

Q What I wanted to know is: if we can determine whether the canal was practically full of water at the time you measured it.

A No, it was not full.

CROSS EXAMINATION by Mr. Story.

Q What kind of a meter did you use, Mr. Thomas?

A Current water meter.

Q What kind?

A I don't know the name of it now.

Q Whose was it?

A Belonged to Provo district.

Q Had you had it corroborated at or about the time that you made this measurement?

AZ No, sir.

Q Do you know anything about its corroboration?

A No, sir.

Q You don't know anything about its accuracy?

A No, sir.

Q Was the five foot depth which you mentioned the depth at one side or the average depth?

A That was the average depth; we took that at every cross section

five feet.

Q How much water was in the river at that time?

A I did not have any measurement made at that particular date.

Q All the water in the river going through the flume?

A No, sir.

Q There was additional water, was there?

A Yes, sir.

Q You merely measured what was in the flume without reference to what you might have been able to push through the flume, or get through the flume at maximum capacity?

A That is right.

REDIRECT EXAMINATION by Mr. A. C. Hatch.

Q Did Mr. Pharis have a meter?

A Yes, sir.

Q And he made his own measurements?

A Yes, sir.

Q What was his actual measurement of the flow?

A He made it 216 feet.

Q Why did you give us 218 and a half.

A Well, I remember the statement that he made, that his machine had not been tested lately and believed it was running about one per cent low, so two and a half feet was added on account of that.

Q Then, did you add anything to yours by reason of anything?

A No, sir, mine was actual measurement?

Q Pharis measurement was actually five second feet less than yours?

A More than six; oh, yes, 5.2.

REVERSE EXAMINATION By Mr. Story.

Q The accuracy of the measurement would depend upon the

accuracy of the meter, wouldn't it?

A Yes, sir.

Q And you know nothing whatever about the accuracy of Pharis' meter?

A No, sir.

T. F. WENTZ, recalled.

DIRECT EXAMINATION by Mr. Jacob Evans.

Q Mr. Wentz, you are the Commissioner of this court at this time?

A Yes, sir.

Q And have been for two or three years?

A Yes.

Q Are you acquainted with the Utah Light & Power Company's flume?

A Yes.

MR. STORY: Just one second, while I think of it. Mr. Evans, are you intending to---Judge Hatch said it was your intention to connect up the condition, the present condition of that temporary flume with its original condition. I don't want to interpose a motion to strike out the testimony in that regard until you have finished your evidence in that regard. Have you some more to offer?

MR. JACOB EVANS: Yes, we have some more.

Q Have you, while you have been Commissioner of this Court in the distribution of water of Provo river made any measurements of the flume of the Utah Power & Light Company?

A Yes.

Q At Donan's station?

A Yes, sir.

Q When did you make the first measurement of that, Mr. Wentz?

A July 27, 1914.

Q Is that behind the point that the water was measured by Mr. Swendson and Mr. Parker, do you know?

A Yes, as I understand the testimony, a point 1845 feet below the headworks or approximately 845 feet below the gate-house or sand-box.

Q What method did you use in making the measurement?

A In all the measurements except the first one of July 27, 1914, I have used the sill well at that point and made the measurements, taken meter observations and put sections across the stream. That is eight across the stream and at depths of approximately eight tenths of a foot. That is generally I have taken forty-eight readings in a cross section of the velocity to determine that velocity factor. In some instances I have taken strata of less depth and taken fifty-six readings in the section and in one or two instances I have taken stratas of still less depth and taken sixty-four readings in the section. These readings, I think, in every instance in 1915 and '16, one hundred and fifty revolutions of the meter were observed except on possibly two points on each side. The observation of the water level, the water height was taken with a still well of two inches in diameter, a pipe two inches in diameter with an intake pipe from the flume of one-eighth inch in diameter. The observation of the still well readings were taken generally at each time a row of observations were made, that is taking the first row of readings across the bottom of the flume. The still well was observed first, and then before taking the second row across, the still well was observed again, making in all nine to twelve observations of the still well. The mean depth of water in the still well was obtained by noting the--taking the lowest depth that the water would pulsate to and the highest point the water would raise in the still well, and taking the mean

of those two points. When the flume is running about two hundred second feet the pulsations from the low point to the high point is about three one-hundredths of a second foot--of a foot. When the discharge in the flume is greater the pulsations are greater and sometimes reach to a height as high as five hundred of a second foot between the low and high.

MR. STORY: You mean of a foot.

A Of a foot.

Q Now, you may give us the results of these measurements, commencing at the first measurement that you made on July 27, 1914; and by the way who was present with you, if you know at the time that measurement was made.

A The discharge July 27 1914.

MR. A. C. HATCH: Mr. Wentz, will you give us the pulsations again, that I may get them, maximum and minimum of the pulsations.

A The pulsations in the still well when the discharge is ~~kw~~ approximately two hundred second foot, is three hundredths of a foot. When the discharge is greater, two hundred and thirty, to two hundred and forty second feet, the pulsation is approximately five hundredths of a foot.

Q Now, you may state what the discharge was on July 22?

MR. STORY: He did not answer who was with him that time.

Q State who was with you if you can, if anyone, on July 27.

A If I understand the question, you want the discharge of just who was with me?

Q I want both, and want to know who was with you now.

A Caleb Tanner and Frank Dusenberry.

Q Who is Frank Dusenberry?

A The foreman of the flume.

Q And Mr. Tanner is the engineer of the Provo Reservoir?

A Yes.

Q Give us the discharge now.

A The discharge on that date was 227.83 second feet.

MR. STORY: I don't want to interrupt you, pardon me for doing it, but won't it add to the clarity of the whole thing if he puts in his height as he goes along, have it altogether.

MR. JACOB EVANS: All right.

A The gauge height at this time was 4.79 feet.

MR. STORY: Is that the average depth?

A Yes, that is the mean.

Q What did you say the gauge height was?

A 4.79 feet.

Q Now, give us the next, second reading.

A October 19, 1914, the gauge height was---

Q What was with you on that occasion?

A Caleb Tanner, Frank Dusenberry, John Carter.

Q Who was John Carter?

A A workman on the flume.

Q All right. Now, give the gauge height.

A Gauge height 4.90 feet.

Q The discharge?

A Discharge 207.92 second feet.

Q Give us your next, Mr. Wentz.

A The next measurement was on November 6, 1914.

Q Who was with you that time?

A Caleb Tanner.

Q What was the gauge height?

A 4.95 feet.

Q Discharge?

A On this occasion we used two meters, meter No. 1351 and meter No. 1843, both counted on the same rod. The discharge by meter No. 1351 was 211.36 second feet. The discharge by meter No. 1843 was 212.75 second feet. The mean discharge by those two meters is 212.06 second feet.

Q Give us the next measurement?

A The next measurement was on November 9, 1914. Mr. Tanner was with me on this date; the gauge height was 5.05 feet. The same two meters were used on this date, mounted the same as on November 6th. The discharge by No. 1351 was 221 second feet; the discharge by Meter No. 1843 was 219.66 second feet. The mean of these two meters was 220.33 second feet.

Q Give us your next measurement.

A The next measurement was on July 9, 1915, Frank Dusenberry was present at this time. Gauge height was 4.74 feet.

Q Discharge?

A Discharge was 224.64 second feet.

Q Give us the next measurement, Mr. Wentz.

A The next measurement that I have--this is arranged not according to the dates for 1915. I have given you the July date. I will now give you the earlier dates. May 8, 1915, Mr. Pratt was with me at that time, D. B. Pratt.

Q Who was he?

A He was later the assistant commissioner on the upper division of the river.

Q Is he an engineer?

A Yes, sir.

Q At that time he was not in the employ of any of the parties to this action?

A No.

Q All right, proceed.

A The gauge height was 4.64; the discharge was 214.75 second feet.

June 3, 1915, Carl Farley was with me on this date.

Q Who was he; that is was he connected with any of the parties to this suit?

A No.

Q Was he an engineer?

A No.

Q All right.

A The gauge height was 4.99 feet; the discharge was 239.72 second feet.

Now, I have the gauge reading for that year but not the discharge.

MR. A. C. HATCH: Were they the same year,

A Yes, July 19th; Gauge reading was 4.82 feet.

Q Just a moment, Mr. Wentz. Are gauge readings dependable to determine the volume of flow at that section?

A No.

Q Then they would not aid the court much in determining the volume of water flowing in the flume, I take it?

A No, unless the conditions are exactly the same there and they are right close to another measurement. I would not base anything on them.

Q Neger mind reading them then. Go on with your next measurement.

MR. THURMAN: You let me clear up one thing here. You used the term "gauge height" does that mean the depth of the water?

A That is the depth of the water in the flume taken by the still well. The next measurement is May 16, 1915, Theodore Farley, Junior, was with me on this date. The gauge height was 4.69 feet; discharge 228.65 second feet.

The next measurement was September 9, 1916; Freeman Tanner and I. H. Griffiths were with me at this time. The gauge height was 4.87 feet, the discharge 198.93 second feet.

October 9, 1916, Freeman Tanner was with me at this time. The Gauge height was 4.70 feet; the discharge was 218.76 second feet.

Next measurement of October 13, 1916; D. D. McCune was with me at that time. Gauge height was 4.68 feet;

Q Who is D. D. McCune?

A He is an employe of the reservoir company.

Q Is he an engineer?

A No, I think not.

MR. STORY: Freeman Tanner, who is he?

A I don't know who he was employed by at the time. He is an engineer. I will say these measurements in 1915 and 1916 all parties with me were on the stay line, that is holding the stay line to the meter and really had nothing to do with the observation. I made the observation of the revolutions and held the meter up and recorded the notes.

MR. STORY: Is Freeman Tanner connected with your company?

MR. A. J. EVANS: I think he has been.

MR. STORY: Was he employed by the company at the time this measurement was made?

MR. A. J. EVANS: I think he was not. He has been in the employ from time to time just occasionally.

MR. STORY: I understood Mr. Wentz to say he did not know who employed him to do the work, whether he got him or whether he went there as one of your employes. I would like to know it, that is all.

MR. JACOB EVANS: I don't know; Mr. Murdock might know.

MR. STORY: Let's get Mr. Wentz' testimony on it then.

Q You can tell us what you know about it, as to whose employe he was in, if you know?

A On September 9th, he was making a trip with me to the lakes, and I told him I was going to make this measurement at the flume and asked him if he would help me do that and we caught the train at the Bonan station and went to Heber that day.

MR. STORY: Was he an employe of the reservoir company at that time?

A No, in the employ of no one at that time. As I remember October 9th, I could not get anyone to go with me to make these measurements and I 'phoned to either Mr. Tanner or Mr. Jacobs asked the, if they would send a man up to help me make those measurements, and hold the stay line, and Mr. Tanner was furnished by them to do that work.

MR. A. J. EVANS: Give us that last gauge height.

A 4.68; discharge 220.33.

Q Is that all?

A October 21, 1916, Freeman Tanner was also with me on this date, holding the stay line.

Q Do you know in whose employ he was at that time?

A He was furnished by the reservoir company, as I remember it. I was unable to get anyone handy those dates, and I asked them to furnish a man to help me on this work.

Q All right.

A The gauge height was 4.625 ; discharge 218.60 second feet.

Q Is that all the measurements you made at that point, Mr. Wentz?

A That is all at the Donan station.

MR. THURMAN: These measurements all made at the same place, were they?

A Yes.

Q Now, Mr. Wentz, how does the oscillation of the still well compare with the oscillations of the water in the flume?

A Well, it is very much reduced, the waves in that flume run about three tenths to twenty-five hundredths high above the mean, when the flume is carrying say 228 second feet. Now, on the measurement of May 16, 1916, I was using depth of stratas there of approximately six tenths of a foot. My meter on the top row of readings, the center of it was down three tenths of a foot, and in two or three occasions in making that top row the meter was left

out of the water entirely. That is the wave, the cross of the wave was below the meter, and in those measurements why, I had to take some of those over two or three times in order to get the velocity with that meter in the water all the time.

MR. A. C. HATCH: How deep did you say it was in the--

A Three tenths of a foot below the top of the mean surface.

Q Mean surface?

A Yes.

MR. A. C. HATCH: What was the variation of the surface of the water, maximum and minimum?

A As I say the trough of the waves was more than three tenths of a foot in depth, the full height of the wave included from the trough to the crest is six or seven tenths of a foot in height.

MR. A. C. HATCH: At that point?

A Yes, at the station.

Q Now, if the flow was increased in that flume, would that increase or decrease the crest of these waves you have spoken of?

A Well, the increase flow in the flume can be readily detected by observation of the top. Now, when the flume is running at the point 198.93, it has a very good top, very smooth, and when it is at 228 the top is very rough. As I say, the difference in the trough wave, crest of the wave, is in excess of six tenths of a foot.

Q Then, if you would put in an additional quantity of water, say seventy or eight second feet, more, what effect would that have on the waves?

A I can't imagine it would be very rough.

Q You have known that flume for a good many years, haven't you Mr. Wentz?

A Yes.

Q Have you ever at any time seen that flume when it was carrying three hundred second feet of water?

A Well, I could not answer that. I can only say according to the observations I have made.

Q Of course you would not know what it is carrying except as you measured it.

A Measured by the gauge height.

Q From what you have seen of it, what would you say, would it carry three hundred second feet.

MR. STORY: Object to that on the ground it is incompetent, the witness has stated he could not tell; it would be a mere guess. He said he could not tell unless he had measured it.

THE COURT: I didn't so understand him. He said he could not tell how much was in it at any time without measuring it, but he is asked as to the capacity. Read the question.

(Question read)

THE COURT: Capacity of the flume.

MR. STORY: All right; I withdraw the objection.

A I have only made observations of the flume in the one year; that is, 1914, with a view of determining or ascertaining the capacity of that flume. The capacity at that time running the wave crest to the top of the siding was ~~was~~ two hundred and forty-eight second feet.

Q That was the test that you made to determine the capacity of the flume?

A Yes.

CROSS EXAMINATION by Mr. Story.

Q You say, Mr. Wentz, that the only time you made measurements of the flume for the purpose of determining the capacity

was in 1914?

A Measurements and observations, yes.

Q At that time you made them with Mr. Tanner?

A Yes.

Q How did you happen to make them with Mr. Tanner?

A It is impossible for one man to measure that flume alone,
and we went on that work together.

Q At whose suggestion?

A On the request of the Provo Reservoir Company.

Q You made those measurements then at the request of the Provo
Reservoir Company in 1914. did you?

A Yes, they requested a record of that flume, and ascertaining
of what the maximum carrying capacity of it was.

Q They requested you to determine that and suggested you do
it with Mr. Tanner, did they?

A No.

Q How did Mr. Tanner happen to go along with you?

A Well, we first went on there together and the method of
measurement, of course, we determined on--I suggested the
method of measurement.

Q I am not asking you about method of measurement now. I am
asking you how you happened to go with Mr. Tanner to make the
measurement?

A I think Mr. Tanner volunteered to go with me.

Q Mr. Tanner was employed by the reservoir company at that
time, wasn't he?

A Yes, sir.

Q And that was not really part of your duties as water commissioner
in distributing the water, it was something especial?

A It may be special, but since this case is up on any
requisition from anyone for any affirmative data for the
case, and I have had time to do it, I have tried to supply
that information to them.

Q Have you made any other determination on capacity?

A No, I have had no other request.

Q Was this the only capacity determination you have attempted to make as water commissioner in this litigation here?

A Yes.

Q Or having reference to this litigation?

A That is the only one I have made. That is the only request that has been made to me.

Q In this particular request, in 1914, made at the request of the Provo Reservoir Company?

A Yes, sir.

Q You subsequently made some additional measurements, however?

A Yes.

Q How did you happen to make those measurements, did you make those on request, too?

A No.

Q I thought you said perhaps I misunderstood, I thought you said you made the capacity measurements only on request of parties, capacity determinations?

A This one determination, as I say, is the only request I have had for the capacity of that flume.

Q But you did make additional measurements in 1915 and '16?

A Yes.

Q How did you happen to make those capacity measurements?

MR. THURMAN: He didn't call them capacity measurements.

A I have not made any capacity measurements ~~far~~ in 1915 or '16. I have merely made the measurements of the discharge of that flume.

Q You made measurements of the discharge ~~at~~ that time, however; at whose request did you make those measurements of discharge in 1915 and '16?

A At no one's request.

Q You just did it voluntarily, did you?

A Yes, sir.

Q For whose information?

A For the information of every one in the suit, the same as we keep a record of all the canals.

Q Did you make it at the request of the Telluride or Utah Company?

A No, sir.

Q How did you happen to get Mr. Tanner to go with you to make those measurements in 1915? Mr. Freeman Tanner?

A Mr. Freeman Tanner was not with me in 1915.

Q 1916, then.

A As I say I was unable to get anyone to help me make those measurements and I 'phoned to Mr. Jacobs or to Mr. Tanner and asked them if they would assist me the next day to make those measurements.

Q As I understood your testimony you called upon the Provo River Reservoir Company or somebody connected with them to furnish you a man to help make them?

A Yes, to hold the stay line.

Q How did you happen to call upon the Provo Reservoir Company to furnish you a man for that purpose?

A They have some men in their employ like Mr. McCune, Mr. Tanner, someone else, they could probably spare for a day or half a day.

Q But you made it, called upon them because you knew that they were particularly interested in it, didn't you?

A Well, that may be, yes.

Q Did you ever call upon the Utah Power & Light Company to furnish a man in that connection?

A I have asked the men at the station.

Q When?

A In 1914, and they have assisted me sometimes in making those measurements.

Q Did you ask him in 1915 or '16 to furnish you a man?

A No, I don't think I have either one of those.

Q How ~~it~~ does it happen you always call upon the Provo Reservoir

Company to furnish you a man instead of the other person who was particularly interested, namely: Utah Power & Light Company?

MR. A. C. HATCH: I object to the question as not being based upon the testimony of the witness, not a proper question.

MR. THURMAN: Had Frank Dusenberry two or three times here.

MR. STORY: He said he was present in 1914; he didn't testify he ever requested him to help him. My question is limited to the last two years. The object of this testimony, Your Honor, is merely to bring out these measurements are made not as a dis-interested person, but as a---

THE COURT: I think this line of examination is proper cross examination of Mr. Wentz, but the objection is made that you assume in your question a state of facts that is not supported by the evidence. Now, read the question. If I understood it correctly, it does assume something that is not warranted, but I may be mistaken as to the question. (Question read)

THE COURT: I think that does assume something that the evidence does not support, as to his always having done so.

Q Strike it out. I will ask the question in another form; how does it happen that in looking for a man to help you you never in the last two-years at least called upon the Utah Power & Light Company to furnish you a man to help you make the measurements?

A Usually at the dam when I have been to the gate-house there only been the one man there, and of course, could not take him away from his work to help me make those measurements, and I have tried always to arrange to take a man with me

on that account. Sometimes like 1915 I have, when they have had an extra man like Mr. Carter or Mr. Dusenberry, they helped me make those measurements.

Q Mr. Dusenberry has ~~not~~ been up there in 1915 and 1916, has he?

A I think Mr. Dusenberry has only been at the gate house once in '16 that I have been there.

Q He has been in charge of the flume there for the last two years, has he not?

A Yes.

Q And he has spent practically all of his time in that immediate vicinity, hasn't he?

A Yes.

Q Why didn't you within the last two years ask him to help you?

A I thought his ~~work~~ other work probably kept him busy; it doesn't make any difference.

Q Did you make any inquiry of him whether or not he could assist you?

A No, I have not.

Q Did you seek to get any other employe of the Utah Power & Light Company up there at the plant to help you?

A No, not this year.

Q I believe in making your report for 1916 you copied part of your report for 1914, did you not?

A Yes, I compiled the 1914, 1915 and 1916 all in one part for convenience.

Q Why did you report it with the part of the 1914 report?

A I put it in so that the attorneys could have all of the information about the Utah Power & Light in one form without going back to the other two reports.

Q Now, you say that you made these measurements in 1914 and 1915 and also some in 1916. In each case, as I understand it, you took, or you obtained the discharge in the flume at the Donan station?

A Yes.

Q Were they all made in the same manner?

A Except the depth in strata.

Q Well, in 1916, if I remember correctly, you took a larger number of readings?

A Yes.

Q Than you did in 1914?

A No, I took on May 16, 1916, I took the larger number of reading, but I have never confined that to the same depth of strata I have taken different depths.

Q How would your meter readings in 1916, for instance, compare with those made in 1914 with reference to the number of strata at which you took your readings?

A July 27 1914, I took five stratas or forty readings per second. October 19, 1914, six stratas. November 6, 1914, six stratas. November 9, 1914, six stratas.

Q Just a moment, as I understand it, these readings were all taken one foot apart, that is laterally?

A Yes.

Q Proceed.

A Do you want the 1915?

Q I would like 1915 and 1916, please.

A May 8, 1915, six stratas. June 3rd, 1915, six stratas. July 9 1915, six stratas. May 16, 1916, eight stratas. September 9, 1916 seven stratas. October 9, 1916, six stratas. October 21, 1916, six stratas.

Q I assume your object in making the different readings at the greater number of stratas was for the purpose of making a more accurate measurement, was it not, if possible?

A Well, up to a certain limit, yes. But the observation of using eight stratas was not as satisfactory as the observation ~~at~~ of six and seven stratas, because as I say the meter on the top strata was out of water several times and those readings had to be taken over sometimes as much as three times in order to ~~in~~ get that velocity/

Q I assume you took your readings over as many times as was necessary to obtain, as you have stated, a correct measurement, did you not?

A In every case, and whenever there was a doubt in the recording meter no matter what part of the section it was, it was always read the second time, and whenever it did not correspond with the reading on either side of it it was read the second time.

Q In other words, you took all these measurements with a great deal of care?

A Yes, sir.

Q Could you tell me any difference in the care that you used in making any one of these measurements over that or any other, or did you use the utmost care of which you were capable in every instance?

A In every instance, yes.

Q What meters did you use?

A I have used in 1915 and '16 meter No. 1351.

Q That is one of the meters you had used in 1914?

A Yes, sir.

Q Did you know anything about the accuracy of that meter?

A After the rating of--after the work of 1914 I took the two meters and sent them to Washington to the Bureau of standards and had them rated by the Department there. All those ratings for 1914 were calculated on those ratings from the Bureau of Standards.

Q And had you continued to use the same ratings in the subsequent measurements?

A Same rating table.

Q Same rating table for your meter?

A Yes, I have used the same rating table in '15 and '16. The meter is in good shape, practically same condition.

Q In other words, the meter in all the measurements you have made you are sure of its accuracy, are you?

A Yes.

- Q You testified, I believe, there was an extreme variation of wave height between six tenths and seven tenths of a foot, and that was calculated approximately two hundred and thirty feet ~~that~~ running in the flume, is that correct?
- A Yes, two hundred and twenty-eight.
- Q And that these variations were the extreme distance between the ~~bottom~~ of the trough and the crest of the wave?
- A Yes.
- Q That is right, is it, the waves caused as much of a depression below the mean, that is in the trough, as much of a trough below the mean as the waves amount above the mean, do they not?
- A Well, practically the same.
- Q So that the extreme height of the waves above the mean which you got from your still well would be approximately three tenths?
- A Yes, approximately that.
- Q These measurements were all taken at a point about a thousand feet below the sand box, were they?
- A Eight hundred and forty-five feet, approximately, below the sand box, at the Donan station.
- Q The upper part there is the most turbulent part of the flume, is it not?
- A Well, there are some bad places I observed in the flume. farther down the canyon in 1914, I have not been over the flume except from this Donan station to the gate house and a few places near the Bridal Veil falls in 1915 or 1916.
- Q Well, the ~~turbulent~~ places below the point where you took these measurements and that you observed you say in 1914 were due to low places in the flume wheter there was an acceleration from that reason, was there not?
- A An abrupt change of alignment in one or two instances.
- Q Where did this abrupt change in alignment occur that you mention?

A I think it is just above the high trestle called the high trestle.

Q Did you measure the variation at that point?

A No, I measured the free board in a number of places down the flume at that time.

Q And that varied, I assume, according to the way the flume was, on or off grade?

A Yes.

Q But the only place where you measured the variation in wave height between the bottom of the trough and the crest of the wave was at the point where you made these measurements, is that right?

A Yes.

Q Now, as a matter of fact, that upper portion is always a turbulent part of the flume, isn't it?

A Well, the flume is, the top of the water surface is very rough in every case where I have observed it.

Q That is the most turbulent part of the flume, isn't it?

A I don't think so, down near the Bridal Veil falls, I put in an additional still well and the oscillation was about the same.

Q Is that where the Bridal Veil falls water came into the flume?

A Yes, just above where the Bridal Veil water comes into the flume.

Q But this point you mention the upper part of the flume, just below the sand box is as turbulent as any part of the flume, anyway, if not more so, is it not?

A There is one place just below the sand box is the worst place of the flume I know of, at the end of the racing section.

Q How far down is that from the sand box?

A Well, I can't say exactly, it is probably one hundred and fifty feet.

Q Do you know the number of the station at that point?

A No, I do not.

Q The turbulence of the water is due largely to the condition

in which it comes out of the sand-box, is it not?

A No, not altogether. It continues down the flume.

Q It grows quieter as it goes down the flume, does it not?

A That depends on the construction of the flume.

Q I am talking about the condition as it actually exists.

That is true, is it not, as it goes below the sand box it gradually becomes quieter?

A No, at the Donan station and at the point at Bridal Veil

Falls I don't see very much difference in the top of the water.

Q Well, as compared with other parts of the flume, how is it?

A I have not observed that only in 1914.

Q And you don't know whether it gets more quiet below the point where you took these measurements at Donan's and other parts of the flume except this one place where the water come in from the Bridal Veil, do you?

A That is all.

Q Now, you testified, I believe, that in 1914 you determined the capacity, made a capacity measurement; what do you mean by that?

A The maximum amount of water the flume would carry.

Q Did you measure the maximum amount of water the flume would carry?

A No, I took the amount from the ratings that I had and the amount more that the flume---the amount more in depth that the flume would stand.

Q How did you determine that?

A At a point 271 feet below the gate-house the crest of the wave is thirty-four hundredths below the top of siding. This was the point of minimum capacity.

Q How long was that?

A Well, I could not say. At a point three hundred feet the crest of the wave was four tenths of a foot, or six hundredths more below the top of siding.

Q I am asking you how far that point of minimum capacity you mention extended, what was the length of it?

A I could not say that. This was the point of minimum capacity at that point.

Q In other words you state in your report for 1916 where you purport to copy your commissioner report of 1914, at a point 271 feet below the gate-house, the flume appears to have been raised, making a break in grade line. At this point when the water surface was six tenths feet below the top of siding and crest of waves 3.34 feet below top of siding, this is the point of minimum capacity; is that the point to which you have just referred in the testimony?

A Yes.

Q You say in your report that the flume appears to have been raised at that point, is that right or wrong?

A I think that is a typographical error there.

Q What should it be?

A Sag in the flume.

Q In other words, flume had got off grade at that point, had it, it was below grade?

A Well, I could not say below the grade line.

Q It was not on an even grade with that above, and that immediately below it, was it?

A That is the appearance, it was not. It was not on a grade with the rest of the flume. I have not run any levels over the flume.

Q Was that on the right hand side going down or the left hand side?

A That is on the left hand side.

Q How about the right hand side?

A I don't remember about the right hand side.

Q You merely took the point where the free board of the flume on the lower side--was the smallest as the point of your minimum capacity, did you?

A Yes.

Q And that without any reference to any other portion of the

flume?

A As I said, it is the point of minimum capacity. The condition of the rest of the flume is also reported.

Q That was the point of minimum capacity that date, wasn't it?

A Yes.

Q Do you know how long that condition had continued?

A No.

Q Had you seen it before that day, when did you first see it?

A I don't know; this was the only trip I made over the flume to determine that point.

Q Have you seen that point since that date?

A Yes, I have seen it this year.

Q Did you measure it that time?

A Yes, sir.

Q What did you find it to be at that time ?

A It is about one foot.

Q It is about--

A One foot. The free board is about one foot at this time.

Q The free board is about one foot at this time?

A In 1916.

Q In excess of what; in excess of this measurement that you have given us as a maximum for 1914?

A No, I say the free board my last visit in 1916 was about one foot at or near this point.

Q You misunderstood me, Mr. Wentz. How did the gauge of the flume at that point compare the last time you saw it with the time you went over the flume to determine the point of minimum capacity, was it higher or lower?

A I haven't any way of judging what the condition of that grade line is, except the water surface. That is all I have reported. That has a free board 1914 of fifty-four hundredths.

Q At that one particular day?

A Yes.

Q You don't know how long that sag had existed in the flume a t

that point, do you?

A No, I do not.

Q And don't know how long it continued after that, same depth?

A No.

Q It was merely the day the condition as it existed at the time you made that one trip?

A Yes, sir.

Q Now, you determined the maximum carrying capacity of the flume at the point of minimum capacity at that time, you say, how much free board did you allow at the point?

A Approximately three tenths; I allowed the crest of the waves to reach to the extreme top of the side.

Q Allowed about three tenths free board?

A Crest of the waves was thirty-four hundredths below the top of the siding at this time and I allowed for the crest of the waves to come even with the top of the siding.

Q And that is about five hundred feet above the point that you made your measurements, your meter measurement, is it?

A Yes.

Q And so, in calculating your maximum carrying capacity of the flume you took these three meter measurements made in 1914 and from that calculated what the flume would be with the depth, a maximum depth of how much?

A 5.39.

Q That being the depth of the mean depth of the water at the point of minimum capacity, allowing three inches free board, is that right?

A No.

Q Then explain to me what the 5.39 was.

A The gauge height from the measurement of November 9, 1914, was 5.05 feet; the crest of the waves, point of minimum capacity, was .34 below the top of side. The maximum capacity of 248 is figured on an addition of this thirty-four hundredths of a foot added to the 5.05 feet at the Donan station.

making the gauge height at the Donan station 5.39 feet.

Q In other words, you assume you could run through the flume at that time 5.39 feet of water?

A Yes.

Q The mean depth?

A That is the Donan station.

OMISSION.

Application to set aside defaults. (John E. Booth)

Testimony of Johanna C. J. Anderson.

T. F. WENTZ-----

CROSS EXAMINATION by Mr. Story, continued.

Q Mr. Wentz, at the close of yesterday's session we were discussing a capacity measurement made by you in 1914. I believe you stated that that capacity measurement was based on an assumed depth of 5.39 feet, and the rating which you obtained from the measurements which you made in 1914, is that correct?

A Yes, with a gauge height of 5.39 at the Bonan station.

Q Is that, in your opinion, at the present time a correct calculation of that capacity?

A No, I have not investigated the capacity this year.

Q Is that a correct calculation of the capacity as it was at that time, in your opinion?

A Yes, that was the capacity at that time.

Q What has caused it to change, if anything, or your opinion to change?

A I have not changed my opinion.

Q You are familiar more or less with the science of hydraulics, are you not?

A Yes, some.

Q Made a study of it, have you?

A Yes, sir.

Q The velocity of water in a flume increases with the depth of the water, does it not?

A Well, if a flume is running regularly and uniform.

Q Is it not a fact as the depth increases in a flume, the velocity of the water increases?

A Not in the Utah Power & Light flume.

Q Is it not the case generally in flumes?

A Generally, yes.

Q Is it not a recognized fact in hydraulic engineering as the depth of water in a flume increases, the velocity of the water in the flume increases?

A Yes, if there are no other factors affecting it.

Q You say that the Utah Power & Light Company flume is peculiar in that respect?~~sixixixDonan~~

A At the Donan station.

Q And does not increase--the velocity of water in that flume does not increase with the depth of water, is that true?

A At the Donan station, yes.

Q In other words, you wish the court to understand you as saying that the velocity of the water in that flume at a depth of one foot is the same as it would be in the flume at four feet?

A No.

Q Please explain to the court what you mean.

A The depth of water at the Donan station does not always show the discharge, that is the velocity factor there enters into the discharge of the flume; sometimes at practically the same gauge readings we may have two different discharges at different dates. The flume does not always stay in the same condition, at this point or near this point, it is not always in the same level, sometimes one side is lower than it was at the previous observation. Then there may be some changes on the flume in the near vicinity that have been made by the Power Company that may affect that, but I have not investigated those changes and have not kept any record of them or the levels.

Q You didn't answer my question. I asked you if it was not a fact that increase in depth of water in that flume increased its velocity?

A Not at the Donan station, no.

Q The indcrease ~~sixix~~ in depth at the Donan station has nothing whatever to do with the velocity, has it?

A If all other conditions were equal, yes.

Q You mean to say that no increase in depth at that point ever makes an increase in velocity?

A It would with the same conditions. But if conditions were changed, the flume changed, why it would not make any difference.

Q Please explain to the court how the flume could be changed so that an increase from one foot to four feet of water in that flume would not give any increase in velocity of water flowing at that point.

A The difference between a foot and four feet would make a difference.

Q Then the increase in depth does increase the velocity in that flume, does it?

A That much difference would make an increase.

Q Then, an increase of cross section of
of the flume or area of cross section of water in the flume---
strike that out---that the increase in the flume of the flow
of water in the flume is not directly proportional to the in-
crease in the cross section of water flowing in the flume,
is it?

MR. HATCH: If the court please, I object to the question as not being based upon any answer of the witness, and as being contrary to the answers of the witness, and calculated to mislead.

THE COURT: Objection is overruled.

MR. A. C. HATCH: Note our exception.

A The cross section of the water in the flume at the Donan station does not indicate the discharge.

Q I want you to fully understand my question, Mr. Wentz. You stated that an increase in depth of water does increase the velocity; you have not said how much it increases it, but you have said it does increase the velocity. My question
is

is then, whether or not the increase in volume of water flowing in the canal is directly proportional to the area of cross section alone?

A At the Donan station?

Q Yes.

THE COURT: Now, read that, Mr. Davis, I don't just understand it.

(Question read)

A May I illustrate that?

Q No, I want an answer to the question.

A The area of cross section at the Donan station does not indicate the discharge.

THE COURT: The question is whether the volume---

Q Flowing in the canal is directly proportional to the area of cross section.

A Not at all times at the Donan station.

Q Is it at any time?

A With the same conditions, yes.

Q I want ~~you~~ to fully understand you, Mr. Wentz. With the same conditions existing you say that the volume of water flowing in the canal is directly ~~proportional~~ to the cross section of water in the flume?

A No, sir, not directly ~~proportional~~.

Q Then, if it is not directly proportional, tell me what is the proportion.

A I cannot tell you what would be the proportion. That varies on the velocity in that flume.

Q Then, there are two factors, are there, that enter into the volume of water flowing, one is the velocity and the other is the area of cross section?

A Yes.

Q And if the velocity increases, the volume of water is

not directly proportional to the area alone, is it?

A That is right, there are two factors in this section at the Donan station.

Q So that there would be an increase in flow as the water is increased in depth greater than what it would be, directly proportional to the area of cross section?

A Not necessarily, if the depth and the velocity both increase, there would be an increase.

Q Didn't you say, or did I misunderstand you, did you not say that an increase in the depth does give an increase in velocity?

A If all conditions remain the same, all other conditions remain the same.

Q Now, please state to me what other conditions you are referring to.

A I will have to illustrate that. Immediately below the gate house is a steeper section that I call the racing section. The water in this section down at the lower end ~~half~~ is of less depth than the water in the main flume immediately below it, and it causes quite a high discharge and back wave over the point where the racing section meets the main section of the flume, causes a great disturbance in the water, as it plunges into the water of less velocity in the main flume, and destroys the current. That is, the fillaments don't run parallel. If the water in the main flume, height were reduced, or the discharge reduced so that these points would come more nearly together, that is the surface in the main flume and the surface in the racing section, the fillaments would be more parallel and the water in the main flume at that point would have a greater initial velocity, so the increase in discharge tends to decrease the velocity in the main flume.

Q That is always the case, is it, when those conditions remain the same?

A I don't understand your question.

Q I say when the conditions which you describe remain the same, that is always the result you have or that you obtain?

A That is the condition at the present time.

Q I am asking you, you described certain conditions there which have a certain effect, and I am asking you if the effect which you have described and those conditions is one that always results?

A That results at the present time with an increase in height the increase in velocity decreases.

Q That condition has been substantially the same for the last three years, has it?

A No, the racing section now is not the same as it was in 1914.

Q What change was made in it?

A In 1914, the back wave or the disturbance near the junction of the racing section and the main flume was not abrupt as it is at the present time and came in more nearly together.

Q When was that change made?

A I don't know.

Q Do you know who made it?

A No.

Q Do you know that a change was actually made?

A I know the conditions are different there now than they were in 1914.

Q Do you know there actually has been a change in that condition from what there was in 1914?

A I know the condition of the water at that point is different from what it was in 1914.

Q Do you know there has actually been a change in the condition of the flume since that time?

A No, I have only observed the water surface, the one time

this year, and it is a great deal different than it was in 1914.

Q You don't know whether there has been any change in the flume?

A No.

Q You wouldn't say there was, would you?

A No, I have not made any observation of that, or taken any levels on the flume.

Q And if any change has occurred, you don't know when it has occurred?

A No.

Q Now, referring to your capacity measurement again, in 1914, will you please explain to the court just how you made the computation?

A I platted the observations on cross section paper of October 9, 1914, November 6, 1914, and November 9, 1914, and continued the line drawn through these points with their respective gauge heights to a height thirty-four hundredths higher than the observation of November 9th.

Q That gave you a calculation of 348?

A Two hundred and forty-eight.

Q Two hundred and forty-eight, and in making the calculation you used a straight line on those three measures, drawn through those three measures, did you not?

A Yes, those three measurements are on a straight line.

Q And you continued in a straight line?

A Yes.

Q Up to the other point?

A Yes.

Q Now, the reason you did that I assume was that because of the conditions which you have described in the flume, there was no increase in velocity of the water, because of increase in depth, is that right?

A No.

Q Then, when why didn't you take into consideration increase

in velocity with increase in height of the water?

A This increases with the height of the water, the rating curve takes in these two factors.

Q In direct proportion to the area of cross section, if you use a straight line, does it not?

A It is in proportion to the three controlling factors I have used.

Q You mean to tell me in making a rating curve where there is no change in the velocity of the water, you use a straight line?

A We used only the line the discharge measurements designate.

Q Did you not testify that except for the peculiar conditions which existed in the flume at that time, that there is an increase in the velocity of the water, increase with the height of the water, or as the height of the water increases the velocity increases?

A Those conditions in 1914 on which this rating curve was made, were not so abrupt. There were not marked disturbances at this point, at the end of the racing section like there is in 1916 where our gauge height don't correspond with the discharge.

Q But, in making that curve, you used only a straight line?

A I used a straight line at the points designated, which is a straight line.

Q And continued that as a straight line?

A No, thirty-four hundredths of a foot farther in height.

Q And that would bring it directly proportionate to the area of cross section, wouldn't it?

A That brings it directly, as the three points designate.

Q I am talking about your final point of three hundred and forty-eight; there is a direct increase there in proportion to the cross section, and that is all, is there not, when you use a straight line?

A Yes, that is true; but that is not the point; the point is

marked by three points of discharge.

Q But the assumed point that you give from your calculation is one which is based solely upon the increase in the area of cross section, isn't it?

A The point is based solely on the three discharge measurements, the line described by those measurements.

Q The three hundred and forty point, or two hundred and forty point, itself, is based solely upon the straight line drawn through those three measurements that you made, drawn through the point reached by those three measurements, is it not?

A Yes, it is drawn through those three measurements.

Q I will ask you to examine defendant's exhibit 145, and I wish you would please check up the points on that exhibit as shown by your measurements. Does that plat correctly represent the measurements you made to which you have testified in court?

A Yes.

Q Then, please draw your line and show exactly how you arrived at the three hundred and forty-eight or two hundred and forty-eight point; in other words, you arrived at that point by drawing a straight line through these measurements, did you?

A Yes.

Q And that then increases the discharge which is shown on the scale at the lower end of the map in direct proportion to the increase in height, does it not?

A Yes.

Q And does not take into consideration any acceleration in velocity, if any, does it?

A Now, I say "yes", that increases direct, this is on a small scale and for a very small quantity, raise the height of thirty-four hundredths. Undoubtedly this line, if it were projected through the several points on a large scale, it

would be a curve same as any other rating curves.

Q There is always a curve, you say?

A Generally in a flume, and for that reason I have marked these in the report as a segment of a rating curve.

Q You said it was a straight line in your report, did you not?

A Described practically as a straight line.

Q Did you not say you have done it by projecting a straight line, in your report?

A I don't remember, I can look that part of it up.

Q I wish you would. You will find it, I think, on the third page there.

A On page 6 of part 12 of 1916 report, top of page reads:

"Ratings numbers two, three and four were plotted for rating curves, as shown by segments of rating curves, describing practically a straight line. That is the discharge varies directly with the gauge height."

Q Then, you proceed, do you not, "assuming this condition to continue to gauge height 5.39, and that the increase in depth of 0.34 at the point of minimum capacity, will also cause an increase in height of the same amount at Donan's rating station, then the maximum flume capacity at the point of minimum capacity is approximately 248 second feet?" ?

A Yes.

Q That is what you state in your report?

A Yes.

Q Now, if a continuation of the straight line above the measurements shown on the plat gives a correct statement of what the discharge would be at a greater depth, a continuation of the straight line below those points will give a correct statement of what the flow in the flume will be at the lower depth will it not?

A No.

Q Lesser depth?

A Not necessarily, with all the conditions, but might for a small

distance like thirty-four hundredths, it would be approximately all right, but the difference here of using this directly is partly assumed, but the assumption is very conservative as I say, with the racing section there, the increase in height tends to decrease the relative velocity and in reality my opinion is that a raise of thirty-four hundredths in that flume the discharge would be less than two hundred and forty-eight second feet.

Q Any correct rating curves has to take into consideration the zero point, does it not?

A No.

Q Any correct rating curve, if continued, will necessarily hit the zero point, will it not?

A No.

Q Why won't it?

A Several of them in case of back water effect they would pass through the gauge points above the zero point. That is we may have a depth of one half foot in a flume with no discharge.

Q A depth of one half foot. You would say that was the maximum, would you, before you would show a discharge?

A No, that depends on the conditions.

Q How much of a height would you say that you would have to have in this flume before your rating curves would show any discharge whatever?

A At this point it would be zero.

Q At this point it would be zero, would it?

A Yes.

Q Now, if I understood your testimony correctly, you made a further measurement in 1914, namely one on July 27, 1914, did you not?

A Yes.

Q Is that shown upon the exhibit?

A Shown upon the exhibit, but is marked 228, that is correct.

- Q Why didn't you-- that was made on July 27, 1914, was it?
- A Yes.
- Q Why didn't you take that measurement into consideration in making your estimate?
- A I had at the time the two points, November 6th and November 9th at the same time that I made the estimate of the discharge. They were the conditions at that time. This other point of July 27, was probably under different conditions.
- Q Do you know what the different conditions were?
- A No.
- Q Did you observe them at that time?
- A No.
- Q So you cannot tell what the difference in conditions were at the present time?
- A No.
- Q Now, you say you made this computation at the time you took this last measurement, on November 9th, did you, 1914?
- A Immediately after that, yes.
- Q Do you know that those conditions which had prevailed in the flume at that time or at intervals were those that prevailed on October 19, 1914, twenty days previous ?
- A No, there may have been some changes at that time.
- Q At the time in July when you made your measurements, July 1914, the gauge height of 4.79, you got a volume of water flowing in the canal of 228, did you?
- A Yes.
- Q On October 19th with the gauge height of 4.9 you got a volume flowing in the canal of only 208, did you?
- A Yes.
- Q In other words, much greater depth of water and much less volume of water flowing through it?
- A Yes.
- Q What was the difference between those two conditions?

A I don't know the conditions on July 27th, I never made any particular observation of them. I went there to measure the discharge and that is all I did at the time.

Q Did it not strike you as queer at the time you made your measurements in August--I mean in October 1914 that there should be such a variation between that measurement and the one that you had made during the previous July?

A Yes, I noticed those conditions and observed them.

Q When you noticed that difference did you make some effort to determine what the cause of it was or what the difference was?

A No. I think the difference is mainly on account of the difference in flume there and head-works and I have not run those levels or made any observations.

Q I believe you testified a while ago that because of the peculiar conditions existing in the flume there, that the increase in the height of the water did not give an increase in the velocity of the flow?

A Not always.

Q That condition was not true when there was an increase of depth over--or increase of volume of water over the--on your November 9th measurement, was it?

A Yes, it showed an increase in discharge.

Q So, then there was an increase at that time?

A Yes.

Q Now, referring to your measurement on July 27th, 1914, you omitted that entirely in making your computation as to the volume or the carrying capacity of the flume at the minimum capacity giving the volume of 248, didn't you?

A Yes, that point is entirely off the curve, was established at that time and could not be used.

Q Why did you not take it into consideration?

A Because it was so far off from the three measurements I have at that time under those conditions.

Q You made some more measurements in 1915 I believe; I wish you would check up the exhibit and see if those which are given on it correctly show those measurements as found by you.

A Yes, they are correctly platted.

Q You have checked also the measurements for 1916, have you?

A No.

Q Please do that at the same time.

A Yes, they are correctly platted.

Q Please tell me what is the cause of the--was the cause of the difference in volume of flow in the flume between the measurements that you made on June 3rd, 1915 where with the gauge height of 4.99 you obtained a volume of flow of 239.5, and the measurement which you made on September 9, 1916, where with a gauge height of 4.87 you obtained a volume of flow of only 199 second feet?

A During 1915 I did not make any observations of the conditions in that flume at all. I simply went there and made the measurements did not make any observation of the flume or the conditions.

Q Well, since--you have taken a number of measurements on that flume, Mr. Wentz, and have noted these variations, have you never in view of all these variations made any attempt to definitely obtain the reason or the cause of variations between your measurements?

A Yes.

Q When did you make that examination?

A I run two lines of levels, took the heights of the water at the gate house at two different times in 1916. I think the last two measurements I made this year to determine and see if that was the main controlling factor on that point.

Q What was it you determined was the main controlling factor that has caused these variations?

- A I have only the two measurements there and difference in discharge with only two second feet and I did not have range enough to make any determination on it at all.
- Q Take two other measurements, what caused the variation between the volume of water flowing in the flume at the time you made your measurement of May 5, 1916 when with a gauge height of 4.69 you obtained a volume of 229 second feet, and the measurement made on September 9th of the same year when with a gauge height of 4.87 you obtained a volume of water flowing of only 199 second feet?
- A I have not observed the difference in the construction there, causes of those variations.
- Q There is a difference there of approximately thirty second feet, isn't there?
- A Yes.
- Q Although the water in the flume was approximately two tenths deeper?
- A Yes.
- Q And you cannot at this time, although those measurements were made this year, explain the variations?
- A No, I have not made those observations to determine what that factor is.
- Q Then, I take it that if the volume of water ^{which} ~~in~~ that flume would have carried in November in 1914, with an assumed depth at Donan's station of 5.39, if it varies in accordance with the conditions which you have described, that that flume would also vary as those other conditions varied, would it?
- A No, the effect at that time in the increase of depth on the back wave from the section there tends to increase-- to decrease the discharge, and as I say, my judgment is, that the real quantity, that the increase of gauge height ^{of 34 hundredths} is less than the two hundred and forty-eight second feet.
- Q Now, if those conditions which prevailed only at that

particular time because you say they were varying, gave this gauge height, then if you are going to establish a curve from these other measurements which you have made, in would give you an entirely different rating at the point 5.39, based on these subsequent measurements, would it not?

A Well, you would necessarily have to have a series of those measurements under the same conditions to describe the curve.

Q I am talking about if the conditions, if the change of those lower measurements, conditions would change with the upper measurements, would they not?

A I don't understand your question.

Q All right. Please establish a curve from these measurements made in 1915 and 1916, and also the measurement made by you in 1914 for a depth of 5.39 feet.

A We have not those measurements under the same conditions there, enough to make a curve.

Q You assume when you make your curve from those three measurements made in 1914, that the conditions would remain constant, do you?

A Yes, for those three days.

Q And then the condition which would exist at a depth of 5.39 would remain constant for only those three days, wouldn't it?

A Yes.

Q And as the conditions vary in the flume at those different times, then your volume of water flowing or the capacity of your flume at a depth of 5.39 would also vary, would it not?

A Yes.

Q Then that difference of--capacity of 248 second feet at a depth of 5.39 holds good for only that particular day, November 9, 1914, does it?

A That particular time, yes.

Q I wish you would examine defendant's exhibit 146 and see if

that correctly shows the measurements made by you October 19, 1914, November 6, 1914 and November 9, 1914.

A Yes.

Q Projecting your straight line through those three measurements gives you a height of--or volume of 248 at a height of or a given height of 5.39, does it?

A Yes.

Q Mark that with an "X" Now, projecting that straight line downward it crosses your gauge height line at what point?

A 2.36.

Q Then the projection of the straight line would show that at a gauge height of 2.36 there would be no volume of flow in that flume, would it?

A No.

Q What does it show with the straight line?

A The curve--projection of the curves does not run in this flume--would intersect the zero points at both zeros, the gauge height zero and discharge.

Q In other words, a straight line drawn through those measurements would not give the correct measurement, correct reading at the zero?

A Not at the zero point, because that curve is greater down near the zero point, and tends to be a tangent after they go up.

Q Are you positive about that, Mr. Wentz, that the higher you go the more nearly a straight line your rating curve would be?

A Yes.

Q And are you quite positive that as the height, gauge height increases, the rating curve does not flatten?

A It is the same thing, the curve approaches a straight line, the flattening is exactly the same condition.

Q But, it tends to give a larger flow of water because of the increase in velocity, doesn't it?

A Yes.

Q So that instead of being a straight line it would tend to flatten as you go above, go up?

A Yes.

Q In other words, you cannot get a correct computation by using a straight line, can you?

A Not back to the zero point, no.

Q If you cannot get it back to the zero point, you cannot get it beyond any particular point, can you?

A Approximately for a short distance.

MR A. C. HATCH: There is some redirect, and in view of the technical examination, we wish to prepare before making our redirect, a plat, showing the measurements for 1916 and '13 and '14.

MR. JACOB EVANS: I desire to ask one question.

REDIRECT EXAMINATION by Mr. Jacob Evans.

Q Mr. Wentz, I wish you would explain what duties Mr. Tanner, Caleb Tanner and Freeman Tanner and these other parties you referred to performed at the time you made these measurements.

A In the measurements of 1915 and 1916, the assistants on this work, Mr. Tanner and Mr. Freeman Tanner, and others, were employed in holding the stay line on the meter. The meter is mounted on a steel rod and from this steel rod and from this steel rod back to a point up stream a small brass or copper wire is run and anchored on the second cross cord above the station. In this cross cord a number of spikes are driven. Beginning on the south side the meter is put into the water, the rod plumb. This wire is wound around these spikes a number of times and then held by the assistant in this position to--from this point two measurements are made in the stay line. The assistant in each case has nothing whatever

to do with the discharge measurements, neither with the meter, the notes or the observation. He simply moves as directed from one nail to the other and fastens the stay line.

Q The fact that Mr. Freeman Tanner or Mr. Daleb Tanner or Mr. Dean was in the employ of the plaintiff in this action at the time---Mr. McCune, was employed by the plaintiff in this action, did that influence you in any way in making correct measurements?

A No, they have nothing whatever to do with the measurements no more influence than Mr. Story in Salt Lake had.

Q Were you in the employ of the plaintiff when these measurements were made?

A No, no more than in the employ of every other party in the action.

Q And in making the measurements that you made, how did you receive your compensation for those measurements?

A Through the Clerk of the Court as provided in the Court's order and the stipulation.

Q Now, in making these measurements, did you have any interest whatever in making them other than to do your duty as a commissioner of this court?

A That is all. My main object in making the discharge measurements over the whole system, is in order to help those parties get a record of the water they are actually using. On some of the canals they take daily gauge readings and I made the ratings for them so that they can get their discharge and the water they are actually using.

Q In other words, it was for the purpose of getting the truth and the facts in the case?

A Yes.

Q Now, at the time of making these various measurements that you have testified to, was there additional water running in the river over the dam of the Utah Light & Power Company,

take, for instance, some particular date?

A On May 16, 1916, the discharge of the flume was 228.65 second feet. The discharge in the river at the United States Geological Survey immediately above there, as reported by the survey was 730 second feet. On September 9th, the discharge in the flume was 198.93 second feet. The discharge in the river at the station was 302 second feet.

Q How far is that station above the dam?

A Oh, approximately a mile.

Q Is the stream an increasing or diminishing stream between those two points?

A I could not say; I do not think there would be very much difference between those two points, some small increase, some small springs along there.

Q All right, proceed.

A On October 9th, discharge in the flume was 218.76 second feet.

Q That is 1916?

A 1916. I have not at this time that discharge with me for October in the river.

Q Can you get it?

A I can get it, yes.

Q If you will please.

A Do you desire the other dates?

Q Yes, if you have them.

A I haven't all that information here. If you desire it, I think the best way would be for me to submit those.

Q If you can get it then, Mr. Wentz, I wish you would.

MR STORY: Just one moment. The witness is comparing it with the geological record. I think that is in the record, getting the geological record into the evidence. And I think if they are going to do anything of that kind, they should offer them and give me an opportunity to make my objection.

THE COURT: What motion or objection do you

make now?

MR. STORY: I object on the ground it is immaterial, irrelevant and incompetent.

THE COURT: I am inclined to think it is. I don't think Mr. Wentz is competent to testify to the contents of a Government record.

MR. JACOB EVANS: Of course, that would be true, as I understand it. There have been a great many of these things already introduced in evidence.

THE COURT: If they are in evidence, of course that would only strengthen the objection.

MR. STORY: There has certainly been no discharge measurements in so far as I know.

MR. JACOB EVANS: Let me ask Mr. Wentz whether or not these measurements have been introduced in evidence in this case.

A Not the original, except for the South Fork of the canyon.

Q If you can get them you get them. Now, I will ask Mr. Wentz, if you know as a fact when these measurements were made whether or not there was water running over the dam in each instance, without stating what quantity?

A May 16, 1916, yes.

Q You mean Yes, you know it as a fact, or was there water running over it?

A Yes, there was water running over the dam on May 16th. The other dates ~~ixxavn~~ of this year I have not made any observation, any notes in my observation at that point.

Q Have you any recollection about it as to those other dates?

A Well I could not say only as by the discharge of the river, ~~part~~ compared with the discharge in the flume. From those facts I know there was water in the river.

Q If you have any information which you can get about that I wish you would get it, from anything that will refresh

your recollection as to whether or not there was water running over the dam at these different dates. You say you know the discharge of the river on these dates?

A From the United States Geological survey, yes, sir. That is how I know them compared with the measurements I have made on the river and the gauge height reported to me.

Q Now, you know only then by reason of the government record, as to the quantity of water in the river as to those dates as I understand it?

A Well, farther than that; I make measurements of the total nearly every week and I have the gauge readings reported to me by telephone from the station at Vivian Park and I keep track from day to day of practically what there is in the river during the whole season.

Q And you know that all the water flowing in the river flowed over this dam, don't you; that is, that is not diverted out?

A Over the dam and through the dam.

Q Yes, over the dam and through the dam. Now, from that knowledge that you have, can you state whether or not on these dates there was water flowing over the dam that was not taken through the flume of the Utah Power & Light Company?

MR. STORY: I object on the ground that it is irrelevant and immaterial and incompetent. The witness stated that he has this knowledge only from the Government record.

MR. JACOB EVANS: He doesn't state so.

MR. STORY: As to any particular day.

THE COURT: My recollection of the substance of Mr. Wentz' testimony on that subject was, it was in part from the records of the Government station; if that is true, I think the objection should be sustained.

Q Have you any knowledge which would enable you to determine either from your measurement of the river or from actual

ly seeing the water in the river, can you determine from any knowledge that you have whether or not there was water flowing over the dam on the dates these measurements were made?

MR. STORY: I object to it unless it be restricted to his personal knowledge.

THE COURT: I understand that is the substance of it. Objection is overruled. He may answer the question, yes or no, whether he has sufficient knowledge to state.

A I cannot say off hand on these two particular dates. I would have to look that information up.

Q If you will look it up and refresh your recollection and we can recall you for that purpose, if you find you have knowledge which would enable you to testify. Have you made any observations about the time of making these measurements to determine the difference of the elevation of the water at the dam and the elevation of the water at the gate house?

A Yes.

Q What is it ?

A Do you mean in the fore-bay above the gate?

Q Yes.

A Or below the gates, there was water in the flume---

Q Both above and below.

A On October 9, 1916, the elevation of the water taken in the forebay is 94.84. The water surface immediately below the headgate, the elevation was 92.36. The water surface, the elevation of the water surface at the gate house was 92.32. These elevations are based on a bench marked, designated 200 on the south end of the inner wall at the head works.

Q How many flash boards were used at that time, do you know?

A I don't know.

RECROSS EXAMINATION BY MR. STORY.

- Q Just one other question, Mr. Wentz. I believe you stated yesterday you had been familiar with this flume a number of years. Does your acquaintance with it date back of 1914?
- A Yes, but I have made no measurement on the flume prior to that.
- Q Did you ever make any particular investigation whatever of the flume prior to 1914?
- A No.
- Q Merely were acquainted with it as you would pass up the road, were you?
- A Yes.
- Q Where is that bench mark of the elevation at the gate house that you referred to?
- A It is on the top of one of the re-inforcing rods that stick out of the concrete on the southwest corner of the inner wall, near the head works.
- Q Where was the elevation of the water surface taken, in the gate house?
- A Just in front of the gate house.
- Q In the flume?
- A Yes, below the concrete pipe.
- Q Outside or inside of the gate house?
- A Outside.
- Q Then it would be immediately below the gate house, in the flume immediately below the gate house?
- A No, it is above the gate house just in front of the door.

MR. A. C. HATCH: We now offer plaintiff's exhibit 147, a measurement, list of measurements made at Olmstead flume at Nunn's rating station by the cross complainants, the Utah Light & Power Company.

MR. STORY: I object ~~that~~ ~~the~~ ~~measurements~~ ~~are~~ ~~not~~ ~~properly~~ ~~authenticated~~ and ~~ground~~ ~~they~~ ~~are~~ ~~not~~ ~~properly~~ ~~authenticated~~. I will ~~have~~ ~~not~~ ~~been~~ ~~properly~~ ~~authenticated~~. I will

make my position entirely clear in that matter.

THE COURT: I don't understand yet what it is.

MR. STORY: The plaintiff company asked us to furnish them with a list of the measurements which were made by the defendant in this case as shown by its records, and we have attempted to comply with their request and give them all the measurements of which we had a record.

THE COURT: I think your objection should be sustained. If you desire them to bring in the record, you have the right to have it done.

MR. STORY: There is no question on that. This is unquestionably a copy of our record, this is what we have given them, but there is some measurements there we don't know anything about their accuracy.

THE COURT: I will consider that question when the records are brought in. I think you have a right to make that objection. They may bring in the record, if you desire.

MR. STORY: Then, we will have to bring in the individual who made the measurement and show the condition.

THE COURT: I think your records are admissible in evidence.

MR. A. C. HATCH: Admissible for what they are worth, but it is presumed people keep correct records.

THE COURT: You may produce them if you desire, but I don't think you are required to have this copy introduced. You have a right to have your records in the shape they are in before the court if you desire that. The objection will be

sustained, and the court will require the records to be brought if you ask for them.

MR. STORY: I will withdraw my objection as far as the copy is concerned, because we know these are copies of the records, and accurate copies of the records.

THE COURT: Then, I understand your objection is made as though the records themselves were presented?

MR. STORY: Yes.

THE COURT: You may make your objection then.

MR. STORY: Objection is there is no showing on the part of the witness these are accurate measurements or showing all the conditions under which they were made.

THE COURT: Objection is overruled. These may be received as the record.

MR. STORY: **Note an exception.** Of course we will have an opportunity to explain them then.

THE COURT: Certainly.

MR. A. C. HATCH: We now offer plaintiff's exhibit 148, a list of available measurements made at the Olmstead flume at Donan's. This being a copy furnished us of the records kept by the Utah Light & Power Company of the measurements of its flume, at the particular point named, Donan's, on their flume, Utah Power & Light Company is their true name.

MR. STORY: With the same objection, I simply make the same objection I did to the last exhibit.

THE COURT: Same ruling and you may have an exception.

that it may be shown in the record that there is a double purpose in offering these, as showing first the same discrepancies in the measurements testified to by Mr. Wentz, and I will call the court's attention at this time to the measurement 5-9-14 by H. L. Stoner, gauge height 4.70, area 37.50, mean velocity 6.58, discharge 237.

On the 2-16-15, the gauge height the same, 4.70, area the same 37.50, the mean velocity 6.81 instead of 6.84, and the discharge 256 instead of 258. The other measurements the same.

MR. STORY: I think the exhibits will speak for themselves. This is really a matter of argument as to what they show.

THE COURT: I understood it was calling the court's attention at this time.

MR. A. C. HATCH: I called the court's attention at this time to one purpose for which they are introduced, as well as --

MR. STORY: Of course, that has for its foundation, however, the correctness of the exhibit.

MR. A. C. HATCH: Now, we offer plaintiff's Exhibit 149, being a certified copy of an application to appropriate water made by Utah Power & Light Company June 13, 1914.

The rating curve that was handed you yesterday, Mr. Swendson, were you through with it?

MR. SWENDSON: I am going to send it back to my office; they belong to me, these files.

MR. A. C. HATCH: They are one of the files of the court here.

MR. SWENDSON: They got there by mistake.

MR. STORY: We know nothing how they got there, as a matter of fact, don't know how they were prepared. They simply appeared in the files here; they have never been filed or introduced in evidence, anything of the kind.

MR. A. C. HATCH: I don't know how they got there, why they got there, but I think that they should remain until some proper disposition is made of them.

THE COURT: What endorsement is made on them?

MR. A. C. HATCH: Nothing whatever, Mr. Tanner had them.

MR. STORY: Some of my notes might have been dropped on the table and picked up by the clerk and I don't think they constitute part of the files of the case.

THE COURT: I don't think there is anything before the court with reference to them. If someone offers them or asks to withdraw them from the place where they were found the court will pass on it. There is nothing now before the court. If you desire to bring something before the court, with reference to them, Judge Hatch, the court will consider it.

MR. A. C. HATCH: I understood yesterday when I handed them to you you were going to check them up and return them.

MR. SWENDSON: I was going to give them to Mr. Story to make a rating curve.

MR. A. C. HATCH: I don't care to raise any question about these, but I understood you were going to check them and see if they were correct.

MR. SWENDSON: I could not check them up here,

I will have to go to my office to do it.

MR. STORY: May I say so that our position will not be misunderstood; we are not at all averse to having any direct record we may have go into the evidence, of course, but our position is that you cannot make a correct curve, a rating curve from gauge readings at that point and Mr. Wentz so testified yesterday.

THE COURT: What are you directing your argument to?

MR. STORY: These gentlemen have stated their position, talked about these rating curves, and I am simply stating to the court my position--

THE COURT: I don't know what their position is yet. They have not asked anything.

MR. STORY: Then I will withdraw my remark.

THE COURT: There is no application made to the court with reference to this paper at all. They were just handed to the court for the purpose of examining to see whether there was any identification mark on them. Now, if any one offers them in evidence or asks to introduce them I will hear that.

MR. STORY: May I ask the plaintiffs the object in introducing exhibit No. 149 before I make my objection.

MR. A. CA HATCH: The purpose is this, they are here claiming a right to pump water out of the Provo river that belongs to them, and we claim that they have no water or water right in the Provo river below their dam. There is the position we take, and that this application is of no right and it establishes that they

claim no right; it gives them only the right to the use of the water, that is our claim for it, of the Bridal Veil Falls for power purposes, but does not give them the right to pump water out of Prove river as against any of the parties to this action below their dam and pump it up into their flume.

MR. STORY: For the purpose of saving the record, I will object to it on the ground that it is irrelevant and immaterial. We are making no claim of right under the appropriation from the state engineer's office, and have not attempted to show anything of the kind in our case. We have, however, claimed the right by actual user of water which seeps through our dam and gets away from us that way, to recapture and pump it, whatever right we have actually obtained by the diversion and application.

MR. A. C. HATCH: Our position is, if the court please, on that, they can advise no right by diversion in 1910.

MR. STORY: We are not claiming any right under the filing.

MR. A. C. HATCH: Or 1909, or since the passage of the law providing how water may be acquired, without making application to the state engineer for it.

MR. STORY: We concede the correctness of that position. As a matter of fact, I will later introduce a motion which will have exactly the same legal ground.

THE COURT: This may be received for whatever it is worth. The court has not examined it.

MR. STORY: So as to make it clear while

we have it in mind. Our right on Bridal Veil falls was acquired prior to the passage of the State engineer's law and whatever right we claimed at that time is merely the right we have at that time.

THE COURT: The court will not pass upon the effects of it. It may be received and will be considered for whatever purpose it may afterwards be considered competent for.

MR. A. C. HATCH: The same fact with regard to arguing the case is applicable at this time.

MR. STORY: I acknowledge the corn.

MR. A. C. HATCH: We now offer Exhibit 150, being page 55 of the report of the United States Geological survey of the measurement of the flow of water in Provo river, at the mouth of the canyon, and also showing the daily discharge in second feet at the Telluride Power Company's flume near Provo, Utah, for 1905. It may be admitted, I presume, that the Telluride Company is the predecessor in interest and that the flume is the flume now used by the defendant, the Utah Power & Light Company.

MR. STORY: Defendant objects on the ground that the exhibit offered is incompetent, irrelevant and immaterial and not properly authenticated or foundation laid for its introduction, and in connection with that objection I would like to add that constituency having something to do about duels inasmuch as I remember correctly, they objected to the introduction of the census report showing the

population of Provo at an early stage of this trial, on the ground that such Government records were inadmissible in evidence for any purpose. I cannot see the difference between that record and this.

THE COURT: I don't remember that.

MR. STORY: Did they not object to the census report, Government census reports?

THE COURT: I don't remember any such reports were offered.

MR. STORY: I was so informed by Mr. Thomas.

THE COURT: Mr. Thomas is not correct.

MR. THOMAS: We presented a tabulation prepared by a Government officer giving the population and estimate of population of Provo City.

MR. A. C. HATCH: Estimates.

MR. THOMAS: They were Government records, however. They were not properly authenticated and because they were not properly authenticated, they were not admitted.

THE COURT: The court does not remember such a ruling as that. Our statutes make all Government records admissible. I remember the ruling quite distinctly and desire to state it so that you will understand it. The court sustained the objection to the estimate made by the Government officer, that was all, not a report of any fact.

MR. STORY: The statute provides, as I remember it, Your Honor, how a public document shall be offered.

MR. A. C. HATCH: If the court please, the report as to the population at the time taken

went in.

THE COURT: Yes, I think so.

MR. A. C. HATCH: But the estimates made what the population might be at another period was not admitted.

MR. STORY: I was assuming that was the case, I was misinformed. My objection this is not properly authenticated is still good, inasmuch as our statute provides that public documents may be introduced in evidence when they are authenticated by the custodian, government custodian. This is not authenticated.

THE COURT: You may direct your remarks to the contention made as to the publication being made by the government. If it is not one of the publications, the court will sustain it, if it is one of the publications made by the government, I will hear from you.

MR. STORY: The only statute I have in mind is the one to which I have referred. If you have the law here I would like to present it.

THE COURT: Objection will be overruled.

MR. STORY: Just a moment. May I call your attention to one section here, section 9.

THE COURT: I am assuming you make no question as to the fact this is a publication.

MR. STORY: I don't make any objection to that no, but under Section 9, documents in the departments, and this is a document in the department of the interior, Documents in the Departments of the United States Government, by the legal certificate of the legal custodian thereof.

THE COURT: Objection is overruled.

MR. STORY: Note an exception

MR. A. C. HATCH: If the court please, we will leave the record, the entire record with the court. We offer page 55, only.

THE COURT: Let me see the book itself. You may proceed.

CALEB TANNER, called by the plaintiff, being first duly sworn, testified as follows:

DIRECT EXAMINATION by Mr. A. C. Hatch.

Q Mr. Tanner, your name is Caleb Tanner?

A Yes.

Q And, have heretofore testified in this case?

A Yes, sir.

Q Civil and hydraulic engineer?

A Yes.

Q I will ask you if you are acquainted with what is known as the temporary flume, the flume of 1902 and the present pipe line and flume of the Utah Power & Light Company?

A Yes.

Q Have you made any measurements to determine the capacity of either of those flumes or the pipe line?

A Yes.

Q Which one?

A I made some determinations of the volume of flow of the flume the first of which measurements was in October, the 20th, 1913. The observations made above ^{the} point where Bridal Veil water is discharged into the flume. The flow at that date being 206.2 second feet. Under date of October 19, made a measurement at---

MR. STORY: What year?

A 1914. Made a measurement at what has been called in the testimony, the Donan's station, when the discharge was 208.09.

MR. STORY: Would it not be better to get the depth and gauge height, so that we will have them altogether as we go along?

MR. A. C. HATCH: Yes, I think so.

Q Is that Donan's station?

A Yes.

Q Above the point where the Bridal Veil Falls water empties into the flume?

A Yes, all of these measurements that I report only measure volumes of flow diverted from Provo river, by the diversion dam of the Utah Power & Light Company across the river there above the first lateral appropriation, which is Bridal Veil Falls.

Q Beginning again with your first measurement give us the gauge height and free board, if you have it, and the discharge.

A I would like to ask for information, if you want all the data I figured with reference to the time of these individual measurements?

MR. A. C. HATCH: Do you desire it, Mr. Story?

THE WITNESS: There were several purposes served by the measurements; one of the purposes was to determine what has been called in the testimony here the coefficient of roughness or coefficient of rugosity.

Q We want that given.

A Then I will give all the data then with reference to each measurement?

Q Yes.

A Going back to October 20, 1913, depth of the water 4.74 feet, area of the cross section 37.41 feet. The width eight feet. The wetted perimeter 17.4 feet, the hydraulic radius 2.15 feet.

Q What does that mean?

A The wetted perimeter divided into the area of the cross section. Mean velocity in the section 5.51. From these elements I compute the coefficient to be .015.

Q The discharge?

A I think I have already reported that.

Q Give it again, so it will be on the same page in the record.

A 206.2. October 19, 1914, measurement at Donan station,

depth of water 4.92 feet;

wetted perimeter 17.84.

Area of cross section 39.36.

Hydraulic radius, 2.21.

Mean Velocity 5.29.

Co-efficient of roughness .015---

Discharge 208.09.

November 6, 1914, at Donan's.

Gauge 4.95, depth of water that is.

Area of the cross section, 39.60

Wetted perimeter, 17.90.

Hydraulic radius, 2.21.

Mean velocity, 5.37.

Discharge 212.92.

The rugosity in these measurements is .014 plus.

MR. THURMAN: That is co-efficient?

A Yes, the rugosity is nearer 15 than 14.

November 9, 1914, discharge 219.57.

MR. JACOB EVANS: Where was this measurement made?

A At Donan's. Depth of the water 5.05; wetted perimeter 18.10; area of the cross section 40.4; hydraulic radius 2.23; mean velocity 5.43; co-efficient of roughness is practically .015, somewhat less.

MR. STORY: Have you got it exactly?

A To be exact, the co-efficient of roughness of 13 would give a velocity of 6; and a co-efficient of roughness of 15 would give a velocity of 5.33, and I have got 5.43. so that it is

just a little above 15.

MR. STORY: Little below 15 you mean?

A Little below 15, beg pardon.

July 27, 1914, at Donan's, 230.42; depth of water 4.79; area 38.32. I don't think it would be advisable to delay while I calculate this, I notice I have not run this one through.

MR. STORY: We would like it very much, Your Honor, willing to submit to the delay, want it, might as well have it one time as another.

A It takes a little time, is all.

MR. STORY: We want it.

A I am willing to give it; I can figure it at noon; it is an omission. I see this is one I only figured part of the distance down. Shall I figure it now?

MR. A. C. HATCH: I think Your Honor, he can get it at noon.

THE WITNESS: I can figure all but the coefficient and I will have to take that from the table. I don't have a table here.

MR. STORY: I thought the measurement was taken for the purpose of getting the coefficient?

A Yes.

MR. STORY: But you have not calculated it?

A I did not run it out. I have it here, but I haven't the detail. Co-efficient is .013, but I haven't the detail. I run it down with.

Under the date 1913, the latter part and also in 1914 I have a set of observations we used in conjunction with a report of discharge at the United States gauge station above the diversion dam by subtraction gives the volume of flow, the publication covering 1913 and '14 is not out. It is published up to and including September, but not down through the months that I made my observations. However, I obtained from the office a blue print sheet of the discharges

covering the period, which would need to be used in conjunction with my own observations of flow on the river at Donan's, on the river at Donan's below the diversion there, in order to determine by subtraction the quantity of water flowing in the flume. This would be more in the nature of an approximation and would not be as definite as the actual flume determinations that I have given, but using that data on October 21st---

MR. STORY: I object to using that data for the reason it is incompetent, irrelevant and immaterial and has not been produced.

THE COURT: I will hear from the other side. Do you offer this evidence, Judge Hatch?

MR. A. C. HATCH: I have never seen them.

THE COURT: I understood it to be a comparison made with the measurements taken by the Government station and which has not been reported or published yet. It does not seem now Mr. Tanner has the information.

MR. A. C. HATCH: I will ask Mr. Tanner a question or two.

Q Do you know who made these observations from which this data is compiled?

A The gauge observer at the south fork, Mr. Dusenberry.

Q And is that the same Dusenberry who is in the employ of the defendant, the Utah Light & Power Company?

A Yes.

Q And was he in their employ at the time of the making of these measurements?

A Yes.

Q How did you receive these papers?

A The office of the water resources branch at Salt Lake City, made application for the data. I presume it would be published by this time and received all the published data,

and they furnished this for these particular months I made inquiry about at the time; they may be published now. That was about a month ago. These are the records of the Water Resources office, covering the flow of Provo river for the intervals of time that is indicated upon the blue print sheets.

Q Do you know who made the blue prints?

A I don't know who made the blue prints, but I am acquainted with the discharge or the interval of October, or a great many dates, and I know that they are correct, but I am not acquainted with all of the interval, there, and I am not acquainted with all of these intervals that I wanted to use in making the comparison.

MR. A. C. HATCH: If the court please, we think this report is now published and we would ask that we be allowed to proceed giving his results subject to the presentation of the published report covering these same dates and if it is not presented that it may be stricken, this part, it would be subject either to the presentation of the published report or to the certification of these sheets by the proper officer of the government who has the original in charge.

THE COURT: What do I understand this paper contains, what is the tabulation?

MR. A. C. HATCH: I will submit it to the court; it is daily gauge height in feet and discharge in second feet, Provo river at Forks, Utah, by Observer Frank Dusenberry for the year ending September 13, 1914.

THE COURT: Do I understand Mr. Dusenberry is a government officer?

THE WITNESS: Yes.

MR. A. C. HATCH. Observer in the employ of

the government for this purpose, as well as an employe of the defendant, Utah Power & Light Company.

THE COURT: I don't think that would make any difference.

MR. A. C. HATCH: These, if the court please, are only the advance sheets of the actual reports that are later published by the United States Government.

THE COURT: That being the case, then I think probably you had better wait until the publication comes, because there would be nothing to be attained by introducing these advance sheets under your suggestion if you don't receive the publication this would be stricken; if you do receive the publication that would be the best evidence.

MR. A. C. HATCH: We don't offer these, what we are asking is that the testimony of Mr. Tanner based upon these may be admitted at this time, subject to be stricken unless we produce---he basis his computation upon comparison with the data given by these sheets and that he may proceed with his testimony subject to the striking of it out, if the proper proof of the data from which he---

THE COURT: Is there any objection to that order of procedure, reserving to yourself all the objections that you would have if the published document were here?

MR. STORY: Only objection is it may be encumbering the record, Your Honor, takes up a lot of time.

MR. A. C. HATCH: I don't think there is

any question about that; if we cannot obtain the published sheet, the full published report we can get certified---

THE COURT: You can prove it in either way, by certified copy of the document; the objection is overruled. You may proceed in this way, if there is no objection than would be made if the document was here itself. Now, Mr. Tanner, you may proceed with your comparison you were about to give.

MR. STORY: I will note an exception to that.

A October 22, 1913, the Government reading station showed a discharge of 335, the flow of the river at Donan's flume; that is wasting down the river past the diversion dam of the Telluride Power Company by my measurement 113.78. In the Telluride flume, by subtracting 221.

MR. STORY: I object, Your Honor, to the question of subtracting. I think if he testifies to the conditions, as he found them in the river the court can draw the conclusion.

THE COURT: It would only be received to relieve the court from computations.

MR. STORY: We might call it the difference, Your Honor.

THE COURT: Yes.

A July 22, 1914, the flow of the river at the government station was 299, at Donan's below the diversion dam 63.34, difference 236.

August 25, 1914, at the government gauging station 300, in the river at Donan's below the diversion dam 84.52, the difference 216.

Those are all the actual measurements I have made with relation to the volume of diversion of the Utah Power &

Light Company.

Q That is all the measurements you have made?

A The actual measurements I have made of the volume of diversion of the Utah Power & Light Company.

Q Were you familiar with what is known as the temporary flume while it was in use?

A Only by observing it in a casual way.

Q During its use you may state whether or not it was in alignment if you know, as to grade?

A I don't know personally that it was ever on a definite grade or what the grades were.

Q Have you see it when the water was flowing in it?

A Yes.

Q During its use?

A Yes.

Q What was its condition at that time as to whether the water was overflowing the flume or was there a free board?

A I have observed it numerous occasions when the water was spilling out of the side of the flume into the river at a point near the fill upon which it rests as it crosses the channel of the river.

Q Were you with Mr. Jenson at the time that he made the survey of the grade of that flume?

A Yes.

Q Joseph Jenson the witness who testified here yesterday?

A Yes.

Q And you may state whether or not the point at which the water was running over was a low place or a sag shown upon the exhibit--I have forgotten the number?

A 143. Yes, the overflow occurred in the immediate vicinity of the point marked as the sag upon the exhibit referred to.

Q Was it within the limits of the sag as shown on Exhibit 143?

A Yes, and in the immediate proximity, or maximum sag departure from the normal grade.

Q About how often did you observe this condition in that flume while it was in use?

A I cannot tell how often but a great number of times.

Q Did you observe the flume on the day that he made his observation, Joseph Jenson made his observation?

A Yes.

Q What was its condition at that time?

A The flume as it exists to-day is due to the operation of the elements. The timber is breaking down and rotting, and the flume itself, in its upper part, has got a good deal of mud and debris in it. The alignment of the flume is in good condition, horizontal alignment.

Q How as to the lateral alignment?

A That is in fair shape. The grade has got that sag in it, but the departures are not abrupt, quite a regular departure.

Q Did you observe the condition of the flume as to its inner surface, battens, or what had been its original condition as to the structure?

A The bottom and part of the sides are better material than the upper part material. In the upper part all the siding is of inch stuff and the cracks are covered with battens. The battens are breaking away now, and the flume has got a great many open cracks in it, when you get above the depth of two or three feet, and the lower part of the flume from the point where Mr. Donan's small power station is, thence to where it once joined the main 1902 flume, has been pretty well destroyed and carried away, only the I-beams or girders that carry the flume over the river, this crosses the river twice and some of the trestle work right adjacent to the road is all that is left immediately down the flume from Mr. Donan's small power station. The flume from there on up is pretty much in the condition that it was constructed except for the ordinary wear of the elements.

Q Have you ever made any observations to determine the capacity

or rugosity or other matters of discharge of that flume,
tha t temporary flume?

A No, except in all these computations that have been made
here by Mr. Jenson and Mr. Swendson I have subsequently
checked them and under the terms of the computation I
have come to the same result. My judgment is in this
flume---

MR. STORY: You were not asked for your
judgment yet.

Q In your judgment, what would have been the rugosity of this
flume when it was being used, if you have any judgment?

MR. STORY: I object, Your Honor, on the
ground it is incompetent and irrelevant, no
proper foundation has been laid and the witness
has not shown that he has knowledge of the
condition of the flume at the time it was being
used.

THE COURT: I understood Mr. Tanner to
say he had made no observation to determine any
of those questions. I may be mistaken as to
that. He may not have referred to this flume
at this time. That is the way I understood
him. If that be true---

MR. A. C. HATCH: The question was had
he made any observations to determine this
matter. I think the court is correct.

THE COURT: And he has said he had made no
such observations; that is the way I understood
him. If that be the case I think he would not
be competent to form or express any opinion.

Q Did you understand my question, Mr. Tanner, whether or not
you had ever made any observations of this flume to
determine---

A Read the question, I might have misapprehended.

Q I will change my question; have you ever made any observations of this flume from which you may form a judgment as to its capacity or rugosity or discharge?

A I have made some observations with reference to what in my judgment should be the coefficient of rugosity or roughness that is used in computing the velocity of this flume. My observations of the flume, grade of the flume, the character of the structure of the flume and alignment of the flume.

Q From these observations have you formed an opinion as to the proper coefficient of rugosity?

A Yes

MR. STORY: Just a moment--

MR. A. C. HATCH: Let me get my question.

MR. STORY: He answered before you got through.

MR. A. C. HATCH: His answer may go out. Where was my question when he interrupted?
(Question read)

Q Of that flume at the time it was in use.

MR. STORY: I object to the question Your Honor, on the ground it is irrelevant and incompetent, and no proper foundation has been laid. Before the witness can state whether he formed an opinion or what that opinion is, he should state what those observations have been.

THE COURT: Objection is overruled. This is seeking now to lay the foundation which you object has not been laid.

A Yes.

Q Now, what were those observations?

THE COURT: Before Mr. Tanner enters upon this description what his observations were, we will take a recess.

OMISSION

Discussion as to entry of defaults and demurrers .

THE COURT: Now, you may proceed with Mr. Tanner.

CALEB YANNER*---

DIRECT EXAMINATION by Mr. Hatch, continued.

A Before proceeding with the answers, I would like to make the explanation that---

MR. STORY: Must a moment; what was the last question?

(Question read)

MR. STORY: I had made an objection he had not stated what his observations were. I take it this question brings out that point?

THE COURT: Yes.

MR. STORY: Not the opinion, but the observations.

THE COURT: Upon which he has stated he is able to express the opinion.

A I can make the explanation that all of the elements for the determination of the coefficient of rugosity were not determined by me personally. One was assumed, that was the slope, and the slope in these computations is assumed to be one in a thousand. The gauging station at Donnan's is marked on Exhibit 142 as located between the points 500 and one thousand feet below the gate house or sand box. The flume is not regularly graded. It has some considerable irregularities in the grade line. Draw a slope line so as to cover five hundred feet on each side of the gauging station gives practically the slope that has been assumed in these computations.

MR. STORY: Pardon me just a moment. You are referring to the present flume below the sand box, are you, the existing flume?

A Yes.

Q To make that clear, is it the flume that has been in use

by the Utah Power & Light Company since 1907?

A It is the flume that has been in use by the Utah Power & Light Company since 1902. The flume at the Donnan station and at Bridal Veil where I made the determinations of the co-efficient of rugosity, were made in the flume of the-- generally the same dimensions as the temporary flume. The grade at Donnans and at the station above Bridal Veil is a little lighter than the grade at the section used for calculating volume in the--calculating capacity in the temporary flume. The general alignment of the flume is about the same in all three of the places, so far as the lateral alignment and the grade is concerned. The departure from grade in the Donnan station has one abrupt place that would probably influence conditions more than departures from the normal grade in the other two stations.

The inside conditions of the flume at the two stations where the co-efficient of roughness was determined are better than the conditions in the temporary flume, the temporary flume having battens and the other two sections of the flume used being smooth, perfectly smooth on the bottom and sides. I used the actual determinations as the basis of the calculation of capacity of the temporary flume, assuming that the temporary flume should have its conditions of surface as superior as the character of construction that was there would permit. Assuming the grade to be the grade that I actually found, namely: 1.4 feet approximately to a thousand, and adding to the actual co-efficient a sufficient additional volume of value, additional value to compensate in my judgment for the additional rugosity to the presence of the battens in the temporary flume. On that basis--

MR. STORY: Just a moment. I would like--

A Those were the observations.

MR. STORY: Those were the observations,

don't give your opinion until after the question is asked. I wish to state an objection.

THE COURT: What were you about to say, were you about to finish?

A I presumed under the terms of the question I was to give my observations, now I have given my observations.

THE COURT: That is all, not your opinion.

Q Now, what was your determination as to the capacity of the temporary flume?

MR. STORY: At what day?

MR. A. C. HATCH: At any time.

MR. STORY: I object to the question on the ground it is irrelevant, immaterial and incompetent and improper foundation laid for the opinion. If the language relates to the condition at the present time, it is incompetent and irrelevant, because the evidence shows the flume has not been used for four years. If it is intended to have it relate to the time when it was actually in use, as was the case when the question was formerly asked, then the observations which the witness has given have related merely to the conditions as they exist at the present time, and it is not connected up, the flume with the conditions as they existed at the time it was in use.

THE COURT: I don't remember that the question fixed the time when these observations were made. Of course the observations that were made may not qualify the witness to testify as to what the situation was at some other time, but I think he may answer the question with reference to his opinion of the carrying capacity of the flume at the time he made these observations

if that has been made definite.

MR. STORY: I understood the witness to say that the observations were recent observations

MR. A. C. HATCH. The witness stated that he made his calculations based upon certain conditions and observations. Now, those conditions and observations stated fixed the flume in a good condition and its carrying capacity as it was in that condition, and notwithstanding it may be now all gone to rack, what its carrying capacity when it was in good condition is what we are asking for.

THE COURT: He may answer the question.

MR. STORY: May I have the privilege of cross examining the witness for a few moments, before he answers the question?

THE COURT: Certainly.

CROSS EXAMINATION by Mr. Story.

Q When did you make these observations to which you have testified, Mr. Tanner?

A First observed the flume in 1907 and at intervals from then on until, last observation being made only a few days ago.

Q Did you make any--when did you first make any particular observations or measurements in connection with the flume?

A The particular observations for the purpose of determining grade exactly were made probably a month ago or something less.

Q What particular observation had you made prior to that time?

A I have observed the flume and walked over it many times, observed the position of the sag section in its use, in all of the observations I had made when the flume was running almost full or practically full of water and that was for

most of the time after the year 1907 until somewhere near 1912, for a number of years.

Q Principal observations that you made during that period, however were that the flume had a low place and ran over the side, was it not?

A That it was a flume of approximately width of eight feet or a little less, and about six feet deep, I knew that also.

Q And during these particular times your principal observation was in addition to the size of the flume, that it was running full and at a low place, it was running over the sides, is that it?

A Very many of the times I observed it, it was running over the sides.

Q Did you make any surveys to determine what the amount of the sag was at that time?

A No.

Q At any time prior to 1912?

A No, not prior to 1916.

Q Do you know what the difference, if any, in the flume at the present time from what it was when it was in use in 1912, as to grade?

A No, I don't know definitely, except as I have heard, and the character of foundation it is built on.

Q Then, you have no personal knowledge on the subject and anything you would say on that would be your opinion, merely, would it?

A Be my opinion based upon almost constant association with the fact.

Q Is it not a fact that a flume which is allowed to remain in dis-use during the period, during the winter season has more or less ice in it and is subject to other changes, climatic changes, changes of grade during the period of four years?

A It depends upon where it is located.

- Q You heard Mr. Jenson's testimony in his opinion there was probably some change, didn't you, in the flume during that period?
- A I don't recall it.
- Q Well, if he testified to that fact would that coincide with your opinion?
- A I don't think there is any change in there since it was in use in 1912.
- Q But you have made no measurement to determine that matter, have you?
- A No measurement except the fact that in running the line over it there is a general co-incidence with what my experience and observation of what the fact was when it was in use, to warrant me to assume that it has not changed materially.
- Q That coincidence that you mention was the fact that there was in years gone by a sag at that point, and there is also a sag at the present time, is there not?
- A Yes.
- Q Is there any other coincidence you have in mind and on which you base your conclusion?
- A The flume rested upon a bed piece, cross piece, trestle, still in place by the road and that goes practically back to the grade and the regular grade coincident with the upper end of the standard section.
- Q But you don't know and have no means of ascertaining, have you, the difference, if any, between the amount of the sag in 1912 when the flume was in use or when it was first constructed and what it is at the present time?
- A Not absolutely.
- Q Have you any idea at all what amount of sag was when that flume was constructed in 1907?
- A No.

MR. A. C. HATCH: If the court please,
just a moment. I don't know what that has to

with the finding of the capacity of the flume on a regular grade; I think it is not proper cross examination at this time for any purpose.

THE COURT: He may answer the question. I don't think it throws much light upon it, but I think probably it is proper.

MR. STORY: I am simply trying to bring out the fact this witness---and it is material, too, connected with the testimony given by Mr. Jenson, Your Honor will remember that you reserved your ruling on Mr. Jenson's testimony relative to the carrying capacity of that flume, on the assumption and promise of the plaintiff, they would connect up the condition under which Mr. Jenson formed his opinion with what it had been in use. Now, the same question is involved in Mr. Tanner's opinion and I wish merely to connect up thoroughly the condition under which he is now testifying, and condition on which he formed the opinion that the condition that existed while the flume was in use and not four years after it had gone into dis-use.

MR. A. C. HATCH: Withdraw my objection.

MR. STORY: Read the question please.

(Question read)

MR. STORY: That is all I want to cross examine on.

THE COURT: Now, can you find the question and read it?

MR. STORY: I wish to renew my objection to the question asking the witness for his opinion, on the ground it is irrelevant, incompetent and immaterial and no proper foundation has been laid.

THE COURT: The objection is overruled, he

may answer.

MR. STORY: Give us an exception.

THE COURT: Do you remember the question?

A I remember the substance of it.

THE COURT: You may answer it, then.

A Under the conditions that I have heretofore specified I calculate the flume capacity to be between 184 and 195 second feet.

Q That is the temporary flume?

A Yes. In making this calculation I just wish to add one additional element, that is that I allowed only three tenths of a foot for free board between the mean,--above the mean surface, and the conditions of flow there would throw water out of the flume measurably in the same way that I observed it doing in actual use at many periods and times of observation.

Q Were you acquainted with what was known as the auxiliary flume that was in use by the Utah Power & Light Company during a portion of the time it was using this temporary flume?

A I have observed it but have not paid careful attention to the structure.

Q Did you ever made any measurements or calculations with regard to it?

A No.

Q Now, going to the flume, called the 1902 flume, now connected with the pipe line of the company, have you made measurements of that flume and observations of it?

A The measurements that I have heretofore given are made on the 1902 flume, the particular point being marked on Exhibit 142, as rating station between the distance 500 and 1000 below the sand box and at a point approximately four thousand feet below the sand box, above the point marked on the

profile as pipe line from Bridal Veil Falls.

Q Now, have you been along that flume, the 1902 flume or across it or over it, and observed as to the flow of water in it and as to the free board?

A Yes.

Q You may state what you have observed with regard to those two matters.

MR. STORY: What years was this, and when?

Q When was it?

A In 1902 and 1903--1903 particularly. I cross the flume scores of times at a point marked here as pipe line from Bridal Veil Falls. I was at the point a great number of times and crossed the flume line, there for a great number of times when the Telluride Power Company, through its-- one of its engineers and myself were making a set of surveys for the purpose of determining the practicability and cost of utilizing Bridal Veil Falls and Lost creek for power development, delivering the water at the mouth of Provo canyon to Provo City for municipal purposes. In the course of that work I have crossed the flume once a day and frequently oftener, also during the period of time.

MR. STORY: For how long?

A That would probably cover three or four weeks.

Q What time of the year, Mr. Tanner?

A In the spring of the year and early summer.

Q Would it be during that period known as the high water period in the Provo river?

A Yes.

Q Proceed.

A And then I measured the flow in Bridal Veil both in the summer season and in the winter fall season great number of times for the purpose of obtaining the ~~ix~~ volume of its flow in order to arrive at some judgment as to what its

normal flow would be to be utilized for the two purposes, for power and culinary purposes. In the course of that work I observed the water in the flume and at no time in my observations there did the water reach to a depth of five feet in the flume. The first crack or plank was uniformly exposed. At rare intervals I have been up to the head of the flume when I have also crossed the flume at Bridal Veil and when the flume was flowing approximately half to two thirds distance above the crack at the bottom of the first board, it was below the crack at Bridal Veil. The upper part of the 1902 flume under the conditions of use in that time would not deliver to the lower sections its full capacity, the free board increasing as you went down the stream at Bridal Veil.

Q Did you observe the head works of the 1902 flume?

A Only in a general way.

Q You heard the evidence of Mr. Buckler in regard to those head works?

A Yes.

Q The temporary flume and the auxiliary flume and the present pipe line?

A Yes.

Q Now, what would you say as to the capacity to deliver water to the flume of the present pipe with the head-works of the auxiliary flume and the temporary flume, assuming as a fact the testimony of Mr. Buckler with regard to that?

A The present intake conditions are far superior to the intake conditions of 1902 as given under the statement of Mr. Buckler.

MR. STORY: That was not the question, Your Honor, and I move to strike out the answer. It was a comparison between the present intake conditions and the temporary flume and auxiliary flume which was constructed in 1907 and 1908.

MR. A. C. HATCH: I think the answer was---

MR. STORY: Move to strike out the answer on the ground it was not responsive.

THE COURT: Motion is denied. Motion does not lie with you. It is not your question.

Q I asked you as to the intake of the auxiliary flume and temporary flume and you answered as to the flume in 1902.

A I cannot--I did not gather from the question just what that was. I know from observations that part of Mr. Buckler's testimony with reference to things that could not change, that are physically impossible of modification, are on the ground and they do not co-incide within feet of what Mr. Buckler's testimony was.

Q As to those heads?

A Yes.

MR. STORY: Object to that and move to strike out the testimony of the witness.

THE COURT: I think that statement may go out.

Q You may state the conditions of the present flume, the pre-

sent pipe line and its headings, if you know them.

A The present concrete intake is located near where the intake of the auxiliary heading was. The temporary intake is located between that point and the dam, the overflow from the dam, the river discharge over the dam. The conditions of entry and the capacity of the present concrete construction as I have observed them on the ground, would in my judgment give a superior diversion capacity to the concrete pipe line, intake pipe line, intake and pipe line, to what was had under the conditions present there when the auxiliary and temporary flumes were in use.

CROSS EXAMINATION by Mr. Story.

Q You made some comparisons, Mr. Tanner, between the flow of the river in 1916, below the dam with some assumed flow as shown by the Blue print furnished by the government of the flow above the river--I mean above the dam. Does that cover 1913, '14, '15 and '16, or what period did it cover?

A Those figures cover 1913 and I believe a part of 1914.

Q You say "those" the government reports as to river flow for those periods have not as yet been published, am I right?

A They had not been published about a month ago.

Q Where did you make your measurements of the river below the dam?

A At a point just at the lower end of Mr. Donnan's resort place.

Q About how far below the dam?

A I should say about a thousand to twelve hundred feet, a thousand feet, approximately.

Q And these results that you have given are the exact dif-

ference between your measurement of the volume of water flowing in the river and the measurement of the river at the gauging station, government gauging station as given in the government reports, are they?

A Yes, sir, they are just the difference.

Q Just the difference. Now, where is that gauging station situate with reference to the dam?

A It is situated considerable distance above the dam, one of them, both of them, one being on the south fork and the other on the main river.

Q Then the one on the main river is above the south fork, isn't it?

A Yes, just above the entrance of the south fork.

Q Did you include in your computation then the south fork as well as the main river?

A Yes, the opinion shows I gave it as the government gauging stations, and the sheets that I had reference to here show the flow at both stations.

Q The flow at both stations; so, in other words, what you have taken as the difference is between then--what you found and the sum of the two?

A Yes.

Q At the time you made these examinations or measurements of the river, did you go up to the dam?

A When part of the measurements were made I was by the dam, several times during the day.

Q Do you know whether there was any water going into the river at all between the dam and the point you measured?

A There was some little water, some little springs.

Q Any water going through the dam those days?

A Going over and through also.

Q How did you happen to be measuring the river those times and what was the purpose?

A The purpose of the work was to make a set of observations at

between convenient and satisfactory places as practicable below the dam and the headworks of the Provo Reservoir Company to determine the losses or gains of flow in the channel of the stream.

Q Did you have a weir at that point?

A No.

Q How did you make your measurements?

A At the point of Donnan's on the river was--gauging point was set and gauging point read at intervals. Measurement of the flow of the water was made by currentmeter, and then at intervals after the measurement the gauging point was observed.

Q These conditions, as I understand you, were merely the conditions which you observed at the time of measurement, were they?

A They were the volume of flow at the times of the measurements.

Q These conditions changed from day to day, did they not?

A Measurably part of the time, they changed over an interval of from October until December of 1913, there was only one interval of considerable fluctuation occurring in the latter part of October. Outside of that fluctuation the stream ran with fair continuity down to about December 4th.

Q The difference in the amount of your measurement and the amount of water flowing in the south fork and main river above the dam changed each time, didn't it?

A I only gave here the times of actual measurement, and not of the observations. I think I gave here only one or two October measurements and then I went on to July and August of the succeeding year.

Q You gave all the measurements you had actually made?

A The actual measurements I gave, but I did not give the intervening approximation.

Q Then you have no actual knowledge of what water was flowing in the Telluride flume except the day you measured the water or the day that you have gotten an approximation

of it by your actual measurements in the stream below, have you?

A Yes, I read the gauge at the government gauging station and I had the actual flow of the station at a definite gauge height of 1.14.

Q Where was that?

A That was in October.

Q I mean, where was that 1.14 gauge height?

A At the government gauging station.

Q That is above?

A Yes, and then I had the actual observation and the gauge point reading below at Donnan's.

Q What gauge point reading below at Donnan's?

A The gauge point I placed there when I began my observations.

Q Did you observe that every day?

A Several times a day during the particular time that I have given you the volume.

Q How many times did you go up there during the summer of 1913, for instance?

A Summer of 1914 I was up there three or four times.

Q Beg pardon?

A Three or four times.

Q During the summer of 1914?

A Yes, three or four times. Sometimes it lasted for several days.

Q But you were not up there every day during the summer, were you?

A No, sir.

Q Nor, you were not up there every day during the summer of 1913, were you?

A No, what observations I made in 1913 were in the fall of the year after the summer.

Q How many times do you expect you were up there altogether in the summer of 1914 or spring and summer if 1914 when you took these observations?

- A I was up there probably in connection with these observations, observing these things, that my information would cover definitely a period of twenty-five to thirty days.
- Q That is spread over the entire six months, is it?
- A It would be spread over what we call the summer season, that would be from the latter part of June until the first of September.
- Q In making your computations of the carrying capacity of the temporary flume did you use the same grade that was used by Mr. Jenson in making his observations in forming his opinion as to the carrying capacity?
- A I am not sure; I did not hear his testimony; I think it might have been, I used 1.4 per thousand.
- Q Did you take into consideration the present sag in the flume in making the computation?
- A Yes.
- Q Did you make any computation as to the carrying capacity of the first fifty feet of that flume?
- A No, but I have observed it many times and know that it was in excess of the other.
- Q Did you, in making your computation first determine the velocity at which the water passed from the upper section to the lower section of the flume where it had a grade of one tenth, or whatever grade you mentioned?
- A I mentioned all the conditions that covered the calculation.
- Q The flume had a heavier grade for the first fifty feet, didn't it?
- A Yes.
- Q Did you, in making your calculations, determine what the velocity of the water would be at the end of that first fifty feet in the flume?
- A No.
- Q So you didn't take that question into consideration in determining your carrying capacity, did you?

- A No, that was quite a considerable distance away.
- Q And you say that you used, you allowed a free board of three tenths?
- A Yes.
- Q At the point of minimum, or at the low point of the sag?
- A Yes.
- Q Although you say that when the flume was actually in use you very frequently have seen it run so full as that it flowed over that sag?
- A And had it so with the free board, average free board that I have given it would still go over.
- Q Then the amount of water which was actually flowing over or flowing through the flume at the time you noticed it, when in use must have been in excess of the amount which you have computed, allowing a three tenths in the free board, must it not?
- A No, it would go over the side of the flume. I am just giving that as what we call the still well height in the water.
- Q How do you know it would have gone over the side?
- A Oh, I have seen it in operation.
- Q It was because the height of the surface of the water was above the bottom of the sag, wasn't it?
- A The top of the wave was above the sag.
- Q Did you notice it was only the waves that went over the side at the time you mention as having seen it running over the side?
- A Oh, I have seen it running higher than that and a stream going over, but in those conditions it would have carried more water.
- Q When there was such a large volume of water going through the flume there was a regular stream flowing over the side, the flume was actually carrying and delivering more water than you mentioned, wasn't it?
- A Yes, some more.

Q If I remember correctly Mr. Jenson allowed a free board of eight tenths at that point; assuming that is correct, how do you account for the difference between your measurements and his, your computation and his computation as to the carrying capacity of the flume?

A I don't know just what elements he assumed. If I can be advised of that I can probably state the conditions. I was not here when he gave that testimony.

MR. A. C. HATCH: He gave the testimony as to free board, he gave two or three measurements.

MR. STORY: Mr. Jenson, did you in your computation use a free board of eight tenths at that low sag?

MR. JENSON: Yes.

MR. STORY: That is the way I understood it.

Q What coefficient of roughness did you use in making that calculation?

A I used a coefficient of roughness for the first quantity I gave.

Q That is 184, isn't it?

A Yes, of seventeen, and the second quantity I used sixteen.

Q How deep would the water be in the flume at the time or allowing the free board of three tenths that you have given?

A I will give you all my figures, if you desire. I use the width of 7.5 and I used the net depth of 4.6 feet. I derived an area of thirty-four and a half square feet, a perimeter of 16.7 and radius of 2.07. I took the measured slope.

Q What was that?

A That is one in 720 and that figures to 1.4 in a thousand, which is a more convenient--so that all the elements that

I used, some of them are derived and some of them I got myself.

Q I think Mr. Jenson testified that he used a coefficient of twenty, was it not?

MR. JENSON: Fifteen.

MR. STORY: A coefficient of fifteen.

MR. JENSON: .015.

Q Point 015 and he allowed a free board of eight tenths; you assume a coefficient of seventeen and a free board of three tenths, and yet you get substantially the same results.

A Yes.

Q Will you please explain how they happen to co-incide.

A They co-incide presumably because the elements when they are placed together in the Cutter formula work out to those items.

Q You think the difference in coefficient would equal the difference in head, do you between three tenths and eight tenths?

A I have not figured what his calculation is; I wouldn't be sure.

Q Now, referring to the 1902 flume; your principal observation on that you say was in 1903 or 1913, a year ago?

A My principal observations on that flume with reference to the position of the water surface in it for a long period of time is in that time, in 1902, and '3, but I have no actual measurements of the volume of flow in the flume at those dates.

Q But you were up there principally, you say you were up there most during the year 1903?

A Yes.

Q Because you were up there at that time for a special purpose of gathering data with reference to Bridal Veil creek, in connection with the Prove City water supply, were you?

A Yes.

Q Were you connected with the power company at all at that time?

A No.

Q What caused you to take any particular observations of the Provo flume at that time, I mean of the Telluride flume at that time?

A Well, you cannot very well go and measure a stream of water flowing into a flume and have your face right against those physical conditions without observing it.

Q That is where you measured it, was it?

A Yes.

Q That is where you measured the Bridal Veil, was it?

A Yes.

Q That is how you happened to have impressed on your memory the water in the flume did not reach above the cracks at that time, is it?

A That and sitting on the flume, walking over the flume.

Q Was there any other particular reason why you should have impressed it on your memory at that time at any other point, if there is I would like to know what it was.

A In the course of my work there as I have heretofore said I had occasion to cross the flume frequently and observe the water.

Q But the work you had in fact only related to the water of Bridal Veil?

A Specifically, yes

Q Now, proceeding to 1904; were you up there frequently during that year?

A Yes.

Q What were you doing up there then?

A Working up and down the canyon.

Q What were you doing?

A Well, variety of things. I don't remember what I was doing in 1904 but I made a great many observations with reference to the flow of streams of water both at north fork and at

south fork and Clear creek, and that would carry me up and down the canyon past the--and across this flume.

Q You mean across this flume on the wagon road?

A Yes.

Q Did you wvwe time you went across that bridge get out of your conveyance and examine it and see exactly where the water was?

A Oh, no, not every time.

Q How many times do you suppose you did it?

A I could not say how many times I observed it in 1904.

Q How about 1905?

A I was up there a time or two in 1905 but not as often as in 1904.

Q Have you any clear recollection at the present time of any condition that you noticed that flume to be in in the year 1905?

A Different from 1904?

Q No, as it existed in 1905. Have you any clear recollection of seeing that at any specific time when you impressed upon your memory the condition that you saw it, with reference to the amount of water flowing in the flume?

A No, I cannot say that I can specifically point you to a definite observation that I can support in my mind.

Q Can you do any better in that respect about the year 1906?

A No.

Q 1907?

A No, except in the latter part of 1907. In 1907 ~~xxx~~ the 1902 flume was destroyed and in--in the summer after its destruction I was up there several times.

Q And saw the temporary flume being construct^{ed}, I presume?

A The temporary flume was constructed, as I remember, in the winter season and then afterwards going up on the road and also stopping sometimes at the head gate and walking down over the flume, and being at Donnan's, I came across that.

Q Have you any clear recollection after the year 1907 or '8 of any specific time when you saw that flume or noticed the water in it when it had any particular height or depth of water?

A Yes, I observed it in 1908.

Q When?

A I cannot be specific about the exact date.

Q What was the occasion that you have in mind?

A I cannot very well fix the occasion except that it is in my consciousness I observed the flume and observed it many times in those intervals between 1907 and 1912, and farther than the impression I have records that would assist me and I could specifically say some of those dates.

Q Records that you yourself have taken?

A Yes, that would give me the days I actually passed, the days I was there.

Q Have you ever taken any other measurements but those that you have given us?

A Yes.

Q During those early years?

A Yes, sir, I have a distinct recollection of the flume, the 1902 flume when the total quantity of water was diverted, all of it as tight as the attendant could make it.

Q That is, you mean the dam as tight as he could make it?

A Yes, the dam as tight as the attendant could make it, and it was in the summer season, I have the date somewhere, and at intervals during that time when it was tight I measured it, the quantity of water that was ~~leaking~~ leaking through the dam and I can identify those particular times and the quantity running through.

Q But those particular times you now mention are times when the company was taking through the flume all the water it could get from the river except such water as it was unable to prevent seeping through the dam?

A Yes, they were the times, they were observations that were immediately preceding the times when they did not have it all and for a period after they had taken it all, and in that measure they were more or less critical.

Q As a matter of fact, the water in the flume has been more or less of a variable quantity, hasn't it?

A Yes.

Q What year was it you said you saw it flowing in the flume?

A I can identify it, I cannot tell you now the date but it was, as I remember, about 1904 or something, about 1904 as I remember, in the summer time in July or August.

Q Now, when you said you never saw the water reach a depth of five feet in the flume, you mean when you saw it at the time you happened to see it you don't recollect of it being more than five feet, is that a fact?

A The depth which I gave as less than five feet was predicated on the observations at Bridal Veil. I have seen it deeper than five feet up toward the head-works.

Q I believe in answer to an inquiry by Judge Hatch on your direct examination you stated that the present intake conditions into the pipe line are far superior to the intake conditions which existed in connection with the old flume in 1902, is that a correct statement of your testimony?

A Yes, that is the substance of it.

Q In what respects are the present conditions superior?

A The pipe line, concrete pipe line intake works will deliver into the flume at its upper section with a raised grade more than the flume will carry.

Q That is the opinion which you formed from the conditions; what I am after is the statement from you of the conditions which you say are far superior to the old, and which, if I understood you correctly, you said gave a larger capacity to the present pipe line than the old 1902 flume; what I

am seeking to learn from you is, what is the difference in conditions of the intake?

A From the intake and pipe line, the intake has a greater cross section, pipe line has a greater utilizable cross section.

Q How much more?

A Of course, that is---you wish me to answer any measurement I have made up there, I have not made any definite measurement, if you ask me the question with reference to some testimony as to dimensions there .

Q You say that it has a larger water opening for one thing; what other conditions have you in mind which are far superior at present to those that existed in the 1902 flume?

A The entry into the pipe is more satisfactory country as a hydraulic construction.

Q What is the difference in construction, you say it is more satisfactory, that is your opinion; what I am trying to get at is the actual description of the condition which are different.

A Well, the pipe is open to the section of approach, taper sectional approach, taper section of approach, as it comes out toward the river expands to a wider section than was utilized in the old construction and in the cross section of the concrete way, itself, is greater than the utilizable cross section in the 1902 construction. Those things tend to increase the delivering power of the head works to the upper stretch of conduit.

Q The sill was at the same datum point, wasn't it, the same level with reference to the datum point?

A The sill for the--

Q Intake.

A Head-gate?

Q Yes.

A Probably I am not--I don't know personally about that elevation.

- Q What was the difference in area of cross section gates between the old 1902 flume and the present intake into the pipe line?
- A I don't recall just what they are, only my observation would indicate that the intake now is larger than it was then.
- Q Did you ever measure it to determine that point?
- A Not accurately, I have just observed it on the ground.
- Q What is the difference in the head?
- A I could not tell definitely that except that ordinarily they run the water somewhere near the middle of the second flash board.
- Q Isn't a knowledge of these different factors necessary for a determination---
- A An absolute determination, yes.
- Q As to whether or not one has a greater capacity than the other?
- A No, not all of them.
- Q What one can you omit?
- A Well, I observed the difference in water level.
- Q I am speaking now about these particular factors that you have mentioned, the head, the cross section of the gates and the height of the sill with reference to the datum point.
- A Of course, I don't know those definitely, but the elevation of the water surface in the fore-bay and in the gate house is in--or in the head of the entrance to the new works, and in the gate house is not materially different. It fluctuates somewhat showing there is a very high capacity in there, even if you don't know anything about what the difference was.
- Q I am asking what one of these elements I have mentioned you may disregard in determining the capacity?
- A I don't need to have any of them to arrive at a judgment of it. I know the amount of water that is present in

the gate house and I know that even with a small loss in head now between the entry works of the concrete intake to the present gate house that it delivers water into the flume, the 1902 flume in excess of any flow I ever saw in there when it was running full at the head and then spills out to the side a considerable volume into the river under the present circumstances, and I conclude, therefore, without knowing these others things, that the intake works now are very much superior in their ability to deliver water than they were in 1902, with the construction I observed and the water volume I observed there at that time.

Q But you formed your opinion without any definite knowledge of the area of cross section, difference in area of the cross section gate or the head water at that point?

A I say it was not definite, the other is definite.

Q As I understand it, in getting your coefficients of the flume below the present sand box you took one tenth in one hundred, did you not?

A Yes. I assumed that; I have never run that absolutely myself.

Q In other words, you assumed the constant grade of one tenth in all these computations?

A Yes.

Q Then, how do you account for the variations which you have mentioned in the coefficient of roughness?

A Those things, whether you can account for them or not, they are just like the forces of nature, if they are there.

Q As a matter of fact, Mr. Tanner, aren't they due to the turbulence of the difference in turbulence of the water flowing in the flume?

A I think that is a factor, in it, I don't know just how important it is.

Q As a matter of fact when the water is turbulent, doesn't that have the equivalent effect of loss of head or you might say

a decrease of grade, it has a retarding effect?

A Yes, I think turbulence always means internal conflict of the water and that consumes head.

Q That consumes head. In other words, it has the same effect as the loss in grade, does it not?

A Yes.

Q And then, isn't it a matter of fact that these variations which you have shown in your computations of the coefficient of roughness, are probably due to the difference in turbulence of the water at the times the given measurements were taken?

A No.

Q Then, what other element enters into it?

A There are several measurements of flume and at different points on the flume. The flume is laid upon a grade. In its maintenance the effort is to keep it upon that grade, and my judgment is that a departure, one out of seven observations or six observations would be more likely to be in error on the average than the five that were consistent, and that the 15 coefficients is more apt to be true of what the continuing fact throughout of the flume is, rather than the isolated 13, which might have a special reason, change of grade in the vicinity, could affect the flow, so that the slope I assumed was not the true slope that should have been assumed in that particular determination.

Q Did you notice any change in the grade yourself?

A No, I have not observed those carefully, except there is a change of grade, you can see it as you go along the flume in places, there is a perceptible change of grade, just as the flume reaches up into the sand box, very much steeper there.

Q Assuming ~~that the flume reaches up in~~ that the measurements made by Mr. Wentz in 1915 and 1916 were correct measurements of

the volume of water flowing in the flume at Donnan's station at the time that he testified to, how do you account for the variations there?

A As I said with reference to the general question before, I don't know; there might have been a variety of reasons.

Q Can you give me any other reason that you have in mind other than change in head or change in the coefficient?

A I don't see how the coefficient could change unless the alignment had been thrown out or the grade had been-- the alignment had been thrown out or some obstruction were present in the flume.

Q If turbulence enters into the flow it might change the coefficient, may it not, in the result?

A No, I observed, for instance, near what Mr. Wentz has called the racing section, I observed some sort of a still well thrust down into the flume's body, itself, and I am satisfied that that, the presence of that obstruction in the flume affected the turbulence for quite a little distance down. If that were present and you measured within two or three hundred feet of that, why I think that would affect the condition.

Q I remember correctly, Mr. Wentz testified that in making all these measurements he used a still well.

A He used it outside of the flume and did not disturb the flow in the flume.

Q He did not testify to the condition you mention now, this was up above the point of measurement, was it?

A Yes, this is up above; I did not observe in all my observations there, I did not observe any modification of conditions that I could point to this modification accounting for the difference in flow.

Q There was evidently a difference from one day to another or from one measurement to another, wasn't there?

A Yes.

Q Do you know of any other difference in conditions which existed between those, any difference which existed in the conditions at the time these various measurements were made, other than turbulence of the water?

A Well, I could not say there was additional turbulence.

Q Assuming there was a difference in turbulence, do you know of any other?

A Then turbulence would. If I were asked to give that, that would form one reason for the difference. It might not be all of them.

Q I want you to give me some other one.

A If I had observed a flow of water at the Donnan station with a gauge height of five and subsequently observed the same flow with a gauge height of four and a half, naturally I would conclude that something was the matter and the conditions to be gone into to account for that would be the alignment of the flume, the grade of the flume, the presence of obstructions, above the flume that might interfere with the flume.

MR. A. C. HATCH: You said obstruction above the flume.

A Obstructions in the channel above the rating station. These ought to be examined in order to see, if practicable, if they would give an accounting reason.

Q You say if you had noticed any such variation you would have made such an investigation, do you?

A I didn't say that because I don't know, I would have made the investigation.

Q In your testimony you gave one measurement, I think it was measurement made on July 27, 1914, it was ^{with} a gauge height of 4.79 feet you found a volume of 230.42 flowing in the flume. Now, your next measurement, or later measurement made by you on November 9th, 1914, at which time you found the gauge height to be 5.05 you got a velocity--I mean a

discharge of 219.57. In other words, with a higher gauge height you got eleven secondfeet less discharge; did you make any investigation to determine what the cause of that variation was?

A No.

Q Didn't it strike you as being worthy of investigation?

A Yes, but it is pretty difficult thing unless you are satisfied you can solve the problem. That at least gave me an idea as soon as I found these discrepancies---a continuing set of gauge heights which is ordinarily a very satisfactory connecting record between gauges was not practicable to be followed on this flume, and what record to be had would depend upon the actual measurements of the volume of the flow through the section. Now, I think that if I had had all to do with the matter and wanted to solve that, instead of a hydraulic problem I would have put on a set of continuing tests as to the position of the flume, whether it maintained a uniform position and the condition that the water was sent into the flume from the gate house and the conditions of grade throughout the section from the gate house down for a thousand feet below the rating section, but all of these things cause a good deal of effort.

Q You think then the condition of the water coming out of the gate house and into the flume has something to do with it, do you?

A Why I think so yes.

Q Can you at this time give an explanation of that variation?

A No I just know that it is a variation. I don't know the reason for it, that is all the reason for it.

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LYMAN LEE DONNAN, called by the plaintiff,
being first duly sworn, testified as follows:

DIRECT EXAMINATION by Mr. A. C. Hatch.

Q What is your full name?

A Lyman Lee Donnan.

Q Where do you reside?

A Provo Canyon.

Q What is the name of the place, if any, where you reside?

A Upper Falls resort.

Q Where is that with relation to the intake of the pipe line
of the Utah Power & Light Company?

A Probably a thousand feet from the dam, west of the dam down
the stream.

Q Down the river?

A Down the river.

Q How long have you resided at that place?

A Since 1898.

Q What has been your business while there?

A I have been in the resort business, proprietor and manager
of the Upper Falls resort especially.

Q Have you resided there during the entire year? during the
time you have had a residence there?

A I have not for a number of years, I spent my winters in
California and the southern part of this state.

Q What years were those?

A In 1898 until 1901 in St. George, and from 1901 during the
winters in California until 1905 I believe.

Q During 1905 has your residence been continuous at the Upper
Falls resort?

A It has.

Q Are you acquainted with the flume and pipe line and works
for conveying water by the power company through its plant
at Nunn's station?

A At Nunn's station?

Q Yes.

A I am above Nunn's station, not so familiar from Nunn's station down.

Q To Nunn's station, you are familiar?

A Yes, I am familiar.

Q Do you know when the pipe was first established there?

A I know when the dam was built.

Q When?

A 1907 or 1897.

Q You were residing there at that time, were you?

A I was in the canyon.

Q At your present--

A No, not '97, I was at what is called Heislett's.

Q Then, when did you move to your present location?

A In August 1898.

Q Then you have been there during the summer months, during the entire period since the building of that dam?

A I have.

Q Now, have you had occasion to observe the flume between the Nunn station and the intake?

A I have.

Q About how often did you observe it?

A Every day around my place.

Q Along its course?

A That is near the intake.

Q For a considerable distance, did you observe it?

A Excuse me.

Q For any considerable distance along its course, did you observe it?

A I have.

Q State at what point and where along the course of the flume you have frequently observed it?

A From a point probably a thousand feet below my house to the dam almost daily.

Q Have you a recollection as to the free board on the flume at

different times during that period--by free board, I mean the flume above the water level in the flume?

A I have.

Q And what were your observations as to the free board, and how much---

A At what particular---

Q ---was there?

A At what particular place?

Q Give them generally along the flume as you know them and have observed them, but specifically I will ask you at the gauging station where the little red house is near to your place?

A The free board at that point until 1913 was probably, according to my observation, was about two feet, as near as I can remember it.

Q How did you determine that, by measurement?

A I did not, just by observation.

Q Did you fix it by the siding on the flume or by just looking at it without anything with which to determine?

A The flume--the flume is six boards high or six feet high, and at that point there is a gauge and the space between the top board and the second board was always free and below that point up to the time or after the date they built the conduit, made use of the conduit, new conduit.

Q When was that concrete pipe line--is that the conduit you refer to, the pipe line?

A Yes.

Q Sir?

A That was the conduit as I was referring to.

Q When was that built?

A 1912, I believe.

Q And after that did you observe the free board at this same point?

A I have.

Q And what is the free board since?

- A The water was up considerably above the upper crack in the board; that is the crack formed by the top plank on the side of the flume.
- Q And that crack is what distance from the top of the flume?
- A About one foot.
- Q What would you say as to how much it was above the crack, how much free board there was?
- A There is probably six or seven inches now.
- Q Now, by free board you understand me to mean in asking you the portion of the flume not covered by the water flowing in the flume, do you?
- A Yes; that is on the side of the flume.
- Q You remember the construction of the flume in 1907?
- A I do.
- Q And the building of the auxiliary--building of a temporary flume and thereafter an auxiliary flume?
- A I do.
- Q Now, after the completion of the auxiliary flume I will ask you if both the auxiliary and temporary flume discharged the water into the regular flume at a point above the gauging station to which you have testified?
- A Yes.
- Q Now, after the building of the auxiliary flume, was there any change in the free board at the gauging station?
- A There was.
- Q State what it was, about?
- A I cannot exactly state the exact amount.
- Q Approximately?
- A Probably three inches, more or less, or three inches more.
- Q Three inches more, free board or three inches less free board?
- A That is three inches ^{or less} free board and more water.
- Q That will give what free board then, if with that water in there from the auxiliary and temporary flume?
- A As I remember it was about eighteen inches.

Q Now, did you observe the 1902 flume from the gauging station up to the head, so as to now say whether or not the free board increased or decreased from the gauging station to the intake in the 1902 flume?

A I cannot say that I remember it.

Q You have no present recollection with regard to that?

A I have not.

Q Now, during the present year, I will ask you if- strike that-- during any time while you have been there, you may state whether or not there has been an overflow of the 1902 flume; that is, the flume as it existed in 1902, not the rebuilt or auxiliary or temporary flume.

A Just the 1902 flume?

Q Yes.

A Not including the auxiliary or temporary flume?

Q Read the question again.

(Question read)

A Yes.

Q When?

A During the early part of this year or summer, the latter part of the spring.

Q And do you know what was the occasion of that overflow?

A Too much water, flume wouldn't carry it.

Q And what, if anything, was being done at the flume at that time?

A I cannot state exactly what was being done except that Mr. Swendson was working there and I understood that they were making a measurement of the water in the flume, the carrying capacity of the flume.

Q Was anything done to the flume at or about that time to increase its capacity at any point along it?

A Yes.

Q What was it?

A There were a number of carpenters busily engaged for some time before this overflow in nailing pieces of lumber between

the cross pieces or ties of the flume, to keep it from spilling over.

Q What distance along the flume, if you know, was this work done?

A I did not go away from the house, but I could hear the hammers for quite a ways down, I don't know how far that was carried on, how far below.

Q Did you observe the flume after the carpenters were there?

A Did I observe?

Q Yes.

A Yes.

Q Did you see any evidence of the work done?

A Yes, with it is still there.

Q And can you now say what length, or approximately what length along the flume these side boards were placed?

A As far as my hearing went it was a for five hundred and a thousand feet below the house.

Q I am asking you what you have seen since the work was done.

A Especially I seen those where the boards are put on right opposite the house, next the place.

Q For what distance back?

A That is two or three hundred feet above and below the house.

Q Can you state approximately the time this was done?

A It was sometime in the early part of the resort season, before business at the resort had picked up.

Q When does your resort season begin?

A In June, business begins generally along about the latter part of June, first of July. We open on the 15th of June.

Q Was there more than one overflow place, place of overflow of this flume at that time?

A There was.

Q How many places was the flume overflowing?

A The flow of water from the flume that I observed lately was all the way down through my grounds in different places.

Q For what distance?

- A That is probably for a thousand feet, between five hundred and a thousand feet.
- Q Was there any point along that thousand feet, five hundred or a thousand feet where the flume was quite considerable in amount?
- A At several places.
- Q About what quantity would you say was overflowing, if you have a judgment as to the quantity at any one place.
- A At one point right opposite the house there was probably ten second feet of water overflowed and run across the road down past and around my house.
- Q Did you see Mr. Swendson there at that time?
- A I saw him just before they turned the water into the flume.
- Q And was that just before these overflows commenced?
- A Yes, just before these overflows commenced.
- Q Was the overflow before or after the boards were put on?
- A Afterwards, they were nailing them on before, and as the water was flowing, as the water was flowing over they tried to stop it.
- Q Why were you, had you any occasion to give this matter especial attention at that time?
- A I did not like the idea of the water overflowing my grounds and I thought if they continue it I might have some damgges to collect, and I took a photograph of the overflow.
- Q I now present to you exhibit 151 and ask you if that is the photograph that was taken by you at the time you have referred to?
- A It is.
- Q You may explain that as you will to the court.
- A Have you a pencil?
- Q And mark the point of the flume, on that; point out first the point in the photographs where the flume is ~~shown~~ shown, if it is shown.
- A That is the line of the flume, top of the flume.

Q Mark it with a figure "1". Now, if you will point out the water as shown in the photograph and mark it with the figure "2"; I will ask you whether or not the lower large white spot in the photograph indicates water.

A It does not show as plain there as below.

Q Does it indicate the width of the water or the water flowing down the hill side?

A It don't show the water as here, that is--

Q At the very bottom of that light spot shows the flowing water?

A Shows the water.

Q About what was the width of that stream, Mr. Donnan?

A About ten or fifteen feet.

Q What does the house in the photograph show? What house is it?

A That is one of the cottages I have for the boarders.

Q On your resort ground?

A On the resort ground.

Q And the stream passes down past this cottage and thence where?

A Past the house and down through the grounds.

Q And back into the Provo river?

A And back into the Provo river.

MR. A. C. HATCH: We now offer exhibit 151 in evidence.

THE COURT: It may be received. Is that all the examination of Mr. Donnan?

MR. A. C. HATCH: That is all; take the witness.

CROSS EXAMINATION by Mr. Story.

Q Is it not a fact, Mr. Donnan, you have been in a controversy with the power company for some considerable time?

A I have.

Q Over rights of way and so forth?

A I have.

Q How far is this--you understood I referred to the Utah Light & Power Company as predecessor and Telluride Company, did you not?

A I do.

MR. A. C. HATCH: Let me ask if you have had any--have you had any controversy with the Utah Power & Light Company?

A I have, but they have been settled.

Q Have they been settled completely, Mr. Donnan?

A As far as the contract was concerned.

Q Is there not a controversy existing at the present time, as to what papers shall be drawn to carry out that contract and how the papers shall be drawn?

A Simply as to the fulfillment of the contract.

Q The controversy is still existing between you and the company until this is settled, isn't it?

A I suppose so. I am perfectly willing to conform to the contract in every way when the power company is ready to do so.

Q And your claim at the present time is that the power company has not offered to carry out the contract, is it not?

A Not according to the contract

Q There is a difference of opinion between you and the representatives of the power company as to what is necessary to be done in order to carry out that contract, is there not?

A I don't know that there is a difference of opinion so much as the manner in which they want to draw it up, want to conform to the contract.

Q You are unwilling to accept the instrument which the power company up to the present time have been willing to give, are you not?

A Which they tendered.

Q Yes, you have been unwilling to accept those, have you?

- A I have not been willing to accept those papers.
- Q And this controversy between you and the Telluride Power Company, predecessor in interest of the Utah Power & Light Company, extended over a considerable period prior to 1912, did it not?
- A It did.
- Q And also extended since 1912 up to the--with the Utah Power & Light Company, has it not?
- A It has.
- Q How far is this flume from your dwelling house?
- A It is across the county road.
- Q Also across the river, isn't it?
- A No.
- Q Across the county road?
- A Across the county road,
- Q How far up the hill?
- A Probably from the house about five rods.
- Q What was your occasion of your going up there every day or two to the flume during all these years?
- A I don't know that I testified that I was up to the flume, on the flume, but I observed the flume every day.
- Q Oh, you observed it from a distance, did you?
- A Not always from a distance.
- Q Well, how many times did you observe it in the year 1903 from going up and looking into it?
- A I could not say as to the number of times that I was there, but occasionally.
- Q When you say you saw it nearly every day or nearly every day, you don't mean you saw into the flume nearly every day, do you?
- A I wouldn't say I saw into the flume opposite the house but where the auxiliary flume, or where the temporary flume was constructed almost every day during its existence.
- Q You saw into that flume?

- A I did.
- Q Now, I am talking about the flume at what is known as the Donnan's rating station opposite your house.
- A That was only occasionally I saw that.
- Q That is where you testified to having seen the free board of two feet, is it not?
- A Yes.
- Q You don't mean to say then you saw that stream nearly every day, do you?
- A Occasionally.
- Q Only occasionally?
- A Occasionally.
- Q How often?
- A Whenever I had occasion to go up on the flume.
- Q What particular occasion did you have to go up on the flume that took you there frequently?
- A In crossing the flume and looking after the cows and in looking after chicken house, situation for a chicken house, when the power company was building their little red house near the station, and at different times.
- Q You didn't keep a chicken house on the other side of the flume, did you?
- A I did not.
- Q The time you would go over there about the chicken house, when you would ^{happen} ~~have~~ to go over there to see about the location for the chicken house?
- A Yes.
- Q Did you go over there once a week to locate a chicken house?
- A No
- Q Do it once a month?
- A No.
- Q As a matter of fact the height of water in the flume was fluctuating, was it not, or was it always constant?
- A Well, I did not observe it sufficiently often to say whether

- it was fluctuating or not.
- Q You mean to say you never saw it at any time up to 1913 when the free board was not two feet?
- A I do.
- Q Did you ever see it when the free board was more than two feet?
- A Not up to 1913.
- Q So that every time you saw it, it was exactly two feet, was it?
- A I could not say that it was exactly that; I did not measure it.
- Q How much above or below it would it be?
- A Probably a foot and a half or two feet. That was as near as I could judge by looking at it.
- Q And it was always at that particular point, was it?
- A I would not say that it was exactly that.
- Q Did you ever notice that during the time that the Telluride Company was taking all the water in the river?
- A I could not say as to whether I observed it at the time when they were taking the water out of the river, mostly or not.
- Q You don't remember then what the condition of the river was at the time you made these observations?
- A Only that one--in one instance and that was at the time when they raised the flume which joined on to the cement conduit, then I noticed that the water was higher.
- Q That was in 1913, was it?
- A That was in 1912 or 1913, shortly after they had finished the construction of the conduit.
- Q But you did notice there was an appreciable lessening of the free board after the temporary flume was constructed in 1907, temporary or auxiliary flume in 1907 and '8, did you?
- A Yes.
- Q Referring to the present year, you say that this, when you took this photograph what time of the year was that?
- A It was before the resort season opened up, it was in the early part of the summer or latter part of the spring; I cannot

definitely say.

Q Well, please give us the date as near as you can.

A The reason I know that is, on account of the photograph, leaves showing in the photograph and I remember you were up there along about that time.

Q You remember seeing Mr. Swendson there, do you?

A Yes, sir.

Q How far were you away from the flume when this pounding was going on?

A I was at the house.

Q How far is that?

A That is across the road about seven rods from the flume, in a straight line north and south.

Q You say that the same conditions prevail at the present time that prevailed then with reference to the side boards having been nailed on, do you?

A Repeat the question, please.

Q I say, did you say the same conditions prevail at the present time that prevailed at the time you mentioned with reference to the side boards being nailed on the flume?

A The side boards are still there, but the water is not overflowing.

Q All of the side boards that were nailed on at that time, are still on, are they?

A I believe they are.

Q Do you know whether they are?

A I don't know positively.

Q Did you make any investigation to determine?

A I did not, only casually as I would observe it in my daily avocation there.

Q Have you since this occurrence that you mention made any investigation to determine how many side boards were put on or how long a distance along the flume?

A Not any special investigation, but I remember they are there.

Q But at the time they were being nailed on, and water was coming over the side, you thought you might have a claim for damages against the company, did you?

A I did.

Q Why didn't you get up and examine the conditions on the flume at that time?

A It wasn't necessary for me to go up there, conditions around the house were sufficient.

Q Did you go up and make any protest to anybody?

A I did not.

Q If you thought they were injuring you, why didn't you do it?

A I would have done so had they continued.

Q And that was the only time--has that occurred any other time during the present year?

A Not to that extent.

Q Well---

A To the extent it did that time.

Q To what extent has it occurred and when did it occur?

A I believe there was once or twice there before or after that time that the same conditions occurred, but not to such a great extent, there wasn't such a great overflow of water as at that particular time.

Q Do you know positively there was another time?

A Yes, I do.

Q Do you know positively whether it was before or after that time?

A I do not.

Q Didn't make much of an impression on your mind then, did it?

A Not so much, because there wasn't so much overflow of water.

Q Were you still looking for a damage suit against the company, this other time you mentioned?

A No, I was not, because conditions were not such to justify a damage suit.

Q It wasn't enough to take into account, this other time,

was it?

A No.

Q How did you form the estimate of ten second feet going over the side?

A I judged by the width of the stream and the depth.

Q Did you get the velocity of it at that time?

A No, I did not.

Q Did you make any effort to get the velocity?

A I did not.

Q Then it is just a mere guess, is it?

A Just simply a mere guess.

Q Didn't you say you measured how deep it was?

A I judge it was about two or three inches deep.

Q Two or three what?

A Two or three inches deep.

Q Did you make any measurement to determine?

A No, I didn't. I walked through it, though.

Q During these other times that you mentioned, having crossed the flume in those early years, what time of day did you make these crossings and take these observations?

A It is pretty hard to remember back a number of years which I have found in looking up testimony in other suits, remember particularly any special time.

Q You haven't any clear recollection then, of any time, have you at the present time?

A Not in particular.

Q Have you any clear recollection whether or not you are in the habit of going on that in the day time or night time?

A I remember of course the flume and was on the flume various times.

Q Were those times day time or night time?

A Always in the day.

Q Between what hours of the day?

A I might state in walking down I recall this to my memory that I walked down one particular time to see the snow

slide at the Bridal Veil falls, and I know of numbers of times I have been over the flume. That was one particular time I can call to mind now.

Q You went to see the snow slide?

A Yes, I did.

Q That was the snow slide that took out the flume, was it?

A Oh, no.

REDIRECT EXAMINATION by Mr. A. C. Hatch.

Q About how long did these flows continue, overflow of the flume when the water ran down over your resort?

A How long?

Q Yes.

A It was probably---

Q Calling your attention now to the one of which you took a photograph that time?

A That overflow was about a half hour duration, best I can remember now.

Q Now, you say there was one or two times during the present year you cannot say whether they were before or after, or both, there were overflows at the flume, can you say it was whether it was one or two times?

A I remember one, I cannot say whether it was before or after, but the volume was not as great as this particular time that I took the photograph.

Q Now, can you give us a more definite idea of the time when you took the photograph, have you anything by which you may refresh your recollection in regard to the date, either here or at home?

A I think I could get near the date by consulting with Mrs. Donnan and with the man that were working with me at the time.

Q What time did you open your resort this year?

- A On the 15th of June we advertise to open.
- Q On the 15th of June?
- A On the 15th of June.
- Q Well, can you say whether this was before or after the opening when these photographs were taken?
- A No, I cannot say whether it was before, but I know it was before our business started to amount to anything. I know I was building on some new bungalows I was making at the time.
- Q You stated there was one or two times an overflow. Can you now state whether it was before or after the opening of the resort when the other overflows occurred?
- A It was before.
- Q About how long before when the first one occurred?
- A I cannot state exactly, because I don't remember only the circumstance of the overflow.
- Q Are you quite certain that it was before the opening of the resort?
- A It was before the opening of the resort.
- Q Did you see Mr. Swendson there on more than one occasion when these overflows occurred?
- A Mr. Swendson was there the day I took this photograph at my place and probably an hour.
- Q Who was with him, if anybody?
- A Well, now, I cannot say whether Mr. Corey was with him at that time, or not? But I believe Mr. Corey was with him at one time when one of these overflows occurred.
- Q I will ask you whether or not any controversy you now have or have had with any of these companies, either the Telluride or the Utah Power & Light would in any way tend to influence you in your testimony given in this cause?
- A I feel I am sworn to tell the truth and nothing but the truth and I don't think it would influence me in any way.
- Q Do you know Mr. Parker of Ogden, engineer?
- A I don't know that I do; I might know him when I saw him.

RECROSS EXAMINATION by Mr. Story.

Q You were rather angry at this large overflow you mention were you not?

A Excuse me.

Q You were rather angry the day this large overflow occurred, were you not?

A Not very.

Q How angry were you?

A Not angry enough to go up and take the trouble to stop them.

Q You were looking for a damage suit, but you were not angry, is that the case?

A Not angry, no.

Q Didn't have any feeling on the subject at all?

A I don't think that I had any very great feeling; I thought this much, that if they damaged me I was entitled to pay.

Q Did you have enough feeling on the subject to keep track of the length of time that they were working up there?

A I did; that is, in a way, I didn't make any, take my watch and time it with a stop watch.

Q Do you remember the length of time they were working on the flume?

A Probably an hour before the overflow commenced, half an hour to an hour.

Q How long, how much longer after the flood stopped were they working there?

A I could not tell you.

Q You could not tell?

A No.

Q Didn't make any effort to keep track what they were doing after that?

A I did not.

Q Did you see Mr. Jenson on the flume?

A I saw Mr. Jenson on the ground, not on the flume.

Q Did you see him on the flume?

A

- A Not that I know of.
- Q Did you make any effort to determine what was being done on the flume other than that you say you heard the nailing of the boards?
- A I could see the flume from where I was, when I took that photograph I could see them nailing boards on there at the time.
- Q How much of it could you see?
- A There is a section there in front of the house.
- Q How long?
- A Probably three hundred feet, two hundred feet within my observation.
- Q Wasn't it a matter of sufficient interest to you under the circumstances to ascertain what they were doing on the flume?
- A Not when I knew.
- Q Wasn't it a matter of sufficient importance or interest to you to ascertain the reason why they were putting those boards on?
- A I knew why they were putting the boards on, what was the use of my going up there.
- Q Who told you what was going on?
- A Couldn't I see the water overflowing and see them trying to stop it with the boards?
- Q Wasn't it a matter of sufficient importance to you to ascertain why they were trying to get a large volume of water through the flume?
- A No.
- Q Wasn't interesting to you at all, was it?
- A Not especially.
- Q So you made no effort to determine what was going on other than that you saw them nailing some boards on the flume?
- A I didn't specially make any effort to find out what they were doing. I knew pretty well without.

GEORGE L. SWENDSON, recalled

DIRECT EXAMINATION by Mr. Thurman.

Q Mr. Swendson, I don't wish to have these papers marked at the present time, but by way of identification in the right hand upper corner of each of them the figures 11-8-16, name Corey, they purport to be measurements of the flume at Nunn's, same date, same name, measurement of the flume at Donnan's, showing the discharge at various measurements at the bottom in each case. I call your attention to it because it refers to Mr. Swendson--which I assume is yourself--ask you if you know what those documents are.

A From the numbers on them, one of them, 4013, down in the right hand corner, I judge they are some files of Mr. Corey. Probably an attempt on his part to make a rating curve at those stations.

Q You note on each it says, "See page 25 Mr. Swendson's report, for details of measurements." Do you know what report that refers to?

A I do not, unless it be a summary of all the measurements I could find from any source on the flume, which he had reference to at the time. I could not tell you farther than that. It has probably reference to a summary of that kind.

Q Is there such a report prepared by yourself on file in the office of the company, a report made to the company?

A Well, I don't think I ever made a report to the company, I endeavored to make a report but I never have made a report to the company on the carrying capacity of the flume, or any other data on the Olmstead flume, for that matter, probably referring in that to a compilation of data that I had gathered together and took his data from that source. The report has never been made to the company by me.

Q This says, "See page 25 Mr. Swendson's report", do you know of having made any report?

A No, sir.

Q Same occurs on the other. Have you any idea what this refers

to?

A I stated that I thought it refers to compilation of data which I made in question with investigations on the Olmstead flume, but the report has never been made.

Q Could you find that compilation of data which you made?

A I don't know whether I could find it at this time or not. I have made so many, gotten out so much data on the case and revised it so much, whether I could find that particular report I could not say.

Q You don't remember by these figures at the bottom indicating the discharge at various measurements, do you remember the occasion of the measurements?

A No, they were not measurements.

Q What were they?

A I say they were evidently a compilation of data that was available from all sources of the measurements at Olmstead flume. There were no measurements made by me unless it be the two measurements I assisted with in measuring at Donnan's which were the only measurements I have made on Olmstead flume or had anything to do with.

Q How many?

A Two. I assisted Mr. Corey with one which he reported made on the 13th of June.

Q You assisted Mr. Parker, did he assist you?

A We made separate measurements that day.

Q In each case you got three hundred?

A I got three hundred and one and a fraction each time I measured it.

Q Are those the only measurements you say you ever participated in there?

A I assisted Corey on June 13, in making one measurement of the flume, only ones I participated in.

Q Did you not assist Mr. Parker?

MR. STORY: ~~Wherix~~ He said he did.

Q On June 14th?

A Yes, sir, that was the measurement where we took separate readings, and made our separate computations. He reported three hundred and two and a fraction to the court, I reported three hundred and one and a fraction and put it on that line as three hundred even.

Q Now, on June 13th you made one with Mr. Corey, didn't you?

A Yes, sir.

Q You remember what that discharge was?

A No, I don't. I would have to look it up.

Q Two hundred and forty-three?

A Yes, sir, that is correct.

Q On May the 25th Corey assisted you, or you assisted him?

A I might have assisted on that day; we took separate readings both of us.

Q On that day you got three hundred?

A I got three hundred and one, at each of the measurements and the stream is reported as three hundred on the line.

Q You don't know of as much as three hundred ever having been obtained in any other measurements, do you?

A No, sir.

Q Made by anybody connected with the company?

A No, sir.

Q Would it be very inconvenient for you to try to find the data that this refers to?

A I don't think so, I could probably get all the stuff Mr. Corey used in that.

Q I would like it very much, if you could; this seems to be a kind of a fugitive document that has found its way in here. Nobody can account for it and yet it looks like it might throw some light on this case.

A I suppose Mr. Corey dropped that out of his pile of papers when he was here in court. I cannot account for it any other way.

Q Where is Mr. Corey now?

A In Salt Lake, I suppose; or he may be on the Bear river, I am not sure.

MR. JACOB EVANS: We offer these exhibits, 152 and 153.

MR. STORY: It may be conceded these may be accepted subject to the right of the defendant to strike in the event we don't find them to be correct on examining them.

THE COURT: I think before anything further is said on the subject they had better be marked.

MR. STORY: They are marked. Mr. Evans, will you be good enough to furnish us with blueprints of those so that we may examine them?

MR. JACOB EVANS: The exhibits referred to are exhibits Nos. 152 and 153, graphical representation of the original sheets that were given to us by the Utah Power & Light Company and which sheets contain the highest peak loads of the peak loads that were testified to by Mr. Brundige and we offer them in evidence now and we are returning them to the attorney for the Utah Light & Power, the original sheets which they turned over to us and from which this information was taken.

THE COURT: They may be received upon the conditions stated in the suggestions of Mr. Story.

MR. A. C. HATCH: Mr. Wentz, did you obtain the data that we asked for this morning?

MR. WENTZ: No, I have not had time.

MR. A. C. HATCH: I think that ends our rebuttal with the exception of the matter we asked Mr. Wentz to obtain during the time he

was upon the witness stand. We want that, if he can give it to us.

MR. JABOB EVANS: We ask permission to withdraw exhibits 152 and 153 for the purpose of making the blue prints.

THE COURT: That may be done.

MR. STORY: Your Honor, I think we will have very little surrebuttal, for instance some of the measurements were introduced as having come from our records, and it may be we shall wish to introduce some testimony in regard to that. There is one other matter I have in mind at the present time that I would like to introduce in connection with the record, the Government record which the plaintiff introduced as to the flow of water in the Provo River and the Telluride flume. I have another record of equal dignity that I would like to introduce in that connection, being a report by the state engineer of Utah compiled by Mr. Caleb Tanner, State Engineer, and I would like to introduce in that connection page 348 of that report.

THE COURT: What year is that, can you identify it by the year?

MR. STORY: Year 1905; it is the report for 1905 and 1906, in which these measurements given in the Government report are commented upon by the State Engineer.

THE COURT: The facts may be received but not the comments.

MR. STORY: It is a comment by the state engineer upon the correctness of those records saying that the records were obviously erroneous, Government reports.

MR. A. C. HATCH: We object to it, if the Court please, any comment.

THE COURT: Objection will be sustained.

MR. A. G. HATCH: The party who was State Engineer is present in court and if he wishes to cross examine him as to any matter--

MR. JACOB EVANS: Does not purport to be signed by the state engineer, anyway, it is signed by different parties.

MR. STORY: It is in his report, isn't it?

THE COURT: I would not sustain the objection on that ground, but it seems to be incompetent and immaterial.

MR. STORY: The whole thing, I think, from the government records is irrelevant and immaterial without showing how these were made. I am simply telling you my ^{information} ~~opinion~~ on the matter. I am informed and understand that there never was any gauging station set in the Provo flume and these readings that are given in the government publication---

MR. A. C. HATCH: Pardon me, Mr. Story, you said the "Provo flume", I don't know what you mean.

MR. STORY: I should have said the Telluride Power Company flume.

THE COURT: I will say in this connection, Mr. Story, my observation has been and my experience has been such that reports of that kind have very little weight with the court. I know the manner in which many of them are taken and they have but very little weight, but they are admissible under our statute as I read the statute.

MR. STORY: May I finish the remark I was going to make, that these were tabulations which were based upon power construction, and estimated back from the power construction obtained ~~some~~ way; I don't know how, and the report which I just referred to and desire to introduce in evidence is a comment upon those measurements as being obviously erroneous and having been worked back in that manner.

THE COURT: I think clearly from your statement they are incompetent for any purpose, merely an argument, is not a statement of any fact.

MR. STORY: He repeats the report.

THE COURT: I was about to say any fact in the state engineer's report that has been published by the authority of our state government is admissible under our statute without question, but any discussion the state engineer has engaged in in that report with reference to the correctness of any other report would not be admissible for any purpose.

MR. STORY: I realize it, I will simply save an exception to Your Honor's ruling. I merely mention these other matters in connection with the objection I have made, and that if these are estimates, pure and simple, made by the government instead of actual readings, it seems to me every consideration of fairness should require there be some information, some ground or some testimony given how they were taken.

THE COURT: Certainly the court would hold that without hesitation, does not want to be understood as holding anything else. If that report that was introduced published by

the Department of the United States Government is an estimate, the court would hold without hesitation it would be incompetent for any purpose. The court held that at the first of this trial when Mr. Thomas undertook to introduce an estimate made by the census bureau or some department of the government as to the population of Provo City. If this appears on its face to be an estimate, the court will not consider it for any purpose, and motion to strike it out will be granted if it is brought to the attention of the court, after I examine it.

MR. STORY: May I call Mr. Tanner?

MR. A. C. HATCH: Just a moment before you proceed.

MR. THURMAN: We won't object to the schedule of measurement.

MR. STORY: That is what you had. It is simply a copy of the schedule you already introduced.

MR. THURMAN: We don't object to that.

MR. A. C. HATCH: If the court will permit me, I ~~wxxx~~ was hardly through with my statement as to our rebuttal and until I heard Mr. Story offering evidence I presumed I had the ear of the Court, but we wish further, if we may deem it advisable, to call Mr. Corey in regard to the matter that Mr. Hansen Swendson was called to testify to--as to certain measurements shown on these papers, before we close the rebuttal as against the Utah Power & Light Company. At this time, if the court please, I think we are prepared to make a motion which I started to make this morning with regard to the demurring defendants. If the court will hear us.

THE COURT: Before you proceed with that, is this record complete as to this offer?

MR. STORY: Not quite, Your Honor.

THE COURT: I think it should be closed up, that report.

MR. STORY: I wish to interrogate Mr. Tanner in regard to it.

THE COURT: As to this report?

MR. STORY: As to this report and these other measurements, take the stand, Mr. Tanner.

CALEB TANNER, recalled.

CROSS EXAMINATION by Mr. Story.

Q I will ask you to examine the volume which I have in hand. State if you know what it is?

A Yes.

Q Is that a report that was gotten out by yourself as state engineer of Utah?

A That is the report of the engineer's office; the particular divisions of the report under the management of whom the divisions report was prepared is given in the text of the report.

Q But is it a report which was gotten out by you as state engineer, was it not, that is the volume?

A It is the state engineer's report.

Q And you were the Caleb Tanner who was engineer at that time, were you not?

A Yes.

Q And this was published with your approval, was it?

A Yes.

Q All the contents of it?

A Yes.

Q At page 348 of that report, the following appears, - after referring to the estimated monthly discharge of the Telluride Power Company's flume near Provo, Utah, for 1905. "It will be seen that the discharge given for the river above the

the Telluride dam do not check with the discharges at the mouth of the canyon during low water, seepage amounting to about thirty second feet, may be expected between the dam and the gauging station near the mouth of the canyon."

The reason for the discrepancy between the discharge above the Telluride dam and the sum of the discharges of the Telluride tail race and runner at the lower station could not be determined. It is probably due mainly to the inaccuracy in the method of reporting the discharge of flume. This was obtained by calculation from the observed power output of the turbines. This was apparently often reported at a time the load on the turbines was fluctuating rapidly and hence did not represent the average flow for the day."

Q Do you remember that part of your report?

A No.

Q You were familiar with all parts of your report at the time you published it, weren't you?

A All that detail was gone into and prepared by H. S. Kliensmith

Q Was he one of your assistants?

A Yes, but I do know that Mr. Kliensmith in that note has given rather an unfair amount of responsibility to the determination of the discrepancy by loading it upon the observer at the station. The station above the Telluride dam was not an accurate station on account of the irregularities which developed there due to the back water at the dam by the presence or absence of the flash board effect. Both of those reasons, I think, figure in the apparent discrepancies that occurred and hex on the face of the report. Now, just the basis of Mr. Kliensmith's criticism I presume was simply his investigation of the records; I did not investigate them myself, personally. Now, I was hydrographer for the United States government when some of that work was done. My understanding that the station officer who was a competent man and made these reports to the department

was that he observed the record of power output at the station and was familiar with it and that when he gave me the flow in the flume it was with relation to a fairly continuous period of power use, so that the overflow from the spill way would get down past the station, and inaccuracy would not occur--that was of such a nature as has been assumed by Mr. Kliensmith there. Of course, whether the man carried out his understanding, I don't know.

Q Well, then the computations which you finally reported to the Government as its hydrographer, were based upon the power output and computed back from that to water, were they, largely?

A Now, I had him send the report direct to Washington and the terms under which he made them, whether he had some actual observations in the flume itself, I am not informed.

Q Your instructions to him were---

A My instructions to him were to report the volume of flow in the flume, so that in the report of that it would not overlap with the volume of flow at the gauging station and I am not advised now and I was not then as to how he obtained the information. Now, my understanding is that he may, under some circumstances figure back from the load but I think that very frequently he knew the volume of flow. They maintained a gauging station, my understanding was, somewhere on the flume.

MR. STORY: Where?

A I don't know.

Q You don't know?

A No.

Q You were Government hydrographer at the time and don't know where this gauging station was?

A No.

Q Didn't you discuss with him the question of computing back from load which he took regularly?

A No, I don't think I did, except that he would give in the report on the cards to the department, he would give the volume of flow in the flume and also read the river section.

Q You mean now you don't know whether the discharge measurements for the flume as reported to the Government were at all based upon the power output?

A No, I don't know that.

Q This report, these remarks of Mr. Kliensmith which are included in your report were published with your approval, were they not in 1906 or '07?

A I was familiar with the matter, he was more familiar with the whole situation than I was.

Q This was published with your approval at that time, wasn't it?

A Oh, yes.

Q You had been the hydrographer of the Government?

A During part of the interval.

Q And had supervised the taking of the gauging of this data?

A At the river.

Q You say that there were some fluctuations in the river? at the gauging station above the dam which caused inaccuracy there?

A Now, I never put in that station but that is my information. The hydrographer afterwards abandoned that station.

MR. A. C. HATCH: If he wants to put that page in, I don't know we have any particular objection.

THE COURT: Objection is withdrawn, it may be received.

MR. JACOB EVANS: He has read it.

MR. A. C. HATCH: No, he has not read, only read a part of it. If he wants to put the whole page in as offered we have no objection.

THE COURT: Objection is withdrawn, you may put it in if you care to, Mr. Story.

MR. STORY: No, I don't care to.

OMISSION.

Motion to set aside defaults and entry of order over-
ruling demurrers.

MR. STORY: Your Honor, I think I failed to introduce those two exhibits--I don't know the numbers--I will give them to the court. Then I wish to read into the record one motion. Not that I care to argue it at the present time-- numbers 145 and 146.

THE COURT: They may be received.

MR. STORY: May I just read into the record one motion.

THE COURT: Yes.

MR. STORY: At this time the defendant, Utah Power & Light Company moves the court to strike all oral evidence introduced by the plaintiff, Provo River Company, in relation to construction of any canals, reservoirs or other works, and beneficial use of water under or pursuant to application No. 1828, to appropriate one hundred and fifty second feet of the waters from Provo river, filed in the office of the State Engineer of Utah April 16, 1898, mentioned in paragraph 30 of the complaint; on the ground that the same is incompetent, irrelevant and immaterial in that the statutes of Utah requiring appropriators of water from the public streams of the state to make application to the State Engineer for permission so to do, have provided an exclusive method for the initiation of rights in and to the use of such waters, since the enactment of such statute and the manner of proof of construction of works, and of beneficial use of water provided in said statute furnishes an exclusive method for the proof of construction of works and beneficial use of water or pursuant to such application. I do not wish to argue the motion at this time, but

would like to upon final argument.

MR. THURMAN: You said 1898; was that right?

MR. STORY: April 16, 1908, it is.

THE COURT: The motion will be overruled pro forma, then if you desire to argue it later when the matter is finally submitted.

MR. THOMAS: As I remember the rule, Your Honor, a motion made by one inures to the benefit of all.

THE COURT: All parties interested may have the benefit of this motion.

MR. STORY: Take an exception.

MR. THURMAN: We think, if Your Honor please, in view of this motion of Mr. Story's that it ought to be more specific, we don't know what it refers to, what it means.

THE COURT: I have overruled it subject to his argument later.

MR. THURMAN: I call attention to it at this time, I am aware of the fact Your Honor overruled it, but we are putting in testimony. The application, for instance, should be defective or not the application defective, but the proof in relation to it is something that is curable. We think he should be fair and specify the particular grounds.

MR. STORY: The grounds specified in the motion, Judge Thurman, is that the statute furnishes an exclusive method of making this proof.

MR. THURMAN: You mean by final certificate?

MR. STORY: By final certificate. I will state it in a few words. I do not wish to argue it now, because I haven't the authorities here. My position is that since the enactment of the statute of Utah providing for the appropriation of water

by filing in the state engineer's office, that furnishes an exclusive method of appropriation of water in the state, and that the method provided by the statute for furnishing proof as to construction of works and as to application of the water to beneficial use is an exclusive statute and hence that the mere proof of use of water is irrelevant and immaterial.

MR. THURMAN: Even where an application has been made unless we have had a final certificate, is that what you mean?

MR. STORY: Yes, you have to go to the state engineer's office before you can get a final right, a right for instance, this court may adjudicate.

MR. THURMAN: That is all right.

MR. STORY: As a perfected right.

MR. THURMAN: We understand it.

5:20 P. M. RECESS TO 10:00 A. M. DECEMBER 27, 1916.

OMISSION.

Entry of defaults.

Discussion of payment for commissioner's services.

12:00 Noon, Recess to 10:00 A. M., January 8, 1917.

MR. A. J. EVANS: There have been a very great many exhibits prepared and put on the board, and for fear that some of the exhibits have been overlooked in getting them admitted, I now ask the court to permit all exhibits that have not been been put in, that they be permitted to be considered as having been admitted.

MR. RAY: You mean exhibits that have been marked and testified to?

MR. A. J. EVANS: Yes.

THE COURT: They may be received if not objected to.

MR. RAY: I don't like the offer to pass without an objection, though I know of no specific objection, because I don't know what is in or out. I merely want to preserve the record by objecting to them as incompetent, irrelevant and immaterial in so far as they are not now in. That objection is about as good as the offer.

THE COURT The court hardly knows to what your objection goes.

MR. RAY: I hardly know what the offer is.

MR. A. J. EVANS: The only thing is to protect all the attorneys alike. I don't know of any exhibits that have been testified to and presented that would be objectionable, but for fear inadvertently some of them have not been admitted in evidence, that was the purpose of the motion.

THE COURT: The court hardly knows what the condition is.

MR. THURMAN: We don't know what the objection is, but insist on the motion.

THE COURT: They may be received. I think Mr. Booth, you may proceed with your evidence.

LARS JACOBSEN called by the defendants Reed Knudson, Lewis Marriott, et al, being first duly sworn, testifies as follows:

DIRECT EXAMINATION BY Mr. John E. Booth.

- Q Mr. Jacobson, where do you live?
- A Lake view, Utah county.
- Q Acquainted with the land of Reed Knudson, Lewis Marriott, Lars Jacobson, Albert Jacobson, Lewis Jacobson, Isaac P. Nelson, H. Knudson, William D. Lewis and William C. Williamson?
- A Yes sir.
- Q Whereabouts is that?
- A Right on the river.
- Q Which side?
- A On the north side of the river.
- Q Do you know the section?
- A Yes, it is in Section 4, I think.
- Q 3 and 4?
- A 3 and 4, yes.
- Q That is 7 South, 2 East in this county?
- A This county.
- Q How much is there of it that belongs to those parties.
- A To each one.
- Q Can you give it altogether, as they all water out of the same ditch, do they not? Do you know how much there is under that ditch?
- A I think there is 2x 80 acres.
- MR. RAY: What is the name of that ditch?
- MR. JOHN E. BOOTH: I don't believe they have a regular name for it, but it is the lowest one on the river, is it not?
- A Yes sir.
- Q On the north side. How long have you known that land?
- A I have known it for forty years.
- Q And who owned it before you owned it?

A My father owned it before I did.

Q And the three Jacobson boys here mentioned are sons of Lars Jacobson deceased? A. Yes sir.

Q And represent the interests of that estate?

A Yes sir.

Q Has that land been cultivated right along for all these years?

A Yes, it has.

Q Have you ever had the water measured?

A No, never had it measured.

Q Have you a judgment about how much water you use there?

A We use all we need all the time.

Q Where does this water come from mostly ?

A It comes from the river, take it right out of the river.

Q Does it come from seepage in a great measure?

A Yes, comes from seepage, that is late.

Q In the late season of the year?

A In the ~~ixat~~ late season of the year yes.

Q This water comes from seepage from the irrigation above?

A Yes sir.

Q Have you ever been interfered with the use of this water in any way?

A Never.

Q Whenever it is there you are entitled to it?

A Entitled to it.

Q Within all these years have you ever missed any year when you have not used this water?

A No.

Q You control it yourself under your own regulation?

A Yes sir.

Q ~~I~~ It is not under any other irrigation company?

A No sir.

Q Now, you have -- you are all together in this, you don't have separate ditches?

A No sir, all one ditch.

Q All one ditch, and you use it in your turn as you need it?

A Yes sir.

Q If there is water that is excessive then it goes on past?

A Goes down the river.

Q Into Utah Lake?

A Into Utah Lake.

Q You desire to have your title to this quieted?

A Yes sir.

Q For the purpose of this suit and getting the matter settled ?

A Yes sir.

MR. RAY: May I ask whether or not the seepage takes care of it or if it is necessary to turn primary water down the river at any time.

Q Have you ever had to go up the river for water for your land down there?

A No, we never had to go up the river.

Q There has always been sufficient?

A There has always been sufficient.

Q At the place. This is below where anybody else can take it out?

A Yes sir.

Q There is nobody can use this water then besides yourselves when it gets to your place? A. No.

Q And there has been sufficient there up to now to supply your needs?

A We have always had all we needed.

MR. A. C. HATCH: Just a moment, it appears to me that some of these are not named as defendants and are not served with summons. Have you examined--

MR. JOHN E. BOOTH: I think they are all made parties, that is my remembrance of it in checking it up, but the three boys, Lars Jacobson, Albert Jacobson and Lewis Jacobson were included in the list as the estate of Lars Jacobson, but that estate has been settled and they are the successors in interest.

MR. A. C. HATCH: And the answer so shows?

MR. JOHN E. BOOTH: Yes.

REED KNUDSON, called by the defendants Reed Knudson, Lewis Marriott, et al, being first duly sworn, testifies as follows:

DIRECT EXAMINATION By Mr. John E. Booth.

- Q Mr. Knudson, you are one of the defendants that are named in this particular hearing, are you? A. Yes sir.
- Q You know the land?
- A Yes sir.
- Q How long have you been acquainted with it?
- A Oh, nearly all my life, ever since I could remember.
- Q About how many years is that?
- A About twenty years.
- Q During that time have you know of this land being irrigated by this lower ditch, lowest one on the north side of Provo River? A. Yes sir.
- Q How much land is there there under that ditch?
- A About 80 acres.
- Q What is your best judgment as to the amount of water that is necessary to irrigate that land?
- A About a second foot and a half.
- Q You never been interfered with by anybody in the use of this water?
- A No sir.
- Q And is this amount that you have used, is it necessary for your successful raising of crops down there?
- A Yes sir.
- Q What do you raise?
- A Oh, sugar beets mainly on this land of late years.
- Q Is there any part of it pasture?
- A No sir, there is none of it pasture.
- Q All of it is cultivated?
- A All cultivated.
- Q This water that you use is principally seepage water?
- A Yes, in the last part of the season, if I be allowed to explain, in early days the water, the river, the course of the river was

- it
different than, is now, it was not always taken out of the river
where it now is, and it was not always seepage water that was used.
- Q When there was plenty of water running in the river you could use that?
- A When there was plenty.
- Q How about the late season?
- A There is usually enough seepage water then.
- Q You have never had to go and get more water from people above, tear out dams, anything of that kind?
- A Not of any organized company, no sir.
- Q And you will be satisfied with a foot and a half if you are awarded that much? A. Yes sir.

MR. JOHN E. BOOTH: Now, your Honor please, the answers we filed a few days before you took your last adjournment, by permission of the court are very much similar to these and we could get through with that now if there is nothing else in the way. Be glad to do that, people just joining these.

MR. THURMAN: What is the name of the right.

MR. JOHN E. BOOTH: The Jacobson ditch.

MR. THURMAN: The same ditch?

MR. JOHN E. BOOTH: No, it is the one next above.

MR. A. C. HATCH: What do you call this ditch?

MR. JOHN E. BOOTH: The lowest one on the north side, it has no regular name. I will state, if your Honor please, that this interest is in with the Utah-Idaho Sugar Company, represented by Mr. R. W. Young when he was down here, and I am not certain but it was included in that, but I did not hear that testimony. That was the understanding of Mr. Jorgenson at the time, but I believe Mr. Jorgenson's interests were not testified to, and it is part of the same ditch and exactly the same condition.

MR. RAY: Are they tenants in common to that ditch?

MR. JOHN E. BOOTH: They are tenants in common to that ditch, but I inclined to believe the sugar company only put in

their testimony for their share of the water. If we find they did include that then we don't ask anything extra for Mr. Jorgensen.

AL JORGENSEN called by the defendants Reed Knudson, Lewis Marriott et al, being first duly sworn, testifies as follows:

DIRECT EXAMINATION By Mr. John E. Booth.

Q What is your name?

A Al Jorgensen.

Q Where do you live?

A At Lake View.

Q Have you some land there?

A Yes sir.

Q Whereabouts is that?

A Just east from the sugar factory, adjoining the sugar factory ground.

Q On the east side of the county road?

A Yes sir.

Q Near the Provo river bridge? A. Yes sir.

Q How much land have you there, Mr. Jorgensen?

A About twenty-five acres.

Q Where do you irrigate it from?

A I irrigate from the Lake View Canal.

Q Lake Bottom canal?

A Lake Bottom canal.

Q Is it part of the Lake Bottoms water?

A Well no.

Q Your interest is separate?

A Our interest is separate, comes out of the river separate, but goes into the Lake Bottom canal and goes through the Lake Bottom canal.

Q About how far from the head of that canal to your ground?

A To my ground?

Q Yes.

A Oh, it is four miles, I should judge.

Q From where the Lake Bottom takes right out of the river?

A Well, it is four miles below that. You mean the head of the canal?

Q Yes.

A It is four miles above my ground.

Q Not where the canal is actually dug, is it?

A Yes sir.

Q Let me see if I understand you?

A But our water is to be distributed through the head gate there, in the old German field about half a mile above my place.

Q That is the place I am asking about.

A It is to be distributed at that overflow at the old German farm.

Q Who else uses water through that same canal?

A Goodrich, Lake View canal, Utah-Idaho Sugar Company. The Utah-Idaho Sugar Company owns water in the same ditch I do, the same stock, and the Zions Savings Bank is also in the same ditch and use water same as I do.

Q Who else, anybody besides you?

A That is all.

MR. RAY: That would be four, Goodrich, Lake View, and Sugar.

A Goodrich and the Sugar Company is the same thing.

MR. RAY: This is not a corporation?

A No.

MR. RAY: You don't own shares of stock in it?

A No, we have a decree, the Morse decree, that decreed us so many shares of water out of the river, and we transfer into the Lake Bottom canal, and that is where we get our water.

Q What you ask for is that the water awarded you in the Morse decree you still have? A. Yes sir.

- Q You are satisfied with that and that is all you ask for?
- A Yes sir.
- Q Do you recall how much that is?
- A Well, no I don't, I haven't, I have never looked over the papers myself, as Goodrich has looked after the whole thing, while he was looking after the Sugar Company interests.
- Q Did you understand that the Sugar Company would see to yours at the same time? A. Yes sir.
- Q Is that how you come to be so late getting in?
- A Yes sir, that was the understanding.

CROSS EXAMINATION By Mr. Ray.

- Q Do you know whether or not your acreage was included in the acreage for which water was claimed by the Sugar Company?
- A I don't.
- Q Does the title to the water for the twenty-five acres stand in your name or the name of the Utah-Idaho Sugar Company?
- A No, stands in my father's name.
- Q Stands in your father's name?
- A And the Utah-Idaho Sugar Company, I am not positive to that, I have never seen those papers; we were awarded so many second feet or so much water out of the Provo river, and the Utah-Idaho Sugar Company had two-thirds and I was to have one-third.
- Q You or your father?
- A My father, and I own my father's property, I own the same property.
- Q What is your father's name?
- A Mads Jorgensen.
- Q Then the distribution wasn't to you in the Morse decree, but Mads Jorgensen?
- A Mads Jorgensen, yes sir.

MR. RAY: I don't know any way your honor can tell whether or not the acreage given by the witness is for more.

REDIRECT EXAMINATION By Mr. John E. Booth.

- Q I will ask if he knows how much land the Sugar Company has?

A I think the Sugar Company has sixty acres.

Q How much has the Zions Savings and Trust Company?

A They have twenty-five acres.

Q Now, did your father own all that at one time?

A He owned the Zions Savings Bank ground and twenty-five acres I own.

Q Then the Sugar Company bought the old Bunnell place?

A Yes.

Q And this is part of that?

A Yes.

Q That would be 110 acres altogether?

A Yes sir.

Q If Mr. Young's testimony showed 110 acres then we don't ask anything in addition?

A I am quite positive it is sixty acres the Sugar Company owns.

CROSS EXAMINATION By Mr. A. C. Hatch.

Q Is all the land of the Sugar Company irrigated?

A You say is all of it?

Q Yes. A. Yes sir.

Q All that they own there? A. Yes sir.

MR. THURMAN: Who is it that owns this other twenty-five acres?

A Zions Savings Bank.

MR. A. C. HATCH: And the bank owns twenty acres?

A Twenty-five.

REDIRECT EXAMINATION By Mr. John E. Booth.

Q Is that whole twenty-five acres of your's irrigated?

A Yes sir.

Q And is all the twentyfive acres of Zions Savings Bank irrigated?

A Yes sir.

Q And all the sixty acres of the Sugar Factory land?

A Yes sir.

Q Isn't there a good deal of it that is wet naturally and doesn't need irrigation?

A It is in the forepart of the season, but the latter part of the season have to irrigate it.

Q Every foot of it?

A Yes sir, practically all.

Q It has always been that way, has it, they didn't need to irrigate it the forepart of the season?

A No, there is some of it you have to irrigate in the forepart.

Q I say part of it you didn't need to irrigate the forepart of the season?

A Yes.

Q The Lake Bottom canal water that you get in late season is mostly seepage water, isn't it?

A Yes sir.

Q It is very seldom they have to go to the river direct for any water?

A Not in the late part of the season when the water gets low, they have to go to the river to get water every year.

Q Isn't it a fact they shut off the river tight up at the mouth of the canyon and keep it tight during the late part of the season?

A Yes sir, but there is seepage comes out from one of those dams that supplies water that the other fellow can catch all the time.

Q That is what I say, the water that goes in the Lake Bottom canal is mostly seepage water in the late part of the season?

A Yes sir, most of it.

Q So far as you know they have never had to go to the mouth of the canyon for water?

A They went to the head of the canal, but not the mouth of the canyon.

Q There are one or two tight dams above where they take it out of the river, isn't there? A. Yes sir.

Q And always have been so far as you know?

A Yes, certain seasons of the year.

Q I mean in the late part of the season? A. Yes.

Q And that is the kind of water you have also to irrigate this, the seepage water that comes out below the mouth of the canyon in the late part of the season? A. Yes sir.

MR. JOHN E. BOOTH: There is one other matter.

THE COURT: very well.

HENRY WILLIAMS, called by the defendants Reed Knudson, Lewis Marriott et al, being first duly sworn, testifies as follows:

DIRECT EXAMINATION By MR. John E. Booth.

Q What is your first name?

A Henry Williams.

Q Where do you live?

A Lake View.

MR RAY: This is in proof of what claim?

MR. JOHN E. BOOTH: Of the Jacobson ditch.

THE COURT: Same as the last one?

MR. JOHN E. BOOTH: No, this is separate.

THE COURT: I had the other marked Jacobson.

MR. JOHN E. BOOTH: I said Jacobson, but I called this first. The other was the Utah-Idaho Sugar Company.

Q Do you know the Jacobson ditch?

A Yes sir.

Q How long have you known it?

A Known it for twenty-five years.

Q Are you interested in that ditch?

A I am not directly, my mother is interested.

Q You represent your mother, Sarah Williams?

A Yes sir.

Q Can you name the others that are interested in that ditch?

A Yes sir.

Q Will you do so?

A Albert Jacobson, Lewis Jacobson, Anna Glade and Zions Savings

Bank & Trust Company.

Q How much land is there under that ditch?

A Sixty-three acres.

Q What is this ditch called?

A Called the Jacobson ditch.

Q In the answer of those defendants it is stated it is the lowest ditch on the north side of the river; that is an error, is it?

A Yes sir.

Q It is the lowest next but one, what ditch is below you?

A Well, there is several ditches below us, there is what is called the Madsen ditch, I guess it is the Madsen ditch, but that does not come out of the same course. Then there is the ditch Lars Jacobson represents, that is below it.

Q Can you tell by the location where this ditch comes out of the river?

A Yes sir.

Q Where?

A Our ditch, our irrigation ditch heads, you might say, right here east of the interurban track about thirty or forty feet, but there is a slough that extends up the river, on the north side of the river about a mile, and our water comes direct from the river into this slough, and we take our water out about 80 rods or a hundred rods right east of the interurban track.

Q You say you have been acquainted with that for twenty years?

A Yes sir.

Q Twenty-five? A. Yes sir.

Q Was the water been used on this land for the whole of that time during the irrigation season?

A Yes sir, it has been used last forty years on that, or more than that.

Q You are told that, I suppose?

A Well, I know it, know it to be a fact.

Q I asked you and you said twentyfive years, now you say forty?

A I have known the ditch for forty years, but the ditch has been

out for fifty years.

Q You people are included in the Morse decree?

A I don't know, I don't think so.

Q Do you know how much water that you have used?

A Well, no, I don't particularly, but judge about a second foot .

Q That has been an estimate you have made, about a second foot for the sixty-three acres?

A Yes sir.

Q And is that, the amount you have had has been sufficient for the successful irrigation of your crops?

A Yes sir.

Q Now, do you go, do you ever go to the mouth of the canyon for water?

A No sir.

Q There has always been sufficient water in the slough and river there to supply you? A. Yes sir.

Q Without interfering with other people above you ?

A Yes sir.

Q And if it continues in that way you are satisfied with that condition? A. Yes sir.

Q You are asked to represent all the defendants that you have named? A. Yes sir.

MR. A. C. HATCH: How much land do they all claim?

MR. JOHN E. BOOTH: Sixty-three acres.

MR. A. C. HATCH: Who are the parties?

MR. RAY: Sarah Williams, Albert Jacobson, Lewis Jacobson, Mrs. Anna Glade and Zions Savings Bank. Now, there is just a question here, your honor, I don't know what Judge Booth's idea is whether this water is claimed in severalty or how it is claimed, how it is to be distributed.

MR. JOHN E. BOOTH: I will ask about that.

Q You don't have several ditches?

A No sir, just one ditch.

Q All of you ^{are} ~~are~~ associated together in this?

A Yes sir.

Q And regulated among yourselves? A. yes sir.

Q You are not under anybody else's regulation?

A No sir, we regulate it ourselves.

Q You prefer having the decree then, whatever is granted to all of you and then you divide it among yourselves?

A Yes sir.

CROSS EXAMINATION By Mr. Ray.

Q Do any of these lands subirrigate, Mr. Williams?

A Well, they do in the spring.

Q They all sub irrigate easily?

A In the spring when the river is up they all sub irrigate. As soon as the water goes down we have to water.

Q Are they all exactly the same character of land as to the water requirements?

A Yes sir, practically the same. It is all within a radius of half a mile, I guess from the bottom of one farm to the top of the other.

Q How late in the season do they sub irrigate?

A Well, right after the high water goes down then we have to put the water on the surface .

Q Is there any seepage coming to those lands directly from the irrigation ditches above and not from the river?

A No sir.

Q How far are they from the bank of the river?

A How far is the farms?

Q Yes.

A Why, they are right on the bank of the river.

CROSS EXAMINATION By Mr. A. C. Hatch.

Q What is your mother's name?

A Sarah Williams.

Q She owns the land, does she?

A She owns ten acres of the sixty three.

CHARLES A. MADSEN, called by the defendants Reed Knudson, Lewis Marriott, et al., being first duly sworn, testifies as follows:

DIRECT EXAMINATION By Mr. John E. Booth.

- Q Mr. Madsen, what is your full name?
- A Charles A. Madsen.
- Q Where do you live?
- A Lake View.
- Q You have some land in there?
- A Yes sir.
- Q Irrigate it? A. Yes sir.
- Q How much land have you?
- A I have sixty acres.
- Q Sixty acres of your own?
- A Yes, sir.
- Q Acquainted with the land owned by your brother D. H. Madsen?
- A Yes sir.
- Q How much is there of that?
- A About thirty-three acres; it is now owned by Mr. Ercanbrack though.
- Q The thirty-three and the sixty acres, are they all irrigated out of the same canal? A. Yes sir.
- Q What is the name of that ditch?
- A Madsen ditch.
- Q Where do you take it, at the source?
- A Why, it is in three large springs that spring up just east of the interurban track, what we used to call the Lake View station, Lake View depot, where the little track used to run out and stop at the cattle yards, just south of the cattle yards.
- Q So you don't connect with the river direct?
- A No sir.
- Q Now, does anybody else use the water from those springs?
- A Yes sir, my brother Edwin Madsen.

Q How much has he?

A He has a little over forty acres.

MR. RAY: Your honor please, I object to this testimony as not going to any part of the waters of the Provo river. I don't understand it is involved in this.

MR. JOHN E. BOOTH: There is a question there that these people are somewhat alarmed about, perhaps unnecessarily, but when a person believes a thing is true it is the same to him whether it is true or not. He acts on it that way. There has been some talk of endeavoring to pump waters from these springs, on to some other ground and these people are considerably alarmed about it, and want to shut that off and have that quieted.

THE COURT: By whom is the water to be pumped, by any party to this action?

MR. JOHN E. BOOTH: Yes, I have understood so, there may not be anything of it, but there is some talk of that.

MR. A. C. HATCH: Are the ~~atp~~ springs tributary to the Provo river?

MR. JOHN E. BOOTH: No sir, they are not connected with the river, but these parties are made parties to this suit.

MR. A. L. BOOTH: Where would the water run to?

MR. JOHN E. BOOTH: The water would run into the lake.

Just a minute--

Q Would the water from these springs run into the river?

A Run into the river, yes, just above where the lower ditch is taken out of the river, if allowed to go.

MR. RAY: Then I withdraw the objection.

MR. A. C. HATCH: And natural channel of the springs is to the river, is it?

A Yes sir.

Q How long have you know of this water being used on this land?

A I have known of it being there for about thirty years, since I could remember anything.

Q Who owned it before you?

A My father.

Q When did he settle on that land?

A He settled on that land in '56.

Q And either he or his children have had it ever since?

A Yes sir.

Q Has anybody ever contested your right in any way, or made any interference with your using the water?

A No sir.

Q You regulate it among yourselves?

A Yes sir.

Q Not connected with anybody else?

A No sir.

Q How much water is there in the spring?

A We have never measured it, but I would think there would be possibly one, or maybe one and a half second feet.

Q Sufficient for your purposes?

A Yes sir.

Q And when you don't use it, then where does it go?

A When we don't use it, it goes down what is known as the Bunnell slough now belonging to the sugar company, and from there on down into the river.

THE COURT: Mr. Madsen, I understood you to say thirty-three acres of the Madsen land has been transferred to someone else, who is that?

A Mr. Ercanbrack.

MR. A. C. HATCH: How many acres are there in all irrigated from those springs?

A About one and twenty-five, one hundred and twenty to twenty-five.

MR. A. C. HATCH: Was it all originally your father's land?

A Yes sir.

THE COURT: As I understood you you have sixty acres

and Mr. Ercanbrack thirty-three, who owns the balance?

A My brother Edwin A. Madsen, he owns; I don't know just what his part is, but I think it is something over forty acres. That would ^{be} possibly one hundred and thirty acres.

MR. JOHN E. BOOTH: That is all I have.

THE COURT: Now, Mr. Story you may proceed.

MR. STORY: I desire first to introduce a measurement which appears in water supply paper No. 310, issued by the department of the interior United States Geological Survey, for the year 1911. It is the discharge in second feet of Provo river above Telluride Power Company's conduit, near Provo, Utah, for the twenty-eighth day of July, 1911, represents to be 240 second feet. Your Honor, I will say at this time that was introduced in connection with the measurement which is specified to by Mr. Thomas, showing merely what the discharge of the river was at that time.

MR. THURMAN: Is that above the dam?

MR. STORY: That is at the gauge above the dam, yes. I also desire to introduce---

MR. A. C. HATCH: Just a moment, please, if a note at the bottom of the tabulation is offered in connection with it--

MR. STORY: Certainly, I don't remember what it is.

MR. A. C. HATCH: It is this, "Daily discharge determined from two poorly defined rating curves, one applicable January 1st to 30th, and October 3rd to December 31st, and the other January 31st to August 20th, indirect method for shifting channels, used August 21st to October 3rd, 1911."

MR. STORY: Yes, that should go in, too.

MR. THURMAN: I understand this may go in ^{power} as ~~para~~ evidence?

MR. STORY: Yes, I think so.

MR. A. C. HATCH: Then, we have no objection.

MR. STORY: I have some further power evidence I want to introduce in connection with the measure-

ments of the plaintiff in this case, being part of the same geological report as was introduced, part of it was introduced by the plaintiff for the year 1905.

MR. A. C. HATCH: Pardon me, do you offer just the one date?

MR. STORY: I offer the only date I care for in that connection, is the 240 second feet, because that is the discharge on the day Mr. Thomas measured the water running in the flume.

MR. A. C. HATCH: I don't remember the date Mr. Thomas testified.

MR. STORY: Mr. Swendson tells me that is the date. I don't recollect it either., the record will probably verify his recollection.

MR. A. C. HATCH: May the whole tabulation go in as a part in this connection, making this whole tabulation?

MR. STORY: I have no objection.

MR. A. C. HATCH: Then, the whole tabulation on page 46 of the exhibit, the surface water supply of the United States in 1911, may go in on the offer.

MR. STORY: No objection.

MR. A. C. HATCH: Let it be marked by the reporter.

MR. STORY: We would like to have it read into the record; I don't care to do it now, but whatever you want so Mr. Swendson can have his record back.

THE COURT: It all may be received; that is, the entire page, the pages may be marked so that it can be read into the record at some time, and Mr. Swendson can have back his book.

MR. STORY: We desire to offer the following paragraph which appears in the Geological Survey Report for the calendar year 1905, which was already offered in evidence by the plaintiff in this case, the part which I introduce being a description of the station and of the conditions under which the measurements were taken which are introduced in evidence by the plaintiff. It reads as follows: "The station was originally established to determine the total flow of the Provo above all diversions to Utah Lake valley, but since that time a small canal has been taken out about three miles above the station and the system of the Telluride Power Company has been extended by a new flume line of sufficient capacity to divert the entire normal flow of the stream. The power plant of the Telluride Power Company has been rebuilt at a point about twelve hundred feet below the station, the tailrace discharges directly in the canal at the mouth of the canyon. Practically no water passes the station except the flood discharge and a small portion of the side drainage between the power company's dam and the gauging station, the greater part of the side drainage being diverted into a flume at various points along the line."

MR. JACOB EVANS: We object to the introduction of that as incompetent, irrelevant and immaterial and hearsay. It is merely the statement of somebody in writing without giving us any opportunity whatever to cross examine that person.

MR. STORY: That was the principal objection which I made, Your Honor, at the time they introduced these measurements.

MR. JACOB EVANS: It is his opinion of certain things without giving us any means or method of cross examination. Object to it as incompetent.

THE COURT: I am inclined to think under the ruling the court made I think this is admissible. It is a report merely. I am not going to pass upon the weight of it now.

MR. JACOB EVANS: Take an exception.

THE COURT: I don't think any of these reports are entitled to a great deal of weight. I think they are admissible under our statute.

MR. JACOB EVANS: We would like to see that offer before this part of the subject is closed.

MR. STORY: Just a moment; if you have anything further you wish to have read into the record at this time, you may do it.

MR. A. C. HATCH: If the court please, this locates the station below the dam of the Telluride Power Company. There is a question in my mind whether the party arriving at it did not know what he was arriving at, or it has no force in this case at all, except to show the leakage that came through the dam. The evidence shows the dam is about a mile above the Olmstead, or old power plant, their old station. This report is about a thousand to twelve hundred feet above the Olmstead station.

MR. STORY: That is true, Your Honor, but it is offered in connection with another matter that I am just going to offer, to show we were taking out of the river all except what Mr. Swendson testified did go through our dam. That is our point. They offered evidence in reference to

gauge readings above our dam and also there were gauge readings prior to the installation of that gauging station at a point about a thousand feet above the Olmstead station in the river, and this note I am introducing is part of the same record and has reference to this other station, then it shows we were--in connection with the measurement of water, I am now going to offer--were diverting all the water of the river except that which went through the dam, and I think, too, just as much--just as admissible for us to introduce the statement by this engineer as to the fact we have a dam which had a capacity at that time sufficient to divert the entire normal flow of the river as the introduction of these other parts of the record, which at most are hearsay and would not be admissible except for the fact they are a Government document. I have not introduced this for the purpose of showing the upper station did not exist.

THE COURT: Mr. Story, I do not understand there is an objection.

MR. STORY: I thought Judge Hatch had made an objection.

THE COURT: No, he merely suggested it was at a different place. I don't think he has made a formal objection.

MR. A. C. HATCH: No, I understood from his offer he was offering it to show the amount of water diverted from that. I was objecting to his statement, purpose for which the offer was made and calling his attention it had no relation whatever to the subject matter.

THE COURT: With the explanation made, it

may be received for whatever it may be worth.

MR. A. C. HATCH: Then, if the court please, the whole of that report becomes a part of the offer without us introducing it?

MR. STORY: Such parts as you want to put in.

MR. A. C. HATCH: Let the whole of the statement in that connection go in with it and should be read.

MR. STORY: If that is the case then, you mean to go to the end of the paragraph?

MR. THURMAN: Commence at the beginning.

MR. A. C. HATCH: The whole report, the notes, the part which you offer is a part.

MR. STORY: I have no objection, you mean the entire written statement?

MR. A. C. HATCH: The entire written statement, page 53.

MR. STORY: It may go in without being formally read.

THE COURT: Very well.

MR. A. C. HATCH: Let me be marked so the reporter can get it.

MR. STORY: I desire to introduce in evidence the first measurement on page 54, first paper.

MR. A. C. HATCH: We don't object to that.

MR. STORY: These measurements are measurements of March 4, 309 feet discharge; May 24, 485 second feet; August 29, 25 second feet.

MR. A. C. HATCH: Then read the note at the bottom.

MR. STORY: Measurement made one hundred feet above rating station.

MR. A. C. HATCH: I understand that means the

other measurements were made at the point where the flume entered the river.

MR. STORY: Above the point.

MR. A. C. HATCH: And the last measurement was made above the point where the tail race of the Telluride plant entered.

MR. STORY: The measurement you introduced were at the station above the dam.

MR. A. C. HATCH: Yes.

MR. STORY: These measurements I am introducing are in connection with the gauging station down near the Olmstead.

MR. A. C. HATCH: Below Olmstead?

MR. STORY: No, about a thousand feet above Olmstead and also above the point of discharge of the Telluride flume into the river.

MR. A. C. HATCH: Let me see it again. I don't understand that "A" refers to the discharge of twenty-five feet in the August measurement.

MR. STORY: They are above the point where ~~the~~ we returned the water from the flume into the river.

J. C. IVEY, recalled.

DIRECT EXAMINATION by Mr. Story.

Q You have already been sworn in this case, have you not?

A Yes, sir.

Q I believe you testified that you have been stationed at the head of the Telluride flume and had been in charge of the upper part of the flume?

A Yes, sir.

Q Since 1902, did you not?

A Yes, sir.

Q That you have been there constantly?

A Yes, sir.

Q You are also familiar with what was known and called in this hearing as the temporary flume which was constructed in 1904?

A Yes, sir.

Q I mean 1907?

A 1907.

Q And also with the auxiliary flume which was constructed shortly thereafter?

A Yes, sir.

Q Now, will you please refer to defendant's exhibit No. 118 on the board and point out to the court the auxiliary flume or the original flume which was constructed in 1902 and the temporary flume and the auxiliary flume.

MR. A. C. HATCH: Just a moment; that was all gone into before by your other witnesses.

MR. STORY: I am simply referring to it to refresh the court's recollection as to the arrangement of these flumes, then I am going to have him testify to some other matters in connection with it in rebuttal of some testimony your witnesses gave.

MR. A. C. HATCH: As far as refreshing the court's recollection, we object, but if it is something in order to lead the witness to testify, it is legitimate.

MR. STORY: I will let the witness refresh his recollection, then, Judge.

MR. A. C. HATCH: We object to going into the location of those flumes again; they have all had exhibits in here showing the whole thing, and if this is the purpose of getting in some-

thing additional, this is not the proper time to do it without permission.

MR. STORY: Nothing except rebuttal of your own testimony. For instance, your witnesses testified seeing in this flume and other conditions, amount of water.

THE COURT: If this exhibit you are now having explained is for the purpose of explaining the evidence this witness is to give in rebuttal I think it it is proper.

MR. STORY: That is the only purpose.

THE COURT: Explanatory of his evidence, so that his evidence may be better understood.

MR. A. C. HATCH: I think the court is absolutely right, but counsel's statement of the purpose of the exhibit was wrong.

MR. STORY: I will withdraw the question.

Q Mr. Ivey, I wish you would please refer to defendant's Exhibit No. 118, I will call your attention to certain flumes shown on that map which have been described in the testimony, the first being the--

MR. A. C. HATCH: Just a moment, where do you get that number?

MR. STORY: From the back of the exhibit. It is one already introduced in evidence.

MR. A. C. HATCH: Very well.

Q --flume which is marked here as having been built here in 1896 and enlarged in 1902. The temporary flume which was constructed in 1907 and the auxiliary flume which was also constructed during the same year.

A Yes.

Q Referring now to the flume which was constructed in 1896 and enlarged in 1902, I will ask you to state whether or not that flume was covered at the time that it was constructed?

A Yes, sir.

Q Please describe to the court how it was covered?

A Well, from the road it was covered with two inch plank taking to the head works, that is to the gates. Then there was a snow shed projected over the flume, extended on down here two or three hundred feet of two inch plank, it is right down on the flume and answers the same purpose as covering the flume. Then it was extended on with inch boards from there on down.

Q Down where?

A Down the flume all the way.

Q Was it tightly covered?

A Yes, sir.

Q How was it covered at the point where the county road crossed it?

A Covered over with two inch plank.

Q At that point?

A Yes, sir.

Q Was it possible for anyone riding across or riding along the county road to see the water in that flume?

MR. JACOB EVANS: Object to that as incompetent, calling for the conclusion of the witness.

THE COURT: Objection is sustained.

Q Was it possible to tell the amount of water flowing in the flume without getting down and looking into the cracks of the covering?

A No, sir.

MR. JACOB EVANS: Object to that as calling for a conclusion of the witness.

THE COURT: Objection sustained.

MR. STORY: It strikes me, Your Honor, that is a fact more than a conclusion.

THE COURT: If he has made any experiments

he may state the result of them.

Q Were you familiar with the flume at that point?

A Yes, sir.

Q Did you walk along it frequently?

A Yes, sir, all the time.

Q As you walked along the flume and cross the bridge, were you ever able to see the amount of water flowing in the flume?

A No sir, you cannot.

Q Could you as long as that flume existed?

A No sir.

Q I refer you to the covering of the flume from what is described here as the gate house down to the station; did you walk along that flume frequently?

A Yes, sir.

Q As you walked along could you see the water in that flume?

A No, sir, you could not.

Q In order to see the water what would you have to do?

A Have to get down and look into the cracks to see it.

Q Was it possible to see a depth of water, tell the depth of water by merely looking through the crack?

A No, sir, you could not.

Q Referring now to the temporary flume, which was constructed in 1907, was that flume covered?

A Partly.

Q What part of it was covered?

A There was about two boards in the center with a little section of flume on top.

Q Walking along that flume you could see the amount of water, could you?

A You could see a small strip of flume.

Q You could see the amount of water flowing in the temporary flume on the sides, could you?

A Yes, sir.

Q I believe that flume ran along the old 1902 flume for a short

distance, did it?

A Yes, sir.

Q About how far below the gate house did that extend?

A Well, the snow shed extended on down to there, then the flume was covered from there on.

Q Well, the point that I have reference to is your flume, the temporary flume lay along the top of the old flume, 1902 flume, for a ways?

A Yes, sir.

Q About how far?

A Oh, it run along there three or four hundred feet.

Q Were you present when that temporary flume was constructed?

A Yes, sir.

Q Were the boards which had originally covered the 1902 flume at that point removed for the purpose of putting the other flume on it?

A Yes, sir.

Q State whether or not the temporary flume was run along the old 1902 flume entirely covered, top of it?

A Yes, sir, we had it covered right over with the temporary flume.

Q In other words, it took the place of the old board covering, did it?

A Yes, sir.

Q I refer now to the space between the cross pieces on the top of the flume, the cross pieces were six inches in width, were they?

A Yes, sir.

Q There was a space above the side boards of the flume between these two cross pieces, was there?

A Yes sir.

MR. JACOB EVANS: If the court please, I submit the witness ought to do part of this testifying instead of counsel testifying for him.

I object to it as leading.

Q How were those spaces originally filled, if at all?

A Filled with a six inch board.

Q How far did those fillings extend?

A About four miles, length of the flume.

Q Length of the flume?

A Yes, sir.

Q You mean top to the bottom?

A Top to the bottom.

Q I mean from one end to the other, rather?

A Yes, sir.

Q Do you remember any of those filling pieces that you have just testified to having been removed at or about the point where the old temporary flume ran along the top of the 1902 flume?

A Yes, sir.

Q When was it done and what was the purpose of removing those filling pieces?

A It was moved on account of our little top flume let water seep through the floor and go in there and gather ice on the cross ties, and we knock the ice off so as to let the water extend through without stopping the force of the water.

Q And these small filling pieces have been removed in order to enable you to do that?

A Yes, sir.

Q State whether or not it has been the custom of the country to repair the flume in respect to renewing those filling pieces when they should be knocked out for one reason or another?

A Yes, sir.

Q I will ask you whether or not any repair of that kind has been done this year?

A Yes, sir.

Q What repair work has been done in that respect?

- A Wherever we found one of these headers out--that is what we call them---it has been placed back and also the flume covering top on top.
- Q Has repair work of that kind been done from the Olmstead station to the gate house this year?
- A Yes, sir.
- Q You know that of your own knowledge, do you?
- A Yes, sir.
- Q Do you remember some boards having been placed on the side of the flume during the present year about the time Mr. Swendson and Mr. Parker made their measurements?
- A Yes, sir.
- Q I will ask you what those boards were--what was done in that respect?
- A Had repair work all up there and the flume got to there and these headers were to keep the wind from draughting through there to freeze the water.
- Q Was there any difference between the boards you put on at that point about one hundred and fifty to two hundred feet below the gate house than there was from those you had been putting on in the course of your repairing from the Olmstead station up?
- A No, sir, just the same.
- Q And the boards that you put on at that time then were merely those that filled in between the cross pieces?
- A Yes, sir.
- Q And those were merely replacing those which had been originally put there at the time the flume was originally constructed?

MR. JACOB EVANS: Wait. Let us let the witness testify.

MR. A. C. HATCH: Pardon us for interrupting, but I would prefer the witness.

THE WITNESS: I can do it.

MR. A. C. HATCH: I haven't any doubt about

that, but suppose you do it instead of counsel.

Q What is the object putting them on at that time?

A Ordinarily to keep the wind from blowing on to the water, freezing our water. Whenever there is one of them off the ice freezes to the board and stops the force of the water. We have them all the way from one end of the flume to the other for that purpose. It is to cover the flume solid.

Q To prevent freezing?

A Yes, sir.

Q Now, referring to the temporary flume, Mr. Ivey, do you remember how that-- how the flume where it crosses the Provo river is supported?

A Yes, sir.

Q How is it supported?

A Supported with cribbing and also I-beams across it.

Q Have you ever done any work in connection with the raising of the flume, the temporary flume at the point where it crosses the river?

A Yes, sir.

Q Just explain to the court what you have done in that respect or assisted in doing personally.

A Well, the flume, the cribbing^{is} ordinarily lower down than the river and we had to get jacks to keep our flume on ~~the~~ a level, as near as possible, keep raising it. It kept sinking we had to keep raising it all the time as long as we used it.

Q I will ask you whether or not the snow slide which was in the habit of running at that point had any effect upon the flume or its foundations, and if so, what that was.

A Yes, sir. It filled in gravel, also sticks and everything else, and when the ^{high} water come why, we dug it out.

Q And the supports of the flume had been placed upon that gravel filling?

A Yes, sir.

Q How many times did you personally between the time in 1907 when that flume was constructed and 1912, when its use was discontinued, raise that--the flume, or the supports of the flume where it crosses the river?

A I have raised it a good many times, I could not say exactly, because I never kept account of them, but we raised them good many times different times whenever we feared the flume was going down we would raise them.

Q What means did you take for raising it?

A We had thirty-five ton jack and ten ton jack.

Q How did you remedy the, or take up the difference?

A The slack?

Q Yes.

A We put in pieces of timber, sixes, eights and whatever required.

Q I understand you that the foundation was constantly changing under your support?

A Yes, sir.

Q Can you give the court an estimate of the number of times between those years you raised that up?

A Well, I could not exactly, but I would say five or six times at the least that it lowered.

Q What time of the year did that settling occur, principally?

A Why, in March, April, May, June, along there when the high water was on mostly, when the flume kindly settled down and then didn't go so much, just ~~went~~ once in a while, a trifle.

Q Mr. Ivey, I believe you testified it had been your custom to walk over the flume twice a day?

A Yes, sir, my general custom, not to walk over the flume twice a day, that is part way from the lower end from Nunn's station up lately last couple or three years.

Q Acquainted with Mr. Nonnan?

A Yes, sir. That is partly knowed him since he has been in

the canyon.

Q Can you give any estimate of the number of times you have seen Mr. Donnan on that flume or crossing that flume in the past eight years?

MR. JACOB EVANS: Object to that as immaterial.

MR. STORY: Mr. Donnan testified he was in the habit going across that flume frequently, nearly every day. I want to bring out from this witness he is in charge of this flume, been walking up and down that flume twice a day for the last eight years, and want him to testify the number of times he has seen him.

THE COURT: What is that in rebuttal of?

MR. STORY: Mr. Donnan testified he never seen water at that point. If he was there so frequently as he testified, it would be very strange this man never saw him.

THE COURT: Objection overruled. I thought Mr. Donnan was your witness.

A Very frequently--I never seen him, hardly ever seen him, I saw him once. I saw him once last month.

Q I am speaking of previous years?

A No, sir, it is very frequent, I never saw him only saw him going up to my head-works telephone to Olmstead, never saw him on that flume walking but once.

Q But once in all these years?

A Yes, sir.

Q How frequently would he come up to your point to telephone?

A Oh, he would come up may be once in two weeks, may be-- that is for four or five months there.

Q For four or five months?

A Yes, sir.

Q And other times?

- A No other times I know of.
- Q In coming to the point you mention for the purpose of using the telephone, would he cross the flume?
- A No, sir, he would not cross it.
- Q Would he go to the point where he could see it?
- A If he took particular notice to look in the flume, he could go down, look in the cracks of the flume.
- Q But he would have to make that special effort to see at that point?
- A Yes, sir.
- Q Just one other question: Are you familiar with the county road where it crosses the temporary flume?
- A Yes, sir.
- Q Did you have anything to do with the construction of that road, or repairing the road at the time the temporary flume was built?
- A Yes, sir.
- Q Please explain to the court how the flume crosses the road or the road crosses the flume at that point marked "A" on plaintiff's exhibit 118.
- A Why, I built the road under the flume.
- Q Was that built under the flume at the time the flume was constructed?
- A Yes, sir.
- Q In driving along under the flume can you see into the flume?
- A Not very well.
- Q Can you see in at all?
- A No, sir, you cannot.
- Q From the rig in which you were riding?
- A No, sir, you could not see in it.
- Q Referring once more to the old 1902 flume, as it crosses the road at the point and proceeds on down toward the station I will ask you whether or not one riding along the country

road below the crossing can see into the flume?

A No, sir.

Q What is the relative situation of the flume to the county road at the point below the crossing?

A Why, it is all covered, a person could not see into it without taking particular pains to go there and looking in.

MR. A. C. HATCH: Just a moment. Move to strike out the answer.

MR. STORY: I consent that be stricken out, because it does not answer my question.

Q Is the flume above the county road below the crossing?

A Yes, sir, the flume is above the road.

Q How high above?

A I should judge all the way from three to four feet, five feet, six feet in different places.

Q As it gets down toward the gate house it is considerably above the flume, is it not, I mean considerably above the county road?

A Above the county road.

Q About how much would you say?

A It is all of eight or ten feet.

12:00 NOON RECESS TO 2:00 P.M.

J. C. IVEY-----

CROSS EXAMINATION by Mr. A. C. Hatch.

Q How much of your time did you spend in going up and down the flume during the twelve or fourteen years of which you have testified?

A How much of my time?

Q Yes, each day.

A Well, it required sometimes more than others.

Q About how much?

A Well, it would take me from an hour to an hour and a half sometimes to go over there from where I lived, up to the head works, sometimes half an hour.

Q Where did you live, at Nunn's?

A At Nunn's store.

Q What would make the difference in the time going up and down?

A Sometimes we would find little leaks on the flume and would stop and calk them up.

Q In what manner did you calk them?

A In a manner with a little chisel we had made a purpose and oakum.

Q Did you go back down the flume or down the road on your return?

A Generally always down the flume.

Q Go up the flume and then back down it again?

A Yes, sir.

Q And you went twice each day?

A Yes, sir.

Q For three or four years?

A Yes, sir.

Q Now, were there no days when you did not go up and down the flume?

A Well, not without when I was off going down to Provo.

Q About how often did you go down to Provo?

A About once a month.

Q And Sundays and all you put in every day going up and down the flume?

A Yes, sir.

Q And during the past three or four years it has been more constant than theretofore?

A Just about the same.

Q When did you first enter the employ of the company?

A 1902.

Q And you have been in their employ constantly ever since.

A Yes, sir.

Q And your duties have been to watch that flume?

A Yes, sir.

Q And you say in all that time you never saw Mr. Donnan on the flume but once?

A That is all I ever saw him on the flume.

Q You are quite certain of that?

A Yes, sir.

Q Can you tell whereabouts and when it was you saw him that day?

A Yes, sir.

Q Please give it to us.

A It was on the 14th of December, 1917.

Q Aren't you mistaken in regard to that?

A Last month.

Q What was he doing then?

A He came up there, I was just going off shift and I met him about four or five hundred yards from the house that we were staying in. He said "Good evening, Mr. Ivey." I said, "Good evening, Mr. Donnan." Mr. Donnan says, "I am looking for coyote tracks," he was up on the flume. I and him walked down the flume between five and six hundred feet or more.

Q You say that was last month?

A Yes, sir.

Q That was 1916?

A Was 1916, then.

Q Wasn't it?

A It was on the 14th of last month.

Q You said December 1917.

A Well, I was thinking it was the new year but I have found out different.

Q Now, Donnan has been living right there by the flume during all the time you have been employed by the company, hasn't he?

A Yes, sir.

Q Keeping a resort there?

A Yes, sir.

Q And will you say that you never saw him but the one time on that flume during all those years?

A That is my saying, sir.

Q Would you say that he was not on there every day during the time you have been employed?

A I could say every minute I have not saw him. He might have been there for all I know, but I never saw him.

Q He might have been there every day during that period?

A He might have been, but I never saw him.

Q And he might have been there two or three times every day during all that period and you not have seen him?

A He might have been but I never saw him.

Q Now, were you living on the 14th day of December last at Nunn's station ?

A Yes, sir, I was there.

Q And did you go out to the flume and find Donnan on the flume?

A I was already on the flume, sir.

Q And he was coming down the flume?

A No, sir, he was standing, when I first saw him, getting up on the flume.

Q Getting up on it?

A Yes, he was standing on the flume.

Q Then, he had not been on the flume before you saw him, getting on it?

A He was standing on the flume, the place we had getting up on the flume.

Q Did you see him get up on the flume?

A No, sir.

Q Then, he might have come all the way down on the flume, mightn't he?

A If he had I would have saw him. I can see from my house around the bend there.

Q Then you were looking all the time, were you?

A Man couldn't help looking down the flume when he is going down it.

Q Donnan lives above the point where you saw him on the flume, doesn't he?

A Yes, about a couple hundred yards.

Q About five hundred yards above Nunn's?

A No, sir, it is pretty nigh a mile above Nunn's.

Q About five hundred yards above Nunn's where you saw him on the flume, you stated, as if I understood you right?

A No, sir, from this dam house.

Q I understood you to say the house where you were staying.

A During the day.

Q Then you have two places where you stay?

A Yes, sir.

Q You live at Nunn's?

A Yes, sir.

Q And stay at the dam house?

A Go up at the dam and stay there during my shift, then go back to Mr. Nunn's.

Q What time is your shift?

A It is from seven o'clock in the morning until five in the evening.

Q Every day?

A Every day.

Q Do you have no lunch hour?

A I eat right on my shift in the dam house.

Q You spend most of your time in the dam house, don't you, during your shift?

A Good deal, sir.

Q Watching the dam?

A Watching the water.

Q It is part of your duty to look after removing the accumulations

on the dam, is it not?

A Yes, sir, good deal of it.

Q That is your principal duty, isn't it?

A Yes, sir, principal duty.

Q And your going up and down the flume is only incidental.

A In the morning and at night.

Q That is going to and from your work?

A Yes, sir.

Q Who beside you has shifts on that same job?

A Mr. Richmond.

Q And how long has he been there?

A Well, he has been there, I think, between six and seven years.

Q And do the two of you occupy the entire day, night and day?

A Yes, sir.

Q And you have the day shift all the time and he has the night shift?

A Yes, sir, he has the night shift.

Q You never had the night shift?

A Yes, sir.

Q You take your turn, half the time night?

A Yes, sir, that is late, in the last year, before this he had the night shift all the time.

Q Now, with regard to the raising and lowering of the temporary flume. You said you jacked it up and put timbers under?

A Yes, sir.

Q Where did you put those timbers?

A Under the eye-beams.

Q On top of the cribbing?

A On top of the cribbing.

Q Those timbers are there yet, are they not?

A Some of them, yes, sir.

Q What became of the rest?

A We had to take them out and put in larger ones

Q And put in larger ones?

A Yes, sir, larger blocking.

Q Those blocks are still there?

A I suppose so.

Q How many of those blocks did you put in?

A Well, we raised it up and put in one, take out little thicker one, put in little thicker one and take out a thinner one.

Q When you first raised it up how thick a block did you put in?

A We put in all the way four to six inches.

Q You only put in one thickness of block the first time?

A Some of the eye beams would need more than the others, one side of the crib would need more.

Q How many cribs are there?

A I should say four, that is on one crossing, four on the lower crossing and there were three on the upper crossing.

Q Beginning at the upper crib on the upper crossing, can you tell us the thickness of blocks you put in there the first time you raised it?

A We put in four inch blocking the first time.

Q Both sides?

A On both sides of the cribbing.

Q And on both sides of the flume, also?

A Yes, sir.

Q How many of those blocks did you put in?

A We put in two on each cribbing of the eye-beams.

Q How wide were the blocks?

A They were all the way from eight to twelve inches.

Q Wide?

A Yes, sir.

Q And four inches thick?

A They were two and we made them four inches thick. Sometimes it would require two pieces of two inch stuff we would put the two inch t stuff under to make it four inches.

Q How are those cribs built, square timbers?

A Some of them are built ~~xxxx~~ out of square timbers and round

A Yes, sir, larger blocking.

Q Those blocks are still there?

A I suppose so.

Q How many of those blocks did you put in?

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A We put in four inch blocking the first time.

Q Both sides?

A On both sides of the cribbing.

Q And on both sides of the flume, also?

A Yes, sir.

Q How many of those blocks did you put in?

A We put in two on each cribbing of the eye-beams.

Q How wide were the blocks?

A They were all the way from eight to twelve inches.

Q "Wide?

A Yes, sir.

Q And four inches thick?

A They were two and we made them four inches thick. Sometimes it would require two pieces of two inch stuff we would put the two inch stuff under to make it four inches.

Q How are those cribs built, square timbers?

A Some of them are built out of square timbers and round

timbers.

Q How is the upper one?

A Out of square timber.

Q What is the size of that crib?

A Well, I think it is eight by sixteen, if I remember right.

Q And what is the long way of it?

A It is up and down the river; I think it is sixteen feet.

Q And eight feet wide?

A And eight feet wide, if I can remember right.

Q You have seen it every day?

A Yes, sir, I have seen it good many times but I didn't take my rule out and measure it every day.

Q You help to build it, didn't you?

A Yes, sir.

Q And helped to jack it up?

A Yes, sir.

Q How many times did you raise that crib up?

A Well, I could not exactly tell you the amount of times because I never kept track of them, but I would judge it was four or five or six times we would raise the flume.

Q How did you get your jack under to raise it up?

A We packed it under.

Q How?

A We packed them on the flume.

Q You set your jack on the crib, did you?

A Yes, sir.

Q And raised the flume up?

A Yes, sir.

Q And then put the timbers under it?

A Yes, sir.

Q You cannot say how many times you did that?

A No, sir, I don't hardly remember because I didn't think it was necessary to remember these things.

Q Have you no data of it?

A No, sir, I didn't take no date of it.

Q When did you last raise it up?

A Well---

Q This particular crib, the upper crib I am talking about.

A I could not exactly tell you the date I last raised it, because I didn't think it was necessary to keep it.

Q Do you know whether you did it more than one year or not?

A Yes, sir.

Q For how many years did you do it?

A Why, we did it off and on for four or five years, ever since it was built, had to jack it up some.

Q When was it built?

A In 1907.

Q It has not been in use for a number of years, has it?

A About three years ^{since} it has been in use.

Q By your company?

A Yes, sir.

Q You have not jacked it up then during the last three years?

A No, sir.

Q Then, you were mistaken in saying every year ever since it was built?

A While we were using it.

Q Didn't you say three years ago you quit using it?

A Yes, I think it was three years ago.

Q What is the size of the middle crib in the upper crossing?

A I think they are all about the same if I remember right.

Q Are they all rectangular?

A Well, I would say they were.

Q None of them are square?

A Not as I remember, they aint square, no, sir.

Q And none of them are triangular in shape?

A That is, the point of them is, the point of them is in a triangle, runs up the river, down the river they are square across.

Q Is that true of all of them?

A It was at that time; that is the three that is in the water.

Q Was the upper one that kind of crib also?

A No, sir, there is no angle on the upper crib at all.

Q It had a square face across the river?

A Yes, sir.

Q And down river?

A Yes, sir, it had a square face, just the same it was on the edge of the river, it was on the bank. It did not require any of these triangles.

Q There is only one of these cribs actually in the river, is there?

A Yes, sir, there is three of them actually in the river.

Q What do you mean by saying the upper one was on the bank?

A This upper crib, there are three other cribs in the river.

Q How many cribs are there altogether crossing the river?

A Upper crossing?

Q Yes.

A There is four.

Q The first one is on the bank?

A Yes, sir.

Q Then, there was three in the river?

A One of them the river strikes it, and two in the river and the other one, the water strikes it, the lower cribbing.

Q Partly in the river and partly on the bank?

A Yes, sir.

Q You had to raise all of those three?

A Yes, sir.

Q At different times?

A Yes, sir, we raised them all.

Q They have a triangular shape with the point up the river?

A Yes, sir.

Q And you think they are about the same size as the others eight by sixteen feet?

A I think so, yes, sir; eight by sixteen, I think they are, if I

remember right, that is the size of the cribbing.

- Q How do you get an eight by sixteen foot crib in a triangular shape?
- A We don't. We put a triangular shape opposite those on the head of it up the river, and fasten it on the cribbing.
- Q So that it is in effect a double cribbing, is it?
- A It is a point, it runs up in the river, so the water would not run square against our cribbing.
- Q Are the points all pointed the same way, that is points of the compass?
- A No, sir, I wouldn't say they was; they point toward the force of the water that is coming down the river, They would not be in the same angle one would not be the same as the other. I suppose they are all little different, I never took no compass ~~and~~ there and tested them out.
- Q You hever have paid much attention to them, have you?
- A Yes, I have paid lots of attention to that, keeping them up.
- Q I mean with regard to looking at them so as to describe them?
- A Any more than that work on them, and around them all the time
- Q There is one of those cribs just below the fish way at the dam?
- A Yes, sir.
- Q Can you describe that, tell the kind of timber it is made of, and its dimensions?
- A One on the lower side of the river?
- Q Right in the river, just below the fish dam or fish way?
- A It is made out of two by eight, or six by eight.
- Q Square timbers?
- A Squarw timbers.
- Q Which way is the point of that?
- A Facing up the river.
- Q Facing up the river?
- A Yes, sir, the point of it.
- Q The current of the river, or point due east and west or

practically so?

A No, sir, I could not say which way it is pointing; it is pointing right up the stream of the water, whether it is east or west, it is pointing right up the bed of the river.

Q Now, you remember raising that flume up, that cribbing up?

A I remember raising the flume up.

Q Well, the flume?

A Yes, sir.

Q How much did you raise it?

A Well, I don't know exactly; we raised it all the time whenever it needed it, and we have raised it up all the way from eight to ten inches.

Q What is the largest timber you ever put under that flume; on top of the cribbing?

A Under the cribbing, put in ten inch--

Q Under the flume, on top of the cribbing.

A Yes, sir, ten inch planking.

Q That is the most you ever raised it?

A That is the most at one time, yes, sir.

Q You say you took out the timbers and you put in thicker ones?

A Yes, sir.

Q So that the timber that was there last would be the thickest one you ever put in?

A Yes, sir.

Q Now, describe what you did there when you raised the flume.

A Describe how we raised it?

A Yes, and what you did where you put the blocks under that you did put under in order to hold the flume up after it was raised?

A Well, we had the cribbing, then we would take our jacks and put under our cross ties and raise it up, then we would put this cribbing--this blocking under the eye-beam.

Q Put the blocking under the eye-beam?

A Yes, sir.

Q And take out the center blocks?

A Take out the ones that did not fill the place.

Q Your flume is built first on cribbing, is it not?

A Yes, sir.

Q That is the foundation?

A Yes, sir.

Q What comes next on top of that?

A There comes the eye-beam.

Q Eye beam?

A Yes, sir.

Q How are they laid?

A Laid across---

Q Long ways of the flume or cross ways of the flume?

A Cross ways of the flume.

Q The eye-beam?

A Yes, sir.

Q Then, what comes next on top of them?

A Sills laying across these eye-beams.

Q And on top of the sills is the floor of the flume?

A Yes, sir.

Q And you put your blocks under the eye-beams?

A Yes, sir.

Q Now, how many eye- beams were there on that particular crib?

MR. STORY: Which crib is that, you have not identified it?

MR. A. C. HATCH: Yes, he understands.

A There is two and three eye-beams across the stream.

Q I am asking you as to this particular crib.

A One of the upper ones?

Q No, the crib just below the fishway in the river?

A Yes, sir, that is it.

Q How many eye-beams are there on that crib?

A There is two eye beams.

Q Just two?

A Yes, sir.

Q What places are there three?

A There is one on the lower one and I think there is one on the upper one, but I won't be right positive now which one it is on.

Q Now, were your blocks the same thickness on each side of the flume?

A No, sir, some of them did not require it. Some of the cribbings would sink.

Q I am asking you as to this particular crib now.

A That is it. I say sometimes it would sink on one side little heavier and sometimes on the other, just the way the water would cut it out and we would block up according as we would find our flume. Sometimes it would be up on one side and sometimes up on another, up more.

Q When you elevated the flume did you put your jack under your eye-beam, or did you put it under the sills?

A We had a timber of ours and put it under the eye beam and put a jack under that and raised it up which ever way it required.

Q Then, you put pieces you said, four inches long by four inches thick?

A Some of them was.

Q Eight to twelve inches wide?

A Yes sir.

Q And how long did you say?

A Our sills is eleven feet.

Q I am speaking of the blocks you put under.

A They would be all the way from ten to twelve inches wide, twelve inches long.

Q Just square blocks?

A Pretty high square blocks, yes, sir.

Q Did you put any filling in between the blocks and the crib in order to keep them level?

A- Sometimes you have a wedge running to a point from an inch

down to a point, sometimes it would be little looser on one side and we would put these wedges under the eye-beams and put the wedges on these blocks to make it level.

Q When was the last time you fixed that particular crib of which I have asked you?

A I could not hardly tell you, because I don't remember the last time.

Q Can you say within two or three years of the time?

A Yes.

Q When?

A Why, last time we were fixing cribs it was about 1909 or '10, along there.

Q You cannot fix it more definitely than that, can you?

A Well, I am just fixing it during the year and the times I don't remember the date nor the month, but I know we were working on it all the time to keep it up in that shape; sometimes it would run quite a while without having to and other times it would be a little closer to fixing.

Q You didn't work on it during the flood waters, did you?

A Yes, sir, right after the snow slide.

Q When the flood waters were on did you have a boat or anything to get to the cribs in the river?

A Flood waters, what do you mean by that?

Q The high waters.

A No sir, we have timbers to walk out. We put timbers thirty feet long from the bank out to these cribs to pack our jacks and timbers out there.

Q During the high water season or when it was on did you jack them up?

A Yes, sir, we would work on the crib and on our flume.

Q I am asking you if you jacked them up?

A Yes, sir.

Q How many different seasons?

A Why, we jacked them up there four or five different seasons in high water time.

Q During the high water time?

A Yes, sir.

Q Then again in low water you would jack them up again, is that right?

A Not so much because it did not require it, very little.

Q When the waters were ^{receding} raised the cribs were stationary?

A Yes, sir, a good deal.

Q Do you remember now of every having fixed them during the low water season, in the winter?

A Yes, sir, we fixed them several different times.

Q Jack up the flume?

A Jacked up the flume.

Q In the winter?

A In the winter.

Q What was the occasion of that, washing away under the flume or under the crib?

A Yes, sir.

Q Of the foundation?

A Yes, sir.

Q Several times during the winter you had to jack it up?

A Yes, sir, we had to do that.

Q That is during the latter part of the summer season, you would have to do it, would you?

A Not so much, very little.

Q Now, during the latter part of the summer and the winter your flume took practically all the water in the river, didn't it?

A Yes, sir, that is at times.

Q There wasn't water there to wash your crib away? wash the foundations away?

A Yes, si .

Q Except during high water, was there?

A Yes, sir, there was lots of water, January thaw and two or three times I have seen in the winter when the water was as high as it was in the summer time.

Q Then, it would wash it away?

A It would wash the gravel out from under.

Q Each high water necessitated jacking this up?

A Yes, sir. We jacked them up more than any other time.

Q You told us about taking the boards off in order to knock the ice off from the timbers along the flume?

A Yes, sir.

Q When did you do that?

A When did I do that?

Q Yes.

A Well, from 1907 on up until in the last three years.

Q Didn't you do it before 1907?

A No, sir.

Q Why?

A Because that flume did not require it at that time.

Q Why didn't it require it?

A Because there was no ice hanging on. We didn't have the water running especially to our flume to gather this ice like it did.

Q The winters were just as cold between 1902 and 1907 as they have been since, weren't they?

A Yes, sir, but we didn't have the water running on top of the flume.

Q What do you mean by water running on top of the flume?

A That small flume running down here. This small flume running on top, we had it running on top of our main flume.

Q Where did the water come from that run in that small flume?

A Comes out of the river above our headgate there.

Q Why did you have that small flume running along there?

A So as to get more water into our flume.

Q Was the intake not sufficient?

A No, our intake was plenty, but flume wasn't large enough; it run across the river, stationary flume after the snow slide had taken it out.

Q Stationary flume?

A The temporary flume was built across Mr. Donnan's ground there.

Q That was not large enough?

A No, sir.

Q And so you built another flume on top of it?

A Around the hill and let it go on top of it.

Q Do you know what they call that flume?

A No, I didn't have no name for it.

Q Wasn't it the auxiliary flume?

A I don't know what you would call it; I didn't have no name for it; I just called it the little flume.

Q Little flume?

A Yes, sir.

Q And it ran around to the other flume then ran on top of it for a little distance?

A Yes, sir.

Q How far?

A Well, it ran on it for about three or four hundred yards.

Q How big was that little flume?

A Well, it was about six feet wide and about four feet high.

Q How big was the big flume?

A The big flume was six by eight.

Q Six by eight?

A Yes, sir.

Q That was eight feet wide?

A Yes, sir.

Q And six feet deep?

A Yes, sir.

Q That was the temporary flume?

A That was the temporary big flume.

- Q It was built on these cribs?
- A It was about seven, I think it was about seven or eight on the bottom.
- Q Seven feet and eight inches wide?
- A Yes, sir.
- Q And six feet deep?
- A Yes sir.
- Q Was it ever changed, do you know, to make it smaller?
- A The timber that we have at the time was not as large as the other timber, and that part was not as wide as the old flume.
- Q The old flume was eight feet wide and six feet deep?
- A Yes, sir.
- Q Is that little flume still there?
- A No, sir.
- Q How long was it there?
- A It was there about five years, somewhere along there, I don't know exactly; I think it was somewhere along about five.
- Q During the time it was there you took the boards off the side of the lower flume, near the top in order to knock the ice off?
- A Knock the ice off at times, yes, sir.
- Q And then when Spring came or warm weather came, you would nail them back on again?
- A No, we did not, because didn't require them back on and we left them off for a while.
- Q When did you adopt the plan of nailing them on again?
- A When we built stopped, the little water from running on top of our flume.
- Q Then you nailed them on again?
- A Nailed them back on when it did not require so much, and nailed them back on/
- Q How many years did it take you to get them all nailed back on?
- A Some would get knocked off and some were there and we repaired

them every year from that on from one end of the flume to the other.

Q Now, I will just ask my question again, about how many years did it take before you got them all back on?

A Some every year.

Q When did you finally finish nailing those boards that you indicate back on again?

A Why, 1916.

Q You quit knocking the ice off several years ago?

A Yes, three years ago.

Q But you didn't finish nailing the boards on until just at the time Mr. Swendson was up there to measure the water in 1916?

A No, sir, I didn't know Mr. Swendson was coming, I didn't know he was in the canyon around up there, and we had been working and was finishing up and had some lumber there and had them, finished them and put them on all the way along from one end of the flume to the other.

Q So you were three years finally getting those boards that you had knocked off nailed back on again, is that right?

A No, sir, it was fourteen years, from one end to the other every year they would more or less get knocked off along these little ~~nine~~ six inch boards, and finally we got them back every year.

Q I don't think I understood you, but I understood you were fourteen years instead of three years getting these boards which were knocked off nailed back on again?

A We have been fourteen years, ever since the flume was built, repairing them every year.

Q I understood you to say that you only knocked the boards off during the period that the little flume was running on top?

A Just knocked a few off there as far as the water run.

Q What was the occasion of putting these boards along the flume and increasing its capacity in 1916?

MR. STORY: I object to the question as framed, as increasing the capacity. Witness has not testified to that at all.

MR. A. C. HATCH: If the court please, I understood the witness to say that they nailed six inch boards on the side of the flume and that the last they did was in 1916, since the commencement of this trial, as I understood the witness. Now, if counsel objects to the increasing of the capacity, nailing boards on the side of the flume, does not increase its capacity at that point, I don't know what he will do in order to increase the capacity.

MR. STORY: I will explain why I object to it, why it does not increase the capacity. The cross pieces are stretched across the flume right at the top of the side boards; these particular six inch pieces were above the side boards and filling the space which was left open between the top boards and the top of the side boards, because these six inch cross pieces the water flowing down in the flume would hit against the top piece, and it was fixed so the water would not go upon the side of this six inch piece at all; the only effect would be to stop if there was a turbulence of the water splashing out, something of that kind, and forming ice on the side; does not increase the capacity.

THE COURT: You may eliminate the assumption it increases the capacity, that may be determined not by this witness.

MR. A. C. HATCH: I don't understand the nailing of boards on in July would have anything to do with the preventing of accumulation of ice

in the flume in July.

MR. STORY: It would in subsequent--

MR. A. G. HATCH: Or April, May or June.

Read my question please.

(Question read)

A I didn't see any increasing of the water whatever, because these here cross ties would fill that and that was only these six inch boards went in over the cross ties between the posts to fill that space up for the air, also everything to go through, that is why we had them there for.

Q That is what you put them there for?

A Yes, sir.

Q When did you first put them there?

A When the flume first was built.

Q Its entire length?

A Yes, sir.

Q Then, do you mean the court to understand that the flume was a box from its head down to Nunn's when it was first built?

A Yes, sir, when I was there.

Q It was a complete box?

A It was a box all the way through.

Q You remember what the first flume was that was there, don't you?

A No sir I wasn't there at the time of the first flume.

Q You wasn't there at the time that it was a pipe line?

A No, sir, 1902 was when I first went there.

Q What part of the flume was it that just had two boards on top?

A It was the flume that run across Mr. Donnan's ground.

Q The other flume was boxed in its entire length from the then power plant to the intake, was it?

A Yes, sir.

Q And is it boxed in now?

A Yes, sir.

Q The same as it was then?

A Yes, sir.

Q And these boards on the side that you speak of, ties, six inch boards are just between the timbers?

A Yes, sir, between the post and the timber that runs up to the board on top of the flume.

Q There was no occasion except by this little stretch that you testified where the small flume run on top for knocking them off, was there?

A Yes, sir, the water would seep through and clog ice on these cross ties, and also on the flume.

Q You didn't understand my question, I think, Mr. Ivey. Except where this flume run on top, the little flume run on top of the lower flume, there was no occasion for knocking off these sixteen inch boards, was there?

A Only just to knock the ice off of the cross ties.

Q Did the ice accumulate on the cross ties the entire length of the flume?

A No, sir, they did not.

Q Well, then, my question is, there was no occasion, necessity rather for knocking these side boards off at any point along the flume except along this part of the flume where the little flume ran on top of the big one?

A Yes, sir, that is all that was necessary.

Q That is the only place where you ever knocked any off?

A Knocked them off along there, yes, sir.

Q You say these boards were put on there to keep the wind from blowing through and freezing the ice on the cross pieces?

A Yes, sir, that is what they were put on for.

Q And that was in the beginning when the flume was first constructed?

A Yes, sir.

Q Constructed that way?

A It was that way all the way through, ever since it was first

begun.

Q What was there to knock these boards off other than individuals knocking them off for the purpose of breaking the ice on the cross pieces?

A I didn't clearly understand what you mean, what you said.

Q Read him the question, please.

(Question read)

A Sometimes just nailed on with a small nail, sometimes climbing up and down the flume, sometimes pulling our posts up with our cables, would sometimes pull them off.

Q That would be just here and there a board then?

A Here and there a board along the flume.

Q There was never any time when there was any considerable distance, say three or four hundred feet in one place where these boards were all off, to your knowledge?

A No, sir, I never saw that place.

Q Or even a hundred feet?

A I never saw that place there was a hundred feet that I remember of.

Q You never saw a place where there was more than one or two boards off any one place, did you?

A Yes, right along where we had our ice bars.

Q That is where you knocked them all off?

A They were all knocked off along there, yes, sir.

Q Why didn't you raise the top boards instead of taking off these side boards, or raise one top board?

A The top board, couldn't raise it.

Q You couldn't raise the top board?

A No, sir.

Q Why?

A It was nailed solid to the sides.

Q Don't you have timbers on top as well as the bottom of the flume?

A We have these cross bars there setting right on top of our top board on our flume, setting right on top of it.

Q Then, your flume was a square box?

A Yes, sir, square box.

Q And these six inch boards, then, stood above the top of the flume?

A No, sir, went right to the top; these six inch boards just reached the top board and went across our cross ties.

Q Illustrate it there on the board, will you; I don't understand that. Just mark a section of the flume, and show it.

A Here are your cross ties, there is a section of the flume. Now,--

Q Is that the side of the flume, the cross section?

A That is the flume and here is the cross ties goes on top of the flume; these little six inch boards went from the board here up to the top board on the top of the flume, nailed on top of the flume and down to the side of the flume on these cross ties to fill this little space up. All those cross ties were six inches, then our boards went right on top of here.

Q Then, these top boards were on top of the cross ties?

A Yes, sir.

Q I understood you they were under the top of the cross ties and that your flume was a solid box?

A That is the flume here.

Q Yes.

A And our cross ties on top of these solid boards there.

Q That would represent the top of the flume?

A That would represent the top of the flume, these boards laying on top of these cross ties.

Q Then, without these six inch boards nailed on your flume, wouldn't be a box, would it?

A There would be spaces between these cross ties, every four feet.

Q Then, did the boards on top of the flume cover the entire top?

A Yes, sir.

- Q They were nailed to the cross ties?
- A Yes, sir.
- Q One of these could have been easily removed, could it not?
- A Could by someone taking a hammer and knocking it up and splitting your boards.
- Q There was nothing to prevent one from pulling the nails and raising the board up?
- A That could have been done.
- Q That is all that would have to be done in order to remove these six inch pieces, pull the nails and remove the boards?
- A Yes, sir.
- Q These boards that were pulled off were right near Donnan's place, were they not?
- A Yes, sir.
- Q And this is the particular place where the two flumes were, one running on top of the other?
- A Yes, sir.
- Q How far from Donnan's house?
- A Why, in one place it would be about a hundred yards.
- Q And in one place about a hundred feet, wouldn't it?
- A Yes, sir.
- Q Not more than a hundred?
- A Not much more than a hundred feet.
- Q While these six inch boards were off, one passing over that flume, could see the water in it, couldn't they?
- A No sir, they would have to get down particularly and look under, look on one side of the flume to do it.
- Q Didn't it leave an opening there six inches wide?
- A No, sir, on the side.
- Q Six inches wide on the side of the flume?
- A Yes, sir.
- Q And one **climbing** over the flume could see water in the flume, in that six inch space, couldn't he, without putting himself out?

MR. STORY: Did you say driving over?

MR. A. C. HATCH: Climbing over. I don't understand one could drive over an eight foot high flume on a hill side.

MR. STORY: He drove over it, I thought.

MR. JACOB EVANS: He said he climbed over the flume, went over the flume.

MR. A. C. HATCH: What is my last question?

(Question read)

A Yes, sir, he would notice if he was climbing over.

Q How could he get over it without climbing over at any place along there by Donnan's?

A Yes, there is a couple of steps we put up there for a little building that was on the other side of the flume. They climb up these steps.

Q Did you ever know when that particular place opposite Donnan's there was closed tight?

A Yes, sir.

Q All the way along?

A It was closed all the time.

Q Is it now?

A Yes, sir.

Q To-day?

A It is closed all the way.

Q Aren't there some boards off right next to the house, right now?

A Right against the house there are some boards off.

Q And it has always been so, hasn't it?

A Right there, in the last three years.

Q Wasn't it prior to the three years?

A No, sir, because there was a flume from there on.

Q What?

A There was a flume from there on; we didn't have no house there that time.

Q Hasn't the little red house been there longer than three years?

A Yes, sir, that is below.

Q Where is that little red house?

A It is about three to four hundred feet below Mr. Donnán's house on the opposite side of the flume.

Q Haven't the boards always been off by that house?

A No sir.

Q They are off now, you say, don't you?

A Not at that place. Up where I am staying at the dam house there is a little place.

Q I am talking about the little red house?

A No, sir, they are on there now.

Q Have they been on all this year?

A No, not all this year. We just fixed it.

Q When were they put on?

A Well, I could not tell you the date, but they were put on this fall when we were fixing the flume up, repairing it up for the winter.

Q Which point is it on the flume where it has been open all the time and is open now?

A Which point?

Q Yes.

A I don't know of any.

Q What particular point where these six inch boards are not on now?

A Right at the head works at the dam where it don't require them being on.

Q At the dam?

A Yes, right at the house I am staying at.

Q What about the gauging station, have you a gauging station there?

A They have a little gauging station, there is a little board off, about a foot board between this one four foot that is

on top.

Q That board is off on top?

A Yes, sir.

Q And where is that?

A That is below Donnan's.

Q How far below?

A About between three and four hundred yards.

Q Is it three or four hundred yards or three or four hundred feet?

A I think it is about three hundred yards below Donnan's house where our gauge is.

Q You know Donnan has a dozen houses there?

A House he lives in, his log house.

Q The house that is next to the road and nearest house to the point to which you refer, how far is it, three or four hundred feet?

A Three or four hundred feet from our little red house.

Q But Donnan's house I am asking.

A He has got lots of tents down in there, I don't know whether you call them houses or not.

Q He has one good house, hasn't he, right by the road house?

A Yes, sir, that is the one I am saying about three hundred yards below our gauge.

Q You say that these boards were finally finished being nailed on where they had been torn off on this three or four hundred foot strip or thousand foot strip just this last year?

A It has been the last quite a number of years, we have had them off there when the little flume was on the flume.

Q You have not used the little flume for three years, have you?

A No, sir.

Q But you didn't get the boards finally nailed on along that place until this last year, did you?

A Some of them were nailed on, yes, sir, some of them all the

way along, but one or two little places there was more off than they were on the others.

Q Those you just finished this last year?

A Yes, sir.

Q Why didn't you as soon as the little flume, quit using the little flume, finish up?

A We were finishing all along, and didn't happen to have the timber--there qualified to fix that place at the time.

Q How long was the timber there before you finally did nail it on?

A We hauled timber up along there on our flume several different times and used it as we come along and we would run out then, it would be sometime before we could get probably the other timber up.

Q Do you know whether timber was taken up specially to fix this particular part of the flume when it was taken up?

A No sir.

Q You don't know?

A I don't know; I don't remember ever taking it up to fix this one particular place.

Q Or for this particular purpose of fixing these six inch places?

A It was taken up, we used that timber for that purpose, the six inch timber, the boards.

Q Now, I will ask you which part of the cribbing, getting back to that issue, ^{washed out} ~~at~~ the most up the river or down the river?

A Up the river and down the river, both. It generally kind of sinks, probably at the center of the cribs ~~be~~ more than the side cribs, would be from one bank to the other. Our center cribs would sink the most.

Q Would they sink more up stream or down stream?

A Sometimes the side cribs, where the water--which way the heaviest current went, seemed like it cut the gravel out.

Q Yes, but they were built with the point, were they not, to the current?

A To the current, certainly, water don't run all the same way,

- sometimes it will whip around and dig out holes in different places; you will find that all the way up the river.
- Q So you cannot build your flume so that it will be a point to the current all the time?
- A It is a little off. Might be off one way or the other.
- Q You build it with the point to the current to make the dam side-ways to the current?
- A I don't hardly think it would; there is too much waste there for that. It would tip, but would not move any.
- Q But the current would change?
- A Sometimes the current would.
- Q So that it would strike the crib sideways instead of end-wise.
- A Sometimes strike against the end of our crib more than other times.
- Q Doesn't the current strike that crib that is in the river just below the fishery, doesn't it strike it squarely on the side?
- A No, sir.
- Q Doesn't it do so to-day?
- A No sir.
- Q Sure of that?
- A Yes, sir, I am sure. It don't strike the side of it.
- Q And it never did?
- A It never struck the full side of it since I have been there.
- Q Can you give us the approximate height of the water that is in that little flume where it ran on top of the other flume?
- A I could not give you exactly, I don't know, but I can get pretty close to how much water used to run in there.
- Q The depth of it?
- A Yes, sir, the depth of the water.
- Q Yes.
- A The depth of the water that ran in that flume reached about twenty to twenty-four inches.
- Q Twenty to twenty-four inches?
- A Yes, sir.

Q You don't know the grade of those two flumes, do you?

A No, sir, not hardly.

Q Was it laid on the cross ties all the way up?

A The small flume on top of the other?

Q Yes.

A Yes, sir, we took timber laying on top of the cross ties and this here little flume was built on that, on top of the cross ties.

Q All the way to the intake, was it?

A Sir?

Q It was run that way all the way up to your dam?

A No, sir, just run that way, then built on posts around the side of the hill.

Q And had a separate intake from the temporary flume?

A Yes, sir.

Q And a higher intake?

A Yes, sir.

Q About how much higher?

A Well, I would judge it was a foot or a foot and a half higher than the--that is where we got the water in it, from the ~~the~~ old flume; that is the little intake where we got our water and run it over.

Q I don't understand how you could get the small flume on top of the other flume, if they were built from the same intake with the fall you had in the first thousand feet.

A Well, I will tell you---

Q And run any water in it at all, more than a few inches, can you explain that?

A Yes, sir.

Q I wish you would.

A I had flash boards across the river and backed it up.

Q How high?

A I had it as high as four feet.

Q Four feet flash boards?

A Yes, sir.

Q In order to get any water into your little flume at all?

A Oh, no, I could get water in with less boards than that, but I had them on there.

Q How many boards did you have to put on to get any water in it at all?

A We had only one or two boards, two boards to get water into it.

Q Would that ~~indicate~~ in a thousand feet then, give you twenty inches of water to run on top of the other flume?

A Yes, sir, we could do, I have done that.

REDIRECT EXAMINATION by Mr. Story.

Q Mr. Ivey, can you see the flume opposite Mr. Donnan's from the house where you usually stay?

A No, sir.

Q I don't mean where you live.

A No.

Q I mean for instance from the gate house.

A From the gate house down around the point there in places you cannot see the flume at all opposite Mr. Donnan's house.

Q There is a turn there, is there?

A There is a turn there, yes, sir.

Q You say that there are some steps going up the flume a short distance up the side of the flume a short distance above Mr. Donnan's?

A Yes, sir.

Q About how many feet above Mr. Donnan's place, are they?

A They are all the way from there, I think it is about two or three hundred feet.

Q There is only one set of stairs?

A One set there and one below.

Q How far below?

A About three to four hundred feet below.

Q You mean below the upper stairs or below his place?

A Below his house.

Q Can you see that section of the flume from the dam or where you would stay in the day time?

A No sir, you could not see it.

Q Was there any other way of getting up on the flume except by going up on these steps unless you climbed up a straight six foot wall?

A That is all.

RECROSS EXAMINATION by Mr. A. C. Hatch.

Q When you went up the flume you would go up in the morning and come down in the evening?

A Yes, sir.

Q And you stayed at the house at the head-works during the day time?

A Yes, sir.

Q Ate your dinner there?

A Yes, sir.

Q Went up at seven o'clock in the morning?

A Yes, sir.

Q And returned at five in the afternoon?

A Yes, sir.

Q And you wouldn't see anybody passing back and forth across that flume that happened to be out of sight of the particular place you were working there during the day time?

A They would have to be out of sight, yes, sir.

Q And your work, your work was directed across the river, removing debris and accumulations at the dam?

A Yes, sir.

Q And a thousand men might have passed over that flume between where you were working and Nunn's every day and you not have seen them?

A I might not have seen them, no, but other men must.

- Q I am asking you, that is all. Just a moment, are you acquainted with Caleb Tanner?
- A Yes, sir.
- Q Ever see him crossing back and forth across the flume?
- A When he was up there measuring water.
- Q When was that?
- A I saw him there two years ago, three years ago, I saw him there.
- Q That is the first time you ever saw him there?
- A I remember seeing him once, I remember, up the canyon. I don't remember, I never saw him on the flume, I saw him up the canyon.
- Q Did you ever see him on the flume at all?
- A Saw him at that time.
- Q Just once?
- A Twice.
- Q Twice?
- A Yes, sir.
- Q Did you know he was working practically all summer, measuring water in the flume?
- A Yes, I knowed he was.
- Q Bridal Veil Falls, going back and forth across there every day?
- A No, sir, I don't know he done that.
- Q You never saw him but the once?
- A I saw him once besides the two years I saw him measuring water on the flume.

CALEB TANNER, recalled.

CROSS EXAMINATION by Mr. Story.

- Q Mr. Tanner, I just wish to identify the measurements that you took from which you determined the coefficients of rough-

ness in the flume. You testified to a measurement made on October 9th, 1914 of 208.09 second feet. Mr. Wenz testified to a measurement on the same day; they were both the same measurements, were they not?

A No, they were independent measurements.

Q Then state what these independent measurements were, how you arrived at them and what was done.

A Mr. Wenz made a measurement and went ahead with his work as if I was not there. I made a measurement also.

Q They were all done at the same time?

A The same time interval possibly covered the same measurement. He started on one side and I started on the other.

Q You were both taking your measurements at the same time?

A On that particular date, I think.

Q This is October 9, 1914. Referring now to the measurement of November 6, 1914, on which you both got the same measurement, his was 212.06 and yours was 212.92; did you take your measurements at the same time?

A Yes.

Q Who helped him?

A I would not be positive about it, without going to the original notes, I don't happen to have them here.

Q Who helped you?

A I would not be certain about that.

Q Did you not testify at the former hearing you held the line across while he took the reading?

A No, I made no testimony of that kind.

Q Didn't Mr. Wenz so testify?

A That is what I did then, so far as Mr. Wenz was concerned.

Q What did Mr. Wenz do when you took your measurement? Did he help you take yours?

A I would not be sure he did.

Q Who did help you?

A I cannot answer.

Q Have you got your notes?

- A I haven't got them here.
- Q How far are they away from here?
- A They are probably over at the house or office, the original notes. Somebody was there, doubtless if Mr. Wenz helped me, or somebody else held the line while I made my rating, or one man might have held both lines, I don't know.
- Q Referring to the measurement on November 9, 1914, in which he found 220.33 and you found 219.57, were they made at the same time?
- A Well, probably, I think they were.
- Q You remember his being there when you made your measurement, don't you?
- A I think that he was there in all the measurements except one I reported in 1913 on the flume.
- Q Now, the same is true of July 27, 1914 measurement?
- A Yes, sir.
- Q And when did you make up your calculations as to the coefficient of roughness?
- A Made some of them up at the time the measurements were made.
- Q What ones did you make up then?
- A I remember at the time that I made the thirteen measurements I took a coefficient of roughness that was ordinarily held for timber flumes of smooth cracks, and figured back for the grade and found that the grade under that measurement should be thirty-eight hundredths of a foot to a thousand.
- Q That was when, in 1913?
- A That was one in 1913.
- Q That is not the measurement which you included in the list which you mentioned to the court at the last hearing from which you determined the coefficient, was it?
- A Yes, sir.
- Q Of 1913?
- A Yes, sir.
- Q Are you positive about that?

A Yes, sir.

Q Then, how many measurements did you use in that calculation?

A For determining coefficient?

Q Yes.

A Five or six, scattered through three years, I think.

Q When did you make your last determinations of coefficients from those measurements?

A In the last of 1914.

Q You made them all at that time, did you?

A I don't think I have a subsequent measurement of the flume at all.

Q I am talking about your calculations of the co-efficient, when did you make your last calculations of the co-efficient?

A Last calculations probably were made yesterday or the day before.

Q I mean previous to your last testimony.

A They were made in the period immediately preceding---I cannot identify just when the calculations were made. They were made in the days preceding when I gave the testimony.

Q Short time before you gave your testimony?

A I think so.

Q You had Mr. Wentz' other measurements before you at that time, didn't you, he had given them to you, hadn't he?

A Didn't have them before me.

Q They were in the report?

A I think they were in the report.

Q You knew of the report, didn't you?

A Yes.

Q Knew of his having made frequent measurements, didn't you?

A Yes.

Q You know that some of these measurements, a greater depth of water showed a less amount of discharge in the flume, did you not?

A Heard that from his testimony, ~~that~~ not his report.

- Q Have you not ever seen his measurements before, had you never considered any of them?
- A Never considered any of them, now, I haven't considered any of them except as I heard his testimony.
- Q But they were in the report of the court, were they? You know they were in the court, do you not, has been included in his report to the court?
- A That is what I understood and I think they are all there.
- Q Do you mean, do I understand you correctly Mr. Wentz had personally never given you any of these other measurements that he had taken, that is the result of any of these other measurements he had taken in the years 1914 and '15 other than those that you took with him personally on the day I have mentioned?
- A I don't think he ever gave me any of the matters except as they are contained in the report. I think I have copy of the report and saw it.
- Q And in so far as they were included in the report to the court you have had knowledge of them, have you?
- A In that way.
- Q Did you ever make any attempt to check up the co-efficient of those measurements in connection with your other co-efficients which you were determining?
- A Oh, no. That flume in 1915 and 1916 I think was, as I remember, was considerably modified from the conditions that were there before.
- Q How was it modified?
- A Well, I think probably---
- Q I am not talking about probably, I am talking about what you know with reference to the modification.
- A The modification, as I recall it, I don't know when it was made, the modification was the introduction of exceedingly swift section in the part of the flume immediately attached to the gate house.
- Q When was that put in there?

A I don't know.

Q You said there was, this change had occurred in 1914, I understood you, between the time these measurements were made you testified to in 1914 and subsequent measurements made by Mr. Wentz; I want to know your knowledge what change had been made.

A There was considerable change as I observed the flume in 1916, in that upper part, and as I observed it in 1914.

Q What is the change as you observed it?

A The racing section, the seep section in the upper end next to the gate house.

Q What change has been made in that section?

A Throws the current swifter.

Q You mean the current is swifter?

A Yes, sir.

Q What physical change has been made in the flume, to your knowledge?

A Flume has been elevated there.

Q Do you know that of your own knowledge?

A I know it as far as you can know anything, if you see swifter water.

Q How do you know it?

A Know it by the velocity of the water.

Q How do you know the velocity is faster?

A I have a general knowledge of speed of water as I observed the flow. The water as it was flowing in 1916 was less than three feet in depth in that section in order to produce approximately the lower reaches of the flume or a thousand feet below the section, in order to produce a depth of approximately five feet or little less, and those were not the conditions there in the year 1914 when I observed the conditions in the upper end of the flume.

Q Did you take measurements--you took these measurements in 1914?

A Yes.

Q What measurement have you taken of velocity since that date?

A Well, I have not taken any measurements of velocity since that date that were made with a current meter.

Q What measurement have you taken in any other way of velocity since that time?

A In the flume, none.

Q At that point?

A Except observations.

Q How did you observe it and how could you tell the velocity from your observations?

A Not unless there was a striking difference.

Q What is the striking difference you noticed during that period?

A Striking difference is the water moves faster up there.

Q How much faster does it move?

A I could not say.

Q Can you guess?

A No.

MR. A. C. HATCH: Guess would not be admissible any way.

MR. STORY: I think that is all he has been doing. That is all.

REDIRECT EXAMINATION by Mr. A. C. Hatch.

Q Just a moment; is that all you have been doing, just guessing; answering these questions?

A When you have a very swift flow of water and then relatively moderate flow of water to say exactly the difference, it would be very difficult thing to do. I have not been guessing on the testimony that I have been submitting here in this connection. I have a draft of the--

Q What did you say with regard to the water being swifter or not, I didn't get that, and where was this racing section?

A In the flume near the gate house.

Q What effect, if any, would that have upon the coefficient which you testified to when you were formerly on the stand?

A Water going from one condition of motion or rate of motion to another rate of motion, or from ^{rest} rough to a rate of motion must overcome its inertia. If you start it out from a dead pond with twenty-four feet of cross section down a slope of a thousand, one foot to a thousand, it must flow a long time before it reaches a maximum velocity that that fall will give it. If you start it out at the maximum velocity it will attain, of course, it will move down that slope with that uniform velocity. The racing section next to the gate house starts the water down that grade at a faster rate than it can maintain and therefore its inertia is all overcome and more than overcome, so that all that flume can do is given to it by that racing section.

Q You say this racing section was not there in 1914 when you made your measurement?

A As it is to-day, not as strong as it is to-day.

RECROSS EXAMINATION by Mr. Story.

Q Just a few more questions; how do you know that the upper end was raised instead of the lower end of that racing section you mentioned being lower?

A It has a falling radius from there on down.

Q I know, if you lower one or raise the other, I suppose it would be the same effect, wouldn't it, as far as the racing section was concerned?

A Well, it would leave a sag and there is no sag there to speak of in the floor.

Q Now, you were speaking of your observations of the racing section and of the velocity, the mean velocity, say of the water when the flume is running, 220 second feet, as given by Mr. Stoner's measurement of October 22, 1914, was 6.39 and the mean velocity of the water in the flume when there

236 feet running was 6.81, difference of about five-tenths of a foot per second; Do you tell me you can detect that difference in velocity by the eye?

A I did not pretend that I could, and I didn't say that I did.

Q How much variation, how much difference in velocity must there be for you to be able to detect it accurately with your eye, so that you would know there had been this change, this much change in the racing section that you have said you thought existed?

A Be considerable change.

Q It would have to be considerable change in the velocity?

A Yes.

Q For you to detect it with your eye and then you could not do it accurately, could you on a change of velocity of one foot per second, would make a very big difference in volume of flow, would it not?

MR. A. C. HATCH: Just a moment; there are two questions or three in one there. I think we are entitled to an answer to the first question before the second.

MR. STORY: Strike them all out and I will repeat the last one.

MR. A. C. HATCH: We ask an answer to the first one.

THE COURT: He has withdrawn his question.

MR. STORY: Read the last question.

(Question read)

A In the same cross section, yes.

MR. STORY: I think that is all, Your Honor.

MR. JACOB EVANS: I desire to offer plaintiff's exhibits Nos. 152 and 153.

MR. STORY: Those are powergraphs, are they not?

MR. JACOB EVANS: Yes.

MR. STORY: No objection.

THE COURT: They may be received.

MR. A. C. HATCH: Have you any objection to our putting these original papers in evidence?

MR. STORY: I want you to identify them if you put them in. I want you to identify them by Mr. Swendson or someone who is competent to identify them and explain what they are.

MR. A. C. HATCH: Mr. Swendson, will you take the stand.

GEORGE L. SWENDSON, recalled.

DIRECT EXAMINATION by Mr. Hatch.

Q I submit to you exhibit No. 157, Mr. Swendson and ask you if you know what it is.

A Yes, sir, it is a plan on a cross section piece of cross section paper made by one of the assistants in my office showing the relative position of eighteen measurements at Nunn's station on the Olmstead flume, together with a curve drawn through--

Q Just there, the Olmstead flume, that is the Utah Light & Power Company?

A Utah Power & Light Company's flume, yes, sir. That, together with curve which is endeavored to draw a rating curve through the several measurements so that the horizontal spaces will show discharge in cubic feet per second and the vertical spaces will show depth of feet in flume.

Q The measurements indicated on this exhibit are measurements all of which have been testified to in this case?

A I am not sure on that; I can read them to you.

Q Very well, I wish you would do so.

A The first one, No. 1, is the measurement by W. J. Layman,
June 13, 1913.

No. 2 is a measurement by H. L. Stoner, July 5, 1913.

No. 3 is a measurement by H. L. Stoner, August 7, 1913.

No. 4 is a measurement February 27, 1914, by Stoner.

No. 5, is a measurement, May 9, 1914, by Stoner.

No. 6, is a measurement, July 27, 1914, by Wentz and Tanner.

No. 7, is a measurement, October 19, 1914, by Wentz and Tanner.

No. 8, is a measurement, October 22, 1914, by H. L. Stoner.

No. 9, is a measurement, November 6, 1914, by Wentz and Tanner.

No. 10, is a measurement, February 16, 1915, by Stoner & Monson.

No. 11, is a measurement, April 9, 1915, by Stoner.

No. 12, is a measurement, May 14, 1915, by Monson.

No. 13, is a measurement, July 22, 1915, by Mr. Monson.

No. 14, is a measurement, September 25, 1915, by Mr. Stoner.

No. 15 is a measurement April 27, 1916, by Mr. Stoner.

No. 16, is a measurement, July 19, 1916, by Mr. Monson.

No. 17 is a measurement, August 8, 1916, by Mr. Monson.

No. 18, is a measurement, September 13, 1916, by Mr. Monson.

All of the measurements shown here by the Power Company or their representatives, are those that make up the list which we compiled at the last sitting of the court.

MR. A. C. HATCH: We now offer the exhibit
in evidence.

MR. STORY: I object to it on the ground it is not shown to be material or correct. You have got the evidence of measurements in the record, now, when it comes to introducing a curve, that has been made for the purpose of seeing whether or not it could be made, it is not admissible, unless it is proved to be correct.

MR. A. C. HATCH: If the Court please, we are

not offering it as a curve. We are offering it as a tabulation of these measurements, showing the gauge height and the discharge, and for this purpose I think it is admissible without question.

MR. STORY: If that is the purpose I have no objection, except it encumbers the record, they are already in evidence.

MR. A. C. HATCHE: For those purposes it puts squarely before the court in tabulated form the measurements with the gauge height at Nunn's, and discharge as testified to by---

THE COURT: The objection is overruled.

MR. STORY: I don't object to it if it is for that particular purpose.

MR. A. C. HATCH: Mr. Swendson would like to have these withdrawn later for the purpose of blue-printing.

THE COURT: You may substitute blue prints for them.

- Q I now present to you plaintiff's exhibit No. 158 and ask you if you can--if you know what that is?
- A This is an attempt on the part of some of the assistants in my office to make a rating curve at the Donnan's measuring station on Olmstead flume in Provo canyon.
- Q I will ask you if you know whether or not or what the circles there with the numbers on represent?
- A They refer to the numbers which I have been reading from in my testimony as to the different measurements. There is an arrow runs from the numbers to the particular circle which represents the measurements. They are so close together we had to run arrows to them and put the numbers in circles to identify them.
- Q And these are measurements made at a different point?
- A Yes, sir.
- Q From that shown in exhibit 157?

A Yes, sir.

Q And the measurements that you just testified to, did those measurements include the data of both 157 and 158?

A No, sir, these are different points entirely.

Q When were these measurements made from which these circles were placed there and numbers were placed upon the plat?

A No. 1--

Q 158?

A No 1 on February 27th, when Mr. Stoner measured the flume at Donnan's, or at Nunn's, as testified to in the other list. He read the depth in the flume at Donnan's. It is 5.3 feet. We assumed the discharge to be practically the same as that at Nunn's, and it forms the first measurement on this list, No. 1.

Nos. 2 and 3 were two heights that were obtained during the season of 1914, one of them marked 13th and the other April 4th, when they were making some surveys up there, getting the profile of the flume, during the spring of 1914 when we found in the records two depths of the flume, water surface levels 5.25 feet and 5.35 feet on March 13th and April 4th, respectively, and the volumes assumed there were the same as the others on February 27th, being so close by we platted those up as two points, three points on this curve.

Q No actual measurement of the flow in the flume?

A No, sir.

Q They are two days as three measurements?

A No, sir.

Q First three days?

A No sir. No. 4 is a measurement by Wentz and Tanner, July 27, 1914.

No. 5, measurement of Wentz and Tanner, October 19, 1914.

No. 6., measurement of Wentz and Tanner, November 6, 1914.

No. 7, measurement by Wentz and Tanner, November 9, 1914.

- No. 8, measurement by T. F. Wentz, May 8, 1915.
No. 9, measurement by T. F. Wentz, June 3, 1914.
No. 10, measurement by T. F. Wentz, July 9, 1915.
No. 11, measurement by H. L. Stoner, July 16, 1916.
No. 12, measurement by H. L. Stoner, January 8, 1916.
No. 13, January 21, 1916, by H. L. Stoner.
No. 14, January 21, 1916, by H. L. Stoner.
No. 15, measurement January 21, 1916, by H. L. Stoner.
No. 17, measurement April 27, 1916, by H. L. Stoner.
No. 18, measurement May 22, 1916, by H. L. Stoner.
No. 19, measurement May 25, 1916, by myself and Mr. Corey.
No. 20, measurement June 13, 1916, by myself and Mr. Corey.
No. 21, measurement June 13, 1916, by myself and Mr. Parker.

The list given here as actual measurements by the company or company employes, same as the last handed in at the last session of the court, but the exception I made a mistake in identifying the last list. There are two measurements platted here that are not included in the list presented to the court, the last time. They are the last two measurements made at the Nunn station, and the list from which I made my copy did not contain them, as I made the copy up last July and those two measurements were made in August and September, and there are, therefore, two measurements on the list at Nunn's station that are not included in the list prepared at Mr. Story's request at the last session of the court.

MR. A. C. HATCH: We now offer, if the court please, exhibit 158 under the same conditions that it may be substituted by blue print.

THE COURT: It may be received.

MR. A. C. HATCH: We ask later to attach a copy of the data from which he has testified to each of these exhibits, giving the date of

the measurement that it may be attached to the exhibits.

THE COURT: Very well.

MR. A. C. HATCH: As testified to.

Q About how far is it between Nunn's station and Donnan's, the two points at which these measurements are given?

A About six thousand feet.

Q Are there any additions to the waters of the flume between the two points?

A Yes, sir.

Q What are the additions?

A There is a flow from Bridal Veil Falls and Lost creek and from the Guardquarters springs.

Q Do you know the quantity of those flows?

A It aggregates around nine or ten second feet, varying somewhat.

Q Would not exceed ten second feet all told?

A I believe it does sometimes; I believe we have a measurement as large as-my memory is eight and a half or a fraction from Lost Creek alone. I am not sure of that, may b e it is six and a half.

Q You could not give us the maximum flow from all those sources?

A No, sir, I made no measurements and the last session I understood the measurements of Mr. Wentz should go in and I believe they are all put in the record and these are all the measurements we have.

MR. STORY: That is all I have.

MR. HUFFAKER: Would Your Honor hear the testimony in support of Mr. Van Wagonah's claim at this time?

THE COURT: Yes.

MR. STORY: May I be excused at this time?

MR. A. C. HATCH: Mr. Tanner was on being

cross examined at one adjournment of the court, in this same controversy and I would like to close that up sometime.

MR. STORY: Mean on the river flow on his direct testimony?

MR. A. C. HATCH: I don't know what it was, I can give it to you.

MR. STORY: At an early session of the court.

MR. A. C. HATCH: No, since we commenced our rebuttal.

MR. STORY: I have not requested his examination be left open since you commenced your rebuttal that I remember. In his original testimony I requested it be left open.

MR. RAY: May it please Your Honor, Mr. Corfman asked Mr. Tanner's testimony be left open as to the Eschma Tanner drainage claim.

THE COURT: Yes, I remember that.

MR. A. C. HATCH: My notes show this: Caleb Tanner recalled to testify in rebuttal, and the state engineer's report for 1905 was introduced by Mr. Story and he was on the stand when court adjourned until December 27, at 10:15 o'clock A. M. and that has never been finished.

MR. STORY: I think I said at that time I might desire to ask him some further questions about it and I have aksed them.

MR. A. C. HATCH: We desire to ask some further questions also; he was your witness I understood at the time.

MR. STORY: You mean when I introduced his report as state engineer?

MR. A. C. HATCH: Yes.

MR. A. L. BOOTH: You made him your witness.

MR. STORY: I think he made a good witness for us.

MR. THURMAN: He always makes a good witness.

MR. A. C. HATCH: His testimony was allowed to stand.

MR. STORY: I thought they closed their cross examination of him, however.

THE COURT: Mr. Tanner may take the stand then.

MR. RAY: If the court please, while Mr. Swendson is here, there is a matter rather extraneous to this inquiry I would like to interrogate him about and unless Mr. Tanner is being recalled now, I will save Mr. Swendson another trip down.

THE COURT: Very well.

CALEB TANNER, recalled.

CROSS EXAMINATION by Mr. A. C. Hatch.

Q Mr. Tanner, when you were on the stand prior to the adjournment before Christmas, there was presented the state engineer's report for the state of Utah for 1905, at which time you were the state engineer and is that exhibit here?

MR. STORY: You objected to it, Judge Hatch, so we proved the fact by Mr. Tanner and finally we did not offer the state engineer's report.

MR. THURMAN: You read from it.

MR. STORY: Only by indicating that such and such did not appear in the record and it had not been published by his consent, and he testified that he had and it appeared in the report.

MR. THURMAN: Where is it, we want to examine him about it?

MR. A. C. HATCH: Where is the report?

MR. STORY: I think Mr. Merrill has got the report, it was his report, we haven't it with us here.

MR. A. C. HATCH: The court being adjourned at the time we should have taken it up then.

MR. STORY: Let me remind you of the circumstance. After Mr. Tanner's examination was finished you asked, or said, you would withdraw the objection to our putting in the report, and I said we did not care to put in the report after Mr. Tanner's oral testimony.

MR. THURMAN: I know, but you read from the report, and that become a part of the testimony and it ought to be here for cross examination.

MR. STORY: It was at that time.

MR. THURMAN: We did not cross examine at that time, we adjourned.

MR. A. C. HATCH: Court adjourned and this is first opportunity.

MR. STORY: I have no objection to your having it, if there is anything more for Mr. Tanner to say about it, I am willing it should go in if Mr. Swendson can get it.

MR. A. C. HATCH: He might be excused and we can take that up later.

MR. STORY: Mr. Wentz has a copy and we can go on with it.

GEORGE L. SWENDSON, recalled.

DIRECT EXAMINATION by Mr. Ray.

Q Mr. Swendson, you are conversant with a certain control that has been installed in Provo river r ecently, are you not? Know about it?

Xo Yes, sir.

Q What is the purpose of that control?

A The purpose is to regulate the flow from the river or to regulate the flow into the head-works of the Provo bench canal.

Q If properly used and accurately used, will it regulate the flow of the water into that canal so as to prevent the fluctuation of which complaint has been made in the past?

A Yes, sir, it should obviate any material fluctuation if properly handled in connection withtheir own dam.

Q Is it feasible to operate such control in connection with the Timpanogas canal?

A Well, this particular control is considerably below the Timpanogas; they have a special set of gates for the Timpanogas canal and special control on the river.

MR. THURMAN: You mean the Timpanogas in this county?

MR. RAY: Yes.

A At the head of the Timpanogas canal.

Q Is that special gate and control so devised as if operated to prevent fluctuations in the flow of the waters into that canal?

A Yes, sir, presuming the flow in the river is steady. The flow in the river there would probably be affected somewhat by the takers between the Olmstead dam and the head of the Timpanogas canal.

Q The flow of water into the Timpanogas canal is in a measure waters which rise below the dam at the intake of your flume?

A That is my understanding, yes, sir.

Q So, whenever there is an overflow in your flume above the

intake of the Timpanogas canal that water would be an accretion to the waters flowing in the river, and going into the Timpanogas, would it not?

A Yes, sir.

CROSS EXAMINATION by Mr. A. C. Hatch.

Q About how often does this overflow occur from your flume?

A I have no data on that, Judge, I don't know.

Q What is the device of which you speak that regulates the flow?

A You mean the upper one, or lower one?

Q Either of them.

A The lower one--

Q Regulates the flow when there is different quantity of water flowing through the wheels.

A They have a device in the river now that was put in last summer by the power company at the head of the supplementary intake to the Provo Bench Canal, which consists of a concrete section across the river, provided with places for putting in upright posts which will support flash boards by means of which they can control the flow of water into that supplementary intake of the Provo Bench canal, and I judge in connection with the flash boards at the head of the Provo bench canal, they should be able now to keep the Provo bench canal fairly uniform in flow, the fluctuation should not be material if properly operated. At the head of the Timpanogas canal it has been installed for some time, and consists of a flash board dam across the stream with incline supports for the flash board, such that they can maintain a proper head at the intake of the canal, to maintain a fairly constant flow.

MR. RAY: Judge Hatch, may I state here for counsel and for the court, the specific purpose of this. In the past both the Timpanogas

and Provo bench have been subject to great fluctuations so that if a measurement of the water flowing in their canal should be made at a time when there was a peak of these fluctuations it might show a quantity of water far in excess of the quantity which they received during the particular period of time, and in addition to that, would come in quantities for which they were not prepared, and therefore not useful to them; and my purpose was to show that it should be controlled and ought to be controlled, so that the water could be given to them in a regular and constant flow, and Mr. Swendson, I think, knows about it.

MR. JACOB EVANS: Does that same condition not apply to Provo City and all the other canals down here?

MR. RAY: I don't know.

MR. A. C. HATCH: It applies to the canals in Wasatch county by reason of the power plant, the Utah Power & Light Company have the Murdock plant which is above the intake of the Wasatch County canals. I will ask you, Mr. Swendson, if such a regulation could be made to apply to what is known as the Murdock plant in Wasatch county, if you know?

A I am not conversant with all the geography of the situation, Judge. It would probably involve an opening in the pipe at the head of the pen-stock, so that when they desired to change the flow of the water through the turbine they would not have to wait for it to come all the way down the river to supply the change that it would cause in the river.

MR. A. C. HATCH: Could such an opening be made?

A I say I don't know about the physical conditions up there, and could not say. I don't know whether the slope is gradual or whether it is a long incline back to where the pen-stock hits the pipe or what the conditions are. I have no exact data on that situation. Have you the plans of the Murdock plant, Mr. Story?

MR. STORY: I don't think I have.

MR. HATCH: Can you get them?

MR. STORY: I presume we can.

MR. A. C. HATCH: Were they not filed with the other proofs?

MR. STORY: Yes, they are in proof, but the only evidence introduced here on the Murdock plant is the certificate of appropriation.

MR. A. C. HATCH: But they are not here.

THE WITNESS: I had instructions not to prepare any other data.

MR. A. C. HATCH: The reason I ask this at this time is this: we are going to insist that the water come regularly to the irrigators below the Murdock plant in the decree, as we have heretofore been at different times seriously interrupted by the manner in which the water has been used there. Show that in connection with your use of the water at that time in our rebuttal.

MR. STORY: You say you expect to introduce some evidence on that point?

MR. A. C. HATCH: Yes.

MR. STORY: When, Judge?

MR. A. C. HATCH: As soon as we get regularly into our rebuttal.

MR. STORY: It is rather a question here whether or not the power company is bound to continue to divert the water all the time, or

whether it may divert it same as any other appropriator, and let the water flow down the stream.

MR. A. C. HATCH: At this point I think it would be a good time to raise the question that the Murdock plant takes the water out at a point, out of the river at a point about three or three and a half miles above its point of use, and takes practically all the water flowing in the river at that point. When the plant is in use the water runs regularly. When the plant is shut down it requires from ^{one to} three to four hours to fill up that three miles of pipe and fill up the pond at the head of the pipe, or intake, so that the water will overflow and go on down the river to the point where the tail race enters the river, and those three or four hours of shutting off the water completely that we say they have no right to do, and we will insist that something in the decree protects us, the irrigators, as against that kind of use. We have the same question raised with regard to the Heber City mills in which I am personally interested, and the Wasatch canal. They are situated right on the canal, and use the water from it and have three or four great ponds there that we fill up so as to have steady water. We have stipulated with the Wasatch people, which stipulation will be introduced later, as to the regulations in regard to the Heber City mills use, and ~~xxx~~ you should be regulated, I take it so that the prior appropriator will not be damaged in the interest of the power light. Now, we will put on the testimony later, I say, now, showing the conditions I have stated, and

ask for a decree prohibiting your clients from stopping the flow of water, and if you have a plan and there is any way of regulating it, as testified to by Mr. Swendson, as to these Utah county canals, probably that regulation might be applied up there.

MR. STORY: I think that the law contemplates waters of a stream may be used for all beneficial purposes. We always have conceded and do now concede that either prior appropriators or subsequent appropriators may use his water right, his appropriation in such a reasonable manner and not interfere with the rights of other appropriators whether they be subsequent or prior, but the suggestion which you have made is perhaps far more far reaching than you intended. For instance you have described a condition which I think is circumscribed, ~~and~~ prevailing at the Murdock plant, because of the long conduit. If the water is turned in at the station so that it is--or turned off at the head-works, then have to flow down the stream, otherwise, instead of flowing down through the pipe as it has before, the result of course is a loss of time, but the proposition you have stated to the court as being incorporated in this decree, if I understand it correctly, is that we would never have the right to turn the water out of our flume for repair, because the moment we turn the water out for the purpose of repairing the flume or purpose of repairing the pipe line, something of that kind, of necessity the water has begun to flow down to your client through the stream, and it will take a considerable period. Now, if you

want to incorporate it in the decree that we may not so use our right as to unreasonably interfere, and I think that is the whole question, then I don't see there will be any objection, because I think that is a statement of the law on the subject.

MR. A. C. HATCH: We want to go further than that. You have a pond, pardon me, you have a pond there, the spill-way of which is considerably above-- that is, the spillway into the river is considerably above the intake of your pipe line. When the water is below the pipe line, draws the water from the pond down to quite a distance below the spillway and before the water can run down the river when you shut it off from your wheels not only has the three or four miles of pipefull of water. but it has to fill your ponds at the top of the spill-way before it starts to run down. Now what we shall insist upon is that there shall be an opening at the bottom of your dam so that immediately when you shut your water off below or before you shut it off below, it be allowed-- that is, the gate be made at the bottom of your dam and the water start to us at least.

MR. STORY: Of course, I am at a disadvantage in discussing this physical conditions, because I am not familiar with them. But it seems to me it is a question you have suggested in your last statement, whether or not we have provided reasonable methods for letting the water go down instead of unreasonable methods which would prevent it going down.

MR. A. C. HATCH: I don't like that word,

"reasonable".

MR. STORY: That word, "Reasonably" you may not like, but it is one of the most important words in the whole law of irrigation, and it has its place--

THE COURT: Gentlemen, I think possibly this argument is of no particular value at this time, because we have not, any of us, the facts before us.

MR. STORY: I was just going to add one more word. It seems to me, Your Honor, that is a matter which is not necessarily at all involved in this decree any more than the interference with John Jones' right by Joseph Smith, after the decree is entered.

THE COURT: I am inclined to think it is in this way. I think both of you have correctly stated the law. It is necessary to determine in a particular case what constitutes a reasonable use, and I apprehend while there is a controversy, as there appears to be between you, or possibly may be, the court in this case, in making the findings ought probably to designate what character of use is reasonable and what particular precautions you should take to prevent damage to the other parties.

MR. STORY: We may be able to get together on the question what would be a reasonable change for us to make in our works to provide this.

MR. A. C. HATCH: If the Court will pardon me, I raised the matter at this time simply to give Mr. Story notice, he seemed to be wanting to go home.

THE COURT: I was suggesting the discussion

between you, while interesting, was probably not of much benefit now, and until we had some evidence what the situation was. Now do you want to examine Mr. Swendson farther?

MR. A. C. HATCH: No, he not being for me with the conditions there.

CROSS EXAMINATION by Mr. Tucker.

- Q I would like to ask if the device which is now installed which affects the Provo bench canal will also prevent fluctuation in those canals heading below the Provo bench canal?
- A Yes, sir, providing the wiers or control at the head of the Provo bench canal is properly managed. It will require the manipulation of both the control at the river and control at the head of the Provo bench canal in order to properly regulate the flow.
- Q- Well, isn't it possible for you people to deliver water without fluctuation to those customers below the Provo Bench canal?
- A Only by the manipulation of those two devices.
- Q Haven't you installed a device at the head of the Provo bench canal?
- A I don't know about that; I could not state about that. The new one was put in the river this year. The other has the appearance of being old and was probably put in at the time the plant was built at Olmstead by the company.
- Q As I understand it, this present device for the Provo Bench canal is put in operation that in the future there may be fluctuation to the canals below the Provo bench canal?
- A No, sir, if the two of them are operated properly there should be no material fluctuation. There are two overflow wiers there, two controls which if operated properly, can control the flow absolutely or so near there may be no material

fluctuations in all of these--in the river, in the Provo bench canal and in the Timpanogas. Only a question of operating the devices. If there is a change in the state of the river or in the tail race of the power plant, there may be a necessity for adjusting the flash boards so as to get the proper elevation in the Provo bench canal, and in the other places. Simply a question of operating those devices properly.

OMISSION.

Testimony as to claim of Wilford Van Wagonen.

Stipulation as to parties using water under the Island ditch.

Stipulation as to John M. Richie, Henry F. Watson and George H. Edwards as to right in the water Daybell springs.

Stipulation as to Hyrum S. Winterton, William L. Van Wagoner and John Van Wagoner, Jr.

MR. ROBINSON: I have a stipulation, but I would like to take some testimony to make a prima facie case on the others that have put in counterclaims.

JOHN W. HOOVER, called by the defendant John W. Hoover, being first duly sworn, testifies as follows:

DIRECT EXAMINATION By Mr. Robinson.

- Q Your name is John W. Hoover? A. Yes sir.
- Q You are one of the defendants in this action?
- A Yes sir.
- Q Have you entered into a stipulation concerning your water right with the plaintiff Provo Reservoir Company?
- A Yes sir.
- Q You were granted certain water rights under the John F. Chidester decree, were you not?
- A Yes sir .
- Q What were those rights?
- A One hundred and fourteen minute feet.
- Q And what right under that decree, so far as that water right you are now speaking of is concerned do you now claim?
- A Fourteen feet.
- Q Fourteen minute feet, cubic feet per minute?
- A Yes.
- Q You disposed of a hundred minute feet, did you?
- A Yes sir.
- Q To whom did you sell that?
- A John Dixon.
- Q What other rights do you claim under the John F. Chidester decree?
- A Why, it is one-tenth of the waters that were decreed to the Wright estate on the west side of Provo river, which was, I think a hundred minute feet.

Q You claim you were awarded one-tenth of that under the John F. Chidester decree?

A Transferred from the Wright estate to me.

Q You have stipulated with the plaintiff that that water right is equal to one hundred cubic feet per minute, and you are entitled to one-tenth of that, or ten cubic feet per minute from that source?

A Yes sir.

THE COURT: Coming from the Wright Estate?

MR. ROBINSON: Yes.

Q You also have some springs that arise on your farm, do you not?

A Yes sir.

Q About how much water do you -- or land do you irrigate from those springs?

A Possibly thirty acres.

Q The springs arise on your land and in the low water season you utilize all the water of the springs, do you?

A Yes sir. Of course, that land is on a different place to what the Chidester decree was.

Q That is on what is known as the Deer Creek?

A Lower place, yes sir.

Q You are also by your answer claiming a high water right for eighty acres of this land which is particularly described in your answer?

A. Yes sir.

Q And how long have you been using this high water right?

A Since 1910.

Q That water right is subsequent to the Provo Reservoir filing, is it?

A. Yes sir.

MR. ROBINSON: In Mr. Hoover's answer, if the court please, we set up that he had a water right of 11 cubic feet per minute, as provided by the John F. Chidester decree, but looking over that decree we found it was one fourth and he is only claiming 14. I should like to have the privilege of amending that.

THE COURT: It may be amended to conform to the proof now introduced.

CROSS EXAMINATION By Mr. Ray.

Q Mr. Hoover, the right awarded you under the Chidester decree was a high water right, was it not?

A No sir. Under the Chidester decree, you say?

Q Under the Chidester decree, it was not a low water right, was it?

A Yes sir.

Q It was? A. Yes sir.

MR. RAY: I want to consult the decree about that, your Honor please.

THE COURT: Class A water, 114 minute feet of Class A water and of spring water.

Q Now, you had certain springs there in addition to the waters awarded by the Chidester decree, did you not?

A I think, yes, there was springs that were mentioned before, use it one way or another.

Q You have been using those on the land?

A Yes sir.

Q And the Chidester decree provided you should have sufficient water from the river in addition to equal 114 minute feet?

A Yes sir.

Q Do you know the flow of the springs referred to in the Chidester decree, the amount of water?

A No, I don't.

Q Minute feet?

A No, I don't.

Q When did you transfer the water, the one hundred minute feet to John D. Dixon?

A Why, I could not tell exactly, I think about nine years ago.

Q And since that time you have continued to use the same quantity of water upon the land you used prior to the transfer, have you not? A. No sir.

Q And are proceeding now to claim a high water right from the Provo river?

A The high water right is on different land.

- Q Where are the lands located upon which you claim under the Chidester decree the right to the use of 11 $\frac{1}{4}$ minute feet.
- A They are on the river, I could not tell.
- Q About where in the canyon?
- A Yes sir.
- Q How high up in the canyon?
- A Well, right at the head of the Provo canyon.
- Q Near the Wright estate?
- A Joining on to the Wright estate.
- Q So that whatever waters were applied up on those lands, the seepage and return water went to the river?
- A Did it go to the river?
- Q Went into the river, did it not?
- A I don't know.
- Q Where was the natural drainage of the land, toward the river?
- A The land laid about the same way the river did, yes.
- Q Whatever waters went through the soil would go down into the river bed and down the river, would they not?
- A Naturally suppose they would, I couldn't say they did.
- Q How many acres of land did you have there, Mr. Hoover?
- A I think we irrigate from sixty-five to seventy-five acres.
- Q You did at the time of the Chidester decree?
- A Yes sir.
- Q How many acres have you irrigated in the last six or seven years a there?
- A Why, we irrigate about the same amount in high water time, in fact, we don't irrigate, the river raises there and irrigates so that we can raise a crop of hay.
- Q You raise timothy? A. Yes sir.
- Q One crop of timothy? A. Yes sir.
- Q That is all you ever did raise, isn't it, one crop of timothy?
- A When we have it in hay, yes.
- Q What else have you ever raised on that except timothy hay?
- A Sugar beets and grain.

- Q Did you raise sugar beets and grain on that prior to the Ghidester decree? A. Yes sir.
- Q How long ago did you raise sugar beets upon that.
- A I think about thirteen years ago, twelve or thirteen.
- Q How many acres?
- A Possibly neighborhood of ten acres.
- Q For how many years?
- A Well, I don't know exactly, two or three.
- Q What other crops besides timothy and sugar beets did you ever raise upon that?
- A Oats, barley.
- Q Prior to the Ghidester decree? A. Yes sir.
- Q Have you raised them since the Ghidester decree?
- A Some little, not much.
- Q Raised sugar beets since the Ghidester decree?
- A No sir.
- Q How many acres of land will your springs upon that property take care of in the low water season?
- A Well, not very many.
- Q How many?
- A Approximately five or six.
- Q Any other seepage water coming on to it?
- A No sir.
- Q And have you personally attended to the irrigation of that land?
- A No sir.
- Q Isn't it a fact, Mr. Hoover, that land has been irrigated each and every year during the past several years in the same method and to the same extent it was irrigated prior to the Ghidester decree? A. No sir.
- Q More or less?
- A We have used this 14 feet I suppose, I never have seen the commissioner, we measured it myself, but we propose to have this fourteen feet and ten feet the additional of the Wright water.

- Q no you know whether that Wright water has ever been used at any time, of your own knowledge ?
- A No, I don't know, they have measured it to us.
- Q Do you know whether or not any high water has been used upon there of your own knowledge?
- A Yes sir.
- Q That floods out and cannot keep it from flooding, can you ?
- A Yes; then we have it in ditches and put it on higher ground.
- Q Have you done that personally ? A. No sir.
- Q Have seen it done? A. Yes sir.
- Q Each year? A. Yes sir.
- Q For how many years past?
- A Well, ever since and before the Chidester decree.
- Q So that you are using as to high water now the same quantity you used before and since the Chidester decree, that is, you have used the same quantity during the two periods before and after the Chidester decree? A. Yes sir.
- Q You only claim the right in low water to fourteen minute feet there?
- A With the exception of the one-tenth.
- Q One-tenth of the Wright estate?
- A Yes sir.
- Q And your springs?
- A Yes sir, we don't claim any springs on there at all, not the use of any spring.
- Q Do you know what springs it is that are referred to in the Chidester decree in connection with the 114 minute feet?
- A There was one spring on the lower end, toward the lower end of this ground we used to back up some.
- Q Do you now?
- A No sir.
- Q Can you now just the same as you used to?
- A Yes sir.

REDIRECT EXAMINATION By Mr. Robinson.

Q Mr. Hoover, do you have any more water now for your upper farm, that is, the farm on which you have 14 minute feet primary water decreed under the Chidester decree and 10 minute feet which you purchased from the Wright estate than you actually need to take care of your crops on that farm?

A No sir.

Q And is this water used by you every year?

A Yes sir.

Q During the low season? A. Yes sir.

Q And has been used for how long?

A Well, we have used water there ever since I owned the ground, and before, I suppose it has been used there for thirty-five years.

Q Now, in regard to this spring that is on this upper farm, what kind of a spring is that?

A It is a spring, kind of a slough that comes out from-- appears to come out from under the canyon there,

Q Do you use that water? A. No sir.

Q Have you ever used it?

A We used to use it.

Q The springs referred to in your answer are springs that arise on your lower farm, or Deer Creek farm, are they not?

A Yes sir.

Q And that is where you irrigate thirty acres of land from the spring? A. Yes sir.

12:00 Noon, Recess to 2:00 P. M.

JOHN W. HOOVER * - - - - -

CROSS EXAMINATION By Mr. Ray.

Q Mr. Hoover, how many acres of land did you say you had at the

point where you were decreed 114 minute feet?

A I think we farm from 65 to 70 acres.

Q How many of them did you irrigate during the entire irrigation season?

A Why, I don't know, I couldn't tell what we irrigated in low water time now. Of course, before we sold the water we irrigated pretty well all of it.

Q By direct irrigation or by sub irrigation?

A Good many years ago it was irrigated by sub irrigation.

Q That was true up to the time of the Chidester decree, a large part of it was irrigated by sub irrigation, was it not?

A No sir, I think it was ~~xxxx~~ about five years before that Chidester decree that I took out of a ditch, out of the river.

Q Out of the river or out of the slough.

A It is the slough at the Wallsburg switch, coming out of the river. Well, it was the drainage of the river.

Q Was it the slough that forms on the side of the river there from which you took your ditch?

A Well, it was the slough going out into the field there and back into the river at the wagon road above my ground.

Q You took your ditch out of the slough from the Wallsburg ditch, did you not?

A Yes sir.

Q Never did have a direct connection with the river, did you?

A That is the drainage of the river, I don't know whether you would call it the river or not.

Q Then you used your spring which irrigated how many acres?

A I think four or five acres. We never used that much after we got the ditch out because when we used that we had to back it up and it drowned out about as much land as it irrigated.

Q How long since you have used that spring at all?

A I don't think we have used it to amount to anything since we have the ditch there.

Q You were not using the spring at all at the time of the entry

of the Chidester decree?

A Not to speak of.

Q You claim^{ed} the right to use the spring, did you not, at that time?

A Yes, I guess we had a right to, I don't know.

Q Didn't you, as a matter of fact, in that litigation claim the right to use that spring?

A We were only claiming the use of the spring because we had used the water. When we got the ditch out we didn't want to use it because it damaged the land in the way we irrigated it.

Q You say you had ten acres of sugar beets one year?

A Yes sir.

Q How many tons did you get that year?

A I don't know.

Q Where did you ~~max~~ sell them?

A We shipped them, I think, to Lehi.

Q You saw the beets growing?

A Yes sir.

Q Measured the acreage? A. No sir.

Q Sure it was ten acres?

A Well, neighborhood of that, yes.

Q You have irrigated that farm, have you not, every year since 1907, the year of the entry of the Morse decree.

A Parts of it.

Q Of the Chidester decree?

A Parts of it.

Q The same parts you always did irrigate ?

A No sir.

Q How many acres of it now sub irrigates?

A There isn't any of it, I don't think, only what sub irrigates in the spring.

Q How much of it sub irrigates in the spring?

A All of it, I have seen the water all over it.

Q The entire farm sub irrigates in the spring?

A Yes.

- Q Are you claiming any high water for it whatever in the spring?
- A I have not.
- Q You are not now claiming any high water for that land?
- A No sir.
- Q How late does that sub irrigation continue.
- A As long as the river is up.
- Q Up to what stage?
- A I don't know.
- Q Those springs would irrigate, I understood you to say this morning, about six acres?
- A Oh, from four to six acres, something like that.
- Q Is there only one spring on the place?
- A That one that amounted to anything.
- Q Were there other springs?
- A Along the barrow pits of the railroad the water seeped through there from the river. Barrow pits is about as low as the river bed.
- Q Would you say those springs flowed fourteen minute feet of water?
- A No sir, I would not.
- Q How many minute feet of water would you say they did flow?
- A I don't know.
- Q Why do you say they don't flow fourteen, if you don't know what they do flow?
- A I thought you said did I say they flowed fourteen.
- Q I say would you say they did flow fourteen minute feet?
- A I think they might, yes.
- Q Now, where does the ditch go you take out of this slough, or the branch of the river by the Waxillsburg switch.
- A It comes down on my land.
- Q And then is divided into irrigation ditches there?
- A Well, it follows right around the wagon road pretty well.
- Q At the top of the land?
- A Not until it gets to my land and then it runs off on to the land.
- Q How many acres of irrigable land lie below the ditch, and land

You have cultivated?

A Well, about all of it lays below the ditch, besides a few acres, part of it we flume across the river. We have done until the last few years. The last year we made a ditch on the other side of the river.

JOSEPH R. MURDOCK recalled by the defendant J. W. Hoover, testifies as follows:

DIRECT EXAMINATION By Mr. Robinson.

Q Your name is Joseph R. Murdock?

A Yes sir.

Q You are the president of the Provo Reservoir Company?

A Yes sir.

Q Acquainted with the Hoover farm which is situated in provo canyon and known as the upperfarm?

A Yes sir, somewhat, quite well acquainted with it.

Q Have you been acquainted with this farm for many years?

A Well, mostly as I have passed over it, crossed it all kinds of ways almost, hunting, fishing, and looking it over.

Q You were also administrator of the Wright estate at the time that the John F. Chidester decree was entered, were you not?

A Yes.

Q And as administrator, did you decree a certain amount of water to John W. Hoover, did you transfer it?

A Some years after the decree in a settlement with Mr. Hoover between the Wright estate and himself on lands and water we conceded to him, tenth, or one-tenth of all the water on the west side of provo river. that had been decreed to the Wright estate.

Q And in your judgment what would that water amount to in cubic flow?

A About a hundred cubic feet per minute.

Q He would be entitled then, under your agreement to one-tenth

of that? A. Yes sir.

Q Do you know whether or not he is now irrigating his farm?

A As I have observed from the road and from the railroad and wagon road which passes through it, I have thought that he was irrigating all of it.

Q You think that fourteen --

A Pardon me, at least during the high water period.

Q You think that fourteen cubic feet of water per minute as a primary right, together with the water right that he has from the Wright estate would be more than sufficient water to irrigate his farm as it now is?

A Not if he takes it across the river, takes part of it across the river, I would think it would take all of that.

Q There would be none that could not be used beneficially?

A No, not of the 14 minute feet.

Q Do you know what kind of crops he is raising there?

A Only as I have observed them passing through his farm from the railroad.

CROSS EXAMINATION By MR. Ray.

Q Those crops are largely timothy, are they not?

A Yes sir, and hay. That is, wild hay.

Q That is a crop which requires the maximum of water, is it not?

A Yes, it requires a great deal of water.

Q More so than the average farm crop?

A Well, I would think so, to do justice to it.

Q But in your opinion, the springs rising on this land and 14 minute feet of water are sufficient for the irrigation of the entire tract, are they?

A Not in high water time. The river rises and during the high water season ending about July first usually, I would say that was plenty to finish up what he had.

Q 14 minute feet and these springs would be sufficient?

A Yes, after the high water is gone.

MR. ROBINSON: That is all.

OMISSIONS.

Testimony as to right of John M. Hüber et al.

Testimony as to right of Benjamin Hair.

Testimony as to right of George Shear.

Testimony as to individual rights under Midway Irrigation
Company.

T. F. WENTZ, recalled by the plaintiff testifies as follows:

DIRECT EXAMINATION By Mr. Jacob Evans.

Q Mr. Wentz, did you make a report covering the work you did in the year 1916? A. Yes.

Q And that report has been --

MR. AL C. HATCH: As commissioner of the court?

A Yes.

Q That report has been filed with the clerk, has it?

A Yes.

Q I show you part 1 of that report and ask you to state what it is?

A Part 1 of the 1916 report contains a letter of transmittal and photographs as a frontpiece of Mt. Watson, and introductory paragraph and list of the contents of the 1916 report from part 1 to part 15 inclusive.

MR. JACOB EVANS: We offer this part 1 as evidence.

MR. RAY: Your honor please, we haven't had copy of the report or opportunity to consult ^{it;} there are many things in it which I have no doubt are material but we object to it generally as immaterial and irrelevant, in order that we may preserve our right to move to strike the immaterial matter.

MR. A. C. HATCH: I understood all of this matter was introduced on motion of Mr. Ray the other day. I may be mistaken, but as I remember rightly he ask that all of the 1916 report that was material be admitted in evidence, and it was so ordered. Am I mistaken.

MR. RAY: I don't remember. I offered the part relative to the distribution to the Provo Bench canal for the year 1916.

THE COURT: Your objection will be overruled with

the privilege of moving to strike out.

Q I show you part 2 of that report, and ask you to state what that is?

A Part 2 of the 1916 report deals with the Provo river for the months of April, May, June, July, August and September. It includes a foreword giving a designation of the Provo river, and summary of inflow below the United States Geological survey Station, situated in Provo canyon at Vivian Park and the points of measurement of the several diversions into Utah Lake Valley from the year 1902 to 1916 inclusive. Also a summary of the 1916 measurements of the total flow of Provo river and its tributaries in the Utah Valley. Also the inflow curve, storage and tunnel waters turned to Provo river for the months of July, August and September. The 1916 river for April, May, June, July, August and September. The 1916 river summary, comparative river, the 1916 with the average river for the months of April, May, June, July, August and September and comparative 1916 river with the average river for the season of 1916.

It also gives the average natural Provo river for the years 1905 to 1916 inclusive, and a summary of the average natural Provo river for this period, and this part of the report also includes a small hydrograph of the average natural river?

MR. JACOB EVANS: Now, we will offer part No. 2 of the 1916 report.

MR. RAY: May I ask just a question or two there.

CROSS EXAMINATION By Mr. Ray

Q By the natural Provo river you mean, do you not, Mr. Wentz, a resultant river computed from the data during the period mentioned 1905 to 1916?

A The average river is from the period 1905 to 1916. I use the word natural to show the waters that are available for use in Utah Valley with the storage waters taken out.

Q But there is actually no such thing as an unnatural river there, is there?

A Yes, the observations at the United States Geological survey show the discharge passing that station and the natural river is the river with the storage water that is turned in past the Wasatch dam taken from the discharge at the station.

MR. RAY: Object to it as incompetent, immaterial and irrelevant.

THE COURT: Objection is overruled.

MR. RAY: Exception in each case.

REDIRECT EXAMINATION By Mr. Jacob Evans.

Q Now, I show you part 3 of your 1916 report and ask you to state what that is.

A Part 3 of the 1916 report outlines the distribution for the season of 1916. It includes a foreword and distribution in the Wasatch division. The distribution in the Provo division.

MR. JACOB EVANS: We offer No. 3.

MR. RAY: Same objection.

THE COURT: Same ruling.

MR. RAY: And exception.

THE COURT: I take it, Mr. Ray, you desire an objection to all of these generally?

MR. RAY: Yes, of course, I am as anxious as anyone to have the material parts in. I don't know what Mr. Wentz' comments are .

THE COURT: Your objections may go to each division of this report, and objection overruled. Of course, in making this ruling the court desires to say the court will not consider any parts that are incompetent. I presume in such a report as this there is much that will be incompetent, must necessarily be, but the only way the court can have the benefit of that part which is competent is to admit the report with the understanding the court does not consider the incompetent portions. You may proceed.

Q I show you part 4, ask you to explain what that is.

MR. RAY: If your honor please I want to suggest whether or not in each instance here the document does not show what it contains without the explanation of Mr. Wentz and if it may^{not} be offered in its entirety from part 1 to part 15 under objection.

MR. JACOB EVANS: Some of them do and some of them don't. I would prefer to have the explanation.

THE COURT: I don't know, I have not examined them.

A Part 4 of the 1916 report is a tabulation of the average natural Provo river for the period 1905 to 1916 for the months of April to September inclusive. It shows the discharge at the U. S. G. S. station in Provo canyon for each day for this period, the total of that discharge. The mean of that discharge for each day. The inflow below that point and the average for that day with the inflow added for the months of April to September inclusive, for the months of July, August and September. It shows also the storage and tunnel waters diverted to the river which is subtracted from the average and shows the average natural inflow for each day -- the average natural river for each day. It also shows for each month the maximum, minimum and mean, and for the season the maximum, minimum and mean. It also shows the maximum maximum, the maximum minimum, the maximum mean; the minimum maximum, the minimum mean and the minimum minimum; and shows the mean maximum, the mean minimum and the mean mean.

MR. JACOB EVANS: We offer that in evidence.

Q I show you part No. 5. ask you to explain what that is.

A Part 5 is a hydrograph of the average natural Provo river. This is a graphic presentation of part 4.

MR. JACOB EVANS: We offer part 5.

Q I show you now part 6, ask you to state what that is?

A Part six is a hydrograph of the inflow curve of the water rising below the station in Provo canyon, and the several points of measurement of diversion in Utah Valley.

Q I show you part 7, ask you to state what that is?

MR. JACOB EVANS: We offer part 6.

A Part 7 includes the observations at the reservoirs, the Union Reservoir system, the Haystack system, the North Fork system, and the Lost Lake system. It also includes an account of a trip to the lake by Mr. Clegg in April, 1916. The discharge over the Union Reservoir company's weir and the amounts of water turned from the reservoirs to the several companies. It also includes 18 photographs of the head waters of Provo river.

MR. JACOB EVANS: We offer Part No. 7.

Q I show you part No. 8, ask you to state what that is?

A Part No. 8 is a list of the diversions and discharge for the season of 1916 for the Provo division.

MR. JACOB EVANS: Offer part No. 8.

Q I show you part No. 9, ask you to state what that is?

A Part No. 9 is a list of diversions and discharge for the season of 1916 for the Wasatch division.

MR. JACOB EVANS: We offer Part No. 9.

Q I show you now Part No. 10, ask you to state what that is.

A part No. 10 includes the correspondence to and from the office of the protest during the season of 1916.

MR. JACOB EVANS: We offer part No. 10.

Q I show you part No. 11, ask you to state what that is?

A Part No. 11, is the miscellaneous correspondence to and from the office during the season.

MR. JACOB EVANS: I offer Part No. 11.

Q I show you part No. 12, what is that?

A Part No. 12 includes the Utah Power & Light Company. This part includes and the data and discharge measurements that were included in the reports of 1914 and 1915.

MR. JACOB EVANS: We offer Part No. 12.

Q I show you part No. 13, ask you to state what that is?

A Part No. 13 is schedule of use of water for the East River Bottoms Water Company for the season of 1916, furnished to individuals

by the commissioner and made from the one weeks schedule made by the secretary of the company.

MR. JACOB EVANS: We offer Part No. 13.

Q I show you part 14, ask you to state what that is?

A Part 14 are the daily sheets of Mr. Wentz.

MR. JACOB EVANS: We offer part No. 14.

Q I show you part 15, ask you to state what that is?

A Part 15 is the daily sheet and report of Ernest Knight, assistant commissioner for the Wasatch division.

MR. JACOB EVANS: I offer part 15.

Q I show you part 16, ask you to state what that is ?

A Part 16 is a supplement of November 11, 1916, and includes the weather bureaus sheets of the Department of Agriculture for the year October, 1915 to October, 1916. It also includes a summary for this period compiled from these sheets for the Provo station and for the Heber station.

MR. A. C. HATCH: Compiled by yourself?

A Yes, the summary is compiled by myself.

MR. JACOB EVANS: We offer part 16. I believe that is all.

CROSS EXAMINATION BY MR. THOMAS.

Q Mr. Wentz, who assisted you in the preparation of this report?

A Mr. Knight furnished his part of the report, the other part of the report no one assisted me except the stenographer.

Q Mr. Caleb Tanner render you any assistance in the preparation, compilation of data?

A No, Mr. Tanner or anyone else ever saw the report until it was filed.

CROSS EXAMINATION BY MR. RAY.

Q Just one question. Mr. Wentz, the report may show it, but can you state-- do you state in Part 7 of your report wherein you give

a compilation of the amounts of water turned from the various reservoirs into the river, what allowance was made for loss in transit during the period covered by the report?

A No.

Q Was there any allowance made for loss in transit?

A No allowance was made from the reservoirs to the Wasatch dam, and from the Wasatch dam to the Provo Reservoir Company in Utah county, there was no occasion for any allowance this year. The Provo Reservoir Company drew some natural water of Provo river during the entire season.

THE COURT: Gentlemen, you may proceed if anyone else is ready, to take up any matter.

MR. RAY: If Mr. Tanner is ready we are ready to take up the Esthma Tanner matter.

CALEB TANNER recalled by the defendants Esthma Tanner and A. L. Tanner, testifies as follows:

CROSS EXAMINATION By Mr. Ray.

Q Mr. Tanner, you offered from your counsel an exhibit showing the location of the Esthma Tanner land, do you remember the number of that exhibit?

A I don't recall the number. It is a tracing cloth map, one of the few tracing cloths maps in the case.

MR. RAY: I would like very much to have that but the exhibits are over at the other room.

THE WITNESS: It is the only map on tracing cloth of large dimensions.

Q Those lands are located between the Provo river and the Provo bench, are they not, Mr. Tanner?

A Yes sir.

Q And below the point at which Spring Creek rises?

A Yes.

Q How far below the rise of Spring Creek are the Esthma Tanner lands?

A About one half mile south of the head of Spring creek.

Q And how far north are they of the land of Mr. Clyde and Mrs. Williams, and those lands?

Q They are adjacent to some land in the vicinity of Mrs. Williamson.

Q And adjoin Mr. Clyde's land, do they not, or what was Mr. Clyde's land?

A Yes, adjoin what was Mr. Clyde's property.

Q Immediately south of the land or immediately east of the land the channel of Spring creek runs, does it not?

A Yes.

Q And a short distance farther east is the channel of the Lake Bottom canal? A. Yes.

Q How far is it between Spring creek and the Lake Bottoms canal?

A The Lake Bottom canal joins Spring creek on the south boundary of Esthma Tanner's land, the natural channel of Spring creek having been modified so as to run directly east for about five hundred feet to join the channel of the Lake Bottoms canal.

Q And along the division line substantially between your land and the land to the south? A. Yes.

Q The Lake Bottom canal has always been a gaining channel, has it not, from seepage?

A That is my judgment .

Q And Spring creek has been a stream made up of seepage water to a large extent? A. Yes.

Q Originally there arose on Esthma Tanner's land some springs, did there not, which came to the surface?

A I cannot understand quite what you mean by originally.

Q I mean prior to the installation of your drain ?

A Oh yes, prior to the installation of the drain there was waters that arose in some seasons of the year and covered the surface , but within my memory, going back to the earlier period

those were all dry lands.

Q That is just what I wanted to arrive at; those springs have arisen within your memory? A. Yes.

Q And followed, did they not, in the period of their appearance there the irrigation to a large extent on the provo Bench?

A Yes.

Q Those springs originally ran to the south, towards your south boundary where they were taken into a defined channel and used for the irrigation of the lands below, were they not, including the Clyde lands and Williamson lands?

A No, the ditch is still there that they were collected in before the drain was dug, and while an overflow from it might have been used part of the time on those south lands, it ran -- the ditch runs east and connects with spring creek.

Q Yes, and the waters flowed through that ditch when not used upon these lands into Spring creek, did they not?

A Portion of the waters, yes.

Q And were used by the irrigators below for the irrigation of their land?

A Yes, considerable portions anyway.

Q Now, your drain has not yet been completed, has it?

A No.

Q There used to be a ditch, did there not, which picked up these waters on the west side of the Clyde land, what were the Clyde lands, and near the bench, carried them along to the south and irrigated the lands lying to the east of the ditch?

A No.

Q There was no such ditch? A. No.

Q How were those Clyde lands irrigated?

A In the beginning, back in the early part of my memory, the Clyde lands were then the Hodgett lands. The Hodgett lands were irrigated by a ditch running as you have described, but that ditch is simply a continuation of A. L. Tanner and Esthna Tanner's diversion that is taken out in the Carter property

- about a quarter of a mile north of -- that is taken out of Spring Creek about a quarter of a mile north of the north boundary of the Tanner land, and is shown upon the exhibit.
- Q Didn,t the waters arising upon the Esthma Tanner lands in later years find their way into that ditch to some extent and were carried off?
- A No, never.
- Q They were always taken into the ditch lying on the south? and used on the Williamson land and down through there, and then when not so used became an accretion to Spring creek?
- A Part of them, the overflow from th seepage ran onto the adjacent land. I don't know how much it was conducted above. I think it was rather an overflow there ~~xxxxxx~~ without any very defined channel, and then there is a very defined channel conducting any surplus before the drain was dug straight east to Spring creek, where it flows down Spring creek to Lake Bottom and Spring creek users as far as they required it.
- Q There are lands lying straight west of your boundary line, and as the Lake Bottom canal turns to the north or to the west those lands are between the Lake Bottom and your boundary line, are they not, I may have my directions wrong there, I mean lying south of your land and between the Lake Bottom canal?
- A Yes, there are lands that lie between the Lake Bottom canal and south of the Tanner lands.
- Q Now, those lands have always been flooded on the surface, or sub irrigated by the waters raising in the spring upon the Esthma Tanner Tract, have they not?
- A They are wet now, sub irrigated now, water standing on them now.
- Q But the Tanner drain has never been opened, has it?
- A Yes, is it open, flowing now.
- Q Into what stream?
- A It is conducted into the Lake Bottom canal, about five hundred feet east of the point where it crosses Spring creek.
- Q What provision was made for the irrigation of the Clyde land last

year, do you know?

A The old Hodgett ditch was opened.

Q Why by?

A By Mr. Smith, that is my understanding, he was the man that made the arrangement about the matter.

Q The reason for the opening of that old Hodgett ditch was because of the diversion of the waters in the Esthma Tanner land, was it not?

A I presume that was part of the reason.

Q And there were other lands, including the Williams land which were subjected to the same necessity?

A Yes, lands lying farther below there.

Q And that had not been the case prior to the opening of that drain?

A yes, I think probably that is true, I think probably the overflow before the opening of the drain was sufficient to take care of those areas that are irrigated by the reopened Hodgett ditch.

Q You spoke in your examination of some sort of a dike that passed through there, that dike is of what material?

A Clay.

Q sort of peaty substance, is it?

A No, just ordinary white clay.

Q How far north on the Esthma Tanner property does that dike extend?

A I don't know. I know of its existence down below the depth of the drain where the drain line crosses it. There is one small corner of clay that goes beyond the depth of the drain. Then one quite wide.

Q That drain of yours passes beneath the bed of Spring creek, does it not?

A Yes, about two feet and a half.

Q Doesn't that dike immediately south of the south line of the Esthma Tanner land bear quite strongly to the east?

A No, it rather bears a little west of south.

Q A little west of south?

A Its direction as it crosses the drain line is northeast and south-

- 7 west, very nearly north and south.
- Q It is apparent on the surface, is it not, so that one examining it might see it?
- A Not very apparent on the surface.
- Q Is it apparent at all on the surface?
- A Not so you could identify it from surface indications.
- Q Is there any dike or particular break going -- raising on the Esthma Tanner near their southeast corner running in a direction substantially south to the south boundary of the Esthma Tanner land, and then bearing east perceptibly, is there any unusual formation going in that direction?
- A I could not answer that definitely. All that I can definitely is that there are these two bodies of clay deposits that reach quite a distance below the bottom of the drain and they are in their direction north and south approximately.
- Q But you don't know how far north they run?
- A No.
- Q Do you know whether they run at all north of the point at which the drain on the Esthma Tanner land goes under the channel of Spring creek?
- A. Yes.
- Q How far?
- A Where the drain line crosses them they cross north of Spring Creek.
- Q I say at the point where the drain line crosses them as it passes under Spring creek.
- A I don't know how far north of that point.
- Q Do you know that it extends at all north of that point?
- A I have got a definite judgment in the matter, but I have never uncovered the ground.
- Q Do you know how far south of the point where the drain passes under the channel of Spring creek this so-called clay formation extends?
- A I don't think it would extend as far in that direction as it does north.

Q How far south would it extend?

A I wouldn't say, probably several hundred feet, two or three hundred feet.

Q Is there any point--

A As a matter of fact, the total area that lies between Esthma Tanner land on the north, the old channel of Spring creek on the east and the Smith ditch bench on the west is only about twelve acres of land, and the clay formation is confined to the northern portion of that ten or twelve acres.

Q But there is a considerably larger area, is there not, lying between the Esthma Tanner south boundary and the bed of the Lake Bottom canal?

A Well, I don't think -- there is more, but the bed of the Lake Bottom canal is not material in this discussion.

Q I am not asking for an opinion as to the materiality, I am asking about the location of that land.

A I don't want to be confusing in the matter because the bed of Spring creek is the controlling physical feature and not the bed of the Lake Bottom canal at all.

MR. RAY: I move that be stricken out as not responsive. I asked a simple question as to the area of land.

THE COURT: That may go out.

Q There is considerably more than twelve acres, is there not, lying between the Esthma Tanner south boundary line and the bed of the Lake Bottom canal?

A There is less than eighteen.

Q There is more than twelve?

A There is less than eighteen.

Q And that lies south of the constructed channel by which Spring creek is carried straight east into the bed of the Lake Bottom canal?

A. No.

Q In what direction does it lie?

A Part of it south.

Q Part of it south, and the rest in what direction?

- A Southwest and west.
- Q Straight west of the Esthma Tanner land?
- A Straight west of the answer to your question.
- Q My question I don't think has any directions around it, I am taking the extension of the south boundary line of the Esthma Tanner land and how many acres of land lie west of that projected line, or south of that projected line and north or northwest of the channel of the Lake Bottom canal, and between the bench of course.
- A Eighteen acres, about, as I remember it. In answering that, as I understand it-- I am not exactly satisfied --I understand the question, but bounded on the north by the Esthma Tanner land, (on the west by the channel of the Lake Bottom canal,) on the east by the channel of the Lake Bottom canal, and on the west by the Smith ditch bench, about eighteen acres of land.
- Q Is the Smith ditch very close to the break of the bench?
- A The Smith ditch branch, ^{that} runs right close to the break of the bench.

REDIRECT EXAMINATION By Mr. Thurman.

- Q Mr. Tanner, about how long has it been since these springs arose on the land?
- A All of them within my memory; there were no springs there when I was a boy. The land on which the drains are constructed was all arid land and was irrigated.
- Q How long ago, your best judgment since these lands were irrigated?
- MR. RAY: Which lands?
- Q Esthma Tanner lands, lands that are being drained?
- A They were always irrigated except for a small body of the land that lay next to the bench, ~~xi~~ and off toward the southwest corner, but in the later years the amount of water that was used was less than it was in earlier years.
- Q When did those lands become, earliest noticeable period, become water logged to render them less efficient for productivity?

Q They were efficient until approximately twenty or twenty-two years ago, then they began to fall off.

Q When was it patented, if you know?

A The patent is -- I have looked up the record a number of times, going back to the 50's sometime.

Q The first survey that was made along in the neighborhood of '69, wasn't it? Are there any patents antedating that time?

A I think probably that is true.

Q Refreshing your memory?

A I was rather harking to the transfers, original transfers.

Q Land were transferred before that back and forth?

A Yes.

Q before patents were issued? A. Yes.

Q That is what you had reference to when you speak of the 50's?

A Yes.

Q Now, the patent from the government itself, have you any recollection.

MR. RAY: You can state what that is, I think the patent is the best evidence.

MR. THURMAN: I know it is.

Q The lands are patented, aren't they?

A Yes, the lands were patented.

MR. THURMAN: I have the date of it.

MR. RAY: Under the rule of going into possession, I think you should go into it strictly.

MR. THURMAN: Approximately the date, not the exact date.

Q I will ask you this question, if those lands become water-logged and these waters rising on them to the extent you have spoken of occurred since they were patented or before?

A Long after they were patented.

Q Have you any judgment there as a layman or as an engineer, your familiarity with it, as to where these waters come from whether from the river channel or from other sources, the waters that

water-logged the land.

A In my judgment they come from the escaping water from the irrigation of the ^{higher} land, the bench lands that lie adjoining them to the west and northwest. The river has been fluctuating in height in earlier years, I am very familiar with that, but it had no effect upon those lands, but as the irrigation on the benches extended, these lands became more and more inundated and seeped, so my judgment is it comes from that source, as the irrigation in that direction has extended seepage has increased.

Q D^o you know of the water-logging of these lands the water contained in these lands, have you any judgment as to whether the appropriations below have been affected, diminished by this land absorbing water, whether, for instance, that might theretofore have been used below by appropriation?

A I wouldn't know about that. I think the available waters of the lower appropriators that are served through what we commonly call Spring creek, which becomes a part of the Lake Bottom canal in its lower course has greatly increased in years, and the increase from the flow of Spring creek, and also been accompanied with an increase seep condition in these lands. If the water could have escaped directly into Spring creek without permeating these lands my judgment is it would rather have augmented the flow of Spring creek. Spring creek is the natural drainage outlet for these lands and the lands to the west where the flow is toward the south and east.

Q I ask you that as relating to one provision I see in the answer. I want to get it clear. The allegation is that the water ~~was~~ so discharged and to be discharged from said drainage system are not waters that were flowing in said river at the time the users of water below made their appropriation, but on the contrary are an added volume thereto, in which the said users below have, nor have they had any right, title or interest. It is to draw attention to that particular allegation I want to ~~to~~ the record to show your judgment or testimony.

MR. RAY: Now, we object to this witness testifying what the right, title and interest of the people below was.

MR. THURMAN: I don't want that part, it is his judgment whether they were waters that had theretofore been used below. It is his judgment from his knowledge of the country as an engineer, as a man familiar with it. I think he has probably already answered, but I want to get the answer clear on that point.

A No, they were not in my judgment water that had ever been appropriated by the users and appropriators below this point.

MR. RAY: Your honor please, I move to strike that answer being a conclusion of the witness of the question of appropriation.

MR. THURMAN: You mean used by the people below, strike out the word appropriated.

MR. RAY: Now, I move to strike the answer as a conclusion, I don't know whether you are interrogating me or the witness. The answer is a mere legal conclusion what is an appropriation.

THE COURT: Yes.

Q Did you mean that word appropriated in the sense of merely using the water or fixing the right?

A Using the water.

MR. THURMAN: I took it he meant it had not been using the water.

THE COURT: I took it so.

MR. THURMAN: The term is sometimes used interchangeably.

RECROSS EXAMINATION By Mr. Ray.

Q To the extent that Spring creek was made up of the return waters from the bench and became a part of the flow of the Lake Bottom canal, the users under the Lake Bottom canal had irrigated their lands with seepage water, had they not, Mr. Tanner?

A They do irrigate with seepage water and have irrigated with seepage water.

Q And have done all the time?

A Not all the time.

Q I mean since the return water began from the bench during the low season of the year they were irrigated to a marked extent with return seepage water?

A Yes, part of the year most of it comes from that source, part of the year comparatively little from that source.

Q Prior to the return of that water from the bench they depended entirely upon seepage water -- on river water, or nearly entirely?

A Yes, when the seepage water is not there they divert water from the river.

Q But as the water gets lower in the river each year there is a coincident return of the waters through Provo bench, which become an accretion to the Lake Bottom canal and Spring creek?

A I don't like to answer it as coincident upon the fact of the water getting low.

Q I mean in the latter part of the season, I don't mean coincident as to the day, but in the latter part of the season the river gets lower ordinarily, doesn't it, Provo river?

A Yes.

Q And in the latter part of the season the seepage water gets higher, does it not?

A Yes, so far as chronology is concerned.

Q And as the river lowers and the seepage water raises the irrigators under the Lake Bottom use a constantly larger proportion of seepage water, do they not?

A Yes.

MR. THURMAN: That is all unless Mr. Tanner has anything he wishes to explain in his testimony.

MR. TANNER: In connection with this matter I sought to make some measurements that would throw some light as to the movement of this ground water, direction of its movement and

volume of its movement. Since the last sitting of the case the drain was blocked and all the springs in the vicinity were carefully measured below the blocking of the drain, and then were carefully measured at a period of approximately a week afterward. No fluctuation was observed in the spring that lay to the east of Spring creek. They remained permanent for a year-- for a week, no inflow occurred into Spring creek above the point where the drain crosses it. There was a considerable return into the channel of Spring creek below the point where the drain crosses it. Conditions were not sufficiently satisfactory to determine exactly what the quantity was. I made a careful effort but did not get very satisfactory returns except that the water from the drain when it was blocked, although it could not be blocked tight, a considerable body of it seemed to get back into the channel of Spring creek. I also dug some test pits, and bored ~~some~~ some pits along the margin of the bench in order to determine the position of the ground water, and the ground water in some instances is higher just under the bench or at the margin of the bench, as a matter of fact at points flows out at considerable elevation above the level of the land in the Tanner field that is drain, and at other points it is below, quite a distance below, three feet below the level of the water, water level of the land and below the level of the water in the Esthma Tanner land, showing that this bench is made up of laminations, alternations of tight material and relatively open material, and in some places the water is flowing from the bench toward the land, the Tanner land, and in some instances it is flowing under the bench, away from the Tanner land. Those are the extent of the detail observations I made with reference to this matter.

RECROSS EXAMINATION By Mr. Ray.

Q Speaking of the bed of Spring creek, is it not entirely possible and even very probable that Spring creek over its entire course is both a losing and gainging channel all the time, losing water

and gaining water all the time?

A I don't know definitely except the places where I observed it. I observed it carefully of course. I have patrolled the stream definitely for nearly half the distance on the Esthna Tanner land from the point north of where the drain line crosses it and in that section it is a water tight channel. There is no increase and no decrease, and I had that observation made with great refinement, certain about that. Now, the observations below, there was confusing elements and very difficult to get at an exact determination.

Q Spring creek is entirely made up of waters coming into the channel below the spring -- I will withdraw that-- the head of Spring creek is in springs, some springs rising out of the ground, is it not ?

A Some seepage outflows.

Q And down in its channel it gathers until it becomes a substantial stream of inflow waters? A. Yes.

Q And that is true during the greater part of its entire course, is it not?

A Yes.

Q Speaking of your drain, is your drain open joints all the way through? A. Yes.

Q So that it will be quite a difficult matter to block up that drain, wouldn't it? A. No.

Q Block up every joint, can you?

A No.

Q Wouldn't you have losses if you should in an open drain close merely one outlet and have losses through the open joints.

A Wherever a drain line passes through compact material that compact material fits snugly and almost water tight around the joints. Now, if you simply put a gate at the upper end of the joint very little water will get through.

Q What is the purpose of leaving open joints?

A To pick up the water as it comes along.

Q Then it is not water tight if it picks up water?

A It would not be water tight below that, the increment that came in below where you packed it. In other words, if you have a drain as this is laid, in gravel, for two hundred feet with open joints it would be gathering water. Then if it ran fifty feet through very tight clay joints just as well be closed, it wouldn't be gathering much water there. So if you block a joint somewhere in this tight material you practically close the drain.

Q And it would not be draining anything then, would it, above the block, might hold some water, but pass through just the same, it wouldn't go into the drain, it would be just a dead drain there without an outlet except at the joint?

A It ^b packs up the water up the drain so that the water when I block^{ed} the drain stood on the surface of the ground above it.

Q Ceased to be an active drain at all, didn't it?

A Yes, it ceased when it was blocked, the water did not escape. That is all of it did not escape, portion of it escaped.

OMISSION.

Discussion as to claim of W. D. Wright.

Discussion as rights of Pioneer Ditch Company.

REDIRECT EXAMINATION By Mr. Thurman.

Q Mr. Tanner, with reference to the point where your intention is to discharge this drain water, what is that point as regards its relation to the channel of Spring creek, will it flow into spring creek?

A No, it is not practicable to drain these lands and discharge them into Spring Creek. I had to go two feet and a half below the bottom of Spring Creek to get the drain down sufficiently to overcome the disastrous effect water was having upon these lands. The waters will be carried from the point where they cross Spring creek at "B" out to the river bed at "A". The river bed extends for several hundred feet from the margin out to the channel itself, and these waters unless they are confined and conducted to the river will waste over that gravelly river bed surface and go into the underflow entirely away from drainage or drainage return to Spring creek.

Q How is it as to being away from land that would be benefited by its flow, are there any--

A The lands that lie immediately south of point "A", portions of the water it would be difficult to form a judgment, portions of the water that was in the underflow would doubtless return to the surface or assist in the return of water to the surface. That, however, compared with the total amount of the underflow is relatively a small percentage. The total quantity diverted at the mouth of Provo canyon compared with the return flow, of the measureable return flow is about as one to ten or one to twelve.

RECROSS EXAMINATION By Mr. Ray.

Q How high on the river are the Esthna Tanner lands above the lowest canal diverting water from provo river?

A I don't know, but there are a number of canals below there.

Q How far in distance, several miles, isn't it, to the lowest canal?

- A I should say approximately a mile and a half, something like that, might be two miles.
- Q How far ~~are~~ are the Esthma Tanner lands above the Madsen-Jacobsen ditch?
- A Madsen-Jacobsen ditch I understand is above the railroad crossing, that would be about a mile and a half.
- Q There are ditches below the railroad crossing, are there not?
- A Yes.
- Q Considerable below it?
- A Yes, there is the Fort Field ditch is down at the lower bridge, wagon bridge that is approximately two miles below these lands.

RECROSS EXAMINATION By Mr. Thomas.

- Q Did I understand you to say your ditch, this drain was not open and not now draining into Spring creek?
- A I think that answer was made with reference to the lands to the south being wet and having water on them now within a few rods of this drain, which is a fact, and this drain is open and running.
- Q Dnto what ditch or into what channel does your drain now discharge its waters?
- A Discharges water into Spring Creek, but it is not completed.

J. F. CLYDE, called by the defendant Provo Bench Canal & Irrigation Company, being first duly sworn, testifies as follows:

DIRECT EXAMINATION By Mr. Ray.

- Q Your name is --
- A J. F. Clyde.
- Q Where do you reside?
- A Provo River Bottoms.

- Q How long have you resided there?
- A About twenty-five or thirty years.
- Q Are you familiar with the lands which have been referred to in the testimony as the Esthma Tanner lands?
- A Somewhat, yes.
- Q Have you, or do you now own any lands in the vicinity of the Esthma Tanner lands?
- A Yes sir.
- Q Located where in relation to the Tanner land?
- A Directly south.
- Q Do you remember at any time the existence of any springs on the Tanner land? A. I do.
- Q Upon what portion of the land did they rise?
- A Well, on the western portion.
- Q What was their course, where did they run?
- A They ran south, little southeast.
- Q What became of those waters?
- A They were taken into the drain that he dug.
- Q Prior to the digging of the drain were they used by anybody?
- A Yes sir.
- Q Who?
- A Myself and Mr. Williamson.
- Q For what purpose?
- A For irrigating our land.
- Q During what period of time were those waters used by you and Mr. Williamson for the irrigation of your lands, for how many years?
- A Well, I could not tell exactly, they were used before we got the land on the land.
- Q At the time you got the land were they being used for that?
- A They were being used on the land when I got it.
- Q That is how many years ago?
- A Oh, that is 1890, I think.
- Q Be twentyseven years ago?

- A I think thats it, I have the deed here, I can hardly read it now.
- Q pardon me, this deed made the 27th day of June, 1890, Joseph Nuttall to Rhoda M. Clyde; that is the date?
- A That is the date.
- Q On which you purchased the land?
- A I think it is, yes sir.
- Q Were those springs,--did they flow in an open defined channel.
- A Yes sir.
- Q When not being used by your or Mr. Williamson for the irrigation of your lands what became of the water from the springs.
- A They entered the Lake Bottom canal.
- Q Has that condition obtained during all of the years until the construction of this drain? A. Yes sir.
- Q What provision was made for the watering of the Clyde land and Williamson lands after the construction of the Tanner drain?
- A They simply went without water with the exception of the small spring that raises on our land. We used that, we didn't have water sufficient to irrigate with.
- Q Was there any provision made to irrigate last year?
- A There was.
- Q Who made that provision?
- A Well now --
- Q If you know; if you don't know say so?
- A I think it was between Mrs. Williamson and Mr. Tanner .
- Q If you don't know about it I don't care to have you testify.
- A That is all I know.
- Q You know where the waters came from that were used to irrigate the Williamson and Clyde land last year?
- A Yes sir.
- Q Where.
- A Came from the springs that formed the Lake View canal above the Tanner farm.
- Q Was a new ditch constructed or old ditch reopened for the purpose of conveying these waters?
- A part of the way there was an old ditch reopened as I understand,

a ditch many years ago. Not since I have been there, it has not been a ditch until last year.

Q How many acres of land are there in the Clyde tract.

A Well, there is about eleven acres altogether.

Q How many in the Williamson tract?

A About ten.

CROSS EXAMINATION By Mr. Thurman.

Q Have these springs increased or decreased or remained stationary since you bought the land?

A Well, I would say they remained almost stationary.

Q Do you know anything about the land, whether the land has become more boggy than when you first -- that is the Esthma Tanner land, before the construction of the drain?

A I don't think, no, I would say no, it had not.

Q Remained about the same, you think?

A About the same.

Q Land has been cultivated and irrigated all these years, has it?

A No sir, not all of it.

Q How?

A Not all of it.

Q Some of it too wet?

A There was a portion of it in the southwest corner that was not irrigated.

Q Was it too wet?

A Well, it was wet enough to grow hay.

Q Raise hay on it?

A There was hay grown on it, yes sir.

Q Harvested, was it?

A Well, I think so, I am not positive as to that.

Q You don't know when these springs came there on that land?

A No sir.

Q Who did you purchase from?

A Joseph Nuttall.

Q7 Your land is adjacent to the Esthma Tanner land, is it?

A What is it?

Q Adjacent to it?

A My son's land is. I sold to my son.

Q Some of your land wet and water standing on it like the Esthma Tanner land?

A Sir?

Q Is there some of your land or your son's land adjacent there, that the water stands on?

A No, doesn't stand on it.

Q Is there any of it wet and boggy?

A Some of it, there are some bog spots on it.

Q Some you don't have to irrigate?

A Some we don't have to irrigate, yes.

Q Where is that land on your son's part?

A South part of it is on the son's part, part on mine.

Q How much is there of it?

A There are very small spots of it.

Q Has that always been that way since you have been there?

A Yes.

Q Just the same?

A Just the same.

REDIRECT EXAMINATION By Mr. Ray.

Q Did you ever see water standing on the Esthma Tanner land in any quantity at the surface?

A Well, during the summer when the watercress grew in the ditch up through the Tanner land it would overflow a little and stand there a little then. That is all I know of overflow.

Q Ditches cleaned^{out} that moved off?

A Ditch is cleaned out that moves off.

Q Into the Spring creek or to the irrigators?

A Either way.

Q Could be turned one way or the other?

A Yes sir.

MYRON C. NEWALL, called by the defendant Provo Bench Canal & Irrigation Company, being first duly sworn, testifies as follows:

DIRECT EXAMINATION By Mr. Ray.

Q Your name is Myron C. Newall?

A Yes sir.

Q Are you acquainted with the Esthma Tanner land?

A Yes sir.

Q How long have you resided in Provo City, Mr. Newall.

A Over fifty years, that is, I was raised in that vicinity, River Bottoms, when I was about twenty years old.

Q During what period have you been familiar with the land referred to in this case as the Esthma Tanner land?

A Well, from about 1865 up until '80.

Q Do you know of the existence of any spring on the Esthma Tanner land?

A Yes sir.

Q How long have you known of those springs being there?

A I had not seen them for the last fifteen or twenty years, it has been eighteen years.

Q When did you first see them?

A Along in, when I was a boy, about 1870, from then on.

Q Were they live, flowing springs then?

A Yes sir.

Q Where did the water from those springs go?

A Went into Lake Bottom canal, the stream that fed the Lake Bottom canal.

Q Do you know whether or not any of that water was used for irrigation on the lands which are now referred to as Mr. Clyde's and Mrs. Williamson's land?

A I think a small portion of it was at that time.

Q And that that was not used you say went into the Lake Bottom canal?

A yes sir.

Q Any of it go into Spring creek?

A I believe there was one spring flowed into Spring creek, but it all emptied into the Lake Bottom channel.

Q Spring creek empties into Lake Bottom channel?

A Yes sir.

Q Are there any other springs east of the springs referred to on the Esthma Tanner land?

A There was one spring east of the large spring, as we used to call it, but that also emptied in the Lake Bottom canal.

Q Where was that from the Esthma Tanner land?

A Due south.

Q About due south. That is all.

CROSS EXAMINATION By Mr. Thurman.

Q Mr. Newall, were you quite familiar with those springs and location of them on the land?

A At that time I was, the land has been split up and sold and considerably changed now.

Q Well, the Spring creek and Lake Bottom is at the same place it has been all the time, ain't they?

A I understand they have changed the Lake Bottom ditch through there south of the Esthma Tanner land running north.

Q Does that run through Esthma Tanner's land?

A Which?

Q Lake Bottom canal.

A part of the way my father's land ran over the channel in some places and some places did not.

Q Could you locate that spring on the map there on the board where you first saw it?

A I don't know, I am sure.

Q Locate now --

MR. RAY: Now, if you understand that map -- if you don't, have it explained.

Q If you can now, Mr. Newall, locate on the Esthma Tanner land as it appears on that map the point where the springs were when you first knew them?

A The spring as I first knew it was a short distance, I should think maybe two hundred yards north of the Hodgett land. I only knew that as the Hodgett land.

Q Knew what, the Esthma Tanner land?

A The spring that was in there.

MR. RAY: The Hodgett land which is now the Clyde land?

A Clyde land, I suppose.

Q How far north from the old lady Hodgett's house, if you know where that house was, was this spring?

A The old lady Hodgett's house?

Q Yes, the Hodgett house?

A I didn't know there was any old lady Hodgett's house in there.

Q Was there any Hodgett house?

A There was one room there, I think, small log room, one time, but that has been many years ago.

Q How far was the spring from that one roomed house?

A It was east and north.

Q How far?

A Well, I would not say as to the distance now, it has been so long ago.

Q Can't you approximate Mr. Newall, of course, we want to we don't hold you down to the exact foot?

A I don't know that I could. That little house, that is standing in the trees south of this spring I couldn't say how far.

Q How far is this spring you have in mind from Spring creek?

A My recollection would be that it would be seven or eight hundred feet, maybe more.

Q Which way, east, west, north, south?

A West, maybe not that far from Spring Creek, I wouldn't say as to the distance. I remember the spring distinctly.

Q Would you say how far it was from the bottom of the bench

through there?

A Well, I would think it would be five or six hundred feet.

Q Do you know approximately the distance from the bench to Spring creek?

A What?

Q Distance from the bottom of the bench to Spring creek?

A No, I don't.

Q You think you saw this spring in about 1870, are you sure about that?

A Yes, I remember of going there to get fish bait.

Q That is about half way between the bench and Spring creek, wasn't it?

A It seems to me it would be about half way, I wouldn't say for certain.

Q Was the land in there cultivated at that time? this Esthma Tanner land?

A. Yes sir.

Q All of it?

A I don't think there was as much cultivated then as there is now.

Q You accustomed to measuring water?

A Not accustomed to, I have assisted.

Q Have you a judgment about how much water that spring flowed?

A Well, it would be my judgment would be at that time it was something less than a second foot.

Q Was it just one spring or group of springs?

A There was one main spring and small springs feeding that.

Q Close to it?

A That is my recollection, there was about two other places that the water seemed to seep into it.

Q Were they remote from it or close by?

A Close by at that time.

REDIRECT EXAMINATION By Mr. Ray.

Q Did your father ever own the Esthma Tanner lands?

A No sir.

- Q Or the Clyde land? A. Yes sir.
- Q The Clyde lands were the lands he owned?
- A I am not sure about that, but I think he owned at least part of the Clyde land. I have understood that is the case.
- Q Where did you live from the springs, your home?
- A We lived on the State road, which would be a little east of south.
- Q How far?
- A About half a mile.

J. F. CLYDE recalled.

CROSS EXAMINATION By Mr. Thomas.

- Q Mr. Clyde, are you familiar with the point of discharge of the drain that has been spoken of on the Tanner land?
- A Yes sir.
- Q Describe it, please, with reference to the flow of water from the drain?
- A Well, the flow of water from the drain runs out of the drain into the canal with a riffle, apparently the canal below the drain is lower than the bottom of the drain.

MR. THURMAN: What canal is that?

MR. RAY: Lake Bottom canal.

RECROSS EXAMINATION By Mr. Thurman.

- Q What canal were you speaking of when you said that the canal was below the drain?
- A The Lake View canal; it is where the Lake View canal comes from the river and the Spring creek joins. The drain empties in right where they come. There is a canal coming from the river and the Spring Creek come together at this point.
- Q And the drain discharges at that point?

Q Yes sir.

Q Into the canal? A. Yes sir.

REDIRECT EXAMINATION By Mr. Ray.

Q Did you mean Lake View or Lake Bottom ?

A They both mean the same thing.

Q That is what I wanted to get?

A Yes sir, formerly it was Lake bottom it is called Lake View now.

RECROSS EXAMINATION By Mr. Thurman.

Q That drain is not completed, is it?

A No sir.

Q It will be made lower when completed?

MR. RAY: I object to that as calling for a conclusion of the witness.

MR. THURMAN: If he don't know he can say he don't know. It is not a conclusion .

MR. RAY: As to what somebody else will do.

MR. THURMAN: The plan there is unfinished. He can see, he says it is not finished.

THE COURT: You may ask him if there is anything to indicate what it will be when finished?

MR. THURMAN: That is in effect what the question was, except it was more leading.

Q Now, the drain runs east of the river, doesn't it?

A Sir?

Q The drain runs clear east of the river, or to the --

A No sir, does not.

Q Or to the river?

A No sir, doesn't run to the river.

Q How far does it run from the river?

A I couldn't just how far it is from the river proper.

Q How does it cross Lake Bottom Canal if it does.

A It goes under.

Q

- Q Goes under it? A, yes sir.
- Q How does the water then -- I understaad you to say the water from the drain dropped into the Lake Bottom canal?
- A Yes sir.
- Q And that the drain is higher than the canal?
- A Yes sir.
- Q And yet you say it run under it? A. Yes sir.
- Q Is the bottom of the drain below the bottom of the canal?
- A No sir, not where it empties in.
- Q It is above?
- A It apparently is.
- Q Yet it runs under it?
- A Yes sir, runs under it.
- Q In a box ?
- A I presume so.
- Q Does the box interfere with the water flowing in the Lake Bottom canal? A. No sir.
- Q Water flows over it? A: Yes sir.
- Q The box lays below the bed of the canal?
- A Yes sir.
- Q The drain runs through the box ?
- A I presume so.
- Q Yet the drain is higher than the bottom of the canal?
- A Where it empties in.
- Q Where it empties into what?
- A Into the canal.
- Q How far from there does it empty in?
- A It is perhaps seventy-five or a hundred yards east of there.
- Q Does it make a bend or something?
- A No sir, it runs parallel with the canal, north of the canal.
- Q Then it doesn't have the-- if I get your idea right, it doesn't drain, doesn't have as much fall between the point where it crosses and the point where it discharges?
- A That's it.
- Q Doesn't have as much fall as the canal?

Q No sir, does not.

Q When you said the canal, the drain was not completed, what did you mean by that, what did you have in mind?

A The drain is not completed only just across the stream where it goes under the stream, it is completed to there. From there on out to where it empties into the canal it is not completed, there is no pipe.

Q No piping?

A No, just an open drain.

Q Does the water stand in it?

A No sir.

Q Dead, or does it run?

A It runs.

Q There is a fall from there down?

A Certainly there is.

Q Much fall.

A Not very much, no.

Q You say there is a riffle, you mean down where the discharge is?

A Where it runs out of the drain into the canal. The canal is lower, I would say a foot or more lower than the drain where it runs out of the drain into the canal. There there is a riffle?

MR. RAY: I think that is all on that, but it is twelve o'clock, and we may possibly have a little more.

12:00 Noon, Recess to 2:00 P. M.

MR. JOHN E. BOOTH: If the court please, we desire to withdraw the stipulation filed between the plaintiff and the West Union Canal Company and Smith interests and substitute another. We found the figures did not quite agree to what we desired, and I would like to file a substitute and they have a copy. I suppose handing it to the clerk will be sufficient.

MR. RAY: If the court please, in Part 8 of the report of Mr. Wentz for 1916, pages 2 and 3 contain the record as to the distribution to the Timpanogos Canal Company of this county, and it appears that there are some typographical errors there in which the flow is not correctly recorded, and I ask that Mr. Wentz may be permitted to withdraw pages 2 and 3 of Part 8 and substitute a correct record as to the discharge during that period.

THE COURT: He may do that.

MR. JOHN E. BOOTH: If the court please, while we are not offering any testimony, but I would like to define our position on the question of the Esthma Tanner. It will take but a moment, and I would like to have it go in the record. On behalf of the Lake Bottom Canal Company, we are not offering any objection to either part of this, but on behalf of the other people, Faucett Field, The past River Bottoms, Carters, the West Union canal and Smith interest, we desire to state our position on that. Under the Morse decree the Lake Bottom canal company is to be supplied from seepage water so long as there is sufficient. You will remember that provision. When there is not sufficient they are entitled to go to the river for water to make up their deficiency. Now, as this seepage water from the Tanner springs is drained off and put into the city part and then charged against the city, the plaintiff allowed to take that out, that much out in their system, that will--

MR. A. C. HATCH: Pardon me, Judge Booth, I don't understand the plaintiffs take it. It is Mr. Tanner.

MR. JOHN E. BOOTH: Whoever it is.

MR. THURMAN: The plaintiff in that claim.

MR. JOHN E. BOOTH: The plaintiff in that claim, I will put it that way. If that is allowed that would probably diminish the water coming from seepage to the Lake Bottom canal. That of course necessarily would cause the Lake Bottom canal company to go to the river for its water. That would disarrange

then the whole distribution of the river water and would tend to decrease everybody using water above the Lake Bottom canal head gate, and for that reason we desire therefore to oppose the proposition. I believe that states our position clearly, but we have no testimony to put before the court.

MR. RAY: May it please your honor, there is just a little testimony from Mr. Wents that I desire relative to two items. One affects the control, the controls placed in the river and testified to by Mr. Swendsen to take care of the fluctuation caused by the Telluride Power Company. The other has to do with the Hoover claim of the Wright land at the head of the Provo river. Mr. Story is not here.

THE COURT: I didn't understand from Mr. Story he expected to come back.

MR. RAY: They are matters of record I wish to put in.

THE COURT: You may do so.

T. F. WENTS, recalled by the defendant Provo Bench Canal & Irrigation Company, testifies as follows:

DIRECT EXAMINATION By Mr. Ray.

Q I show you exhibits 174 and 175 and ask you to state what they are.

A Exhibit 174 is the register record of the Provo Bench canal from July 18, 1916 to October 4, 1916.

Q What is 175?

A Exhibit 175 is the register record of the Provo Bench canal from June 2, 1916, to July 13, 1916.

Q Those registers are made by an automatic device which shows the quantity of inflow into the Provo Bench canal at the dates indicated upon the two exhibits ?

A This record shows the height of water in the rating flume of the provo Bench canal. in ink, in indelible ink. At the bottom of the sheet the dates are shown, the mean gauge height and the discharge for that day.

MR. RAY: Now, I desire at this time to call the court's attention, without putting the exhibits on the board because of their length, to the irregularity of that line.

Q Now, the paper upon which the curve is made, Mr. Wentz, has lines, light red lines, what is the distance between these lines?

A $2/100$ of a foot.

Q And the heavier red lines running up and down show the period of twenty-four hours, do they not?

A Yes.

MR. RAY: I desire to call the court's attention to the variations in that line, and ask the witness if he knows the cause of the variation in that inflow?

A The variation is caused by the control of the Utah Power & Light plant, and variation in discharge at the head of the canal, caused by the power plant.

Q The variation here for instance between the 26th and 28th, the low and high point would be what in inflow, Mr. Wentz?

MR. A. C. HATCH: What is that 26 and 28.

MR. RAY: The date, 26th and 28th of September.

A The difference is 68 second feet.

MR. RAY: I desire to call the court's attention to the fact that after the first of July, 1915, some irregularities are shown on Exhibit 175.

Q How do you account for the fact, Mr. Wentz, that the line prior to the first day of July runs practically at a constant?

A prior to the first day of July the canal was under pressure, the head gates were under pressure and we were discharging water over the spillway near the head of the canal. The spill is some sixty feet in length.

Q Mr. Swendson testified to the control placed in the river and which could be so handled as to regulate themselves. If the control at the head of the Provo Bench canal was so regulated as to make the inflow into that canal constant except as the gates were changed, what effect would it have upon the other canals below and drawing water at the same time?

A It would throw all the variation on to the other canals.

Q Under your 1916 arrangement I understand that you so regulated the gates as to divide the shock of the variation caused by the Telluride Power Company?

A Yes, the variations were divided over the whole system.

Q So that the two exhibits, 174 and 175 show the variations in the Provo Bench and measurably the variation in the Timpanogos and other canals drawing water below the outlet of the Utah power?

A Well, not the Timpanogos, the Timpanogos is above the tail race of the Utah power & Light, but it -- the variation in the other canals, the City and Upper East Union and the others, is much the same as it is in the Provo Bench.

MR. RAY: Have other counsel any questions on this question?

MR. THURMAN: I would like to ask this question; it might not be directly cross examination.

MR. RAY: I don't ask you to cross, you may direct him.

CROSS EXAMINATION By Mr. Thurman.

Q What system could be adopted to avoid the effect of that variation.

A Well, as I understand the Olmstead plant is a controlling plant for over a great section of country here. If the controlling feature and the variation was distributed through a number of plants it would not be so marked. That would be a great improvement. Of course, we have no storage there and have no way of controlling the fluctuation. All of the water that goes

through the plant is used by the parties below the mouth of
St the canyon.

Q It can be controlled by the companies?

A Yes, by taking the governor off. Now, when I desire to make precise measurements on the Provo Bench canal and when I desire to get the precise total of the Provo river in Utah valley, I ask the superintendent of the plant to take off the governors for that time, and usually I can cut off all the river. That is, when I am making a total of the river I can cut off all that part that is affected by about one o'clock, and usually have the governors taken off at six in the morning and kept off until I have made the measurements down the river.

Q What, if you know is the difference, if any, in operating with or without the governor in efficiency?

A Well, they get the same power output either way. Of course, the same water goes through the plant. When the governors are off there is no control. That is, the plant discharges the same amount of water all of the time, and when the governors are on, the governors draw sometimes a large head and sometimes a small head as the requirements of that plant are met.

Q I take it then that to operate with governors this irregularity is bound to continue more or less?

A Yes, when the governors are on. Just as soon as the governors are put back on they begin to change the flow as the load comes to the plant.

REDIRECT EXAMINATION By Mr. Ray.

Q Mr. Wentz, as to the lands of Mr. Hoover, concerning which you testified yesterday at the point in Provo canyon adjoining the Wright land, you state how those lands are irrigated and have been during the past few years?

A They have been irrigated by a small ditch near the Wallsburg switch, and by sub irrigation.

Q What proportion of them sub irrigates?

A Well, during the early part of the season they are practically all sub irrigated. There is a small tract that they use water on for surface irrigation.

Q How large is that tract approximately?

A I couldn't say how large a tract that is.

Q Ten acres?

A Well, I couldn't say the amount.

Q In your opinion is and has been fourteen^{minute} feet of water together with the springs on the property and the sub irrigation sufficient to mature the crops planted and which have been planted and growing upon that land?

A Well, I couldn't say what the area is that requires surface irrigation there.

Q Has it been sufficiently irrigated with the fourteen minute feet turned to it while you have been commissioner?

A Yes, he has had sufficient water there at all times.

Q Do you know how long the condition of sub irrigation has obtained upon that tract of land?

A Well, as long as I have observed it for a number of years. It is all sub irrigated on that land.

Q Ten years past? A. Yes.

MR. A. C. HATCH: Was the fourteen minute feet the quantity turned to Mr. Hoover for the irrigation of this land by you as commissioner?

A That is the amount that I have given him a schedule for. Now, it may have been a little more than that or a little less; I have given him a schedule for the fourteen minute feet.

MR. RAY: I understood, your honor, that Provo city was proposing to put in further rebuttal, and after they have concluded I shall be ready to introduce all the rebuttal I have, sur-rebuttal as to their case.

THE COURT: Are you ready to proceed?

MR. THOMAS: We are ready.

THE COURT: You may proceed.

ADOLPH G. OLSON, called by the defendant Provo City,
being first duly sworn, testifies as follows:

DIRECT EXAMINATION By Mr. Thomas.

- Q State your full name?
- A Adolph G. Olson?
- Q Where do you live, Provo City?
- A Yes sir.
- Q Do you own land here in Provo?
- A Yes sir.
- Q Where is it located?
- A Tenth South and Eighth West.
- Q You irrigate the land?
- A Yes sir.
- Q Under what ditch and through what ditch do you receive water?
- A Under the Provo City water, I don't know just the name of the ditch; it comes out on Fifth West.
- Q Do you know if the ditch is sometimes known as Nelson ditch?
- A Yes, I take water and use it on the Nelson ditch.
- Q And through a ditch also known as the Dahlquist ditch?
- A Yes.
- Q They are both down on the Fifth West.
- A Yes sir.
- Q These are ditches which take out of the Fifth West ditch?
- A Yes sir.
- Q Directing your attention to the 25th day of July, 1916, you stated you were using any water for irrigation purpose at that time?
- A. Yes sir.
- Q At what time?
- A I used on both ditches that date.
- Q Do you recall at what hours of the day you had the water?
- A I had the water on the Nelson ditch from three to four o'clock in the afternoon.
- Q State if you were using the water on that date?

- A Yes sir, I was.
- Q And what were you irrigating?
- A I was irrigating beans, trying to.
- Q How large an area did you have in beans?
- A Well, on that hour there I have got just an acre to water out of that one ditch.
- Q Did you irrigate the whole of that acre on that date?
- A Yes sir, but I had to use the water out of the other ditch to do it.
- Q Which other ditch, the Dahlquist ditch?
- A The Dahlquist ditch.
- Q How much land do you have under the Dahlquist ditch?
- A There is ten acres.
- Q Were you irrigating the land under that ditch on that date?
- A Yes sir.
- Q What were you irrigating at that time?
- A I was irrigating beans.
- Q You may state if any water went to waste past your place on that date ?
- A No sir, there was not.
- Q Have you ever had occasion to irrigate at night?
- A Yes sir.
- Q Do you sometimes have water assigned to you for use at night?
- A Yes sir.
- Q And you have irrigated it at night?
- A I have irrigated it lots of times at night.
- Q During the year 1915?
- A Yes sir.
- Q Do you recall if you irrigated at all at night during the month of July?
- A Yes sir, I know.
- Q If I said '15, I meant 1916?
- A Yes sir.
- Q That is this last summer?

A yes, sir, I did water in the night, 1916.

Q you may state what you are irrigating under the -- what crops you were irrigating under the Dahlquist ditch?

MR. A. C. HATCH: Just a moment, of what is this rebuttal?

MR. THOMAS: The testimony of Mr. Stratton and the other two gentlemen -- Knight --

MR. A. C. HATCH: I don't understand wherein it is up to the present time pertinent to rebut anything.

MR. THOMAS: I would like to have you glance at this transcript of the testimony, judge, you will find it is? These gentlemen testified to certain waste of water.

MR. A. C. HATCH: On certain days.

MR. THOMAS: Yes, and this is one of the days and this is one of the streams that empties into the stream which these gentlemen say was containing a certain amount of ^{wasted} water at that time. This is directly in rebuttal of that testimony.

MR. A. C. HATCH: The hour of the day is of course rebuttal, but as to whether he water during the night during 1916, I cannot understand what that has to do with it?

MR. THOMAS: No, that is rather a blanket question, and if you have not interrupted I should have asked the question by this time.

MR. A. C. HATCH: I object to that, you can ask him when his turn was, if he had any turn, and let him tell it.

MR. THOMAS: we will do that, and would have long before this if you had not interrupted.

Q Did you irrigate at any time during July, 1916, at night?

A Yes sir.

Q Were you irrigating at night during the days of July 24th and 25th?

A Not the 24th, I wasn't, but was on the 25th.

Q You may state whether or not you had sufficient water to irrigate your crops on that date?

A I did not have.

CROSS EXAMINATION By Mr. Thurman.

Q What time did you commence on the 25th, watering?

A On what ditch?

Q Any ditch on the 25th?

A I begin on one ditch at three o'clock.

Q Which ditch is that?

A On the Nelson ditch.

Q And when on the Dahlquist ditch?

A I began at eleven o'clock,

Q You were not there early in the morning at all?

A Not on the 25th, on the 26th I was, up until seven o'clock on the 26th, eleven o'clock in the morning of the 26th until seven o'clock the next morning.

MR. THURMAN: I think we will move to strike out the testimony of the last witness as not rebuttal, not touching the time testified about, if I remember it right, the evidence this is sought to rebut. My recollection is it was early in the morning. He don't touch the early morning at all.

MR. THOMAS: The early morning, if the court please, is not spoken of on the date of the 25th, according to the testimony.

MR. THURMAN: Is that a transcript of the testimony?

MR. THOMAS: Yes, this is a copy from Mr. Davis.

THE COURT: My recollection was that all of these observations made by Mr. Knight and the others were in the early part of the day. I might be mistaken, I didn't remember except except those that were in the early morning.

MR. THOMAS: There was one gentleman, I have forgotten which, who testified as to a later time. It was on a trip he made through the lower part of the county, not the early morning, but through the forenoon. Now, this is the testimony, if I may read.

THE COURT: Of whom?

MR. THOMAS: This is Mr. Stratton. "Question. Now,

during all of these visits how many men did you see irrigating at four and five o'clock in the morning? Answer. Just one man. I had went on July 25th, 1916. Question. What did you observe then? Answer. Five second feet in Old Dry Creek, dumping into the bull-rushes, Three at Second Ward pasture; three at the bottom of Fifth West going down through City creek; and three town streams east of Academy Avenue, twenty-nine second feet. This was on July 25th. "

MR. THURMAN: Don't you understand that ties it to the hour he mentions that day.

MR. THOMAS: Now, "Mr. Hatch, how many in all? Answer. That is the trip that I made in the afternoon on the 11th, August 11, 1916". Now, the sentences are running through here, punctuation is not exact. "On the way to Benjamin I observed three and a half second feet"-- now, that is August 11th, there is nothing directly ties this up to July 25th with the early morning, unless we assume that is what the witness had in mind. I have read the testimony just as the transcript was given.

MR. RAY: Reason I did not cross examine, I am positive that record shows the early morning.

THE COURT: That is my recollection.

MR. THOMAS: It was, your honor, as to the majority of the investigations, there is no doubt about that, but as to this date, July 25th,

THE COURT: I didn't remember any of those trips made by those gentlemen in July that were other than in the morning, yet I might be mistaken.

MR. THOMAS: Mr. Goddard reminds me when we presented part of this testimony before your honor had some notes relative to July 25th, and I recall there was then slight discussion whether or not this had to do with the morning or afternoon. Then, as I recall,-- my memory may be in fault-- there was a statement made this was an afternoon visit. Then I offered

to produce evidence in rebuttal as to the afternoon. There is no question as to the earlier testimony being being between four and five o'clock in the morning. There was a question as to this particular date, July 25th, being in the afternoon. I recall reading the testimony at that time.

MR. A. C. HATCH: To save all this, Mr. Stratton could have been recalled and found out what it was.

MR. JACOB EVANS: How much have you to put in?

MR. THOMAS: He could do that very quickly. Stand aside a moment. Is Mr. Stratton present?

JOHN H. STRATTON recalled by the defendant Provo City, testifies as follows:

DIRECT EXAMINATION By Mr. Thomas.

Q Mr. Stratton, did you make any visits of which you have heretofore given testimony, and particularly through Provo City and particularly on July 25th, in the afternoon?

A Well, in regard to July 25th, I cannot call to mind now only by my notes at what time of day.

Q Now, would you turn to your notes and refresh your memory, and give us your best judgment as to whether it was in the morning between four or five o'clock or in the afternoon?

A Well, on July 25th it wasn't at three or four o'clock in the morning. It was sometime in the day, but whether it was before twelve o'clock or after, I don't know, and my notes don't state, July 25th.

Q Were you alone at that time?

A Yes sir.

THE COURT Motion is overruled with that statement.

NEPHI ROSS, called by the defendant prove City, being first duly sworn, testifies as follows:

DIRECT EXAMINATION By Mr. Thomas.

Q State your full name?

A Nephi Ross.

Q You reside in Grove City ?

A Yes sir.

Q What is your business?

A Farming?

Q How long have you resided in Provo?

A I have been here, resident of Provo since '83.

Q Do you own land here?

A Yes sir.

Q Where is it located?

A My address is 776 South, 11th West.

Q You irrigate the land? A. Yes sir.

Q From what ditch do you take water to irrigate it?

A From the Scott ditch, called the Scott ditch, I believe.

Q Is that in the neighborhood of the Old Dry Creek ditch?

A Yes sir.

Q Does it empty into the Old Dry creek?

A It comes out of the Old Dry creek and empties back into what goes to waste.

Q Directing your attention to the 25th day of July, 1916, can you state if you were irrigating on that date the land in question?

A In the afternoon, yes sir.

Q Between what hours?

A From twelve to seventhirty in the evening.

Q How much land do you irrigate?

A I have eight acres.

Q Did you irrigate eight acres on that day?

A Yes sir, aimed to.

Q Did you do it? A. No sir.

Q Did you have insufficient water?

A I had insufficient water. I will say there wasn't much more than half the stream at my watering turn.

Q State if any water went to waste at that time?

A None that I know of during my time.

Q Any water go by your place?

A No sir.

Q Empty into the Old Dry creek?

A No sir, not during my watering turn.

Q Who takes the water preceding you?

A Preceding me?

Q Yes.

A I couldn't say whether, hardly whether Durrant or Scott took it preceding me, I believe Andrew Scott, I think, took it.

Q How much will the ditch hold from which you take the water, when it is full?

A Well, I could not say exactly.

Q Give your judgment?

A When the ditch is full I suppose it will hold about three or four feet, what they call three or four feet of water.

Q Which would it be, three or four.

A Well, say a full ditch be four feet, somewhere about that.

Q And you stated on this date the ditch was about half full?

A About half full, as near as I can remember. It wasn't much over half a stream.

Q How many water users are below you on this ditch?

A There is --

Q Give us the name, please?

A Below me there is Andrew Scott and Durrant, Roberts & Taylor, Granneman and Johnson.

Q Is there a Mr. Jacobsen?

A Well, he is on what we call the -- he bought a piece of ground in there belonging to -- what is the name, Mr. Goddard, please-- Bill Park -- bought part of Park's possession last summer, and

of course we call that the Park ground all through there.

Q Now, do these people take the water before you or after you?

A I could not say, there is one of them, I took the water from one of them, but as I said, I cannot state which one it was, whether Durrant or park's ground it went on.

Q They are below you ? A. Yes sir.

Q What is the custom on that ditch, for the lower water users to take the water first?

A When my turn comes, yes sir.

Q You didn't understand, what is the custom on the ditch, for the lowest water users to take the water first?

A Well, I couldn't say exactly, because I never bothered to look into those things. to see whether they were given their turn of water in line or not, from the bottom or from the top down. I could not say exactly, or whether they were spaced out in between.

Q Does any of the water when it once gets on your land go to waste?

A Not to speak of.

Q After it is once turned on for the purpose of irrigation is there any means of it getting off and going back again into the Old Dry creek?

A No sir, I aim to use it all on the ground, and it takes steady and careful work to get anywhere near cultivated or irrigated if I use the water during my turn.

Q At this time did you use care to see that the water was beneficially and properly used? A. Yes sir.

CROSS EXAMINATION By Mr. Ray.

Q You say that stream flows about four second feet if it is full?

A I couldn't say. I say when it is full I would say somewhere near that, supposed to be that, I think, but I couldn't say exactly, because I never bothered to see it measured or understand just how much was supposed to run in the ditch.

- Q Now, do you have a full stream during your turn?
- A Yes sir.
- Q For how many hours, twelve noon to seven thirty in the evening?
- A Seven thirty in the evening.
- Q That is seven and a half hours?
- A Seven and a half hours supposed to be the time.
- Q How often does your turn come?
- A Every week.
- Q During the entire irrigation season?
- A Yes sir.
- Q And it requires that stream full to properly irrigate your land?
- A Yes sir.
- Q You have eight acres?
- A Little over eight acres.
- Q Cultivate it all?
- A There is about eight and a quarter acres altogether, but there is some the water don't get on, little high, a part which I don't bother to water with.
- Q How much?
- A About quarter of an acre.
- Q How was your supply of water on July 18, 1916?
- A My supply on July 18th and 25th was pretty limited.
- Q How was it on the 11th?
- A Well, it was a little more of a stream on the eleventh.
- Q How was it on August second?
- A On August second, I think was -- the ditch was just common stream, there was no excess of water at all.
- Q You were unusually dry on July 25th, weren't you, Mr. Ross?
- A Yes sir.
- Q Unusually small stream?
- A For that month.
- Q Did you go out to see where the water was going?
- A I went up the ditch over two or three of the users above, two or three users above me to see whether it was taken up anywhere

or not, and I could not find anywhere it was taken up. I found the same stream as it seemed to be coming all the way down the ditch.

Q Did you go up the Fifth West ditch to see whether or not you were getting your quantity out of that ditch?

A Yes sir.

Q Were you?

A I think so. I found one watering turn during the month of July where there was another party taking part of my water, but that was only a matter, I guess, of taking things out of their turn for a little while.

Q The Scott ditch comes out of Little Dry creek, does it?

A Yes sir.

Q And back into Little Dry Creek?

A It saves all the waste water, all that goes to waste goes into Dry Creek.

Q Waste water all goes down into Dry Creek?

A Yes sir.

Q That is ^{of} true, all those ditches down there, isn't it? Mr. Ross, that the waste water goes back into Little Dry creek?

A I think so.

Q They are taken out then, there is a tail race made so that the waste water doesn't go in the streets, but carries right down into Little Dry Creek again?

A Carries down into Dry Creek again, that is right.

MR. THOMAS: There is only ditch, however, that is taken out of Dry Creek and goes back into Dry Creek, isn't there, several water users, but the one ditch?

A Yes.

Q One ditch. That is all.

CARE WILLARD, called by the defendant Provo City,
being first duly sworn, testifies as follows:

DIRECT EXAMINATION By Mr. Thomas.

- Q Your name is Carl Willard? A. Yes sir.
- Q You reside in Provo? A. Yes sir.
- Q Your business farmer?
- A Farmer.
- Q You are familiar with the lands of W. O. Willard?
- A Yes sir.
- Q Is that your father's land?
- A Yes sir.
- Q Were you in charge of that land this past year.
- A Yes sir.
- Q Directing your attention to July 25th of this year, state if you were irrigating upon that date?
- A I was not.
- Q What is your irrigating time?
- A From eleven thirty to three thirty.
- Q Isn't it ten thirty?
- A Ten thirty to three thirty, pardon me.
- Q State whether you were using the water upon that date yourself at that time.
- A I had hay down.
- Q State whether or not that water was put to beneficial use at that time and during your period.
- A It was.
- Q Who was using the water at that time.
- A John Peay.
- Q Is Mr. Peay farming under the same ditch?
- A Yes sir.
- Q What is the name of this ditch from which you take the water?
- A Nelson ditch.
- Q That ditch is taken out of what stream?

A Fifth West.

Q State if it goes back into Fifth West?

A No sir.

Q Doesn't go back at all?

A. No sir.

Q Is all the water that is taken out of the Fifth West ditch of this Nelson ditch used wholly on the land?

A Yes sir.

Q It is used wholly on the land and there is no waste ditch to carry it back again?

A No audible response.

Q Does the water after it has been irrigated by the waste water pass down to what is called the South Pasture?

A Yes sir.

Q At the extreme end? A. Yes sir.

Q How much land have you there?

A Five and a quarter.

Q Acres? A. Yes sir.

Q What is it planted to?

A Orchard.

Q Do you raise any grass?

A Grass between the trees.

Q At this time you had your grass out?

A Yes sir.

Q And ready for hauling? A. Yes sir.

Q Are there times when --other times than July 25th of last year when you did not use the water?

A There was.

Q Was it put to beneficial use at other times?

A It was.

MR. THURMAN: What does this rebut, MR. Thomas, I don't like to object if it rebuts anything.

MR. THOMAS: Withdraw the question.

CROSS EXAMINATION By Mr. Ray.

- Q You water in the Nelson ditch, do you?
A Yes sir.
Q And its waste water empties into the South Pasture?
A Yes sir.
Q Good many other ditches on the west side have the same outlet for waste water, haven't they?
A Yes sir.

REDIRECT EXAMINATION By Mr. Thomas.

- Q What other ditches water into the South Pasture besides the Nelson ditch, of which you have knowledge?
A Well, there is the Jones ditch, DeLong ditch and Lunberg ditch.
-

RODNEY CARTER, called by the defendant Provo City, being first duly sworn, testifies as follows:

DIRECT EXAMINATION By Mr. Thomas.

- Q Your name is Rodney Carter?
A Yes sir.
Q You reside in Provo? A. Yes sir.
Q You are a farmer? A. Yes sir.
Q Where is your land located that you have been farming?
A Located on Fifth West, about Eleventh South.
Q State if that land is irrigated from what is known as the Fifth West ditch?
A Irrigated from the Nelson ditch.
Q Does that Nelson ditch get its water out of the Fifth West ditch?
A Yes sir.
Q How much land have you under the Nelson ditch?
A Fifteen and three fourths acres.
Q Directing your attention to the 25th day of July of last year,

state if you were using the water upon that land at that time?

A Yes sir, from four o'clock in the afternoon.

Q To what time?

A Until nine fifteen the next day.

Q State if you were on that date, or those days, between those hours were irrigating? A. Yes sir.

MR. A. C. HATCH: We object if the court please, as being wholly outside.

THE COURT: Now, I have looked up my notes, I find that Mr. Stratton, as my notes show visited -- made a visit on July 25th in the afternoon. I haven't the date or time, but it seems --

MR. A. C. HATCH: Today he testified it was not as late as three or four o'clock in the afternoon.

MR. THOMAS: He said he didn't know whether it was in the afternoon or not.

THE COURT: I didn't think he made it that positive.

MR. A. C. HATCH: He said he didn't know whether it was after twelve.

THE COURT: The conditions as they existed at three or four o'clock might throw some light upon what the conditions were a little earlier than that; objection is overruled, I think it is proper rebuttal.

Q How much water did you have in the ditch?

A I had --

MR. A. C. HATCH: Now, pardon me, but what day?

MR. THOMAS: Day he just testified to, July 25th and morning of the 26th, between four P. M. and nine thirty A. M.

A There was about half a stream at that time.

Q By half a stream you mean about how much water in second feet?

A Probably two feet and a half.

Q State if any water went to waste while you were irrigating?

A No sir.

Q Did any water go by in the ditch from which you were taking the

water? A. No sir.

Q Where did the water go after it was once turned on your land?

A Goes on the land, but don't get off.

Q Did you have sufficient water to irrigate your land at that time?

A No sir.

Q During that season of the year -- that question will be withdrawn--
what were you raising this year and irrigating at that time?

A Beets and potatoes and hay and grain.

Q State if you have ever used Mr. Willard's water?

A Yes sir, I used Mr. Willard's water two turns.

Q State if you used it on July 25th?

A No sir, I did not.

BOYD ROBERTS, called by the defendant Provo City,
being first duly sworn, testifies as follows:

DIRECT EXAMINATION By Mr. Thomas.

Q State your full name?

A Boyd Roberts.

Q Where do you live?

A Provo City.

Q What is your business?

A Farming.

Q Directing your attention -- let me ask where your land is
located that you are farming?

A Well, it is located-- I don't know the Section or the number,
but on the county line in the direction of the East Union.

There is where --

Q Do you get your water for irrigating out of the East Union ditch?

A Yes sir.

Q How far do you have to take it from the East Union ditch to the
land where you use it?

A Two miles.

Q You have to cross the county road, do you?

A Yes sir.

Q And the water crosses the county road down near the county infirmary, doesn't it?

A No sir, by the two mile post there.

Q That is two miles from the center of town here?

A Yes sir.

Q The water crosses the road at that place, the two mile place and goes across the county road and in the ditch down to the land where you are farming? A. Yes sir. It goes south and then turns west.

Q And west to the Rio Grande railroad track?

A Yes sir.

Q Whose land is this?

A B. M. Roberts.

Q Your father? A. Yes sir.

Q Directing your attention to August 11th, I will ask you if you were irrigating that land at that time?

A Yes sir.

Q August, 1916? A/ Yes sir.

Q And you were taking water out of the East Union ditch on that day, which water ran across the county road and down on to your father's land where you were putting it to use?

A Yes sir.

Q When did your irrigating time begin?

A Well, we don't have -- he told us to take it at four o'clock .

Q Four o'clock in the morning?

A Yes sir.

Q And on this date you had it from four o'clock in the morning until what time ?

A Ten, he turned it.

MR. RAY: He has not testified he took it at four. You asked him and he didn't answer. He said "They told us to take it at four."

Q Did you take it at four o'clock?

A No sir, not quite that time.

Q What time on this date, August 11, 1916, did you get the water?

A It was four o'clock when we left home; we had about a mile to go to it in the buggy.

Q State if at ten thirty A. M. on the morning of August 11th, that water was running across the county road and down on to your father's land? A. Yes sir.

Q Were you using that water also on August 27th of the same year, 1916?

A I don't know the date, but two weeks on Friday we take the water.

Q About two weeks after this first day of which you spoke then you were using it again? A. Yes sir.

Q That would be about the 27th, would it?

MR. RAY: Now, from the 11th, wouldn't be the 27th.

MR. THOMAS: He said it was on Friday.

Q Were you using it on Friday the second time, or do you remember, Mr. Roberts?

A No sir, I don't remember.

Q Can you refresh your memory and ascertain definitely when you did use it the second time?

A No sir, not the date, I could not.

Q But it was about two weeks afterwards? A. Yes sir.

Q That is as near as you can give it?

A Yessir.

CROSS EXAMINATION By Mr. Ray.

Q How do you remember specifically it was on the 11th of August you took it at four o'clock in the morning? How do you recall that date, might it not have been the 12th?

A No sir, Friday morning is when we have the ditch down there. That comes our turn, that is when we aim to get it. We flood the water over the top of the pasture, let it run over the top, catch it below and take it a mile farther on, and Friday and

Saturday comes out turn in this ditch, and the ground the said water goes on is pasture and wet ground.

Q And comes every other two weeks, does it?

A I don't know, that is when we are supposed to get it, I think, or get it that way.

Q You get your water in two weeks, so you miss every other Friday, don't you?

A. Yes sir.

Q What was the first Friday you took the water in the irrigation season in 1916? The day?

A I don't know.

Q What is the second Friday?

A I don't know the date.

Q Well, how do you know that Friday, if Friday was the 11th of August that was not one of the days you missed?

A I can soon find out.

Q You don't know now though, do you?

A No sir.

Q So that you might not have been irrigating at all on Friday, the 11th day of August, that might have been one of the ^{Fridays} ~~days~~ you missed, mightn't it?

A It might have been, but they have the dates showing Mr. Thompson turned the water.

Q What Mr. Thompson knows is a different thing, You don't know whether you took it at all on the 11th, do you, of your own memory?

A. No sir.

REDIRECT EXAMINATION By Mr. Thomas.

Q Just a moment, do you know whether you used the water at all on the land last year or not, Mr. Roberts?

A Yes sir.

Q Didn't you use the water several times during last year?

A Yes sir.

Q And didn't you use it on the 11th day of August?

MR. RAY: Your honor please, I object to that as leading

and suggestiave, he said he didn't know.

MR. THOMAS: He said he did know too.

THE COURT: He stated on direct examination he watered on the 11th day of August, told when he commenced and the water was running at ten o'clock across the road on that day. What is the object of having him repeat it, I cannot see it would make it any stronger.

Q Mr. Roberts, did you ever miss a turn during the season of 1916, that the water master assigned to you?

A No sir.

THOMAS E. THOMPSON recalled.

DIRECT EXAMINATION By Mr. Thomas.

Q You have already been sworn?

A Yes sir.

Q Directing your attention to August 11, 1916, and ^{to} the waters running in the East Union ditch, can you state to whom you assigned the waters of that ditch between four A. M. and nine P. M. that date?

A. Yes sir.

Q To whom?

A Mr. Roberts had the upper stream and Eddenburg had the lower stream. There was two streams in that part of the ditch.

Q Directing your attention to the 27th of August, 1916, and to the waters of the same ditch, the East Union, can you state to whom the waters were assigned between those hours, four A.M. and nine P. M. on August 27th?

A P. M.?

Q Between the hours of four A. M. and nine P. M.?

A I would have to look that up because there would be three or four changes between four A.M. and nine P. M.

Q Can you fix, can you now state who had the waters on that date

from that ditch? between the hours of four A. M. and twelve M?

MR. RAY: Who was using them.

MR. THOMAS: To whom, they were assigned.

MR. RAY: It is immaterial and irrelevant to whom they were assigned.

THE COURT: I see no materiality in it.

MR. THOMAS: I think it is material, we will take a ruling on the matter.

THE COURT: Objection is sustained.

MR. THOMAS: Exception.

THE COURT: Unless you can indicate some materiality.

MR. THOMAS: Our purpose is to show the water was assigned by the watermaster of Provo City on this date these hours, and we propose showing they were used by Mr. Roberts at that time.

THE COURT: If that is the object the objection is sustained, it doesn't tend to show it.

MR. THOMAS: Note an ~~exception~~ exception.

THE COURT: If I understand what you mean by assign.

MR. THOMAS: Indicated the time.

THE COURT: If that is what you mean, the objection is sustained. If Mr. Thompson was there and turned the water to them he might testify to that.

Q Were you present at the time the water was diverted by Mr. Roberts, either August 11th or 27th?

A I wasn't there, he took the water at four o'clock, I got there quarter to five to regulate it on the 11th of August. On the 27th he didn't have the water.

Q On the 11th of August at about five A. M. you were there, I understand?

A Quarter to five I was there and regulated the water. They had turned it, I got there and regulated it.

MR. RAY: Mr. Thompson went over that whole matter, your honor.

MR. THOMAS: I think that is true; I think that very

question was brought out before. That is all, that is all the rebuttal.

THE COURT: Now, are there any other matters to be presented.

MR. THOMAS: One of the witness, Mr. John Peay was to be here, but we have just learned he is ill in bed. It may be before the court adjourns this time he may be here, and if he is we wish to have him in on the same question Mr. Willard testified to, and that will be all. If he is not recovered we will have to let it go.

THE COURT: Are there any other matters to be presented now?

MR. RAY: I wish to call a witness in relation to the matter Mr. Thomas has been examining on.

THE COURT: Very well.

MR. RAY: This testimony may be objected to as not rebuttal.

NEWELL J. KNIGHT recalled by the defendant Provo Bench Canal & Irrigation Company, testifies as follows:

DIRECT EXAMINATION By Mr. Ray.

Q You were sworn, Mr. Knight?

A Yes sir.

Q Your name is Newell K. Knight?

A Newell J. Knight.

Q You testified relative to certain observations as to waste water from Provo City? A. Yes sir.

Q I want to direct your attention first to the City race and ask you whether or not the observations there made by you were below the lowest diversion and above the inlet of the City sewer.

MR. THOMAS: Just a moment. Object to this as being

incompetent, immaterial and irrelevant, not proper surrebuttal. The matter was testified to, as I recall, on his direct testimony.

THE COURT: Do you remember what his testimony was.

MR. RAY: Yes, I do, but Mr. Thomas testified to the city sewage going in, and I want to show that was eliminated in these observations.

MR. THOMAS: Object to that as immaterial. He stated as to his observations, his observations were made by the three gentlemen.

THE COURT: Do you say he did testify that was eliminated. If he did I will not permit it again.

MR. THOMAS: No, I will not say that, because my memory is not sufficient, but they testified as to their observation.

THE COURT: He may testify on this particular subject if it was not called to his attention at that time, of course.

MR. THOMAS: It seems to me I asked one of the gentlemen, Mr. Stratton, I think, whether or not they knew that the sewage was emptied at a certain place, and I think it was Mr. Stratton --

THE COURT: There was evidence in relation to the sewage, I don't remember who gave it.

MR. THOMAS: As I recall.

THE COURT: It will be quicker to let him answer the questions. Just answer the question.

A If I understand the City race there is no ~~was~~ sewer on the --

Q I mean the Factory race.

A On the Factory race our observation was above the city sewer, and at the point of the lowest water user that there is on the ditch.

Q And state whether or not the water which passed the point of your observation went and emptied into the lake.

A Yes sir.

Q Take the South pasture, as I understood your testimony your obser-

vations were near the gate?

A Yes sir.

Q State whether or not you have traced the ditch passing through the gate of the South Pasture from that point to the lake to know whether or not it empties into the lake?

A Yes sir.

MR. THOMAS Object to this as improper and immaterial.

THE COURT: Yes, I think that was all gone into, they traded it down.

MR. RAY: I think that is true, I wanted to refresh.

Q Now, as to the stream coming from the lands below the East Union and passing down to the north of the city cemetery and then into the Bullock springs, state whether or not that water which you described was traced to the bull-rushes?

MR. THOMAS: Object to that, there is nowater running from the north side of the cemetery to the Bullock springs. The springs are in another part of the city.

THE COURT: Objection is overruled on that ground.

MR. THOMAS: Object to it as immaterial and irrelevant, and not proper surrebuttal. That was entered into in direct testimony.

THE COURT: What is the object of it?

MR. RAY: My memory upon that -- Mr. Bagley took the notes of this and I am not able to refresh my recollection. My recollection is there was testimony as to it going into the Bullock springs and then into the lake. Mr. Thompson then goes on the stand and testified there was no connection whereby that water could have gotten to the lake. If my direct testimony does show the water they testified to ~~was~~ went directly to the lake I am satisfied on that point, but if not, I think I should be permitted to show it.

THE COURT: Objection is sustained upon your statement. I don't think you would be entitled to show it. Your statement is you went into that fully, and Mr. Knight testified what they

did and observed, and I don't think it would add anything to it to have him testify again, and certainly not unless he remembers now that he is mistaken in his testimony.

MR. RAY: No.

MR. THOMAS: We will recall Mr. Pfister as a witness.

CASPER PFISTER called by the defendant Provo City,
being first duly sworn, testifies as follows:

DIRECT EXAMINATION BY Mr. Thomas.

- Q Where do you live?
- A I live at Mr. Taylor 's, H. W. Taylor's.
- Q What is your business?
- A I work on the farm for Mr. Taylor.
- Q Which Taylor?
- A H. W. Taylor.
- Q Were you working for him on the 25th of July, last?
- A Yes, I worked all summer for him.
- Q Were you irrigating at that time?
- A On the 25th of July I could not get the water because I had the hay down.
- Q On what ditch?
- A On the Fifth West.
- Q What is the time that is given to you for watering?
- A Every Tuesday from eight o'clock in the morning until six o'clock in the morning.
- Q On the following Wednesday.
- A Yes.
- Q You did not use the water on that time?
- A No.
- Q And because the hay was down?
- A The hay was down.

Q Do you know if anyone else used that water between those hours?

A No, I don't think so. I don't think anybody used it.

Q And if it wasn't used it went down into what ditch?

A That went down in the lake .

Q At that time? A. Yes.

MR. A. L. BOOTH: Is Mr. Taylor a defendant here,
I don't see him on my list.

MR. THOMAS: Yes, he is under the Provo City's use.

THE COURT: Is that all, Mr. Thomas?

MR. THOMAS Yes, except the testimony of Mr. Peay.

THE COURT: Are there any other matters to be presented?

MR. A. C. HATCH: I have a matter.

MR. THOMAS: Judge Hatch, will you permit an interruption.
Mr. Peay is not well enough to come, I could state now that he
would testify that he used the water on the date Mr. Willard,
who just testified, said he didn't use it. He turned the water
over to Mr. Peay for use at that time and during those hours. I
merely make the offer of this testimony subject to any objection
that may be raised against it, because Mr. Peay is ill and may
not be here. That is the only testimony we will have on that
matter. If he were here, he would testify he did use the water
that was allotted to Mr. Willard on that day between those hours.

MR. A. C. HATCH: Of course, I don't understand it would
make any difference if every man testified he used the water at
the time it was distributed to him that would not show water was
not running down.

MR. THOMAS: If they used all the water allotted to
them there could not be water going to waste.

MR. A. C. HATCH: I don't understand there wouldn't be
waste water going down Dry Creek.

MR. THOMAS: Yes, because these ditches are all tri-
burary to the various ditches these gentlemen on provo Bench said
were filled with waste water. This is another ditch.

MR. RAY: That is argumentative.

THE COURT: Are you ready to proceed.

MR. A. C. HATCH: The answer of John H. Carter and others using water from the Carter ditch recites in Paragraph 10 that by mutual agreement and stipulation by and between the plaintiff and these defendants, these defendants are accorded the rights awarded to them by said decree. I don't understand there is any stipulation of any kind between the plaintiff and these defendants, and in the testimony of Mr. Wentz in regard to the acreage of the land and water distributed did not cover these particular defendants, that is, the Carter tract of land, and I wish to call Mr. Wentz at this time and let him testify as to his report. It doesn't show, as I understand it.

T. F. WENTZ recalled by the plaintiff, testifies as follows:

DIRECT EXAMINATION By Mr. A. C. Hatch.

- Q Mr. Wentz, are you acquainted with the lands known as the Carter lands irrigated through the Carter ditch?
- A Yes.
- Q Now, from what source is the water diverted into the Carter ditch?
- A From the West Union canal.
- Q And do you know the number of acres that are irrigated under that ditch?
- A About eighty acres.
- Q About eighty acres?
- A About eighty acres.
- Q As to the defendants, I will read the list of defendants: John H. Carter, R. G. Carter, Amos Carter, David Carter, R. D. Young, Lafayette Carter, Fernis Carter, Mary E. Downs and Eliza Ashton, administrator for the estate of Aaron Carter, deceased, Mary E.

Downs and John M. Downs, do you recognized those named defendants as being owners of land under that ditch?

A Yes sir.

Q And the entire area is how much?

A About eighty acres.

Q What is the duty of water upon those lands?

A The same as I gave on the blackboard schedule for Spring creek users, these lands were included in that.

Q Are these lands included in the report, any written report that you have made or any exhibit that you have introduced and specified as the Carter land?

A They are included in the West Union in the 1900 acres in the West Union.

Q They are not segregated from the West Union in any way in your report, are they?

A No.

MR. A. C. HATCH: That was all I wished to call attention to, these are within the West Union area.

Q Now in addition to the water supply they get from the river, do they have any other source of supply?

A Yes, they take some water from Spring Creek.

Q For these 80 acres?

A No, there is an additional area they take from Spring creek, this 80 acres includes the water under the Carter ditch through the West Union. Then there is an additional 80 acres as reported by Mr. Stewart for lands from Spring creek.

Q There is an exhibit on the board there, what is the number of that?

A Exhibit 129.

Q Can you mark those ditches on that exhibit, Mr. Wentz, the ditches that irrigate these Carter lands from Spring creek?

A From Spring creek?

Q Yes.

A The main heading of the Spring creek is in the tract marked John H. Carter 18.58 acres. From there on down the Spring creek

there are a number of small ditches leading to the Carter land, and on the south boundary of this tract there is one branch of the Carter ditch coming from the West Union irrigating some of these lands.

Q Now, Mr. Wentz, I have understood there was only 120 acres all told of that original homestead of the Carter tract. You have said there was 80 acres under the West Union ditch and additional 80 acres irrigated from Spring creek.

A No, I didn't say an additional 80 acres.

Q I beg pardon.

A I haven't a list of the number of acres that is irrigated from Spring creek, but there is an additional acres irrigated from Spring creek that is in addition to the 80 acres that comes-- that is under the Carter ditch from the West Union, and that was given in the June hearing by Mr. Stewart.

Q That is the area of the Carter land under the Spring creek ditch?

A Yes.

Q Did you fix the duty-- you fix the duty of water under the West Union Canal?

A. Yes.

Q That is all then, Mr. Wentz.

MR. JOHN E. BOOTH: I desire to state, your honor please, I have been ~~xkx~~ taken by surprise, as I understood that the plaintiff and the Carter people had agreed on the Morse decree and did not know anything different to that until just a few moments ago. It appears, according to that they are not satisfied with that.

MR. A. C. HATCH: I will say, Judge Booth, I never knew of any stipulation in regard to that.

MR. JOHN E. BOOTH: It was not in writing, we didn't make any stipulation.

MR. A. C. HATCH: Had not been informed in regard to it, and this was the only one tract of land I know of that was not in under the different sources from which they got the water.

MR. JOHN E. BOOTH: When we put in the Carter testimony

it was on that theory.

THE COURT: Now, is there any dispute between you ?

MR. JOHN E. BOOTH: I don't know, it depends upon what they claim for this hearing. If they don't contest the Morse decree, then there is no contest. If they do, then there may be.

MR. A. C. HATCH: Do you know what the Morse decree awards to the land; the Carter lands under the West Union ditch?

MR. JOHN E. BOOTH: There is no question I think-- as to the West Union, yes.

MR. A. C. HATCH: D^o you know, Judge Booth.

MR. JOHN E. BOOTH: It seems to me like it is 85/100-- 85/10000, I don't recall just the figures now, 85 minute feet on the theory of ten thousand, as I remember.

THE COURT: John Carter and all other persons taking water from the Carter ditch, is that it?

MR. A. C. HATCH: Yes.

THE COURT: Decimal 0120, that is, when the volume is not exceeding twelve thousand. The first schedule it is .0085 and in the next the same, and then in this other period ~~at~~ .0120.

MR. JOHN E. BOOTH: That is about a 40 acre duty. We have the testimony in on this matter; it is only a question whether they are disputing how duty, I don't know whether they are or not.

MR. A. C. HATCH: This will be in the way of rebuttal that is being offered, and if there is any misunderstanding about it, why I wish to postpone any further hearing on it until I can confer with my clients. Personally I have absolutely no interest in it.

MR. JOHN E. BOOTH: I realize that.

MR. RAY: I thought Mr. Wentz put in the duties originally.

MR. JOHN E. BOOTH: He put them all in.

MR. A. C. HATCH: It was the area that ^{we} were testifying principally to now. It was the area and segregating the lands under that ditch from the other lands.

MR. JOHN E. BOOTH: We have no opposition to them proving the lands that are there. I don't think there is any difference between us.

MR. A. C. HATCH: M^r. Wentz has testified 80 acres.

MR. JOHN E. BOOTH: We agree to that of course.

THE COURT: David Carter testified there was between 75 and 80 acres.

MR. A. C. HATCH: If the court please, the record may show that it is stipulated now between the plaintiff and the defendants using water under and from the Carter ditch known as the Carter lands, and also from the Spring creek, the Carter lands being irrigated from that source may have a duty of water awarded to them as testified to by Mr. Wentz, 50 acres to the second foot, delivered at the land. The reason being that we are informed these lands are such as require an extra amount of water, being river bottom lands, and the record may show that is the stipulation. You agree to that, Judge Booth?

MR. JOHN E. BOOTH: Yes sir.

MR. A. C. HATCH: We can go on now with our rebuttal if the court wishes.

THE COURT: You may do so, if you are prepared to.

MR. RAY: This is as to what claim?

MR. THURMAN: Young & Baum ditch.

MR. A. C. HATCH: By permission, while Mr. Evans is looking up his notes, I will ask the witness a few preliminary questions and then Mr. Evans will continue with the examination, by permission of the court.

THE COURT: Certainly.

MR. A. C. HATCH: Who is representing Mr. Baum, Lafayette Baum, the parties using water under the Baum ditch and the Young ditch?

MR. CLUFF: I represent them.

CALEB TANNER, recalled by the plaintiff, testifies as follows:

DIRECT EXAMINATION By Mr. A. C. Hatch.

- Q Mr. Tanner, have you since the testimony was given in regard to the Young ditch and Baum ditches and lands lying under them, made any examination of those lands?
- A Yes.
- Q When did you make the examination?
- A The examination was made just after the last adjournment.
- Q Did you make any tests to determine the quantity of water that the soil would retain? A. Yes.
- Q You may state what you did with regard to those two matters, what you found with relation to your examination of the lands under those ditches and also what you found with relation to the soil tests.
- A On Exhibit No. 66 I have drawn approximately in a yellow line in the north central part of the map the location of the Young and Baum ditches in yellow. The Young ditch diverts water from the stream called in this testimony City creek on the west bank, conducts it for some distance along the west bank, crosses City creek in a flume to the east bank in one branch. The other branch runs for a little distance down the west bank a small lateral ditch then crosses the creek in a flume, the said lateral continuing on down across the railroad track, entering a barrow pit without any particular confinement.
- Q What is the size of that barrow pit, about the size of it?
- A It is the ordinary railroad barrow pit, about ten or twelve feet wide, three or four feet deep below the general surface of the land. It is recovered from the barrow pit by a dam across the barrow pit course and raised out onto the ground as you see it on the map. The distances, as near as my judgment serves, are marked on the map. A second ditch--
- Q Map marked as an Exhibit?

A Exhibit 66. Another source of supply is obtained from the Spring branch, its approximate location, in a yellow broken line. The irrigation ditch which takes the water from the Spring branch, course is drawn on the north side of the map. The land all lies approximately in a body, part on one side and part on the other side of the Rio Grande Western track. On the map are a series of circles and opposite the circles are numbers. The circles are the location of soil pits made with a two inch auger and the reading which I will make from my notes can be carried to the plat by me using the same numerals in the reading as are contained on the plat.

Q Just there; you were present when the witnesses were testifying as to examinations of that soil and the different points on the land where they made the examinations. Were examinations made by you upon those particular lands.

A I was here when the evidence was given, but the only material that I recall about that matter was that the soils were very open, porous, water consuming soil without identifying any specific location where particular examination had been made.

Q Proceed?

A The field of James Amibome, which is toward the south end of the arrow point, sixteen rods north of the southwest corner of the land, pit was located, soil is a fine, sandy loam from the surface to three and one half feet in depth. Is underlaid with gravelly silt on the east. That is Pit No. 1.

No. 2 on the east side of the field from the pit next above from the surface to two and a half feet silt loam underlaid with gravelly material that stopped the auger.

No. 3, the northeast corner of the field silt loam from the surface two feet.

No. 4, northwest corner of the same field from the surface to the full depth of the auger six feet plus silt loam, lighter color below the depth of two feet.

No. 5 is on the east side of the railroad track toward the

north part of the land, marked on the plat as in the ownership of Samuel Cluff. Sandy loam from the surface to one and a half feet in depth.

No. 6 also shows the same soil conditions.

No. 7, which is in the same field --

MR. CLUFF: Where is No. 6, Mr. Tanner?

A No. 6 is just north of No. 5, and on the east side of a small spring branch that comes down through that field.

No. 7 is on the west side of the spring branch between the spring branch and City creek, silt loam from the surface to four and one-fourth feet, dark at the top and at the bottom, lighter color between.

No. 8 is on the east side of the track in the south part of the field marked in the ownership of George Baum. From the surface to two feet silt loam from two to two and three fourths feet sandy material. The hole shows mucky wet below the depth of two feet.

No. 9 toward the north part of the same field silt loam from the surface to three feet; the soil is mucky wet below the depth of two feet.

No. 10 is on the west side of the track, north part of the land, marked in the ownership of George Baum. From the surface to three and one-fourth feet, silt loam, somewhat sandy at the bottom, mucky wet below two and one-fourth feet.

No. 11 is between No. 10 and the railroad, near the railroad in a separate pasture enclosure; sandy loam with some pebbles from the surface to one and three-fourths feet. The ground water is at depth of one and one-fourth feet.

No. 12 is south of the two holes given above, silt loam from the surface to two feet and a quarter. There is a clay streak from one and a half to two feet, ground water occurs at two feet.

No. 13 in the same field, west of No. 12, black silt from

the surface to one and a half feet, ground water at fourteen inches.

No. 14 is near the south boundary, ^{of the} land, marked in the Baum ownership; on the west side of the railroad track, silt loam from the surface to three and one-fourth feet, sandy at the bottom.

No. 15 is in the north part of the Stewart area on the west side of the track -- railroad track. From the surface to three feet silt loam, sandy streak of three feet. From three feet to four and one-fourth feet gravel is struck, or silt three to four and one-fourth feet, silt. The auger stopped by gravel.

No. 16 is in the field marked on the map as in the ownership of James Stewart, on the east side of the track, railroad track, and south part of the Stewart area. Silt from the surface to six feet, the depth of the hole.

No. 17, is on the east side of the track, railroad track, in the northwest part of the Provo Pressed Brick field. From the surface to three feet gray silt, from three to four and one-half feet sandy silt, from four and one-half to six feet plus gray silt.

No. 18 lies a little to the north and west from No. 17, in the Cluff area west of the track. From the surface to four and three-fourths feet gray silt underlaid with gravel. This is the observations in the field. In addition, in the area marked "George Baum" in the northwest part of the area examined, a drain line extends up two-thirds of the distance, draining off toward the south into a channel that has been cut by the flow of the river at some past time. The upper part of this drain is closed, outlet probably extending farther down. The water runs in the drain to the south, only a small volume when I was there, and stands all the way from fourteen to sixteen inches below the surface of the ground. Toward the railroad track the land becomes wetter. There was standing water on the

surface when I was there in the fall of this year along after the irrigation season. The tract on the east side of the railroad--

Q How much land was covered with standing water in area?

A Very small area was covered at the time I was there, but the ground water in that pasture tract is very near to the surface all over it, not more on any part of it than about fourteen inches. Some places three or four inches, then some places it is standing on the surface, but not very much where the water is standing on the surface. On the east side of the railroad track in the Baum area ground water occurs near the surface as you approach City creek a little deeper to the ground water. The land rises as you go toward the east. The Stewart land, the Amicome land, the Provo Pressed Brick land and all of the Cluff land that I examined on the west side of the track the ground water plane is deep. The Cluff land that I examined on the east side of the track the ground water plane is not so deep. In places in the center of the Cluff area that extends over on the east side, the ground water occurs within two feet of the surface of the ground near the Spring branch that extends through the tract. I took certain of the samples that I collected and run them through a laboratory test to determine their water holding capacity. These soils belonging in what I have heretofore described as the superior type their water holding capacity is not as high as the clay land, but they are ^{very} much higher than the sandy soil. They belong in the coarse and fine silt soil. Their water duty is therefore intermediate. These lands from my observations and investigations, I should say were lands that should be properly irrigated with a duty of seventy-five to eighty acres to the second foot at the lands.

MR. A. C. HATCH: I suppose it will be proper for Mr. Cluff to cross examine now upon that branch. There is other rebuttal we wish to offer as to other matters in which Mr. Cluff is not interested.

THE COURT: That is all you have with reference to these lands?

MR. A. C. HATCH: From this witness.

THE COURT: Then you may cross examine with reference to this matter.

CROSS EXAMINATION By Mr. Cluff.

Q Mr. Tanner, these lands are very much uneven, are they not?

A There are certain parts of them that are uneven. Taking them as a body they lie well for irrigation. There is one disadvantage in some of them; for instance the Cluff land lying on the west side of the track, railroad track, the length of the run is comparatively short and irrigated as the ditches indicate straight across to the west. In order to make a proper irrigation I would think they would have to hold the water on there such a length of time as considerable would escape toward the lower western side. Outside of this Cluff field -- and the main drawback on that is it is narrow--the other lands are in pitch and in slope well suited for irrigation.

Q Now, the James Amicone tract; you have stated some of the pits that you made you discovered three to four feet of soil?

A Six feet.

Q Did you observe any portion of the surface of that tract of land to be gravelly soil right on the surface?

A Yes, there are occasionally fingers of gravel that come down on to this tract. It is located immediately east of the discharge, the old discharge from Rock Canyon.

Q West?

A I should say west, and some fingers of gravel have carried down as far as to invade the Amicone land, but not in any body. On my judgment there isn't on the whole Amicone tract but a half few square rods that are gravelly on the surface.

Q The Baum tract also is lying, great portion of it, west of City creek, is it not?

- A The larger area, I believe, is west of City creek.
- Q And isn't it a fact that that portion of the tract of land is practically in what is the old river bed?
- A Well, it might be what was old river bed. It is the highest type of black loam. I never saw any better in my life. It is not as thick as it is on the east side.
- Q Don't you find occasionally places even on that ground where there is gravel right next to the surface?
- A Oh yes, next to the railroad track, the area that is separated from the balance of the field for pasturage is all of it very thin soil, as my borings show, and it has the water plane very near the surface even after the irrigation season is over.
- Q These samples were taken of course, shortly after the irrigation season was over, they had been irrigating all around in that country all summer?
- A The water plane was down.
- Q How far is it from these lands that you sampled on^{to} the bench lands just above?
- A I did not go on to the bench lands just above -- east, you mean?
- Q Yes.
- A Do you mean by the bench lands the lands that are little elevated above this City creek?
- Q As a matter of fact, there is a bench just above these lands that may be termed bench lands from them?
- A Still under the Young ditch?
- Q No, not under the Young ditch. A. Yes.
- Q That would come under the Upper East Union canal?
- A Yes.
- Q And irrigating -- these lands just above these on the bench are irrigated from the Upper East Union? A. Yes.
- Q All lands that are farmed and irrigated?
- A Yes.
- Q And the seepage would naturally come down under these lands?

A measurably in places.

Q Now, isn't it characteristic of that tract of land through there, the Baum land, as well as all other lands by the river bottom, that there be places where the river in times gone by has gouged out holes and perhaps that has filled in with deep soil and maybe a rod from there would be very little river gravel bed?

A Oh yes, that is characteristic of a good many parts, but it is not characteristic of this tract.

Q Would you say that is not the case on the the great portion of these lands you have testified to?

A No, the inequalities here in the soil are rather due to the presence of that Rock canyon wash. That is the controlling feature here. There is a fairly uniform depth of soil over the Baum tract even on the westside of the railroad track that was probably very recently exposed to the conditions which you give than that on the east side of the railroad track.

Q And all of these holes you bored were simply with a two inch auger?

A. Yes.

Q You didn't dig any other pit ?

A No.

Q Do you know it to be a fact that under this soil where you did strike gravel it is coarse river bed formation?

A No, I rather think it is on the west side. On the east side I rather think there is a great deal of soil mixed with the gravel. Gravel is angular, has not been carried-- been carried from steeper grades, has not been worn so smooth, and there is more or less silt with it.

Q You say these lands are situated at what may be considered the discharge of the old Rock canyon?

A Where it crosses across what you might call the south third of these lands forming a narrow belt that separates the Aminone field from the Stewart field and the inequality is very plainly

brought out on the map by the swinging of the ditch, the projection toward the west being where the Rock Canyon wash crosses the track, but the Rock Canyon as it traverses is not carried across at all into the Cluff field in the vicinity of the pits that I have specified here from the dwelling house of Mr. Cluff to the south. That soil is a good type of silt soil.

Q You made one pit just in the north portion of the Cluff field on the west side of the track?

A Yes.

Q Did you make any other in that field?

A No, but there is a deep wash that comes between that field and Mr. Cluff's house, exposes the soil, sections there, and shows it to be on the north side of where I bored practically the same as where I bored.

Q But did you notice on the south side of that same field it was gravelly?

A Toward the house across the wash, yes.

Q So that in that ^{same} small field there just a short distance from where you bored a pit and found three feet of soil it is gravelly soil on the surface?

A Very narrow belt of gravelly soil crosses through there just about where the road that comes down to Mr. Cluff's house crosses the track, crosses the railroad track.

Q You haven't give any test, of course, of any of the soil on the west side of City creek and near Mr. Cluff's house, or in the north?

A That little area in there is quite gravelly right from where Mr. Cluff's house is situated and little to the north on both sides there is practically no cultivation in there. There is some pasturage and brush.

Q The portion of the City creek or the Provo Pressed Brick canal comes in to the north of there, did it not; did you examine the soil just north of that old channel through there that leads out

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Q The portion of the City creek or the Provo Pressed Brick canal comes in to the north of there, did it not; did you examine the soil just north of that old channel through there that leads out

to the main river channel?

A I don't just get what you --

Q You know where the Provo PRESSED BRICK Company has brought a canal or opened, rather, an old channel, and it is now a canal that comes from the main river channel into City creek just north of Mr. Cluff's house?

A Yes, there is a channel comes down there with a flow of water in it.

Q Did you examine the soil just north of that channel and east of it?

A When you get out beyond this narrow belt of cultivated land toward the river bed from the bottom land on the north to the extreme south of the Cluff land, you get into gravelly soil, river bed conditions, with growth of willows and cottonwoods. That soil in there even where it has a growth of willows and grass is very thin.

Q So that all over this entire tract of land both the -- that is, under this Baum ditch and the Young ditch, the variation is quite sudden; you might find a place where you would get deep soil and in just a little ways you would get gravel right at the surface almost.

A I might explain on the Baum land I have drawn here what is termed Spring branch. Now, that Spring branch enters the river somewhere in the Baum tract, and above the diversion of the Provo PRESSED BRICK Company from the river. As you drop off the cultivated land, and they have pretty well cleared the land, that is good soil. In this drop off into what is called the river bed then the transition is sudden. As you go toward the east the transition is little more gradual before you get to very thin soil, near the railroad track in the pasture, as I have said.

Q Now, calling attention to the land of the Provo PRESSED BRICK Company, isn't it a fact that there is an elevation that projects down into a portion of their land, just east of the track

that is practically a clay hill there?

A Yes, the very end of the Young ditch goes on to Provo Bressed Brick land. It is not a clay there, it is a fine soil.

Q You get perhaps good soil there, thirty feet deep?

A It is deep of course there, I would not say how deep.

Q Yet a few rods north on their land, joining the Amicone ground you would get soil that some places would be gravelly on the surface and other places find perhaps two or three feet of soil?

A No, I bored very near the Amicone land, and six feet in depth. That is as far as I am certain it goes.

Q The bed of City creek goes around right near the junction of the Amicone land and the Provo Pressed Brick land, doesn't it?

A It is not far away there.

Q And the bottom of that creek of course is all gravel?

A Oh yes, the creek runs in gravel formation all the way through this tract. It is out some places pretty deep into the area.

THE COURT: Now did you desire to proceed with some other matter with Mr. Tanner?

MR. A. C. HATCH: We wish to go into rebuttal as to the Provo City too.

THE COURT: Do you want to put in some other evidence on this particular line?

MR. A. C. HATCH: Not on this particular matter.

THE COURT: Then you may proceed with the other.

MR. A. C. HATCH: We will temporarily excuse Mr. Tanner.

OMISSION.

Testimony as to claim of William L. Van Wagoner and Hyrum S. Winterton.

Testimony as to claim of Julia M. Davis.

Testimony as to claim of Washington Irrigation Company.

Discussion as to rights of parties in Summit County.

Testimony as to claim of Levi M. North.

Testimony as to claim of Wilford Van Wagoner.

Testimony as to claim of Johanna C. J. Anderson

IN THE DISTRICT COURT IN AND FOR UTAH COUNTY, UTAH.

Provo Reservoir Company, - - Plaintiff, :
vs :
Provo City, et al, - - - - - Defendant. :

T. F. WENTZ, called by the plaintiff,
testified as follows:

DIRECT EXAMINATION by Mr. Hatch.

Q. Mr. Wentz, you are the commissioner who has testified in this case and who testified with relation to measuring the flow in the flume of the Utah Power & Light Company?

A. Yes.

Q. In that you assume the coefficient of rugosity, did you, or did you take one at all in the making of the computation of the flow?

A. That is of the maximum discharge in 1914, you mean?

A. Yes.

A. No, I used the point through the three points of actual measurement and extended it to the limit that the flume would hold, or thirty-four hundredths of a foot higher in elevation, and computed the discharge on that.

Q. Did you make a more exact determination of that since you testified?

A. Yes, I have platted the Cutter's curve from the point zero through the points and extended it.

Q. Now, have you a plat of it?

A. Yes.

Q. Have you that with you? Just have it marked and then explain it.

A. This is Exhibit 185 and platted---

Q. Just explain the curve that you have made.

- A. On Exhibit 185, which is platted on millimeter paper, I have shown on the left side of the paper the vertical ordinate, the gauge heights from zero marked to 5.00. On the horizontal ordinate at the bottom of the exhibit is shown the discharge in second feet and marked from zero to 250 second feet. In the upper right hand corner I have shown with black dots the discharge of the several measurements made at the Donan's rating station, platted according to their respective gauge heights and their respective discharge and have shown near each point the date of measurement.
- Q. So as to identify the several spots with the date of measurement?
- A. Yes.
- Q; And the amount of discharge?
- A. And the amount of discharge and these points may be verified by referring to the part of the report treating with the Utah Power & Light for each measurement on these dates shown on the plat. Beginning at the zero point I have drawn in a yellow line Cutter's curve calculated on a coefficient of roughness of .015 with a width of flume of eight feet and a slope of one foot per thousand. The points on this curve were calculated for every foot of elevation beginning at 0.50, and extending to a gauge height of 5.5. I have also shown on the exhibit in a red line Cutter's curve from point zero to gauge height 5.5, and calculated to the point shown for every half foot in elevation. This curve is calculated on a coefficient of roughness of 0.0135 with a width of eight feet for the flume and slope of one foot per thousand. I have also shown on the plat a line in pencil extending through the point of discharge marked 11-6-14, and intersecting the vertical ordinate at 2.46, which corresponds with the

line shown on Exhibit 146.

Q. The pencil line on this is a duplicate or representation of the line made on Exhibit 146, is it?

A. Yes.

Q. Now, what would be the result of that, what have you determined by making these computations as shown on the plat which you are now explaining?

A. The line as shown on Exhibit 146 which I marked on this exhibit 185 as A-B is a continuation of the line I used to determine the maximum capacity of the flume in 1914, and is an extension of the line through the two points of measurement at that date, October and November. This line shows a greater discharge for an increase in gauge height than the Cutter's curve. That is the line drops or appears flatter than the Cutter curve as shown on the plat.

Q. Which is the more trustworthy or reliable of the two, more accurate?

A. I would say the Cutter curve. Now, in connection with that these points of measurement were determined just as precise as it was possible to do it, but you will note on the point marked 11-9-14 that it is off of the Cutter curve about two second feet in two hundred and twenty second feet, which is a less error than one per cent; and the point marked 10+19-14 is also off the Cutter curve approximately two second feet which is within one per cent of the actual discharge.

Q. Are they off on the same side or both sides of the curve?

A. The two points are off on opposite sides of the curve and the curve passes through the other point marked 11-16-14.

Q. What ^{then} ~~difference~~ is the capacity under the more accurate computation?

A. Two hundred and thirtysseven second feet.

- Q. What was the amount you gave in the former testimony?
- A. Two hundred and forty-eight second feet.
- Q. So that there is eleven second feet mistake or approximately eleven?
- A. There is eleven second feet difference in the two methods. The more proper method as I say is the Cutter curve.
- Q. And that is the one you are now explaining?
- A. Yes.
- Q. Now, the lower of those curves, explain that, Mr. Wentz.
- A. The lower of the curves, the one in red is on the lower coefficient and is flatter as I have stated before. This curve passes to three of the points on the plat with two points on the left side and one point on the right side of the curve. This curve more nearly fits the conditions of the flume for 1915 and 1916.
- Q. Now, that would indicate what, any improvement in the flume?
- A. Yes.
- Q. Give it less roughness or rugosity?
- A. Yes, the increase, it indicates an increase in speed of the water through this station.
- Q. The flume itself is a more efficient carrier in 1915 and 1916 than it was in 1914?
- A. Yes.
- Q. As shown by these curves?
- A. Yes.
- Q. Did you make any curve including the measurement of three hundred feet as testified to by Mr. Swenson?
- A. Not the three hundred feet would be off of this map entirely at the bottom of the exhibit.
- Q. The map is not large enough, does not include---
- A. No, it is not large enough to show.

MR. HATCH: I offer this 185 in evidence.

THE COURT: It may be received.

CALEB TANNER, recalled.

DIRECT EXAMINATION by Mr. Hatch.

Q. You testified with regard to the rugosity of the different flumes of the Utah Light & Power Company?

A. Yes.

Q. And you also testified as to the measurement of those, of the flow?

A. Yes.

Q. In those flumes. Were you present when Mr. Swenson testified to having measured the flow and gave as a result some three hundred second feet?

A. I was present at the time that the hypothetical question was put to him and he reported the capacity of the flume under the conditions of the hypothetical question as three hundred and forty-six second feet, assuming a coefficient of roughness of 11--.011.

Q. Have you since then taken the measurements that were testified to and made a curve or curves thereof to show the result?

A. Yes.

Q. Have you the curves with you?

A. Yes.

Q. I wish you would explain it, have them marked, two together as one Exhibit.

A. One exhibit. Exhibit 186 shows three curves of the theoretical discharge of a flume eight feet wide and a depth of water from zero to six feet, slope one foot per thousand; and respectively for the coefficient of roughness .015, .0135, .011. The curves are determined by Cutter's formula, the horizontal axis being the discharge

in second feet, the vertical axis being the gauge height or water depth in the flume. These curves were drawn on this paper from the formula without reference to or consideration of any actual measurement made by myself, or of which I had information of the actual volume itself.

Q. As I understand, the curve was drawn and then the measurements were placed, as testified to?

A. The gauge readings and volumes of discharge observed by water commissioner Wentz and Thomas, and by Caleb Tanner as testified in this case, are shown by black dots on the plat having the dates of measurement opposite the observations platted. They are all made at the Donen's rating station, on the Utah Power & Light Company's flume in Provo Canyon. These black dots group themselves around two of the curves of the measurement taken in 1914, 1913 and 1911---with one exception, group around the first curve having a coefficient, .015. The observations made by water commissioner Wentz in 1915 and 1916 with one exception group around the second curve with a coefficient .0135. The theoretical questions with reference to what the assumption of coefficient of rugosity for that flume should be is answered by the flume itself. In 1914, 13 and 11, by a plotting out as .015 actually. The flume answers in 1914 with a superior efficiency, the gaugings in the year 1915 and 16, falling upon the curve ~~xxx~~ or ~~o~~ very near the curve .0135. There are no answers that the flume itself has given that are near ~~xxx~~ ^{or} even approximate the values of the coefficient of roughness which is assumed by Mr. Swendson and which is platted the curve farthest to the right and considerably distant from any observation of flow that has ever been reported in the flume.

Q. So that in the making of Exhibit 186 and the computations

thereon shown, what have you to say as to what is the actual coefficient of rugosity, what was the actual coefficient of rugosity of that flume during the periods mentioned?

- A. In the years 1911, 1913, 1914, it was at the times of the observation .015. In 1914 and 1915 at the times of observation it was .0135.
- Q. Did you not make any rule as to sixteen, any curve including '16 measurements?
- A. '15 and '16 I have just reported.
- Q. You said '14 and '15.
- A. Then I will state it again. The coefficient of roughness in 1911, 13 and 14, at the time the observations were made was .015. In 1915 and 1916 at the times the observations were made it was .0135.
- Q. Did you find any measurement that was given or testified to that would justify the assumption of a coefficient of .011?
- A. No.
- Q. And did you make computations as to all the measurements given for the years you have testified to?
- A. I made computations for all the measurements that I had access to that contained all the elements that would permit them to be platted. There were a number of measurements made and reported but only the volumes were given by Mr. Swendson and I could not plat them. The volumes were read out rapidly by Mr. Swendson and the gauge heights not given. These contain such observations as were made by commissioners Wentz and Thomas and by myself.

MR. HATCH: I will ask now 186 be admitted.

THE COURT: It may be received.

- Q. Have you, Mr. Tanner, obtained certified copies of the measurement of the Provo River discharged at the South Fork

station and at the Provo river station above the Telluride plant?

A. Yes.

Q. Have you them with you?

A. Yes.

Q. Let's have them. I now present to you exhibit 187 and ask you what it is?

A. It is a tabulation of the daily gauge heights in feet and discharge in second feet of Provo river at the South Fork for the years 1913, the last three months, '14, '15 and '16 up until the end of September.

Q. That is for a part of the year 1913, all of the years 1914 and 1915 and for the year 1916 up to September?

A. Yes, sir.

Q. MR. HATCH: We offer the exhibit 187 in evidence.

THE COURT: It may be received.

Q. I now present to you exhibit 188 and ask you to state what it is?

A. It covers the same data for the same period of time as the preceding exhibit for the south fork tributary of Provo river, which enters Provo river a short distance below the gauging station on the main river given in the exhibit before.

MR. HATCH: We now offer Exhibit 188.

THE COURT: It may be received.

OMISSION.

Testimony as to claim of Emma Kummer Bond et al.

THE COURT: You may proceed, Judge Hatch.

JOHN C. SWENSON called by the plaintiff being first duly sworn, testifies as follows:

DIRECT EXAMINATION By Mr. A. C. Hatch.

Q Where do you reside, Mr. Swenson?

A Here in Provo.

Q For how long have you been a resident of Provo?

A Since 1898.

Q What is your occupation?

A I am a teacher.

Q A teacher? A. Yes.

Q Have you been engaged in farming at any time?

A Well, not particularly, no sir.

Q Have you had anything to do with what is known as the Ellertson farm?

A I rented the pasture last year.

Q For last year? A. Yes.

Q What was its condition as to being properly irrigated during the season.

A During the forepart of the season it was fairly well irrigated. During the latter part of the season, especially during the month of August it was not.

Q What was the reason it was not?

A I simply neglected it for one reason and another.

Q You didn't use the water when your turn came to use it?

A No. For three successive weeks during the month I guess I didn't water it.

Q Then it dried up?

A It dried up and there were parts of it, by the way, I didn't water

at all, that were a little high, and I didn't take the trouble to put the water out there.

Q When did you first miss irrigating, if you know?

A I think it was the Fourth of August, or ^{at} any rate it was the day that the State Convention, Democratic convention was held in Ogden. I think I went up to that convention and missed my watering turn because of going there, and I believe that was on the Fourth of August, if I am not mistaken.

Q And after that you missed subsequent turns?

A Yes, I missed a couple times after that. I was in the habit of asking Mr. Rieske to turn the water down. I put the dams in by the way, I was to take it down, and phoned up to him to turn the water down, and I think the dams went out and my land did not get water. That was one occasion and on the second occasion I think the water was not turned in at all.

Q That would be in September?

A No, that would be still in August, I think.

Q During September of that year?

A September of that year I didn't pay so much attention to it. I don't remember anything about that, but I rather think the water was turned in during most of the time.

Q Do you remember going over the land with Mr. Murdock and Mr. Tanner

A Yes sir.

Q About the first of September?

A Yes, I think, or the latter part of August, I thought it was somewhere in there.

Q At that time the land had just been irrigated a day or two before?

A Yes, I had succeeded in getting it watered in just the pasture, use it for pasture for cows, I rented it for pasture.

Q When you did irrigate and tended to it, you had plenty of water with which to irrigate, didn't you.

A Well, I wouldn't say that. I think that if the land had been properly ditched for irrigation there would have been enough, but

it was not. The latter part of the field usually was not well watered. The soil is very porous by the way, and I didn't take adequate precaution or measures for getting it down there. I was busy with other things and simply neglected it.

Q Wasn't worth your while?

A That was the point exactly.

CROSS EXAMINATION By Mr. Tucker.

Q This land was used only for pasture purposes?

A Yes sir.

Q You don't have any idea how much water it would take if it were used for the cultivation of crops, do you?

A No, I don't.

Q The land could be made so that crops could grow on it, I suppose, could it not?

A You mean with an amount of water?

Q This pasture land.

A Oh yes, certainly, good land.

Q Where is this Ellertson place?

A It is along that east land leading to the mountain about forty rods from the opening of the lane, right opposite Mr. Reiske's place.

Q How many acres of it all together?

A Four acres, not quite four acres, not quite four acres under the irrigation ditch, part of it is under the lower East Union, that is not irrigated at all, probably three and a half acres.

REDIRECT EXAMINATION By Mr. A. C. Hatch.

Q It is all irrigated from the Upper East Union canal, is it not?

A Well, the lower East Union ditch cuts a corner of the lower part, and that that is beyond that is not irrigated from the Upper East Union ditch, it is waste land.

Q What is irrigated is irrigated from the Upper East Union canal?

A Oh yes, what is irrigated.

CALEB TANNER recalled by the plaintiff, testifies as follows:

DIRECT EXAMINATION By MR. S. C. Hatch.

Q Are you acquainted with the preceding witness, Mr. Tanner/

A Yes.

Q Went over the Ellertson tract with him?

A Yes sir.

Q And did you make an examination of the East Union Canal and the lands under it to determine whether or not they were properly irrigated during the year 1916, and prior thereto?

A I made particular examination of the Upper East Union canal and of the Ellertson field, of the field in the ownership of Aaron Dugdale, just adjacent to the mental hospital ground, and attempted to locate the particular field described as being in the vicinity of the University land which was suffering for water.

Q For want of water?

A For want of water in the latter part of August. I was, however, unable to identify the exact location of that field.

Q Did you hear the testimony of the witness Clark with regard to that? A. Yes.

Q And the condition of the lands as crops suffering for water, lands that are irrigated from the Upper East Union canal; now, with the Ellertson tract the pasture of approximately four acres what was the condition of that tract as to the kind of soil, the slope, and the crop, if any, that was being ground upon it last year?

A The field is watered from two ditches. One of them running along an elevated place or ridge in the northeast corner of the land, which lays approximately in a rectangle with the longest dimension north and south. This northeast corner contains a ridge that in its slope controls probably one half of an acre. That part of the land at the time of my observation was in poor condition so far as crop was concerned. It appeared to have been

without water for quite a period of time. The balance of the land generally was wet with a very recent irrigation, being irrigated by a ditch that entered the north end of the land about midway of its north boundary, and spread out through the land by three small distributing ditches. The main ditch for a little distance at the upper end was in good condition to carry water. In a few rods after it branched the lateral ditches were wholly overgrown with grass and conducted the poor and wasteful way toward the lower end of the field and toward the margin of the field. There, however, had been sufficient supply of water to run down the whole length of the rectangle down to the East Union canal which runs across the south boundary, cutting off a corner, and evidence in four places that water had escaped from the field into the East Union Canal itself. After going over the field carefully I estimated that three-quarters of the land had been irrigated and that the main body of unirrigated land was under this elevated ridge tract in the northeast corner, and no water had been run down through that lateral at all. The crop was alfalfa and variety of grasses growing among the alfalfa, making over most of the field a fair sod.

Q What was the date of this?

A This was September first of this year, just after the adjournment.

Q Last year?

A Or last year, just after the adjournment of this court.

Q What did you find with ~~xxx~~ relation to the nature of the soil?

A The soil is a sandy loam. On the ridge part it is thin, being less than two feet in depth. As you go toward the lower end and toward the west it is deeper. There are, however shallow spots or ridges. Farther down the field toward the Upper East Union canal the soil is a very fair soil both as to depth and quality. The lay of the field is not in the best condition to be irrigated. It is, however, in fair condition to be irrigated if the ditches were open through the several parts of the field.

- Q I understand you to say that the ditches were not prepared for the proper irrigation of the land?
- A The lateral ditches leading to the rear in the irrigation of the land are practically filled with grass. They have not been cleaned.
- Q Now did you examine another tract of land irrigated under the, or from the Upper East Union canal and testified to by Mr. Clark as suffering for water?
- A Yes.
- Q Where was that?
- A The Dugdale land.
- Q Where is that located.
- A The Dugdale land is located just north of the State Mental Hospital, I think, on the extreme east end of Second North street, in the Provo city street designation.
- Q What did you find with relation to the condition of the crop on that tract?
- A That land is a part of the mountain slope. The whole interval between the East Union canal which comes out of the river miles below the Upper East Union, the whole distance between those two canals as they pass through the Dugdale land at the south boundary is only twenty rods, so that the land is not only from its close attachment to the mountain rather rough in soil texture, but is also steep, very steep, and the irrigation is directly across this steep slope toward the East Union canal. There is evidence all along as you walk along the western boundary of the property of the water escaping into the East Union canal from the irrigation of the land that lies above the East Union and below the Upper East Union. The source of irrigation, the main difficulty with this land is its steep slope and short irrigation length.
- Q And the soil?
- A And a stony, open soil. There are very few acres of land that

are all as poor a type as this under the Upper East Union canal.

Q Do you know about how many acres there is in the Dugdale tract.

A I think four or five acres, looked to me like there was about four acres, or a little better.

Q What have you to say as to its condition and condition of the crops ~~that~~ when you examined it?

A The most of the crop was in fair condition of the fruit I observed, and the corn crop, the crop of tomatoes in excellent condition. The forage crop, the hay crop where the hay had been grown which comprized probably half-- the hay and grain, half or more of the area, was dry, apparently had been slighted in the interest of the other crops that I have mentioned.

Q Had the grain crop in it been harvested?

A The grain crop had been harvested, but the ground was dry and the sand was not superior, inferior stand, appeared to me.

Q Did you make any further observation with regard to the land testified to by Mr. Clark?

A No further observations of the land, I made some detailed observations, however, with reference to the canal.

Q And its condition of maintenance?

A Yes.

Q What did you find as to its maintenance and the condition of the gates and diverting channels and so on?

A I went to the canal on September 5th, in the evening, 1916, between five and six o'clock. The Upper East Union canal, I observed that the waste gate was leaking a small stream of water. Just south of the waste gate which I have marked on Exhibit 52, which is marked on Exhibit 52 as overflow near the letter "O" in red. A few feet below this point marked overflow, which is the waste way of the canal, I observed more than one cubic foot of water going over the top of the bank through a partial cut that had some waste and rocks thrown in to partially block it. This water spread over a little tract of grass of two or three square rods poured down into the waste way channel and ran west

toward Provo River.

Q Would that water be running to waste so far as any use could be made of it by the Upper East Union canal?

A I followed that water beyond the limits of irrigation of the Upper East Union. The depth of water I observed at the bridge crossing, wagon bridge crossing, just south of the waste way showed a depth of water in the ditch of two and one-fourth feet. A very slow movement to the water or the current being very sluggish. The water at the old rating flume, which is marked on Exhibit 52 in red as "flume" showed a depth a little in excess of two feet. There was at this date a small stream wasting over the top of the lateral gate at the point marked "A" on Exhibit 52, the depth of water being so great in the ditch that it was flowing over the top of the lateral gate down into the adjacent field, the ~~win~~ volume at this point being estimated at one-eighth of a second foot. The moss was very bad in the canal in the whole section observed on this date.

Q For what length of canal was the observation made on that date?

A Observation extended at that time from the point marked "flume" down to the point marked "D", south of the overflow.

Q What distance, about what distance?

A Within a few hundred feet, about a quarter of a mile.

Q Now, you mentioned the moss being in the canal.

A The moss was very bad in this section of the canal. The full ^{of} capacity was being used to carry the volume, flow present at that time.

Q What effect would the moss in the canal have upon the flow of the water?

A It increases the wetted cross section and decreases the capacity by obstructing the flow so materially that if it is permitted to grow without ever to check it, it practically stops the flow in a ditch where the conditions are good for its growth.

Q What would be the proper remedy for that condition?

A There are variety of ways of cleaning moss. It can be taken out

with an ordinary shovel or fork, can be taken out in many places where it is not associated with too much mud, by a mowing machine, and if the ditch is wide enough to operate a mowing machine in. It can be taken out by a scythe, collected and thrown out on the bank, and can be taken out by a harrow being dragged up and down the bottom of the canal, loosening the moss and retrieving it from the canal at points below.

Q Now, about how often during the irrigating season would it be necessary in that canal to clean the moss out in order to keep moss -- the canal in good condition for carrying water, proper condition ?

A My judgment is that the moss in sections where it grows well, ought to be cleaned at least three times.

Q During the irrigation season?

A During the latter part of July and August and early part of September. I observed the canal again on September 3rd. The observations made on this date were very much more thorough than on the first, which I have heretofore described. The volume of flow at points marked "weir" on Exhibit 52 was measured showing that there was approximately 13 second feet at that point in the canal. The measuring device here is a gate, we could make the determination with a fair degree of accuracy.

Q 13 second feet, did you say?

A Yes. At a point 480 feet above the point in red "flume" on the map Exhibit 52, there was a leak in the lower bank four feet below the top of the bank. The water in the ditch at this point was 1.85 feet deep. The top of the bank above the surface of the water was .65 feet. The horizontal distance from the water edge to the leak outflow was six feet. I observed evidence of overflow and small break from the top of the bank at the point 465 feet up the canal from the point marked in red "flume". At the point marked in red "flume", the water in that rating flume was 1.82 feet deep. The lateral gate just west of the

bridge which crosses the canal near the flume, or approximately a point marked "A", there was running through this lateral gate one-hundredths of a second foot of water. Since my observation of September first, the water had receded somewhat in the canal, it was not longer running over the top of the gate; this being the point which on September first I observed the water running over the top of the lateral gate. The water, however, at this point is only two-tenths of a foot from the top of the bank. At a point approximately marked "B" through the lateral gate turnout, I observed wasting two-hundredths of a second foot of water. The leak through the waste gate at the point marked "overflow" two-hundredths of a second foot. There was still a flow over the top of the bank at the same point described heretofore just below the overflow at "C" of one-fifth of a second foot. Depth of the water in the center of the canal on the road, east and west road through the center of Section 25 -- I am unable to give that depth-- there was at a point "D" a leak through the lateral gate which carries a distributing ditch down along the west side of the State road. The leak was ten-hundredths of a second foot. The leak in this case was not through the gate, but around the gate and was all along standing two hundred feet below the State road crossing. The water in the canal was 1.90 feet deep. At a point 350 feet below the State road bridge crossing, the top of the bank was four tenths of a foot above the surface of the water, and the water at this point 1.95 feet deep. At a point 50 feet farther down the canal the bank was four tenths of a foot above the surface of the ~~extant~~ water. The water depth being 1.95 feet deep. At a point 300 feet north of what I remember as the Gillespie lateral, which is approximately marked on the map as "E" there was evidence of recent overflow over the top of the bank. A small new bank of earth, fresh earth was shoveled in place at that point, the small bank being fresh and the marks of the place where the earth was taken to make the bank being also fresh. The evidence of the water was present on the .

flank of the canal bank from the point marked "weir" for more than one half the distance to the old flume, marked "flume".

Q You are referring to Exhibit --

A 52. The moss was bad for one half the distance. For the balance of the distance it was fairly clear. Frequently at the places where the moss occurred more than one half of the cross section was shut off by the moss growth and silt. From the point marked "flume" thence down to the State road the moss was plentifully present. Thence from the State road for a short distance the moss was not so bad. Then the moss conditions became severe again down as far as the Gillespie lateral, which I have referred to as occurring approximately at the point "E".

Q What do you say as to the canal having its water to its capacity in it at that time, and in its then condition whether it had all the water that would safely flow in it without waste by overflow.

A The margin of bank was very small at a number of places, as I have reported, appeared to me that the ditch was full to its maximum carrying capacity at the time these observations were made, and with a flow in there at the head of 13 second feet approximately. Now, at 150 feet north from the point marked "E", the bank was four tenths of a foot above the surface of the water, and the depth of the water 2.15 feet deep, and for more than two rods at this point the bank was four tenths of a foot only above the surface of the water. At the point marked "E" there was a ~~lak~~ through the lateral of one-fourth of a second foot.

Q What is the total leakage from the canal on that date as you observed it?

A I can give that if you don't wish the detail. These observations were carried on down the course of the canal as far as the point marked on the map "A-5" which is about half a mile north of the main building of the State mental hospital. The total outflow on this date was 1.6 second feet. A great many of these observa-

of lateral leaks made under the date of September the third were estimated. On September 5th I made another examination of the ditch from the weir to the point "A", one half mile north of the main building of the State Mental Hospital. On that date I measured over one of the streams, provided myself with such instruments as were necessary for the purpose. The inflow at the head on that ^{date} was approximately 13 second feet, the same as on the preceding date. The total waste through the laterals and over the bank was 2.31 second feet, making a net diversion to the irrigation ditches of approximately 10.70 second feet.

Q Can you give us the total area of land irrigated under that canal, have you made any measurements?

A Not of the total irrigated land. I have made a measurement of the total area lying between the Upper East Union canal and the next irrigation canal to the west, and including all the land from the extreme north boundary of the Upper East Union irrigation to the extreme south boundary of Upper East Union irrigation

Q What is that area?

A 783.87 acres. This contains the full details if you wish to use it.

Q I now present Exhibit 189, and ask you if that gives the detailed information of the area of irrigated land?

A The area of land.

Q Area of land?

A Gross land.

Q Whether ^{irrigated} or not? A. Yes.

Q Then the figures you have given us is the gross area of the land?

A Yes.

Q Whether it is irrigated or not? A. Yes.

Q Then the Exhibit --

A This is the outside limit of the possibilities of Upper East Union irrigation from their ditch as it is now constructed on the ground.

Q As shown by Exhibit 189? A. Yes.

Q And the total area is 783.87 acres?

A Yes.

MR. A. C. HATCH: We now offer this exhibit.

Q Have you computed the duty of water assuming it had thirteen second feet with which to irrigate?

A No, I did not compute that.

Q Can you do it in a moment and allowing nothing for waste through head gates and overflow?

A Practically 60 acres to the second foot.

Q Could you estimate or attempt to determine the number of acres not irrigated, or that have ~~never~~ never been irrigated from the canal included within the 783.87 acres?

A No, that detailed investigation with reference to the irrigated area was made by Mr. Stewart, I have no definite knowledge except as I have stated to the gross area within the system.

MR. A. C. HATCH: I think, your honor please, Mr. Stewart gave in his testimony the area.

Q Did you make any further observation, Mr. Tanner, in regard to the Upper East Union canal?

A Of course, I have not reported all the detail, the general fact is that the canal is in its upper two-thirds used constantly. In about the lower third it is used periodically. The moss conditions are not present in the lower third. They are present only in the upper two-thirds, and the conditions, moss conditions at the time I observed it were almost uniformly about from one end of this upper two-thirds to the other. This canal I have observed many times, measured it when it had in excess of 30 cubic feet of water flowing in it, and at that time it did not have as large a water cross section as it did on the date of this observation when it had only 13 second feet at the head.

Q What is the greatest capacity of that canal if it were in good condition?

A About 35 second feet.

Q What was it as to capacity at the date when you made your observa-

tions, September, 1916?

A Less than twelve second feet.

CROSS EXAMINATION By Mr. Robinson.

Q How many times did you visit this Ellertson land, Mr. Tanner?

A I was across the Ellertson land a number of times, and I visited it to go over it carefully only on the first of September.

Q That is the first time you visited it to make any observation ?

A Oh no, I made observations in this immediate vicinity and on this land in the earlier months of 1916. I was across this land in 1915 several times when I was making observation as to the general type of soil conditions in the eastern part of the area irrigated from provo river. I have soil samples which are in evidence here, a little distance east from the Ellertson land and little distance south of the Ellertson land and little distance west of the Ellertson land. I didn't have a sample directly upon the Ellertson land, but I walked across the Ellertson land when I was making investigations in 1915.

Q What condition was it in in 1915?

A It was in better condition in 1915, than it was at the time I observed it in 1916, the pasture area.

Q Do you know how long it has been used as a pasture?

A No, I don't know.

Q It is land that had been previously cultivated?

A Looked to me like it had been an alfalfa field that had been pastured rather intensely and the alfalfa gradually wanning and grasses, blue grasses and other grasses coming up in the intervals between the alfalfa heads, making a sod condition over parts of it.

Q How many times did you visit the Dugdale land for the purpose of making observations?

A I have been over the pugdale land probably ten or twelve times from 1914 to the present day, until 1916.

Q I think you stated it was in 1916 that you found part of it,

especially the grain and alfalfa dry?

A The place where there had been grain was dry at the time I made the observation, which was on the first of September.

Q You didn't observe it earlier during the year?

A Yes, I have seen them irrigating it in 1916, earlier in the year, and have observed the condition of the difficulty attached to making an economical use of the water under the physical conditions there.

Q Now, in regard to the moss in the canal, do you know when the canal was cleaned, this canal in 1916?

A No, I don't know when it was cleaned in 1916. My judgment there were ~~xx~~ long sections that were not touched after the spring cleaning. There were long sections there where the willows had practically closed in overhead, and the sweet clover, and there was no indication of any disturbance, so that I had to press my way through, rather break a trail. If there had been any cleaning done within a month and a half or two months, in my judgment, there would have been evidence of it.

Q How often, in your judgment, should this canal be cleaned?

A In the latter part of July during the month of August and for the first half of September up to the 10th, anyway, my judgment it ought to be cleaned every three weeks of the moss. It is not a very difficult matter to take care of the moss conditions. I think that the moss ought to be out and the sides of the banks trimmed. Where the willows bend down into the current and check the current the moss grows thriftily and every particle of detritus that is carried in the water falls and fills up bars there that otherwise would move down the current and get out of the ditch.

Q The irrigation is largely over by the first of September, is it not?

A Oh no.

Q In the region? A. No.

Q What do they irrigate?

A They were irrigating all their pastures, they were irrigating

their alfalfa, there is a great deal of hay land under that ditch, they were irrigating all their fruit.

Q There is not the heavy irrigation at that time of the year there is two weeks earlier is there?

A I presume the last irrigation of wheat, there isn't very much wheat in this period -- last irrigation of wheat and grain would have been made little earlier.

Q Potatoes?

A No, potatoes were being irrigated. The grain that was there was being irrigated at the time I went through there.

Q All the earlier crops, such as strawberries-- are there many early crops raised in that particular vicinity?

A There are some patches of strawberries, but the strawberry area as compared with the whole area is practically negligible.

Q So as to get clear on this, it is not your idea there is as heavy irrigation the first of September as there is the first of August, is it, is that your idea, it is necessary to have the canal in the same condition the first of September as it is the first of August in order to care for and properly handle the irrigation of that region?

A Absolutely there is no more reason why a canal should not be maintained in good condition even up to the end of the irrigation season, for it is wasteful of the water not to preserve it in good carrying condition.

Q You said something about waste water where the county road crosses the ditch, did you observe whether all of the waste water there was coming from the Upper East Union canal, or whether part of it was coming from the City water works?

A I don't just understand the application of your question. Now, just west of the State road, where the State road crosses the canal, there is a lateral gate, carrying a ditch parallel to the State road southward. That gate was leaking water around the gate, very small stream, not effective as an irrigation supply.

and I have reported that in my testimony heretofore as being waste. Down at the Gillespie lateral there was also a small stream leaking through the gate in this instance. Now, between those two points there is a bad place in the State road itself where the city pipes go along the course of the road, or cross the road, wet and boggy spot there. This water that I speak of getting around the first gate and through the next had nothing to do with that boggy place by the pipe line.

Q You said something about there being evidence of an overflow at the Gillespie gate, what was the condition there?

A The gate was not closed off tight and there was a flow of water coming through the gate., and to the east bounday of the Gillespie land where it divided, part of it running to the north and part of it running to the south and entering the lands that are -- or were one time in the Gillespie ownership. Small stream of water that could not be effectively used in irrigation, and that was running on the first, on the third and on the fifth.

THE COURT: Now, you may proceed with the rebuttal against Provo City.

CALEB TANNER recalled, by the plaintiff, testifies as follows:

DIRECT EXAMINATION by Mr. A. C. Hatch.

Q Mr. Tanner, since Mr. Goddard and Mr. Swan testified with regard to the taking of samples of soil from different places in Provo City -- Provo City's irrigated area including farm land irrigated under the City system, I will ask you if you have made examination of the several tracts of land testified to by Mr. Goddard and Swan in order to determine the quality, kind of soil, and if you have made examinations of the soil of Provo City in the

vicinity where they made examinations and testified with regard to the quality of soil and produced samples in court of the several qualities of soils that they found ?

A Yes, I have made examinations in some of the fields that were specifically mentioned here in connection with the soil samples taken. My work, however, was made largely to show the general soil conditions of the locality rather than the individual field.

Q I call your attention to the question, the final question asked of Mr. Goddard. "Were those samples, Mr. Goddard, in your judgment fairly representative of the localities from which you took them? the question going to all of the exhibits that were introduced in evidence under the testimony of Goddard and Swan. You saw the samples, did you not?

A Yes.

Q And heard their testimony as to the locality from which they were taken?

A Yes.

Q Now, I call your attention to the first, what is known as the Taylor-Roberts, or Roberts-Taylor tract of land.

A I sampled that field in detail.

Q Now, you may state whether or not you found any soil upon the entire tract that was like unto the samples produced by Mr. Goddard and Swan?

A There is at the point marked on the map --

Q What map, refer to the Exhibit.

A 66. The Taylor and Roberts tract occurs in the southwest part, and the point at which the Goddard sample is taken is marked with a cross and the number 5 opposite and is just west of the street running eastward, known as Delong Avenue. There is in the Taylor & Roberts field, west of the end of the Delong Avenue a tract of land on the Taylor and Roberts farm approximately two rods and a half to three rods wide and ten rods long that the poorer portions would fill the description of the soil sample

given in the testimony here.

Q By Mr. Goddard and Swan?

A Mr Goddard and Swan. All the balance of the field--

Q Of how many acres does the field consist?

A If I could have the rule, I could calculate it. It is not marked here. The whole Taylor & Roberts tract is approximately forty acres. This field is approximately 1300 feet long and six or seven hundred feet wide.

Q Describe the nature and kind of soil of the balance of the field other than the thirty square rods maximum that you have testified to, the worst portion of which corresponds with the sample produced in court as an exhibit under the testimony of Messrs. Goddard and Swan?

A Pit No. 1 is marked on the map just south of the ^{dwelling} ~~Exhibit~~ house on this tract. From the surface to two and three-fourths feet is a silty loam, the first foot being dark in color and the balance light in color. Gravel in sufficient presence to stop the penetration of the auger occurring at two and three-fourths feet.

MR. THOMAS: Gravel what?

A Gravel occurring in sufficient presence to stop the auger at two and three-fourths feet. Three hundred feet south of No. 2, marked on the map Exhibit 66, dark, pebbly, silt loam from the surface to three-fourths of a foot; light colored silt loam from three-fourths to two feet where the pebble stopped the auger.

No. 3 marked on the map brown pebbly silt loam from the surface to three-fourths of a foot, then light color fine silt to three feet, containing a few pebbles, then sand material from two to two and one-fourth feet. Pebbles stopped auger at two and one-fourth feet. This pit is about 60 feet northeast of the location given for sample No. 5 by Mr. Goddard, and is the closest pit that I have to his sample pit.

Pit No. 4, brown pebbly silt loam from the surface to one

foot, light colored silt from one foot to two and three-fourths where gravel stopped the auger;

No. 5 being near the southeast corner of the field sandy loam from the surface to one foot. Light silt soil from one foot to one and a half. Sandy material from one and a half to one and three-fourths and light colored silt occurring again from one and three-fourths to two and three-fourths. Fine sand from two and three-fourths to three, where the pebbles stopped the auger.

Thence west three hundred feet to pit No. 6. Brown sandy loam from the surface to one foot. Light color soil from one foot to two and a half. Pebble stopped the auger at two and one half feet.

Thence north three hundred feet pit No. 7. Brown, sandy pebbly loam from the surface to two and a half feet. Light colored clay silt from two and one half to four and one half feet. From four and one half to six feet sandy material, fine texture. Gravel stops the auger at six feet.

Three hundred feet north, pit No. 8; brown and reddish sandy loam from the surface to three and one-fourth feet. Dark clay silt from three and one-fourth to three and three-fourths feet. Brown silt to four and one-half feet. Sandy soil from four and one half to five feet. This pit is about 225 west of the pit described as sample No. 5 in Mr. Goddard's testimony and is the next nearest pit which I made to his sample pit. There is a row of post holes on the ground at the time I was there, running east and west, and occurring a little south of pit No. 8, and extending towards Mr. Goddard's pit No. 5. These reveal --

Q What depth were the post holes?

A Two feet approximately. These pits reveal toward the eastern part of the line the soil conditions described by Mr. Goddard, the soil here being twelve to fifteen inches and composed of a dark

colored silt and sandy loam underlaid with gray sand and gravel.

No. 9 --

Q Just a moment; Mr. Goddard in his testimony said, describing the soil in general, it was a gravelly loam, top soil about ten inches deep and rocky subsoil below, and, as I understood from his testimony, the sample No. 5 exhibited in court was a sample of the rocky subsoil, beginning at the depth of ten inches.

A My observation showed in these post holes that there was as little as twelve inches, that was my minimum observation. I think that there might have been places in that vicinity, a small area if it had been uncovered, which might have shown as thin a soil as ten inches. The gray sand and gravel underlying the surface soil here is practically without any silt or fine material mixed with it. It is a very open, light colored material, the humus being absolutely wanting. It is practically without plant condition, very open, stony soil below the surface there.

No. 9, three hundred feet north, brown sandy loam from the surface to two feet. Lighter colored silt to two and one-fourth feet, where pebbles stopped the auger.

No. 10, three hundred feet north near the north fence from the surface to one and one-fourth feet in depth, brown, sandy loam. One and one-fourth to two and one-half, white silt, fine grained material. Two and one half to three, brown sand very fine. Three to four a clay soil. Four feet gravel material encountered.

Thence west 350 feet to a point near the west margin of this particular field. From the surface to one and a fourth feet brown silt loam. One and one fourth to two feet, brown sandy loam. Two to two and one fourth feet, silt loam, brown and very fine. Two and one fourth to two and one half white clay silt. Two and one half to three feet brown sandy loam.

Thence south three hundred feet from the surface to four and one fourth feet, brown silt loam, more sandy at the bottom.

No. 13, three hundred feet south zero to two feet brown silt; two and two and one-fourth white soil; two and one-fourth to five brown fine silt and sandy silt; five to five and three fourth fine sand;

No. 14 three hundred feet south of the next above from surface to one and a half feet, brown silt; one and one-half to two and one-half feet white silt; two and one half to five and one-fourth, brown silt, streaks of fine sand, auger stopped at five and one-fourth by pebbles.

No. 15, which is near the southwest corner of the field--

Q All of those are marked on the exhibit, are they ?

A Yes. Three hundred feet south of the next above zero to two, brown silt loam; two to five and a half light colored silt with an occasional sandy layer. Pebbles at five and a half feet stopped the auger. This completes the examination of the Taylor field. Now there is a sample described in the testimony of Mr. Goddard as his Nol 6, taken in the Durant field, but it is outside of the irrigation system of Provo City, as I understand it, being across the channel of Dry Creek on lower land and I did not make any investigations outside of what I assumed to be the limits of the city's irrigation responsibility.

Q You didn't examine the Durant tract then?

A No.

Q Now, No. 7 as testified to, what was known as the John Sampson land, is that within the area irrigated from the Provo City system?

A Yes. I only bored two holes in the Sampson tract.

Q Did you find the point where Messrs. Goddard and Swan took their sample from on the Sampson tract?

A My pit is not exactly at the point.

Q At what point?

A That they took their sample. It lies about fifty or sixty feet to the northeast, one of my sample pits and the other lies about three hundred and fifty feet to the south. In the

effort to establish No. 8 being representative of the locality, I connected up by a series of pits the Taylor field with the Sampson field and with the other --

Q That is the Taylor-Roberts field?

A Yes.

Q With the Sampson field?

A With the Sampson field, and carried that scheme north along the general line of the series that were testified to here by Mr. Goddard. My pits don't always come identical with his, but some of them are very near and they connect up with mathematical intervals and not with with judgment determinations. I spotted these pits three hundred feet apart and test the soils as they are there, bored the hole without choosing the spot.

Q From which to select?

A Without choosing the spot from which to select, but letting the three hundred foot interval fall where it would. Those intervals sometimes nearly coincided with the pits shown by Mr. Goddard.

Q Did you examine the pit on the Sampson land from which sample N8, 7 was taken?

A No, I didn't find the pit, and so far as I can identify the place upon the map as it is shown here, my pit is about less than fifty feet northeast of the --

Q Point from which they took the sample?

A Point from which their sample is marked.

Q What did you find?

A That is No. 20.

Q Your No. 20?

A On the map; from the surface to two feet, dark, pebbly sandy loam; from two to three and a fourth feet, light colored silt and silty sand. From three and three fourths to six feet plus -- I had only a six foot auger-- fine sand. This point is three rods south of 6th South Street.

The pit in the extreme south end of the Sampson field I have--

my No. 19--this is a dark brown silt loam with occasional pebbles from the surface to two and three fourths feet. From two and three-fourths to four and one-half it is stiky white clay silt. Pebbles stopped the auger at four and one-half feet.

Q Did you make any further borings on the Sampson tract?

A No further borings on the Sampson tract, but I connected --

Q Did you examine the surface of the Sampson tract is representative as far as superficial observation would determine the two pits in the extreme end of the field are representative of what the field is generally.

Q The two pits you have bored?

A Yes.

Q That you have just testified to. Now, the Peay land, W. C. Peay land, their sample No. 8, did you make any borings on that tract?

A I have No. 21 and 22 on the Peay land that are in the immediate vicinity of their pit No. 8. Mr. Peay's land extends for about twelve hundred feet north and south.

Q That is W. C. Peay?

A W. B. Peay.

Q No. W. C. Peay; W. B. Peay is another, No. 9, their No. 9.

MR. THOMAS: It should be "B", according to my notes.

MR. A. C. HATCH: This is stenographic copy, one is W. C. and the other W. B. on my copy. You say they are both W. B. Peay?

MR. THOMAS: Yes.

Q Very well then, two samples 8 and 9 taken from that tract, their numbers 8 and 9?

A Yes, I have Number 21, 22, 23 and 24 in the same ownership. No. 21 which lies about 175 feet northeast of their pit No. 8. From the surface to four feet --

Q How many feet did you go from their pit?

A 175 feet. From the surface to four feet brown, sandy loam, more

silty at the bottom; pebbles stopped the auger at four feet.

No. 22, three hundred feet north of 21, from the surface to four and three-fourths feet, brown silt loam, light in color, below the depth one and one-half feet. From four and three-fourths feet to five and one-half feet in depth sand. Pebbles stopped the auger at five and one-half feet.

No. 23 three hundred feet north of 22, from the surface to two and three-fourths feet, brown silt loam, lighter color below. one and one-half feet. Two and three-fourths to three and three-fourths fine sand. Pebbles stopped the auger at three and three-fourths.

No. 24 which is very near to Mr. Goddard's No. 9.

Q About how near?

A Apparently forty feet to the northwest or less. This point falls on the south margin of the draining depression that crosses the country there, and extends toward in its course, the west. Associated with this drainage channel both on its banks and in its bed is gravel and sandy drift. That gravel and sandy drift is confined to the bed and margin of this channel, and does not extend but a few feet beyond them either north or south. From the surface to one foot --

Q Just a moment, is that true of the entire W. B. Peay tract?

A It is the only channel in the W. B. Peay tract.

Q Is it the only place in the W. B. Peay tract where the gravel extends far from the surface down?

A Yes.

MR. THOMAS: Just a moment.

Q Did you make a detailed examination of the whole of that tract, Mr. Tanner?

A Went across it north and south, and then went up and down this drainage channel to the fences adjoining on both sides, and this is the only area where depressions occur in the tract, showing this drainage, and the only place where I observed any gravel on the surface. The gravel appears here mixed with silt

and sand immediately on the margin and bottom of the channel. The pit that I dug here from the surface to one foot is a dark loam, from one to two feet a sandy loam, gravel stopped the auger at two feet. The pit was a little distance south of the channel as it occurred on the ground. These marks that I made are only approximate, and from the position I platted mine without reference to the position of the sample pit as marked by Mr. Goddard. The position of No. 9 of Mr. Goddard would seem from this map location to be a little farther south than mine.

Q Your number what?

A My number 24, and in that location the soil ought to be a little better.

Q Now, did you examine the S. B. Merriweather land?

A No, sir.

Q Did you make any pits upon it?

A No.

Q Why didn't you?

A Well, the day closed on Mr. Pierpont's land and by the time I checked by back so as to get my distances correct by measuring to the railroad the day was gone, and that was the only field in that vicinity; it lay in close proximity to the field of Pierpont's and it doubtless is the same type of soil.

Q What did you do as to the Pierpont land, their No. 11.

A No. 11 of the Pierpont land made by Mr. Goddard is toward the north end of the Pierpont tract and toward the west. My pits are numbers 28 and 29. 29 is in the vicinity of 11 and is about 100 feet southeast of 11.

MR. THOMAS: What of pits 25, 26 and 27?

A I am following the directions given me; I can report these whenever they are desired. They are for the purpose of connecting up in fact between the specified fields.

Q Between the Peay field and the Pierpont field?

A Yes.

Q What did you find in those three pits, No. 25, 26 and 27?

A Do you want to go with that end of it?

Q Connect them up from the Peay land and the Pierpont land, if you have the connection.

A Yes, I have the connection. 25 is 300 feet north of 24, heretofore reported in an apple orchard. From the surface to two and one half feet is sandy loam, dark color for the surface, three fourths of a foot. Lighter below. From two and one half to four and one half feet dark soil, which becomes a white silt, very dense and fine toward the bottom. From four and one half to five feet fine sand, pebbles stopped the auger at five feet.

MR. THOMAS This corresponds with what number of Mr. Goddard's testimony?

MR. A. C. HATCH: Not any number, as I understand it is connecting between the Merriweather land and Pierpont land.

A No, it is connecting between the Peay land and the Pierpont land.

MR. THOMAS On whose land was it?

A This is on the Pierpont land, but not in the enclosure, the field enclosure in which No. 11 pit is, and I presume from the previous question they wish to limit me to that particular field. No. 26--

Q Mr. Tanner, I don't wish to limit you only to the general locality covering the final question asked Mr. Goddard. I will read it to you. "Were those samples, Mr. Goddard, in your judgment fairly representative from the localities from which you took them". What I want is an answer to the localities from which all of the Goddard samples were taken and to the testimony wherein you found it to be different.

A I have reported now 25, which is in the south part of the south Pierpont field. No. 26 three hundred feet north--

MR. THOMAS: Just answer the question, Mr. Tanner; I think perhaps we can limit the rebuttal.

A The particular sample taken in the Pierpont field is No. 11 of the numbers reported by Mr. Goddard. The Pierpont ownership

extends for about twelve hundred feet north and south, and No. 11 is in the north end.

MR. THOMAS: Just a moment, I object to this as not proper rebuttal. The question propounded by Judge Hatch has not yet been answered. If it has been answered, I have not got the answer.

MR. A. C. HATCH: What was it?

MR. THOMAS: As to whether or not these samples were fairly representative of the soils described by Mr. Goddard. I think no answer has been given to it.

MR. A. C. HATCH: I think he is answering that right along.

THE WITNESS: I didn't understand I was asked the direct question whether it did or did not constitute a fair representation.

MR. A. C. HATCH: That was the purpose of the testimony only and read Mr. Goddard's answer in order that the witness might confine himself to the subject matter.

THE COURT: I don't understand your objection, Mr. Thomas.

MR. THOMAS: I may be in error, your honor, I understood Judge Hatch twice to ask the specific question, he says now he did not ask it or did not present it as a specific question. He asked, as I got it, if the samples taken by Mr. Goddard were fairly representative of the soil in that locality. As I remember that question has not yet been answered.

MR. A. C. HATCH: That has never been asked.

THE COURT: I did not understand such a question to be asked.

MR. THOMAS: You read Mr. Goddard's testimony twice asking that very question, that is the substance of it.

MR. A. C. HATCH: I stated in that connection, if the court please, what we were wanting was to rebut that statement of Mr. Goddard's by the evidence that we were producing now

in every particular where we could rebut it.

THE COURT: I understand it, objection is overruled, I think it is proper rebuttal.

MR. THOMAS: Exception.

MR. A. C. HATCH: I say except for that answer of Mr. Goddard's we would probably be confined to the identical pit from which you took the samples. That opened it up so that we could go into the general locality and testify as to all of these tracts of land.

Q Proceed, Mr. Tanner, you were giving us 25.

A 25 is finished. 26 three hundred feet north of 25, in the San Pedro right of way. From the surface to one foot, sandy brown loam. From one foot to two feet, whitish silt, auger stopped by pebbles at two feet.

No. 27, one hundred twentyfive feet north of pit next above from the surface to four and one half feet, sandy loam, more silty in composition below two and three-fourths feet.

No. 28, one hundred seventy-five feet north of 27, just over the railroad right of way in Pierpont orchard. From the surface to one and three fourths feet dark loam. One and three fourths to two and one half feet, whitish silt. Pebbles stopped the auger at two and one half feet.

MR. RAY: This is No. 28, Mr. Tanner?

A Yes.

Q Where was that with relation to their sample No. 11 or 12, if you know?

A It is about 340 feet south, No. 29 is, a short distance.

Q Of what, 11 or 12?

A South of their pit No. 11. No. 29 three hundred feet north of 28, and little southeast of their pit No. 11, from the surface to two feet sandy loam.

Q Upon whose land was that?

A Thomas Pierpont. The next field contains, in the set of samples

submitted by Mr. Goddard is No. 12 in the city block, owned by Nels Rasmussen, the sample being taken in the southwestern part of that block.

Q Whose sample, yours or his?

A Their sample No. 12. I have a set of pits made in this tract to determine the character of soil in the field, and pits in the adjacent territory showing the character of soil in the locality.

Q Give them to us.

A No. 30 is located two blocks south of the Rasmussen land. These pits are plotted in the southeast corner of the block. They are not chosen, but each are set in the southeast corner of the block. From zero to two feet brown silt loam. From two to three and a half feet white silt. One block south of the Rasmussen land, No. 31--

MR. THOMAS Where do you strike gravel in these?

A At three and a half feet in No. 30. No. 31 from the surface to four and one half feet, brown silt loam. There is between pit No. 31 and 32, extending the length of the block on the east side of the street a trench line open, the excavation being carried to the depth of two feet below the general surface of the adjacent land. This excavation for its whole length shows in fine grained silt soil.

No. 32 is at the southeast corner of the Rasmussen tract. From surface to one foot, dark loam, from one to one and a half light silt. At one and a half pebbles stopped the auger. Thence west one half block to No. 33.

Q Just a moment there on the Rasmussen land that was their No. 12, can you say whether or not there is any part of that block where the soil is not surface soil that is not more than 8 inches deep?

A There is a small area of this block, but not at the point marked as No. 12 where the soil is thin. The particular part where the thin part occurs being in the northwest portion of the block

There is more than 80 per cent of the block with the soil in excess of 15 inches.

Q Did you examine the identical pit from which they took their sample No. 12?

A Pit 34 is south. 35 is northwest and 36 is east of 12.

Q About what distance respectively are the pits from 12?

A About quarter of a block, hundred feet.

Q You did not examine the point where they took 12?

A The nearest I am to 12 is with 35, and 35 is fifty feet approximately northwest of No. 12.

Q Very well, proceed?

A No. 35 from the surface to three feet is a black clay loam. From three to three and one half feet is a light colored loam. This is the nearest pit to the No. 12. Do you wish me to continue with the balance of the pits on that block.

Q The next is their 13 sample in Mr. Woods' garden.

A I carried a set of pits from the Rasmussen land north to the Woods land. I have three pits, Nos. 43, 44 and 45 in the Woods land, and they are on the eastern, near the eastern boundary of the Woods tract, while the ^{sample} ~~was~~ in No. 13 of Mr. Goddard is taken near the southwest part.

Q West of the Tanner race?

A Yes, all my pits two are west of the Tanner race.

No. 43 in the southeast corner of the Woods tract is sandy loam from the surface to two feet where gravel stops the argue. This is on a knoll which covers a portion of the northwest corner of the southeast corner, and extends westward for a considerable distance.

Going north to 44 from the surface to one and a half feet dark loam, one and a half to four feet, light clay silt, from four to five silt and sand.

No. 45 being near the northeast corner of the tract, from the surface to two and one fourth, sandy silty loam, from two

and one fourth to three feet, dense clay silt, gravel encountered at three feet.

Now, I continued northward to the bank of Provo River to develop the general locality conditions, boring No. 46 and 47 still to the north.

No. 46 from the surface to three and one fourth feet silt loam.

No. 47, which is at the river bed, from the surface to two feet, sandy silty soil when gravel stopped the auger.

Q As I understand you these borings were made at regular intervals?

A Yes.

Q Without regard to the nature of the soil, and none of them were made in selected places

A None of them. They were spotted at different intervals with reference to block intervals, when the blocks were used. When the fields were used with reference to distances in hundreds of feet, even hundreds of feet, and the distances being regular.

Q Do you know where the Abraham Smith lands are situated?

A Yes.

Q West of 5th West street in the northwest part of the city?

A Yes.

Q Did you make some borings or samples?

A I took samples in the locality but not in the same field except one sample, and there is some question as I put it on the map whether that is in the ownership of Smith, although it is very near. I thought it was in his ownership.

Q State what you found there and where it is in reference to their sample 14, if you can.

A No. 64 is about 400 feet east, probably 500 feet east of what one of the Goddard samples is marked 14, and No. 63 is about 400 feet south or almost, east of my pit No. 63.

THE COURT: I think you made a mistake, you say Pit No. 63 is about 400 feet almost east of 63.

A I was east of the second No. 14 of Mr. Goddard. Mr. Goddard has two No. 14's spotted on the map. My No. 64 from the surface to one foot is a black loam silt, from one to two feet a white silt. My No. 63 from the surface to two and one half feet a black loam. From two and one half to four and one fourth feet white silt; from four and one half to five feet a yellowish fine sand.

No. 64 occurs in the natural depression and drainway. Across the country going west from this point I examined the locality south and north. At no point within half a mile north and south of 64 is the soil as shallow as it is at 64, the general depth being in excess of three feet. No pit within half a mile north or south shows a depth of soil as small as three feet. The soil to the west of 64 is on the margin of a natural drainway through the country, and is gravelly, large streams of water in my memory having flowed from Provo River through the channels lying in the section in the vicinity of No. 14 of Mr. Goddard. The soil to the east is uniformly a deep soil. I determined this by a series of pits extending from Mr. Smith's land eastward to the eastern bench, the depth in every case being in excess of four feet, and in most cases being beyond the reach of a six foot auger.

Q Now, in all those tests made near or on what is known as D. O. H. Beans land north of the ice plant road.

MR. THOMAS Leo H.

A That is marked as No. 17, I believe, in the Goddard sample.

Q 15 in the Goddard samples.

A The map seems to show 17 in this tract.

MR. THOMAS: 15 is Mr. Bean's, 17 is Thomas's land.

MR. A. C. HATCH: Who made these marks, Mr. Thomas?

MR. THOMAS: I think Mr. Swan marked them.

MR. SWAN: I didn't mark those, I think Mr. Goddard marked those.

MR. A. C. HATCH: It is marked 17 on this map, there is

no 15 there.

A No.

Q 15 would be then what they have marked at 177

A It is properly marked now.

Q Marked Marcellus Bean's land instead of Leo Bean, it is marked on the plat Marcellus Bean?

A Yes, I have a pit to the west about 250 feet and pit to the east about two hundred feet from the pit 15 of Mr. Goddard. They are numbered respectively 76 and 74.

Q What is the nature of the soil there, what did you find?

A 76 from the surface to two feet, a brown loam, practically free from pebbles; at two feet pebble layer stopped the auger.

74 from the surface to one and a half feet black loam.

The pebbles here stopped the auger at that depth.

In order to show the conditions in that locality I bored pits 73, 75, 77, 78 and 79 which lie in a crescent shape south of the Bean land.

73 from the surface to three and one fourth feet black loam, pebbles stopped the auger.

75, from the surface to three feet a dark silty sandy loam. At three feet pebbles stopped the auger.

77 from the surface to two feet, dark loam. From two to three feet dark clayey loam. Pebbles stopped the auger.

78 from the surface to four feet, dark loam, from four to four and one half feet sandy material.

79, from the surface to two and one half feet, dark, brown loam; two and one half to three and one half feet sticky silt loam, three and one half to four feet, sandy silt, from four to six feet plus, fine gravel and sand in water.

Q Why did you make those borings in a crescent shape instead of straight line?

A The soil type from surface indications changed south of the pit No. 15 in relatively a short distance, and also changed going east at a moderate distance. The purpose was to show what

the facts were a few hundred feet to the south and east of the spot chosen for the Goddard sample No. 15. Provo river runs in the immediate vicinity, being only, its bed being only a few hundred feet away from Pit No. 15, and the areas in the immediate vicinity and along the margin of the streams are generally speaking more gravelly in their character and shallower in their depth than the soils that lie a considerable distance away from the channel, so that the area of thin, shallow soil is confined in this part of Provo city's area to a relatively small tract of country. All of the soil lying to the south of the street ax that we call 14th North, or that forms the south boundary of the Bean land is deep soil, All of the soil lying to the east of City creek and eastward to the margin of the bench is deep soil. The shallow soil is confined to that small tract of country that is approximately 700 feet on the base of the triangle, and approximately 700 feet on the west leg of the triangle.

5:15 P. M., Recess to 7:30 P.M.

CALEB TANNER - - - - -

DIRECT EXAMINATION By Mr. A. C. Hatch continued.

Q I think you quit at No. 47.

MR. RAY: 79 was the last he gave.

A The next succeeding pit reported by Mr. Goddard is marked on the map No. 16.

Q 16 is Amasa Penrode land, clay on top soil about one foot deep and sandy clay subsoil?

A I did not make any test pits in the vicinity of No. 16. The facts reported by Mr. Goddard in that section from examinations I have made in the tract before this particular examination are representative of the soil type there, except that the soil body is very deep. The channel of a branch of the East Union canal

runs east of this land, and has cut down into the soil to a depth of seven to ten feet. I have a boring in the same vicinity of the city irrigated area, and lying considerably farther to the south, the pit in question being about a quarter of a mile south of Mr. Goddard's No. 16 and lying between the two branches of the East Union canal.

MR. RAY: What is it numbered on the plat?

A The number on the Plat Exhibit 52 is 19. The soil there is approximately six feet deep and has heretofore been reported. That is the only pit I have in that section, that is within a quarter of a mile of the pit. I have my numbers 70, 71 and 72 on Exhibit 66, which are the next nearest pits in the vicinity 69, 70, 71 and 72.

Q The next is R. T. Thomas's land, Number 17.

A The log of the holes are as follows:

No. 69 from the surface to two feet black loam, from two to six feet plus, white clay, with a few pebbles scattered through it.

No. 70, zero to one and one half feet, black silt; one and one half to three feet, white clay; three to five and one half feet, yellow clay; five and one half to six feet plus, fine yellow sand?

71, from zero to two feet brown silt loam; from two to three and three-fourths feet yellow sandy loam; from three and three fourths to four feet gray sand, gravel at four feet.

72 from the surface to one and three fourths feet brown silt; one and three fourths to five feet light colored clayey silt sticky; from five to six feet plus yellowish sand, mushy wet. No. 17 of Mr. Goddard's pit is located in the field of Mr. Robert Thomas. I have a set of pits, 108, 109, 110, 11, 112 in this field. The mark of the pit on the plat does not seem to correspond with the description in Mr. Goddard's evidence. I intended to locate my line of holes exactly in line with his pit 17. They appear on the plat a little south.

The log of these holes is as follows:

Just west of 108 a short distance are a series of deep excavations made in the soil covered by the operations of the brick plant, located for many years in that vicinity. They expose a soil layer to the bottom of these excavations six feet in depth, and the fine textured clayey soil which is farther down than this.

No. 108 shown on Exhibit 66 from the surface to three feet is brown loam, from three to six feet plus a yellowish silt clay at one and one half to three feet in this pit a few scattered pebbles occur in the soil. Thence 300 feet east to pit 109. From the surface to two and one half feet brown loam; two and one half to six feet plus yellowish gray silty clay; from the surface to two and three fourths feet a few pebbles occur mixed with the soil cover.

Thence east 150 feet to pit 110, from the surface to two and one half feet. brown loam; two and one half to four and one half feet brown silt; four and one half to six feet, yellowish white clay silt.

Thence east 150, pit 11, from the surface to one and three fourths feet brown loam, sandy at the bottom, pebbles stopped the auger at one and three-fourths feet.

Thence east 150 feet to the Upper East Union canal. Pit 112 is located in the northeast corner of the Thomas field, 110 feet below the East Union canal. From the surface to one and three fourths feet, pebbly brown loam, one and three-fourths to three feet fine silt silt, grayish brown. Stones stopped the auger at three feet.

The general soil conditions in this locality are a deep soil at a distance from the canal ranging from practically nothing at one -- at Pit 113 to two or three hundred feet in the neighborhood of Mr. Goddard's pit Numbers 17 and 18. This area where the East Union canal swings in a long curve to the

west is on the alluvial cone or delta of Slate canyon, and fingers of gravel reach out even beyond the line of the canal. They are limited in their extension westward, but, as I have said generally don't invade that territory west of the canal more than two hundred and fifty feet at the maximum.

The log of hole 113 is from the surface to three feet brown loam with pebbles. From three and one half to six feet plus clay silty soil free from pebbles.

These are all of the pits taken in the immediate location of Mr. Goddard's No. 17 and 18.

In this locality to the northward the same general facts of an irregular invading finger of gravel occurs as far as the Mental Hospital. North of the Mental hospital the soil is generally a deep soil. I have six pits located in the area within half a mile of the Mental Hospital, and ten located within a radius of a mile from the hospital. These pits show soil the minimum of which is an excess of three feet.

Q Just a question there. Did you at any point on the R. T. Thomas survey find ~~any~~ ~~soil~~ the top soil gravelly except as to the fingers which you have spoken of and to a depth of twelve inches open gravelly sub soil below that depth?

A Except for these narrow fingers I found no such soil as that except right against the canal. For a distance out from the canal the soil is shallow. Where is No. 19?

Q No. 19 is E. B. Suttons, south of the county infirmary. The State Mental hospital land is similar to R. D. Thomas. No. 19 was on the E. B. Sutton, that was similar to the State Mental Hospital and the Thomas land. No. 20, James Gray, east of the county road about thirty rods.

A Pit.No. 20, I don't have any pit in the immediate vicinity of No. 20. My nearest pit is located about 550 or 600 feet to the west of No. 20. The same general facts that I have reported occur also here. It is along the alluvial cone of Slate Canyon.

The gravelly condition of the soil at No. 20, as to its relative thinness is true, but it is not representative of the locality, ^{as} is shown by the soil types and depths lying a little farther to the west. The soil at the two red dots unnumbered, which lie to the west of No. 20, show the soil in both instances a fine grained silt and silty clay to a depth in excess of six feet without pebbles, and that condition extends also to the westward. I have also in the locality -- no, I have here one of Mr. Goddard's pits No. 21 that is located to the north of his 20, about a quarter of a mile, something less. That is also directly under the Upper East Union canal, is near to the canal, and as I have heretofore reported the soil conditions there are irregular. The gravel fingers that have been swept down from Slate canyon are observable here and there, crossing the canal line, and invading the territory to the west. I have two pits lying to the west -- three pits lying to the west of No. 21, being bored along the margin of the tract of land in the ownership of Provo City. These pits are unnumbered. The first two nearer the State road have a soil of a depth in excess of six feet. The one farthest is a sandy soil some pebbles occur in that pit at a depth of six feet.

Q That is all of those; now, did you make further tests or further borings with regard to the termination of the locality and the nature of the soil in the locality or vicinity of these pits testified to by Mr. Goddard and Swan?

A I made a great number of additional borings, but not in the immediate vicinity. I have reported those that are near or at the points of observation reported by Mr. Goddard. I made a great many other borings farther distant.

Q Have you made any borings between the two points. As I understand you made borings and have testified to the lands lying to the west of the city and the north of the city and to the east of the city, that is the platted portion of the city.

A Yes.

Q Now, have you made borings intersecting them running either north and south or east and west?

A Yes.

Q To show the general quality of the land between these several points?

A I bored a set of holes beginning approximately two blocks south of the platted part portion, or what would be 8th South along 5th West up to the proximity of the Best land.

Q North of the city?

A North of the city on 14th North.

Q Did you make any other line or boring?

A I bored a set of holes on 3rd East from 6th South to 8th North. I bored a set of holes along 5th North from the vicinity of Pit No. 13 of Mr. Goddard, eastward to within a block of Academy Avenue. I bored a set of holes on 8th West, from 8th West north to Center street, which I have not made any detailed report concerning. I bored a set of holes--

Q Beginning at what point south of the street south on 8th West?

A 8th South to Center street. I bored a set of holes from the Smith land No. 14 of Mr. Goddard's testimony east to the East Union canal.

Q Have you the log of that set of holes last mentioned?

A Yes.

Q Are they numbered on the map?

A They are numbered from 65 to 72. I have reported all but 65, 66, 67 and 68.

Q Give us those?

A The log of 65 from the surface to two feet, black loam.

MR. THOMAS: Let me ask is this in the vicinity of the holes or pits dug by Mr. Goddard, testified to by him?

A No. 65 is approximately 700 feet east of Mr. Goddard's pit No. 14.

MR. THOMAS: Object to this as not proper rebuttal.

THE COURT: Objection overruled.

MR. THOMAS: Exception.

A From the surface to two feet, black loam; two to four feet white silt; from four to four and one half feet, yellow fine sand, some pebbles. pebbles stopped the auger at four and one half feet.

66 from the surface to two feet black loam; from two to three and three fourths feet stiff white clay; from three and three fourths to five and three fourths feet black and gray and mucky clay, gravel stopped the auger at five and three fourths.

67 from the surface to two feet black loam; from two to three feet black clay; from three to four feet white clay; from four to five and a half feet, gray muck. Gravel at five and one half feet.

68 from the surface to one and one half feet, black loam from one and one half to four white silt; from four to six plus; black clay.

Q Now, the holes that you bored on the west, how far are they from the the pits made by Mr. Goddard and testified to by him?

A Mr. Goddard's pits from No. 5 to 11 lay in the general north and south direction. My series on 8th West located about 1500 feet parallel to and farther east.

Q Give us all of these borings?

A Beginning at the extreme south, or approximately 8th West and 8th South, pit 118, from the surface to one and three fourths feet, brown loam; from one and three fourths to two and three-fourths feet, white clay silt; gravel encountered at two and three fourths feet. 119--

Q Give us the distance apart of these, and if they are regular in the distance.

A These are spotted exactly a block apart and fall on the southeast corner of the block.

119 zero to two feet, brown loam; heavy pebbles stopped the auger at two feet.

120 from the surface to two feet, brown loam, sandy, containing some pebbles. Pebbles stopped the auger at two feet.

121 from the surface to one and one fourth feet, brown loam; from one and one fourth to two feet, white silt; from two to three feet, sandy loam.

122 from the surface to one and three fourths feet, brown loam; from one and three fourths to two and one fourth feet, white silt, sticky; from two and one fourth to two and three fourths feet yellowish sandy silt. Pebbles at two and three fourth feet stopped the auger.

123 surface to two feet brown loam; from two to three and half feet white clay silt; from three and one half to four feet, yellowish fine sand. Pebbles stopped the auger at four feet.

124 from the surface to one and one half feet brown loam; one and one half to two and one fourth feet, white clay silt. Pebbles stopped the auger at two and one fourth feet.

125 from the surface to one and three fourths feet brown loam, sticky near the bottom; one and three fourths to two feet, white clay silt. At two feet pebbles stopped the auger.

That brings that series up to No. 30 which I have heretofore reported in connection with the Rasmussen tract. I bored a set of holes parallel to this set lying 1500 feet to the east extending from 8th South to 14th North.

Q You may give us those, logs of those.

MR. THOMAS: What is the distance, Mr. Tanner, from 8th South?

MR. A. C. HATCH: To 14th North.

MR. THOMAS I will interpose my objection to this, if the court please as not being proper rebuttal.

THE COURT: I don't understand just your objection.

MR. THOMAS: It is not proper rebuttal, he is now describing or attempting to describe conditions of soil 1500 feet-- Mr. Tanner?

THE WITNESS: 1500 feet from the preceding. Some of the lower end of the pits are near some pits reported by Mr.

Goddard.

MR. A. C. HATCH: Our theory of this is that it appears --
I don't say it is --

THE COURT: I think I will hear from Mr. Thomas.
If I understand the object of the evidence given by Mr. Goddard
this would be clearly rebuttal. I don't know that I do. I don't
get your theory, Mr. Thomas, exactly.

MR. THOMAS: If the court please, I have stated all I
have to state in the objection. Mr. Goddard and Swan made
twenty-one soil tests, and these tests and examinations of Mr.
Tanner are made thousands of feet away from them. I don't
remember Mr. Goddard's testimony as covering this area, and if
it does, of course this testimony is clearly rebuttal. My
memory serves me it is not.

THE COURT: I had supposed, at least I took it
from your introducing that evidence, that the object of it was
to give the court information with reference to the character of
the soil in this city.

MR. THOMAS: I withdraw the objection.

THE COURT: And not confined to the particular points
at which they were made. You asked Mr. Goddard if they were
not typical or representative of the soils in this locality.
That being the case this is clearly rebuttal. If, however, you
want to confine them to just that particular point they would
be of no value to the court and consequently would not require
any rebuttal. If I understand the objection it is withdrawn.

MR. THOMAS: I withdrew the objection, your honor.

A Beginning with the most southern of the pits on 5th West, numbered
on plat on Exhibit 66, 117 from the surface to two and one half
feet, brown sandy loam, containing some pebbles; from two and one
half to three and one half feet white silt mixed with fine yellow
sand.

Then a block north to pit 116, from the surface to three feet

brown sandy loam with pebbles, more sandy at the bottom, pebbles stopped the auger at three feet.

Thence one block north to pit 100, from the surface to one and three fourths feet, brown silt loam, pebbles stopped auger at one and three fourths feet.

Thence north one block to pit 101, from the surface to one and a half feet, black loam; from one and a half to three feet brown dense silt.

North one block to 102, from the surface to four feet fine grained silt. Pebbles stopped auger at four feet.

North one block to 103, from the surface to three and three fourths feet loam and silt soil; pebbles stopped auger at three and three fourths.

North one block to 104, from the surface to three feet, fine textured soil. The pit was not carried beyond this depth. However, no obstacle to the penetration of the auger was encountered.

One block north to 105, from the surface to two and one half feet soil; at two and one half feet gravel stopped the auger.

At 106, a block north, from the surface to two and three fourths feet, soil; auger stopped by pebbles at two and three fourths feet.

Thence north one block to pit No. 55, from the surface to six feet, sandy silt loam. The first one and one fourth feet dark, thin reddish brown. At five and one half the soil is sandy.

Thence North one block to 56, from the surface to four and one half feet, light silt loam, brown in color for the first foot and a half, reddish in color for the balance of the depth. Pebbles stopped the auger at four and one fourth feet.

One block north to 57, from the surface to one and a half feet, brown silt; from one and a half to two and three fourths

feet reddish silt; from two and one fourth to two and three fourths feet white silt; from two and three fourths to three and one fourth reddish silt, when pebbles stopped the auger.

58 being one block north of the last given, from the surface to two feet, brown silt; two to two and three fourths feet white silt.

Thence north one block to 59.

MR. THOMAS Did the gravel stop at two feet there?

A The pebbles stopped the auger at two and three fourths feet.

59, from the surface to one and three fourths feet, brown dark silt; one and three fourths to four feet, white silt, sticky; from four feet to four and one fourth feet fine sand. Gravel stopped the auger at four and a fourth feet.

Thence one block north to 60, from surface to two and one fourth feet, black clay loam, from two and one fourth to four and one half white sticky clay, gravel stopped the auger and at four and a half feet.

Thence north one block to 61. From the surface to one and a half feet black silt; from one and a half to two feet dark clay; from two to five white clay; from five to five and three fourths sandy silt. Water at five feet.

Thence north one block to 62. From the surface to two feet black loam; from two to four and a half feet white silt; pebbles stopped the auger at four and a half.

Thence north one block to 63, which I have heretofore reported; soil to a depth of five feet.

64, which I have heretofore reported, soil to the depth of two feet.

Thence north one block to 65. Let me recall that -- to 82.

MR. THOMAS: From 64?

A Yes, from 64 one block to 82. From the surface to two and one half feet black loam. Pebbles stopped the auger at two and a

half feet.

Thence north one block to 81. From the surface to two and one half feet, black clay loam; from two and one half to three feet sand and fine gravel.

Thence north one block to 80. From the surface to three feet, dark brown loam. Pebbles stopped the auger at three feet.

79 has been heretofore reported in connection with the Bean tract.

I bored a lines of holes on 3rd East from 8th North to 6th South, beginning with No. 84 on the map.

MR. THOMAS: Mr. Tanner, let me ask on what street that was?

A On 3rd East beginning at 8th North.

Q Just give us the log of those.

A 84, from the surface to two and three fourths feet° brown sandy loam; two and three fourths to five and a half feet, sandy material, containing a fair number of pebbles at three and one half feet. Pebbles stopped the auger at five and one half feet.

85, from the surface to one foot brown loam, from one to one and three fourths feet thin yellowish silt, pebbles stopped the auger at one and three fourths feet.

Thence one half block east to pit 86. From the surface to two and one fourth feet, brown loam; from two and one fourth to two and three fourths feet dense yellow silt; pebbles stopped the auger at two and three fourths feet. Let me withdraw that.

MR. THOMAS: The whole of 86?

A No, I just wish to amend; I have left out a little part. From two and three fourths to three feet fine yellow sand. Pebbles stopped the auger at three feet.

Then back to 3rd East one block south to 87. Brown loam from the surface to one and a half feet. Pebbles stopped the auger at that depth.

Thence south one block to 88; brown loam from the surface

to one foot; yellow silt from one to two feet. Pebbles stopped the auger at two feet.

Thence south one block to 89; from the surface to two and one half feet, brown loam. Pebbles stopped the auger at two and a half feet.

South one block to No. 90. From the surface to ten inches brown loam. Pebbles stopped the auger at ten inches.

South one block to 91. From the surface to one and one half feet, brown loam. Pebbles stopped the auger at one and one half feet.

Thence south one block to 92. From the surface to two feet brown sandy loam; from two to two and one half feet yellow sand. Pebbles stopped the auger at two and one half feet.

Thence south one block to 93. From the surface to one and a half feet, brown loam. Pebbles stopped the auger at one and a half feet.

No. 94 one block south; from the surface to one and three fourths feet brown loam; one and three fourths to five and one fourth feet yellow silt.

Thence one block south to 95. From the surface to one and three fourths feet brown loam. From one and three fourths to three and one half feet sticky silt; from three and one half to five feet yellowish and white clay. Pebbles stopped the auger at five feet.

Thence south one block to 96. From the surface to one and a fourth feet brown sandy loam; from one and a fourth to three feet yellow fine sand, pebbles stopped the auger at three feet.

Thence south one block to No. 97. From the surface to two and one fourth feet. brown sandy loam; from two and one fourth to three and one half feet fine yellowish sand. At the bottom of this hole a layer of very fine silt occurs. Gravel stopped the auger at three and a half feet.

Thence one block south to No. 98. From the surface to two and one fourth feet brown sandy loam; from two and one fourth to

three and one fourth feet brown fine sand; from three and one fourth to three and three fourths white silt; from three and three fourths to four and three fourths yellow-ish white sand, fine. Pebbles stopped the auger at four and three fourths feet.

Thence south one block to No. 99. From the surface to one and one half feet brown sandy loam; from one and a half to three feet, yellowish silt, sticky; from three to four white silt muck. Pebbles stopped the auger at four feet.

Scattered somewhat irregularly in the area to the north and east -- north and west of the Mental Hospital are a series of holes beginning with No. 126.

Q Borings made by you .

A Yes.

Q Give us those?

A No. 126--

Q Locate that as nearly as you can, the land that it is on.

A About one fourth north of the Mental hospital, and directly adjacent to the East Union canal.

MR. THOMAS May I interrupt. Mr. Tanner, sometime ago you referred to the Upper East Union canal; did you mean the Upper East Union or East Union canal when you are referring to the cone, alluvial cone near the southeast corner of that map?

A I meant the East Union. The upper East Union is not platted here.

MR. THOMAS: I thought you did, and I should have called your attention to it at the time.

A It was an error if I said so. These pits, the first two or three, were only carried to ground water. The notes don't show the condition of the -- the texture of the soil below that point.

No. 126 is in loam soil, and is thirteen inches to ground water.

No. 127, which lies to the northwest of 126 in a field marked State Mental Hospital, being four hundred feet northwest of the pit next above, the fine textured loam soil to ground

water is four inches.

128, which lies about 350 feet northeast of 127, near the north boundary of the field marked Elizabeth Saxey, fine grained loam soil, ground water at two feet.

No. 129, which is northwest of 128, about 500 feet, near the southern boundary of the field marked Edmond Dugdale, fine grained clay silt soil from the surface to two feet three inches, where ground water occurs. The soil in this pit is yellowish clay below one and one half feet.

No. 130 is just over the East Union canal, being northwest of 129, and near the south boundary of the field marked Hyrum Thorup. From the surface to three feet a light color yellowish silt. The auger used for this hole was only three feet long. No obstruction appeared within that depth.

No. 131 lies practically west of 130, in the eastern part of the field of Eber Rawlins. The type of soil is identical with that uncovered in No. 130.

132 is near the north end of 7th East street about one block south of the point where the East Union canal crosses 7th East. From the surface to one foot, sandy loam; from one to two feet yellowish clay silt; at two feet the pebbles stopped the auger.

South along this street about one block to 133. From the surface to one foot sandy loam. Deeper the soil becomes light colored silty material, fine grained to a depth of seven feet, the depth to which the hole was carried. Ground water occurs at two and three fourths feet.

No. 134 is two blocks south of 133, from the surface to one and a fourth feet sandy loam; from one and a fourth to two feet yellowish clay silt, at two feet white granulae of clay occurs. Ground water at one and one half feet.

One half block south of pit 134 is pit 135. From the surface to one and a half feet dark clay loam; from one and one half to two and one half feet yellowish clay; from two and one half to three feet whitish smooth grain clay. No ground water at

three feet.

136 lies east of 135, approximately ^{ly} two thirds of the distance from 7th East to the East Union canal. It is in the field marked M. E. Kartchner. From the surface to one foot sandy loam; from one to three feet yellowish fine silt clay. Ground water at two feet nine inches.

137 is in the same field, situated about three hundred feet farther east. From the surface to one foot clay silty loam. Ground water occurs at fourteen inches. The soil cover extends beyond the depth of the auger.

No. 138 is on 7th East and 1st North, practically at the intersection. From the surface to one foot sandy loam, the sand being rather coarse grained and gritty. Yellowish and fine loam at two feet, yellowish sandy material inclined to whitish at three feet, growing somewhat coarser below that depth. The depth of the hole is three feet. Ground water occurred at two feet six inches.

Q When were these borings made, the last ones to which you have testified?

A These borings were made in 1915, about July 26th. The other points spotted on this map that are not numbered have the details reported in the exhibit of soil samples which I prepared and were presented to the court in the hearing in September.

Q That completes the list and number of the borings that have been made by you in the vicinity of the pits testified to by Mr. Goddard and within the Provo city irrigated area?

A Yes.

CROSS EXAMINATION By Mr. Thomas.

Q The last borings you referred to, Mr. Tanner, were those on the swamp land, that you said were made in 1915?

A The first two, No. 126 and 127 are in the wet pasture land of the Mental Hospital. The balance of those borings that I reported are on farming land.

Q By farming land do you mean those lands that are used for pasture purposes?

A Agricultural purposes, crop purposes other than pasture.

Q Are they the lands that have been redeemed by draining?

A In none of the lands that are examined by these pits with the exception of the few in the field of Kartocher. That field is cultivated to crop of potatoes and corn, but there are drain ditches that render it fit for that purpose. If the drain ditches were not there it would be like the adjacent pasture area to the east where the ground water is practically at the surface.

Q That entire area which you have just described as having the ground waters approximately near the surface, is that territory that has been heretofore designated as swamp lands, and which had to be drained, is it not?

A Let me get that.

Q Let me reframe the question, You have just described certain borings as having been made through lands where the ground water was comparatively near the surface, which prevented you making-- north and west of the aslyum in those borings water was very near the surface, isn't that territory the country designated as the swamp land that had to be drained here by Provo city.

A In the country that I reported as to the two borings, the Kartocher tract I have just now spoken of which is very near to the pasture area of the hospital, to the east, was being irrigated by surface irrigation on the 23rd day of July, when I made the examination in 1915.

Q Was water running upon the ground at the time --
water

A Irrigation, was running from the East Union canal and irrigating that tract.

Q Have you made borings or examination of that soil at any other time?

A Yes..

Q When and where?

- A I have examined the soil there a number of times passing over those fields. The drain ditches and the irrigation ditches that intersect it cut into the country and reveal the top soil which can be observed as you pass over the field, and I am familiar with the country and have been for many years so that my examination, while never heretofore as intimate as the particular observation that I have described, I have had a general judgment as to the character and quality of the soil there for many years.
- Q But have you before this time, have you made any borings to ascertain the depth of soil and character of the subsoil?
- A No.
- Q Directing your attention, Mr. Tanner, to the first part of your testimony, when did you make these borings that you have testified to on the Taylor & Roberts land?
- A December 5, 1916.
- Q In making your tests and your borings, you followed the general northerly direction, did you not, on the Taylor and Roberts land?
- A Yes, practically north.
- Q And then you turned a little to the northeast, did you not? in a general northeasterly direction?
- A No, I went as near north as I could go to the center of the street and then appreciating that going through the orchards that I might have got off the line I checked by pacing to the railroad and then marked the position at which I came out on Center street, and that shows that I had not veered from the true north and south line.
- Q When you got up as far as the boring No. 29?
- A Yes.
- Q Didn't you divert then to the -- digress to the northeast?
- A No, that was the termination of the day.
- Q And your next borings were in a northeasterly direction from 29, were they not? A. Yes.

- Q And they were about three or four blocks to the east and about three blocks to the north?
- A Yes.
- Q Then you began your examinations on the next day, December 7th ?
- A Yes.
- Q About December 7th, 1916? A. Yes sir.
- Q Then you proceeded in a northerly direction, did you not?
- A Yes.
- Q And then diverted again to the northeasterly direction, that would be true, would it not, from 47 over to about 64?
- A The actual progress of the work chronologically is contained here in the numbered series.
- Q I assume that Mr. Tanner, but then I am following the general direction of the area investigated and I am right, am I not, in say from 47 you digressed in a northeasterly direction to about 64?
- A No, I digressed to 48.
- Q And then you proceeded easterly then along 5th North street?
- A Yes.
- Q But your investigations along from 45, 46 and 47 took you in the old bed of the Dry Creek, did they not?
- A Dry creek goes across there.
- Q And the entire area of your investigations was in an old bed of the creek, the lines of which are more or less distinctly marked, is it not ?
- A No, I never saw but one well marked natural channel, and that I have ~~heretofore~~ heretofore described in the Peay land.
- Q But the general area that you have traversed in your borings constitute largely the bed, the old bed of the stream, isn't that true?
- A No.
- Q Isn't that the course, or one of the old courses of a branch of the prove river at sometime in the past?

A The only evidence I saw of a stream way is the one I have reported in the Peay land.

Q That is in part of the area, is it not, that I have just mentioned?

A Yes. No, that line nor --

Q It is right on that line, isn't it, Mr. Tanner?

A Near No. 24 of my borings.

Q And extends a distance farther north than that, doesn't it?

A There are some channels, traverse channels moving toward the west there.

Q And in those very channels you found the richer deposit than beyond, did you not?

A No, that is the shallowest place that I found.

Q And that is the richest part you found too, is it not?

A No, I won't say that.

MR. A. C. HATCH: I don't understand what you mean by richest.

MR. THOMAS: I think Mr. Tanner understood.

Q Now, following that old Dry Creek, of that old bed, you extended your researches along north and up to the Provo River, along much the same old bed line, did you not, Mr. Tanner.

A No, the stream channel that I observed there had a general westerly course, and the line of borings was almost true north, and the river itself, where I intersected it had almost a westerly course.

Q I am referring to the old bed and old creek bed in which you made your investigation?

A I observed no such thing.

Q You didn't carry your investigation and your borings to a point east of the Peay land to any distance, did you?

A I bored another set of holes, but it was fifteen hundred feet westerly.

Q Just where were they bored, Mr. Tanner?

A On 8th West.

Q Going down here to this territory by the Taylor, you made no investigation of the land east, immediately east of that?

A I didn't make the set of borings east and west across this territory, but a set of borings were made by a representative of the plaintiff in this action, and I presume before the close of the case will be presented. I did not desire to duplicate that work, but I know that a line of borings was extended from the Taylor land straight across the country to the East Union canal, being spotted very much as I have indicated in my work, definite mathematically distances apart.

Q Now, directing your attention to the examination that you made on the Taylor & Roberts land, you referred from time to time to dark pebbly silt loam, just what do you mean by the pebbly loam?

A Great many of our surface soils contain quite an admixture of fine material, pebbles or more or less frequency. If the pebbles are in great number the soil somewhat dense or fine grain, it is not practical to penetrate them with an ordinary steel auger. The presence of a few pebbles or small pebbles don't make such resistances as to stop the auger's penetration. I should say that pebbly soil was a ~~spa~~ soil in which the stones might compose of the weight from one per cent to fifteen to twenty per cent. They would be all pebbly soils, but the pebbles in one instance being much more plentiful than in another. These soils on the Taylor tract that I have spoken of as pebbly loam soils had a fair admixture of pebbles.

Q To what per cent would you say, twenty per cent?

A No, except probably at isolated spot or two, right opposite the DeLong Avenue, where a selected sample from the surface of the soil might reach twenty per cent.

Q Then you don't differentiate between pebbly soil and gravelly soil?

A Yes.

Q Are the terms different?

A Yes, a gravelly soil is a soil in which the amount of fine grain

material is very small compared with the bulk of the soil.

A gravelly soil, as I would describe a gravelly soil would be made up of more than half, from half to two thirds by weight of the coarser material, sand and gravel pebbles.

Q Where you refer to pebbles having stopped the auger do you mean the soil was not to exceed twenty per cent in bulk of gravel or pebbles?

A No, the probability is in the pits immediate opposite DeLong Avenue in the Taylor & Roberts field, the pebbles which stopped the auger there were a great deal more pebbles and sand -- the coarse material was in its presence in a higher per-centage than twenty. As a matter of fact, it was a gray sand and gravel and was not a soil at all.

Q And it would be such soil as would be generally described as gravelly soil, would it not?

A If that soil was exposed to the surface and had mixed with it a fair amount of humas I would describe it as a coarse gravelly soil, but as it is, lays in the field there under the surface, it is not a soil, it is simply a sand and gravel deposit.

Q It would be what would be designated as a subsoil of gravel, would it not?

A Yes.

Q And what throughout this case has ^{generally} been described as a gravelly sub soil?

A Yes.

Q And the whole of that land that you have examined there was wanting in humas, was it not; didn't you so designate?

A That below, yes.

Q So that the land that you have described as pebbly, if it were on the surface, probably you would say was gravelly soil, would you not, this soil which you have designated as pebbly would, if

- it were on the surface, be designated by you as a gravelly soil?
- A No.
- Q Then you make the distinction between pebbly soil and gravelly soil one of per cent purely?
- A Oh, the field conditions have considerable to do with the designation. I would not describe any of that soil on the Taylor tract as gravelly soil, any portion of it. There are some portions of it that have a fair admixture of pebbles in the surface layer.
- Q Then do I understand your designation of gravelly soil that soil which is so limited in bulk, in soil particles and contains such an excess of stone as to be utterly unfit for the raising of vegetation at all?
- A It would be a poor and meager product from such a soil. It is a soil in which the fine grained material and humus is wanting, and is not present in amount. In some instances 30 per cent to 40 per cent, the balance being very coarse.
- Q Under your general designation then you found no gravelly soil in any of your borings, did you?
- A On the Taylor tract?
- Q Yes.
- A No.
- Q Did you find any gravelly soil, as you determined it, on any part of your borings north of the Taylor tract on the first or second date of your examination?
- A Yes.
- Q Whose soil was gravelly?
- A Pit No. 17, located just north of the --
- Q That is your pit?
- A Yes.
- Q Your pit No. 17.
- A Just north of this pit there is an area of gravelly soil. It surrounds a two story adobe building which is adjacent to the line of pits. The distance across this gravelly soil tract

extends from a point 100 feet north of Pit No. 17 for a distance of 250 feet. The soil would not penetrate except just a very little in the surface, six inches or so in the loose surface for this distance.

Q Whose land was this on, I don't seem to have a note of 17, Mr. Tanner, was that on the Sampson land or purant?

A It is on the land marked Mary Ross.

MR. RAY: I don't think 17 was given in at all.

A There possibly was a few of those holes along that line omitted in this connecting link, there are probably a few of those holes between the Sampson land and Taylor land that were omitted.

Q I didn't have them, I was wondering if I had made an error. Now, on the Taylor --

MR. A. C. HATCH: He could give the log of those two, 17 and 18 now, with your permission.

MR. THOMAS: Very well, Judge, it is all right.

A The log of No. 17--

MR. RAY: 16, 17 and 18.

A The last hole in the Taylor land is No. 15. No. 16 lies three hundred feet north of No. 10 of the Taylor tract. From the surface to one and a half feet brown sandy silt loam, some pebbles; one and a half to three feet whitish silt, pebbles stopped the auger at three feet.

No. 17, three hundred feet north of 16, from the surface to one and a fourth feet brown sandy loam; one and a fourth to two and a half feet whitish silt; from two and one half feet to three feet brown sandy loam. Pebbles stopped the auger at three feet.

At one hundred feet north from 17, the south edge of a rocky knoll on which is located two story adobe house built at the point three hundred feet north of No. 17. At three hundred feet north of 17 is the north edge of the rocky knoll. The auger at this point penetrates the surface one and one fourth feet in

pebbly, sandy loam.

Thence north to No. 19, fifty feet north to No. 19.
From the surface to two and three fourths feet --

MR. RAY: You gave us 19.

A Yes, it has been given, that is right.

9:15 P. M. Recess to 10:00 A.M. January 24, 1917.

CALEB TANNER - - - - -

CROSS EXAMINATION by Mr. Thomas continued.

Q I want to direct your attention to the map Exhibit 66, you note those parts that are colored yellow. I think the direct testimony was to the effect those portions colored yellow upon that map indicated a clay deposit. Do your investigations verify that, that there is more of clay in that than in any other part of the city, the platted area rather?

A That location of the three bodies there shown in yellowish color are generally clay types of soil.

Q What investigation did you make if any in that, that is lying immediately to the west of that center clay spot, and marked Plat B?

A I bored this line of holes on 3rd East throughout the length of the city, and another line of holes near the eastern margin of the yellow colored area on 7th East. I also have pit No. 264, which has been given in my preceding testimony, located between those two lines of borings.

Q Now, I want to direct your attention again to the Taylor & Roberts tract of land, Mr. Tanner, and immediately to the west and running through the southwest corner of the Taylor & Roberts tract, marked John T. Taylor. here; I will ask if you followed this line marking the course of an irrigating ditch?

A I know there is an irrigating ditch running through the tract, I

was not far from that ditch with pits No. 6 and No. 7, probably thirty or forty feet east.

Q State if you found this ditch to be running to the east and to the south on the southwest corner of the Taylor tract to run around the hill or knoll or elevation there?

A No.

Q Was the land upon which pits 14 and 15 were marked on a level with the other tract or substantially so?

A Substantially so, the tract slopes to the south, is irrigated from the south, is a very well prepared and comparatively level field.

Q Then you would say that southwest ~~the~~ corner on which your pits 14 and 15 are indicated was not higher than the rest of the ground?

A No.

Q Is it a fact that this ditch rather circles that knoll like eminence here upon which you have marked 14 and 15?

A No, there is a small ridge that extends eastward beginning at a point about a hundred feet east of the ditch in question, and extending to the street going north and south. That ridge is the ~~only~~ one upon which the post holes were dug that I described yesterday. It is the strongest and practically the only irregularity in the whole enclosure.

Q Directing your attention to that line immediately to the west of the west boundary of the Taylor tract, and I will ask you if that line moving irregularly to the northwest does not mark the edge of a little bluff, or the end of the eminence there down which the land slopes toward the lake?

A There is a small bluff to the west approximately in that location, but from my knowledge of the country I would assume the irregular line to be about the location of Old Dry creek channel, which is a little to the west of the bluff.

Q Now then following that Old Dry Creek channel, I wish you would indicate generally its direction on that map through to the river?

A I cannot do that, I am not sufficiently familiar with the detail of its course.

Q Isn't it a fact that many of these investigations which you made are in the bed of that old Dry creek channel?

A No, I crossed the Dry Creek channel, the old Dry Creek channel at some point between 24 and 26, as I remember the Old Dry creek channel. Now, the depression and channel course which I described near No. 24 may have been in the distant past the course of Dry creek, but the Dry creek crossing, as I remember, across this line of borings was farther to the north.

Q Didn't you find one of those old time channels, either river channel or overflow channel which is still now marked by a depression in your investigation?

A Yes, that was at No. 24.

Q That is on the Pierpont land, is it not?

A On the Peay land.

Q Or Peay land. No. 20 is on the Pierpont land?

A Pierpont land.

Q Now then, following that course of your investigation, isn't it true, you followed in the main the old bed, or what was at one time and old bed of an overflow channel of the river.

MR. A. C. HATVH: If the court please, that has been answered five or six times, and object to continuing that repetition of that question.

THE COURT: If this has reference to the same line of holes that was referred to in the former question that is true. I know Mr. Tanner has been asked that question a number of times and he said no, but I am not certain it referred to the same line of experiments. There are a number of different series of experiments made. He may answer this if it has reference to some other series than those heretofore referred to.

A As I understand the question it is the same line of holes, first line of holes that is in the question, and I have heretofore answered that by saying it was not along the course of a natural

channel, but across the course of Dry Creek at a point between 24 and 26, Dry Creek from that point being wholly to the west of the line, southward in its course, southward to the lake, and westward and wholly to the east of the line from that locality in its course eastward and northward to the river.

Q With reference to that row of post holes that you say you found on the Taylor and Roberts tract, you found them on an average of two feet in depth?

A Yes.

Q I haven't a complete note here, Mr. Tanner, as to just the condition of the soil. I wish you would refer to your notes and give me again that character of soil you found in those post holes?

A This row of post holes showed a soil cover from twelve to fifteen inches thick overlaid with gray sand and gravel.

Q In what way did that gravel differ from the pebbles which you found in other portions of that tract?

A It may have been the same. The auger was not penetrating the sub surface deposit of soil and gravel where the auger holes were bored. I could not tell its color, but it was in sufficient presence to stop the auger. It might have been gray sand and gravel at the depth that the auger penetrated, or it might have been a large single pebble bedded in rather compact soil that stopped the auger.

Q How large an auger did you use in your investigations?

A Two inches in diameter.

Q You were not able to tell in your borings how large a pebble would from time to time stop your auger in its boring, were you?

A No.

Q It is possible then in boring as you did that you might have struck the edge of a stone of considerable size and slipped past those larger stones into a looser formation again?

A Yes, but a sample of the looser formation would be brought up on withdrawing the auger.

Q Would you say the investigations that were made by Mr. Swan and Mr. Goddard and the samples of soil which they produced in court were not fair samples found at the places they have indicated where it was taken from?

A On the Taylor & Roberts tract, I think that was a fair sample of the spot. I was not at the exact spot on the Sampson field. It was a fair sample of the Peay, No. 14 -- No. 9 of Mr. Goddard at the spot. No. 5 was not at the identical place.

Q You made no investigation upon the Durant land to the west of the Taylor & Roberts tract?

A No, that was down adjacent to Dry Creek, and the water plane there is very close to the surface.

Q Are you familiar at all with that Durant tract.

A The borings made on the Durant tract will be presented by--

Q I am asking you if you are familiar with that Durant tract?

A Only in a general way. I know the water plane is very close to the surface below the margin of the hill.

Q Isn't there is a little ridge or finger of gravel along the west edge of that Durant land at the east end?

MR. A. C. HATCH: I don't understand that question.

MR. THOMAS: The witness, I think does.

MR. A. C. HATCH: West side of the Durant land at the east end.

MR. THOMAS No, I corrected it and said the east end, Mr. Swan corrected me and said east.

MR. A. C. HATCH: I don't understand it yet. The question would be, isn't there a finger of the gravel at the west end --

MR. THOMAS: At the east end of the Durant tract.

A The east side of the Durant tract, I have practically along that line only a few feet from the Durant land three pits, No. 11, 12 and 13. These don't show gravel. The soil cover there is at the minimum more than two feet and a half deep.

Q Didn't you find the gravel at the surface there?

A No.

- Q On your pit No. 20, I wish you would describe that soil which you have indicated as being dark, pebbly sandy loam?
- A That is what I have endeavored to do in that description. There is in that surface two feet of soil, and admixture of pebbles. They are not in sufficient number to resist a rapid and easy penetration of the auger. The total weight of the rougher material compared with the finer grained material I would estimate at the point in question to be approximately 7 per cent. That would be coarse enough to stop on a hundred mesh seive.
- Q Your auger, however, would not bring up many of those stones that had a seven per cent admixture, would it?
- A Brought up every stone. It was a clean out hole for the two feet. It was a clean out hole down to the depth the auger reached. The material had a sufficient admixture of fine grained material so that it did not cave. If you have a large presence of stones with a relatively small admixture of silt the ground runs and the hole is obliterated.
- Q In what way would you say that your investigations more fully describe the Peay land on your holes 21 and 24 both inclusive, than that given by Mr. Goddard on his examination No. 9; wherein he described the land as being coarse soil and gravelly from the surface, becoming more open with depth.
- A That is the description as I remember for No. 9, that is not the description for No. 8. I have four holes --
- Q I am in error there. There is a correction or mark over figure No. 9, what I was reading from, Mr. Tanner. If I sayd from 8 with reference to Mr. Peay's land, it should be No. 9.
- A As I have heretofore remarked Mr. Goddard's No. 8 is more representative of the tract than Mr. Goddard's No. 9. Mr. Goddard's No. 9 is taken, as I have heretofore described, from the immediate margin of the channel, and that channel in its bed and bottom is gravelly, and is the only gravelly material found in

the whole course across the Peay land. It is stoney even on the surface. The soil is thin, and it is only a fair description-- that description of No. 9 in the immediate vicinity of the channel in question, the bed and bank of that channel.

Q How wide is that channel, Mr. Tanner?

A Well, it would be in the neighborhood, the channel's irregularities there would be in the neighborhood of a hundred to one hundred and twenty feet.

Q Where do those channels extend?

A Extend to the westward coming in ^{from} the eastward.

Q Where do they come in from the Eastward, from what river or what part of the canyon do they come down?

A I never traced them out, I couldn't answer that by personal knowledge.

Q Isn't it true there are a number of those channels running across Provo city in different places?

A Yes.

Q And isn't it true those channels have come from Slate canyon and Stone canyon as well as from the Provo canyon?

A From my general knowledge of this locally, this channel, in my judgment was one of the channels of Provo river.

Q Isn't it true there are channels which have made their way across this general tract of land from Slate canyon and from Stone canyon as well as from the Provo canyon proper?

A No, I think that in this particular section that the only natural channels that traverse this part of the Provo city area are channels from Provo river and the main channel from Provo river in this particular area is what I have known and described as Dry creek, sometimes called Big Dry Creek, it had its head up near the Smith land, near pit No. 14 of Mr. Goddard, and followed in an irregular course southwesterly down to what we describe as Spring lake, an arm of the Utah lake.

Q The bed of this Old Dry creek which you have described traverses

- diagonally the Peay land, does it not, for about 80 rods?
- A Well, it traverses that, I wouldn't be certain as to the distance it traverses this tract of land.
- Q Isn't it true, Mr. Tanner, that those old channels have left irregular and uneven deposits ~~ms~~ of soil upon the land which you have examined?
- A There are irregularities of soil and deposits in the immediate vicinity of the channel.
- Q And very marked irregularities?
- A Yes.
- Q And that is true of all the other channels which have come down from Rock canyon and from Slate canyon, is it not?
- A Yes, a great number of them.
- Q And the very fact those channels have made those irregular deposits has produced an extremely irregular surface through the whole of this Provo area, is it not true?
- A No, sir.
- Q Would you undertake to say there is comparatively even depth of soil throughout the whole of this area?
- A No, I wouldn't say that.
- Q Isn't it true that the fingers which you described yesterday as coming down from the east side established the fact there are uneven surfaces in the east as well as in the west of the Provo area?
- A Yes.
- Q And that those gravel extend for considerable distances from the canyons down through toward the lake?
- A Yes.
- Q That those old channels have left irregular deposits of silt and have left large bodies of gravel in many of the cultivated areas of Provo city?
- A Yes, that is true.
- Q Would you say those fingers of gravel which you described as extending about 250 feet from the eastern slope would extend

only that distance?

- A No. That is in the area from the Mental Hospital southward to the mouth of Slate canyon. At the exact mouth of Slate canyon a little bit either way the tearing power of the current has sent the gravel from there to the west. For instance, in all ^{of} the distance from the northeast corner of Provo city where the road turns south, the State road turns south to Springville, the soil is fine grained soil until you get right opposite the mouth of Slate canyon. It is gravelly there, extending across the road and then a little distance from there to the south it clears of gravel, and is then deep soil clear to the Bullock land.
- Q You found the Pierpont land to be uniformly shallow, did you not?
- A The Pierpont land particularly on the north side is shallow soil, little deeper toward the south side.
- Q Isn't the Merriweather land little to the east of that?
- A Yes.
- Q You made no investigations there?
- A Yes.
- Q On the Rasmussen land, did you follow the old ~~bed~~ bed of Dry Creek in your investigation?
- A The Rasmussen land is located near the old bed of Dry creek, as I remember it.
- Q Did you make any investigation of the land to the west and north west of the Rasmussen land?
- A Not at this time.
- Q Are you familiar with that location?
- A Generally.
- Q What can you say as to the gravelly condition there on the land to the west and northwest of the Rasmussen land, and immediately adjacent thereto?
- A This land in the vicinity of the Rasmussen tract, and particularly north, northeast and southwest is very irregular. A short distance takes you very comparatively thin soil to deep soil. there are a great many gravelly knolls, ridges and bars ^{Water made}

in this area. It is the maximum or irregularity of soil conditions that I observed in this vicinity.

Q Didn't you find gravel at any point on the Rasmussen land within thirty inches from the surface?

A I have so reported that I found soil conditions on the Rasmussen land that compared to what was reported by Mr. Goddard, but not at the exact spot reported by Mr. Goddard. The gravelly part of the Rasmussen land is in the east side of the block and the thinnest soil is in the northeast corner.

Q Are you familiar with the place marked by Mr. Goddard as No. 13, James Wood garden, north of 5th North, your investigations there I think were No. 43, 44, and 45.

A Yes, I know the Wood tract very well.

Q With reference to his No. 13, where was your No. 44?

A No. 44 is about 450 feet northeast.

Q Where is that with reference to the Old Dry creek bed?

A The Old Dry creek bed lies to the east as I remember, about two blocks.

Q You found the soil there deeper than any other point, didn't you?

A That is the deepest soil that I found in that immediate locality.

Q Was the soil there -- I will withdraw that question-- the soil in the other parts of that tract you found to be very shallow, did you not?

A No. No. 43 is a relatively deep soil.

Q You found gravel within two feet?

A I should say 45-- I beg pardon, it should be 45 instead of 46.

Q You found gravel there within three feet?

A Yes.

Q And did you make any investigation from that corner where you made your investigation No. 45 through to the north to the Smith tract, the Knudson tract and Warner, the Knudson, Warner and Smith tracts?

A I made some investigation in the Warner tract, but only two in

the Knudsen tract.

Q Didn't you find a very gravelly condition there?

A No. No. 46 is in the Knudsen tract. The soil is three and a fourth feet deep.

Q What are the indications of gravel there on the surface?

A There are occasional ridges of gravel as you approach the river.

Q Now, you find a number of those gravel fingers extending all through that land, do you not?

A There are occasional gravel patches in that land, knolls and ridges.

Q Do you find these occasional fingers of gravel upon the Warner, Smith and Knudsen tracts?

A Yes.

Q On the Bean tract you have a gravel formation within two feet of the surface according to your investigation, Mr. Tanner, referring to your investigation No. 76.

MR. A. C. HATCH: Is it within or at?

THE WITNESS: At two feet.

Q Didn't you find considerable admixture of pebbles and gravel in the surface there at 76, that is on the Bean land?

A My note here, this is a brown loam, practically free from pebbles. There are in the Bean land and in the adjoining land, an admixture of pebbles, variable in its amount found in the surface soil in that whole area north of the State road.

Q You found the whole of that area comparatively shallow and the gravel bed very easily reached, did you not?

A Yes, that is what I would describe as a shallow soil.

MR. A. C. HATCH: I didn't understand that, describe the two feet of depth of the shallow soil.

A That tract was what I would describe as a shallow soil. There was more than a single pit in this area.

Q The whole area north of the State road.

- A The whole area north of the State road and west of City creek, in my judgment, as far as I know it, is shallow soil.
- Q With reference to Mr. Goddard's investigation No. 17 where were your investigations 69 to 72 inclusive.
- A These pits lay approximately quarter of a mile to the south or a little more.
- Q Just withdraw that last question. Your investigations 109-9-10-11 and 12 were in that area that is marked on the map Exhibit 66 as being in the clay district, weren't they?
- A Yes.
- Q You found the heaviest of clay deposits in that neighborhood?
- A Yes, there is a deep body of clay there.
- Q The same is true of 110, 11 and 12?
- A No, the clay doesn't appear in 11 and 12.
- Q You referred to the fringes of gravel near the East Union canal yesterday. You found those fringes of gravel near the upper end of the canal?
- A No.
- Q At what point?
- A The gravel comes in on the adjacent irrigated land near the point "A" of the word "plat" on Exhibit 66.
- Q Plat D, Mr. Tanner?
- A Plat D, and is present in the eastern course of the canal over to about Sixth East, comes in again in the adjacent irrigated land south of the Mental Hospital and occurs then in this fringe or fingering condition in the whole of the distance where the canal moves in a crescent shape around the delta or alluvial cone of Slate canyon.
- Q Why didn't you make investigations and determine the soil depth in that neighborhood?
- A I did.
- Q I understood you to say yesterday that you made no pits in the immediate vicinity of this James Gray land, which is in the very neighborhood there, isn't it?

- A The James Gray land, I have a pit just across the road from it.
- Q What is the number of that pit?
- A I don't have the number on the map here, but I know the soil is more than six feet deep.
- Q Locate that last named pit, Mr. Tanner, with reference to the county road.
- A It is practically on the west side of the county road.
- Q And right in that clay belt ?
- A No, no,-- yes, right in the margin of the clay belt in this vicinity. I have a pit No. 115 outside of the clay belt, and pit 113 outside of the clay belt. I think I have reported heretofore both of these pits. 113 shows a soil in excess of six feet, and 115, as I remember, in excess of three feet. I would like to modify 115 and put that four and three quarters feet.
- Q Instead of six?
- A No, instead of three.
- Q You found the soil conditions or the soil depth to be somewhat shallow in 118 and 19 to 125 inclusive, did you not?
- A Well, they ranged from the soil depth of minimum of two feet to a maximum of four feet.
- Q Where did you find the four feet maximum?
- A 123.
- Q That is correct, on your examination along 5th West you found a very gravelly condition?
- A No.
- Q At what point did you find soil greater than six feet or to six feet, except in 55?
- A There are several holes along 5th West where the soil was beyond the depth of the auger. I don't recall the numbers. There was a great many pits along that line. The pits to the south of Center street show soil conditions inferior to those to the north of Center street. That general separation can be made.
- Q You say from the south of Center street you found what?

- A The soil conditions are shallower in the pits to the south of Center than they are to the north of Center street.
- Q At 57 on 5th West and 3rd North at what depth did you find gravel?
- A At three and a quarter feet.
- Q Would you call that deep soil?
- A That is soil of good depth, probably wouldn't be called a deep soil, but it is soil of good depth.
- Q with only one and a half feet of brown soil?
- A Yes, that soil there is a superior soil. It is a brown silt on the top, then a reddish silt two and one fourth feet and dense white silt which makes an excellent subsoil at two and three fourths feet.
- Q At put 80, that is on the Warner tract?
- A Yes.
- Q You found that containing very heavy admixture of pebbles, didn't you ?
- A No, there are pebbles on the surface of the ground, but they are not in great number at this point on the Warner tract.
- Q You found a very shallow condition, shallow surface soil from 89 -- 88 to 99 inclusive?

MR. A. C. HATCH: I think that is covered by his answer, all of that soil to the north of the State road and west of City creek.

- A Yes, generally speaking the line of borings on 3rd East down to Center street show generally shallow stoney soil. South of Center street the soils are deep.
- Q From 84 to your 92 inclusive of 3rd East would you say that the soil found there would be fairly indicative of the soil west of that tract or west of that point through to 5th West?
- A No.
- Q Wherein would the change occur, if any?
- A It would be fairly indicative of the soil west to the Mill race, or west to the break of the hill that traverses Provo City, leav-

- ing the Mill race about a block to the east at Center street.
- Q That description of your covers a large portion of Plat D and Plat A, does it not, as platted on this map?
- A It traverses portions of Plat D and Plat B.
- Q And also Plat C?
- A And Plat C?
- Q And Plat A?
- A No, I wouldn't be just exactly sure, I don't know just the limitations of Plat A.
- Q Here you describe as Center street marked here, where would be the limitations of this soil investigation as you have just described it?
- A Well, it might be a small area off the northeast portion of Plat A.
- Q Have you ever seen any of the excavations made for sewer, telephone or any other purpose here in the hearth of the city, or near Center and Academy Avenue?
- A Yes.
- Q Seen a number of excavations withⁱⁿ the last year, haven't you?
- A Yes.
- Q Aren't the descriptions which you have given as to shallow soil upon this tier just described as containing the pits 84 to 99 inclusive fairly indicative of the land that you have found right here in the heart of the city?
- A Fairly indicative of the excavation I have seen north of Center street on Academy Avenue up as far as 7th North.
- Q How far to the west of Center street -- west of Academy Avenue, pardon me?
- A To the break of the hill or the Mill race.
- Q Mr. Tanner, wouldn't you say that that same gravelly and shallow soil condition would extend as far west as fourth West in Plat A?
- A No.
- Q Yet on your investigations one block farther west than that you

found a very shallow condition of soil. Your auger was stopped in many places at three feet, why do you make a difference between 5th West and 4th West?

MR. A. C. HATCH: Just a moment, we object to the question as assuming on the part of counsel that three feet is a very shallow soil. The witness has not at any time so stated.

THE COURT: I think it is apparent how shallow three feet of soil is, just three feet deep, I don't think the assumption hurts anything particular.

A There are some of those holes on 5th West, as I recall south of Center, showing a depth of three feet or a little less, but I don't recall any north of Center until you get to about 10th or 12th North where as little as three feet occurs again.

Q Now, directing your attention to your investigation 126 to 135 and 138 inclusive, Mr. Tanner, I think you said you found there water level in some instances as near as two feet to the surface?

A I think I reported one pit as four inches.

Q Four inches, that is 127?

A Yes.

Q Where is that with reference to the East Union canal?

A Marked on the map.

MR. A. C. HATCH: I think that was all gone over last evening by counsel on cross examination, one of the first matters he took up.

THE COURT: Questions were asked in relation to it, the witness was cross examined with relation to it, as I remember, about 150 feet from the East Union canal.

Q Is there any land irrigated from the canal above this point of investigation, that is between your point of investigation and the canal?

A Yes.

Q Was irrigation in progress at the time you had made your investigations?

A. No.

Q The irrigation was upon the land which you were then boring on?

A No.

Q I did ask you last night if they were irrigating the land at the time, or I intended to, at least that was the idea I had in my mind, if they were irrigating the land at the time you made these investigations, and I think you said they were. Now, I may have misunderstood you?

A You misunderstood me in that particular field.

Q Was any irrigation in progress in that vicinity and between the point of your investigation and the canal proper?

A Not actually in progress there, but there was a field being prepared for irrigation by the irrigator, and there were evidences of irrigation on the tracts lying between 127 and the canal, the field marked Elizabeth Saxey. I am not sure what field is owned by the gentleman, but the field owned by Mr. McEwen who lives in the eastern part of the town. The first name I have forgotten.

Q Did you make any investigation of the land owned by the State Mental Hospital near the canal, Mr. Tanner?

A I have no pits on the Mental Hospital ground except 126 and 127.

Q Those are on the Saxey land?

A Those are on the pasture areas to the north. I have no pits on what you describe as the agricultural land of the Mental Hospital, although pit 112 is near the canal and only the fence divides the Thomas field from the Mental Hospital agricultural land.

Q Did you make any observation as to the condition of the soil there of the State Mental ground near the canal?

A No, except in a general way. I have been familiar with the area generally speaking for a number of years, and have many times made excavations at a point about one block north of 112 at the point marked Section corner.

Q Did you find the soil there to be gravelly?

A It is a soil that would be described as an occasional pebble on the surface; it is soil of fair depth at that point.

Q What do you say as to the surface conditions east of that section corner?

A My judgment and my memory would say they were comparable to what I have heretofore described in the area to the south on the Thomas land. That is an occasional finger of gravel from Slate canyon has run out beyond the margin of the canal bank, out into the land, and then as you get nearer the hospital ground or the Hospital buildings, you get very close to the mountain Talus itself, and that tends to develop a rougher soil condition that ordinarily obtains.

REDIRECT EXAMINATION By Mr. A. C. Hatch.

Q Mr. Tanner, from your investigation what do you say as to whether or not the several exhibits introduced with the testimony of Mr. Goddard and Swan were fairly representative of the locality from which they were taken, that is, representative of the soils?

A No.

Q They were not?

A They are not.

Q Would you say that they were selected samples or taken for the purpose of evidence or otherwise?

MR. THOMAS: Object to that as improper redirect, calling for a conclusion of the witness. The court is able to determine better than the witness .

THE COURT: Objection sustained, you are asking for the motive which actuated them.

FREEMAN TANNER called by the plaintiff, being first duly sworn, testifies as follows:

DIRECT EXAMINATION By Mr. A. C. Hatch.

Q What is your full name?

A Freeman Tanner.

Q Where do you reside?

A Provo.

Q What is your occupation?

A Engineering.

Q Have you made any investigations of the soil, depth, quality of the soil, in the vicinity of Provo City?

A I have.

Q When?

A I don't remember the exact day, I haven't those dates down. It was in the forepart of September, as I remember.

Q Last year? A. Yes.

Q How did you make the investigation, by boring or digging pits.

A By boring solely.

Q And where were they made?

A They were made--

MR. THOMAS: Just a moment, Mr. Tanner, I now wish to enter an objection to this testimony as being not proper rebuttal. The plaintiff in its case in chief did on the 7th day of June, through its witness Mr. Wentz, and on the 12th day of June, through its witness Mr. Wheelon introduce evidence covering soil conditions and soil surveys of Provo City. That matter was then gone into quite extensively, made investigation to determine the duty of water and also the various soil conditions throughout the tract in question. This testimony must of necessity be similar if not identical with that testimony which was introduced in chief.

THE COURT: I will hear from you, Judge Hatch, as to your theory of this matter.

MR. A. C. HATCH: The question was asked yesterday of Mr. Cabel Tanner why he did not make a set of borings across the south end of the city, and counsel seemed to feel he had not done his duty in that regard, and this testimony is simply to show that there were borings made the entire length across

the south end of the city and show what they were. We don't care for it and will not insist upon it.

THE COURT: Very well then.

MR. A. C. HATCH: And it was to meet counsel's objection we had not done it that we brought this witness here who did it. If you don't want it we will withdraw the witness.

THE COURT: I take it he doesn't want it because he objected.

MR. A. C. HATCH: Very well, I stated what it was, and withdraw the witness.

MR. THOMAS: Now, I wish to move to strike out the testimony of the witness Caleb Tanner, and the whole of it, on the same ground.

THE COURT: The motion is denied.

MR. THOMAS: Exception.

THE COURT: You should have made your objection to it at the time.

MR. THOMAS: I don't understand, your honor, I am barred from the right to move to strike out the testimony of the witness.

THE COURT: No, you are not barred of the right to move to strike it out, but the court will not sustain it on that ground. You are not entitled to have it sustained.

MR. A. C. HATCH: We have one other witness in this rebuttal of Provo City, Mr. Barrett of Salt Lake; he could not get here at this time, but we can have him here tomorrow morning if the court should be in session at that time. That is all.

NEWELL J. KNIGHT recalled by the plaintiff, testifies as follows:

DIRECT EXAMINATION by Mr. A. C. Hatch.

Q I will ask you, Mr. Knight, you are the same witness who testified

to water running to waste at the lower end of provo City in this trial? A. Yes sir.

Q Since you formerly testified have you made further investigations as to the waste of water, or whether or not there was any waste of water below Provo City, and from the city system?

MR. THOMAS Just a moment, object, if the court please, as not being proper rebuttal.

THE COURT: This is a preliminary question whether he has made some investigation. I don't know what it is going to lead to.

A Yes sir.

THE COURT: If it is directed to the time or near the time testified to before, it will not be proper rebuttal.

MR. THOMAS: Then may I ask a few questions on cross examination to determine?

THE COURT: Not at present.

Q When were these latter investigations made?

A On the second and fourth of September, as I remember.

Q Of last year?

A Of last year, yes sir.

Q Who, if anyone was with you?

A Mr. Stratton.

Q What Stratton?

A John Stratton and Charles G. Johnson.

Q I will ask if you at that time found any water running to waste from the provo City system?

THE COURT: Now, you may cross examination.

A Yes sir.

MR. THOMAS Just a moment.

MR. A. C. HATCH: Answer may go out.

THE COURT: Yes.

CROSS EXAMINATION By Mr. Thomas.

Q Mr. Knight, was this a part of the same investigation you and Mr. Stratton and your associates made before?

A I don't know whether you would call it a part or not. Our previous, our investigations before that were earlier in the season, about August 3rd.

Q And also August 27th, weren't they?

A Yes sir, and August 27th, then again on September 2nd and on September 4th.

Q They are part of the same general series of investigations.

A Well, we investigated in the same way.

Q And part of the general investigation that you made?

A I suppose you would call it a part. It was very similar investigation and only a few days later, 27th and said second of September are pretty close together.

MR. THOMAS: I object to this, if the court please, not being proper rebuttal.

THE COURT: I am inclined to think so, Judge Hatch.

MR. A. C. HATVH: Our theory of it was this, if the court please. We made out case, that is, established our rights, then Provo City established its rights, or attempted to, and we think we have a right to rebut anything they made have said in regard to their use of the water. Now, if we have already been over it in rebuttal we are now barred. If we have not, I think we have a right now to rebut it after they were through with their testimony. The other rebuttal, the court please, was Provo Bench. Witnesses were called in behalf of Provo Bench and introduced by Mr. Ray and testified. Now, we have not had either of these witnesses on except in matter of rebuttal of Provo City's claim.

THE COURT: If that be true, Judge Hatch, this evidence was brought out by Mr. Ray on behalf of the Provo Bench, the objection will be overruled, and you will be entitled to go into it. The mere fact Mr. Ray went into it for his clients

of course in no way would bind or affect you . Until you suggested and spoke of it, I was of the impression it came out in your case, but since you speak of it, I think it was all introduced by Mr. Ray.

MR. A. C. HATCH: I will ask the witness has the Provo bench heretofore called you to testify in its behalf in this case?

A Provo Bench?

MR. A. C. HATCH: Provo Reservoir Company.

A No sir.

MR. A. C. HATCH: I didn't remember we had ever had him.

THE COURT: You may examine further.

Q Haven't you spoken to your counsel about having this testimony presented.

THE COURT: I don't care to hear anything about the discussion between this witness and his counsel.

MR. RAY: We certainly do object to that, your Honor.

THE COURT: Objection sustained. The only question in the mind of the court is as to the condition of the record. If this matter was gone into by the plaintiff in anticipation of your defense they have precluded themselves from going into it now in rebuttal, but if, as Judge Hatch has presented, and as I now think the situation is, this matter was not gone into at all by the plaintiff, but was gone into by Mr. Ray in behalf of the defendant Provo bench Canal, then they are entitled to go into it.

MR. THOMAS: I recall your Honor Mr. Ray had these witnesses testify, then we introduced the testimony in rebuttal as to that.

THE COURT: Yes.

MR. THOMAS: And, as I remember, the plaintiff took a very active part in the cross examination.

THE COURT: That won't make any difference.

MR. A. C. HATCH: I don't remember cross examining the

witness at all.

THE COURT The matter will not be argued further. The question is overruled. I remember distinctly this matter came up after the summer adjournment or vacation, and I didn't remember the plaintiff's case, presentation of it, extended to that time. Objection is overruled, the plaintiff not having gone into it at all, they are entitled to go into it on rebuttal.

MR. THOMAS: Exception. I would like to ask if this will preclude Provo City from introducing any evidence now as to these days that were not presented.

THE COURT: Yes, you went into that fully, introduced your evidence on that subject.

MR. THOMAS Not as to those dates, it is another period brought up.

THE COURT: very well, you may offer the evidence when presented, and I will not rule upon it now, because it would be merely a moot question at this time.

(Question read)

DIRECT EXAMINATION By Mr. A. C. Hatch continued.

Q On what date, the second of September?

A Yes sir.

Q About the quantity, aggregate quantity, if you have it?

A About forty second feet.

Q And did you make any report to the court commissioner or to others with regard to it?

A Yes sir, we asked the water commissioner for more water at that time.

Q And by reason of the water running to waste from Provo City?

A Yes sir.

Q I will ask whether or not you received additional water in the Provo pench canal by reason thereof at that time?

A Yes sir.

CROSS EXAMINATION By Mr. Thomas.

Q Where was this water going to waste?

A There was about five second feet through the Scott farm, and what has been designated in this trial as Old Dry creek or tributary from that.

Q Let me ask if you know whether or not the Old Dry creek is part of the Provo system?

A Yes sir, I think so.

Q Was that Big Dry creek you have reference to.

A Big Dry creek or Old Dry creek, it has been called by both names.

THE COURT: I didn't get the amount going to waste.

A About 5 second feet.

THE COURT: That was through the Scott farm?

A Yes. And about five second feet in the Second Ward pasture which would be on 10th West, I believe. About 7 second feet in the South Meadow which would be on 5th West. About 15 second feet in the First Ward Pasture, down the Factory race. Now, there is another ditch between the Scott farm or Old Dry creek and the Carter farm that runs south through there on 6th South, there was a stream there of about four second feet which was also running down through the country there to waste on the morning of the second of September at about four thirty or five o'clock A. M.

Q Was that all?

A Yes sir.

Q Where was the other four feet.

A Well, at Carter's farm water that we figured came from the Tanner race about two second feet. That is all I have. I thought that totaled forty second feet.

Q Where did you say that two second feet came from?

A Out of Tanner's race we supposed.

Q Didn't you make any investigation?

- A This at the Carter farm is a way down in the southwest corner of the city, and as I understood the City's testimony, that did not come out of their system.
- Q Just describe things as you found them, not as your understanding of the testimony of the city.
- A We found that at the Carter farm and we traced it back up this way until we figured that it came out of the Tanner race.
- Q Did you see it come out of the Tanner race?
- A No sir, it came through the field off in the southwest of the city.
- Q Then you don't know whether it came out of the Tanner race then or not, as a matter of fact?
- A That particular stream I don't know I could swear came out of the Tanner race, but I can swear it was going to waste into the rushes into the southwest corner of the city.
- Q Five feet through the Scott farm; five feet through the Second Ward Pasture; seven feet through the South Meadow, fifteen to the First Ward Pasture and four feet between the Scott farm and Carter farm, and two feet at the Carter farm in the southwest corner of the city?
- A Yes sir.
- Q Do you know whether or not the city has any irrigated land west of the Scott ditch?
- A Well, I don't know as I do know just exactly where their west line is.
- Q At what point did you see this water going to waste in the second ward Pasture on 10th west?
- A We seen it right at the Second Ward Pasture, ^{gate,} ~~ix~~ ~~go~~ about 20 feet north of the Pasture gate on the east side of the street. That went over the sill. There is a head gate in there, and I believe Sam Jeppson owns a piece of ground on the east there and it was pouring over that sill, and we followed it for a quarter of a mile below ~~by~~ the Pasture gate clear down into the rushes below all irrigated lands.

Q How long did you remain there?

A Oh, we were there probably twenty minutes or twenty-five. We turned our car around right at the pasture gate, then got out and measured the depth of the water in the stream and looked at the sill, and estimated there was about five second feet going over that sill, and followed that down until it was way below any irrigated land, could not be used on land without being pumped back up, because it was below all the land.

Q Why didn't you testify to this before, Mr Knight.

MR. RAY: I object to that as irrelevant and immaterial, if your honor please.

THE COURT: Objection is sustained.

REDIRECT DIRECT EXAINATION by Mr. A. C. Hatch.

Q I neglected to ask about the fourth of September. You say you made an examination on the fourth of September.

A Yes sir.

Q And were the conditions on the fourth of September practically the same as you found them on the second?

A Yes sir.

Q As to the waste of water?

A Yes sir.

REGROSS EXAMINATION By Mr. Thomas.

Q What were your figures on the fourth of September?

A 40 second feet.

Q Give me the figures segregating them?

A As to right where we found the water?

Q Yes.

A In the particular ditches?

Q Yes.

A At the Carter farm, southwest of provo city, six second feet, Scott farm about five second feet, South Pasture six second feet;

South Meadow seven second feet; First Ward Pasture, sixteen second feet.

Q How did you measure this water?

A We didn't measure it at this time, we estimated it.

Q Did you estimate it on the second of September?

A Yes sir.

Q You never did measure the water at any of your investigations, did you?

A Yes, I believe we reported having measured as near as we could the depth of water that was going over certain sills and the width on the sill. I have forgotten those figures exactly.

Q How far up did you follow this water to determine whether or not it was being used up above?

MR. A. G. HATCH: Object to that as irrelevant and immaterial whether it was being used above.

A We found it going to waste--

THE COURT Just a moment, I don't just understand the question. Do you ask how far up he followed to see whether this water they found down there was being used above?

MR. THOMAS: No, let me withdraw the question.

Q How far up did you follow this stream to determine whether the water was being used or not?

MR. RAY: What water?

MR. THOMAS: The water in the stream.

MR. THURMAN: You mean down the stream.

MR. THOMAS: I mean the water in the stream.

MR. RAY: At what point?

MR. THOMAS: We will find out.

MR. RAY: I object to it as irrelevant and immaterial.

THE COURT: Objection is sustained. I don't think the question is such that the court would understand the answer if given.

MR. THOMAS Very well.

Q Did you make any visit up the stream at any time on these dates?

A We were not looking for water that was being used, we were looking for water that was being wasted.

Q You just answer that question; did you make any investigation up these streams?

A No sir.

Q Then you cannot tell what was being used up above?

MR. RAY: Object to that as irrelevant and immaterial.

Q Do you know whether or not this was wholly seepage water, or any part of it was seepage water?

A We figured it was all river water, it was in streams that carry river water.

Q Did you follow these streams to the source to see if the water was being diverted directly from the river?

A Not on this particular morning, but we did on other occasions.

Q What other occasions ?

A At some of our earlier visits we followed the stream up until we found it going out of river water.

Q You didn't so testify before, did you.

A Yes sir, I think we did.

Q Not on that, did you?

A Yes sir, on these very same streams.

Q That phase of it is new to me. That is all.

MR. THURMAN: You didn't ask about it before.

MR. THOMAS: Yes, I did, and he didn't testify to it.

MR. RAY: We object to that comment of counsel.

THE COURT: It is unnecessary to discuss it among yourselves.

CROSS EXAMINATION BY MR. Ray .

Q You stated, Mr. Knight, at the gate of the Second Ward pasture you saw five feet of water passing through, and followed it to the rushes?

A. Yes sir.

Q Below all point of irrigation. I now want to direct your attention to the five second feet which you saw on the second day of September, going through the Scott farm, what became of that water, if you know?

A Why, it run right on down through the Scott farm, and the old Roberts farm, and bordering along the west side of the Bent John-son farm, which joins the South Pasture on the west side of the gate, and we followed that right down through those fields until it run right into the rushes, so far below irrigation that it could not be used for irrigation.

Q I desire to call your attention to the Second Ward Pasture, and ask if you know what became of the five second feet of water which you observed going to waste there on the second day of September?

A That likewise run right into the lake.

Q Did you follow it to determine whether it did?

A Yes sir, it did.

Q Was any of it diverted below the point of your observation?

A No sir.

Q Taking the fifteen second feet which you observed at the First Ward Pasture, did you make any investigation to determine whether or not there were diversions from that water for the purpose of irrigation below the point of your observation?

A No sir, there was not.

Q What became of the water?

A Why, it run right into the rushes and swamp way down in the First Ward Pasture, I should think half a mile below the gate. We followed the race.

Q You observed a ditch carrying four second feet between the Scott ditch and the Carter ditch on 6th South on the second of September?

A. Yes sir.

Q Where did that water go?

A That run, I believe-- the farm belongs to Bent Johnson; there was a lane running south from 6th South about, I would judge, half

way between the Carter farm and the 10th West, which runs south from 6th South right straight down into the swamp.

Q Now taking your observations on September 4th, I ask if you followed them in the same way on that day?

A Yes sir.

Q In following these streams on these two dates did you bear in mind and observe whether or not below the points of your observation in each case there were any diversions for the purpose of irrigation?

A Nothing below where we went and looked at it.

RECROSS EXAMINATION by Mr. Thomas.

Q Just a question relative to the ditch last spoken of to Mr. Ray, that ran between the Scott farm and the Carter farm on 6th South street, carrying about four second feet of water; would you now say that ditch carried water directly from the river?

A No sir, I don't know that I could say that. I could say that ditch was running to waste, but I could not say positive that identical stream came out of the river.

Q Isn't it a fact that ditch is made up, the water there you found is made up of seepage waters?

A Some of that might have been seepage water but it was running to waste, whether it was seepage or whether it was river water.

Q And if it were seepage water was there any place where it could have been used where you saw it going to waste?

A There was a farm or two along on either side of that same stream.

Q You don't know whether those lands had been recently irrigated or not?

A No sir, not at that time.

Q So there might have been this condition existing there, that was seepage water and there was no occasion for its use at that time?

A That might have been true in that particular instance.

JOHN H. STRATTON recalled by the plaintiff, testifies as follows:

DIRECT EXAMINATION By MR. A. C. Hatch.

Q Your full name?

A John H. Stratton.

Q You have testified heretofore in this case?

A Yes sir.

Q And testified with regard to water being wasted from the Provo River system? A Yes sir.

Q I will ask you if you made any investigations other than those you have heretofore testified to as to water being wasted from the Provo River system by Provo City?

A Made two.

Q When?

A I think one was on the second of November, and the other on the fourth.

Q Of November?

A Or September.

Q In what year?

A 1916.

Q Who was with you, if anyone?

A Mr. Knight and Mr. Johnson.

Q Mr. Knight, the witness who just testified?

A Yes sir.

Q And what Mr. Johnson?

A C. G. Johnson.

Q What did you find as to whether or not water was being run to waste through the Provo City system?

MR. THOMAS: Just a moment, I object to this, if the court please, as being merely cumulative, same testimony that was gone over by Mr. Stratton, and he has testified before.

MR. A. C. HATCH: Do you admit he would testify in full corroboration of Mr. Knight?

MR. THOMAS: No, I will admit nothing of the kind.

THE COURT: Objection is overruled.

MR. THOMAS: Exception.

A We found water going to waste.

Q About what quantity?

A As Mr. Knight has testified.

Q Well, you say about what quantity?

A September second, Second Ward Pasture, five second feet; Second Ward Meadow, seven second feet; three town streams east of Academy Avenue going over the hill into those meadows.

Q Did you estimate the quantity in those streams?

A I am not sure whether I did or not.

Q Was there any other water?

A First Ward Pasture fifteen second feet; Dry Creek five second feet; Scott farm, four second feet, on the second of September.

Q What did you find on September fourth?

A At Carter's farm on September fourth, six second feet.

MR. THOMAS: What was that ditch, Mr. Stratton?

A At Carter's farm.

MR. THOMAS: How much?

A Six second feet.

Q Proceed Mr. Stratton.

A Dry Creek five.

Q Second feet?

A Second feet. Second Ward Pasture six second feet. I believe I have got that mixed, I have here in my notes Second Ward Pasture, that is Second Ward Meadows.

THE COURT: Should be Second Ward Meadows?

A Second Ward Meadows seven second feet; Mill race down at the First Ward Pasture sixteen second feet. At Bullock's farm there was three second feet.

MR. THOMAS: At what farm?

A Down at Bullock's farm, small stream there.

THE COURT: Three second feet?

A Yes sir.

Q What did you do, if anything, with regard to reporting to the court commissioner this waste of water by the city?

A We reported it to the water commissioner and made an application for more water.

Q For more water from what system?

A Provo Bench canal.

Q Did you get more water? A. Yes sir.

THE COURT: Let me ask, see if I have these correct. On September fourth, you say at the Second Ward Pasture there were six second feet, and then at the Second Ward Meadows seven. Was that a correction or was both of them.

A Second Ward Pasture six second feet.

THE COURT: And Second Ward Meadows seven?

A Yes.

Q You gave the measurement or estimate as to only the one day?

A This was --

MR. RAY: No, he gave both dates.

MR. A. C. HATCH: I thought he had, but counsel said not.

Q You gave both dates?

A Yes.

MR. THURMAN: If the court please, I have a short deposition to take on the case of Mr. Tanner. Witness we expected to get here is too ill to come. I wanted some intimation from the court whether there will be court here tomorrow.

THE COURT: I think so. I think we will hold court all day tomorrow, that is, if there is enough to occupy the time, and I apprehend there will be.

12:00 Noon, Recess to 2:00 P. M.

MR. A. C. HATCH If the court please, there were two questions I overlooked with Mr. Stratton, I would like to ask before the cross examination begins

JOHN H. STRATTON - - - -

DIRECT EXAMINATION By Mr. A. C. Hatch continued.

Q Mr. Stratton, in your former testimony as a witness for the Provo bench Canal company, you testified as to having seen waste water running below Provo City on two different days, as I remember July 10th and July 17th?

A Yes sir.

Q Now the Provo City later in rebuttal of that testimony introduced evidence to show that, or tending to show that the water from the particular ditches to the east of the city or the eastern part of the city did not run to waste and could not find its way into a ditch that would carry it to the Utah lake; now, since you testified before have you made any examination of those same ditches to which you testified as having examined on July 10th and July 17th?

A Yes.

Q South and east of the city and south of the city. What did you find with relation to whether or not the water that you said was waste water would find its way, or did find its way into Utah Lake?

A In one place, if I remember in their rebuttal, they claimed that the water could not get to the lake, or could not get to waste ditch running in the First Ward Pasture.

Q From what ditches did it reach the First Ward Pasture?

A It came down ~~an~~ from the East Union on the street immediately south of the cemetery and run along on the county road, on the west side of the county road east of the cemetery until it got to the other corner of the cemetery, then it took west and run nearly the length of the cemetery and across the road again

through the corner of the cemetery ground and below, just down over the hill in the corner of the cemetery, then it took south there across the top of a little field.

Q Where did it--

A Then it turns west and run on the south side of that field down to the ditch that came from the north, and then run southerly and went through the Rio Grande Western track and the Electric track there, interurban track near the gas plant, then it went off to the west again and into the First Ward Pasture, where, if it was used for irrigation it need not have been there, because a big drain comes in there and runs on the same ground and through the pasture.

Q That is the city drain?

A Yes sir; also water would go down there too, take south, right on the north side of the cemetery. It runs from there north to 5th South and take west on 5th South and dump over into the drain that comes out there, and it would be caught up by this same ditch that runs direct to the gas plant, and run in the same way other waters that would get around there.

Q Where does the city drain into?

A The city drain?

Q Yes.

A The big drain, it comes down just a little west of this point that I have mentioned, and runs south into the First Ward Pasture.

Q Is it used for irrigation, or is it run into the lake?

A I think it runs into the lake, comes out through the pasture there, and I never followed that right down to the lake, but then I am satisfied it wastes into the lake.

MR. THOMAS I ask that be stricken out.

THE COURT: That may go out. That is, the statement he is satisfied.

Q Is there any other ditch of those that you examined on the 10th and 17th of July that you followed to where they were shown to be actually wasted and not used for irrigation?

- A This other one ditch that cut across the county road between Eddenburg's farm and Bullock's springs carrying that water that runs down the east side of the county road there for a piece, then it crosses the county road down there, I should judge a quarter of a mile this side of the Bullock spring. It runs southerly on the county road line for a little distance, then takes westerly and goes down through the tracks, through those two railroad tracks, and then it goes westerly little piece and dumps into another stream there that comes in from the north, that evidently is spring water. Then it takes southerly a little ways and then there is an overflow there where it goes down in an old slough like, or natural channel through the meadow there, through the farm rather into the sloughs and goes through the sand under the San Pedro track right at the point the San Pedro track goes into the rushes there, goes into the lake there.
- Q There is no irrigated land below that point?
- A No, not below where it goes down the San Pedro track.
- Q Then are you prepared to say whether or not the water was actually running to waste and not being used for any irrigation purposes.
- A Yes sir, it was running to waste.
- Q Was running to waste?
- A Yes sir.
- Q And you may state if that is true as to all of the waters on that east side to which you have testified on July-- as having been running to waste on July 10th and July 17th.
- A This was, I think, July 17th that we saw that stream, and there was also water coming in from the Bullock spring that same morning and from the East Union and Bullock spring, and there was a small portion of the water, but the major part of it was running into the lake. It was running into the lake that come through the Bullock spring at a different point.
- Q Now, why did you make these examinations on September second and September fourth?

A Well, first place we were very short of water, and we needed more.

Q That is the Provo bench canal?

A Provo Bench canal.

MR. THOMAS: Object to this testimony as not proper rebuttal, it has all been testified to before, as to why he made the visits, testified to that upon their examination by Mr. Ray.

THE COURT: That was the other witness.

MR. A. C. HATCH: September second and September fourth these examinations were made.

A As I said, we were very short of water and we just thought we would go and see if they were still wasting water into the lake. Found the water and applied to the water commissioner for more water.

Q Did you get the water?

A Yes sir.

A

CROSS EXAMINATION By Mr. Thomas.

Q Do you know whether or not the commissioner ~~was~~ made a subsequent investigation of your report?

A I do not.

Q When did you go down over these Roberts land to find out whether or not that was irrigated and cultivated?

A I didn't testify I went over the Roberts land.

Q When did you go down by the Roberts land and ascertain if any of it had been cultivated or irrigated?

MR. RAY: I object to that as irrelevant and immaterial, he is not testifying anything about the Roberts land I know of.

MR. THOMAS I know he didn't mention the Roberts land by name, but I am asking a question. I submit it is a proper question.

THE COURT: Objection is sustained.

Q Do you know where the Roberts land is located?

A Not to be sure, I don't.

Q You heard young Mr. Roberts testify here as to his use of water upon the land below the tracks taken from the Bullock springs and East Union, didn't you?

A I am not sure whether I did or not.

Q When did you make the investigation of this last described ditch?

A July 17th we found water there.

Q You saw the water crossing the road at that time?

A We followed it down that time, or followed it up rather.

Q Do you know that that -- do you remember a young man here by the name of Roberts, testifying on those dates that you saw this water, that you said you saw this water crossing the road, that they were using the water down below the tracks, they carried it about three miles, and irrigated land below the tracks.

MR. RAY: Object to that as irrelevant and immaterial, not proper cross examination what young Roberts testified to.

THE COURT: If it is for the purpose of calling his attention to some fact connected with it, it might be proper.

MR. THOMAS: That is the purpose of it.

A On this --

THE COURT: Just listen to the question, you can answer that yes or no. Read the question.

(Question read.)

A I can remember this young man testifying, but I don't remember what he testified to.

Q On the day you saw this water crossing the road did you follow it up to see that it was used at all, or that it was not used?

A Yes sir.

Q Was there any irrigated lands along the line of that ditch?

A There is land along the line of that ditch.

Q Just answer that question.

MR. A. C. HATCH: Just a moment; do you mean either above or below the point?

MR. THOMAS: Just read the question again and let the witness answer.

(Question read)

A There is a patch of beets.

Q Where?

A Down below the San pedro track.

Q Was there any pasture land to the east of the tracks?

A I never seen any.

Q(Would you say there was no pasture land there?

A I don't understand at what point you are referring to.

Q Between the tracks and the county road, along the line of this ditch that you followed.

A There is a little piece of pasture land there, I think.

Q There is considerable land between the county road and track at that point, isn't there?

A No, not very much.

Q What is the distance, best of your judgment, between the track and county road at that point?

A About forty or fifty rods.

Q What is the distance between the interurban track and San Pedro track?

A I guess that is just as much.

Q Can you state to what use that land is put?

A I could not remember just what was on the land between the county road and the track.

Q Was it cultivated land?

A Unless it was pasture.

Q Was it cultivated land?

A I don't think so, I don't remember.

Q What is the distance between the San pedro track and Rio Grande track?

A I never measured it, I should guess --

Q Give me your judgment?

- A Fifty rods or more.
- Q Was that land cultivated?
- A Part of it.
- Q Beg pardon?
- A Part of it.
- Q What was the other part, waste land?
- A Waste land.
- Q In brush?
- A No, where it was, it would be slough at the lower end, next to the San Pedro track it was slough.
- Q How much of it.
- A Might be pasture, I don't know.
- Q Don't you know it is pasture, Mr. Stratton.
- A I never seen any stock in it.
- Q Is it always necessary to see stock on land to determine whether or not it is pasture land
- A It would make pasture sure, had grass growing on it.
- Q Is it necessary to see stock on land before you can determine whether it is pasture land?
- A Be necessary to see stock on it, or evidence of stock before you would know whether it was used for pasture or not.
- Q You just answer that question.

MR. A. C. HATCH: If the court please, our testimony in this case was to show that the water did run to waste down there and that there was ditches to convey it to the lake in rebuttal of their testimony that it would not reach the lake. I think I made that quite plain. Now, this matter as to the land has been gone all over by cross examination of this witness once before, same identical questions that are now being gone over.

MR. THOMAS Don't you want your witnesses cross examined Judge Hatch?

MR. A. C. HATCH: I want them cross examined as to any thing that is material, touching the points upon which we examined

them. I don't want to take up the time of the court to go over matters that are already fully in the record.

MR. THOMAS: I deeply appreciate the Judge's economy of time. This witness, if the court please, testified this water was going to waste, other witnesses testified at the time he said it was going to waste it was being put to beneficial use upon pasture land. Witness now says he didn't see any pasture land there, didn't see any stock upon the land. I submit the question proposed was a proper question to determine whether or not he knows pasture land when he sees it, and if the presence of cattle upon the land is necessary to determine pasture land.

THE COURT: The witness has answered the question, I don't think there is anything before the court now.

Q What acreage of beets did you see there?

MR. RAY: Your Honor please, I want to object to this line of cross examination as immaterial and irrelevant. The fact there were lands susceptible of irrigation is not proof that water was not going to waste.

THE COURT: I am unable to see the object of it.

MR. THOMAS: I think it goes to the credibility of the witness as to what he has seen there.

THE COURT: Possibly that may be true if that is your object. You may pursue it, but I would not take very much time if that is the only object.

MR. THOMAS: With that implied suggestion of the court I shall certainly not follow it.

Q This ditch that you described as going around the cemetery in your description to Judge watch, is that the same ditch that you described as running to the north of the cemetery in your direct examination last August?

A Yes.

Q You didn't follow that ditch at that time did you?

A We didn't follow it every inch of the way that date, but seen

the water where it entered there and where it came out.

Q Have you made any other examination since that time?

A Yes, I believe we have.

Q Do you know whether you did or not? A. Yes.

Q When did you ?

A I don't know the date, I have forgot.

Q Isn't it a fact you didn't make any other examination than the one you first testified to?

A The one I first testified to, the water was running through there, it was running into the pasture.

Q You didn't follow it down to see whether or not it was being put to beneficial use at that time?

A It could not be put to beneficial use.

Q You did not follow it, did you, to determine that?

A We followed it to where it went into the pasture.

Q Do you remember Mr. Farrer testifying here in this case as to the use of water in that ditch?

A No, I don't remember anything in regard to his testimony. In fact, I have not known half of the witnesses that were put on, I have not been here all the time.

Q Do you remember a witness testifying here as to having built that ditch and taken water through it and put it to beneficial use at the time you said it was going to waste, you remember any such testimony as that being given?

A No sir.

Q You remember hearing any of that testimony relative to that north ditch presented by prove City since you testified?

A Which do you call the north ditch.

Q The one running on the north side of the cemetery, the one you have been speaking about?

A I remember they said the water could not get through that ditch into the pasture or into the lake.

Q You remember that man so testifying?

A I remember somebody testifying, I don't know who he was.

- Q And since that time you have not made any any further examination of that ditch, have you?
- A Yes sir.
- Q When did you do it?
- A Why, it was -- I don't know what date it was, it was in the fall, late in the fall, this fall.
- Q Who was with you?
- A Mr. Knight, Mr. Frampton.
- Q Was it the same date you made these investigations and measurements of water?
- A No sir.
- Q Have you made any other visits than on September second and fourth since you last testified?
- A We made this one visit to refresh our minds just which angle the ditch took that went to the lake. You see, when we were around in the summer time, why it had been some time. We took note of the water where it went to waste. Since that, why, we thought maybe it would be necessary for us to testify which way it went and how it got down there to waste.
- Q When did you make that visit?
- A I haven't got the date of the visit, we made it late in the fall.
- Q Have you got any note of it?
- A No sir.
- Q You kept notes of the other, didn't you?
- A Yes.
- Q You didn't keep any notes of this?
- A I did not, Mr. Knight did, I think.
- Q This water that you said was running to waste in Dry Creek, is that what is known as the Little Dry Creek?
- A That was in Old Dry creek, as I understand.
- Q Do you know whether the Carter farm ditch is sometimes known as Little Dry creek?
- A I believe I have heard it referred to as Little Dry Creek.
- Q At what point did you ~~xxx~~ take the measurement of the water on

that creek or ditch?

A At Carter's farm.

Q Below any point of use?

A No, it could not have been used below I think, I don't know.

Q I said below any point of diversion, could it be used at any point below that?

A I don't know, I don't think so.

Q Did you make any investigation as to that?

A The water at Old Dry creek, at Little Dry creek, or Carter's farm, is that what you call Little Dry creek?

Q The ditch that runs by Carter's farm?

A We just took note of the water right there at Carter's farm.

Q That is on 5th South?

A Fifth South.

Q There is considerable land that is cultivated below that point, isn't there?

A I think there is.

Q You don't know whether that water was being used on that land or could be used on that land at all, do you?

A No, that is where we made our estimate.

REDIRECT EXAMINATION By Mr. A. C. Hatch.

Q If there was anyone who testified that the water was not running to waste on these east ditch at the time you saw it on July 10th, & 17th, would the testimony be true?

MR. THOMAS: Object to that as calling for a conclusion of the witness.

THE COURT: Objection sustained.

MR. THOMAS: That is getting pretty raw, Judge.

MR. A. C. HATCH: I don't want to get too raw on Mr. Thomas, he is having too hard a time as it is.

MR. THOMAS: Did you mention some ditch that was running by Bent Johnson's place, east of the Carter farm?

A No sir, I don't know where Bent Johnson's place is.

MR. RAY: Mr. Knight referred to that.

MR. A. C. HATCH: We had another witness, Mr. Johnson, we thought to put him on as the third one of these later. At this time we will take up that Allen matter, MaAfee springs matter.

OMISSION.

Testimony as to Pioneer Ditch Company, Jackson R. Allen
et al.

Discussion as to Wasatch County stipulation.

LYMAN L. DONNAN, recalled.

DIRECT EXAMINATION by A. C. Hatch.

Q You testified before in this case as to having viewed the water flowing in the flume of the Utah Power & Light Company ?

A Yes.

Q Have you examined the flume since you testified to determine whether or not there were open spaces along its course where one passing over the flume could see the water as it was flowing in the flume?

MR. RAY: I object to that as not rebuttal.

THE COURT: The court does not remember exactly what the evidence was.

MR. A. C. HATCH: The testimony of the witnesses for the defendant, Utah Power & Light Company---particularly of the witness Donnan, that this flume had been so boarded up that it was that tight one passing over would not see the water flowing in it without they would get down and stoop to look.

MR. RAY: I understand Mr. Donnan's testimony; he said he had gone over it and seen the water, he had gone into that question.

MR. A. C. HATCH: Then, further as to the places along it where one might possibly see the water, was a part of the testimony of Mr. Ivey and one other witness if I remember correctly.

THE COURT: Objection is overruled, if that is the only objection to the evidence. I don't remember just to what extent Mr. Donnan testified before.

A I was on the flume shortly after I testified and the flume is now covered with--

MR. RAY: Just a minute; I want to interpose an objection here now, it is irrelevant and

immaterial because it goes to the flume which is not shown to be the same as ^{to} its condition as the flume in question at the time of Mr. Donnan's original testimony.

Q What was its condition, Mr. Donnan, as to being able to see the water compared with what it was when you originally visited it and at the time to which you testified heretofore?

A At present you could not see the water except in one place and that was at a gauge, a hole out in the flume which has never been closed and which is not entirely closed now with the snow.

Q What point is that on the flume?

A That is about one hundred and fifty yards below my house.

Q What was its condition at the time you testified heretofore in regard to having seen the water when you passed over the flume?

A There was no snow many times and other times there was some snow.

Q Do you mean by its condition now when you last viewed it, it is covered by reason of snow?

A It is covered by reason of snow.

Q If I am asking you with regard to the board covering and artificial covering?

MR. RAY: It is apparent that he cannot say whether it is the same, it is covered with snow.

A As I stated, it cannot be seen into except at that one place at present.

Q What was its condition when you did pass over it as to being open or closed, a tight box or otherwise?

A At what time?

Q At the times you testified to having seen the water in it?

A Why, there was breaks in the flume at different places where the boards had been broken and this opening at the

gauge was, if anything, a little larger than it is now, and you could see the water at different places and especially at a point near the old section house. That is pretty nearly a mile below my place.

Q About how many places would you say the water was exposed to view along the course of the flume at the time you testified to having passed over it and saw the water?

A Why, I could not testify how many places because the flume was broken in--I never paid any particular attention to the number of places.

Q Were there many or few?

A There were quite a number of places.

Q Do you know what the term "headers" or "billows" on the flume, strips of board between the bents is?

A Yes.

Q Between the upright posts?

A That is those pieces between the ties on the top of the flume.

Q Yes. Now, at the time you made your examination to which you testified in your former testimony I will ask you whether or not those boards were on?

A They were on a portion of the way, a very small portion.

Q And what portion of the flume were they on?

A I have reference to the original, those pieces that were put on in the first place, but there was some put on later and most of the spaces between the ties were filled, ~~were~~ especially on the low parts or on the bents of the flume.

Q Where they were not filled in passing over the flume could you readily see the water?

A In climbing up over on to the flume, getting onto the flume you could.

Q Could you see the water where they were filled?

A Not very readily, except where the flume is broken on top.

Q You say it was broken on the top?

A In places.

IRVIN JACOBS, recalled.

DIRECT EXAMINATION by Mr. A. C. Hatch.

Q You reside at Provo City?

A Yes.

Q And what is your profession or occupation?

A Civil engineer.

Q You qualified in this case once?

A Yes.

Q Have you made a tabulation of the flow of water in the Provo river from the South Fork station to the Timpanogas Irrigation Company's intake at the mouth of Provo ganyon?

A Yes, I prepared tabulation showing the --

MR. THURMAN: I think that Timpanogas
Irrigation Company is a mistake in the name.

MR. A. C. HATCH: Timpanogas Canal Company.

A I prepared tabulations showing the discharge of the South Fork station of the Provo river together with the discharge on the corresponding dates of the Timpanogas canal and also the Provo Reservoir canal, taking the discharge for Provo river and subtracting from that the sum of discharge of the Timpanogas and Provo Reservoir canal and adding twelve second feet for inflow. I arrived at values in the tabulation which I have designated as quantity in power flume.

Q That is the Utah Power & Light flume?

A Yes.

Q And for what period does it cover?

A Covers July, August and September, 1916. Covers all the days on which I could get simultaneous measurements for that particular day on all the streams involved.

Q I will ask if it covers any of the days in which a large flow of the natural river was going over the power and light dam.

A Yes, considerable flow of natural river was going over the power dam on these days.

Q You may state what you found for the days in July.

MR. RAY: Your Honor please, I object to that as being irrelevant and immaterial as to what quantity of water was flowing in the flume in July 1916, three years after the beginning of this suit unless it is for the purpose of determining the capacity. It cannot be a factor as to use it seems to me.

MR. A. C. HATCH: It goes to the question of the use of the water by them down to even the present time, down to September of last year. There is testimony in here as to their measurements, capacity and use of water.

MR. RAY: If it goes to measurements I admit it.

MR. A. C. HATCH: Down to late in September was their testimony, late in 1916 was their testimony. They have been put in here in different forms and this is simply another way to show an addition to what we already have, another source of determining the water that was flowing in the flume.

MR. RAY: Now, Your Honor please, it is easy to understand why a measurement taken in September in a flume, which is practically constant might be material, even though two or three years after the beginning of the suit, but it is not material at all how much water they used last year; that is not material at all unless it goes to the question of the capacity in the flume. As to their necessities, I object to it as irrelevant and immaterial.

THE COURT: Objection is overruled. It will be considered only for this purpose.

MR. RAY: May I ask a further question as

to this?

THE COURT: Yes.

MR. RAY: Were the data you have based your tabulation upon there made first hand, measurement at the South Fork station and the diversion of the Provo Reservoir canal and the diversion of the Timpanogas Canal Company's intake, all of the measurements made by you?

A This tabulation is based on measurements made by the Commissioner and which measurements are an exhibit in the case, and also the measurements made by the geological survey at the station in South Fork, which is also an exhibit.

MR. RAY: Are those measurements in evidence in this case, geological measurements?

THE COURT: Then, I understand it is merely a tabulation from evidence already in?

A Yes.

THE COURT: He may proceed.

MR. RAY: That is what I wanted to determine, whether it was.

A July 21st, river at South Fork station was 293 second feet.

MR. RAY: That is what year?

A 1916, all of these are 1916. Provo Reservoir Canal discharge, 69.2. Timpanogas canal discharge 16.4. Difference between river and combined above diversion, plus inflow quantity in power flume, 219.4.

On July 23rd, river was 292; Provo Reservoir Canal 65.8; Timpanogas, 16.4; derived quantity in flume 221.8.

On the 25th of July, river 294; Provo Reservoir Canal 67.8; Timpanogas canal 14.4. Derived---

MR. RAY: Your Honor please, if that is a printed compilation, I think it is a waste of time to have the witness read them here. The court cannot remember them; counsel cannot take

them down; they are tabulated.

MR. A. C. HATCH: We will offer it as an exhibit without reading it into the record.

MR. RAY: I suggest if it is admissible at all, it is admissible in that way. I object to it as irrelevant and immaterial.

THE COURT: Objection is overruled. You don't make the objection it is in this form?

MR. RAY: No.

THE COURT: It may be received then.

MR. A. C. HATCH: I would like to let the offer at this time of Mr. King, 190 be admitted. It has not been admitted although it was offered by him.

THE COURT: It may be received. I think it should be received as illustrating the stipulation.

MR. A. C. HATCH: That is the sole purpose.

Q What do you understand is a true definition of the term, "free-board" as used in engineering practice?

A It is the height of the sides of a structure above the maximum water surface.

Q From what do you obtain that definition of the term?

A Simply give a definition from my general experience.

MR. RAY: I object to that as irrelevant and immaterial and ask that it be stricken.

Q Have you any authority upon which to base it?

A No. I haven't looked up any authority on that.

MR. RAY: Judge Hatch, I want to move his definition of it be stricken because it is his experience.

MR. A. C. HATCH: If he will state that is the common use of it among engineers, I think that is better than any lexicon definition.

MR. THURMAN: I understood that was the meaning of the answer.

A It is my experience that is the definition among engineers.

Q Well, now, from what do you obtain your experience, from the books, from your conversation with other engineers, or from your teachers?

A My experience has been obtained from my knowledge, that definition has been obtained from various sources, that is training and my application, personal application.

Q I did not hear your first statement.

A I say through my training, experience and professional application.

Q Did you ever read the definition in a standard engineering work?

A No, I don't remember that I have.

Q Have you during your practice as an engineer had occasion to investigate the free board necessary in a canal or in a flume such as the Utah Power & Light flume to safely carry the water, the minimum free board?

A I have observed free board in various instances, but I have made no special measurement or test to determine the actual necessities in any given case.

Q Do you know the free board allowed and determined by the United States Geological Survey---by the United States Reclamation Service?

MR. RAY: I object to that as calling for hearsay, irrelevant and immaterial.

MR. JACOB EVANS: He is just asking him if he knows.

THE COURT: You may answer.

A Yes, I have investigated the general usage of the Reclamation Service to determine the free board which is the ordinary practice in their construction.

Q Have you made a study of their designs and plans for their

canals and flumes and gates?

A Yes, I have.

Q Do you have any of those designs with you?

A I have---

Q That are comparable to the Utah Light & Power flume?

A I have three pamphlets here with specifications for flume construction of the reclamation service on the Strawberry Valley project, also one paper in general, not referring to the Strawberry project, showing the design of different flumes with the free board.

Q Do they give the minimum free board with which water may be safely carried in the flume comparable with the Utah Light & Power flume?

A They give the free board which they deem necessary.

MR. RAY: Now, I object to that as calling for a conclusion of the witness, what the geological survey deems necessary.

MR. A. C. HATCH: Reclamation Service.

MR. RAY: Or Reclamation service, deems necessary.

THE COURT: You object to the answer?

MR. RAY: I move that it be stricken out.

THE COURT: It may be stricken out.

MR. A. C. HATCH: That is all.

CROSS EXAMINATION by Mr. Ray/

Q The term, "free board" is in common usage, isn't it, Mr. Jacobs?

A Yes.

Q And it means the unwetted surface by the water on the sides of a flume, doesn't it, ordinarily?

A That would be one way of stating it.

Q How do you determine your inflow between the South Fork

measuring station and the intake of the flume; how did you determine your inflow there into the river?

A Intake of the power flume?

Q From the South Fork measuring station, inflow to the river.

A The inflow, I never measured any inflow, I assumed a flow of twelve second feet.

Q How do you know that is right?

A I assumed that after converences with, or talking over the question of inflow with Mr. Tanner and Mr. Wentz who had made definite measurements on that.

Q So that it is not based upon any evidence in this case, or any experiments you ever made, is it?

A I don't know as there is any evidence. Tanner's evidence is in the case on inflow, I don't think Mr. Wentz' is.

Q Do you know of any evidence in this case as to the inflow determinations made to fix the inflow between the South Fork measuring station and the intake of the flume of the Utah Power & Light Company?

A Not for that special stretch, no.

Q So that is just an arbitrary factor, isn't it, as far as---

A So far as I am concerned, yes.

Q Do you know what the inflow is below the dam?

A Same thing applies to that.

Q You don't know what it is?

A Only from--not from my own knowledge.

MR. RAY: If Exhibit 191 under that testimony, Your Honor, is of any value---I don't like to strike it out, but it seems to me with one factor arbitrarily taken, based purely upon hearsay, that the calculations are subject to the objection they are irrelevant, immaterial and hearsay.

MR. A. C. HATCH: I understood the witness that the testimony of Tanner as to inflow---

that is the one element to which you object.

MR. RAY: He said there is no testimony he knows of as to that section of the river.

MR. A. C. HATCH: There is testimony as to that section of the river given by Mr. Tanner.

MR. RAY: During what period, during what years?

MR. A. C. HATCH: 1913 and '14 was Tanner's testimony. There is no testimony as to the inflow for that particular period on which these measurements---

MR. RAY: I think, of course, the court will judge of the weight of the evidence.

THE COURT: Yes, if the court in considering that should not find in accordance with Mr. Tanner's statement, if that were the statement, this would be valueless. Of course, if the court found that to exist, the factor would be present, ~~is~~ and the court might consider this tabulation.

MR. RAY: Will there be any more as to the Telluride?

MR. A. C. HATCH: I don't know. There is a tabulation made by Mr. Wentz.

MR. RAY: We had been assisting and cooperating with Mr. Wentz in the preparation of the plat and I wanted to rather talk to Mr. Tanner about it, and I think if we did we could get that on very quickly. It might be done right now, as far as I am concerned. Mr. Wentz has brought the plat at my request.

THE COURT: I think probably better submit that at the evening session. I understand Mr. Davis is to go out with someone to take the evidence of a witness and probably be better they

go so that they can go before dark and get back for the evening session

MR. RAY: Do you desire Mr. Davis be appointed Commissioner of the Court for the purpose of taking that deposition and administering the oath?

MR. THURMAN: Yes, that is about the easiest way to do it.

MR. RAY: Will we have to have an order of the court?

MR. THURMAN: Unless we stipulate it, it is just the same.

THE COURT: Yes, the order may be made appointing Mr. Davis commissioner to take the evidence of Mr. John Carter.

5:00 P. M., Recess to 7:45 P. M.

T. F. WENTZ, recalled.

DIRECT EXAMINATION By Mr. A. G. Hatch.

Q You have testified heretofore in this case?

A Yes.

Q And are the Commissioner appointed by the court to distribute the water pending the determination of the issues in this case?

A Yes.

Q Were you commissioner prior to the time of your appointment as commissioner in this case?

A Yes.

Q For how long?

A 1913, I have been on the river the last four years.

MR. RAY: Judge Hatch, I understand that was always under appointment of the court under one decree or another.

Q That is true, is it not?

A Yes.

Q During the time that you have been acting as commissioner have you ever turned to the Provo Pressed Brick Company any water,

have you ever been requested so to do by the Provo Pressed Brick Company?

A Not until September the 30th, 1916.

Q Were you requested by them in 1916, September?

A September 30th, 1916, they made application for water under their application to the State Engineer's office No. 1221, as against the plaintiff Provo Reservoir Company in this case, the water they were using in their canal at that time.

Q What was the date?

A September 30, 1916.

Q The water the plaintiff was using at that time was its reservoir water, was it not?

MR. CLUFF: I object to that as incompetent and immaterial.

THE COURT: Whether the Provo Pressed Brick Company was using --

MR. A. C. HATCH: Whether the plaintiff was using at that time.

THE COURT: Now, what is your objection, Mr. Cluff?

MR. CLUFF: I object to it as incompetent and immaterial.

THE COURT: Objection is overruled, if I understand the question.

Q Was the plaintiff at that time using any of the natural flow of the waters of the Provo River?

A Yes.

Q Did you at that time divert any of the waters from plaintiff to the Pressed Brick Company?

A No.

Q Or from any other user above the Provo Pressed Brick Company's plant; did you divert any water to them?

A When they made their application I went over the system of Provo river in this valley above the Provo Pressed Brick Company and saw that there was no canal system using or having water more than their necessity, that is, at that season of the year; on the main

system, 70 acre duty, excepting a small amount to the East River Water Bottoms Company and the Provo Reservoir Company did not have more than enough water in their canal to supply a 70 acre duty for the acreage recorded.

Q So that you turned none to them on their demand?

A No.

CROSS EXAMINATION By Mr. Cluff.

Q You say the first time the company, Mr. Wents, has ever made any request for more water was in September this year, 1916?

A That is the first time they ever made a request on their application.

Q What other requests have then made then?

A Well, in 1915, in the autumn after their engine had broken, they made a request for water and I did the same thing at that time saw that there was no systems that were operating or had a greater quantity of water than they actually needed.

Q In other words you disregarded the appropriation of the Provo Pressed Brick Company entirely, so far as it affected any of the other people that were using water for irrigation?

A Well, I saw that the irrigation rights were supplied with their necessity and any amount over that, why, I would divert through City creek to the Provo Pressed Brick Company. The irrigation rights up there to their necessities were considered in every case first.

Q Regardless of priority of appropriation?

A Regardless of the application No. 1221.

Q Now, have the Provo Pressed Brick Company prior to 1915 made any request or demand for more water you know of?

A No, no, the amount distributed has been distributed on the basis of the amount due Provo City, and the Pressed Brick Company use the amount going to the Factory race and to the City race of Provo City, went through their wheels; of course, in 1914 or 1915 all the mill interests were subject, took a second class to

the irrigation rights. I held the irrigation rights as a 70 acre duty all through the low water season of 1915, and the deficiency was borne by the Factory race.

Q So that beginning with 1915 you have cut down all these power rights and made them secondary to the other rights, or irrigation rights?

A I don't understand what you mean by all these power rights.

Q On the Factory race.

A In the other years except 1914 there has been sufficient supply to supply the Factory race, but in 1915 there wasn't enough to supply the Factory race, and I made that secondary to the irrigation rights, but in each and all of the years, I have never considered the application No. 1221 ahead of the irrigation rights

Q prior to the time the plaintiffs diverted water from the river there was always ample water to supply the Provo Pressed Brick Company with their amount they required or desired, wasn't there?

A No, I couldn't say that. Now, I have the records from 1902 since the Morse decree, and I have been over those many times carefully, page by page, and there is not a word in all these records about the Provo Pressed Brick Company application. Division is made solely to Provo City and the other parties.

Q In other words the commissioner seemed to have diverting the water to Provo City and not paying any attention to any particular power right on the Factory race, is that true.

A That is true.

Q Any demand that may have been made for more water than, or anything, has been, so far as you know, been through Provo City, is that right?

A Yes, it has been made on the division under the Morse decree, and has been classed with Provo City, and there is no separate record of diversion to any of the mill interests.

Q But isn't it a fact that prior to the time the plaintiffs diverted waters from Provo River in their canal, there was always sufficient

water to supply these power companies on the Factory race, and the Pressed Brick Company of course being the first or head on that race?

A I don't get your question on that, I don't understand exactly what you mean.

Q In September of 1916, when the Pressed Brick Company claimed they were short of water, isn't that right?

A Yes sir.

Q And ^{at} that time you were diverting a large quantity of water to the plaintiff through their canal?

A Yes sir.

Q Now, if that water had not been diverted there would have been ample for the pressed Brick Company, wouldn't there, to make up the hundred second feet?

MR. JACOB EVANS: Yes, to make up the hundred second feet.

A If that water that was in the Provo Reservoir Company had been diverted to City creek, yes.

Q And prior to the time Provo Reservoir Company diverted any water there was always sufficient going down the river to supply the Provo Pressed Brick Company with their hundred second feet?

A No.

Q When wasn't there?

A I think 1902 and 1905, I couldn't say off hand without going into the river record of the discharge for those years.

REDIRECT EXAMINATION By Mr. A. C. Hatch.

Q How much of the water in the Provo Reservoir's Company's canal was water of the normal flow of the Provo River and not from its reservoir at the time the demand was made by the Provo Pressed Brick Company?

A Have you a copy of that report here, I will have to get a copy of that, I can get it in a minute.

Q Nevermind, the major portion of the water? A. Yes.

- Q Going into the Provo Reservoir Company's canal was water from its storage reservoirs, was it not?
- A No, as I remember now without looking up the record, but that can be ascertained from the report of this year. There was 15 second feet of reservoir and tunnel water of the 80 second feet and 65 second feet of river water.
- Q If that 65 second feet had been divided according to the Morse decree, would any portion of it have reached the Provo Pressed Brick Company? A. Yes.
- Q What portion?
- A Be about a third of it.
- Q About a third of it, that would have been wholly insufficient to have supplied its demand of 100 second feet?
- A Yes, that would have been less than a hundred second feet as I recall the measurement of that date.
- Q You can get from your records, can you not, the quantity that was used by the Provo Pressed Brick Company from the beginning to the time that it first made its demand upon you for water?
- A Yes, from 1902 to the present time.
- Q Can you give us a tabulation of that tomorrow?
- A Yes.
- Q Can you say now whether or not it ever reached the 100 second feet in the latter part of the season, low water season?
- A Well, there would be ~~at~~ ~~in~~ I think three years that it would, but on those dates, those three years, that is 1907-8 and 9, I think possibly it would reach that amount, but in those years we have only a very few measurements. I think in 1909 only one measurement.
- Q Because of the excessive flow of water in the river?
- A Yes.
- Q You say that the first demand was made at the time they broke their engine in 1915?
- A Yes, they asked for more water in the autumn of 1915, and I used

the same plan then as I did in 1916. If there were any rights above their actual necessities I cut them down to their necessities.

Q You said something about the breaking of the engine in 1915. Provo pressed Brick company, what was that?

A That was in the autumn of 1915 that the engine that supplied the auxilliary power to the plant was broken; that is, when there is not sufficient water to run the plant this is hooked on as an auxilliary to make up the deficiency of power.

Q At the time they first applied to you for additional water was at a time this was broken?

A Yes, about that time.

Q If you will give us that tabulation of the quantity of water used by them during the several years at the time the distribution of water began, I wish you would do so in the morning, or tomorrow forenoon, that will be all for the present.

MR. OLUFF That will be all until he gives us that in the morning.

H. F. THOMAS, recalled by the plaintiff testifies as follows:

DIRECT EXAMINATION By Mr. A. C. Hatch.

Q You have testified before in this case, Mr. Thomas?

A Yes sir.

Q And for what years were you commissioner of the court in the distribution of the water?

A I served from the year 1902 to 1911.

Q And during that period of time were you ever called upon by the Provo Pressed Brick Company to distribute any water to them by reason of any appropriation they had made through the office

of the State Engineer?

A I think not.

Q During that time did you ever distribute to the Provo Pressed Brick Company any water other than was distributed to Provo City irrigation district?

A No sir.

CROSS EXAMINATION By MR. Cluff.

Q You say you never distributed any water to the Pressed Brick Company?

A Not to them directly.

Q Where did you distribute the water to Provo City, the water that they used.

A Through City creek.

Q And at what point was that measured?

A Several points from several canals City creek, the city had some four canals of its own.

Q Well, wasn't there any point where you measured the water that came to Provo City as a city and not through canals to the farmers?

A The city took its water at four different points out of City creek, that is, there was four streams we usually measured to get the total amount going to Provo City.

Q And where did you make those measurements?

A In the several races designated at Tanner's race, City race, Factory race and East Union canal.

Q So that the Provo Pressed Brick Company had used the water through its plant then before you made measurements of some of those streams?

A Well, at that time when I was distributing the water they drew all their water, as I now understand it, through the Factory race. The other streams were all separate from that one. I think, however, that the Factory race and the East Union ditch ran together until it reached their flume, then they separated.

They got what water could go through the Factory race as a part of the provo system.

Q Any other?

A That is the only canal through which they ran it that time, as I understood it.

Q Isn't it a fact that water that came through their plant supplied the Factory race and supplied other races also?

A Not at that time.

Q Where did the water that went east through the Tanner race come from?

A That took out above.

Q Went west, beg your pardon.

A The Tanner race?

Q Yes.

A Went down the old river bed from the point above their canal at that time.

Q Isn't it a fact that the water for the Tanner race and Little Dry Creek passed through the provo Pressed Brick canal?

A Not at that time.

Q When did it?

A I think that canal has been changed since I was commissioner. At that time they were separate.

Q Didn't they ever go through the Pressed Brick plant during the time you were commissioner?

A It may be that the City race might have done part of that time, but my recollection is even that was separated from the Factory race.

Q So as a matter of fact, Mr. Thomas, you don't know now whether the Pressed Brick company used more water than was distributed to the Factory race or not during the time you were commissioner?

A I am reasonably sure they got all their supply through the source, through the water that was coming through the Factory race. I kept a record of it, and that record would be the best

evidence, but that is my recollection of it.

Q And where was that water measured?

A The Factory race water?

Q Yes.

A We usually measured it at a flume, oh, about 100 yards below the Pressed Brick plant.

Q You remember the amount of water that you distributed to the Factory race?

A No sir.

Q You don't know whether it would be a hundred second feet or not?

A I don't remember of ever measuring that much at any one time in their race, it might have reached that amount.

Q During the time you were commissioner did the Pressed Brick Company ever apply to you for water at all?

A I think they did, yes sir.

Q And what did you do?

A I endeavored to keep in the race in which they were taking the water the amount of water to Provo City through that branch of its division.

Q Have you any figures, Mr. Thomas, that would show the amount of water that came to Provo City during the time you were commissioner and that was distributed through the Factory race or other races that the Provo Pressed Brick might have first used the water?

A Yes sir, that is, I have no records in my possession, they were the records of the court and turned over to my successor.

go so that they can go before dark and get back for the evening session.

T. F. WENTZ, recalled.

DIRECT EXAMINATION by Mr. A. C. Hatch.

Q Mr. Wentz, have you prepared a detail---have you prepared or have you the notes showing the measurements of the Utah Power & Light flume, original notes and diagrams showing your work in that regard?

A Yes.

Q Give them to us, will you,--I mean as testimony, not literally?

MR. RAY: That has all been put in, Your Honor please, and is in his report, result of his measurements and I cannot see the purpose of putting them again into the record. It seems to me they are totally irrelevant and immaterial except for the purpose of testing the correctness of his own results.

MR. A. C. HATCH: I will state the purpose of this is to introduce as an exhibit, one exhibit the plan of the flume, showing a specimen measurement as made by him at the Donnan station.

MR. RAY: Object to that as irrelevant, immaterial and hearsay.

MR. A. C. HATCH: It would not be hearsay because it is all a result of his own observations and records.

THE COURT: A plan made by Mr. Wentz?

MR. A. C. HATCH: I so understand it.

MR. RAY: From memorandum made on the ground. I don't understand they are admissible as testimony. He can ^{use} ~~can~~ them to refresh his recollection.

THE COURT: He could hardly testify as to a plan.

MR. RAY: I understand it is not a plan
at all

MR. A. C. HATCH: My understanding, it is
a sketch showing the detail of the work.

Q Have you the sketch, Mr. Wentz?

A The original notes, as the question---

Q October 9, 1916?

A The original notes of October 9, 1916, are the current meter
notes for that day, show the method of making the measurement,
the position the meter was held and the number of revolutions
in seconds and so on. On the back of this sheet, on the plain
sheet is a small sketch of a flume, showing the dimensions
of the flume and the position of the still well and so on.
At the bottom of the blank sheet is a measurement of the
gauge reading in the still well at intervals taken after
each row of water readings across the flume.

Q Let me see it.

MR. RAY: I cannot see the purpose of this,
Your Honor please. The result of it is in the
record, and the accuracy of it has not been
questioned.

THE COURT: The result of the measurements
possibly may be in the record, but the plan or
sketch of the flume is not in the record.

MR. A. C. HATCH: That is what we desire to
offer as an exhibit. I will submit it to counsel
(Exhibit 192)

MR. RAY: I submit ~~it~~ to the court under
my objection as to its materiality. The testimony
is certainly as clear as the illustration.

THE COURT: Now, Judge Hatch, would you
indicate what ~~the~~ you claim for this as an exhibit.

MR. A. C. HATCH: The sketch of the frame of
a cross section of the flume with the still well

shown on the side illustrates the testimony as to the measurements and tabulation of the one measurement showing in detail how it was taken and the manner in which it was taken.

THE COURT. I am inclined to think you are entitled to have this sketch received in evidence as illustrating all the evidence.

MR. RAY: We reject the remainder of it then except the sketch.

MR. A. C. HATCH: The remainder explains it. Without it all I take it the sketch itself will show nothing.

MR. RAY: Your Honor will remember there is a full cross section of the flume in showing the flume, there are detail maps of it.

THE COURT: Possibly this may be rebuttal of that; I don't know, the sketch may be admitted. The objection to the other is made that it is a memorandum merely that may be used to refresh the recollection of the witness, and he may testify as to the facts contained in it, but the memorandum itself, of course, would not be competent.

MR. A. C. HATCH: I have understood he had testified. Have you testified as to the facts stated on that exhibit?

A And the results of the measurement, yes, the discharge in the flume at that date.

THE COURT: Then, this would merely be a repetition of that.

MR. A. C. HATCH: Yes, let it be admitted as the court directs.

MR. RAY: Judge Hatch, is there any objection

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IN DIST. COURT
UTAH CO., UTAH.
* FILED *

SEP 26 1911
W. M. Hale Clerk
E. B. Dastrop Deputy