# In the Privy Council.

No. 47 of 1916.



## ON APPEAL FROM THE SUPREME COURT OF TRINIDAD AND TOBAGO.

BETWEEN

CHARLES CONRAD STOLLMEYER .. .. (*Plaintiff*) *Appellant*

AND

THE PETROLEUM DEVELOPMENT COMPANY, LIMITED .. .. .. .. .. (*Defendants*) *Respondents*

# RECORD OF PROCEEDINGS.

## INDEX OF REFERENCE.





V. & S., LTD.—60199.

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AND

THE PETROLEUM DEVELOPMENT COMPANY LIMITED .. .. .. .. .. *(Defendants) Respondents.*

## RECORD OF PROCEEDINGS.

RECORD.

*In the Supreme Court.*

No. 1. Writ of Summons dated 17th Sept., 1914.

### No. 1.

### Writ of Summons.

George V., by the Grace of God of the United Kingdom of Great Britain and Ireland, and of the British Dominions beyond the Seas, King, Defender of the Faith, Emperor of India.

To the Petroleum Development Company Limited whose registered office is at Brighton in the Ward of La Brea.

We command you that within eight days after the service of this Writ on you, inclusive of the day of such service, you do cause an appearance to be entered for you in our Supreme Court, Port-of-Spain, in an action at the Suit of Charles Conrad Stollmeyer and take notice that in default of your so doing the Plaintiff may proceed therein and judgment may be given in your absence.

Witness: His Honour Eric Blackwood-Wright LL..D. Acting Chief Justice of our said Court at Port-of-Spain, in the said Island of Trinidad, this 17th day of September 1914.

RECORD.

*In the Supreme Court.*

No. 1. Writ of Summons, dated 17th Sept., 1914 —*continued.*

*Endorsement.*

The Plaintiff's claim is for damages for wrongfully diverting the natural flow of and abstracting water from certain ravines and streams flowing into the Vance river situate in the Ward of La Brea and Guapo in the Island of Trinidad and also for obstructing and polluting the same to the damage of the Plaintiff And for a perpetual injunction restraining the Defendants their servants agents and workmen :—

(A) From damming up the water in the said several ravines and streams so as to interrupt the flow of their waters into the said Vance River and so as to deprive the Plaintiff of the undiminished flow of the waters of the said River and from erecting or constructing any dams erections or works in the beds of the said ravines and streams so as to interrupt and diminish or otherwise obstruct the natural flow of the waters of the said ravines and streams into the said river and

(B) From discharging from the Defendants' lands into the said ravines and streams salt water and oil and other noxious matter so as to pollute the waters thereof or render them unwholesome and unfit for use to the injury of the Plaintiffs ; and

(C) Ordering the Defendants to remove forthwith all dams erections and works in the beds of the said ravines and streams placed there by them.

This writ was issued by Mr. Charles Leonidas David of No. 32 St. Vincent Street, Port-of-Spain (and whose address for service is the same place), Solicitor for the Plaintiff, who reside at Lot "A" St. Clair, Maraval Road, Port of Spain.

CHAS. LEONIDAS DAVID,
Plaintiff's Solicitor.

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No. 2. Appearance of Defendant dated 28th Sept., 1914.

## No. 2.

## Appearance of Defendant.

Enter an Appearance for the Defendants The Petroleum Development Company Limited the Defendants to the Writ of Summons herein whose registered office is at Brighton in the Ward of La Brea.

Dated this 28th day of September 1914.

Yours etc.

PHILIPPE DE LA BASTIDE,
Defendants' Solicitor.

The place of business of Mr. Philippe de la Bastide is No. 107 Queen Street, Port of Spain His address for service is the same.

To The Registrar of the Supreme Court.

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## No. 3.

## Statement of Claim.

1. The Plaintiff was at all material times and is possessed of certain lands called Perseverance situate in the Ward of La Brea and Guapo in this Island along and through which the Vance River flows and was and is entitled by his riparian rights as owner and occupier of the said lands to the natural and undiminished flow along and through the Plaintiff's lands of the water of the said Vance river and of the ravines and streams which feed the same without obstruction or hindrance.

2. The Defendants are the occupiers of certain lands situate in the said Ward of La Brea and Guapo through which certain ravines and streams which feed the said Vance river flow. The said lands are higher up the said river than the lands of the Plaintiff.

3. In or about the month of March 1914 and thenceforth until the date hereof the Defendants wrongfully obstructed and stopped the flow of the water in the said ravines and streams by erecting and continuing walls or dams in the beds of the said several ravines and streams and thereby penned forced and kept back the waters of the said ravines and streams so that except in time of flood they were hindered from flowing into the Vance river and the Plaintiff has thereby been deprived of the natural unretarded and undiminished flow of the water of the said river along and through his lands.

4. Large and appreciable quantities of the water of the said several ravines and streams penned back as aforesaid have been and still are being taken and used by the Defendants for the purpose of working their oil wells situate on the said lands of which the Defendants are in occupation.

5. Not any portion of the water taken as alleged in the preceding paragraph is returned to the said ravines and streams or to the said Vance river in the volume or character in which it is taken or at all.

6. The Defendants still continue the acts complained of in paragraphs 3, 4 and 5 hereof and threaten and intend to continue the same unless restrained by injunction from so doing.

7. The Plaintiff carries on business as an Oil Refiner on the said lands of the Plaintiff.

8. The Plaintiff for the purpose of his said business was and is entitled to use the water of the said Vance river in its natural state and without being polluted and disturbed as hereinafter mentioned.

9. In or about the month of May 1914 and thenceforth until the date hereof the Defendants and their servants agents and workmen polluted and still pollute the said several streams and ravines which feed the said Vance River by discharging from the said lands in the occupation of the Defendants large quantities of oil and salt water and other noxious matter thereby rendering the water of the said Vance river unwholesome and unfit for domestic purposes and for the purposes of the Plaintiff's said business.

10. The Defendants still continue the acts complained of in paragraph 9 hereof and threaten and intend to continue the same unless restrained by injunction from so doing.

RECORD.

*In the Supreme Court.*

No. 3. Statement of Claim, 9th Oct., 1914 —*continued.*

11. By reason of the said acts complained of in paragraphs 3, 4, 5 and 9 hereof the Plaintiff has suffered damage.

Particulars under Paragraphs 3, 4 and 5.

The Plaintiff uses the water of the said Vance river and its tributaries and feeders for the purposes of his said business and for the domestic needs of persons in the employment of the Plaintiff working on the Plaintiff's said lands and by reason of the said acts complained of in paragraphs 3, 4 and 5 hereof the volume of water of the said Vance river flowing along and through the Plaintiff's lands has been sensibly and appreciably diminished and in the Dry Seasons of the Year the flow of the said water is completely stopped and the Plaintiff is thereby deprived of the use of sufficient water for the purposes aforesaid.

Particulars under Paragraph 9.

In or about the month of May 1914 by reason of the acts complained of in paragraph 9 hereof the water of the said Vance river used by the Plaintiff for the purposes of his business contained large quantities of oil salt and other noxious matter which damaged the Plaintiff's boiler and pumps and thereby totally prevented the Plaintiff from refining oil for fifteen days and to a partial extent of three months thereafter.

| | |
|---|---|
| Cost of repairs to the said boiler .. .. .. | £4. 3. 4 |
| Deterioration of said boiler and pumps .. .. | 50. 0. 0 |
| Loss of profit on 3000 gallons short made at 15 cents per gallon .. .. .. .. .. | 93. 15. 0 |
| | £147. 18. 4 |

The Plaintiff Claims :—

1. Damages for wrongful diversion and obstruction and for pollution.

2. An injunction to restrain the Defendants their servants agents and workmen :—

(A) From damming up the water in the said several ravines and streams so as to interrupt the natural flow of their waters into the said Vance river and so as to deprive the Plaintiff of the undiminished flow of the waters of the said river and from erecting or constructing any dams erections or works in the beds of the said ravines and streams so as to interrupt and diminish or otherwise obstruct the natural flow of the waters of the said ravines and streams into the said river ;

(B) From discharging from the Defendants' lands into the said ravines and streams salt water and oil and other noxious matter so as to pollute the waters thereof or render them unwholesome and unfit for use to the injury of the Plaintiff ; and

3. An injunction ordering the Defendants to remove all dams erections and works in the beds of the said ravines and streams placed there by them.

4. Such further or other relief as the nature of the case may require.

Sgd. L. A. P. O'REILLY
of Counsel.

Delivered this 9th day of October 1914 by Mr. Charles Leonidas David of No. 32 St. Vincent Street, Port of Spain Solicitor for the Plaintiff.

Sgd. CHAS. LEONIDAS DAVID, Solicitor.

To Mr. Philippe de la Bastide,
107 Queen Street, Port of Spain, Defendants' Solicitor.

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## No. 4.

No. 4.
Statement Defence, 3rd Nov., 1914.

## Statement of Defence.

1. Except that the Plaintiff and the Defendants are in possession of certain lands at La Brea and Guapo, the Defendants deny the allegations contained in paragraphs 1 and 2 of the Statement of Claim and say that there are no streams or ravines having any natural flow through their lands which feed the Vance River.

2. The lands of both Plaintiff and Defendants referred to in the Statement of Claim are situate in a district in which the oil industry is the principal one carried on and both Plaintiff, Defendants and others have bored wells on their lands for the purpose of extracting and have extracted crude petroleum therefrom.

3. In the course of the operations usual and necessary for carrying on the said industry the Defendants have erected sumps or reservoirs on their lands for the purpose of storing and collecting their oil production.

4. The Defendants deny each and all the statements and allegations in paragraphs 3, 4, 5 and 6 of the Statement of Claim and the particulars thereunder and say that if it be proved that there are such streams and ravines as are therein referred to they do not take any water from the said streams or ravines for the purpose of working their oil wells or for any other purpose, and all waters which may collect in the sumps or reservoirs referred to are returned to the Vance river.

5. The Defendants deny each and all the statements and allegations contained in paragraphs 8 and 9 of the Statement of Claim and say that they

RECORD.

*In the Supreme Court.*

No. 4. Statement of Defence, 3rd Nov., 1914 —*continued.*

are entitled to mine or bore mines or wells on their land and to win petroleum therefrom in the usual and proper manner and without default or negligence, and that if any oil, salt water or other noxious matter escapes into the said ravines the same is inevitable and due to the force of gravitation and the action of other natural forces independently and irrespectively of any acts of the Defendants.

6. Long prior to the month of May 1914 the Plaintiff bored wells on the said Perseverance lands and struck crude petroleum oil in large quantities and discharged the same into the said Vance river and still continues to do so at a spot higher up than the spot at which it is alleged by the Plaintiff that the Defendants are discharging salt water oil and other noxious matter, into the Vance River.

7. In or about the year 1912 the Plaintiff erected a sump or reservoir across the said Vance river at the point referred to and collected therein large quantities of crude petroleum oil, subsequently and prior to the acts now complained of the said reservoir or sump gave way and the crude oil so collected flooded the said river and saturated the banks of the same up to their highest level and has since polluted and still continues to pollute the said river in time of rain.

8. Owing to large deposits of Asphaltum and crude petroleum oil in and over large areas of land in the district in which the said industry is carried on seepages of oil are numerous and such oil in the time of rain is washed into drains ravines and other depressions in the general watershed of the said district.

The Plaintiff has not suffered the damage complained of or any damage at all.

(Sgd.) W. BLACHE-WILSON,
Of Counsel.

Delivered this 3rd day of November 1914 by Mr. Philippe de la Bastide of No. 107 Queen Street Port of Spain Solicitor for the Defendants.

(Sgd.) PHILIPPE DE LA BASTIDE,
Solicitor.

To Mr. Charles Leonidas David,
32 St. Vincent Street, Port of Spain,
Plaintiff's Solicitor.

RECORD.

*In the Supreme Court.*

No. 5.
Reply.
12th Nov., 1914.

## No. 5.

## Reply.

Reply of the abovenamed Plaintiff delivered this 12th day of November 1914 by his Solicitor Mr. Charles Leonidas David of No. 32 St. Vincent Street, Port of Spain.

(Sgd.) CHAS. LEONIDAS DAVID,
Plaintiff's Solicitor.

1. Save as to admissions therein contained the Plaintiff joins issue with the Defendants on their Defence.

2. The sumps or reservoirs referred to in paragraph 3 of the Defence have been made by the erection of walls or dams in and across the beds of ravines and streams which flow through the lands in the occupation of the Defendants and which feed the Vance river. The said sumps and/or reservoirs are used both for the purpose of storing the oil production of the Defendants and of storing the waters of the said several ravines and streams.

3. The Plaintiff admits that in or about the year 1912 a sump erected on the lands of the Plaintiff gave way and that a considerable quantity of crude petroleum oil flowed into the Vance river. Since that time heavy rains have washed away to the sea all the oil which had flowed from the said sump into the said Vance river and not any oil whatsoever has been allowed or suffered to flow from the Plaintiff's lands into the said Vance river. Save as hereinbefore admitted the Plaintiff does not admit the allegations contained in paragraphs 6 and 7 of the Defence.

(Sgd.) L. A. P. O'REILLY,
Of Counsel.

To Mr. Philippe de la Bastide,
107 Queen Street, Port of Spain,
Defendants' Solicitor.

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## PLAINTIFF'S EVIDENCE.

Plaintiff's Evidence.

Mr. L. A. Wharton, K.C., and Mr. L. A. P. O'Reilly for Plaintiff.
Mr. E. Agostini, K.C., The Hon. H. A. Alcazar, K.C., and Mr. W. Blache Wilson for the Defendants.

No. 6.
Examination of Charles Conrad Stollmeyer, 10th March, 1915.

## No. 6.

## Examination of Charles Conrad Stollmeyer.

Owner of Perseverance Estate. (Deed of 16 March 1905 Benlisa to Plaintiff conveyance of Perseverance C.C.S.I. put in). 983 acres—a little more than deed shows. I purchased it in 1905 as a cocoa estate. It also

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 6. Examination of Charles Conrad Stollmeyer, 10th March, 1915 —*continued.*

had coconut and tonka beans. I also purchased with the prospect of liquid asphalt being in it. That was the bait at the time. I started oil operations in 1910—boring wells for oil. I have been successful. Average daily labour roll—80 persons; 60 on cocoa and rest on oil field.

Two plans compiled by employees of Defendant Company put in by consent. C.C.S. 2 and 3. No. 3 is an enlargement of section of No. 2.

A third plan C.C.S. 4.

My knowledge of Perseverance began in 1905. Vance river flows through it and empties into sea. It has many feeders. There is a ravine in my own oil field and there are branches flowing into Vance River through oil fields of Defendant Company. One is the main ravine and there are smaller feeders of it on lands of Defendant Company. Vance River has a defined channel, very well marked. I know it for about 4 miles up from mouth and along that distance, it is well defined throughout. Smallest width of river proper is about 6 feet; and widest about 40 feet. That is width of the water as it would be now. The smallest width of bed is fully 10 feet and largest width of bed is 40 or 50 feet. Width of water in lower reaches is 40 to 50 feet. I have never seen the main channel of river dry. It flows continuously throughout the year even in the dry season. It is in pools but one pool flows into another in driblets through crevices in the rocks. It is in pools at height of dry weather—middle of March to end of May. To-day it is flowing continuously. May to March it is a partly decent volume of water. The wet season is from latter part of May and dry season generally from middle of January. Ravine through my oil field has a well defined channel. I know it from its entrance in Vance River for 1 mile or 1¼ mile counting the winding. Width of bed 3 feet to 10 feet between the immediate banks which hold the water; from that it starts off. I mean the actual banks to height water rises in wet. Greatest width 10 feet so far as distinct. Depth anything up to 4 feet. With abnormal rains it would rise to any height. Banks are 40 feet high in some places. In many places it has banks above the bed. The actual groove down which the water flows averages about 4 feet in width. In heavy rains that groove of course would not take the water. Flow of water in my ravine is fairly continuous except for 2 or 3 months when there are pockets—that appear not to move. Pockets at interval of 1 to 10 feet according to ground. Continuous flow end of May when rains begin till about this time *i.e.* middle of March. I speak of the ravine next to Parry's Land—alongside and into Parry's Land. Ravine through Company's land into Vance River has a defined channel up by end of Company's oil field for about 1/3 mile. That is what I take to be main ravine. I have followed it on the ground. There is no mistaking the bed. Width from 2 feet. It is very broad in some places. The land is very flat. Width 2 to 15 feet from Forest down to Vance River. I regarded the ravine shown on the map C.C.S 4. as running off to the right as one ascends the ravine as being the main ravine—not the one which runs nearly straight on. There is a well defined channel as it turns off to the right with a width of 5—6—10 feet and from No. 11 well to source 2 to 5 feet. Those ravines feeding the main ravine about 4 on the right—from a little before No. 11 on plan agrees with my recollection. I visited three feeders

in particular at various times during the last 16 months on Defendant Company's ground They had well defined channels. Average width is about 6 to 8 feet. It is difficult to say. They have well defined channels. I have known the main ravine on Defendant Company's land at Vance River end for 10 years, and further up immediately where the oil fields are for the last 4 years. At river end it takes same character as the river: it is dry except for pools during the dry season—not whole of the dry season—but in the driest part of it. In section where oil fields are I have known it 4 years. Where the sumps are there was a well defined channel. Flow of water there: in the dry season there were good pockets of water there in the dry season before Defendant Company started work. I had been there 3 or 4 times before they started work. I don't remember how many of that 3 or 4 were in dry season but I have been in both. In wet season it would be flowing, in dry in pockets. I never saw it entirely dry. It was good drinking water because I used to send a man to bring water from that part for drinking purposes. That was just where Defendant Company now has its oil wells. The man would go where the sumps are now in main ravine. I don't remember whether I have drunk water there. Company started work there latter 1913 or early 1914—boring wells and winning oil. They have erected dam there on the main ravine—I know of three on it. On the feeders I know of 1 on each of 3 tributaries. The effect of dams is to keep back any liquid that would come down the ravine. There are sluice gates—higher up than level of the bed. The pipes to which the sluice gates are connected are higher up than the bed of the ravine. We call them sumps; they are reservoirs for oil. The water and oil comes down the ravine and the water settles below the oil and the oil is pumped off and then the water is let off, the valves or sluice gates being opened. I have seen the oil and water collected in the Defendants' sumps at least a dozen times. I have seen sluice gates shut off several times. I have experience of these sumps. Opening of sluices every 2 or 3 days or 2 or 3 weeks. From rush of water it would be every 2 or 3 days. It has been that lately since beginning of this year from my observations. Height of dam from bottom of ravine 10 feet. Sluices from that bottom 3—4 feet in biggest dam. Oil is pumped off top and a pipe which is a suction to a pump. The latter is the common way. As to height of that pipe it is moveable. I have oil fields adjacent to Company's and shown on plan. I collect my oil in my ravine and in tanks. Tanks not in ravine. My sumps are more or less like the Defendant Company's. I started work in 1910—not in that spot. I started there in 1911. I have also a plant for refining oil further down 1 mile below where Company's ravine enters the river—less than a mile—about 4,100 feet—and just by the main road. I have 2 or 3 boilers on my oil fields—one at the refinery. I have had trouble with refinery boiler. First noticed last May. Refinery started about end of 1913—I think before Company started their work in this particular. The trouble was the water in river became very salt which had never occurred before. Never noticed to be salt before. Effect on boiler was to corrode all mountings and joints. Festoons appeared of salt. It humbugged the work altogether or to a great extent. That trouble has been continuous since last May till I stopped work 3 or 4 weeks ago. Water

in river is salt till now. In consequence of the salt water I have lost money —considerable repairs to boiler. $20 paid. Cost of boiler in England £100—here as put up about $650. Salt burnt out one of the tubes—galley boiler. Deterioration of value—more than half value is gone. Much less heating surface. Nobody would give us £30 for it because of the effect of the salt. 17th Sept. action filed. The boiler has split and we had to patch. Deterioration then—17 Sept.—was fully £50. Salt was sometimes more, sometimes less. We closed few weeks ago because it did not pay to make gasolene, we were having so much trouble with it. We could not make so much gasolene; much less. May to Sept. 1914 average amount of gasolene would have been 60 gallons easily—have made 88 a day. Just about May we double the size of our plant and have never had it working under normal conditions. We have made 88 a day since September. Sometimes you get less salt in the water when there are heavy rains. We made it during one of these favourable times. We did not have the festoons. As they were made they were torn off. 25 working days a month at 60 gallons = 1500 gallons per month, therefore May to Sept.—7500 gallons. We actually made 3626 gallons therefore loss over 3000 gallons (only 3000 claimed). I put the profit then at 15 c. per gallon. It is not that now therefore on 3000 gallons = £93.15/-. I only claim for that loss. In May 1914 I looked for source of trouble. I had never known the river salt before. We traced the trouble up to Company's oil fields. It got out river from their wells. It was pumped up. I have been on the field and tasted the water from 3 wells. I went first about July. Nos. 5 and 6 then. I have since tasted No. 9. Water was as salt as brine. From No. 6 at the time I visited it was flowing. In No. 5 and No. 9 the water was being pumped. I have since seen No. 6 being pumped. Oil and water come up. In No. 5 it is pumped into a tank and the water is let off by a cock into ravine. In another instance it was let off direct into ravine. It was so in No. 6 when I saw it last. Nearly all these wells were being pumped when I was there last, viz., this month. Even before Sept. I have seen some of them being pumped. Some were gushing. I saw one gushing intermittently and one just after it was struck. I was with driller. Before September 6 or more were being pumped. I have been told by one of the Company's men looking after derricks that they had six wells giving salt water. That was this month. All that salt water flows into the main ravine. I have tasted the water below the oil wells in several places in the ravine and found it salt every time. I have tasted water of Vance River before where Company's ravine joins it and found it salt also. Besides salt there is pollution by oil in varying quantities coming down since last May or June. Salt noticed first, then oil. Both continuous since, oil quite perceptible. 100,000 barrels have gone down I say since last June. Before that my contractor drank water for drinking and cooking. Now they can't use it *i.e.* water of River or ravine. Seepages: before any oil was worked there there was no trace of oil in the water. I was the first to work oil in that area. No trace before that in ravines or river. Well No. 5: each time I saw was a volume of 2-inch bore pipe: *i.e.* the salt water from it. I never measured it. I speak of water alone—and No. 5 derrick. It goes into a tank. Oil and water together—but I spoke

of water alone. I have always seen the bore in question (like a 2-inch) open. There is no salt coming out of my wells. I have never had salt troubles from my boilers on my oil fields. I never pumped up water at all. I have tasted water in ravine and it is quite fresh—before my dam—that is the one that burst. I remade it. The water is polluted with oil. The oil on water below my dam, the pollution occurred in early February this year. We were disconnecting a pump and 3 to 4 barrels were emptied in the ravine. Before that since August 1912 my ravine had been quite clean from oil pollution. In 1912 I struck a gusher, 15th May and oil accumulated till about 1 week in July when it and heavy rains broke the dam and the oil ran to the sea. Estimated loss about 60,000 barrels. The river was polluted about middle to end of August. We had heavy rain continually which washed everything out to sea. River was pure till last May when Defendants polluted it. When water is let out of sump after being under oil it smells strongly of sulphuretted hydrogen gas—rest fit for drinking. That is when it has been standing for some time. The water has not remained there in my time, and I can't speak as to its being in that condition. Between bursting of my dam and pollution by Defendants people drank the water.

Defendants' main ravine: I went to what I call source with Tomlinson in February and with Mr. Cornillac on 1st March. At source in February we noticed pools all the way up till we came to a kind of bluff where was a pool of water with little fish, like "millions," in it and we could see the water oozing under the strata. Country was fairly flat till we got to that bluff. Water seemed to be oozing from sandstone rock there. I have a large boiler at my refinery waiting to be erected. I am waiting till river becomes clean. My industry is completely stopped. I have the plant and permission from Government to erect it, but dare not. I wrote letters to Defendants myself apart from my solicitor's letters. I have copies at my office.

(O'Reilly: Originals have been called for.)

My first letter was 23rd March. I wrote one myself.

The others went through my solicitor.

Fowler's letter—30th March 1914 ) Put in C.C.S.
Agostini's letter—6th April 1914 ) 5 & 6.

To the Court:

I know of 3 dams erected by Defendants in main ravine.

(Agostini: There are at least 12.)

My ravine and Defendant's ravine run into a common pool in river and whole of pool is influenced by salt from Defendants' ravine. They run 40 feet apart. I have a bridge across river a little nearer to Company's ravine than to mine.

To the Court:

Water is not tidal.

To O'Reilly:

Lowest dam is the main ravine. It controls all the dams in the main ravine and its feeders: *i.e.* if all were open it would hold back whatever

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 6. Examination of Charles Conrad Stollmeyer, 10th March, 1915 —*continued.*

came through. I have 4 boilers at my wells and 1 at refinery and another ready to go up. Since dry season 1912 I have worked well boilers continuously. I get water from my ravine in wet and dry season—both. Before my dam was built in 1912 I could get water from ravine in height of dry season carried in pitch oil tins by coolies enough to feed boilers. I complain of the Cruse Syndicate. They have 4 dams—across another ravine—other ravine which merges into one feeder of the Vance River. On my own ravine I have to complain of people who work Parry Lands viz., Trinidad Oil Fields—now United British. They dam my ravine just above my wells. The dam is not there. We threatened them with an action and they broke it down.

To the Court :

They did not give up working. Trinidad Oil Fields broke it down United British had one branch of that ravine and other ravines.

To Wharton :

I know of two dams they have, I have not been there for some months They have not polluted me up to now.

To O'Reilly :

It is absolutely necessary for my estate to have water. Vance river has many feeders. Damming them all up would dry the bed up altogether.

To the Court :

In some cases the water remains there for all time. Some dams are used for storing water.

To O'Reilly :

Result would be as I have said if all did so. I am not speaking of the Company's dam. I have seen an appreciable amount kept back the Defendants' dam. Last time I went, water was 4 feet above sluice gates *i.e.* 6 feet deep of water. I am right on sea. Man with 10 acres on both sides below. I bought him out.

Oil Companies polluting Trinidad Oil Fields, now the United British sent down oil to my ravine—but it never reached the river.

Cross-examination.

Cross-examination :

Because of my dam, if it passed my dam it would reach the river.

Q. If you and that Company has 10 gushers your dam could not resist it ?—A. It depends on the size of the gushers. 1000 acres Perseverance Estate is about that. Bishop Prospere was the man I bought out. He could have been a terrible trouble.

Q. He could have stopped the expenditure of a billion dollars ?—A. It might have been.

Q. If the law was as you would like it to be billions would be at stake ?—A. I will defend my estate. Whoever was above me, that would be their

business. I have 400 to 500 acres of cultivation. I bought estate really because I was looking for liquid pitch. $20,000 I paid for it. I know the watershed. I have some cane cultivation about the road, nothing to speak of. There are thousands of acres of cocoa in the Vance Watershed. Behind my wells is Forest. I have 400 to 500 acres in cultivation below.

Q. Where there is pollution from our oil wells is any one else interested? —A. No, nobody. Whole reserve is part of the watershed and above me. It is leased out to various Oil Companies—Cruse Syndicate, U.B.W.I.P.

Q. Trinidad Leaseholds?—A. I am not quite sure if they are in Vance watershed. They are in the Morne L'Enfer reserve.

Q. Whole part of Vance watershed which is Crown reserve is leased to the Oil Companies?—A. Leased or under prospecting licenses.

Q. Acreage is 11,000?—A. I suppose so. That is whole reserve, in various watersheds—in all of them. All started working within the last few years. I was the first in that district. A company allied to Defendants' Company had been working oil near Brighton before me.

The industry is in its infancy. The Crown Reserve is practically all oil lands. There will naturally be great extensions of the industry. I will extend and am extending now. You have stopped me in the meantime about gasolene. I should make a thousand gallons per day with the present plant. I got a new boiler to extend gasolene business. I can't because afraid of this water. I am extending my oil fields. I am extending my operations but not my fields *i.e.* I am putting up more derricks. Eventually I may develop all the land I have.

Q. Your principal wells are a few hundred yards from nearest well of Defendants' Company?—A. 500 to 600 yards. Not more than that. U.B.W.I.P. nearest well is nearer to mine than Defendants' Company's nearest one. Cruse is just on one of my boundaries.

Q. Defendant Company's acreage is just about 16 acres from where their wells are?—A. I can't tell. There are over 20 wells. I am getting oil from 3 wells. Cruse, I think, have only 3 wells.

Q. You might all have 20 to 30 wells apiece?—A. It is possible. They might have many gushers.

Q. Daily production from Defendant Company's wells varied from 1000 to 2000 barrels a day?—A. I don't think that is unlikely.

Q. Sometimes 6000 to 10,000 a day were given by a single well?—A. I believe what you say.

Q. If you put in 5 or 6 more wells and get gushers and U.B.W.I.P. get a gusher too, could you keep it all in with your dam?—A. I don't know. I have not enough experience. I have had no expert training. I have no expert machinist. I have mechanics, fitters etc. such as we have here able to mend a pump etc.

Q. If the industry develops you know the spread of oil can't be prevented?—A. I don't know.

Q. You admitted in another case it would be impossible to prevent the escape of oil dirtying the river?—A. Yes. If you have a gusher and can't control it you can't prevent dirtying the river.

Q. With 10,000 or 12,000 barrels a day there must be an escape ?—A. I can't say. It depends *e.g.* some gushers spatter all over the County. I had one went up 100 feet.

Q. It killed the fish in the sea ?—A. I don't admit that.

Q. With reasonable working of this industry, it is necessary to have sumps ?—A. Yes to settle the oil. Sand covers up with the oil.

Q. A considerable amount of oil scum must escape through the sumps ? —A. I don't know. It has done so. After wells have got pumped I don't see why it should. Even after pumping period some of the oil has come down. I don't say it must do so.

Q. If you got 3000 to 4000 barrels a day, your dam would prevent escape ?—A. No, I would build it higher and put in pumps and you would need bigger gate valves below. I would pump it into tanks. I would open sluices and let water out. The water collecting in ravine would be let out. Water would not come through. Oils in my district are different from others. They are lighter, I have never known it get so thick as to fall below. It always floats on the water. I am pumping water away down to the sea beach through pipes, to seaside of my estate. What I pumped depends on my demands. The oil in my dams is what has escaped from wells. I pumped first into settling tanks, then into other settling tanks, and then into a suction pump which forces it into a reservoir on beach. I have only one dam. Escaped oil in sumps; I pump when I get enough to pump. Some has come down from the U.B.W.I.P. I don't know why they don't keep it. I don't know it is because they can't. It remains against my dam for a considerable time. 100,000 barrels at least you have let escape. I have often wondered and thought it was carelessness. A little lack of supervision will let it away. It has come down in volumes for days and days. I don't say of late. I heard you were surprised at the quantity when you thought it was mine coming down, that it was my ravine.

(Shewn sketch.) I don't recognise it. It is not correct. There is only one sluice in my dam. The water comes down in direction shewn by arrow and comes against my dam. I understand it now.

Marked X for identification.

Q. You see " Stollmeyer's wells," that is more or less where they are ?—A. Yes. Oil goes in direction of arrow.

Q. All that corner " Stollmeyer's well " is a mass of soft stuff ?—A. Sand, fairly solid now, discharged from the wells. When my well gushed.

Q. From that arm of ravine to the ravine itself is swampy ?—A. No. A layer of oil and sand became hard. It all came out of wells. I get water for boilers from dam only. I take all the water, none goes through sluices. I have no opened sluices. Since dry weather began I had to keep water there for my industry. Without a dam I could not get water in large quantities there. Formerly coolies carried what I wanted from ravine below dam. It was not a huge industry. It would not do for that. I knew Defendant Company used no water from this watershed before I entered my action. I knew of the 4-inch pipe, and that you used none from well for working wells. I told you I always saw water in the ravines.

Paragraph 4 of Statement of Claim :—

"Being used for working their oil wells."

Q. That is not correct ?—A. I won't say. I refer to my lawyers.

To the Court :

They were not using water from their ravines to work their wells.

Paragraph 5. "No portion . . . is not returned ?" It is not returned in same volume or quantity ?

Q. Any water that comes down our ravine to Vance River comes from the Vessigny River through a 4-inch pipe ?—A. No.

Q. A great part does ?—A. It is Vessigny water added to salt water from your wells and whatever water might be in the ravine less the quantity kept back by the dams which are solid up to the sluice gates. Water from Vessigny goes to the works, not direct into ravines. I don't know the quantity. It must be a fair quantity to run the works. A great deal of it is returned from boilers and rotaries, &c., and goes down the ravine. 50 per cent. it was said in the last case. It goes down charged with salt and oil.

Q. New wells will discharge salt water ?—A. It may be so. I have not done so yet. 460 feet is my deepest well and that is shallow. Some wells in Island between 2000 and 2500 feet deep. It is quite probable some will discharge salt water. To work you must have water by making a dam or procuring it somewhere.

Q. Whether there is water or not in feeders or feeders of feeders there would be no water to depend on ?—A. Not for a number of wells, but might be enough for one well. I can't say why you have not dammed.

Q. Because there would not be enough ?—A. I would not say so.

Q. If we could have got it there we would not have gone to expense of 4-inch pipe ?—A It depends on the convenience. If any other Company were there how could they get water except from Vessigny ? I saw fish swimming above your wells. They are called "Millions." I suppose they die if pool dries. You get fish in the mud. The feeders are natural drains. It looks to me like a spring. At first at block of rock in same pool and water oozing from stratified rocks. There was not a continuous flow from it all way down but pockets followed each other all way down. From pool I suppose it percolated to next pocket. It may dry up later on. I was there about middle of February and 1st March, when there was less water. There is a defined channel even there. My ravine below my dam is not dry. Immediately below my dam is dry. There are some deep pools in it below. I was there 1st and 2nd March with Cornillac. It is flowing in some places. Other feeders run into ravine. Spot where I crossed road was actually flowing. Pool with fish is 1/3 mile from highest of Defendant's wells. I gave $20,000 for property. I have had it 10 years. I would not take a million dollars for it. One well 296 feet gave 140,000 barrels of oil at $1 per barrel. I would take two million dollars for it, or something in between. Value of cocoa is a bagatelle so long as I have a clean river. If I had that I would set up a big industry at once. If gushers occurred in cocoa I would knock out the cocoa.

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 6. Cross-examination of Charles Conrad Stollmeyer, 10th—11th March, 1915 —*continued.*

Q. From your cultivation to near point on Vance river to get sweet water for your people?

A. At least a mile, and other labourers lower down would have to walk 2 miles.

To the Court:

They would have to go through forest and up above salt water beyond my bridge.

Cross-examined:

That is the main river.

Q. How far from your refinery to main Vance river above its junction with Defendant's ravine and your own to get pure water carried by pipe?—A. About a mile. It would be very inconvenient.

Q. It would be in your land?—A. I can't say. When next person polluted I would have to go further up. I don't see why I should be compelled to submit to that.

Q. You know the river, for how far above your refinery?—A. About 2 and half miles. It is flowing now, once water to where Parry's road crosses the river. In dry season it makes pools flowing from one to another. I have never seen it entirely stagnant. Pools and small passages. It trickles from pool to pool. I don't know how far that goes.

Q. Making sumps is the only mode of working?—A. I don't know. All here in Trinidad do it. I think there is carelessness because so much oil comes down the river. I can't see why it should. None comes from me. I think a lot that comes down might have been prevented. I don't say a certain amount must come down. I admitted in other case a gusher must dirty beyond the dam but when you are working I don't see why it should come down. Few barrels leaked from pipe to dam. It came into ravine and polluted it so far. It may get to river sometime. Before that and since dam broke, my ravine has been quite clean.

Q. 12th February you went there, was that after leaking?—A. I can't give date. Pollution in 2 ravines was not the same. I don't admit there will be pollution if I get another gusher. I hope to control next one. I admit some gushers have been uncontrollable. I have the machinery. I expect it every day now, to control another gusher. A film of oil spreads a long way. I expected oil at 600 to 700 feet and got it at 296, I was taken by surprise and to try and save it I kept building, but rain came and it burst. Accidents can always happen, but constant discharge for months is not an accident. My daily production from that well is 8 to 10 gallons a minute, *i.e.* 280 barrels a day with present pump. My whole actual production is 4000 to 5000 tons during last 10 months about 32 to 35,000 barrels.

Q. That quantity is easy to control in sumps but 10,000 would be very different?—A. If I had 10,000 I would equip for it.

Q. Is there not a point beyond which you can't control?—A. I don't know. You would only have to enlarge. I pump to beach and intercept what I want in refinery at which I have a reservoir—a pit, not a tank.

Q. That oil from that pit escapes into river?—A. I don't know that. There is a drip here and there—and rain may convey it into river.

Vance is not a mud river—but clean with a sandstone bed. When it rains very hard like all rivers it becomes muddy. It is on a hard bottom. You could wade through water without sinking in mud except by the sea. All water from above comes into my dam. It was coming in on 1st and 2nd March from main ravine and from a branch into it. It is not true that none is coming in now. It has been doing but we have had showers. I should not say the coming down came from the U.B.W.I.P. one giving water did not come from their direction so that a supply is kept up from that ravine for my reservoir. I have never measured my reservoir, but there is 8 feet of water deep there now. Ravine slopes to nothing. Width of water now is at least 40 feet. It tapers back to nothing. Water is about 150 feet long—from nothing down to dam. I have 4 small boilers for my wells. I don't know what water they require. Horse power is about 11 for three and one $12\frac{1}{2}$. I don't use rotary drill now. I use cable tool drill. I take water into my boilers direct from the dam.

Q. Does it interfere with your boilers?—A. No, it is better in wet season but now it begins to get stagnant and frothy. The quality of the water does not interfere with my boilers. I clean them I can't say how often. If worked regularly, say once a month. But not always worked regularly. Horse power of boiler at refinery, I think, is 12 or $12\frac{1}{2}$. I worked day and night at refinery and still do so at oil fields.

Q. When you had salt water at refinery how often did they clean out?—A. Sometimes once a week. It depended on the salt. We pump into receiving tank from river and from former into boiler. I have no analysis of the water in the river. I tasted it, the water, myself and found it salt. I don't know percentage of salt. It would vary—according to dry or wet weather.

Q. As river goes to sea it is tidal how far—1 mile?—A. No, but more than $\frac{1}{2}$ mile.

To the Court:

Refinery is as river winds $1\frac{1}{2}$ miles from sea I should say. In a straight line 1 mile and 300 yards. On 1st March water very salt in Defendants' ravine. I don't know for to-day. At my refinery it was less salt, but salt. At my refinery it was brackish. I last tasted it on 1st March. I have tasted it many times before when it was very much more salt. As it is now it would interfere with boiler.

Tidal Water: My house and labourers' barracks are near the sea—but not near the river at all. Drilling and estate house, cocoa house, sweat house, labourers' barracks are on Vance river road—200 yards from sea, and about 400 yards at least from nearest point of river. They are to West of River. Marks on C.C.S. 4. Refinery with X or by line run of road to sea. Road marked is a public road. For the buildings I get water from springs and tanks—for labourers living in barracks round buildings and others working there. Springs are towards sea—one is just off the road near sea. Water is tidal up to point which I mark O in C.C.S. 4. Between it

and my refinery there are contractors living near tank—and right along S. Central Road. Branch going up almost right to lot one from mouth: I saw it recently but can't say if it is dry or not. Branch on other side of Vance River *i.e.* on right bank going towards mouth on 1st March there was a little water near where it joins the main river. I don't know whether there was water beyond. As to other branches, not the Defendants' or my ravines, they were dry. They are much smaller.

Q. All branches are dry in dry weather unless they are fed by springs? —A. I would not say so. I have never seen your ravine or ravines dry.

Q. How far up is the water in main ravine?—A. I have never been further up than Parry Lands bridge. I was there some time last year when water was being pumped from it. Beyond that I don't know whether there is water now (I have never been)—of my personal knowledge. 1/3 mile from your highest well I found a pool with millions.

Q. In what direction is it from our highest well?—A. On C.C.S. 3 is where I found the pool. That ravine I took to be the main ravine at the time I found it. That is where the bluff is. I walked from the Defendants' well. We came from little trace through my forest and went up on right of that ravine. No. 9 well is one side of it and No. 5 on the other. I did not mark the numbers of the others—Shown plan, C.C.S.3. 9 is one side—5 on the other. 20 on one side, 17 on the other *i.e.* of the ravine I walked up.

Q. Whole spot is entirely banked up with sand?—A. Yes, you have disfigured. It is not blocked up. The water, oil and all finds its way down. On 4th or 5th Feb. there were intermittent pools below the bluffs. Showers might account for the pocket.

Q. Pools would not run through because of sand caused by working?—A. No, if it rained the water would pour down. If there were two moderate rains, the sand would not keep the water back. Your dam where two tanks are I call the main dam. I have traced the ravine right down—but it is impossible to walk in it. I have traced it right down and several times walked in part of it. There is water there and oil and salt. I still say you have sent down at least 100,000 barrels of oil. I have reflected and not changed my mind. Branches flow into that branch and account for some of the water in it. Some wells flow salt water and in some it is pumped. No. 6 flowed salt water. I saw no other do so. I saw two which I am sure were pumping salt water and oil because I tasted them. The salt water came because of the pumping. Pumping up salt water is no good. I don't suppose you want to make salt. You said you had stopped the salt water in a letter. I don't know every endeavour was made nor whether a great deal of money was spent—but it was not stopped.

Q. How old is boiler at refinery?—A. Placed there in 1913, I think—the middle of 1913. I was at La Brea before where it was used for a week. In use in all for about 2 years. It is cleaned out sometimes once a week—others sometimes once a month. We blow out every two hours latterly *i.e.* let out water to clean it and clean out salt. 15 c. a gallon was my profit. I have nothing to show that. It is estimated. I can give no figures.

Q. It costs 27 c. with duty now?—A. With a larger refinery it would cost more. I am going to have a larger one. Manager's pay and many other

things have to be calculated. I sold at 28 to 36 c. a gallon. It went down to 28 c.—not as a fixed thing. I was not in the refiners' agreement.

Q. That is 52% profit?—A. I think it is more than that. Not of late since excise duty. It is now more difficult to make a profit. I don't approve of that legislation at all. It is stifling. I can't give any real figures about that 15 c. Present damages claimed is a mere matter of form. I am thinking of now and the future when I can put up my large refinery. If I struck salt gushers I would hurt nobody because I have nobody below me. It would be my own business if it affected the river. It would hurt my business. It is a possibility. I don't say a probability. It is very probable the other Companies will strike salt water. But I don't intend to bore deep wells. I have only gone to 460 feet. 60,000 barrels were lost by bursting dam and all the oil ran off the river by middle or end of August. It is difficult to tell whether marks on river are yours or mine. The marks of the burst are still on my ravine. We have had heavy rains and river continually in flood.

Re-examination, 11th March, 1915.

Re-examination :

The marks on my ravine are dry and hard—there is no oil left on the ravine. It has all been washed away by the floods. The damages I am claiming are a mere matter of form. Value of boilers is lessened by half. I was making 15 c. per gallon profit before duty was put on *i.e.* at least the excise duty. I still work at a profit.

Q. How did you estimate 15 c.?—A. Because I worked it out. Take cost of wages—resultant of each day's work.

Q. What does it take to make gasolene per gallon?—A. Day's work 60 gallons—6 labourers, 4 get 72 c. and 2 get $1.00 *i.e.* $4.88. 60 gallons at 28 c.=$16.80 a day. That leaves $11.92 profit. That is over 19 c. a gallon. Cost of fuel: fuel cost me nothing, it is my own oil. Value of oil is $1.00 per barrel.

Q. How much gasolene from a barrel of oil?—A. 4% to 9% and barrel is 40 gallons. The balance is residue which I run into my main reservoir and it is sold at $1.00 per barrel, sometimes more. Therefore I arrive at 19 c. profit and striking off 4% for depreciation there is my 15 c. profit nett. I have seen the oil coming down river an inch thick on the river—rushing down—and the flow continue intermittently from last June till 1st March when I last visited.

Q. How long flow an inch thick?—A. From one day to another I know I lost 60,000 barrels and know how it came down the river—how thick and how long it took to flow. I wrote to Fowler. I think I mentioned waste of oil to Agostini at Vessigny the other day. I never wrote to Fowler about the oil—but I did about the pollution. 100,000 barrels is not a wild guess. To bluff ravine is a defined watercourse. I have no doubt about that. There is sand which has come from the oil well. It gradually presses down into the ravines. It falls on ground below the derrick. Some remains there but while it is soft part gets into the ravines—but it does not obstruct the flow. Salt water and oil was going down over the sand. The salt water

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 6. Re-examination of Charles Conrad Stollmeyer, 11th March, 1915.

and oil was coming from the wells. That is at Defendants' end of the 1/3 mile, at upper end of their oil field. All behind that are pockets—more pools—not trickling from one to another. I have 10 years' experience of my own lands and have known the development lands 4 years *i.e.* Defendants' lands and have never known Defendants' and my ravines dry. I don't know if there is any other means of settling the oil except by sumps. Sumps can be made water-tight so as to prevent oozing from reservoir.

Q. Is it merely a question of money?—A. And ability I suppose. One cause of escape from Defendants' land is we made them break down one dam. In one place they had a pit with oil flowing into it. Before it was full well gushed sand and oil and sand displaced the oil which ran into my ravine. Lack of supervision would account for the escape. Again it is a question of money.

Vessigny water: that is the subject of an action in which I have appealed. Their supply may be stopped.

One or two days at different times I have seen oil flowing one inch thick. I won't say in greater thickness. You can estimate it by pulling the oil aside with your hand.

(The Plaintiff was re-called—see pp. 53 and 56).

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## No. 7.

No. 7. Examination of Henry Archibald Green, 11th March, 1915.

### Examination of Henry Archibald Green.

Engineer—Tunapuna; appointed by Government to examine boilers. I know Plaintiff has boilers at La Brea and Perseverance. Some at Perseverance at oil fields and one is at refinery and one at sea shore. Boiler at refinery was erected by me. I examined it 14th July 1914. The water used was salt, and all mountings, viz., cocks and especially manholes, showed signs of salt. Salt round mud and manhole doors. I saw kerosene can full of salt about 4 gallons. I concluded salt water had been used from what I saw. Nothing else was wrong with the boiler. She would not give the same pressure as usual because of the incrustation caused by the salt. It was cleaned out and the salt came out of the boiler.

To the Court:

I did not see them cleaning it out. But I instructed them to clean it out fortnightly and blow the boiler, three times a day.

To O'Reilly:

I went to Plaintiff's oil field and thence to Defendants' oil field. I saw dams—about three in main ravine—a 2 in main and one in feeder to it *i.e.* Defendants' ravine. Main dam had sluice valves—*i.e.* the first dam

from the source. It was closed. I did not look to see whether water was flowing. Behind dam looked like a little oil. Defendants' wells were being pumped. In one I saw a little oil and muddy water being pumped out into first dam. I passed 2nd dam and paid no attention to it. I saw 3rd dam with 4 sluice valves and oil in it. It was being pumped. The valves were from 2 feet to 6 feet from bottom of dam. At top of dam was a sluice gate 6 feet by 3 feet deep. But, I should say, for an overflow in heavy rains. There was a little water running through three sluice valves and I saw an attendant open one of them slightly more. I tasted the water running out of the sluice valves from the dam. It tasted salty. That water finds its way into the Vance River. 20th Feb. 1915 I went there in connection with same boiler. It had the same salt and one of the brass tubes was removed in the furnace—therefore heating surface was reduced. I saw that for myself. The cause was it was apparently burnt by the heavy oil fire. If salt water had been used in boiler, the salt and dirt made a deposit and caused the boiler to be burnt by incrustation. By dirt I mean mud from the pump—*i.e.* Defendants' pump and other dirt, coming into the river—the water not being pure—*i.e.* water of Vance River. I examined the joints round manhole: they were covered with salt. When I put up boiler in 1913 it was in perfect order. Value then was with freight about $600. Salt has caused deterioration. In Feb. for Plaintiff's purposes it is not worth anything except to work a few of the small pumps. No use at all for refinery. I would not give $60 for it except to make into a water tank.

Cross-examination:

Cross-examination.

I saw no salt in the boiler myself. I saw some in mud and manhole doors and on mountings. It tasted salt. I saw it white, ordinary salt. I don't know the chemical analysis. I can't say I have tasted salt water which did not contain sodium chloride. I am not aware of other constituents to cause salt taste. I did not analyse it at all. In the can there was no dirt. I tasted water coming out of the dam—and some in kerosene can.

Q. Did you notice where water for boiler came from?—A. From river. I saw the pipe it came from. It was good even to feed boiler except for the salt. There was a certain amount of dirt in it. There was salt and dirt in the boiler. The water in dam looked clear enough. End of pipe was in river. Water was pumped up into a tank and from tank fed the boiler. I tasted the water in the tank which fed the boiler as it was being pumped from the river into the tank. It did not remain in the tank long enough to settle much—400 gallon tank—and boiler requires about 500 gallons per hour in that state. In good working order 200 to 250 gallons per hour—roughly speaking. I never tested. All the river and feeders are dirty. The water looked pretty clear coming out of the valves. I saw dirt being pumped and thrown out into the dams. I saw water in Vance River was not quite clear as rain water. When it rains all the water comes into the ravines. I can't say the dirt on the boilers came from the Defendants' lands. He was using salt water and the water was not pure like rain water.

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 7. Cross-examination of Henry Archibald Green, 11th March, 1915 —*continued.*

Q. Salt alone would not have caused the burning of the furnace?—A. Yes it might have. In fact, I see no other reason. It was the salt alone did it. Tell me what I said before. I say salt alone would do it if it was left there. If it was blown out, it was still sure to affect the boiler. I did not see the salt in the boiler itself. I can judge of the diminution of steam pressure. I saw how long it took to raise steam etc. I say it was caused by the boiler being dirty. I did not see inside the boiler, but it is a natural conclusion that it was due to an incrustation which I did not see. Many other things might cause diminution of pressure, *e.g.* continual leaking also caused through salt. It is about 35 H. Power. It was constructed a very strong boiler for a working pressure of 120 lbs. per square inch. It works two pumps and the distillery at times. Pumps are very small Duplex $2\frac{1}{2}$ to 3 inch bores. One slightly larger than the other. About 3 feet to $3\frac{1}{2}$ feet long.

Q. Feet of steam coils, how many in still?—A. I never measured it. Boiler kept ample power to work pumps and still but can't do it now. I saw that. I go there very often—two to three times a year. Examine all Plaintiff's boilers.

Q. Dirt alone might cause same result—burning?—A. Not quite.

Q. To a certain extent?—A. No. When it was blown out with dirt alone, it would be much more easily kept clean. You are told it was cleaned out every fortnight and blown three times a day and you can't do more than that. On steamers using salt water they blow every 4 hours. That helps to remove the salt. But now they use condensers to condense the salt water rather than use salt water.

Sluice valves: lowest two feet from bed of river in middle. That was the outlet. I could not see the outlet because covered with oil. You can judge by the outside. They put it horizontal for easy flow of water.

To the Court:

It was 2 feet on outside from lowest valve to river bed in middle.

Cross-examined:

The water dropping there would not make a hole in bed. It was a heavy hole it might do it a little. They are not in the middle but all on one side, all 4—in step ladder fashion. About 6 feet above bed of river, the highest. On side of dam.

Witness corrects statement.

I said boiler took, would take 25 to 30 gallons in a good state. It would really take 35 to 40. At present the pump has to keep on going all the time on account of leakage and blowing the boiler.

Cross-examined:

I have not measured the quantity required. I know from various boilers I have used. I know from the 400 gallon tank being empty so often. I came to that conclusion on 20th and 14th Feb. $2\frac{1}{2}$ hours I was there on 20th Feb.

Q. How often was tank emptied?—A. I should say twice at least. I would not see it emptied. I observed it 2½ hours. I did not stand by the tank all the time.

To the Court:

The water is being pumped into the tank most of the time. I judge it was emptied twice by the water being wasted running out of the taps and cocks. I looked in at the manhole 14—16 inch diameter. Water when I first saw it it was full and sometimes half or three quarters. then the pumps started again. I looked in about half a dozen times.

Cross-examined:

Q. You did that to give evidence?—A. Not exactly. I had an idea I would be a witness. I took a note at the time—but have not brought it here..

To the Court:

Q. Incrustation of dirt, of what sort was it?—A. Like rust in colour. No appearance of oil in incrustation and water clear in appearance. During last 8—9 months I have examined boiler about 6 times. I have never seen it incrusted with oil—only salt and dirt—no oil in the dirt. If the oil was inch thick on river there would be none because the pump sucks in only the water below.

Cross-examined:

I went there two or three times for examination.

Q. Now you say 6 times in 8 to 9 months?—A. Because I was asked specially to go and examine the boiler. About 4 times a year I would go to examine boilers—*i.e.* other boilers of Plaintiff. As a rule I don't take notes. Last time I took no written notes but mental notes. I have notes, but not for this particular thing. When in good state 35 to 40 gallons per hour. Some is blown out and not converted into steam.

To the Court:

It should keep from 90 to 95 lbs. to the inch. Heating surface diminished by 5—6 square feet. Total heating surface—I have not measured it. It is not diminished by half. I will not venture to give the proportion. It has not been considerably diminished. Not very slightly. When heating capacity is diminished it converts less into steam—but water is lost through the cocks leaking running water.

To the Court:

The cock is ruined by the incrustation. You can't keep it tight.

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 7. Cross-examination of Henry Archibald Green, 11th March, 1915 —*continued.*

Cross-examined :

And the boiler priming—*i.e.* a rush of water takes the boiler and rushes into steam pipe. That is owing to the water not being pure.

To the Court :

I can't describe how the impurity causes. I think it is a chemical action—not a mechanical. I am not sure.

Cross-examined :

Q. How much more water would it use because of priming ?—A. I can't say. It would have very often to be done, once an hour with a dirty boiler. I can't say how much water would be lost each time. There is no other cause except leakage and priming. I can't say how much is due to each. Roughly speaking it is using 7 times as much water as before. I can make no calculation as to amount due to each cause. It is a guess, an estimate : 200 to 225. Valves : I did not see the outlet of the sluice valves. It is possible lowest may be at the bottom of the reservoir. I have not seen it.

Q. Incrustation of salt water would not pit the boiler ?—A. It would damage it but not necessarily pit it by small holes. It would damage it by diminishing the thickness of the plates, corrode them.

Q. Experts say salt sodium chloride has no such effect on boilers ?—A. Then why do all Engineers at sea try to avoid salt water which necessitates blowing out every 4 hours on a steamer.

Q. Sodium chloride does not injure a boiler ? You don't agree with these experts ?—A. I don't agree or disagree. If they say so, I disagree with them.

I don't know the constituents of the solids in the pan. I saw solid salt—no water in the pan. I don't know if it was sodium chloride. I would cook my food with that salt.

To the Court :

I know nothing whatever about chemistry.

Cross-examined :

I conclude it was salt. I have brought a lump here.

To the Court :

I saw oil from Defendants' wells and from Plaintiff's well. Some give thick oil. Plaintiff's is beautiful not very thick. I only saw Defendants' oil in dams. It seemed thicker than Plaintiff's oil. I saw oil in the river but never saw it covered. Never an inch thick. Suction pipe is put as deep as possible. Depth of water is 4 feet. Mouth of suction pump is about 12 inches from bottom. It is a powerful pump. I can't say what H.P. It is powerful enough for that little boiler. It would not suck mud from bottom. Bottom is clay. If oil came down inch thick none would get into that pipe though it is a heavy oil.

Q. Dirt on cocks and manholes, of what kind?—A. I found nothing but salt. In some places it is a little greyish or brownish. No dirt that I saw. In parts the salt was slightly brownish. I only found dirt on the cross tube in the furnace. Its colour was like brownish powder like iron rust. No doubt it was rust mixed with other dirt. It might be clay—not sand. I am quite sure there was no oil. Not a trace of oil. Gauge glass showed dirty water in it. Clayish dirty water.

Re-examination:

I am 70 years of age. I have been an Engineer over 40 years. Suction pipe placed 12 in. from bottom would draw more water than mud. Only a madman would put it so as to draw mud. The mud in the cross-tubes was mud from the Company's wells—partly—not altogether. I could not say what proportion would be from their wells. It was a Duplex pump. Its suction pipe is fixed in the river so as to prevent it touching the bottom. Mouth of suction pipe was a rose, with little holes to prevent heavy dirt. It would not keep out fine dirt.

To the Court:

Quarter inch is the biggest hole.

Re-examined:

It does not break the suction. We make it so as not to touch the flow. It is put horizontally, so as not to draw up dirt. It had worked a considerable time before this trouble. I think since 1912. I had no trouble before these appearances of salt. Nor found cross tube incrusted with dirt. I could not see inside the cross tube until it was cut, broken by the salt. The river gets the salt from the Company's well.

To the Court:

I can't say what the dirt in the engine was.

Q. Then how say it was from Defendants' well?—A. (Wharton: "When we give evidence Your Honour will see how plain that is.") I have charge of hundreds of boilers and have experience of salt water in them.

Q. Salt water boilers are differently constructed?—A. I am not aware. Salt water kills a boiler very shortly. All the mountings start leaking, can't keep tight joints. They corrode and get slack.

To the Court:

The corrosion is not rust. It is fine dust.

Re-examined:

The boiler itself is affected by an incrustation inside, which diminishes its heating capacity and its life by leaking joints. The iron works, the thickness of the plates is affected. That is a disadvantage because it will not stand the pressure it ought. I noticed as these in my opinion as* the

* *sic.*

result of the salt water. Tank was emptied about twice in 3½ hours, I was there. 400 gallon tank. I conclude about 235 gallons were used per hour instead of 35 as it ought to be. I judge from fact that the pump had to be kept going to feed the pump.* When tank is quite full pump stops for a few minutes. Then it is fed into the boiler.

Q. Can you then gauge flow into boiler?—A. Yes. Gauge glass goes up and down and shows amount of water in the boiler. When tank is full water is shut off for a few minutes. Once or twice I looked in through manhole.

To the Court:

There would be about 6 leaks of cocks and taps. All spurting—all, I can't say how much each would leak in the hour. I noticed the diminution in the tank.

*Sic.**

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No. 8.
Examination of John William Tomlinson, 11th—15th March, 1915.

## No. 8.

### Examination of John William Tomlinson.

Retired from Civil Service on pension. I was Locomotive Engineer since 1897 to 1913—25 years. All actively employed. Considerable experience of engines and boilers. 26 boilers at a time.

I went on 6th August 1914 to Defendant Company's land with Plaintiff and Perreira. I rode part of the way and walked rest. We started our observation from the refinery. At refinery I took a general view. I did not examine boiler, but only saw it under steam. I went along track through Perseverance estate. When I got to Defendants' land I saw a main ravine with 2 branches. The watercourse was dammed up. The main ravine was dammed up in 2 places and the branches in one place each. Dams in main ravine; one was about 10 ft. high. There was a flood gate at the top of it. It was 6 ft. wide and 2 feet 6 inches high, I should say. There was a sluice valve down below. That was in first dam *i.e.* nearest the source. I saw dam contained water and oil, and sluice valve was below.

There was neither water nor oil flowing from the dam. The oil was not very deep and the water 6 to 8 feet deep. At first I thought 6 feet. If you threw a stone on the water it showed up through oil. Oil was one inch deep or perhaps two. I went to next dam. First dam was in main ravine. Next dam was a branch ravine on right side going towards sea. It was something similar to the other one. Depth about 6 feet. Contained water and oil. I did not test depth in that one. No water or oil flowed from it. I went to another branch ravine on same right side. Depth of water about 6 feet. No water flowing from it. I went to last dam, *i.e.* one nearest sea. Depth there 8 feet. It is biggest of all. It was different in that sluice, valve was slightly open and water 2 gallons per minute flowing out.

Flow was about ¾-inch in diameter. Sluice 10 or 12 inches in diameter. A disc was lifted at bottom very little. Water flowed over a very small section of bottom of valve. I don't quite remember number of valves: two or three, only that one open. I am not sure that all the dams I had seen before had valves, but some had.

Q. How high was delivery end of sluice was* 4 feet from bottom of ravine?—A. I can't say how high above the bed the intake was. Water from sluice: I did not examine it. Not take it up nor taste it. I went to wells and looked at them. I went to see 300 yards from boundary of Perseverance. It was not being worked. Water was flowing from the well, and ran on surface of ground towards ravine and got into it. I tasted it. It tasted like sea water. After that I went to the ravine beyond the last dam, *i.e.* main ravine. I walked a short distance along it that day. There was oil to be seen in the bottom of the ravine mixed with the water. Difficult to say if a large or small quantity of oil. Water was not covered wholly. Oil went in streaks. If it ran so all the year round it would make a large quantity. It is very difficult to estimate. I saw it flowing with the stream with the water. I did not that day follow ravine till Vance river. I got to the confluence of the main ravine through Defendants' land and the main river by another way that day. A fair quantity was flowing from the ravine into the Vance river. Water was discoloured.

* Qy. "it"

Q. By what?—A. Clay matter. It is a little muddy. From there I visited the refinery. The boiler was not in use at that date. It was being repaired. Part of firebox was so. One portion of the plates had bulged and cracked. I examined it. It was due to overheating of the plates from incrustation. I saw no signs of incrustation. Boiler had been cleaned. I saw a lot of salt in a bucket which it was alleged had come from the boiler. Apart from any information I would have come to the conclusion it was due to overheating and incrustation.

Q. If you had not seen the salt you would not have known the cause of the incrustation?—A. I don't quite understand. I would have known it came from the feed water. I saw a bucket of salt incrustation.

Q. If boiler incrusted with salt you would expect to find it in that state? —A. If it became incrusted the overheating would be the result.

To the Court:

All I saw inside firebox was consistent with idea it had been incrusted with salt.

To Mr. Wharton:

On 8th February last I revisited it with Plaintiff and Perreira and Hart. I passed along main ravine through Defendants' lands. We went to end of clearing from high woods to one edge of oil field—and went to first section of ravine, *i.e.* to source of main ravine. Ravine had pockets of water all the way up. I went about half a mile up from edge of the clearing. Not a continuous stream. Along the whole track were pools of water. It was rough and rugged through high woods. A watercourse, clearly defined bed

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 8. Examination of John William Tomlinson 11th—15th March, 1915 —*continued.*

on ground. Nowhere lost that character. At source two feet wide, and towards edge of oil field 4—5. Some pools were very shallow. Depth from bottom to top of banks water-washed a foot in places—1-3 feet—varying character. Even first section of it had visible feeders. I saw small fish "millions" in the pools. The water was pure and drinkable. I tasted it. It was better quality than water below dam. Second section is that between the dams. My second visit: First section of ravine between Company's land and source I dealt with and had come to second section, viz., part. of Defendants' land cleared of high bush. The sumps lie between the two extremities of the cleared land. On 2nd visit my impression was that number of sumps had been increased. I saw water coming from two places:

(i.) From a distance discharged from one of derrick pump. I only saw it from a distance and can't say as to its quality. On 2nd visit water, oil, oil sand, mud were being discharged from pumps of derricks: from more than one pump. From all the derricks I could see 4 or 5 along line of that ravine. Some at a higher and some at a lower elevation. Sand was discharged in larger quantity from some—smaller from others. I saw large quantity of sand and mud by the derricks. I can't describe the discharge. I saw water from a pump coming out fullbore: 2—3 inches. Discharged in quantities. Oil in fairly large quantities. Some discharged into sumps, and some on side of ravine. The liquid portions all gravitated into sumps by the force of nature, because they were delivered from the derricks by pumps. All that was so gravitating was so pumped up. I went to one of the wells. I tasted the water and felt it. I tasted it out of my hand. It tasted like brine—far salter than sea water—intensely salt. Water was gummy to the hands. The gumminess indicated salt. I got the impression that it came from a stratum of rock salt. As I walked to 2nd boundary I saw an oil storage tank being flushed out and cleaned with water. Half as large as this Court. There flowed out of it muddy water and oil. That flowed to Company's ravine towards Vance River. It flowed to waste.

To the Court:

There was no sump there.

To Mr. Wharton:

That was beyond the last dam. It went into the Vance River.

Q. Did you see it?—A. I saw it flowing along at various points of ravine.

Q. And into Vance River?—A. Well, the water from the ravine was flowing into the Vance River. It seemed a continuous flow. Manholes were taken off and it was flowing from the tank. I could not gauge the flow—but it was a large quantity.

Q. Did you notice other discharges?—A. Not on that occasion—but on others I have seen water flowing down the Company's ravine from the sluice gates. It is doubtful if on that occasion I saw water coming from the sluice gates. I took a sample of the water flowing into ravine 100 yards from its junction with Vance River, *i.e.* above junction. I tasted

it. It tasted salt. On same occasion I took a sample water from Vance River at point above contaminating influence of Company's ravine—about 100 or 200 yards above junction of Company's ravine with Vance River. It was above confluence of Plaintiff's ravine with Vance River. The water was . . . there was no salt in it perceptible to taste. I felt it. It was not gummy. It could not possibly be. I also took water from Plaintiff's ravine on same occasion between its confluence with Vance River and his oil field *i.e.* the dam. There was no salt perceptible to taste or hand. That was third sample. I took a fourth along Plaintiff's refinery from Vance River. It tasted salt. There was no gummy feel. From my tastings I judged the water came from Defendant's ravine. My visit extended over several days. Second visit was on 8th. I went on the 4th. It was on 8th. I made observations of the wells and river. On 4th February I visited refinery, and saw a boiler under steam and two gasolene stills forming part of it. Boiler gets water from Vance River. It is pumped into a feed tank. I examined the tank. The water tasted of salt. Boiler was then in steam. I saw a deposit on outside of shell of boiler—of salt. It developed from a leak from the boiler, a leak from a mudhole door joint. It incrusted from the water of the leak—from the water in boiler. I took some of it. There was plenty more. This is it. These 2 lumps I took myself. That is not usual with boilers. There was an accumulation on several of the mud hole door joints and the glass water-gauge cock J.W.T. 1.

Q. Judging from salt would you say salt was pumped into boiler in large quantities ?—A. Large. Salt is corrosive in a boiler and reduces its life 50%. It affects working expenses. It forms an incrustation inside which is a bad heat conductor and requires more heat to convert water into steam and is apt to cause overheating of plates. The result of that is that they bulge and sometimes crack and leak. The water in boiler I tested with a salinometer.

Q. But as to its effect ?—A. It gives a lot of trouble from leaks. After my visit I made experiments.

Q. And estimated salt in water in boiler ?—A. Yes, I made that estimate while I was there. Its density was equal to sea water. I tested it with salinometer. I estimated quantity of water used in boiler; 180 gallons in proper condition, *i.e.* at one time. Its heating surface I estimated at home: 6-5 square feet. When I was there I heard tube had been put out. (Not evidence.) I did not see tube. None of the tubes. Its loss would be a loss of heating surface. I had a specification of boiler: it was about 6 square feet: 9 & $\frac{1}{4}$% of heating surface.

Q. How many gallons would it consume per day ?—A. I can only give a rough guess. In good order 800 to 1000 gallons per day of 9 or 10 hours, *i.e.* water evaporated into steam. I estimated that from other boilers. From leaking state: I estimated leak from glass water gauge cock at 1 gallon per minute. There were minor leaks from other places. I put it down at about 25% of the other leak, *i.e.* 1 & $\frac{1}{4}$ gallon in all. $\frac{1}{4}$ gallon from the others.

Q. There was 750 gallons therefore more than required ?—A. Yes. Leaks due from corrosive action of salt. I examined water in feed tank.

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 8. Examination of John William Tomlinson, 11th—15th March, 1915 —*continued.*

It seemed fair sample of feed water to eye. It tasted of salt. I did not test its density, but I did that of water of boiler, which was equal to sea water. I estimated salt in water 5 ozs. per imperial gallon of water. It would not always be that. As it boils off into steam density increased.

Q. Density of water salter than the sea water at well: did you test that?—A. Yes. Quantity of salt to imperial gallon 25 to 30 ounces therefore 5 to 6 times greater than in boiler. It was more expense to work boiler with sea water because it requires more fuel: fresh water boils at 212 and sea water at 213·02—*i.e.* 1·2 difference. You require about 1% more fuel. I have had experience of salt water in boilers: several boilers. One with fire engine: in Port of Spain sent to Wharf to extinguish fire at Custom House—fed with sea water. After 20 minutes working it was rendered useless by bursting of 2 small tubes in boiler. Result was that fire was extinguished in fire box. I examined it myself. It was due to salt incrustation. Mud holes, there are generally several.

Purpose: They are taken off when boiler is cleaned from incrustation, dirt or any accumulation. With fresh water you find incrustation to a limited degree. You find scale, *i.e.* incrustation. You find dirt, *i.e.* sandy mud. It does not affect to any appreciable extent. To none at all. It is easily washed out. Mud comes in with feed water which is impregnated with solids held in solution in water. Volatile substances of water go off in steam and leave residue behind.

Q. You examined suction pipe?—A. No, nor depth of water in Vance river. There I found no traces of oil in boiler, neither in feed tank nor in gauge glass of boiler. If oil got into boiler it might cause overheating and deposits. It combines with sediment of boiler and forms greasy deposit on the heating surfaces. But I saw no indication of oil in tank of gauge-glass.

Q. Did you smell it in incrustation?—A. I did not smell it. I smell sample in Court. It has a smell. I can't say it is of oil.

To Wharton:

Flow in Plaintiff's ravine above his dam. I examined that 5th to 8th or 9th February. I saw a small quantity of water flowing from 2 small ravines into one which is dammed. Flowing freely, very small—almost what you could contain in 2 hands held together. It seemed a perennial flow.

Cross-examination, 15th March, 1915.

Cross-examined:

Salt would corrode boiler or other plates.
Mr. Thresh, I don't know him.
Q. He says . . . Objection.
Alcazar: I don't quote him as an authority.
Wharton: Both must be brought into Court.
Russell J.: Question may be put, but not as a quotation.

Q. Water containing much Sodium Chloride is without effect on boiler plates ?—A. No. I don't agree with that. It is contrary to my observation.

Q. Apart from your observation you saw plates being repaired : would you say it was due to salt ?—A. To incrustation, not necessarily by salt. In an ordinary boiler using fresh water you expect a certain amount of incrustation, *i.e.* muddy sediment is, to a limited degree, a bad conductor of heat. I did not examine to see how far boiler was damaged by overheating. Principal defect I saw was leaking. It was consuming twice as much water as it ought. It was not consuming 8 times as much : that would be absurd. Water leaked principally from glass-water gauge cock. I concluded it was so because corroded with (Salt ?). Leaks can take place with fresh water to a limited degree. Boilers have to be looked after and boilers closed down to repair leaks.

Q. It would be easy to arrest leak at start ?—A. Easier than later on. When it became bad you can put in a new cock or it could be repaired. A new cock would cost probably $5—about that. It is a brass cock.

Q. Horse power of that boiler is what ?—A. That is a misnomer. It may mean anything. In an English Catalogue 10 h.p. In States 25 to 30 h.p. I would call it 10 h.p.

Value in proportion about £120 *i.e.* 1st cost freight and fixing. It is a very good boiler—plates thick. An English boiler.

Q. Trinidad Leaseholds boilers cost $350 landed here : 40 to 50 h.p. ?—A. That is from America cheap and nasty. That and difference in horse-power explains difference in price. Salinometer does not distinguish between sodium chloride and other salts.

Q. It would be easy to get rid of the salt before it gets to the boiler ?—A. It could be done by evaporation.

Q. An evaporator could easily be put up there ?—A. It would not pay. It would be very expensive. I would not call Plaintiff's an up to date plant.

Q. A sort of temporary makeshift ?—A. It is made in Colony. Its results are fairly good. I don't know if put up as an experiment.

Q. The salt in combination with other impurities would cause much more damage than alone ?—A. With dirt, lime and mud it is worse. Density of water in boiler can be diminished by blowing a certain quantity of water through blow-off cock to waste. You don't blow off a particular portion—but water anywhere in boiler.

Q. Who looks after the boiler there ?—A. I saw the attendant but don't know him. An intelligent trained man is required. Priming might be due to other causes than salt.

Q. *E.g.* too sudden filling ?—A. The salt by increasing density creates a foam and the water is lifted and carried through pipes. It might be caused by too sudden filling when in a dirty state. You need a careful man and properly instructed.

Ravines in Defendants' land :

Q. It is practically filled up in most places by mountains of land ?—A. I did not notice that particularly but a certain amount of sand would get into the ravines.

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 8. Cross-examination of John William Tomlinson, 15th March, 1915 —*continued.*

Q. It would be impossible to (trace) ravines. They get filled up ?—A. To a partial extent. The channel is a pretty good fall-incline. I have only been there twice : August 1914 and February 1915.

Q. You can't say if water was flowing where it always flowed. Already in August there were large bodies of sand ?—A. No. In some places I saw the bottom of the ravine. I knew it by the shape. It was narrow.

Depth of Dam :

Last dam was 6 to 8 feet deep in water or liquid. I did not test it. I took more notice of dams in August. I judged from depth behind the dam *i.e.* below the dam. In one of them I tested depth of oil by throwing a stone. That was not the principal dam but higher up. I have no idea of depth of oil or water in principal dam. I did not observe pumping at derricks at any length, simply passing along. I noticed the quantity of fluid pumped up in one or two instances. Same pump would bring up sometimes water, sometimes mud and sometimes oil. I know that from knowledge working. I saw oil delivered. What appeared to be so. I can't say whether mixed with oil mud or sand. I saw from another derrick what appeared at a distance water. I saw what appeared to be water issuing from a separating tank along derrick.

Q. Company was pumping for oil and other liquid came with it ?—A. Yes *i.e.* I don't doubt it. You don't doubt that. The liquid portions would all find their way into ravines. Some of the oil is delivered in tanks. The liquid portion gravitated to sump. Without tanks or sumps it would gravitate into ravine.

Q. You were with Plaintiff when he saw water dripping into pool near bluff ?—A. Yes. Below that there were pockets of water not connected. That was in February—about 8th February. There was rain till about 1st week in January : fairly heavy, about the beginning of dry season.

Q. The water dripping there would be enough for any industrial purposes ?—A. If it was accumulated and pools lower down filled up, it would all help.

Q. Repeated ?—A. Not in that position. It was running. It was not a dry ravine because of these pockets, and will be drier now than then. Without a dam you can't use it for industrial purposes in the dry season. You would have to accumulate it in wet season to work it in the dry. Plaintiff uses water from his own dam for his wells. It lies under his oil.

Q. 5 ounces : what percentage to gallon of water ?—A. An imperial gallon weighs 10 lbs. fresh : sea water a little over 10 and $\frac{1}{4}$ lbs. It can be worked out so *i.e.* about 3%.

Q. 2% would be safe to use ?—A. Yes. 3% is safe in a boiler.

To the Court :

Sea water is safe in a boiler at its own density : but that is increased by evaporation. It stopped fire engine in 20 minutes.

Cross-examined :

Q. 2% would be quite safe to use ?—A. It is safe.

Q. It would not interfere naturally with a boiler looked after ?—A. It is safe from our heating with 2%.

To the Court :

How long it would remain safe depends on the evaporation. Water goes off in steam and leaves salt.

It depends on the evaporative power of the boiler. Some evaporate at twice the speed of others. The salt would accumulate. It becomes unsafe if you get more than 8 to 10% in the water.

Cross-examined :

By evaporation it reaches that. You can reduce the density by blowing off.

To the Court :

With 1% water it would become unsafe too by evaporation after a time.

Q. As long as you keep it below 10% it does not incrust ?—A. No : it does not alone, but with other substances. Babcock and Wilcocks—I know the name, a well known firm of boiler makers. These are one authority.

Re-examination :

Re-examination.

1% salt water is not so good as fresh water. 2% is worse than 1%. If no sumps or tank liquid would gravitate to bottom of ravine. If there were no sumps there would be nothing to gravitate.

Blowing off to waste : all have to blow off for emptying boiler. It is a disadvantage and not usual except with salt water. You do it as little as you can.

With ordinary fresh water it is not necessary at all. Only once a fortnight when you wash it out. With this water it is sometimes fresh and sometimes dense : you are at the mercy of the water let from Defendant's ravines. Muddy sediment is a bad non-conductor to a less extent without salt. Boiler is vertical fitted with fire box and three brass tubes.

Mud goes to bottom of a narrow space between the boiler shell and fire box.

Salt would be in solution, some of it and would create corrosion of all parts with which it is in contact.

To the Court :

Muddy sediment would not necessarily accumulate in cross tubes. It would be carried out by circulation caused by evaporation. Some of it goes to surface in foam, but bulk passes to bottom of boiler.

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 9. Examination of Jules Cornillac, 15th March, 1915.

## No. 9.

## Examination of Jules Cornillac.

Sworn Surveyor 26 years. At request of Plaintiff I visited Development Lands on 21st and 22nd December 1914 and 1st and 2nd March 1915 to take dimensions of dams in bed of several tributaries of Vance River. There are 5 dams. I followed also some ravines at the back. Country where the sumps are is undulating and dams are erected by an earth wall right across bed of ravines sometimes where there is a small gully and sometimes again the road *i.e.* the private road of Company. I called them A.B.C.D. and E.—A. and B. are the tributaries of the main ravine. C. and D. on main river. They are placed on the plan C.C.S.2, and E. is on a tributary too. I surveyed the County. Average width of bed of ravine 4 to 8 feet *i.e.* in tributaries. Main ravine:—10—15 and 8 feet: 15 feet at the mouth, *i.e.* confluence with Vance river. 8 feet in front of sumps 5 feet at back of sumps and 2 feet at its source. I traced it right back to source by walking in bed of channel. From back of sumps to source it is an unmistakable channel. That was in March. In December I did not follow it. Length from back of Defendants' land to source we estimated at about 1/3 mile. Did not measure. Nearer the source there were pockets of water. At back of sumps it was dry *i.e.* at entrance to high woods up stream. Half way up bed was moist and further up pockets all in a defined bed.

I examined the dams.

Dam A. Bed of ravine dammed by wall of ravine: 75 feet across its course: base 27 feet wide tapering to 7 feet at top. I read from notes taken on spot. Depth at (Well) 9 feet extending to nothing at back. It would flood $45 \times 60$ feet *i.e.* area is that. 8 inch pipe through earthwork 4 feet above level of bed of ravine and dam below—at the outlet.

Dam is opened with no valve *i.e.* pipe is free. Sumps was practically empty. Intake of pipe was 2 feet above level of river which slants 4 feet in front. These were my measurements. Capacity 126,000 gallons.

Q. Sump 2 feet from bed. Before any flow through pipe?—A. I can't tell.

Dam B. Wall of earthwork 114 feet long across ravine. 20 feet base to 8 feet at top. Top of dam a wooden flood-gate 6 feet 6 inches wide—2 feet high.

Depth 8 feet to nothing at back. 6 inch pipe horizontally through earthwork 2 feet above bed of ravine and flood an area of 114 by 151 feet.

Capacity 320,000 gallons. I did not notice if there were valves but wall of sumps was broken and water and oil flowed freely. Seemed to be condemned as a reservoir. 2 to 3 feet was depth of ravine there. I have not a note of it. Just in front of, I did not measure it.

Dam C. Wall 180 feet across, 27 feet wide at base to 8 feet at top.

Dam E. (Also on a feeder therefore taken first *i.e.* before C. and D.).

Wall of earth 130 feet across. 33 feet at base and tapering to 9 above. Depth 16 feet to nothing at back. 1 6-inch pipe, a suction for pump in dam *i.e.* pump is attached to that—8 feet above bottom of dam. Outlet

1 8 inch controlled by valve through earthwork 2 feet above bed of ravine. Height above bed inside unknown. Large quantities of oil and water: area 130 by 100 feet. Capacity 630,000 gallons.

Q. Does well No. 5 empty into it?—A. No, into C. and D.

At time of my visit No. 5 was being pumped and it was being pumped into a tank from which water flowed into sump at D. in main ravine. I tasted the water from tank and found it very salt. From tank it flowed into main ravine—out the sump at D. It flows into D. and from there comes down to C. C. is the last sump. It can't flow from C. to D., that is up the river. Tank was 400 gallons—iron. Ordinary coolie—400 gallons. I did not notice the capacity. From it the water flowed into sump D., by the side of ravine and into it. It flowed from tank through a cock. Ordinary bore. I don't know what. Flowing fast. From D. it went to C. and thence to main tributary of Vance River, and thence in Vance River. I tasted water flowing from tank. It was very salt.

Dam C. 180 feet across—27 feet wide at base tapering to 8 feet at top. Wooden flood-gate 6 feet wide—2 feet high. Depth 10 feet. Outside 4 eight inch pipes with valves horizontal through earthwork. 3 feet above bed of ravine. They rise gradually. I took the lowest. Area 180 by 150 feet. It extends 250 feet further in bed of ravine. Capacity $1\frac{1}{4}$ million gallons. Height above river bed at intake unknown. All valves were flowing about $\frac{1}{8}$ open. Flow, rate of: unknown.

Q. What followed?—A. Mud and water. Into tributary and thence to Vance River. I tasted it lower down the sump in the tributary, below the sump.

Dam D. Bed of ravine dammed on 3 sides against Estate Road. 120 feet across course; and 110 and 70 feet the other two sides. Total 290 feet of wall. Width of earthwork 30 feet tapering to 6 feet at top. Depth 8 feet. Valves—two 8 inch pipes with valves through earthwork horizontal 3 feet above bed of ravine open letting oil and water go to dam at C. Capacity 509,000 gallons. Area—20 by 85. There is a bridge on road over ravine allowing free course of water to ravine at back of dam D. The bridge allows free course of water in tributary. There are no pipes there. I can't show it on plan. Road is not on plan. On visit on 1st March I visited ravine—not in December. Between dams and Vance River I visited on both occasions.

Plaintiff's ravine: I saw from Plaintiff's dam to confluence with Vance River. Water was clear. No pollution. Tasted and found it quite drinkable. 2nd March 300 feet below going to confluence I found now there was no pollution. Above that water was clear and fresh to taste. I would not say much pollution—but pollution by oil remained on banks on both sides. It had reached to the river. On 2nd March I went back to dams at C. and D. Both closed. Nothing flowing. From the dams I went towards confluence of Defendants' ravine and Vance River. There was water. Well defined bed and channel with water flowing polluted with oil. Width 15 feet at confluence and 8 feet in front of dam. Depth varies 2 feet, 3 feet, 1 foot.

I did not walk whole length of river bed but along small ridge between two ravines and down to Plaintiff's ravine twice and also to Defen-

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 9. Examination of Jules Cornillac, 15th March, 1915 —*continued.*

dants' ravine on to confluence. In Defendants' ravine was pollution. There was water. There are large basins 4 to 5 feet wide. There was a small flow through from hole to hole which was continuous. On 2nd March I went to 5 and 9 wells.

Valves at D were flowing.

Well No. 9: they were pumping there. Also at Well No. 5. River bed was not being polluted by operation of Defendants. I tasted water in No. 9. It was very salt. I examined main ravine of Company from source. I examined no other tributaries. Effect of damming is to cause the ravine at the back: deforestation helping the drying up. Defendants' main ravine is fed by tributaries.

Q. They all have well defined courses so far as you saw?—A. Yes. Passing where they fell into main ravine I saw they had well defined courses. I went to source of Defendants' ravine. There were pockets and ground around was spongy from water. I saw the bluff and there was a pocket of water. I did not see any coming from the bluff. That was on 2nd March. I did not go there in December.

Cross-examination.

Cross-examination:

Dam A. Intake 2 feet above bottom of ravine. Pipe is open. No valve. I can't say how much water would be held back. I did not calculate. I think very little. Ravine there very steep.

Tank at D.

Q. Is the cock over sump or does water fall on soil and gravitate?—A. The latter.

Q. Subsidiary ravine you saw only at confluence with main ravine?—A. That is so. I did not notice any water in them, *i.e.* going towards source. That was on 1st March. I did not go there in December at all. Lands there are undulating. The ravines are simply the lowest portions of the undulating lands.

To Mr. Wharton:

With defined beds. They are ravines.

Cross-examined:

They seek the lowest level as all rivers do. They do not simply carry on storm water in rains. But for deforestation and sumps they would run all year round or nearly.

Q. What is above sump would not be affected by it?—A. All the water is drawn down.

To the Court:

(Question repeated.)

A. That is so.

Cross-examined :

Main ravine above top sump towards source there were merely pools.

Q. That was consistent with that ravine carrying off merely the storm waters ?—A. It was dry at back of sump and above were merely pools.

(Question repeated.)

A. I can't answer that. Ravine from dam to confluence flows. That is fed by tributaries. Valves at C and D are all closed. I can't say where the water came from but it was in river, *i.e.* Defendants' ravine below dam. There is $1\frac{1}{2}$ mile of ravine there between dam and confluence with Vance River.

Q. Between dam C and confluence with Vance River, are there any tributaries ?—A. One tributary.

Q. It is also dammed ?—A. Yes at A and B. I did not go to it in March but gave evidence of what I saw in December, viz., one sump (B) condemned and the other (A) practically empty. I did not observe water in any of the tributaries—but I saw it in Defendants' main ravine. I did not go to any of the tributaries. I marked the dams on C.C.S. 2. I did not survey the ground. I know of no final dam below C and B—after the main ravine and tributary joining. I have marked A and B and C on Map C.C.S. 3.

Messrs. Alcazar and Agostini : They don't correspond.

To the Court :

Q. You say there is no big dam below B and C ?—A. No, there is none.

(Question repeated.)

A. I did not see that on the ground.

Cross-examined :

Q. What area has been cleared of forest by Defendants ?—A. I can only say roughly—100 acres. I think it affects ravines. Can't say to what extent.

Re-examination :

Re-examination.

To be taken another time to give time to settle confusion as to dams.

(See p. 44.)

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 10. Examination of Emmanuel Perreira, 15th—18th March, 1915.

## No. 10.

### Examination of Emmanuel Perreira.

Manager of Perseverance Estate since purchase—10 years. Live there. Know Defendants' lands. Known them about 9 years, and main ravine on Defendants' land about that too. Defendant started there early last year, I think, and cleared forest. I went there in the old days hunting about 9 years ago. I went there 2 or 3 times a year before they worked.

To the Court :

Q. Did you hunt there in 1913 ?—A. I can't say exactly. I might.

To Mr. O'Reilly :

The ravine always had water flowing, before Defendants worked there. I went there in dry season. I have seen water cut off at points and remain in pockets. Where the sumps I knew the ravine perfectly well. There was a place called Jungal where people made a thoroughfare. Before woods were cut I have been up as to where well No. 2 is now. Ravine always had water. In rainy season I have seen it—you could not pass. Channel is well defined all through ; where sumps are and right through. Plaintiff started to work wells in 1911. He got water for boilers from ravine near by, and in dry season coolies carried water from a ravine lower down for wells. To get good drinking water he had to send a man to ravine in Defendants' land where they are working now. Coolies headed water from Plaintiff's own ravine lower down.

To the Court :

Drinking water : man went where sumps are now. There was a flowing ravine and in dry season he took it from that pool where sumps are. Pool : There was a big long pool—15 feet long, 4 feet wide. I never examined to see if there was a spring there. There were pockets all the way up. Water in pool was 12 by 18 inches deep.

To Mr. O'Reilly :

I never knew Defendants' ravine completely dry. We struck a gusher on 5th May 1912. In same ravine we collected oil by dam—which broke in July and a good lot of oil was washed away. All went down Vance River to sea and polluted it for 5 to 6 weeks. It went quickly because of heavy rains which washed it clean.

Q. With that exception does any oil flow from Plaintiff's ravine to Vance River ?—A. Not a drop. Pollution down ravine was caused by a pipe line which broke as they were repairing it, *i.e.* Plaintiff's oil pipe line. We have 4 boilers there. Feed water taken from same ravine. No pollution by salt in feed water. I have been to Defendants' land several times since they began, 2, 4, or 6 times a month. I am always there. Water and oil collects in sumps. Largest sump : I have seen it shut, half shut and open,

and in all kinds of ways and seen a man open it. It controls all the other dams and is lowest down. It has 4 sluice valves. I know one by bridge—one by tributary and another further up: 3 in that ravine and one in a tributary to it.

To Mr. O'Reilly:

Q. That dam with 4 sluice valves controls which other dams?—A. Those in Southern part of the field. Besides it and those others, there are two on a ravine below dam C (which is the controlling one). Ravine below dam C enters main ravine. It has a defined channel. Dam A I saw practically empty. Dam B had oil and water. It was broken and the oil and water running towards main ravine. 21st and 22nd December I and Cornillac visit there. I went to Dam D. I noticed two pipes—8 inch—controlled by valves—above bed of ravine 2 to 3 feet. I did not measure height. I have seen wells on Company's land being pumped—pumping up oil and oil and water, slush, mud. One pumping pure water at times. At Well No. 5 it is pumped into tank with bottom outlet and valve. Water is let out from valve.

Q. Everything pumped from wells, where does it go?—A. At all time anything on ground and gravitated to ravine. Of late they had been putting up new tanks and iron troughs except two wells which still pump and throw it on ground—when I went there last. The troughs have partitions which keep back the sand. I saw that during February. I think they had another pump to pump it from there to their tanks. I am not sure whether it goes to the sumps. Sand in troughs is thrown out in same spot where they are cleaned. It is sand and oil. The liquid part when thrown out gravitates to sumps. You can see it. More solid part remains on the sides. I have tasted the water pumped up. It is salt.

Q. When first notice it?—A. Since May 1914.

Q. Which bring up salt water?—A. Nos. 5, 6 and 9. It is brought up by pumping. I have seen them pumping myself. One of the employees, I don't know his name, not a driller, he goes round looking after the wells, told me they had six wells giving salt water. It is part of my duty to look after Plaintiff's refinery and wells. Since May 1914 we had trouble with refinery with salt water. I had experience with boilers since about 1911. I look after boiler at refinery. Foreman reported to me in consequence of which I examined boiler and found nothing wrong. That was first week in May 1914. The boiler could not keep up steam. Up to that time we had no trouble of that sort. It was put up in 1912. Next morning I was called again and went and saw blocks of whitish stuff—by the manhole doors and other parts, the mountings. I found out it was salt and tasted water in tank and found it salt. I went to river and found water there salt too. Then I went up river tracing salt up to where Defendants' ravine joins river and found No. 5 well pumping up water salter than the sea. We shut down repeatedly and in middle of February entirely. We have not worked boiler since then.

Q. May 1914 to Feb. 1915 has boiler worked all right?—A. No. It never worked rightly. It varied. Sometimes after very heavy showers

of rain the river got brackish, *i.e.* bitter—a trifle bitter—and the boiler would work a little better—a trifle. The salt caked in big lumps at manholes and all mountings, *e.g.* gauge glass. We had repairs to do, *e.g.* a plate cracked—needing a patch—tube burnt out, 2 patches to cover the place and we had to clean very often. Before the salt trouble we cleaned once in about 12 weeks. After the salt trouble, about every two weeks—and latterly at the end of every week. When we clean, we clean all salt off mounting and manholes and put new joints every time. Water gauge glass leaked steadily and there was dripping from one of test cocks—and a steady run from blow off cock. Blowing-off: we had to do that very often since salt trouble, sometimes 10 to 12 times a day. Sometimes it took me ¾ day and at night also—to put matters right. I supervised it every day I am there. We shut down several times for 3 or 5 days. I have seen inside boiler—as far as I could see. I took out a lot of saltish muck—brown muck. Down at bottom as well as on the tubes. We took out certain portion of the tubes. The lump in evidence was taken out by some of the labourers in my presence. We had a small bag of it in town. The salt was taken from manholes and mudholes and mountings. We have a suction pipe from river. We had to shut down entirely because of the leaks and the whole thing working so badly because of the salt. Suction pipe in river; we move it; its place depends on how the water is in that part. Last time I saw it there it was 3 feet from bottom of bed. As a rule we keep it at very lowest 14 to 18 inches from bottom. Depth of water at the pool was 6 feet deep; in centre of that pool last week. Suction pump can't draw much from bed of river. During heavy rains the water gets muddy before and after the salt trouble. A certain quantity of mud gets pumped up into tanks. It has not always time to settle. That applies to before May 1914. The mud would not cause leaking. We clean it out about once in 12 weeks. There were no manhole or mudhole troubles. Nothing of that kind. Boilers in oil fields have never given me trouble at all. One down by back also has given me no trouble. It is fed with water from a well. Well is 250 feet away from boiler. The ravine water is sometimes muddy like the water of river. We have no trouble with the boilers—no leaking. We have firemen. They certainly have knowledge. Two have been trained by me, one of whom is now working as fireman for the Defendants. Defendants' sumps I have seen sometime open and muddy and water and oil coming through. The muddy water would come from the wells. I have seen slushy water coming down the Defendants' ravine without any rain—many many times. They started early last year to work there. The Vance River water then was clear and drinkable. All the people around our refinery and the road used the river, water was for drinking, washing clothes, watering animals and I have seen labourers bathe there. Since Defendants started work nobody can use it at all. It is a sewer with salt and oil continual.

Q. Oil from sumps how often does it come down?—A. Every day. It is always on the river. It is noticeable. You can see it. I have seen I could take up pure oil and no water in my hands just at confluence of Defendants' ravine and Vance River. On occasion where I lifted up oil in

hands, it must have been fully 5 inches thick. On that occasion I think one of the dams was broken, to account for it. That was some time last year. Plaintiff's ravine: 1912 sump broke and once a pipe broke: apart from that no oil comes from Plaintiff's ravine. There are about 23 wells in Defendants' land in that part.

Fowler then General Manager has been there and I spoke to him about the salt trouble and pointed everything out to him. The boiler was working, but was priming. He was sympathetic with a pitiful face. I said the Americans were giving us hell. He held his belly and laughed heartily. Tanks on Defendants' oil-fields: I have seen them being cleaned; manholes being open and men slushing them out. Muddy water and oil came out and ran into the main ravine below Dam C.

Dam D: I have seen it with the earthwork broken away and oil flowing down.

Defendants' main ravine between source and Defendants' wells: I went there with Tomlinson in February. It has a visible bed right up. There was water in pockets; we went up to top and saw water coming from under a stone and "millions" in a pool. Ravine lower than our refinery comes from "jungal": it goes through Boodoosing's lands. Plaintiff's land in Vance River below refinery, I saw there Wednesday last week in afternoon. Water was running. I went up to jungle, and I saw water all the way up —not in pockets but running.

Cross-examined:

Cross-examination, 18th March, 1915.

I used to hunt there 9 years ago. It was all forest, above our refinery. Forest reserve: I have been told it has been reserved by Government. Where Defendants are working I have seen water in pockets, not connected.

Q. Last 3 years have been unusually dry?—A. There was a slight difference. There was a heavy drought about 3 years ago.

Q. Where No. 2 well is?—A. I have reached up to out there these days. In wet weather it ran hard in all ravines and at height of dry season I have seen water in pockets there.

Q. Why send to Defendants' ravine for drinking water?—A. Water was in pockets in our ravine and we had to go lower down for use of boiler —but the water on the other side, the men thought, was much nicer for drinking. The man took water from a pool 15 to 16 feet long. That was one of the pockets. There are many pools all the way up.

Q. The height of dry season there would have been no water to work boilers?—A. Not in the denuded state now. I did not say that pool was the biggest *i.e.* one man got water from. I can't say if there was any larger.

Q. Without cutting water was there water enough for 20 wells?—A. I can't say. I won't say. I am inclined to say that there was an underground flow connecting the pool because as you stood on the ground between it was marshy.

Q. Plaintiff has not said that?—A. He does not live there, I do. I can't say if there would be enough water for a big industry. May 1912 we struck that gusher or early part of last year. We had made a dam across ravine. Without a dam I have water to carry on our oil wells. The dam

was meant for oil and to collect water also. Dam broke and we lost a great quantity of oil—estimated at 60,000 barrels.

Q. How long did well continue spouting?—A. 2 days and stop again and started and last time it went for 39 days. Great heavy rains came and broke the dam, *i.e.* the earthwork at side, not the whole thing, at night. Next morning the whole oil was gone. The well got choked. At that time it was stopped. We had very heavy rains that year and the river got quite clean again though there were oil marks on the banks.

Except then and when a pipe broke no oil passes. Bursting of pipes was about 3 days before Agostini went there last month. It burst a little below our dam—just by a little house.

I am drilling a well now. 390 feet deep when I left. I don't know if they have stopped since. We are better equipped to stop the oil if it gushes. I think we will be able to command it. I am in charge of the oil field. I am not a professional driller but I have some ideas. I have a man. I could not call him a professional driller. We have only one man drilling. We work only in day at wells at refinery day and night.

At wells we have one boiler cast aside. It got burnt out. Fireman dropped and it got run out of water therefore it was burnt out. It has no tubes. It has 2 small tubes left in it now. It had porcupine tubes and from time they got bad and we took them out and put in plugs. I think that was an American boiler. We have got some English boilers now at the oil fields. We have an English one at refinery—a Galloway boiler—2 tubes. One is cut out and the other is still in boiler. Cut out one is still there on ground. I have examined it. I was not there morning when it was taken out. I had already taken out mud from it. It was brownish sort of mud and saltish to taste. That was on one of the cleaning outs. There is less chance for a man to sleep at refinery because we have a man to keep them awake. And I and the Overseer pay surprise visits. In 1911 when I started, I knew nothing about boilers or drillers except I used to go often to Point Fortin and a driller there used to give me ideas.

To the Court:

I was a cocoa planter before. I am not an engineer but a knowledge of fitting pipe lines and so forth.

Cross-examined:

Production now from oil well—we have only one pumping—250 barrels a day.

Visit with Tomlinson and Plaintiff. I then saw the fish pond. It was a small pool about so (size enclosed by arms with hands joined). There are tributaries all about.

Q. That part never had flowing water in dry season?—A. I have seen it flowing and in a very dry season in pockets.

To the Court:

Q. Have you ever seen it flowing in March?—A. I think it was in March our man used to go for water, and then I saw these pockets and between them the ground is very marshy.

Cross-examined :

15—16 feet long and 4 feet wide, was the pool he took water from. It is changed now. Where I went with Tomlinson there were pockets of water where Defendants are working.

To the Court :

Where pool was there are sumps and oil, sand and the forest has been cleared.

Cross-examined :

I don't say they should not clear. It diminished the water. There is still some bush there where the pockets are. There is a defined watercourse : a dug out bed, not very large, a small bed, I would not say it is merely a gully into which water falls.

I can't say whether in dry season there would be enough water in Defendants' ravine to work twenty wells. I don't know how much water they would require. I don't know about their working, but if I had 20 wells there I would have plenty water there—our way of working.

Re-examination :

Re-examination

My system is cable. Theirs is rotary. They use both, but more rotary—which requires a considerable amount of water and cable much less. I have absolutely no experience of rotary drilling. I don't know whether the supply in the ravines in the dry season would be enough or not.

Q. If you had 10 wells gushing at once, you were asked, could you suppress them ?—A. If I had an equipment for each such as I have now, yes. I am not now working or prospecting 10 wells. I am working only one now.

To the Court :

Since we began we have had 9 wells—but not all completed. We tackle 9 spots. Largest number at one time is one—never more than one.

Re-examined :

We have struck oil in every one we tested and went down with. We have struck oil in 5. In those where we struck it but are not working, the oil does not even flow to the top. We were hand boring and as we struck oil we stopped. I think our drilling has been very successful. In normal dry season in Defendants' ravine you find a connected stream between big pools. The stream flows. My ravine when I last saw it had water running. I saw it about Thursday of week before last, below our own dam. Part is in bush above Defendants' wells. Part of ravine is in bush. Low bush. Alongside the river bed—not in the bed itself. It was on the banks. Below Defendants' sumps ravine ran oil and water.

Q. Some of it is natural water ?—A. I believe so *i.e.* some of the water coming into the Company's ravine below dam C.

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

## No. 11.

### Re-examination of Jules Cornillac.

No. 11. Re-examination of Jules Cornillac, 18th March, 1915.

Re-called for re-examination (see p. 37 *ante*).

I have examined Company's maps and there is a tributary falling in Defendants' main ravine below dam C on their plans and on the ground.

Mr. Agostini admitted that the plans showed that.

See C.C.S. 3.

That feeder below C was flowing freely the other day with natural water: on 2nd March. I tasted it. Between wells and source there is no grass going in bed of the ravine.

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No. 12. Examination of Charles Garcia, 23rd March, 1915.

## No. 12.

### Examination of Charles Garcia.

Contractor on Perseverance for 4 years. I know Defendants' lands. When I started my contract they were not yet working. I know Vance River and ravine which comes into it from Defendants' land. There are other ravines but not connected with the one which has the salt. I know where Defendants' wells are.

Q. Before they worked did you know the ravine?—A. Yes. It is floating with oil. I knew it before they worked. It had clear water. A good bit of water. In the dry season even at driest part of the year there was always water in the ravine—but not running—only in pockets. They were forest lands. I went there hunting. Several times I have drunk the water. It was good. Since working I tried it and it was not drinkable at all. It was too salt. I was hunting on that occasion. I know Vance River proper. I used the water of Vance River for all purposes: drinking, and washing and household purposes. All the contractors near by did so. About 3 years ago Plaintiff's dam broke. We were using the water up to the time. After it broke we could not use the water for a couple of months. After that we were using it till the salt flow came into the river. Before dam broke the water was good. After the two months it had a little oil, but we used it. When the salt came we could not use it. All who have tried could not use it. The salt began more than a year ago. I can't say exactly. Oil as well as salt came down from Defendants' land—a good deal—continually.

Cross-examination.

Cross-examination:

Q. You used to do a lot of hunting four years ago?—A. Everything in wood. I am now 78 years old. I hunted all about, sometimes in Defendants' land, sometimes elsewhere.

Q. How often did you hunt on Defendants' land?—A. Not often. Two or three times in year. I ceased hunting about a year ago because my

sight is very bad and my hearing. When hunting I would notice a ravine. You must notice all ravines.

Q. All ravines you met had water all year round?—A. Not all. The largest one where the salt is. I noticed it. Plaintiff's ravine I notice too. I have not been exactly to head of Defendants' ravine. It did not run all the year; but in dry season it had pockets of water. It ran in rainy season. In dry season it keeps water from pocket to pocket.

Q. What size of pocket?—A. Some three feet deep—some one foot deep; about two to four feet large according to size of pocket. The land was under forest then.

To the Court:

I did not live there before I became a contractor there.

Cross-examined:

I live at Tunapuna. My contract is just by the pumping station. By Plaintiff's refinery. My house is there. I took water just by the refinery—below the refinery. To the road.

Q. You continued to do after he put up his refinery?—A. Yes. There was some oil, but we could drink the water. Where it is running free there is no oil and we used to take water there. Since refinery was put up there has always been a certain amount of oil on the river. Now it is salt. I have to go down the estate to some springs in the field about 1 mile from my house. I often go to Plaintiff's ravine. The wells are quite up in the wood. I sometimes go there. I knew the ravine before him. There is a small bit of oil in the ravine running.

Q. Are there many houses near you?—A. Two a little lower down, and higher up Vance River there are several. There are two contractors on Perseverance and some on Boodoosingh's land. There are water wells on estate. There always have been. The labourers get water from them.

Re-examination:

Re-examination.

There are also springs. I use water from wells to about 1 mile from my house. Those being in Boodoosingh's lands, I can't say where they get water now. It is no longer from Vance River. About 200 from my house I used to get water from Vance River. I knew Plaintiff's ravine before any work was begun. There always was water, just as there is now.

Q. Describe the ravine as it was before Plaintiff worked?—A. Good plain water used for all purposes. I drank it. It was running of course. At all seasons. Sometimes in high dry seasons it went to pockets too.

Q. Defendants' ravine or Plaintiff's ravine, which is bigger?—A. The Defendants' is bigger. Since Plaintiff began working I have passed his ravine. Near works it is not very bad. I did not notice what was done to ravine.

Q. You know there is a dam across?—A. No answer.

Question repeated.

A. No; a dam is a big hole they dig.

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 13. Examination of Ageea, 23rd March, 1915.

## No. 13.

## Examination of Ageea.

Owner of lands bounding with Defendants' oil field. I am from Plaintiff's land half a mile. From Defendants' land half a mile. Between me and Defendants is high woods, and then the river. I bought 6 years ago. Four years I have lived on it. When I went there Defendants had not begun to work there.

Q. There is a series of dams on Defendants' land now ?—A.——

Q. You know the place ?—A. Yes.

Q. What was there before ?—A. High woods and the ravines running.

Q. Where were they running ?—A. All into Vance River.

Q. Where did you get water from ?—A. During rains from ravine in my land. In dry season from Vance River.

To the Court :

Q. Why ?—A. Because my ravine was dry.

Q. Quite dry ?—A. Yes, quite dry. I took water in dry season from holes in Vance River where it accumulated.

To Mr. Wharton :

Q. What is there now ?—A. Salt water.

Q. Did you know ravine flowing from Defendants' lands in Vance River ?—A. Yes, there is a small ravine. Nothing is flowing in the small ravine now. The small ravines are dry. The big ravines had water here and there in holes. Now there are holes filled with salt water.

Q. Are the ravines now as they were before ?—A. They are in the same condition. There is pitch oil and salt water. There are dams in which they accumulate.

Q. They are in holes of ravines ?—A. The dam is in ravine where Defendants take oil. I got water from that ravine.

Q. How did it flow if at all ?—A. It went and joined the Vance River.

Q. When did it flow ?—A. In rainy season.

Q. Did it always flow in rainy season ?—A. Yes, a continuous flow. In dry season it never flowed. The water only remained in holes. I have not counted the holes. I don't know how many thousands of holes. I went there for water in dry season. I kept cows. I took water from there on my head for them in dry season. There is no water there now.

Q. Can you get at it from Vance River where you did before ?—A. No, it is no good because of salt and pitch oil. We brushed off the oil and took water—which was good. But now the water is salt.

Q. You sell milk ?—A. Yes. I sold it all about. I sold it to Company's people.

Q. Did you ever see them cleaning dam ?—A. Yes.

Q. What becomes of the stuff from it ?—A. It goes to the Vance River.

Q. Repeated.—A. It goes to the Vance River. There is a small ravine through which it passes.

Cross-examination :

My land is now gone in with the reserve. No. 2. Where Defendants work as No. 2 oil fields. I don't know the Manager, nor whether it is Feisthamel. There is a Company next to Defendants by Pointe Fortin. I bought my land from Jaipaul and Judanoo. I have 16 acres. Two quarrees and my brother's and I, 2 quarrees.

Q. Your neighbours, who are they ?—A. On one side Government land and on one Lewis Glodin. He bounds with me, and a Spaniard—Benjamin.

Q. You don't know what Company is working those lands you refer to ?—A. I don't know. I hear it is the Brighton Company.

Q. How many derricks are there on lands of Company you speak of ?—A. Nos. 2, 3, 4 and up to No. 9. I hear they are working that number.

Q. Was it from ravines or only from Vance River you took water ?—A. During rainy season from ravine, on my land, but in dry season from Vance River. Vance River is in the high woods. There I took water in dry season. Even Vance River was only in pockets at that season. One of my ravines is not one of those that empty into Vance River. It goes to Boodoosingh's land.

Q. Your ravine only carries off the surface waters in rainy season ?—A. Yes it carries the storm water.

To the Court :

There are no springs in it.

Cross-examined :

Q. That is true of all streams in the district ?—A. There are no springs in the ravines. In Vance River water remains in pockets.

Q. Your lands are in a sort of Coolie settlement ?—A. Yes.

Re-examination :

Re-examination.

Q. You went on Defendants' land with Cornillac and Perreira ?—A. Yes.

Q. On which side of dam were you ?—A. I was coming from Defendants' lands selling milk when I met Cornillac in the river which flows into Vance River. People for that reason call it the Vance River.

Q. Where are the pockets (a) in the river which flows in Vance River or (b) in Vance River itself ?—A. The river which flows into Vance River. The Vance river itself in the dry season is dry.

Q. Where did you get water for cattle ; in (a) or in (b) ?—A. In (a) That is river which is dammed.

Q. You know Plaintiff's land which he bought from Glodin ?—A. Yes. There is a road there—from the big road and comes to my boundary and goes to the high woods. I used the track.

Q. To go to Plaintiff's lands ?—A. Yes.

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 13. Re-examination of Ageea. 23rd March, 1915 —*continued.*

Q. You pass through whose land ?—A. First through Defendants' land. You cross the same ravine which I used to take water. I go to Plaintiff's lands to sell milk.

Q. That part of Plaintiff's land you go to, what is being done there ?—A. Take out pitch oil.

Q. To get water for cattle you went to ravine not to Vance River ?—A. Yes I call it Vance River because it flows into Vance River.

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## No. 14.

No. 14. Examination of Dil Muhammad, 23rd March, 1915.

### Examination of Dil Muhammad.

I live on Boodoosingh's land.

(Told by O'Reilly to stand down.)

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## No. 15.

No. 15. Examination of Pooran, 23rd March, 1915.

### Examination of Pooran.

To O'Reilly :

I live at Cochrane trace—Guapo—next to Ageea. About 8 years I have lived there, $\frac{3}{4}$ to 1 mile from Plaintiff's land. Plaintiff is doing oil work there—also the Brighton Company.

I have been where Company is working. There is a ravine flowing through their land. There is a dam in it. I have seen two or three.

They have made more in another place—but in that ravine there are two. Before Defendant began to work it was all high woods. In rainy season I used to get work on our land. I own land, 6 acres of my own and 13 of my family's. In dry season I got in ravine *i.e.* company's ravine—which has dams.

Q. Since Defendants have worked could you get water there ?—A. No. The water is oil and salt and dirt, salt water. It is not good for drinking. Plenty of us used to go for water to Defendants' ravine. This water was in ravine where dams were. Dams are built of earth.

Q. How does water come out ?—A. There are 2 pipes. I used to go about 160 to 200 feet below the dam. About 50, 60 or 100 feet.

To the Court :

You said 160 to 200 ?—A. Yes. All there. There are 4 pipes.

To Mr. O'Reilly :

Q. How far below did you go ?—A. Sometimes near sometimes farther if the water was dry. As far as Wharton K.C.'s Chambers (about 300 feet).

Q. What road do you take ?—A. There was a track all the way in the high woods. Now the Government has a trace near the ravine, but nearest

to the ravine. It does not go right up to the ravine. We call it Cochrane's trace. The track I used is still there.

Cross-examination :

Q. You got water from ravine before Company worked ?—A. Yes. It was not spoilt yet with oil and salt and dirty water.

Q. There is as much water now as there was before ?—A. No. Sometimes in dry season water was in pockets in the ravine. They were not dry. Not running, but the water was standing in pockets. My ravine was quite dry. It is a small ravine. That is the only ravine we used to get water from.

In my ravine the water was dry near me and to get water in it one had to go far down. But we could get water nearer in Defendants' ravine. I always got water from Defendants' ravine in dry weather, all time I have been there. Vance River itself is a distance from me.

Q. Why not go to Vance River which was nearer ?—A. I was not so near to Vance River. The Vance River is far from my place.

Q. You are on Glodin's boundary ?—A. Yes. I don't bound with him. It is a little distance. I don't bound with Ageea.

Q. You are next to Ageea ?—A. He is not too far. I can't tell how far I am from Vance River. It is 1 and $\frac{1}{2}$ miles from my place.

Q. Nearest part of Vance River is how far from you ?—A. If I go by trace and road 1 and $\frac{1}{2}$ miles.

Q. How far are you from the ravine ?—A. $\frac{1}{2}$ mile to $\frac{3}{4}$.

Q. The last 2 or 3 seasons have been very dry ?—A. Yes. We were taking water from this ravine. All the rivers of Trinidad have less water than they had. I have no well on my land—never had.

Q. Where get water now ?—A. The ravine that passes in our land is dry above. I have to go right below. Sometimes we did dig big holes in our ravine quite down below for the water to collect in during the rainy season.

Q. The pockets in ravines get water in same way ?—A. Yes. At this time all is spoilt by oil and salt.

To the Court :

This does not get spoilt so badly but we still use it.

Q. What by ? That it gets stagnant ?—A. Yes and taste of pitch oil and salt. It tastes rotten.

Q. In your own ravine ?—A. My water does not spoil badly not when sun is hot and leaves fall in it, it tastes bad when the weather is very dry.

Re-examination :

Re-examination.

Q. Why is it so far to get to Vance River if it is near on map ?—A. There are high woods and hills between and no track. You could not bring a pan of water. People must take Cochrane's trace and the high road. Between me and the ravine there is a track. There are very little small hills.

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 16. Further examination of Dil Muhammad, 23rd March, 1915.

## No. 16.

### Further examination of Dil Muhammad.

Recalled :

I live in Cochrane's trace. I know Ageea's house. I live from it a mile. I have lived there 4 years now.

Q. You know Plaintiff's oil land ?—A. Yes. Company is working next to him. Before the Company started there were high woods there. I did work cutting the wood. On Defendants' land there is a ravine. When I started to work I came to know of it first. There was water in it then. It was in the rainy season. I worked there 6 months. The water was clear. I used to drink it. It was running.

Q. During those 6 months what was its condition ?—A. Clear water. It stopped flowing. I don't know how long it flowed. From time Company dammed ravine it stopped flowing.

Q. How long did it take you to fell trees ?—A. 6 months. During them Company had already started work. I was working for the Company.

To the Court :

I had worked for them 3 or 3 and $\frac{1}{2}$ months before they dammed the ravine.

To O'Reilly :

During these 3 to 3 and $\frac{1}{2}$ months the water flowed *i.e.* before dam was made.

Q. When last were you there ?—A. 8 or 9 months since I left the work. I went to Sobo the other day. I saw the ravine then. That is about 1 month ago. The ravine then had pitch oil and nasty water and salt. I live at Cochrane's trace. Vance River is near it. We used water of Vance River. We don't use it now.

Q. Since when ?—A. 8 or 9 months ago. Because it is salt water. It is spoilt.

Cross-examination.

Cross-examination :

I have lived in that district 4 years in Cochrane's trace. I don't own lands but I live on Boodoosingh's land. I am a labourer of Boodoosingh's. No I am not. I rent lands from him—I get water. Boodoosingh has a large tank and I beg water from him.

Q. You have lived 4 years on Boodoosingh's land ?—A. Yes. That is on Southern Main Road between that road and sea. Ageea is on other side of road.

Q. Near Southern Main Road ?—A. No. Far to the East of me. Boodoosingh is right on South side of main road.

Q. And opposite to him on North side of road is Glodin ?—A. It is Crown lands. I don't know Glodin's land.

Q. Whose land is across the road from Boodoosingh's ?—A. Crown land and an old man called McCarthy.

Q. To west of McCarthy is Glodin ?—A. I don't know the name. I live ¼ of a mile from the Vance River.

Q. You Indians don't measure by miles but by quarrees ?—A. I don't measure by quarrees. I speak approximately. I don't know much about chains. I was indentured here. I don't know about chains or rods. Ageea lives on southern main road. More to the east of me.

Q. To get job in forest from Company where did you go ?—A. To " 35 " not at Brighton. At Vessigny and up to Forest.

Q. So you went to work daily ?—A. While working at " 35 " I passed there and when work was started at No. 2 I passed by Ageea.

Q. Cochrane's trace goes how far ?—A. A distance of 2 chains.

Q. It is Southern Main Road ?—A. Yes, it is called Cochrane's trace. Cart and mules cannot pass there. The road is not made up yet. I know where you passed yesterday. That is not by Cochrane's trace. There is a ravine on Boodoosingh's land. We don't get water there in dry season, only in wet season. There is another ravine on Boodoosingh's land. It is dry too at this time.

Plaintiff's works at the back : I know them.

Q. There are 2 ravines on Boodoosingh's land ?—A. I have seen one. I don't know about the one inside. I spoke only of one. I have seen only one ravine. I was referring to the ravine which has salt water.

Q. Works at back : how does Plaintiff get water there ?—A. I don't know. I did not see a well there. I went there—I saw it from the road.

Q. He has a pump there ?—A. I don't know. I have seen no wells in that district. I have none, my friends have none. I have not seen one in 4 years there. I know what a well is. I have seen one, but none there. I have seen one in my country and in Trinidad in several places. I don't go in for fishing. For water I used to go to Vance River. Now I go to Vessigny and sometimes I beg from Boodoosingh who has a tank. I get spring water from Vessigny. Trace you went up yesterday, I never went up there.

Q. You have never gone up to Plaintiff's well ?—A. I only know as far as Plaintiff's junction. One road goes to Cedros and one to Stollmeyer—on the main road. I have never been to Plaintiff's wells. I saw one reservoir near the refinery. I have never passed his oil wells.

Q. By what road did you go to Defendant's wells ?—A. By Cochrane's trace. Not over bridge on Vance River. I don't pass big river. I passed a small ravine. I never crossed the Vance River. I passed through high woods and across the ravine. I never went hunting.

Q. Water you drank in ravine was rain water ?—A. I don't know. I used to take the water up with leaves. The water collected in pools. I have seen fish in it. I was working, not looking for fish.

Re-examination : None.

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 17. Examination of James Jarvis, 23rd March, 1915

## No. 17.

## Examination of James Jarvis.

Labourer at Perseverance, working for Plaintiff in his oil fields—over 4 years. By his oil wells is a ravine flowing into Vance River. I know Defendants' land and their ravine. I knew it before Company started work. I cook for the gangs and supply them with water. Anywhere round there had water in wet season. In dry season I would go where Company has dammed now. It is very pleasant water there, very clean. It was in dry season in pockets. Since Company started it is salt and has oil, and sometimes is very dirty.

Gusher and breach of Plaintiff's dam: in about 2 months all the oil was carried away. There is a dam across Plaintiff's ravine in which he stores oil and Vance River. Nothing from it flows into Vance River.

There has been a little oil there since last month because some oil got away when they were putting on a new joint or something to a pipe. Till Defendants started water in Vance River was very good. I used sometimes to take a bucket from it going up. Now it is salt and has oil and is very dirty. It is so since sometime last year. It is due to pump salt from Defendants' lands.

Q. Where does Plaintiff get water for boilers at wells?—A. From ravine by his dam.

Cross-examination

Cross-examination:

I take water from most convenient spot. Water is exposed—place is hot. Where covered nice and cool. The Vance River may be sheltered in parts but not all. I took it whenever it was convenient.

I know several other ravines. Some are always dry in dry season. Small little ones are generally dry in dry season. Defendants' is a big one. Plaintiff's ravine is pretty large. I can't say which is largest. They are almost the same. I often go to Plaintiff's oil fields. Where the oil is pumping all is there, all round the well. When the rain falls likely the oil may go to the ravine. Before Defendants began work except for 2 months after Plaintiff's dam broke I never saw oil on Vance River. I say about 2 months. I did not date it.

Q. All traces disappeared?—A. You see signs of oil on the bank but no oil was left. It was washed away. Pipe which broke is a couple of rods below the dam.

Q. Is it below watchman's house?—A. Just about there.

Re-examination.

Re-examination:

I got water in Defendant's ravine mostly because they were nearest to us. I have worked in different places on Plaintiff's land, *e.g.* putting down pipe lines and then it was I took water wherever it was most convenient.

## No. 18.

No. 18. Further examination of Charles Conrad Stollmeyer, 24th March, 1915.

### Further Examination of Charles Conrad Stollmeyer

(see pp. 7—20 *ante*).

Recalled at request of O'Reilly :

I went on 4th and 5th February with Tomlinson all over the estate. I took 4 samples of water. 1 on the 4th—3 on 5th February. They were taken by Tomlinson, Perreira and myself. In presence of each other.

Sample A : " Vance River above influence of Ravine from Development." That is my writing on the label. It was taken above influence of Development Ravine and sealed by Tomlinson and myself.

Sample B : " Water from Ravine flowing from C.C.S. dam about $\frac{1}{4}$ mile from dam and about 300 yards from river." That was taken from my ravine. What is stated on label is correct. It was written by Perreira in my presence.

Sample C : is water from Defendants' ravine. Writing on label is in my handwriting. It was taken about 100 yards above its confluence with the river.

Sample A : was taken above influence of Defendants' ravine. About 100 yards above its confluence with Vance River and above junction of my ravine also.

Sample D : " Pumping Station feed tank water." That was written by Perreira in my presence and the statement is correct. That is at the refinery. It was taken from the tank there. All 4 samples were sealed by Tomlinson and me together on the evening of the 5th.

Sample D : was sealed on the 4th at the pumping station at refinery. The other three were sealed on the 5th, in estate house—near the sea. They have been in my custody till 16th March when they were delivered to Mr. Shrewsbury.

No Cross-examination.

(The Plaintiff was again recalled—see p. 56.)

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## No. 19.

No. 19. Examination of Herbert Shrewsbury, 24th March, 1915.

### Examination of Herbert Shrewsbury.

Principal Assistant Government Analyst. I have permission of Director of Agriculture to give evidence but not outside certificate unless order by the Judge to do so by Court.

Russell J. :

You will answer all questions unless you have some ground of objection ; if so, state it, and I will give my decision on it.

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 19. Examination of Herbert Shrewsbury, 24th March, 1915 —*continued.*

I am member of Institute of Chemistry.

(Counsel all assure Court that they know of no reason why the witness should not be examined in the usual way.)

Witness: Part of my duties is to analyse things submitted to me by any member of the public. I think position of Director of Agriculture is that he be the Government Analyst, is called on both sides and I his assistant ought not to take sides. His direction is as Director of Agriculture. He is also Government Analyst.

Samples had been sent to the Laboratory by both sides. That is the only reason as far as I know. He does not want contradictory opinions to issue from his office. I have been qualified about 10 years. I have 12 years' experience at Municipal Laboratory, Birmingham, with City Analyst and before that for 2 years Chemist to Messrs. Tanners, Nottingham. I was given these 4 samples on 16th March by Plaintiff and analysed them. This paper shows the result of my analysis.

Samples A and B.—These are normal river waters.

Sample C.—845.7 of total soluble salts. Principal ingredient Sodium Chloride.

Sample D.—575.4 parts of soluble solid matter. Largest ingredient was common salt 455.8.

Comparing D with C I came to the conclusion that D contained at least 66% of C. B and C flow into D. In D there is 66% of water C.

Q. *I.e.* D is C diluted from 100 to 66?—A. I don't take that view exactly. I would rather say that 529 parts per 100,000 of soluble solids have been added to water A. Those solids added are mostly common salt and sodium carbonate. They amount to at least 52 lbs. per 1000 gallons.

Q. You calculated amount of solids added to A?—A. The amount of solids in A had been increased at least 12 times in D. Water D is very bad for boiler because of amount of soluble solids put in. The salt would corrode brass fittings make them loose and to leak. D is not drinkable at all. I tasted it and from that and further work I found soap there. I found soap in C, not in D; I found it also in D—but I was thinking then of C.

Q. How do you account for soap in C and D?—A. One can only suggest that any oil coming in contact with an alkaline water such as C would form soap more particularly when it was heated. You would expect to find soap in the boilers which would tend to corrode it and cause irregular boiling. It would certainly tend to cause priming. A and B are ordinary boiler waters of ordinarily good quality. Both C and D are very bad boiler waters. I found no soap in A or B.

Report of 23rd March 1915 put in—H.S.1.

Shown cardboard box—I know that box and analysed the contents which came to me as a lump and were powdered by me. Plaintiff gave me the contents and I supplied the box. I analysed that sample. My analysis is stated on paper in my hand—H.S.2—23rd March 1915. Box and contents put in and marked "X" for identification by Perreira.

Q. If this substance in box was found to have exuded through fitting of boiler and caked outside boiler would that be what to expect as the use of D to feed boiler?—A. Yes.

The presence of soap would also lead to expect corrosion in the boiler.

Cross-examination :

I have no engineering knowledge but have experience of analysis of boiler waters.

Q. Salt in water generally : sodium chloride has an effect on boilers so long as it is not of a greater strength than 7 to 10 ozs. per gallon ?—A. May I see that literature. I should like to see the context. I would expect qualifications further on.

Question repeated.

A. I should not agree with that.

Q. What percentage would make it harmful for boilers ?—A. It would be very difficult to give a limit—but in my opinion this amount is harmful.

Q. Kindly give it in ounces per gallon ?—A. In D amount of salt works out .73 ounces per gallon—*i.e.* $\frac{3}{4}$ of an ounce per gallon. In my opinion that proportion would injure boilers. It is an alkaline water. Sodium carbonate : the amount in D would be objectionable as a boiler water.

Q. It is sometimes used as a preservative to precipitate permanent hardness of water ?—A. Preservative is a very bad term. The action of the carbonate is to remove some of the calcium and magnesium salts which would cause incrustation. It does not preserve the boiler but tends to prevent in the particular form. If there is excess of sodium carbonate it actually attacks boiler. The proportion in D was excessive and would corrode the boilers. I distinguish between corroding and incrusting. Corrosion implies actual dissolving away of the metal of boiler by chemical action. I would rather say removing, not dissolving. Incrustation is merely the deposition of solid matter on the metal.

Q. The water which deposited " X " would be more saturated than when it entered boiler by time it exuded through cocks etc. ?—A. It probably had been concentrated. It is hard to say definitely. You get a deposition of solid matter when it becomes concentrated. A saturated solution is one that has as much as it can hold. The effect of heat on D would be to make it more concentrated.

Q. If you get rid of the liquid before it becomes too saturated or concentrated, it does not harm the boiler ?—A. Not necessarily. In first place irregular boiling will occur with a strong solution of salt without solid matter present at all.

To the Court :

D is already too concentrated not to harm the boiler—without any concentration.

Cross-examined :

Q. Blowing off or blowing down would not make it harmless ?—A. No, it would improve matters but you could not use it satisfactorily with any amount of blowing off.

RECORD.

*In the Supreme Court.*

Plaintiff's Evidence.

No. 19. Cross-examination of Herbert Shrewsbury, 24th March, 1915 —*continued.*

Q. Quantity of soap in C & D: was it a trace?—A. More than a trace. At least 40 parts per 100,000 in C—I can't give figures for D or X. That would be (in C) .04%. That was in C. In D it would probably be proportionately less—because 66% of C was in D. It think it would tend to cause priming.

Q. Would it cause it?—A. In my opinion it would. I can't give figure as to amount of soap in "X."

Re-examination.

Re-examined by Wharton K.C.:

Blowing off is not what a boiler is required for and means a certain expense and waste and with D would require to be very frequent.

Q. It would have to be done how often?—A. I don't like to give a figure.

I have experience of analysis of boiler water in Municipal Laboratory at Birmingham and at the Tannery where I was previously.

Letters and copies put in by consent:

1. Copy of letter 23rd March 1914, Plaintiff to Manager of Defendant Company—Fowler.
2. .. .. Plaintiff to Agostini, 15th April 1914.
3. .. .. 21st May 1914, Plaintiff's solicitor to Defendants.
4. .. .. 8th June 1914—Defendants' solicitor to Plaintiff's solicitor.
5. .. .. 15th August 1914—Plaintiff's solicitor to Defendants' solicitor.
6. .. .. 21st August 1914—Defendants' solicitor to Plaintiff's solicitor.

Batch of 6 marked "Y."

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No. 20. Further examination of Charles Conrad Stollmeyer, 24th March 1915.

## No. 20.

## Further Examination of Charles Conrad Stollmeyer.

(See pp. 7—20 and 53 *ante*.)

Recalled:

I got a block of salt from Perreira during first days of this case, and I took it to Shrewsbury. It was the block shown in Court. It was in my custody till I gave it to Shrewsbury.

No Cross-examination.

By consent Perreira's evidence as to "X" to be taken later on.

PLAINTIFF'S CASE CLOSED.

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## No. 21.

## Examination of Herbert Donald Fletcher.

I represent the Cruse Syndicate here. It has interest in Forest Reserve. I am an engineer and act as such for them. I have experience of oil fields and in different parts of the world. I went to Morne L'Enfer on 12 February along with several others. I went to lot 1 of Defendants' oil fields and walked from there to Plaintiff's oil field and thence to Plaintiff's refinery, or rather to the spot where it is. I did not examine the refinery. I know Defendants' wells and their system of working and methods. They are the most up to date of any there are in the world. They use same system as the first companies in the world. I was in the oil fields of Peru and Californian oil fields and Canadian oil fields, then here. I observed things everywhere. It is a difficult country this to get to any depth because of the softness of the formation and the amount of sand. I have seen the sumps on Lot 1 and the class of ravines. No water is being used from any of the ravines. The water used comes from another district on their property. There are water pipes conducting it several miles.

Q. Where there is an industry on that scale is it possible to prevent oil from escaping?—A. I don't know it is quite impossible here from my own experience. I don't think you could control even a small quantity. When rain comes a certain quantity of it is bound to get away. If you have an outlet in bottom of these dams and open them, a certain amount of oil which has sunk to the bottom is certain to get out. A certain amount is certain to sink to the bottom. When it has been exposed to sun in an open reservoir some of it is bound to sink to bottom. The higher oils evaporate and lighter sink. The longer it is exposed the heavier it gets; after a time it becomes a liquid pitch.

Q. Is presence of salt water frequent in oil fields?—A. Yes, all oil fields I have seen contain salt water.

Q. It is one of the indications looked for?—A. I could not say that—but the majority of oil fields contain it. I think practically all have, *i.e.* all I have seen and read of. In same oil fields some districts may have salt water and others not. Lot 1 is not an exception. Defendants have salt water and oil. The salt water sometimes comes up gushing with oil as result of gas pressure or artesian flow. In pumping it comes up too. You can't separate it in the well. That is happening there. Sand comes up too, in a soft formation like this. In all wells here in Trinidad it comes up in larger or smaller quantities and in that particular district in very large quantities. When there is water and sand in the oil it must be allowed to settle. Sand settles quicker than water. You don't fill tanks with sand—but a certain quantity always gets in. It would be a bad practice to pump straight from well into storage tanks. It is better to let it settle in settling troughs. That is the general practice. The only practice. There are several areas of sand round the outlet of each well blown out by the well

when it is come in *i.e.* when you first tap the oil sand the gas pressure is practically controllable and blows out sand and whatever else is in the hole of a loose nature. From the settling trough it is run into sumps or reservoirs and from them into tanks for shipment or whatever they are going to do with it. That is the general practice. I went into Plaintiff's oil field. The nearest wells are not far apart. It may be about 300 yards. I made this sketch from a rough one made on spot. H.D.F. 1.

Q. In walking from Defendants' to Plaintiff's oil fields the first thing you meet is the well of United British Oil Fields?—A. Yes.

Q. They are just some hundred of yards higher than Plaintiff's wells? — A. Yes, say 250 to 300 yards. There is a large quantity of oil come from United British Oil Field lying (in) the ravine. That is independent of Plaintiff's working. It floats down to him from United British Oil Company's dam. It passes by his oil wells and out his dam. Also they had a quantity of oil stored up there at United British. If a heavy enough rain comes, that also is bound to go. Plaintiff's wells are marked in my sketch.

Q. Against Plaintiff's well is a bank of ravine and a smaller ravine?— A. There is a smaller ravine running past the Plaintiff's wells and into the ravine on which the United British Oil Field is. Both the escape from U.B. and the escape from his own oil fields connect with his own reservoir which is held back a dam across the ravine, in the same way as everybody else. His sump has water below and oil at top and some at bottom I presume. It is no doubt getting heavier and a certain amount sinking. I don't know if that is where he gets water for his boilers. That is only some hundreds of yards from where Defendants are working. They could drill within 70 feet of each other according to Government regulation. These lands adjoin. It is practically one oil area.

Q. It is probable the same result will be obtained on Plaintiff's land as on Defendants'?—A. Yes; I should say it is more than probable.

Q. Is it likely one man will get a nice light pure oil and his neighbour only asphalt and salt water?—A. No. I should not be surprised to strike salt water in Forest reserve. I am not expecting it. It is a very bad thing. I did not see a flow of water in the ravines. There was none in those I looked at. I have been working in Vance watershed. I know where Vance River runs. The sources of supply are surface water from rainfall. That is all I have ever seen.

Shown Plan C.C.S. 2.

Q. You see main river going through Lot 2?—A. Yes. Cruse Syndicate has just 3 wells marked by me on C.C.S. 2 as 1, 2 and 3. My land is marked Gransaull. River is of value to me. I have not to collect water. I have to hold up surface water by damming ravines. Without that I should not have any. There is not a continuous flow of water. 24 hours after a shower there is no water there unless a little in the wet season. I should call them dry ravines. I have never noticed a spring.

Q. You have gyrated considerably?—A. Yes.

Q. When you all strike salt water, there will be a lot knocking around?— A. Yes.

Q. Did you observe any other ravine before you got to Plaintiff's from Defendants' well? A sort of ravine formed by a depression?—A. Yes. There was nothing in it. We walked through it without getting wet. No water in it at all. It is full of vegetation and dry.

Q. At that fork where 2 ravines meet what is formation?—A. Sand has been thrown up by his well.

Q. It is one big sand-bank?—A. Yes. It is similar to those round all wells in that district. It gets hard and solidified after a time. There are a good many systems which may or may not prove to be successful in shutting off the salt water. Cementing is the usual system but in a sandy and soft formation like this the water will even pass the cement and find its way into the well. You cement below the sand which contains the salt water. It is expensive and elaborate and it remains to be seen if it will be successful. If it is not it is a great expense to the Company if it is a good well.

To the Court:

The oil in the sand being nearer than oil helps it down and you don't get anything like the quantity you should of the oil and it will rust your tools. Cementing is effected thus:—If you have an open hole with salt water without casing you pour in enough mixed cement and set a string of casing right down to bottom of hole and leave it till that is set. After that the solid cement in the casing is drilled through with a smaller drill and the hole continued down to oil sand. In a soft and sandy formation the salt water will get round that wad of cement. There are other methods.

To Mr. Agostini:

Two ravines meet near the bridge. They are 30 to 40 yards apart.

Q. From Plaintiff's dam to that spot at bridge what is character of Plaintiff's ravine?—A. Polluted with oil. Defendants' ravine where it joins Vance River is also polluted with oil. I did not taste the water at that spot. I tasted it on the Vance River below Defendants' just at bend of river. I should call it brackish. Perreira tasted it the same day and said it was only brackish. I walked from there to high road where refinery is. I walked through woodland. You see the river every now and again. It was polluted all the way down to road. I speak of oil as the pollution. Visible to the eye. Have known it so 16 months. 12 months before last November when I came out here. I don't know when Defendants started. Point B, on H.D.F. 1. There is an independent pool where a hole has been dug. It has a thick coat of oil. I don't know what supplies. Heavy rain would float it out into river or ravine, below the dam. River immediately below.

Dam at B was polluted with oil all along banks. The grass was saturated with it.

Q. Is there any other hole near that one?—A. I did not notice one.

Q. Is there any excavation in ravine?—A. I don't remember.

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 21. Cross-examination of Herbert Donald Fletcher, 18th—23rd March, 1915.

Cross-examination :

Defendants have adopted best known methods in the world. They do what the best people do. You can't contain the whole oil. It is not a mere matter of expense. It is impossible there are so many things. You could only do it by disposing of it and a certain amount would get away while you are doing that, *e.g.* pipe lines may leak from expansion and contraction of sumps may leak. I won't say you expect a daily leakage but you may have a quantity of oil in a reservoir and a pump breaks down during a heavy rain and it may float the oil over the top before you can repair or replace it or let the valve out below in which case it will carry a certain amount of sunk oil with it. Also a big pressure through outlet will sink down a certain amount of floating oil.

I have not frequently, but about 6 times visited Defendants' wells.

Q. On each occasion you saw a considerable quantity going to waste ?—A. No. I have seen a considerable quantity more at one time than another coming down Plaintiff's ravine. I was thinking of Plaintiff's wells when I said I had been about 6 times. To Company's wells I have been about the same number. On Defendants' ravine also I saw a considerable quantity. The same on both. Flow on Plaintiff's ravine land does not come from Cruse Syndicate, but I believe part of it does from U.B.W.I.P.—I speak of a flow below Plaintiff's dam. I have seen not so much there, but enough to pollute it. I have seen a flowing from the dam into ravine and Vance River. I have not seen it dropping from the dam, but I have seen it floating in the water below dam into Vance River. I saw it half way between dam and Vance River and all the way back to the dam. The banks are polluted all the way and a thin (in the film) right up to dam. I saw that one of these times. I saw it the last time I went. Each time I have been across there I have seen it. It varies. At places you will see a patch of black oil and elsewhere a thin film of light oil. I heard Plaintiff's evidence. I can only say what I have seen. I can't say where it comes from. He may open his valves or a heavy rain may come.

Q. You don't know the source of the oil which you said you saw polluting Plaintiff's ravine ?—A. I have little doubt it came from Plaintiff's wells, but I have not seen it dropping from outlet to his reservoir. I can't say where it comes from.

Q. I suggest you only saw this considerable quantity once ?—A. No more than once. It is difficult to say at what intervals. Intervals of 3 to 4 months.

Q. Other witnesses say none has been in that ravine except after bursting of dam and late accident ?—A. I don't agree with that. I can't say more precisely than I have. But Vance River has had considerable quantity since I have known it. I don't know most of it comes from Defendants. If Lot 1 of Defendants had not begun work 16 months ago, then the oil in Vance River must have come from Plaintiff's. River goes under road. I passed there 3 or 4 times a week. I did not know the source of the pollution.

Q. The pollution comes mainly from Defendants ?—A. If it is polluted, it is polluted.

Bursting of Plaintiff's dam: effect may have been washed away; but since then some of his oil must have got in from his working. I don't know where the oil below his dam comes from. I should say from his dam.

Q. Plaintiff pollutes as much as Defendants?—A. I won't say so, but enough to make it a polluted river and the Defendants the same.

Q. There are degrees of pollution?—A. Yes, but——

Q. Defendants added to pollution more than Plaintiff?—A. I should say the Defendants add more oil probably, but when it is polluted it is polluted. I have not seen enough to say considerably more.

Q. Your observations were casual?—A. Yes until I went for that purpose on 12th February. I think I noticed river was polluted below the dam. I heard it was polluted by leak of a pipe. A good deal of what I saw may have been due to that, but not all. Round edge of water I saw grass saturated with oil. I saw a thin film and here and there quantities and here and there round of black oil 6 inches in diameter, on the water, not many but occasionally you would see one.

Q. Below Defendants' dam the flow was continuous?—A. That would depend on the rain. I have not seen a continuous flow of oil. You would see streaks of it. Throughout length of Vance River there is a well defined course of oil. It does not fill the river. I should call that a film; you see filmy streaks here and there—a continuous flow of such streaks.

Q. Same kind of films you saw below dam?—A. No, much thicker. About breadth of hand—4 inches and sometimes 3 of them parallel, on Vance River I don't know where all of it comes from. I suppose part from Defendants and part from Plaintiff.

Formation of country before sumps were built: I can't speak to that. I have seen nothing to make me think they were watercourse *i.e.* continuous watercourse *i.e.* a continuous stream. I can't say if sumps are made in bed of watercourses. I would say in the beds of ravines. I also have sumps across ravines. We are intensely interested in this litigation. There is a case against us by Plaintiff.

Q. Why build sumps on ravines and not elsewhere?—A. It could not be done advantageously. It would not be more expensive but it would be no use. I have been to Vessigny wells. The sump there is on side of a ravine. It would cost considerably more to build sumps away from the ravine and you would not get any capacity. I suppose they wanted that reservoir there. It is to a certain extent a question of expense and it depends also on the contour of the lands. There are other methods of collecting oil but it is the best in this country chiefly for settling the oil. Another method is to settle it in earthen reservoirs and then pump it into a tank. The earthen reservoirs are built in ravines if there are any. Failing that they construct them of concrete.

Q. There you have absolute control?—A. That depends on contour. Any oil getting away will gravitate to any ravine or river near. Concrete reservoir can't be guaranteed water tight. I have never seen a concrete reservoir without considerable quantities of oil all round it.

Concrete reservoir: quantities of oil round them: I would not say they are due to leakage. They are gone to waste. It depends on the means

you have for preventing. I have never seen operations without a considerable loss. It would be more expensive to prevent that loss than the value of the oil *i.e.* value of quantity lost.

Q. Salt water: it is indispensable that it be left to flow down ravines? —A. The salt water may be uncontrollable.

Q. That is if forced up by gas?—A. Yes.

Q. But when pumped up it can be controlled?—A. I suppose there are means, but it would never pay to try and stop it. It could be shut off in the well.

Q. It could be carried in pipes to the sea?—A. If you can control it you can do that. If you pump it up you can control it.

Q. It is cheaper to let it flow into ravines?—A. Yes, naturally.

Q. You know Defendants' well from which salt is being pumped?—A. No, I saw one from which salt was being pumped. I did not take particular notice. Salt water and oil was being pumped up. The two app ar distinct from each other. You can judge of the quantity of salt water by sight.

Q. Would there have been any difficulty in controlling the salt water from that well which you saw?—A. No.

Q. These ravines which you say are all practically dry un ess after rains, they are like the Vance River. They have well defined channels?—A. Yes, at the bottom of each. They are not so long as the Vance River.

Q. If they draw only surface water so also does the Vance River?—A. I don't know. I have seen no springs in that. There may be springs for anything I know.

Q. The rainy season extends over a considerable portion of year and during that time there is a flow in the ravines?—A. I have only seen it flow for say 24 hours after rains.

Q. Not 2 or 3 days?—A. There may be a trickle or so. During the rains there is considerably more than a trickle.

Q. Can you recall any time when you have seen these ravines dry during rainy season?—A. No.

To the Court:

I can't fix limits of rainy season here. It seems rather vague. I have heard different views as to it.

Q. Have you ever seen the ravines dry during the rainy season?—A. No. My statement with regard to seeing a flow only for 24 hours after rain applies to the rainy season. In the dry season they are perfectly dry.

Cross-examined:

Those that I have seen are so.

Q. On Company's land?—A. Yes, those that I have seen. On Lot 1. They are not all covered with oil. I walked through bed of one, on way to U.B.W.I. concession.

Q. That ravine is on a high side?—Yes, on two hill sides, I walked down one side of it and up the other *i.e.* of the ravine.

Cementing wells is one means of preventing salt: it proves practically useless here. There are only different cementing systems: there are no other means of preventing it that I know of.

Re-examination:

Reservoirs of concrete: there would still be quantities of oil about. I mean with concrete walls and bottom.

Q. Would anyone be justified in pumping from a well into a concrete reservoir?—A. It is not the practice. It is first run into a sump to settle—a settling sump. If you had steel tanks you would do the same *i.e.* settle the oil first. It would run through a trough with partitions and then into a settling sump such as Defendants have across these ravines.

To the Court: Some wells will flow for weeks from gas pressure or months without a grain of sand coming—*e.g.* in Peru. That is on a flat desert. We ran it into small tanks at each well and pumped it from there into larger storage tanks.

Where settling is required sumps on ravines are used—or if there are no ravines a large earthen wall circular is made and the oil settled in it. That is done in parts of California but only where there are no ravines. If there is a ravine they will, of course, put a dam across it.

Re-examined:

Whatever the system is you will find oil all over the place. It escapes into the watershed. You could construct a concrete sump and use it for settling the oil. It would soon get full of sand and require to be cleaned out. That would involve expense. In cleaning the oil would spread all about. The ground round about after a time would be much impregnated.

To the Court:

The pollution to the area would be same as if sumps across ravines were used. Not greater.

Re-examined:

Wells would have to be shut down during the cleaning. That is to detriment of wells especially in this country. Building a circular construction and settling it in that, would be practicable here. It is all undulating land. In California they usually shovel the sand deposit on to the nearest spot.

Q. Would you advocate that plan at Lot 1?—A. Yes—No, if I could get a cheaper material I would not use concrete.

To the Court:

I have no idea what settling reservoirs of concrete in California cost. It would be cheaper to dam the ravines. I would not say very much cheaper. It depends on the capacity of ravines. To build a reservoir of same capacity you would have to build a much longer wall. The cost would be only a

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 21. Re-examination of Herbert Donald Fletcher, 23rd March, 1915 —*continued.*

little greater, I should say. I mean it would only be a little more expensive to build an earthen wall in circular shape than an earthen dam across a ravine. In California they use both earthwork and concrete. It depends on the class of stuff they have to build with. If it very sand it would be to build with and they would use concrete.

Q. Use of concrete or earthen wall would depend on contour of land. —A. Yes. If you have a flat country you would erect one of these. If you have a ravine you would dam it. It would not be practicable to erect concrete or earthen circular reservoirs on Defendants' land because of formation of the ground that I have seen. It would be practically impossible to construct such circular enclosures there.

Q. If we had, would not the escape of oil be the same?—A. Yes.

Q. Therefore you can control the escape of oil?—A. Yes, you can control it.

Salt: there are ways of controlling it, I know Defendants have tried to cement the salt water, That is the only method I know them to have tried. If the well is flowing salt water you can control it.

Q. When pumping it, if your cementing systems fail, is there any other method?—A. No.

Q. How would you dispose of it?—A. Separate it from the oil. It would require a very expensive and elaborate plant for evaporating it. I suppose it could be carried in pipes to the sea. In many cases your pipes would have to pass through other people's lands and there would be leaks at joints which you could not control. You could not collect salt water when gushing to evaporate it. Certain wells which were pumping being under control would not alter fact that one which was gushing at same time would be uncontrollable. I know of no method by which Defendants could prevent the pollution by salt water and yet make their workings pay. Wells are capricious. They are liable to give out at any time without any warning at all.

No. 22. Examination of William Fowler, 24th March, 1915.

## No. 22.

### Examination of William Fowler.

Manager of Defendant Company since 1911. It is one of several allied Companies forming the asphalt one. They carry on oil mining industry in a large area at Guapo. Altogether about 7,000 acres are controlled by them including 2000 acres Crown Lands under lease from Government. Part here in question is on lease from Government. It is now on license. That license was acquired, part of 3 to $3\frac{1}{2}$ years. There were complications.

Q. Ultimately you acquired license when?—A. It (license) expires in June with privilege of leasing it. When we licensed the 2000 acres they

were in high woods—virgin forest. Part of the 2000 acres consists of watershed of Company's ravine.

(Showing on C.C.S. 2 on tracing paper.)

Q. The watershed is there enclosed by blue lines?—A. Yes. Watershed area—143 acres—C.C.S. 2.

Q. The contour of the land, describe it?—A. Very broken—rolling—no cliffs or abrupt changes in level—intersected by drainage channels following the lowest points in the contour and going up between the hills. We first cleared ground after one of two wells had been sunk and were satisfied oil was there. We required water for the wells. We investigated drainage area and channel and found we could not get enough from area itself. At that time all the small ravines were dry. All the ravines there were dry. That was in the dry season—in 1913—therefore we laid a water pipe line to Vessigny dam—originally a 3 and since enlarged to a 4-inch pipe. We found no springs in that area. Vessigny dam is about 2 miles away. We don't use any water from our own watershed in question. Two dry seasons since 1913 *i.e.* this year and last, all the ravines have been dry. All within those blue lines. We have sunk 23 wells in that area—22—one is just off the area—22 within the blue lines. Number of dams we constructed is 9 or 10, I think. I don't recall exact number just now.

Q. With what object?—A. To settle sand from oil which is very heavy and retains the sand a long time. Then we could get the pure oil and run it into tanks and pipe lines. It has to pass through measuring tanks. It is Crown Lands' oil and we have to measure it to ascertain the amount of duty. 5,000 barrel tanks. We have two of them there. We try to measure it as clean as possible. Also the sand must be taken out of the pipe line or it would fill it up. We have obtained oil only in two ways: 1. Wells flowing of themselves—which occur, if at all, on first opening. The stuff coming up of itself would flow to lowest points on the ravine and gravitate into Company's main ravine, if there were no sumps. 2. By pumping—tubing and pumps and pumping rods are lowered into well into the fluid oil or water inside well. Then pump rods are operated by the working tram moved by the engine. Result is that a vertical reciprocating movement is given to pump rods and it brings up oil and sand if that alone is there—(all have a lot of sand here), or oil and water and sand. Water has come up with oil in gushing. There is a lot of sand in the gushing. In some cases the oil, sand and water are led into settling sumps where water and sand go to bottom and oil to top and water is drained off at bottom and sand largely accumulates in the sumps and the oil is drained off through pipes into measuring tanks and then into pipes. It is necessary to remove the water and sand before putting oil in receiving vessels. That method is used very generally—practically exclusively. When wells are gushing occasionally they are not controllable and unless you have large sumps it goes into lowest level and you have to collect it as best you can.

Q. A vigorous gusher will throw oil how far?—A. Depends on wind, but commonly 100 yards.

Q. Is it possible to control every ounce?—A. No, they call it running wild. It is uncontrollable. I don't see how a certain amount of pollution

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 22. Examination of William Fowler, 24th March, 1915 —*continued.*

can possibly be avoided. I have experience of oil industry in Texas, California, Oklahoma and Louisiana. They are all very large oil fields. The methods of Company here we believe to be the best that can be employed. In this oil field we use three methods—cable, rotary and combination or circulating system.

In rotary a very considerable amount of water is used as circulating water. After it has been so used it runs away to the lowest level. All our water is got from Vessigny *e.g.* for the rotaries. The water would find its way into Defendants' main ravine and thence to Vance River. Of water used in boilers at least 1/3 condenses and falls in waterways and channelways. In rotaries, it is at least 25%—might be 100%. It depends on the formation in which you are drilling. We have encountered salt water in wells: in 8 or 9 of them. Salt water has gushed from Nos. 5, 6, 12 and 15. It is gushing—running from 2 now viz.: Nos. 12 and 15. It is running of its own accord. It is not being pumped in 12 or 15. It is generally almost always with heavy oil a disadvantage to encounter salt water, decidedly a disadvantage to us here. It diminished the production very greatly *e.g.* Nos. 4, 5 and 6—especially 4. At beginning of last week it was making about 150 barrels oil per day. Salt water broke in and it is giving about 25 barrels a day and 200 barrels salt water. We have tried and spent a very considerable amount of money and time to get rid of salt water. For 8 months we have been trying with 5 and 6 and spent several thousand dollars on each well to prevent it getting into oil-sand—to cement it—cut it off. We partially succeeded twice with both 5 and 6 but afterwards salt water broke in. No. 8 was successfully cemented and has never made salt water since. It was cemented 7 or 8 months ago. We have used all the known methods so far as we know.

Q. Plaintiff said 120,000 barrels of oil had escaped from your wells?—A. I should say it was very unwise to place any figure on the amount we have lost. Our estimate is: maximum 15 to 20 thousand barrels during whole period—including gushers *e.g.* No. 11 gushed and there was a very heavy rain which raised the oil above the level of the dam and it flowed into ravine and was lost. There is a certain small loss daily—scum which escapes from settling sumps and measuring tanks. Very little oil makes a great show on water to one not familiar with its action and he would be greatly inclined to over-estimate amount present. The salt water from No. 4 is being pumped up: 200 barrels a day. I know Plaintiff's oil wells and his refinery. I did not know him state that apart from bursting of his dam and of a pipe there is no pollution from his wells. On every occasion when I visited his property there was pollution in his ravine. I have been there at least 6 times in last two years. I was there on Monday. Pollution from bursting dam: I don't think you could get rid of it all in less than 6 months or a year. Theoretically it could never be got rid of because it forms asphalt—and will remain there for centuries and indestructible except by fire—and may get into water from time to time if heated. But practically I think you would get rid of the pollution in 6 months or a year but the traces would remain for many years. Difficulties of control increase with increase of amount dealt with. Our production there has

been about 1,500 barrels a day on an average. There are other Companies there: Plaintiff, U.B.W.I.P. and Cruse Syndicate. The Leaseholds also operate in the Vance River watershed. From my experience I think it is almost inevitable that they also will strike salt water. We have struck it in every well that went below 1,000 feet in Forest Reserve. Plaintiff probably will strike it. He will be very very fortunate if he does not. We have struck it at 300 feet. We have determined the presence of salt water over practically the whole of that 2,000 acres and I conclude therefore that its extent is considerable in every direction beyond.

Q. If you stopped pumping the salt water what would happen?—A. Judging from our experience with 2, it would rise and flow of its own accord. By pumping we keep the level down. One well was closed up and the salt water is still flowing up—No. 15. That one we had cemented. No. 12 is doing the same thing. We cemented it and are not pumping and it is still flowing salt water. There is difference of opinions as to where the salt water comes from. Our geologist thinks it comes from the bottom of the oil sands (or horizons or levels or belt); and two of our field operators think it exists together with the oil itself. If we knew it might help us in cementing it off. Plaintiff's machinery is a small type, but probably efficient for the work it has to do. It could not do very deep work. I am speaking of his drilling machines. I don't know what his production is. Plaintiff's refinery could hardly be called a first class even small refinery because it is a makeshift. All it can do is to take the very light tops off the oil. It is only a steam still, not a fire still. The temperature which can be attained is only that of the steam which is used in the stills. That is somewhat lower than the steam in the boilers because it is lessened in going to the stills. The result of temperature not being higher, is that you can't make lubricating oils but only oils which distil off at 275° to 300°.

Cross-examination:

Cross-examination.

Some of our wells have gushed salt water. Two now are making salt water, flowing of their own accord. The salt water goes in the Company's main ravine. It is stopped there temporarily. It may or not be so according as the valves are open or not. They are open the majority of the time. If you have oil sand and water flowing in continuously you can have the bleeder, the valve open. . . . Most of our wells are always giving something. As a rule the valves are not closed. In my opinion they are open most of the time. I never keep a watch on them. I think it should be and that it is. It is not fully opened or some of the oil would go. The idea is just to have it open enough to let water go out as it comes in. That applies to night too—to all the time. It runs in behind the main dam. It would go there of its own accord. I don't think we direct it there.

Q. No. 9 was giving salt water and oil on Monday?—A. Yes. It flows into the ravine.

Q. But above the dam?—A. Yes.

Q. So that in effect you collect it there?—A. I can't say that, we let it pass through. In some cases we bring it to surface and from that it flows into the ravines.

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 22. Cross-examination of William Fowler, 24th March, 1915 —*continued.*

Q. You direct it into your sumps?—A. I can hardly say that. It runs down till it gets to the ravines where we may keep it temporarily. Some wells we direct into sumps. But 5, 9 and 6 flow of themselves into the ravine unimpeded except by the sand itself.

Q. No. 9: it came out of pumps and flowed into your sump?—A. It flows into the ravine which you may say is obstructed by our dam.

Q. If you did not pump No. 9 no salt water from it would rise to the surface?—A. That is a question. It might rise of itself as it has done in two other instances. We pump to make it rise faster. It would not rise fast enough of itself. In 4 and 9 and 5 we pump it up. In 15 and 12 it comes up of itself. We are now pumping 17 or 18 wells in that area. 8 or 9 originally gave salt water. Nos. 5, 6, 4, 9, 10, 15, 12 give salt water now. 15 and 12 were closed down, but are giving it now, running of themselves. Except 15 and 12 what salt water comes up we pump up.

To the Court:

Not all give salt water. 2, 3, 8, 7, 11, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23 never did give salt except 8 and 23 which gave it originally. We were able to cement them and stop the flow of the salt water.

Cross-examined:

Q. Those you pump you have control of the oil and salt water—and do with it where you please and you collect it in that sump?—A. We can't do with it what we please. I think the great part of the salt water that you pump up finds its way into the Vance River.

Q. Because you allow it?—A. Yes, it flows by gravitation. I don't know how I could prevent it. Because of its volume and the contour of ground &c.

Q. It is poured into Vance River in great quantities?—A. I would not say that. We don't pump it up in great quantities—but enough to make the control very difficult. I don't think that it is a question of expense—it might be a physical impossibility.

Q. You might take it by pipe to sea or elsewhere on your large area? —A. An engineer would have to inquire into that. Certainly it could not be done by pipes alone. You would have to force the water over hills and a large distance to collect and separate it from the oils and prevent it from reaching any part of the ravine. We have pipe lines—two of them. One a 2 and one a 4-inch to Brighton and to Vessigny.

Q. You could have a pipe to take your salt water to sea at Brighton? —A. We could not get rid of it all that way. It is hard to retain salt water. It saturates the water. When it gushes it is thrown and sprays over the territory like the oil does. Same principle applies to getting rid of the oil: you can't get rid of it all. We would first have to separate it from the oil and then drain it through the sump and you are sure to have leaks and there are sure to be leaks in the pipes. Plaintiff has leaks in his pipes. It would be very very difficult using any means, if not impossible. Ours is the natural course and it is cheap. That is not our sole reason, but whatever we

did, even if we got rid of 99% of the salt water, we would still pollute the river by the 1%.

Q. You could prevent most of it?—A. That might be at very considerable cost. I don't admit it is not simply a question of expense. What is the use of spending money to do the job half-way.

Q. You claim a right to pollute the river?—A. I realise it could not be helped. The question of right is not for me. If I were Plaintiff I might have to put up with it. I might complain as he does.

Q. Has he a substantial grievance?—A. About the boiler?

Q. You might as well throw that part out of the window, it is least part of our claim?—If I never used the river I might not care for the pollution. If I had his refinery I might not like the pollution. If I am to work our oil wells I must do it as I am doing. I think the damage might have been prevented by proper means. By boiler compounds and proper attention. Certain chemical reagents prevent corrosion and incrustation and render the harmful parts harmless. I don't admit any corrosion, &c. on his boiler. There was undoubtedly some sodium chloride which we put in that river. I could not admit there was corrosion due to what we put in river. There may have been incrustation due to what we put in river—but it was also partly due to want of care and prevention. The omission of adoption of preventative means; boiler compounds and careful attention including blowing and scaling and washing out.

Q. All of which would not be necessary but for your pollution?—A. No, I should think there would be a good deal of mud in Vance River which would necessitate blowing down and washing out.

Q. Till your pollution it only required to be cleaned once in 10 or 12 weeks. Is that reasonable?—A. I have no reason for doubting that. Sometimes you have to clean a boiler once a week. It is difficult to say what are ordinary circumstances.

Q. Since pollution it required to be blown off 3 or 4 times a day?—A. That is possible. Reagents and blowing off are not very expensive. Boiler compounds cost more than 3 or 4 dollars a month. That is a small boiler like that. I have analysis made of water in Vance River at pool where he draws up water. Compounds would not cost Plaintiff more than $4 or $5 a month. You don't need a chemist. You can analyse it once. Take the maximum pollution and use compounds for that and you will be safe. I had an analysis in March or February and based that calculation on it. Blowing out involves a certain waste. It would perhaps reduce the steaming capacity 10%. I saw at its joints an incrustation which tasted salty. It probably was the result of using the river water, I won't say certainly.

Q. "As this damage is easily repairable"—letter of 8th June 1913. Is this class of damage repairable once for all?—A. I thought two engineers conferring together could arrive at preventative measures and ascertain the extent of past damage.

Q. They would suggest what compensation for future damage?—A. That would be left to them, if there was to be future damage. It was written in good faith.

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 22. Cross-examination of William Fowler, 24th March, 1915 —*continued.*

Q. I have no doubt; but you go on "as this damage is easily repairable . . . your client will accept this proposal"?—A. At that time we were temporarily successful in shutting off salt water as we have been on several occasions since. I thought possibly or probably there would be no more salt water. We did not wish to hurt Plaintiff. We have been successful from a week to a month but the salt water broke in again on different wells. We have had 4 or 5 gushers in that field: pretty lively. We did not control them. No. 11 ran a week or more: it made 7,000 barrels a day of oil and sand. Nos. 5 and 6 have been the gushers of water. No. 5 for a month or two months. We could not control it. We began pumping and so kept it down; at any rate the gushing stopped. All that salt water went into the ravine, we could not prevent it. The salt water pumped from same well also went into the ravine. The time of its flow was controlled by our sluices—but not the amount.

Q. A considerable quantity of oil and salt water is pumped into a tank? —A. Yes, of No. 5 I think. The salt water goes out at the bottom, after we have got it into a little 100 barrel tank by the well. No. 4 was yielding 150 barrels of oil a day.

Q. Salt water broke in as the result of your pumping?—A. As the result of pumping and relieving the gas pressure, and withdrawing a certain amount of oil the salt water followed up and took place of the oil. I was pumping the well at the time.

Well No. 8: we were successful in cementing it. It is difficult to say why not successful with the others: the same men have been working at them. It all depends on the underground conditions. It is impossible to say why we have been successful in one case and not in others. You tried to cement every well giving salt water—and have been successful in 8 and 23—or there may have been 16. Unsuccessful in all the others. I did not try to cement 10. I don't believe I tried No. 9. We were trying to work out problem with 5 and 6 and knew if we were not successful with 5 and 6 we should be working in the dark and we were not successful with 5 and 6.

Cementing operations: we began them in April or May. I could not say if after Plaintiff's letter to me. We would not have waited for his letter. It had nothing to do with our attempts. I have not got the figures as to cost of cementing here. I don't think Plaintiff's letter had to do with matter. The salt water was doing us a lot of damage.

Q. Plaintiff's estimate of 120,000 barrels is too generous?—A. In my opinion. I put maximum at 15 to 20,000 barrels. If it all flowed at once it would pollute the banks and do more damage: it depends on manner of flow. 42 gallons in a barrel therefore over 800,000 gallons.

Q. Plaintiff's pollutions nothing like yours?—A. I think we have polluted more than he. Probably in proportion to amounts of oil we are getting. 280 barrels a day is about 1/5 of what we are getting.

Q. 5 or 6 thousand tons a year is Plaintiff's actual output in 10 months therefore about 80 barrels a day?—A. 100 barrels. I have seen oil in Plaintiff's ravine. It was polluted each time I was there. 5, 6 or 8 times I was there. At least 2 times last year and 2 times the year before. There was oil in the ravine. I have seen it with oil film so thick, the water was

not visible. You could not see through a film 1/64th of an inch thick. He put more oil I suppose except for when his dam broke. I think there would be very little pollution from that now. Practically none. There would be very little a year ago. But there was other pollution by him in the ravine. As soon as he got oil there was pollution. I think it is likely to increase both oil and salt water. It might still be possible to use the water for boiler purposes.

Q. As the result of your operations and those of others interested, the Vance River would be made a sewer?—A. That is too strong.

Q. A drain, then?—A. It might be the character of the river would be changed.

Q. There are considerable prospects on Plaintiff's land?—A. It may have been once on a time, but the salt water is changing the prospects. I mean the salt water in such quantities makes the fields less valuable. The results are much poorer than he hoped for. We are adding 1 or 2 wells because we still hope to make something but the field is blighted to some extent. Plaintiff is probably not deep enough to get salt water. We have struck oil at 490 feet. I think we have found top sand at 200 or 175 feet. We don't know from what depth the salt water comes. We are trying to tell by cementing etc. it is most difficult to tell.

To the Court:

I may have said I had struck it at 310 feet. I don't know what caused me to say so. If we struck it at 300 feet, it could not be deeper. It is in the oil sand or very close to them. That is becoming apparent. It occurs in lenses—pancake masses of land—not continuous pockets. That makes it difficult to form a scheme. The ground is very broken up.

Cross-examined:

Plaintiff's refinery: he may make gasolene at a profit and sell it: so he says. I have no reason to doubt it. It has been stopped because no water has been flowing in the Vance River. I did not go down to see it on Monday. I know the U.B.W.I.

No, there was no water in the Vance River. I know the Vance River gets no water from our wells except what we put in it. He showed me a little dam for his well—a little pond.

Q. Water flowed down his ravine into his dam?—A. Very very small. What I saw was a very small trickle and water stored in his dam supplied most of the water for his wells, I believe. The rest was not enough.

Refinery: What I saw on Monday there was not enough fresh water flowing in the Vance River above to supply boiler. There was enough in a pool by the refinery. I don't know that he stopped his boiler for the reason he gives. I know Vance River to be dry in property of U.B.W.I. 1 and ½ miles up from his refinery.

Q. Plaintiff has worked 3 years since you went there?—A. No, not his refinery. I have been there 3 years.

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 22. Cross-examination of William Fowler, 24th March, 1915 —*continued.*

Q. Plaintiff has worked 20 months *i.e.* dry season before this. It has never lacked water. You can't deny that?—A. No. The dams are all across beds of ravines. All ravines converge into one main ravine. I would not call it a well defined watercourse. The bare dirt shows only a very small area. I speak of about the centre *i.e.* part where we have dammed. I saw it 3 years ago in grass.

Q. Above your dams to its head, have you been there?—A. Yes. A well defined channel is a matter of opinion. In mine it is not a well defined watercourse. You would know water had flowed at certain intervals and had been furrowed out by water. That is in certain portions. In upper part the water just seeps down. Within 3/8 of head there was more or less of a channel showing water had flowed at different times but that channel disappears as you go up. At the measuring tanks it was fairly well defined. By upper sumps it was not well defined. Some of the sumps are within ½ a mile of its head. Before it gets to our field it is not well defined, because its head is in our field. By our field, I mean what is clear.

Q. Beyond your clearing Plaintiff and Cornillac say they trace a well defined course to a bluff?—A. I never saw the bluff. I consider the head of that main ravine is in our field. What they traced may not have been the main ravine. They may have gone there with my plan and may have followed it.

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No. 23. Further Cross-examination of William Fowler, 29th March, 1915.

## No. 23.

### Further Cross-examination of William Fowler.

Q. They followed your plan 1800 feet beyond your main. That would take them beyond our field?—A. Perhaps; I can't say definitely. I have never been outside our boundary line. The clearing is along South side of our boundary line.

Q. The ravines are well defined?—A. I would hardly say the water courses are so. In parts they are. I consider the main ravine ends in our land. There is a ravine on our land not controlled by the main dam. It was controlled by a dam which was broken. There are two wells on the watershed of those ravines viz., 14 and 2. Their waste finds its way down that ravine into the Vance River. 14 and 2 are working *i.e.* are being worked. They make oil, but no salt water. It finds its way into the ravine and may get into Vance River. Some slight scum of oil would get down to Vance River. 8 and 23 have been successfully cemented. We can't find cause of failing in other wells. We are still continuing our attempts. No. 4 has stopped giving salt water for the last three days. Nothing was done to it to make it stop. It was giving 150 to 200 barrels of salt water a day pumped with the oil. We put it on the ground and did not trace it after that. It would get into one sump in bottom of main ravine. It goes through

the drain pipe into the Vance River. We are pumping No. 4 and getting oil now and no salt water. Sand and some clay or shale are brought up with the oil.

Q. Some slush?—A. A mixture of sand and oil and shale and clay. You may call it slush. It is collected in the sumps and some of it may get out through the drain work. The slush would settle. It is the scum of oil, a little of it, that would get into Vance River. We never clean out the sumps. The slush settles. The liquid part floats. That is oil. Except in those wells which make water.

Q. Most of the salt water which found its way into Vance River was result of pumping?—A. It is hard to say. Two wells now are giving salt water without pumping: a relatively small quantity. Two others, 5 and 6, gushed salt water very much at first. A considerable quantity of salt water has been pumped up by us.

Re-examination.

Re-examination:

It has been pumped up with oil. Well No. 4: that only began giving salt water two to three weeks ago so none of the salt water complained of came from it.

Q. It was making salt water when sample waters were taken on 4th and 5th February?—A. No. 4 was not making salt water then.

Q. Wells 14 and 2: does the whole of what is pumped up go into the ravine?—A. No. 98% perhaps of the oil is saved and goes into the measuring tanks. They are pumped and the stuff goes into sumps near the well. What gets away is the part which it is very difficult to control. We pump to make the oil come faster. That is the usual course. We are mining in the ordinary way. Life of a well is precarious. It may stop at any time.

To the Court:

Q. Average life of a well in your own fields in Trinidad generally?—A. Original field near Pitch Lake began 5—6 years ago still has some producing wells—6 to 7 out of a total of 26 to 27. In the other two new fields we can't tell yet how long they will last. I believe in 2 or 3 cases the casing has collapsed or salt water has broken in etc. and stopped the production. There is probably oil there but it is impossible to get it. It is impossible to give any figure as to life of oil wells here on an average. The fields are not old enough. I have heard of averages elsewhere, but can't say of my own experience.

Re-examined:

Q. To carry away the salt water by pipes to sea would not be practicable commercially?—A. It can't all be carried away. It would be very expensive to carry any considerable quantity. It might be so high as to be prohibitive. Some fields are so productive as to be on almost any cost; but these fields are not of that nature. The profits on them will be small under any circumstances; are small, and such expenditure would be unjustifiable. My Company has spent three millions of dollars in Vessigny and Brighton Fields. In field in question I put the expenditure at half a million dollars.

Q. If injunction asked for were granted would it be possible to carry on the industry in this particular watershed?

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 23. Re-examination of William Fowler, 29th March, 1915 —*continued.*

Objection overruled.

A. It would stop our industry in that particular field immediately.

Opportunity of re-cross-examination offered by Court.

Q. Pool by refinery contains water brought by you from Vessigny?—A. Almost certainly it does.

To the Court:

I don't suggest that without that he would not have enough to work refinery at this season.

Re-examined:

I don't know upper reaches of Vance River. I have been asked for water by the U.B.W.I. I have no personal knowledge.

To the Court:

Lots 4, 5 and 6 are ours. 2 and 3 U.B.W.I.'s. Land to West of Lot 2 —Cruse Syndicate's.

Re-examined:

Q. How much do you use from Vessigny?—A. 1,500 to 2,000 barrels a day—*i.e.* 60,000 to 80,000 gallons a day. 10% or 15% is put into main ravine and flows into Vance River.

To the Court:

The rest is evaporated in steam or sinks into the ground or is used in drilling wells.

Wharton K.C. declines to put any question about effect of injunction.

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No. 24. Examination of Arthur William Ibbett, 25th March, 1915.

## No. 24.

## Examination of Arthur William Ibbett.

Engineer in charge of fields of Trinidad Leaseholds Company which is working here in Trinidad. I have experience in mining of various kinds of oil mining in various countries in gold and copper &c. In West Australia and West Central Africa, in Canada, Newfoundland, England and Russia. I have seen and worked in oil fields in Baku. I have visited oilfields in California to get information also Oklahoma and Texas for same purpose.

I have been 14 months in Trinidad in charge of this work and have superintended the drilling of 9 wells. I have heard a great deal of evidence given here I know the Forest Reserve where Defendants' wells are, between

Guapo and Siparia. I know Defendants' wells well. I have visited them before and especially with regard to this case by request. I am familiar with Vance River. I know the main river. It passes practically North and South through block 2 and its source if you call it source, is in block 13. I say it has no source because I can find no springs there. The main river at present is dry except for one or two isolated pools. Defendants' land is on Northern decline of a range of hills running almost East and West. I know the contour quite well and the various ravines that open into a ravine entering the Vance River, called in this case the Company's ravine, also the Plaintiff's ravine and Plaintiff's refinery and the river as it passes there. I am working on part of the same watershed as Defendants and Plaintiff.

The Cruse and the U.B.W.I. also work on that watershed.

I have visited their workings: the United on 2 occasions. Their working requires lots of water. I know the supply in that district. There is not water enough there from ravines for working without damming. Without collecting water artificially every Company would have to close down. Some of us have closed. The B.W.I.P. have closed altogether on that district, and I have closed down 2 wells. Defendants have not closed down. They get water from the Vessigny exclusively so far as I know. There is a large dam on the Vessigny collecting water. The Vessigny watershed is the best in the district. It is topographically favourable for collecting water. It has high sides. Without Vessigny dam and pipe line from it, Defendants would not have enough water to carry on this industry. I don't think they would have any water at all now,—in dry season. I know their system of sumps and collecting oil and working generally. As an engineer experienced in that class of work I don't see what they could do else. It is what I do—What the B.W.I.P. do—What the Plaintiff does and I know of no other way.

Defendants are quite up-to-date in their machinery and other appliances. In oil districts the striking of oil is frequently accompanied with the striking of salt water. Some Geologists think an indication of oil. I am inclined to agree with it. I know of no means of controlling salt water and oil which would be practicable there except by sumps. Concrete erections are not practicable there commercially. Circular earthen works erections would be physically impossible there.

Q. Sand: large quantities are thrown up in boring?—A. In most cases. It accumulates very rapidly.

Q. Could it be cleared out of concrete or earthenwork structure?—A. Yes, but it would only be putting it elsewhere. You would have to put outside the watershed to be quit of the trouble which it causes. Nothing is physically impossible, but it is commercially impossible *i.e.* it would never pay. If removed into next watershed, it would pollute it. The average life of an oil well in Trinidad I estimate at 5 years. In Baku at 10 years. That is my estimate and it is generally agreed the same. The fresh water used for working would also have to go into the sumps and the salt water gushing or pumped up. From time to time also you would have flood or rain water. There is an immense amount of water to deal with. No other way of dealing with the salt water and all the detritus, can be thought of.

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 24. Examination of Arthur William Ibbett, 25th March, 1915 —*continued.*

Q. Can you pump direct from the wells into pipes and send the stuff to the sea?—A. No. You must first settle the sand. Whenever the sand would cut up the pipes and the pumps you had to force that fluid through the pipe line. The pipe line would be cut. The action would be the same as the sand blast *i.e.* jet of sand forced through with water at great velocity which cuts into iron and wood: *e.g.* cutting on a tumbler. There must be some escape of oil and salt water no matter what you do.

Plaintiff's boiler: Damage to it: I heard what was said of that, *i.e.* at refinery. I saw it.

Q. It is said there is a formation on it like X?—A. Yes. That is from outside boiler. There was nothing like that on the inside of the boiler to judge from the tube—taken out of it which I saw on Monday.

To the Court:

I don't think it has been cleaned. Some of the scale may have been knocked off it, but I don't think salt has ever been there.

To Agostini K.C.:

I saw what was on the tube. I believe it has been analysed. I saw the analysis yesterday. Not put in yet.

O'Reilly:

No Cross-examination was addressed to Plaintiff and his witnesses about the substance taken from the interior of the boiler.

Agostini:

I consent to the Plaintiff and his witnesses being recalled to give evidence on that subject.

Witness:

I saw the analysis yesterday.

Put in and marked Z for identification:—Shown analysis. There is no sodium chloride *i.e.* salt here is only carbonates which are insoluble.

Q. The tube had been out 6 or 8 months?

O'Reilly:

I don't admit that.

Q. Assuming it to be so, if there was sodium chloride in that incrustation would it still be there?—A. I think so. It would be a conglomerate. Not like what was got on the outside of the boiler. I have an intimate knowledge of boilers.

Q. The burning of plates, is it due to carbonates or to common salt?—A. It is due to this incrustation composed principally of carbonates. If that tube had this deposit on it and had not been kept short of water, at some time, the blister would not have formed on it necessitating its cutting

out. It must have been let get short of water at some time or this burning would not have occurred. If that tube came from that portion of the boiler which was above the water-line then it was burnt out entirely owing to incrustation. That is indisputable. I don't know where the tube came from. It may be that is a water tube or it may be a tube worked into the design of the boiler to attain super-heating, to get drier steam. As a boiler in my opinion it is not well designed. A boiler of that type is no good in a country where you get water brought out from a river apart from any question of oil or salt.

To the Court :

That boiler is composed of 2 concentric tubes connected with each other at the bottom and at the top finishing round a smaller tube which carries off the gases from the furnace. The inner tube is connected by tubes across—horizontally across the boiler. There may be 2 or more tubes but those tubes one side of which is exposed to the furnace offer surface for heating and at the same time permit the water in the boiler to circulate from between the shelves (*i.e.* the outer and inner tubes) ; thereby facilitating the raising of steam. If it was a big tube boiler, such as I think it is, the lower tube would be just over the fire and the inside always containing water. The upper tube might only contain steam, which being heated by the gases passing from the furnace, would become super-heated and of greater value for work.

To Wharton K.C. :

I know the type of boiler. I have handled them since I was so high. It may have water tubes only—if so, both tubes would always contain water.

Counsel agree to witness making a sketch later.

To Agostini :

As to exhibit X : there would be no deposit like that inside the boiler because that salt got from the outside is an accumulation deposited there in fine particles with the escape of boiling water and saturated steam which could not happen inside the boiler because the boiler is hermetically sealed from the atmosphere which has to do with the deposit outside because the condensation cannot take place till it is exposed to the atmosphere. The water escaping outside would form a precipitate as it was evaporated. If the boiler was blown down the water and steam could never arrive at such a density as to cause precipitation inside the boiler. An ultimate period could be reached when if you kept putting fresh water into the boiler—water of that class—and allowed none to escape when you would fill up the boiler completely with salts—including alkaline carbonates and all the known salts in water. But that state ought not to be allowed. Closer attention to his job would be required than if the man in charge had perfectly clean water from a tap such as town water.

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 24. Examination of Arthur William Ibbett, 25th March, 1915 —*continued.*

Q. One witness said it would require 35 gallons in normal state and was using 225 owing to leakage ?—A. Mr. Green said that. That would be 190 odd gallons an hour. It must be like a basket. It is impossible. He could not raise steam in such a boiler. The water must have run out just as fast as he run it in. He must have made a mistake in his arithmetic.

The salinometer : tests salinity of water. That includes all the alkalies, not merely sodium chloride. It includes magnesium, sodium, calcium, all the ferric salts, potassium and all other alkalines. It is used in same way as a specific gravity instrument. Whether it should be used with hot or cold water depends on the make and it requires compensation to be made for the outside temperature. To use the water from the feeding tank and say that contains so much sodium chloride would be wrong ; but it would give an approximate density of the general salinity of the water.

To the Court :

Specific gravity reading is the principle of it. You can figure out the density of any water with an ordinary hydrometer.

To Agostini K.C. :

There never need have been the amount of salt incrustation outside the boiler if the attendant had kept the mountings just wiped over with a greasy waste. That would have increased their life. I know places where water impregnated with salt has been used in boilers *e.g.* Kalgoorlie West Australia. There was till a few years ago no fresh water at all. All domestic water had to be condensed and boiler feed water was all salt.

To the Court :

I know about boilers on steamers. They used the sea water through their condenser. In all steamships no steam is allowed to escape to atmosphere. It passes through a series of tubes contained in a cylinder. The outside of those tubes is cooled by the circulation of cold water. But also before ships carried so much water ballast as to-day if they got short of fresh water they used sea water in their boilers. The effect of that was a necessity of cleaning them out a little more often and not so efficient for raising steam quickly. The boiling temperature of salt water is much higher than fresh water necessitating more fuel. I have seen a boiler in which sea water had been used—a good many times.

The brass work was green. A little salt incrustation at the blow off valve and the safety valve. There was no incrustation such as there is on Plaintiff's boiler.

Cross-examination.

Cross-examination :

It is better to use fresh than sea water. I heard Shrewsbury's evidence. I have not seen his analysis.

Q. A and B are almost without salt, C and D have a relatively large quantity ?—A. (Shown analysis) Yes.

Q. C and D are not so good feed water as A and B ?—A. Yes.

Q. Compare C and D with sea water ?—A. They are much salter than sea water. They would necessitate more fuel than sea water even. The boiler temperature would be much higher.

As to the Merrimac water—I said in another case that one could not carry on an industry with the water at Merrimac they would have to buy a new boiler every fortnight. I was speaking of a mixture of the Gulf of Paria water with the Merrimac River water. I was speaking about that water at Merrimac at La Brea.

To the Court :

At Merrimac it was water we spoke of and I said it was unfit for industrial purpose and you would need a new boiler etc. That is a very different water from C and D.

Cross-examined :

It was partly sea water and partly water which has come down the Vessigny River.

To the Court :

Vessigny River is not so very salt. But almost the dirtiest part of the Gulf of Paria is along that beach. All the iron salts and other salts and mud from the Orinoco accumulates there and the water is heavily charged with it as it is here in Port of Spain.

Cross-examined :

I agree that C and D are bad boiler waters. A and B are not the best —but moderately good boiler water. The solids in C and D are about 12 times as in A and B. It is more in C than in D. I speak of all solids solubles and insolubles. It is that difference makes A and B better than C and D. Soap would not harm boiler but would interfere with business by causing foaming. It is a very trifling matter.

I don't agree with Shrewsbury that it would tend to corrode and cause irregular boiling. Common salt would corrode the brass fittings. I don't admit that it would cause leaking. Not for a long long long time. The amount of harm done by the salt to the brass fittings if they are kept clean does not amount to very much.

Q. With D you would need more precautions than with A and B ?—A. You would not be able to sleep so much. It would need more attention to the boiler. It would need more blowing off

Q. Thus causing waste of energy and loss of time ?—A. Yes, if you like to put it so.

Q. Trouble only began after the pollution by salt : is that consistent with salt being the cause ?—A. I have no doubt salt contributed to it among other things. You would naturally get your water analysed and make preparations to meet the trouble. That would be necessary with

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 24. Cross-examination of Arthur William Ibbett, 25th March, 1915 —*continued.*

sample D. You would put in a certain amount of boiler compound suitable to the trouble you had. That would be sufficient for a month or a fortnight according to the degree of trouble you had.

Q. Fusible plug. If the boiler was short of water it would go first? —A. Not necessarily. It would depend at what level it was put in the boiler. I would have liked to have had the cover of the boiler taken off. I don't think it has been opened for 6 months *i.e.* manhole or mudhole etc.

Q. It was cleaned every week?—A. I don't say that is untrue. But I don't think these doors have been opened for 6 months before last Monday.

To the Court:

Because it is in such a bad way. Even though they were getting salt every day nobody was entitled to have a boiler in that state. The gaskets were as hard as iron *i.e.* jointing of canvas or lead—jointing material between manhole door and shell of boiler. They had the appearance of not having been taken off for a very very long time. If I found a boiler like that I would "fire" everybody from top to bottom even under those circumstances. Cocks all have a way of leaking if you don't look after it. The salt helped—just as a silver spoon turns green if you leave it in the salt-cellar. I have the same difficulty as the Defendants in obtaining water. I get water from Ariparo River because we are shut down with regard to some of our operations when we are short of water. I know the Forest Reserve better than any other district in Trinidad. We have the blocks adjoining the Defendant Company's. I only visit their wells occasionally.

Q. Vance River proper has a well defined channel? alveus?—A. Yes, a natural declivity. It has a well defined bed. I have been to its source—as I interpret it at least. It is fed by a great many ravines.

Q. Plaintiff's ravine has a well defined bed?—A. Yes. I mean that all the time in the sense that all those rivers including the Vance River but not in the sense commonly understood all the world over as run. They are natural land drains.

To the Court:

(Question repeated.)

A. It has a well defined course—with a channel hollowed out and the hollowing is quite distinct.

Cross-examined:

Defendants' ravine also has a well defined course. The rivers and tributaries there in that district so far as I know are merely fed by rain. There no springs that I have ever seen. There may be some where I have not been. In rainy season both ravines and river have a continuous flow, I think. Some of them hardly deserve to be called ravines and only carry off water while or immediately after it has rained. Rainy season before last I saw Plaintiff's ravine. It was flowing then. Defendants' ravine is about the same size. These two flow a little all the time in rainy season—in an unbroken stream—not merely in pockets. The volume is

greater or less according to the rain. Some of water flows on the surface some percolates through the porous rock, joining the river at a lower level

To the Court:

These rivers are rather brooks or burns or aqueducts.

Cross-examined:

At beginning of dry season they would go on flowing for some little time. Fed by water held back by the foliage and vegetation in the forest.

Q. The rainy season, what months is it?—A. Opinions vary. In 1915 it rained 7 months.

To the Court:

Q. Which months?—A. We had rain from 23rd March or beginning of April till end of June and again from beginning of August till middle of September and then again in November, beginning of November. We had a dry spell end of September or beginning of October and people said it was unusual. The rainy season was in three pieces last year.

Q. January to April is generally recognised as the dry season?—A. Yes. The source of the Vance River is two miles as the crow flies from Plaintiff's wells. It is in clay.

Q. Have you been to head of Defendants' ravine?—A. Not beyond the clearing. I don't think there is anything beyond. A ridge rises from the edge of the clearing. Cornillac said it was 1/3 of a mile above the clearing. I did not go to see. From topographical maps I don't think it goes beyond the clearing. There are no fish ponds or crystal streams.

Vessigny dam is across the Vessigny gorge. Commonly called Vessigny River. The course is dammed—and so the water is collected.

Sumps: I would do the same. I think it right. Apart from engineering knowledge, I think it is only thing one could do.

Q. Oil in that area cannot be collected in any other way?—A. It could be collected as Plaintiff collects it but not on a sound commercial basis.

Q. Is there any other method except sumps—apart from all questions of expense?—A. You could put in concrete filter beds and use artificial means to take out the sand; but you would still spill some *i.e.* oil, sand, salt and all sorts of things. You could not in that way develop that oil field. Concrete is dear here. Iron tanks would be cheaper. At No. 5 well of Defendants oil is pumped straight from well into a tank. We always do that whenever it is possible. All salt water from wells goes in Vance River to the sumps.

Q. You would have it under control in filter beds?—A. It depends on the quantity. Yes, if they spent enough money.

Q. They could take away the salt water as they bring the fresh from the Vessigny?—A. Yes, if they spent enough money. Even so there would be a certain leakage of oil and salt water. It would be infinitesimal. If you put in concrete beds and tanks etc. etc. you would get rid of everything.

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 24. Cross-examination of Arthur William Ibbett, 25th March, 1915 —*continued.*

Q. It is a question of pounds, shillings and pence?—A. Exactly. I have seen salt water pumped up. I have seen them letting it run down over a small ravine into the sumps—and I have seen them allowing it to run through a pipe mixed with oil into tanks and then into a sump. Those small ravines are not artificial; just hollows in the ground. Some of it squanders itself on surface—if it is flowing while they are drilling; it is just run down the side of the hill with the muck. If it is salt water only it is allowed to run away naturally. You would not put up a pipe for that. When there is oil it is different. I once saw there oil and salt water being pumped from well and let run down hill into a sump; on another, oil and salt water going into a tank. They may have a dozen ways of handling it that I never saw. I don't know the capacity of any of the dams.

Re-examination.

Re-examination:

Q. £. s. d. was what you said an imaginary sketch. What would you do with the sand?—A. Build a railway and take it out to sea.

Q. Or in an aeroplane?—A. Yes. But if you contemplate doing any of these things, you might as well shut up your business at once. Five years is average life of a well. It may last only two—a whole field. I know the Brighton fields have petered out. Lot 1 may give out at any time. Its value is much less because salt water is there. It is a serious injury. We first do exploration work—by sectioning and cross-sectioning with well—before spending any big amount of money in sumps and the like. It only requires some trouble and some expense to enable Plaintiff to carry on his business as things are. He might have made an attempt to compound his interests with some Company. He could clean that way. I shall be glad to give him such advice.

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No. 25. Examination of John Henry Weller, 29th March, 1915.

## No. 25.

### Examination of John Henry Weller.

Engineer in employ of Defendant Company and all the allied companies. I know their holdings in Forest Reserve and have paid many visits there. I have had 8 years' experience in the profession. I was at Panama Canal for 6 years in charge of work there. I am Assistant Manager of this Company. I have been with them since November 1913. I have heard some of the evidence. I have no experience of oil work except here. I have seen the work here and am connected with it as an engineer. Salt water is given by certain of the wells. It is both self-flowing and being pumped up. It comes up with the oil. I have seen it come up of itself. I have also seen sand which is deposited in large quantities at sides of wells.

Q. Is it necessary to collect the stuff in sumps?—A. Yes. It is necessary to let it settle in settling lairs to get the clear oil off. I know of no method except that in use. There is no other way to enjoy the use of the wells. No. 4 was pumping very nearly pure oil and suddenly it produced a large quantity of salt water with a small proportion of oil. I have not seen it since it stopped giving salt water. The first well was put down in 1913—before I was here. When I arrived they were getting ready to put down No. 3. There was no work then because of the Yellow Fever—till February or March. I know Vance River—and the measuring tanks and plans put in. About end of February 1914 we were erecting the two measuring tanks on map at main sump. At that time I did not get more than 100 below the tanks, down the ravine. It was then dry.

To the Court:

Quite dry. Not even pockets of water in that place.

To Mr. Agostini:

I have since followed up the Company's ravine. I did so last February (1915). I found a succession of pools all covered with heavy oil. Some of them were collected by small channels in which was water. I estimated that the quantity of water in the larger was about 1,000 gallons a day. It was salt to the taste. I am speaking of the ravine below main dam and down to the main river. There were a number of ravines leading into this ravine, but none of them was flowing water. I concluded all the water came from our sump. Any water from the wells ran into the sump. All the water we use comes from the Vessigny reservoir. The natural ravines about dam, I followed them up in March or February and there was no water flowing in any of them. In one ravine above our boundary I found a pool 12 inches in diameter and 1 to 2 inches deep. That was all the sign of water I saw. I followed up all these ravines and found no spring or sign of water supply. All water in main ravine was water from Vessigny and our wells. No natural water supply there. Where ravine (branch) from Lot 1 joins Vance River. I know the spot. I visited it on 12th February I think. There was considerable water flowing there about 150 to 200 thousand gallons a day in Vance River. At that time it was very slightly salt. I visited it on 5th, 6th or 7th of March, and very little water was flowing—25 thousand gallons a day perhaps. I visited it a few days after that, 8th or 9th of March. There was less water 6,000 gallons a day. I measured it with a wire. There is a very small flow. 12 inches wide by 1 to $1\frac{1}{4}$ inches deep. I speak of main Vance River at the point below junction, with ravine from Lot 1. Since then I have seen it once. The discharge was about the same. Defendants' ravine I last saw it on day when I made measurements in Vance River with wire; it was then dry of water. Our ravine was probably supplying water to Vance River then but not Defendants' ravine. I also went further up main Vance River. There is also a succession of pools connected by very small channels in which water was running. Channel farthest up as wide as my hand and $\frac{1}{4}$ inch

deep. River from high road to sea: I have been there. Banks are steep. It is a sort of gorge. I have seen the cultivation. There is a tidal water to where a ravine joins it on the right. It is marked on map. There is a cultivation from road to sea—banana and cocoa on left hand. Very little cocoa on right bank. River tidal as far as cocoa estate.

The banks are high there, but less so than higher up. Pollution would not injure cultivation there, because of the high banks. I found only one house from road to sea. Plaintiffs oil fields: I know them. On 12th March I visited them. I visited them *i.e.* same day. His water supply for oil fields is taken from bottom of sump in which he also stores his oil by damming up the ravine in same way as Defendants do. I found a very small stream of water flowing into river from above. I followed up ravine to junction with another ravine which drains the Parry Lands. There was no water flowing in the latter ravine *i.e.* from Parry Lands. I saw them again about a week later. There was a small pool in the ravine in the Parry Lands and a very small stream falling into Defendants' sump from the Parry Lands. I noticed the wells and machinery. A boiler had been burnt out and cast aside.

Plaintiff's refinery: I visited it several times. The boiler had been damaged. I have had experience in boilers.

(Ibbett's sketches shown to witness—and put in.)

I looked in at fire-door of boiler.

Q. What style of boiler is that?—A. It is the first of its kind I have ever seen. It is not used in U.S.A. One of the water tubes was one on the ground. There was only one inside. I presume the other had been cut out. I took a sample of scale on tube which was outside.

Shown P—(so marked for identification).

This is the scale from inside of tube which was outside.

(5 bottles shown to witness.)

1. Taken at pool at refinery.
2. Taken at Defendants' well 5.
3. Taken at main sump.
4. Taken at Tank No. 2.
5. Taken at R.V. ½ way between Defendants' refinery and bridge. I gave them to Mr. Fowler.

Wharton K.C.:

I will admit that they have been sent to analyst, if Agostini make a similar admission as to X.

Agostini:

I do so.

P. Scale: it would require considerable force to remove it. It is not exposed to weather. That side is the water side. There was no sign of salt that I could see or taste. I put some of scale on my tongue. It is due to use of water containing sediment mud, which shows the boiler was not properly cleaned. I have seen such scales in boilers using ordinary river

water. Boiler has a blow-off cock. It could be easily blown off. There is a hand hole at each end of the water tubes through which they can be easily cleaned.

(Shown Ibbett's sketches.)

The boiler is the same type as the sketch on the green paper. By consent sketches put in and marked O and R. I recently visited every one of the ravines above Defendants' well on Lot 1. I saw only water in one pool mentioned before. That is all the water there is.

Cross-examination.

Cross-examination :

I think I went to ravines in March and made a special examination of the watershed in June or July 1914.

We have a rainy and a dry season.

Q. Dry season begins in January ?—A. It did this year. Last year in April we had considerable rain and considerable dry weather about August.

Q. First 4 months are more or less constantly dry ?—A. That is about it. Vance River has a well defined course. Inside of Lot 1 it is easy to pick out the lowest portion of the drainage area.

Q. The tributaries have well defined courses ?—A. Up to Lot 1 the Vance River has two steep banks.

Question repeated.

A. The tributary from Lot 1 has up to the wells. Defendants' ravine has a well defined course so far as I saw it.

Q. Its bed is about as large as Defendants' ravine ?—A. Ours near the river is rather larger. Further up they are about the same size.

Q. How far above your main sump was the ravine well defined ?—A. Up to about well 20—marked now by me with asterisk on C.C.S.3. That is compiled from Veitches map. He was Company's geologist and surveyor. The lowest part of every country is a watercourse when it rains, so I don't disagree with his marking the ground above that by lines interrupted with dots. That stands for watercourses.

To the Court :

Deep lines on hill side might be a watercourse. So also where water drains in a flat place.

Cross-examined :

In places higher up than asterisk the ground may have been furrowed by water, but I don't think it is a continuous channel. I have been up to the divide where the water goes to another watershed. In rainy season the water has not a continuous flow. I was there last rainy season. In June or July 1914, the upper part of these ravines was dry. The lower part full of oil sands. I can't say it there was after a period of dry weather.

Q. Have you ever seen a continuous flow ?—A. Yes, after heavy rains.

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*In the Supreme Court.*

Defendants' Evidence.

No. 25. Cross-examination of John Henry Weller, 29th March, 1915 —*continued.*

To the Court :

I have never seen a continuous flow for a week. I can't say for how long because sometimes I don't get out there for 3 or 4 days. There is a run into the sump from above for half a day after heavy rains.

Cross-examined :

After that there is no appreciable flow. I have seen times in rainy season when there was no water. Not only in June 1914.

Q. From middle of January how much rain ?—A. Since 1st January 6 inches, 3000 gallons first 2 weeks in January. Vance River is fed by nothing but rain water except what is pumped over from the sea.

They began to pump Vessigny water before I came. Channel below our main sump gets a little longer than it is above. Immediately below the dam I have seen it dry. Only once viz., in February or March 1914. There was a small flow in Plaintiff's ravine one day. Day we all went there *i.e.* Judge went with us *i.e.* on 22nd instant, it dried shortly before that. I saw it and there was no flow—2 weeks or so before. There was no flow in ravine from Parry Land—not in Plaintiff's main ravine above point where it is joined by a ditch draining from his boiler pipe and pump station.

There was a flow into his sump from the condensed water from his boilers and the water from his pumps. There was no natural water flowing into it. There was no water coming from either the branch leading into Plaintiff's sump.

Q. Vance River is fed throughout its length by these tributaries ?—A. Yes. I had no experience in oil before I came here. I have had experience as a mechanical and as a civil engineer, both.

Water largely impregnated with salt is not good boiler water. Cut-out tube was on ground near boiler. Exposed to weather

Re-examination : None.

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No. 26. Examination of Archibald Edward Collens, 29th March, 1915.

## No. 26.

### Examination of Archibald Edward Collens.

Member Chemical Society. Assistant Government Analyst now. I was acting principal assistant analyst when I received these samples—5 from Mr. Fowler. These are my reports—3 sheets—A.E.C. 1, 2 and 3. I also analysed a sample of boiler scale received from de Labastide—Solicitor.

Report on sample P marked A.E.C. 4.

Wharton K.C.: I consent to P going in, Reports 1, 2 and 3 relate to the 5 boilers put in evidence, 1—5.

(Russell J. : If I admit the evidence as to analysis I must allow cross-examination upon it.)

Petroleum and salt are often in association. We have had sample from oil shown *e.g.* mud volcanoes which were both saline and alkaline and containing traces of oil.

Q. Proportion of sodium chloride in samples I.—V.: 1/89 and 1/92. A.E.C. 3: would 2.55% and 2.14 make the water objectionable as boiler water?—A It could be used but would corrode brass fittings. Salt in boilers is not taken to have much effect on iron. A.E.C. 4—Report on scale: we found only bare traces of salt. 2.55%=025 lbs. per gallon; a 2/5 of an ounce.

Cross-examination:

Cross-examination.

My analysis and Shrewsbury's ditto accord fairly well.

Q. As to water in Defendants' ravine?—A. I got water from the well itself *i.e.* pumped up which exudes from Well No. 5—not the water coming down the ravine.

Q. Water of Vance River below Defendants' ravine?—A. He got higher solids and higher salt.

Shown Report on D. 575 parts he gets: I 334 and in another sample 432.

Q. D—would be very bad for boilers because of salt?—A. It is not desirable for boilers because of the solids you would have to get rid of them *i.e.* soluble solids. It is nearly all salt. I found a slight trace of soap. A small trace might not do any harm. A large amount would. I did not estimate the amount. It is not a desirable water. I have done some work in analysing boiler waters.

Q. You have had practical experience of their results?—A. No. The consensus of opinion is that salt has practically no effect on iron. I have searched and all authorities seem to agree that salt in itself is not injurious to iron plates. There may be another school. I don't know. So far as I know it only affects brass—not iron. With this water you would have to blow off pretty frequently.

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## No. 27.

No. 27. Examination of George Alexander Macready, 29th March—1st April, 1915.

### Examination of George Alexander Macready.

Geologist in employ of Defendants and allied Companies since 1911. I have made a geological survey of Lot 1, Forest Reserve. I examined holding of Defendants in 1911. At that time in September and October 1911 there was one hut on a ridge along a road made by Company. Rest of Lot 1 was jungle. I examined the boundaries and all principal ravines and a number of minor branches and went into the adjoining territory and acquired a very thorough knowledge of the place. I have been there since. In 1911 about where well 13 is there was a seepage of oil also about 14 and

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*In the Supreme Court.*

Defendants' Evidence.

No. 27. Examination of George Alexander Macready, 29th March—1st April, 1915 —*continued.*

15. There were several. One near 13 was biggest—heavy viscous—asphaltic appearance. It floated out and down the ravine a short distance. That is ravine by well 11 or 13. There was some water flowing in it then. Wet season is May to January about that I consider. This oil floated down river and stuck to banks. Lower down it was dried to a hard pitch. It is not a river. It is the ravine by wells—11, 13, 5 and flowing over present dam : what we call the main ravine.

To the Court :

I don't remember seeing oil below where the dam now is. By the time it reached that point it had all stuck to bank and dried.

To Agostini, K.C. :

I followed ravine further down, also I went up Plaintiff's ravine. There seemed to be an habitation. I understood he had a well but I did not go there. There was no oil on water in Plaintiff's ravine. That was about October 1911. There are no springs in Lot No. 1 except these seepages of oil. I have had a hand in compiling these maps. I was here with Mr. Veitch. I had access to all his information.

Shown Map C.C.S.2. I call them watercourses or gullies. They carry off rain water. A sort of natural drainage. Depressions—cut by the action of running water. Undulating V shaped ravines till you get to lower parts. In dry season they are dry, where not fed from water from the operations. In wet season they are torrents, or rather during rains they are so. In rainy season there are days when they get down to a little trickle.

Q. Plaintiff started boring before Defendants ?—A. I don't know exactly, but I understood he had some working in 1911. I did not go up to it. His gusher started in 1912, about that : spring in 1912. Shortly after he struck the gusher I visited the well—in July 1912. I was not in Trinidad when he drilled. I was in Venezuela. When I returned I found oil all around the coast of Venezuela. I had traced it to Guapo. On my arrival I visited the well almost immediately. Rain had come and washed it down the river. A big rain I supposed. Vance River was plastered with oil at Bridge on main Southern Road. I went up in Plaintiff's field and visited the well. Vance River had a lot of oil plastered on it. I passed Plaintiff's ravine and there was a lot of oil slewed around that. Since then I have been very many times. This year I have seen it, this very month. Since 1st March there is a trickle out of Plaintiff's ravine. From Company's ravine it varies. I saw what I took to be the natural flow which I estimated to be about 5000 gallons daily. I don't know the natural flow. It has always been fed by the working—from Lot 1 field. I mean not natural, but ordinary flow. There is no water in Company's ravine this month except what comes from the working. Natural is hardly the right term. I mean the average flow—5000 gallons is about the average flow. I visited Plaintiff's ravine.

To the Court :

The trickle out of Plaintiff's ravine comes leaking out of his sump through a 4 inch valve cracked open—leaking. By " Crack " I meant that the valve was a little open. It is so used in the industry. The ravine is dammed. There was only one source of supply viz., from exhaust of pumping engine. It would exhaust on the sand and water seep out. I have visited all about Plaintiff's well. Also all tributaries about Lot 1. All above the Defendants' wells. There was no water above Lot 1 except one bucketful in a little hole. I have been looking for it. There was no water flowing in the Lot. Banks of Plaintiff's ravine were plastered with oil ; in some places 3 feet above the quick bed. I took samples. Also there was asphaltic oil floating on the pools.

Opens tin : This was taken about January 7th, 1915, from Plaintiff's ravine, 1/8th mile above Vance River.

7th January. G.A.M. 1. leaves taken 24—30 inches above low water in ravine from Plaintiff's well.

2 Ditto bed of Plaintiff's ravine near dam March 1915. These are fair samples of the sides of the ravines. At the bottom the leaves are more pasty. The water accumulates in pools before drying off altogether. The pools are coated with oil 1/8 inch to a film thick. In Plaintiff's ravine this year there was not enough oil to leak but 1914 about June oil leaked through cracks in Plaintiff's dam. Some of joints in pipe line leading North leaked. Most of my time has been devoted to oil fields. I have seen them in U.S.A. California—middling—principally Los Angeles—Oklahoma and Oregon. I studied the conditions in each. The Defendants' methods are up to date. I agree that it is impossible to prevent the escape of oil. In all fields I have seen the waste oil leaks over. It is so wherever there is a large production. There have been attempts to stop it because it is a waste ; but they have been unsuccessful. It is particularly difficult or impossible to prevent it from those fields which have large quantities of a heavy viscous oil. Salt water : most oil fields will have salt water in some of the wells. (a) In some fields they can control it ; (b) in others only with great difficulty ; and (c) in others they can't control it at all. It is very difficult to control here. They have not been successful so far. We are trying it still. Not all the known methods have been used because some would not work here ; *e.g.* lead plugging would not do because of soft nature of ground. It is sandy and clayey. There have been only two wells in Trinidad that I know of in which it has been successfully shut off with result of a commercially productive oil afterwards. Sometimes we shut it off for a time or part of the flow is stopped that * we get an oil production. Only in two cases has the success been complete and permanent. I have looked up the records of the Defendants as to salt water. Money has been spent—a considerable quantity to stop the salt water ; about $8,000 to $8,381. Sheet of figures put in—G.A.M.3.

* *sic.*

For our own sake we want to stop it. It is ordinarily a detrimental feature to the field. It is a heavy oil here. In several wells the salt water has gushed or after cementing has continued to flow. Most of the proposed methods of prevention mentioned in Court don't look very promising to me.

Q. Sand comes up ?—A. Yes.

Q. Mountains of it?—A. Yes. The sand is not so bad because they will separate: but the greasy mud is difficult to separate. Also the muddy oil.

Q. Quantity of oil escaping from Defendants' ravine: 100,000 barrels in 8 to 9 months—it has been suggested?—A. I have figured and would estimate it at about 2,000 altogether—coming down Defendants' ravine into Vance River. I have been here at the production of most of the fields. I estimated 2,000 barrels since No. 2 started in September 1912 and that covers not only No. 2 but all the wells.

Q. Average daily escape is what?—A. There is no flow. Every few days the bleeders (or sluice valves) are opened according to the amount of rainfall necessary to drain. It will average about two barrels a day. In a wet season it may possibly be more because of rains washing off the loose asphaltic oils from the sides of the ravine. Maximum I have observed is 10 barrels a day after a pretty good shower. When they bleed the tank, it may be at the rate of 100 barrels a day; but only for a fraction of an hour, That is when they open the valves to prevent oil washing over top of dam owing to accumulation of water.

I don't see how 120,000 barrels could ever go down. It would represent 20% of the whole oil production of the field—or 25% of what has been obtained. I visited Plaintiff's refinery in October 1914. The vicinity was dirty with oil escaping. Some had washed back into Vance River. Oil escaping from the refinery works ran down into Vance River. There was a ditch in which it could be seen oozing down. At East end of refinery building there was a ditch running alongside of a concrete tank—better call it a concrete structure—into the river. Suction pipe to boiler was a swing pipe put down into a pool of water in the Vance River. The escape of oil was about 10 yards below the pipe. The suction was up stream. The waste went into the same river. I know where the tidal water is. It was going in that direction. I visited the refinery recently—last month. Yesterday and once or twice during March. I know Parry Lands—and visited them—and Plaintiff's well—and Defendants' wells—and Defendants' ravine—and Plaintiff's ravine. In March I went up Vance River from tidal river to Plaintiff's wells to the Plaintiff's ravine and up it to Plaintiff's wells. There was some water flowing down Vance River from Plaintiff's and Defendants' ravines to tide water.

To the Court:

There was a scum of oil. Not all the way. Streaks of oil.

To Agostini K.C.:

Yesterday there was not 5000 barrels a day coming into Vance River from Defendants' ravine. There was none coming in from any other source. None from Plaintiff's ravine. I followed down Vance River from Parry lands to the Plaintiff's and Defendants' ravines. They come in very close to each other, within sight of each other. Parry Lands are on Lot 2 and above Plaintiff's wells—Parry Lands are South of Plaintiff's well.

Q. Would water from Parry Lands come through Plaintiff's ravine ?— A. Some would, and some would not. Some would go out other branches of the Vance River. All the Parry Lands in the vicinity of Plaintiff's well and Parry Lands (*i.e.* B.W.I.P.) would go into Vance River source through Plaintiff's ravine and some not. The tributaries from Parry's land—all of them, have no water flowing—only stagnant pools. The B.W.I.P. have been short of water. I saw where they had dug ditches to connect the pools of stagnant water to make them drain into one pool where they had a pumping station. These drains were made both above and below the pumping station by some of the water being brought up stream again to their pool. There is water in some of the pools which have not been completely drained. There is no flowing water in the ditches. If there is a shower they will prevent the water stagnating. The B.W.I.P. had stopped for want of water when I was there yesterday. When I was there a few days ago they were just getting ready to stop. There is no flow in the Vance River from any sources above tidal water except from Defendants' ravine. The water in it comes from the workings. The Defendants get their water by pipe from Vessigny dam, and there is the escape of salt water from the wells. The Plaintiff has not been working his refinery for some time. His wells were working yesterday. He has his own dams to collect water for his working. At his refinery there is a pool and I attribute the water in it partly to water from Defendants' workings and partly to water accumulated during last rains. In my opinion if we were working that refinery, there is not enough water there to carry on considerable operations for any length of time, barring the water from Defendants' workings. There is no dam by his refinery, but a chunk of rock which makes a natural dam : an outcropping of the sands which forms a natural pool behind it.

I have had experience of California. They use salt water from borings both for drilling and boiler purposes. It is even bought and sold for boiler purposes. I have no special knowledge of boilers, only what I have observed there and in my general experience.

Cross-examination :

Cross-examination.

You can call it choice because in some Companies *e.g.* North American Oil Consolidated, they had pipe connections for fresh water purchased for domestic purposes and sometimes for boiler purposes ; but they used the salt water from borings for drilling and for boilers. In one instance, one well they could not get enough salt water therefore put in a compressed air pipe and so got more salt water. In that case the salt water was not purchased. In others it was purchased. They had to buy it. They had a choice, but the waters were not at the same price. At same cost fresh water is what any one would choose. But the salt water was not injurious in any way to the boilers. It is a question of the relative cost of salt water and the expense of evaporating either water. Blowing off means blowing off hot water and so represents fuel consumed. The question is whether the Company can buy that salt water cheap enough to balance the cost of fuel. I know the Vance River along its length. There are no springs feeding

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 27. Cross-examination of George Alexander Macready, 1st April, 1915 —*continued.*

it at all above tide water and none feeding any of its tributaries. All the streams are fed by surface water which is sometimes retarded for weeks by the soil and vegetation. There are many tributaries.

To the Court:

Q. How many?—A. It is simply a ramification of branches. The map shows them. Branches every 5 feet. It depends on whether it flows round a tree or not.

Cross-examined:

The map shows only the main branches—or gullies. Defendants' ravine has a course cut by action of flowing of water. The bulk of the cutting occurs during torrential floods (shown C.C.S.3.)

Q. This compiled by you from Veitch's Map?—A. Yes, it is a compilation by me from a number of maps in possession of Defendants. The scale is one in 2000—190 feet to the inch. The scale is marked here.

Q. River in March: for twenty months refinery was worked?—A. I don't know. He could not do it this dry season. Last season he would be pretty skimp of water towards end of it but might skim through. I could not say. I don't know the capacity he was working at.

Q. That boiler normally consumes about 40 gallons an hour, or 1000 gallons a day. At that rate could he carry on through the dry season?—A. This dry season. I don't think he could. Last dry season. I can't say.

Q. Would he be short now?—A. It would not be much longer. He would pump that poor little pool dry.

The U.B.W.I.P. have been pumping right out of the Vance River itself. They have been draining it till last week. They were pumping about a week after they drained the Vance River into these ditches. They ditched the river itself. I did not see any ditches in the ravines. I did not go into the ravines.

Q. What is condition of Vance River above where Plaintiff's ravine?—A. Yesterday there were pools of stagnant water smelling badly. I went from Parry Lands pumping station clean down to Plaintiff's ravine. I went into several of the branch ravines also. Parry people's pump is above Plaintiff's ravine. It may be a mile up. Above the Parry people's place there are stagnant pools drained by ditches. The flow from them has been stopped for . . . they are stopped now. The flow till recently has been decreased. They have been obliged to go slowly in their operations, to curtail them gradually. A month ago two wells were idle *i.e.* only flowing naturally, flowing oil. The other one was drilling. A fourth well had been abandoned a month ago. A certain amount of pollution is inevitable.

Q. Partly from leakage of pipes, from collection of oil in earthern sumps?—A. In the escape, not the collection.

Q. I mean that, and also to a certain amount of oil coming up by the wells?—A. It all comes up. If it is not stopped or trapped it will get down. Sometimes we stop it in sumps but it escapes during the bleeding of sumps and storage tanks.

Q. Any other way?—A. I can't at present think of any. Of course there are accidents, and the complete flooding away of oil. Some oil has escaped us but not recently, *i.e.* a wash-over due to rain. Last rainy season there were one or two but no large escapes. None since the present controlling dam was put into its present shape.

Q. That was done when?—A. Some time in latter part of last year.

Q. The lip of your main dam is coated with oil?—A. No, not from any flood over. The tread-way is not. There is some oil on banks up to top of dam and in sand which made the dam. I don't think there is any on the foot path. If there is, it is due to oil in the sand and to people walking on it with dirty feet. We are still trying to stop salt water. We have a crew at present trying to cement off a well. I can't speak confidently as to the result. In some it has been a success and in some a failure. It is a very difficult operation.

Q. When did you first start to cement your wells?—A. In May or April 1914. I compiled some figures which have been put in. They include labour, cement, power, cartage and other materials used in shutting off water, which requires other features than the mere putting of the cement in the well.

Q. Shown G.A.M.3. Can you tell me from this when you started cementing, roughly?—A. May 1st 1914—No. 6 well.

Q. Are there no earlier dates?—A. No, these are of trying out or testing wells to see if they were giving out water. There are 5 wells which we have cemented with various degrees of success. My estimate of amount of pollution is based on frequent observation. I am not there every day—but frequently I have access to all the information and all the men employed there.

Q. It is part of your duty to observe the flow from sumps during bleeding?—A. No, but I am there and watch it. My duty is in connection with drilling wells in particular. Also those giving salt water and those which don't produce enough oil. October 1914 at Defendants' refinery I saw evidence of common salt in a 5 gallon can and some stuck on outside of boiler.

To the Court:

Not over whole round of boiler. Like what would spatter out from leaks.

Q. In California did you ever see salt stuck on outside like that?—A. No. I can't recall any instances. They keep their boilers clean there. There is some round the blow-offs there in California and sometimes round a manhole or handhole.

Cross-examined:

In California they use boiler compounds in some fields—but not for salt water. No I can't recall if they do or not. I am under impression that they have tried them for salt in water. I don't know why. For the salt they rely on blowing off. I don't remember the quantity of salt in the water

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 27. Cross-examination of George Alexander Macready, 1st April, 1915 —*continued.*

there in California. I have seen analysis. The taste was similar to the water here. I have visited Plaintiff's wells—I guess 20 times and over. All along in the last year most of my visits.

Vessigny watershed: there are no springs in the upper part; in none of the tributaries above tide water. Defendants collect water there in a dam. I cannot recall the quantity.

Q. 25 to 37 million gallons?—A. I can't recall now. It is a considerable quantity.

Q. The various Companies together take 120 gallons a day?—A. I can't recall the figure. It is all rain water collected behind the dam. The Vessigny has a great many ramifications. They all converge together.

Re-examined:

They only feed when it is wet, during wet season or immediately after. I don't superintend the bleeding of sumps; but watched. I have to measure production from wells, of oil, and amount of salt water. I have an intimate knowledge of measure oil and other liquids.

To the Court:

I make a mental estimate almost every time I look at them.

Re-examination.

Re-examination:

The main dam was enlarged, some time last year I believe it was. I am not sure of the date. 22 wells have been drilled in Vance River watershed, at various dates. The field is always changing. If Defendants shut down there would be no water at all flowing in the Vance River.

To the Court:

Since 1911 I have been here—not continuously. I visited Vance River in 1911 about October. In 1912 I don't recall if I was there in dry season. September 1913 the first production came.

Q. Were you there in dry season of 1913?—A. I don't recall it.

Q. Did you ever see Vance River so dry as to be without a flow in it?—A. At main Southern never. Higher up, yes. I have seen it close to and above Plaintiff's ravine, without a flow, the water simply standing in pools.

To Agostini K.C.:

It may have been dry, but I have not seen it dry. Ramifications have water only during or shortly after rains. I have called them rivers sometimes when there is water in them. It depends on the state they are in.

## No. 28.

## Examination of James Inglis.

Engineer—Allenghen Technical School. Apprenticed as Marine and General Engineer Shop foreman Rogers & Co. Foreman—Inspector of castings, forgings and boilers. Chief Engineer in Trinidad Shipping and Trading Company for nearly 7 years—in charge of all the plant in Trinidad. I have over 20 years' acquaintance with marine and all kinds of boilers. I have seen salt water used in boilers. Water in boilers is a most important question. There are impurities in all except distilled water. Even distilled water will corrode a boiler under certain circumstances. Any boiler will deteriorate if not looked after, no matter how good the water is. With bad water you have corrosion *i.e.* eating away of metal or incrustation *i.e.* deposit of scale.

Shown P.—I would say this is ordinary rust.

Shown paper:—Collens analysis A.E.C.4.

| | |
|---|---|
| 14.40 | Iron |
| 23.26 | Ferrous oxide |
| 43.64 | Ferric oxide |
| 83.30 | |

All these make up what you call rust, and therefore 83.30% of the incrustation consists of rust. Insol. silic 8.25—that is mud sand. Calc. carb—that is common lime.

Mag. Carbonate is present very often in boiler water and it and the common lime form the common scale—calcium salt and magnesium.

Sodium carbonate is used as a boiler preservative. It is added to throw down the lime salts. A boiler tube containing water in that state, I would say it had not been cleaned for a long time, judging from the thickness of the scale. That scale would not damage the boiler but show it had been damaged. It is the direct result of corrosion. It is not a boiler scale produced by deposit of salt or lime or magnesium. It is purely and simply the iron has been rusted. It should be prevented by careful treatment of the boiler. Salt has had nothing to do with this.

Shown J.W.T. 1 & X:

Q. Those two are the same and are from outside of a boiler fed with water containing sodium chloride and sodium carbonate as in analysis before you. Would you say any harm had been done to the inside of the boiler by salt?—A. Not necessarily. The rust inside is what has damaged the boiler, rather than this salt outside. Shown A.E.C. 3—Total solids—·432 Sod. Chl. ·255—Sod. Carb. ·098. There is barely half an ounce of common salt in the gallon of water.

Q. Shrewsbury estimate was about $\frac{3}{4}$ oz. per gallon?—A. Total salts are just about that.

Q. Is either proportion harmful to a boiler?—A. It could only cause a slight corrosion which would easily be corrected. I would not call it very impure. It might cause harm, but not if properly looked after. It would require slightly more looking after, than a purer natural water.

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 28. Examination of James Inglis, 1st April, 1915 —*continued.*

Q. Does Sod. Chl. or Sod. Carb. cause a scale?—A. Neither till they reach saturation. Then they will crystallise out of the water. Sod. Chl. saturates at about 32 to 36 ounces to the gallon *i.e.* it would deposit very rapidly then. ½ ounce per gallon is nothing. Marine Engineers consider it safe to allow the density to go up to 7 and ½ ozs. before lowering their density; and never let it get more than 10 ounces to the gallon. This salt would be no harm till the density got too great—to 7 and ½ or even away above that. There is no reason why it should ever be allowed to get a density of 10.

Salinometer tells density of all salts—not of only one. The salinometer used by engineers away gives accurate readings at 200° Fahrenheit *i.e.* you must draw the water out from boiler as far as possible. It is of use with cold water because you can correct the reading. Every 10° lower temperature gives a reading of ¾ ozs. more solid matter than there should be. It is about ¾ oz. roughly.

To the Court:

To get, deduct 8 from the total number of ounces taking water at 86% as ordinary temperature here. That is true for sea water. It is true for every water, but the amount to be deducted varies.

To Agostini K.C.:

It is supposed to be used on water fresh from boiler. There is a blow-off cock. I did not say there should be no corrosion—but if it did not get about 7 & ½ to 10 there would be no incrustation. X. & J.W.T. 1—is the ordinary deposit from leaking gland or seam. You get a similar deposit with the Port of Spain Town supply from main, not from the gulf. Not the same but similar. There would be no common salt in it, but calcium carb. and calcium sulph. The boiling water has leaked out and the water evaporated and this formed.

In a water containing lime they use sodium carbonate to deposit the lime. Salt won't deposit at a density of 10 ounces. It won't do any harm, it does not get beyond, but it ought not to be let come even to that point. You should blow out and add fresh water.

Q. Priming: a trace of soap?—A. If there was oil in the water the sodium carb. might combine with it and form soap. That has nothing to do with the common salt. With that quantity of salt and no blowing off, it would take 24 hours before the salt rose to 10 ounces in the gallon. Salt in these quantities is not difficult to counteract. I have experience of gulf of Paria water. I have charge of oil barges. They are affected by the Gulf water very seriously and require particular attention. I have gone into the question. In ordinary sea water we paint a barge only once here*; here every 4—5 months because of the corrosion. We surmise it—the organic acid that comes out of the swamps. We don't know for certain. Nobody attributed it to the salt in the water of the Gulf. We attribute it to the other impurities.

* *Sic.*

Q. We are told Fire Brigade water had to stop in a few hours. Was it wise to put the Gulf water in boiler?—A. It depends on where they took it. If outside the Custom House, it should never have been done, unless it was a case of necessity. It might be partially due to sodium chloride. A boiler of that class has to raise steam very rapidly. It contains practically no water and therefore the increase in density is very rapid. Its tubes are commonly made of brass or copper—which are much more liable to burn out. The corrosion would not affect them. Box "P" contains no chloride of sodium.

Q. Could it have been washed out from the rust?—A. It is possible, but not probable. If it had been so the carbonate of sodium would equally have been washed out—which it is not. While there is more sod. chl. than sod. carb. in the water. At home I often examine steamers' boilers, not very often here. Incrustation like J.W.T. 1. is practically always found in boilers here and at home where there is a leaky joint. It is outside, not inside.

To the Court:

It is so even with most fresh waters, though not to the extent it is in this box. It would never be allowed to get to the size of these lumps before it was knocked off. With a steamer running for three months on end it would be even bigger than those because while steamer was running they could do nothing to it. They could knock it off, but not sort what was causing it. The time a lump like this would take to form would all depend on density of water in boiler *i.e.* density to which it was allowed to rise, and to size of the leak. It would take about three weeks as a good mean. If the water were allowed to get very dense it would do it in a day or a couple of days.

Cross-examination:

Cross-examination.

Q. Shown H.S. 1. Analyses A and D, compare them. Which is the better boiler water?—A. A is the better. Trouble in water is not the quantity of solid in it, but the quantity that will remain when brought to boiling point and deposit on the shell. Most boiler waters contain 2 or 3 salts which will form scale.

Q. Why is A better than D?—A. Because a boiler fed with A will require less looking after. D will need more blowing off than A.

Q. Why?—A. Because the soluble salts in it will reach their maximum density quicker.

Q. There is 12 times as much soluble salts in D as in A?—A. I will take the chemist's word for it. Whether sod. chloride corrodes a boiler is a debated point. If it does so, it is to a very slight degree. The stronger the solution of salt becomes, the less it will corrode. I speak only of common salt.

To the Court:

A very slight proportion of salt caused corrosion and with an increase of that proportion in the salt the corrosion increases up to a certain point after which it diminishes. That point is about 12 ounces.

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 28. Cross-examination of James Inglis, 1st April, 1915 —*continued.*

Cross-examined :

I know that both from books and observation. Common salt corrodes brass. There is no doubt about that. It would corrode brass fittings to a certain extent—more appreciable than in iron.

Q. Collens thought it had no action on iron. You think it has ?—A. A slight action. It all depends on the strength of the solution. Distilled water will corrode iron. In manufacturing salt the evaporating pans are made of iron and they put strong brine just because if it were weak it might corrode. I don't say it would, but it might corrode. That is my principal reason for saying so. Siebal speaking of salt in iron tank and dealing with question of . . . paper with passage put in by consent. "R" for identification by consent. Both to be put in before argument.

NaCl=Sodium Chloride.

CaCl=Calcium Chloride.

Chemists don't know how soda counteracts the sodium, but it is so. This shows the action of the sodium chloride must be very slight. The chief water we use with common salt is sea water. The percentage of common salt there is very high. 25 parts common salt and 1/10 part of calcium sulphate. Yet marine engineers find their difficulty in getting rid of the calcium sulphate, not of the common salt. On analysis of scale in marine boilers although there is 25 parts common salt to 1/6 part of the sulphate (*i.e.* 1 : 250)—in sea water, yet the scale shows from 81 to 85% of calcium sulphate. All marine engineer books don't mention the action of the salt is so slight and how to counteract it. I don't say action of common salt is very slight on brass fittings. It depends on the quality of the brass. In some brass boiler mountings I have seen the salt water not affect it at all and in others fairly heavy. Partly due to negligence, not wholly. It all depends on where the corrosion is.

To the Court :

It may be in the valve and the inside of the mounting when not due to negligence. It may be the wearing away of the flange or the gland in which case it is likely to be negligence.

Cross-examined :

Only knowledge that every engineer should have is necessary to prevent the corrosive effects of any water in the boiler.

To the Court :

No special knowledge would be needed to prevent injury by salt water—only such as every engineer should have.

Cross-examined :

Q. There is more common salt in D than in D water ?*—A. No, there is only 1/6 of the common salt that there is in sea water. H.S. 1. shows 455.8 parts of common salt in the 100,000. In sea water I think there is

*sic.

only 251=2,510 parts per 100,000. So D contains only about 1/6 of the amount of common salt which sea water contains. Average sea water contains 2.51% of common salt=2150 to the 100,000.

Blowing off: you would need more with D than with A. With A perhaps once a week. With D every 5 to 6 hours. It is to prevent the density becoming too great. P is due to corrosion to begin with but the scale is not. It is the after effect of corrosion.

Q. There were traces of salt in P?—A. That would happen in any case. If there is scale at all, it absorbs a certain amount of the water in the boiler before the boiler is empty.

To the Court:

It would happen with any water containing salt. It would contain a trace of any element in the order, *e.g.* lime. Corrective measures are various: blowing down is the most important. Then the water must be kept slightly alkaline. That is done by litmus paper test. If it shows acid you add a little caustic soda. Hanging zinc plates to counteract any electric action. You can't test the density without a salinometer. Leaks when started in boiler and mountings should be attended to at once; otherwise a very small leak will get large at once and cause bar corrosion where otherwise there would be none. A boiler must be thoroughly scraped clean every fortnight when it is new to see no corrosion is starting and if it is it must be checked at once. I am referring to any boiler and any water.

Q. With D more frequent cleaning out would be required than with A? —A. About twice as often, not more. No special means are used in marine boilers except the blow off cocks. Also evaporation to eliminate all salts—including common salt, but what they bother about is the lime sulphate.

Re-examination:

Re-examination.

Even with A looking after would be needed. A has impurities. D has only one impurity which A has not, viz. sodium carbonate which is used as a boiler preservative.

Q. A has most of the things in P?—A. No, those in P are mostly oxides of iron due to oxidation, *i.e.* rust due to neglect of the boiler.

Question repeated:

A. The elements are all in A except the sodium carbonate.

To the Court

D has much more common salt than A. D has one impurity, viz. common salt in a much larger degree than A. I understand common salt as an impurity.

P is just as light to form given negligence with A as with D. All boilers need attention and proper cleaning out and examination. Without attention a boiler will go off with the best of water. The fact of the boiler leaking so badly as to show so much salt outside shows neglect in itself.

RECORD.

*In the Supreme Court.*

Defendants' Evidence.

No. 28. Re-examination of James Inglis, 1st April, 1915 —*continued.*

To the Court:

Even making an allowance for the impurity of D—Because* are the most prolific source of boilers and should be always attended to at once.

Q. Given a competent engineer and proper care would it be possible to work the boiler with D without its getting into that state?—A. It depends on the boiler because I don't know if it is capable of being so built that it can be properly cleaned and examined. Many are so built that they cannot be so.

Q. But assuming that it was so built that it could be so cleaned. Could it be worked in D without getting into that state?—A. Yes.

Q. This incrustation was not an inevitable thing even with D?—A. No.

*Sic.

No. 29. Examination of Frederick Thompson Bruce, 1st April, 1915.

## No. 29.

## Examination of Frederick Thompson Bruce.

Engineer in charge of Government Floating Dock and Workshop. I served as a marine engineer and hold an extra first class Board of Trade Certificate as a marine engineer. I have had 13 years' experience of boilers. I have seen sea water used in boilers. I have heard Inglis' evidence and agree with him. Sodium chloride has very little corrosive effect on boiler plates and even less so when it becomes a nearly saturated solution.

Q. If it is allowed to get so dense as to deposit common salt on the plates inside what effect would it have on plates outside?—A. The saturated solution of salt would crystallise out and locate itself on some plate where the circulation was weakest and the heat would not be conducted from the plate and the plate may get red-hot with effect that gases may be formed between the deposit and the plate and burst away the scale that is formed—unless the plate got red-hot sufficient to give way itself.

To the Court:

The crystallisation in itself would be a sign of negligence even with such a water as D.

To Mr. Wilson:

Q. Any one who knew how to attend to a boiler, though not an engineer, would not let that occur?—A. He would not allow it.

To the Court:

But an ignorant attendant might do so.

To Mr. Wilson:

I can hardly imagine it out of malice—but it might be by neglect. A density of 7 to 10 is quite safe. You should not go above 10 unless at sea where there is no fresh water available.

To the Court:

You could reduce the density otherwise, viz., by introducing sea water, but in so doing you would get more sulphate of lime which is objectionable. Very few steamers use sea water nowadays. I had in mind a tramp steamer where little fresh water was available and leaks from piston rods had to be made up for with salt water.

To Mr. Wilson:

Half an ounce or three quarters of an ounce of common salt is quite safe and should do no injury. Deposit of salt outside is result of a badly fitting manhole or a faulty joint—or badly made cocks—or faulty packing of same.

Q. With proper attention such deposits as these should accumulate?—A. Only from cocks and valves which are being worked. You can't stop it with cocks that are being worked. When the boilers are being cleaned, the cocks can be rectified.

To the Court:

You can stop the boiler and put the cocks and valves right. All boilers if not properly attended to will go bad. It depends on what water they are using. It will go bad with pure distilled water if not properly attended to.

To Mr. Wilson:

It would take much longer to go bad with A than with D. Still it would want care even with A.

It would not require such care with A but it would require care or you would get the thin end of the wedge in and the boiler would gradually go worse.

Shown analysis of P.

Q. Compare that with A. Would you that* scale from A? As the result of neglect?—A. It is quite possible because the principal ingredient is rust, the others are very small indeed. It is not due to common salt.

*Sic.

Cross-examination by O'Reilly:

Cross-examination.

I heard your questions to Inglis and I agree with his answers. The other solids other than salt are in much larger quantity in D than in A. Common salt corrodes brass fittings slightly. More than iron. If there is any salt at all in the boiler you expect these deposits of salt outside through badly fitting manholes etc. The construction of boiler may not be bad, but fitting of door may be bad. Using this quantity of salt in D I don't see how it would effect the leak of the cocks. It is due to the leaks of the cocks that the salt comes through. It would have a more harmful effect on the boiler than pure water. A is better than D as a salt water.

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DEFENDANTS' CASE CLOSED.

RECORD.

*In the Supreme Court.*

No. 30. Certificate of Judge's Clerk 11th April, 1916.

## No. 30.

## Certificate of Judge's Clerk as to correctness of Notes of Evidence.

(Not Printed.)

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Exhibits.

No. 31. Exhibit C.C.S. 1. Conveyance between J. C. Benlisa and C. C. Stollmeyer, 16th March, 1905.

## No. 31.

## Exhibit C.C.S. 1.

Stamp Duty £15. 15. 0. Regr. fee £1.

Trinidad. No. 874.

This Deed made the Sixteenth day of March in the year of Our Lord one thousand nine hundred and five Between Joshua Charles Benlisa of the Town of Port of Spain in the Island of Trinidad Merchant of the one part and Charles Conrad Stollmeyer of the said Town of Port of Spain also Merchant of the other part Whereas the said Joshua Charles Benlisa is seised in fee simple of the hereditaments intended to be hereby conveyed and he has agreed to sell the same to the said Charles Conrad Stollmeyer at the price of Twenty thousand dollars now this Deed witnesseth that in consideration of the sum of Twenty thousand dollars to the said Joshua Charles Benlisa paid by the said Charles Conrad Stollmeyer on or before the execution of these presents (the receipt whereof the said Joshua Charles Benlisa hereby acknowledges) The said Joshua Charles Benlisa as beneficial owner hereby conveys unto the said Charles Conrad Stollmeyer All and Singular that certain parcel of land or plantation called "Perseverance" situate in the Ward of Guapo in the Island of Trinidad comprising Eight hundred and Ninety-four acres one rood and thirty-six perches (be the same more or less) and abutting on the North partly upon the sea partly upon land of Jean Postillion partly upon land of George Townsend Fenwick and partly upon Crown land formerly the L'Esperance Estate on the South partly upon Crown land partly upon land of Alexander Victor partly upon land of Aumaitre partly land of Remey Philojion and partly upon land of Charles Richard on the East partly upon Crown land partly upon land of the said George Townsend Fenwick partly upon land of Jean Postillion and partly upon land of Mrs. Raynales and on the West partly upon Crown land partly upon land of Alexander Victor partly upon land of Aumaitre partly upon land of Remey Philojion partly upon land of Charles Richard and partly upon the Sea or howsoever otherwise the same may be butted or bounded known situated designated or described To hold the same unto and to the use

of the said Charles Conrad Stollmeyer in fee simple In Witness whereof the said parties hereto have hereunto set their hands the day and year first herein above written.

This Deed was prepared by me.

LOUIS WHARTON, Barrister-at-Law.

Signed and delivered by the within named Joshua Charles Benlisa in the presence of } J. C. BENLISA.

WM. H. DEWHURST of 11 Cipriani Boulevard of Port of Spain, Clerk to Mr. Louis Wharton, Barrister-at-Law.

And of me

LOUIS WHARTON, Barrister-at-Law.

(Certificate of William H. Dewhurst, Clerk, together with Certificate of registration attached.)

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**No. 32.**



**Exhibit C.C.S. 2.**

Plan by Geo. A. Macready. 1914.

(See No. 1, Book of Plans and Sketches.)

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**No. 33.**



**Exhibit C.C.S. 3.**

Plan by Geo. A. Macready showing Vance River Tributaries. 26th December 1914.

(See No. 2, Book of Plans and Sketches.)

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**No. 34.**



**Exhibit C.C.S. 4.**

Plan by Geo. A. Macready. 4th June 1914.

(See No. 3, Book of Plans and Sketches.)

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RECORD.

*In the Supreme Court.*

Exhibits.

No. 35. Exhibit Y (a). Letter from C. C. Stollmeyer to The Petroleum Development Co., Ltd., 23rd March, 1914.

## No. 35.

### Exhibit Y (a).

To the Manager, 23rd March 1914.
The Petroleum Development Co., Ltd.
Dear Sir,

I would like to call your attention to the interference by your Company to the right of the unrestricted flow of the water from the ravines which supply the Vance River, as this tends considerably to depreciate the value of my property by diminishing the flow of water through it. I hope you will see your way to remove the dams without unnecessary delay.

I remain, etc.,
Sd./ CHAS. C. STOLLMEYER.

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No. 36. Exhibit C.C.S. 5. Letter from W. D. Fowler to C. C. Stollmeyer, 30th March, 1914.

## No. 36.

### Exhibit C.C.S. 5.

THE PETROLEUM DEVELOPMENT COMPANY, LIMITED, BRIGHTON, TRINIDAD. B.W.I.

March 30, 1914.

Charles C. Stollmeyer Esq., Port of Spain.
Dear SIR,

I hereby beg to acknowledge your letter of the 23rd instant, in which you call the attention of the Petroleum Development Company, Limited, to the possibility of your land being depreciated in value by the diminution in volume of the flow of the Vance River, caused, as you say, by the construction by the Petroleum Development Company of a small dam in one of the water courses which drain into the Vance River. I have turned your letter over to Mr. Edgar Agostini and have asked him to take the matter up with you in Port of Spain.

Yours very truly,
THE PETROLEUM DEVELOPMENT CO., LTD.,
W. D. FOWLER, Manager.

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No. 37. Exhibit C.C.S. 6. Letter from E. Agostini to C. C. Stollmeyer, 6th April, 1914.

## No. 37.

### Exhibit C.C.S. 6.

THE PETROLEUM DEVELOPMENT COMPANY, LIMITED, PORT OF SPAIN, TRINIDAD, B.W.I.

Chambers, St. Vincent Street,
Port of Spain, 6th April 1914.

Chas. C. Stollmeyer Esq., Port of Spain.
Dear Sir,

The Manager of the Petroleum Development Co. Ltd. has sent me for reply on his behalf your letter of 23rd March calling his attention to the

alleged interference by the Company with the unrestricted flow of water from a ravine which you allege supplies the Vance River.

From information obtained from the Manager I understand that no water has been in this ravine for over a month nor is there any intention of interfering at any time with such flow of water as may be therein in the future, and it is therefore not easy to see in these circumstances how the value of your property can be depreciated.

The Company cannot admit your claim to the "unrestricted flow of water from all ravines" whether dry or not, which might or might not supply the Vance River with water.

I remain, etc.,

EDGAR AGOSTINI,
for T'dad Development Co., Ltd.

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## No. 38.

## Exhibit Y (b).

15th April 1914.

Edgar Agostini Esq.,

Acting for the T'dad Petroleum Development Co., Ltd.

Dear Sir,

I regret that your Company has not taken seriously the complaint made in my letter of the 23rd March last, for it seems idle for their Manager to instruct you to write on their behalf that there is no intention of interfering at any time with such flow of water as may be in the ravine in future, when as a fact there is already a dam cutting off the head waters of one of the ravines supplying the Vance River.

You will permit me to observe that further reference to my letter will show that I have not asked the Company to admit any claim on my part to the unrestricted flow of water from all ravines, whether dry or not, which might or might not supply the Vance River with water.

I have given your Company fair warning that any interference on their part with my rights to the water of the ravines will not be allowed, and if they wish to treat such warning as a joke, as you appear to do, that is their affair.

I remain, etc.,

Sd./ CH. C. STOLLMEYER.

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RECORD

*In the Supreme Court.*

Exhibits.

No. 39. Exhibit Y (c). Letter from C. L. David to The Petroleum Development Co., Ltd., 21st May, 1914.

## No. 39.

## Exhibit Y (c).

No. 32 St. Vincent Street,
Port of Spain, Trinidad.
21st May 1914.

Messrs. The Petroleum Development Company, Limited, Brighton.
La Brea.

Sirs,

Mr. C. C. Stollmeyer the owner of the Perseverance Estate at Guapo has called my attention to the serious inconvenience and loss sustained by him and his workmen owing to the discharge from your oil wells of a considerable quantity of salt water and oil into the Vance River. Water from the River hitherto used in his boilers is no longer available for the purpose owing to the heavy sediment of salt which is left in them when the salt water is used in consequence of which his refinery for distilling petrol and the works at his intermediate pumping station have had to be stopped as otherwise his boilers would all have been ruined. Furthermore his labourers and workmen can no longer use the water for domestic purposes which they did before.

I shall be glad if you will give this matter serious attention as unless immediate steps are taken by you to compensate my client for the damage estimated at £15.0.0 a day already and now being done and to put an end to this pollution of the River and the consequent inconvenience and damage to my client my instructions are to commence an action for damages and an injunction to restrain you from continuing this nuisance.

I am desired to call your attention to the continued interference with the flow of water from one of the ravines feeding the Vance River by the dams erected across such Ravine and to ask for its immediate removal.

I remain, etc.,

CHAS. LEONIDAS DAVID.

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No. 40. Exhibit Y (d). Letter from P. de la Bastide to C. L. David, 8th June, 1914.

## No. 40.

## Exhibit Y (d).

8th June 1914.

Charles Leonidas David Esq.,
Port of Spain.

Dear Sir,

I am instructed by Mr. Fowler of The Petroleum Development Company Limited in answer to your letter of the 21st May last and in connection with an interview held by him with your client, to state that the discharge of salt water from the Company's well may have caused certain damage to Mr. Stollmeyer's boiler by a diminution of its steaming capacity for a short period.

No. 40. Exhibit Y(d). Letter from P. de la Bastide to C. L. David, 8th June, 1914 —*continued.*

As this damage is easily repairable my client has suggested to Mr. Stollmeyer that a reference to one or two engineers would determine the extent of damage done and I trust your client will accept this proposal. Meanwhile all salt water has been shut off from the wells and from the date of your letter there has been no further discharge into any ravine.

As regards any discharge of oil into the Vance River I am informed by my client that pollution (if any) of the Vance River has existed from the date of the discovery of oil on your client's own Perseverance property several years ago.

The concluding paragraph of your letter refers to a continued interruption of the flow of water from one of the ravines feeding the Vance River. Mr. Stollmeyer has already been informed that the ravine referred to has been dry continuously from the early part of the year and that no water has ever been taken from it nor has any flow of water been interfered with.

Yours faithfully,

PHILIPPE DE LA BASTIDE.

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## No. 41.

## Exhibit Y (e).

No. 41. Exhibit Y (e). Letter from C. L. David to The Petroleum Co., Ltd., 15th August, 1914.

No. 32 St. Vincent Street,
Port of Spain, Trinidad.

Messrs. The Petroleum Company Ltd. August 15th 1914.
Brighton. La Brea.

Sirs,

The inconvenience and damage complained of in my letter of the 21st May last and which you promised in your letter of the 8th June 1914 to put a stop to still continues to the great injury of my client's works. I must again call upon you to remedy the mischief which your works are causing, otherwise my client will have no alternative but to take the steps of which I notified you in my letter of the 21st May last.

Yours truly,

CHAS. LEONIDAS DAVID.

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## No. 42.

## Exhibit Y (f).

No. 42. Exhibit Y (f). Letter from P. de la Bastide to C. L. David, 21st August, 1914.

C. Leonidas David Esq. 21st August 1914.
Solicitor etc.

Dear Sir,

I am instructed by The Petroleum Development Company Limited to acknowledge the receipt of your letter of the 15th instant and to reply to the same.

Whilst disclaiming liability for any damage done to your client by proper and necessary operations for the exploiting and winning of petroleum oil from their lands my clients are taking every precaution possible to avoid injury to their neighbours.

RECORD.

*In the Supreme Court.*

Exhibits.

No. 42. Exhibit Y (f). Letter from P. de la Bastide to C. L. David, 21st August, 1914 —*continued.*

With a view to that end they have plugged one of the wells from which salt water issued and are treating the others similarly.

They are also following certain advice of the Mines Department which they hope will effect what is desired.

I would suggest that this matter be allowed to stand over until Mr. Edgar Agostini's return about the end of September.

I am, Yours faithfully,

PHILIPPE DE LA BASTIDE.

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No. 43. Exhibit H.D.F. 1.

## No. 43.

## Exhibit H.D.F. 1.

Sketch.

(See No. 4, Book of Plans and Sketches.)

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No. 44. Exhibit H.S. 1. Analyst's Certificate, 23rd March, 1915.

## No. 44.

## Exhibit H.S. 1.

Department of Agriculture,

Government Laboratory, Trinidad, B.W.I.

Registered No. 205—208 U.O. March 23, 1915.

Date Received 16. 3. 1915.

REPORT.

Samples of Water Received from C. C. Stollmeyer Esq.

| Sample. | A. | B. | C. | D. |
|---|---|---|---|---|
| Lab'y No. | 205 U.O. | 206 U.O. | 207 U.O. | 208 U.O. |
| Description. | Vance River above influence of ravine from development. | Water from Ravine flowing from C.C.S. dam about ¼ mile from same and about 300 yards to river. | Development ravine. | Pumping Station Feed Tank Water. |
| Reaction. | Neutral. | Neutral. | Alkaline. | Alkaline. |
| Taste. | Faintly saline. | Faintly saline. | Strongly salt. | Salt. |
| Parts per 100,000 of | | | | |
| Sodium Chloride .. .. | 7·2 | 5·8 | 670·0 | 455·8 |
| Organic matter .. .. | 9·0 | 23·0 | 106·0 | 63·0 |
| Sodium Carbonate .. | .. | .. | 29·7 | 6·4 |
| Potassium Chloride .. | 3·8 | 3·1 | 23·0 | 34·0 |
| Calcium Carbonate .. | 2·5 | 3·8 | 9·3 | 6·0 |
| Iron Oxide and Alumina | 1·5 | 3·0 | 7·0 | 8·5 |
| Sodium Sulphate .. | 1·4 | 6·7 | 0·4 | 0·9 |
| Magnesium Carbonate .. | 0·6 | 0·6 | 0·1 | 0·8 |
| Total Soluble Solids .. | 26·0 | 46·0 | 845·5 | 575·4 |

These figures indicate that water D contains at least 66 per cent. of Water C, or that at least 529 parts per 100,000 of soluble solids have been added to Water A. The solids added consist mainly of common salt and sodium carbonate and amount to at least 52 lbs. per 1000 gallons.

The amount of solids in A has been increased at least twelve times.

HERBERT S. SHREWSBURY H.C.F.C.S.
Principal Assistant Analyst.
for Gov't Analyst.

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## No. 45.



## Exhibit H.S. 2.

Department of Agriculture,
Government Laboratory, Trinidad, B.W.I.
March 23, 1915.

Registered No. 209 U.O.
Date received 16. 3. 1915.

Report

Sample of Mineral
Received from C. C. Stollmeyer Esq.

| | |
|---|---|
| Sodium Chloride .. .. .. .. .. | 71.3 |
| Sodium Carbonate .. .. .. .. .. | 13.6 |
| Organic Matter and traces of Oxides, carbonates, chlorides and sulphates of iron, aluminium, calcium and magnesium .. .. .. .. .. | 5.8 |
| Potassium chloride .. .. .. .. .. | 5.3 |
| Moisture .. .. .. .. .. .. .. | 4.0 |
| | 100.0 |

HERBERT S. SHREWSBURY H.C.F.C.S.
Principal Assistant Government Analyst
For Gov't Analyst.

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## No. 46.



## Exhibit Q.

Sketch of Water-tube Boiler.

(See No. 5, Book of Plans and Sketches.)

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RECORD.

*In the Supreme Court.*

Exhibits.

No. 47. Exhibit R.

## No. 47.

## Exhibit R.

Sketch of Dry-tube and Water-tube Boiler.

(See No. 6, Book of Plans and Sketches.)

No. 48. Exhibit A.E.C. 1. Analyst's Report, 6th March, 1915.

## No. 48.

## Exhibit A.E.C. 1.

Department of Agriculture,
Government Laboratory,
Trinidad, B.W.I.

March 6, 1915.

Registered No. 193 U.O.
Date received 3. 3. 1915.

Report

Sample of Water from Well 5. Lot 1, 2/28/15

(Sgd.) JNO. H. HELLER.

Received from W. D. Fowler Esq.

Results of Analysis.

| | | |
|---|---|---|
| Specific Gravity @ $\frac{80^\circ \text{ F.}}{80}$ | | 1045.00 |
| Free ammonia | | .01636 per cent. |
| *Total Solids | | 5.832 ,, ,, |
| *Containing | Sodium Chloride | 4.10 |
| | ,, Carbonate | 1.431 |
| | Calcium Oxide | 0.003 |
| | Magnesia | 0.024 |
| | Potash | heavy traces |
| | Sulphuric Anhydride | traces |
| | Phosphoric ,, | ,, |
| | Loss on ignition | 0.26 |
| | | 5.818 |

The sample is a natural alkaline and saline water, such as is usually found associated with deep borings and mud volcanoes in the Southern district. Such saline waters frequently occur in conjunction with petroleum deposits.

A. E. COLLINS F.C.S.
Acting Principal Assistant Analyst.

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RECORD.

*In the Supreme Court.*

Exhibits.

No. 49. Exhibit A.E.C. 2. Analyst's Report, 6th March, 1915.

## No. 49.

## Exhibit A.E.C. 2.

Department of Agriculture
Government Laboratory
Trinidad, B.W.I.

March 6, 1915.

Registered No 190—191

Date Received 3. 3. 1915.

REPORT.

Sample of Waters
Received from W. D. Fowler Esq.

| Lab'y No. | 190<br>Sample of water drawn from bottom of large sump near storage tanks at Lot 1<br>2/28/15<br>(Sgd.) JNO. H. HELLER. | 191<br>Sample of water drawn from bottom of tank 2, Lot 1.<br>2/28/15<br>(Sgd.) JNO. H. HELLER. |
|---|---|---|
| Specific Gravity $\frac{80° F.}{80}$ | 1034·80 | 1040·00 |
| Total Solids | 4·61 per cent. | 5·51 per cent. |
| Sodium Chloride | 3·16 „ =4·38 per cent. | 3·77 „ =5·04 per cent. |
| „ Carbonate | 1·22 per cent. | 1·27 per cent. |

A. E. COLLINS F.C.S.
Acting Princ. Asst. Government Analyst.

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RECORD.

*In the Supreme Court.*

Exhibits.

No. 50. Exhibit A.E.C. 3. Analyst's Report, 6th March, 1915.

## No. 50.

## Exhibit A.E.C. 3.

Department of Agriculture
Government Laboratory
Trinidad, B.W.I.
March 6, 1915.

Registered No. 189—192
Date Received 3. 3. 15.

REPORT.

Sample of Waters
Received from W. D. Fowler Esq.

| | Pool Water. Sample of water taken from pool in Vance River near Stollmeyer's refinery. Sample taken about 8" below surface of water. 2/28/15. (Sgd.) Jno. H. Heller. | Vance River. Sample taken in Vance River at a point about midway between the pool at Stollmeyer's refinery and bridge on Main Southern Road. 2/28/15. (Sgd.) Jno. H. Heller. |
|---|---|---|
| Lab'y No. | 189 | 192 |
| Specific Gravity @ $\frac{80°\ F.}{80}$ | 1003·06 | 1002·48 |
| Total Solids | 0·432 per cent. | 0·334 per cent. |
| Sodium Chloride | 0·255 | 0 214 |
| ,, Carbonate | 0·098 — ·353 per cent. | 0·09 — ·304 per cent. |

Both samples are slightly alkaline.

The analytical data indicate the presence of respectively 7 per cent. and $5\frac{1}{2}$ per cent. of the well water in these samples—the calculation being based on the assumption that the original water was in character a normal river water.

A. E. Collens F.C.S.
Acting Princ. Assistant Analyst.

## No. 51.

## Exhibit A.E.C. 4.

Department of Agriculture
Government Laboratory
Trinidad, B.W.I.

March 23, 1915.

Registered No. 213 U.O.
Date received 17. 3. 1915.

### Report.

Sample of Boiler tube scale—marked Exhibit "B"
Received from W. D. Fowler Esq. per P. de Labastide Esq.

The sample has the following composition :—

| | |
|---|---|
| Moisture | 0.65 |
| Organic Matter | 1.24 |
| Insoluble Silica and Silicates | 8.25 |
| Iron | 14.40 |
| Ferrous Oxide (FeO) | 23.26 |
| Ferric Oxide ($Fe_2O_3$) | 45.64 |
| Calcium Carbonate | 2.80 |
| Magnesium Carbonate | 1.68 |
| Sodium Carbonate | 0.25 |
| Alkalies (Chiefly soda) | 1.37 |
| Sulphuric Acid | trace |
| Phosphoric Acid | heavy traces |
| Undetermined and loss | 0.46 |
| | 100.00 |

A. E. Collens F.C.S.
Assistant Analyst.

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RECORD.

*In the Supreme Court.*

Exhibits.

No. 52. Exhibit G.A.M. 3. Estimate of Expenses, 1st March, 1915.

## No. 52.

## Exhibit G.A.M. 3.

Stollmeyer vs. Petroleum Development Co., Ltd.
Cost of shutting off salt water. Lot 1.

From the records of the Petroleum Development Company, Limited, I have prepared the following estimate of the expense which the Company has had in attempting to shut off salt water in the oil wells at Lot 1.

| | |
|---|---|
| Well No. 5 | $3,150.00 |
| Well No. 6 | $2,726.00 |
| Well No. 8 | $ 306.00 |
| Well No. 15 | $1,904.00 |
| Well No. 22 | $ 295.00 |
| Total | $8,381.00 |

.....
Geologist.

March 1st, 1915.
L.G.S.

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No. 53. Judgment of Russell J., 13th May, 1915.

## No. 53.

## Judgment of Mr. Justice Russell.

The Plaintiff is owner of the lands of "Perseverance," through which there flows what is known as the "Vance River," and his claim against the Defendants, who are occupiers of certain lands containing what are called ravines opening into it, is in substance as follows:—(1) damages for wrongful diversion, obstruction and pollution, (2) an injunction (a) from damming up the water so as to interrupt the natural and undiminished flow, (b) from discharging salt water and oil into the stream; (3) a mandatory injunction to remove their dams. There are three main grounds of complaint, therefore, to be considered: (i) diversion and obstruction (which may in this case be dealt with together); (ii) pollution by oil; (iii) pollution by salt water.

At the outset there is an important preliminary question, viz., whether the so-called Vance river is a watercourse in the legal sense, so as to confer on the Plaintiff the rights of a lower riparian owner. The main points relied upon on behalf of the Defendants in contending that it was not a watercourse were: (1) that it derives no supply of water from springs; (2) that it is a mere natural drain carrying off surface, *i.e.* newly fallen rain water; (3) that it has no permanent, or even approximately permanent flow of water. With regard to springs, I accept the evidence of Mr. Macready, the geologist, viz. that there were no springs of water at all, above tide water, feeding the

so-called river or any of its tributaries. (Certain seepages of oil of which he spoke are of course quite a distinct matter.) Mr. Macready seemed to me a truthful and careful witness, and on such a point as this his scientific training and the care with which he has applied himself to study the whole locality entitle his statement to respect. Even if it be true that the Plaintiff and Mr. Corneillac discovered a small spring near the top of a certain ravine, this would not in my opinion be a sufficient ground for holding that the river generally was fed by it or by other springs; but on the whole evidence I am more inclined to think that what these gentlemen discovered can hardly have been a spring in any strict sense of the term. With regard to the Vance River being a mere natural drain for surface water, this is bound to be true in a certain sense once it is settled that there are no springs: but a passage in Baron Alderson's judgment in Broadbent v. Ramsbotham at page 682 of 105 Rev. Rep. (p. 615 of the original report) was relied upon for the Plaintiff as showing that mere rain water once it collected itself together so as to form a stream acquires such a character that the owner of the land cannot appropriate it. That, however, is not what the learned judge said, nor yet, I think, was it what he meant. "No doubt," the passage runs, "all the water falling from heaven and shed upon the surface of a hill, *at "the foot of which a brook runs*, must by the natural force of gravity, find "its way to the bottom, and so into the brook; but this does not prevent "the owner of the land on which the water falls from dealing with it as "he may please and appropriating it. He cannot, it is true, do so if the "water has arrived at and is flowing in *some natural channel already formed.*" These words "at the foot of which a brook runs," and "some natural channel already formed," seem to me to explain one another and to have been inserted for a very intelligible purpose. Once rain water gets into the channel of an existing brook it cannot be separated from the other waters of the brook, but becomes part of the brook, so that all the rules with regard to riparian owners of the brook apply to it together with the rest of the water. But that is very different from saying that if mere rain water collects and forms a stream, it thereby, *ipso facto*, becomes a watercourse "entitled to protection" (to use an expression employed by Vice-Chancellor Sir John Stuart in Ennor v. Barwell), so that the rights of owners of lands through which that collection of rain water may flow must necessarily be regulated in the same manner as in the case of a spring-fed or otherwise permanent stream. A flow of water caused by a temporary inundation due to rains, for example: is that to be regarded as being jurally a stream? Clearly not: other elements are required, viz., a defined channel, and a more or less permanent character. What degree of permanency is requisite? I know of no definite and recognised criterion. Vice-Chancellor Stuart in Ennor v. Barwell expressed himself thus: "Springs and boggy ground are the ordinary sources of all streams entitled to protection"; and the value of such sources of supply as tending towards permanency is evident; but it would almost certainly be going beyond the learned Judge's intention to refuse recognition to a perennial mountain stream, for example, having its source in melting snows, because it happened to be neither bog-fed nor spring-fed. Every case must be decided according to its own circumstances.

RECORD.

*In the Supreme Court.*

No. 53. Judgment of Russell J., 13th May, 1915 —*continued.*

One very noticeable circumstance about this Vance River, certainly, is the extremely variable flow of the water, which is very marked even during the rainy season; while at times during the dry season it is dry except for pools, connected with one another by a slight trickle of water or otherwise. Still on the whole it has a substantial existence as a stream or watercourse: I am satisfied of that fact upon the evidence, though certain circumstances to which it is due (*e.g.*, the amount and distribution of rainfall throughout the year, and the effect of the river bed, and surrounding vegetation, etc., in keeping back water), were only roughly described. Here again I attach importance to Mr. Macready's evidence. The streams in his view are merely fed by surface water: but on the other hand that surface water, he stated, might be retarded for weeks by the soil and vegetation. That tells in favour of the contention of permanency: whether it is boggy ground or springs, or something else which keeps back the water, it may be said, is quite immaterial; the important point is that it is kept back in such a manner as to some extent to equalise the supply: and an admitted retardation for weeks cannot be ignored. On the whole, though it is more a rivulet or brook than a river, I am not prepared to refuse to the so-called Vance River the character of a stream to which the ordinary rules of law relating to streams are to be applied.

Diversion. In paragraph 4 of the Statement of Claim the Plaintiff pleaded that large quantities of the water were taken and used by the Defendants for the purpose of working their oil wells: but Plaintiff's counsel intimated at the outset of the trial that on later instructions he withdrew that contention, and the evidence went to disprove it. Before going further, it may be well to say something with regard to the legal meaning of the term diversion. In Rawstron v. Taylor, 1855, 105 Rev. Rep. 567, in that part of the case relating to the conveyance of the close G.B. "together with all ways, water-courses, etc.," to the Plaintiff, the Defendant by erecting a lock-up tank upon his land, caused the water which rose on his land and had been accustomed to flow along an old drain and water-course into the close G.B., and thence contributed to supply the Plaintiff's mills, to be conveyed from the tank to a lower part of his land and to be used by his tenants for purposes provided for in the deed, but the surplus could not be returned to the close G.B. This was held to be a diversion: the term occurs in the judgments of all three Judges: the passages in those of Parke B. and Platt B. would seem to indicate that in so holding they had in view mainly the Plaintiff's having been deprived of the use of the water ("placing "it under lock and key and by so doing have deprived the Plaintiff of the "use of it: locks up the water and thereby deprives the Plaintiff of the "use of it"): but Martin B., referred to Northam v. Hurley, 93 Rev. Rep. 329, as showing that the correct rule was that, where a party is entitled to a grant of water under a deed the grantor is liable in damages if he derogate from his grant by diverting the water, although the grantee be not deprived of the use of any of the water by such diversion. The act constituting the diversion, however, in the view of all the Judges, seems to have been the turning of the water aside into a new channel, with the result that it (and even the surplus) was lost to the Plaintiff. Without tracing the term through other cases, I take this one as fairly exemplifying the legal meaning

of the term diversion, viz.: the turning aside of water, as distinct from its mere retention for a shorter or longer period by damming, and if that be so, then it may be said at once that there has been no diversion in this case. The taking and consumption of water from the ravine for the purpose of working the Defendant's oil wells might have been a diversion, had it been proved, or it might not: the point is one which it is unnecessary to decide: but that complaint was withdrawn, and with it goes any question of diversion in the sense which I have mentioned.

Obstruction. Is the damming up of a stream in itself an injury entitling lower riparian owners to an injunction? I don't think the law goes quite so far as that. I set aside, of course, cases where the right to dam has been acquired by prescription as in Ennor v. Barwell, 66 Eng. Rep. 171, at p. 173: there is no question of that sort here. But it is of some importance to settle the general question which I have just indicated, because it is undoubted and admitted, that the Defendants here have been damming up their ravine, which opens into the Vance River. Is the very fact of their doing so an infringement of the Plaintiff's rights? I don't think so. Upper riparian owners have their rights also; for example, to use the water for primary purposes: and also they are entitled to use it for secondary purposes subject to certain conditions. The question, therefore, comes to be: what secondary purposes does the law permit, and what conditions attach to the user? The limit to which such secondary or extraordinary rights extend have never been accurately defined, and probably is incapable of accurate definition; (per Lord Macnaghten in McCartney v. Londonderry and Lough-swilly Railway, 1914, A.C. at p. 307); but in the exercise of them a riparian owner is under considerable restriction. The use must be reasonable: the purposes for which the water is taken must be connected with his tenement, and he is bound to restore the water which he takes and uses for those purposes substantially undiminished in volume and unaltered in character. In the present case, is the Defendant's user of the water a permissible one? They do not employ it to work their wells—that contention is withdrawn; in point of fact it can hardly be said that they use the water at all; their purpose in damming up the ravines in question is not to accumulate water for use for any purpose, but to form reservoirs and settling places for their oil. All the water they use they bring from elsewhere; the natural water of the area in question, like the water which comes up in working their wells, is an inconvenience, instead of being of any advantage to them. It might be otherwise under other circumstances: had they not their supply from the Vessigny River, they would probably (like the U.B.W.I.P. Co.) have to use all the water they could collect in their ravines and in the Vance River itself, but their supply from the Vessigny makes that unnecessary, and they don't use the local water at all in the sense of either consuming or putting it to any useful employment. I will not spend time in describing how the oil is collected in the sumps, and what is subsequently done with it. What I am at present concerned with is what is done to the water, and as none of it is kept back permanently, the point to be decided at this stage, *i.e.*, in dealing with the complaint of obstruction alone, apart from other grounds of complaint, is whether the mere temporary keeping back of the water,

RECORD.

*In the Supreme Court.*

No. 53. Judgment of Russell J., 13th May, 1915 —*continued.*

is an injury entitling the Plaintiff to damages or to an injunction. I don't think the evidence is sufficient to entitle him to either, because the mere damming in itself not being in my view an injury, the user or rather the control exercised over the water being a reasonable one in connection with the Defendant's property and necessary for its enjoyment, and the water being restored and undiminished in volume, all conditions attaching to extraordinary or secondary uses apart from pollution, which I will deal with immediately, seems to me to be fulfilled, if the matter be regarded as an instance of user.

Nor does it appear at all certain that the Plaintiff has really been damnified by the temporary retention of the water. Its stoppage might occur at a time when he was running short, but it might just as probably occur at a time when he had all he wanted; and its subsequent release might come just at a critical time and save him from having to stop working. There is no overwhelming presumption either way; and I know of no case which has been decided on a bare possibility, or for that matter probability of loss to a lower riparian owner under such circumstances.

Pollution. It is clear on the evidence that the Defendants have been polluting the stream both with oil and with salt water brought or coming up from their wells, with the result that the usefulness of the water of the stream for primary purposes has been destroyed or impaired, and its fitness to supply the Plaintiff's boiler at his refinery has been impaired. The latter is a secondary or extraordinary use, but the Plaintiff is entitled to exercise it so long as he does so under proper conditions; and no trouble on that score seems likely to arise as he has taken the precaution of buying out a small lower riparian owner and now owns all the land down to the sea. Is, then, the Plaintiff entitled to an injunction or to damages? It was contended that he was not, on various grounds. One was that the alteration in the water for boiler purposes was inconsiderable, and that with ordinary care and skill, and the use of certain chemical compounds to counteract the salt in the water, the boiler could be worked quite satisfactorily. I am inclined to think there is a good deal of truth in this contention. I am satisfied that the boiler could never have got into the condition in which I saw it, or that which is described by the Plaintiff's witnesses and borne out by the deposits of salt, &c., put in evidence as having formed on certain parts of it, had it been properly attended to. It must have been grossly neglected, whether for the purpose of preparing evidence for this case or otherwise. I was particularly struck with Mr. Ibbett's evidence in this connection; the impression made on my mind on inspecting the boiler leads me to think that his remarks, *e.g.*, that " nobody was entitled to have a boiler in that state," and that " if he found a boiler like that he would fire everybody from top to bottom," were not a whit too strong. But that does not affect the main point, viz., that the Plaintiff is entitled to have the water in its natural state, which admittedly is better for boiler purposes.

There is another set of circumstances, however, which seem to me to render it inexpedient to grant an injunction at present. I refer to the fact that the working of oil in the area in question is really only commencing, and important changes of various kinds will almost certainly come about

as it progresses. The Plaintiff himself admitted: "The industry is in its "infancy. . . . There will naturally be great extensions of the industry. "I will extend and am extending now. I am extending my oilfields. I "am extending my operations, but not my fields, *i.e.*, I am putting up "more derricks. Eventually I may develop all the land I have. Q. Your "principal wells are a few hundred yards from the nearest well of the "Defendant company?—A. 500 to 600 yards. Not more than that. ". . . There are over 20 wells (on Defendant's land). I am getting oil "from three wells. . . . (Perreira, be it said in passing, stated that "they were only working one now, and never worked more than one at a "time; and that out of 9 tackled they had struck oil in 5.) I have had no "expert training. I have no expert machinist. I have mechanics, fitters, "&c., such as we have here, able to mend a pump, &c." Now, as he proceeds developing his lands in this way, what is likely to happen? He admits having lost 60,000 barrels of oil on one occasion through the bursting of a dam: but now he says, he would build his dam higher, put in pumps, &c. The oils in his district are lighter than the Defendant's oil, and don't sink in water so as to escape through the valves. He does not collect his oil in sumps, but pumps it into tanks, and thence by pipe to the sea-shore. He has never struck salt water or water at all. All this evidence of his, apart from the loss of the 60,000 barrels, sounds very reassuring and comfortable for the Plaintiff at present; but is it a state of matter which can reasonably be expected to last? Salt water, for example, that common concomitant of oil, is he never going to strike it? He admitted that it was quite probable that some of his wells would discharge it: hitherto 460 feet was his deepest well, and that was shallow. Again, he said: "If I struck "salt gushers I would hurt nobody, because I have nobody below me. It "would be my own business, if it affected the river. It would hurt my "business. It is a possibility. I don't say a probability. It is very "probable the other Companies will strike salt water, but I don't intend to "bore deep wells. I have only gone to 460 feet." Was ever an injunction granted in such circumstances as these? Can one take seriously this declaration. "I don't intend to bore deep wells"; or believe that in the event of striking salt water, he with his few inexpert hands will be able to do what the Defendants with a highly qualified staff and the most up-to-date appliances have been unable to accomplish in a large proportion of instances? Much the same sort of considerations apply to the pollution by oil; the Plaintiff attributes it largely at least to carelessness on the part of the Defendant Company's employees; but in point of fact the evidence seems to me to show that there has been a good deal of pollution in his own ravine, which cannot be attributed merely to two accidents which he mentioned, viz., the bursting of a dam on one and the bursting of a pipe on another occasion; and before he has developed all his own land, as he spoke of doing, he may find it an extremely difficult matter to prevent a much larger escape of oil; nay, I am satisfied on the evidence that he *will* find that the only practical way of developing his oilfield to a profit is by settling the oil in sumps in the same way as the Defendants are now doing, and with practically the same results, despite whatever difference there may be

RECORD.

*In the Supreme Court.*

No. 53. Judgment of Russell J., 13th May. 1915 —*continued.*

between his oil and theirs, now or at that time. Again he is damming back the water and using it for his drilling operations: which is a thing the Plaintiffs are not doing, though their dams no doubt keep back more water. I cannot think it right that a plaintiff, because he happens to be the lowest riparian owner, should prevent owners above from developing their lands in the same way as he is doing himself or will almost certainly have to do. So long as he abstains, or is so fortunate as to escape the trouble causing the pollution, he may be entitled to damages: even that seems doubtfully fair, for why should his mere good luck or delay give him a claim against those who are pushing on more energetically though with worse luck? But in any case it would be most unsafe to grant a perpetual injunction as though the existing position of matters were a permanent one, when in point of fact it is certain to change in so far as relates to the Plaintiff's own workings, when he carries out his avowed intention of further developing his oilfield.

The Plaintiff's declaration that he "does not intend to bore deep wells" may be made in perfectly good faith now; but if he discovers later on that he can get more oil or can only get oil by going deeper, will he abstain from doing so? Or if he sold the land for say a million and a half dollars, as he admitted he might do, would the purchaser be bound to abstain? Also it must not be supposed—though probably that was in his mind—that by confining his workings to sinking shallow wells he avoids all danger of striking salt water; the Defendants apparently have struck it at a depth less than Plaintiff has already gone, though at a greater depth it is no doubt more constant. "We have struck it," said Mr. Fowler, "in every well that went below "1,000 feet in the Forest Reserve. Plaintiff probably will strike it; he will "be very, very fortunate if he does not. We have struck it at 300 feet. We "have determined the presence of salt water over practically the whole of "that 2,000 acres, and I conclude therefore that its extent is considerable "in every direction beyond. . . . We don't know from what depth "the water comes. We are trying to tell by cementing, etc. It is most "difficult to tell."

Pennington v. Brinsop Hall Coal Co. 1877, 5 L.R. Ch. 769 is not a parallel case, despite the fact that there are certain points of resemblance; for example, the ground of complaint being injury and damage caused to the Plaintiff's boilers and machinery by the Defendants pumping water impregnated with deleterious matters from a mine into the stream; and the defence being set up that the pollution was due to other sources, and in particular to the water from the mines being discharged into the brook at points below the Defendants' mine. Had the pollution been in part due to water being pumped into the brook from mines owned and worked by the Plaintiff himself it seems very doubtful whether any injunction would have been granted. That appears to me an important distinction. When a number of men carry on a common industry by similar methods, with the result that each of them pollutes a common stream, it would be unreasonable to hold one of them entitled to an injunction to prevent the others from doing what he proposes to continue to do himself: at any rate it would require very strong circumstances to make the Court so hold: and a contention

" The injury to my boiler is, or probably soon will be, partly of my own " making, but that does not excuse the other part which is of your making," seems the very reverse of strong; it is as weak in equity as, so far as I can see, it is unfounded in law. Another point of similarity is that in that case, as in the present, it was contended for the Defendants that the effect of the injunction would be to oblige them to shut up their colliery, with great resulting loss to owners and loss of work to their employees, whereas the utmost damage caused to the Plaintiff's boilers must be relatively inconsiderable; but though Fry J. declined to yield to these suggestions, he did not express himself in such a way as to indicate that any question of inconvenience resulting to the one party and to the other was wholly irrelevant in cases of this nature generally. He said: " I cannot yield to the suggestions, " nor can I find any such balance of inconvenience resulting from the granting " of the injunction as would induce me to refuse it," which seems to imply that he considered the question one not wholly to be disregarded. How the Defendants were to prevent the water getting into the brook without ceasing working the mine does not appear; but presumably the learned Judge was satisfied that it could be done, and without expense which would be practically prohibitive. In the present case, however, it appears that the expense would undoubtedly be prohibitive, in view of the comparatively poor returns given by the wells, and the difficulties encountered in working them, their shortness of life, etc., etc.

In Swindon Waterworks Co. v. Wilts and Berks Canal Navigation Co., 7 English and Irish Appeals 697, the canal proprietors had previously done something which they complained of the Waterworks Company doing, viz.: sold some of the water to the inhabitants of the town and others; and Lord Hatherley held that that formed no excuse for what had since been done by the Waterworks Company. But that does not appear to me at all parallel to what I have to deal with in the present case. What was urged by way of defence was merely something done in the past: had the Canal Company been still selling any considerable volume of the water, that might have materially affected the judgment of the Court. And here in the present case, the Plaintiff has avowed his intention to go on developing his oil-field, eventually perhaps the whole of it; the almost certain result of which, it appears to me from the evidence, will be to pollute the water both with oil and salt, more and more; so that it is a question whether in course of time his own obstruction and pollution may not equal or even exceed that caused now, or which will then be caused by the Defendants.

Every riparian proprietor is entitled to have the natural water of the stream transmitted to him, without sensible alteration in its character or quality; and any invasion of this right causing actual damage or calculated to found a claim which may ripen into an adverse right entitles the party injured to the intervention of the Court. The law was thus laid down in Young v. The Bankier Distillery Company 1893, A.C. 691; and one very instructive part of the report of that case, as bearing on the present case, is the judgment of Lord Shand dealing in some detail with an American case —Pennsylvania Coal Co. v. Sanderson—in which it was held by a majority

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*In the Supreme Court.*

No. 53. Judgment of Russell J., 13th May, 1915 —*continued.*

of four out of seven Judges of the Supreme Court of Pennsylvania that the owners of a coal mine were entitled to pump up water from the low strata of their mine, and to send it into an adjoining stream, although the quantity of the water was thereby increased and its quality so affected as to render it unfit for domestic purposes by the lower riparian owners, on the ground that the use and enjoyment of the stream by these last " must *ex necessitate* " give way to the interests of the community, in order to permit the develop- " ment of the natural resources of the country, etc." The decision in that American case was expressly disapproved; *vide* the Judgment of Lord Watson at p. 697; and Lord Shand's more detailed references to it at pp. 701—3. The law of England applied in this Colony and I must be guided by it alone. If special rules, different from those which have been laid down by the Courts in England, are necessary for the development of our local resources, it is for the legislature to introduce them. (See Lord Shand's remark at page 702): " While the enormous value of the mining " interests of the district of Pennsylvania from which the case came and " which is fully explained in the judgment, might have formed a good reason " for appealing to the legislature to pass a special measure to restrain any " proceeding by interdict at the instance of surface proprietors, and to " confine them to a right to damages only for injury sustained, that value " could in my opinion afford no good legal ground for allowing the proprietor " of a mine so to work his minerals for his own profit as to destroy or greatly " injure his neighbour's estate by subjecting it, by means of artificial opera- " tions, to the burden of receiving water enlarged in quantity and destroyed " in quality without payment of compensation or damages for the injury " done." I must be guided by the principles laid down in Young v. Bankier Distillery Co. and other English cases and by those cases alone. But in none of those cases were the circumstances quite the same as those which are present here: *i.e.*, the Plaintiff himself already doing two of the things he complains of, viz., holding back the water and polluting it with oil, and the practical certainty that he will strike salt water as he goes on extending his wells.

With regard to the Plaintiff's, already himself holding back water, using a sump to store oil and polluting his own ravine with oil, Mr. Fowler gave evidence: " I have seen oil in Plaintiff's ravine. It was polluted each " time I was there. Five or six times I was there. At least two times last " year and two the year before. There was oil in the ravine. I have seen " it with an oil film so thick the water was not visible." Then after referring to the effects of the bursting of Plaintiff's dam, he said, " there was other " pollution by him in the ravine."

Mr. Weller said:—" Plaintiff's oil-fields: I knew it. On 12th March " I visited them, *i.e.* same day. His water supply for oil fields is taken from " bottom of sump, in which he also stores his oil by damming up the ravine " in same way as Defendants do." Mr. Macready said: " I went up on Plain- " tiff's field and viewed the wells. The Vance River had a lot of oil plastered " on it. I passed Plaintiff's ravine and there was a lot of oil slewed around " that. . . . The trickle out of Plaintiff's ravine comes leaking out

" of his sump through a four-inch valve cracked open, leaking. By ' crack ' " I meant that the valve was a little open. . . . Banks of Plaintiff's " ravine were plastered with oil ; in some places 3 feet above the quick bed. " I took samples. Also there was asphaltic oil floating on the pools. . . . " The water accumulates in parts before drying off altogether. The pools " are coated with oil, an eighth of an inch to a film thick. In Plaintiff's " ravine this year there was not enough oil to leak ; but in 1914, about June, " oil leaked through cracks in Plaintiff's dam. Some of joints in pipe line " leading north leaked." I am satisfied that these gentlemen gave their evidence in absolutely good faith, and have no reason to doubt the correctness of their statements. Some water from Parry Lands runs down through the Plaintiff's ravine, and this may contribute to the pollution. The Plaintiff himself said :—" Trinidad Oil Fields, now the United British, send " down oil to my ravine, but it never reached the river because of my dam ; " if it passed my dam it would reach the river. . . . Escaped oil in " sumps, I pump when I get enough to pump. Some has come down from " the U.B.W.I.P. I don't know why they don't keep it. I don't know " it is because they can't." He can't keep all he collects himself, however ; that is clear from the above evidence, and whether it be his own oil or another's oil collected by him for his own purposes seems hardly material. It is clear also that he uses a sump or dam to settle some of his oil ; whether escaped oil or not again seems hardly to matter so long as the resulting pollution is considerable ; as it will naturally be when he has a large number of wells working. Asked " Q. With reasonable working of this industry, " it is necessary to have sumps ? " he replied " A. Yes, to settle the oil." And again " Q. If you get 3,000 to 4,000 barrels a day, your dam would " prevent escape ? A. No, I would build it higher and put in pumps ; " and you would need bigger gate-valves below. I would pump it into tanks. " I would open sluices and let water out." This is exactly or practically what the Defendants do. Unfortunately a certain amount of oil escapes through the valves, and perhaps more than in the Plaintiff's case, because the Defendants' is a heavier oil. But how long will that difference exist ? It may come to an end any day ; and the probabilities, it seems to me, are that the day is not far off. The two fields being contiguous, it can hardly be presumed that they represent two completely different geological formations, so that the whole of the one will be of one character, and the whole of the other of another. Such a thing is conceivable ; but it can hardly be accepted as an established fact simply on the strength of a few wells in one place having given better oil than a number of wells elsewhere.

A man is no doubt entitled to develop his land in his own way, and if he prefers to do so one-well-at-a-time, he is at liberty to do so ; from a commercial point of view it may be merely playing with his oilfield, instead of dealing with it so seriously as its great value would seem to justify ; but there is nothing unlawful about it so long as he does not interfere with his neighbours. Only, the results obtained in a year or two by such a method clearly cannot be relied upon as settling what will be struck or will not be struck, etc., etc., when the field comes to be extensively worked, whether to a greater depth or not.

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*In the Supreme Court.*

No. 53. Judgment of Russell J., 13th May, 1915 —*continued.*

The granting of an injunction is in the discretion of the Court, and in exercising that discretion it will consider not merely the present, but the future: for example, here, the Plaintiff's avowed intention to continue to develop his oil-field, and work perhaps the whole of it; and the further practical certainty that in the course of his doing so salt water will be struck and contribute to the pollution, so that he himself will then be the cause in part at least of the water being worse for his boiler. The question of damages, however, is one of strict law, and must be dealt with on the basis of existing facts; and the facts being that the Plaintiff has not so far struck salt water, and the salt pollution is attributable to the Defendant Company, he is entitled to some compensation for the trouble caused to his boiler. I am satisfied that the degree of the trouble was very much exaggerated, and that with competent men and proper care it could have been worked despite the salt in the water; so that the claim for loss of profit due to shutting down can only be allowed, if at all, to a very modified extent. I fix the total damage at £50, as a substantial sum probably considerably above what he would be entitled to on a strict computation of the injury which would necessarily be done to his boiler, and the extent to which its working would be interfered with even in proper hands. There will be judgment for the Plaintiff for that amount with costs, with leave to bring further actions for further damages, if and when they are sustained; or, when the condition of matters has developed, if the circumstances justify it, for an injunction.

No. 54. Order, 13th May, 1915.

## No. 54.

## Order.

On the 13th day of May 1915.

Before His Honour Mr. Justice Russell.

This action coming on for trial on the 9th, 10th, 11th, 15th, 18th, 23rd, 24th, 25th, and 29th days of March, and 1st and 14th days of April 1914, in the presence of Counsel for the Plaintiff and the Defendants Upon reading the pleadings filed herein the Deed dated the 16th day of March 1905, marked "C.C.S. 1" the three plans marked respectively "C.C.S. 2," "C.C.S. 3," and "C.C.S. 4," the letter dated the 30th day of March 1914, marked "C.C.S. 5," the letter dated the 6th day of April 1914, marked "C.C.S. 6," the sketch marked "H.D.F. 1," the Analyst's certificates dated the 23rd day of March 1915, marked respectively "H.S. 1" and "H.S. 2," the six letters dated the 23rd day of March 1914, the 15th day of April 1914, the 21st day of May 1914, the 8th day of June 1914, the 15th day of August 1914, the 21st day of August 1914, all marked "Y," the sketch marked "Q," the sketch marked "R," the four analyst's reports marked respectively

"A.E.C. 1," "A.E.C. 2," A.E.C. 3," and "A.E.C. 4," the estimate marked "G.A.M. 3," upon viewing the sample of salt marked "J.W.T. 1," the three bottles containing liquid marked respectively "A," "B," and "C," the cardboard box containing salt marked "X," the five bottles containing liquid marked "1," "2," "3," "4" and "5," the tins and contents marked "G.A.M. 1" and "G.A.M. 2" put in evidence at the said trial Upon hearing the evidence of the said Charles Conrad Stollmeyer, of Henry Archibald Green, John William Tomlinson, Jules Cornillac, Emmanuel Perreira, Henry Donald Fletcher, Charles Garcia, Ogeer,* Pooran, Dil Mahomed, James Jarvis, Herbert Shrewsbury, William Fowler, Arthur William Ibbit,* John Henry Weller, Archibald Edgar Collins, George Alexander Macready, James Inglis and Frederick Thompson Bruce and upon hearing what was alleged by Counsel for the Plaintiff and Defendants The Court did order that this action do stand for judgment and this action standing for judgment in the paper this day The Court doth Order that Judgment be entered for the Plaintiff for £50 damages with costs of suit to be taxed and paid.

* Query Ageea.
* Query Ibbitt.
* Query Collens.

And the Court doth further Order that leave be and the same is hereby granted to the Plaintiff to bring further actions against the Defendant Company for further damages if and when they are sustained, or, when the condition of matters has developed, if the circumstances justify it, for an injunction.

T. A. THOMPSON, Registrar.

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## No. 55.



### Plaintiff's Notice of Appeal.

Take Notice that this Honourable Court will be moved on Tuesday the 1st day of June 1915 at the hour of 10.30 of the clock in the forenoon or so soon thereafter as Counsel can be heard by Louis Anthony Wharton, Esq., K.C., of Counsel for the abovenamed Plaintiff by way of appeal for an order that so much of the Judgment herein of His Honour Mr. Justice Russell dated the 13th day of May 1915 as dismisses the Plaintiff's claim herein for the injunction claimed in paragraph 2 (b) of the prayer for relief in the Plaintiff's Statement of Claim herein may be reversed and that instead thereof it should be adjudged that an injunction be granted against Defendants their servants agents and workmen in terms of the above mentioned paragraph 2 (b) and that the costs of this Appeal be paid by the Defendants to the Plaintiff.

Dated this 15th day of May 1915.

Yours &c.,

CHAS. LEONIDAS DAVID, Plaintiff's Solicitor.

To Mr. Philippe de la Bastide,
107 Queen Street, Port of Spain.
Defendant's Solicitor.

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RECORD.

*In the Appeal Court.*

## No. 56.

### Defendants' Notice of Appeal.

No. 56. Defendants' Notice of Appeal, 8th June, 1915.

Take Notice that the abovenamed Defendants intend upon the hearing of the Appeal under the Plaintiff's notice of Appeal, dated the 15th day of May 1915, from the Judgment of His Honour Mr. Justice Russell dated the 13th day of May 1915 to contend that the said Judgment whereby it is adjudged that the Plaintiff should recover against the Defendants the sum of £50 and costs be reversed and that instead thereof it should be adjudged (or ordered) that Judgment be entered for the Defendants upon the several issues the claims whereon are set forth in paragraphs 1, 2 (a), 2 (b), and 3 of the prayer for relief in the Plaintiff's Statement of Claim herein and that the costs in the Court below and of this Appeal be paid by the Plaintiff to the Defendants.

Dated this 8th day of June 1915.

Yours etc.,
PHILIPPE DE LA BASTIDE,
Defendants' Solicitor.

To Mr. C. L. David, Plaintiff's Solicitor.

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## No. 57.

No. 57. Judgment of Lucie Smith C.J., 4th Jan., 1916.

### Judgment of Lucie Smith C.J.

The Appellant, Plaintiff in the Court below, claimed damages for the diversion, obstruction and pollution of certain ravines and streams which feed the Vance River and an injunction to restrain the Defendants from damming up the water in the ravines and from discharging into the ravines salt water and oil so as to pollute the waters thereof. At the hearing of the appeal it was stated that the claim as to diversion and obstruction was abandoned and that the only question for decision in this Appeal was as regards the pollution. The learned Judge in the Court below gave £50 damages for pollution by salt water and refused an injunction.

The locality, where the Vance River is, is an oil district and the oil industry is practically the only industry carried on there. The country is hilly with what are called ravines. The rainfall of the district flows down the hill sides to the ravines and thence into the channel which is called the Vance River. There is practically no water in the dry season and even during the rains the flow of water is very uncertain, the only source of supply being the rain—the supply is so uncertain that the Respondents had to bring water to their works from Vessigny. There are no springs or marshy land or snow from which the river takes its rise. The river has, however, a well defined channel through which the water flows after rains. It would

therefore appear to be a question not without doubt whether the so-called Vance River is a water course in respect of which riparian owners have certain legal rights. I think, however, that as the questions of diversion and obstruction have been abandoned it is immaterial whether the Vance River can legally be called a water course or not.

As to the pollution, it is of two kinds by oil and by salt water, it appears that pollution by oil is brought about in two ways, (i) by striking a gusher and (ii) leakage from pumps, pipes and valves, and even seepages. As regards a gusher I do not think an injunction could possibly be granted. No person can tell when a gusher will be struck, to grant such an injunction would be to stop all drilling operations. It is admitted that it is impossible to control a gusher, the oil must find its way through the ravines to the sea, it cannot wholly be retained, if it was possible there can be no doubt the Company would be only too glad to keep the oil instead of letting it go to waste. The Court could not grant an injunction restraining the Defendants from striking a gusher—if one is struck and any damage is caused to other parties there might be a good cause of action to recover such damages. As regards the leakage the evidence shows, and the learned Judge has found that the Defendant Company carry out their industry in the ordinary course and that there must be a certain amount of leakage of oil, that on the Plaintiff's own workings there is such leakage and there is also leakage from other companies working higher up. Again I do not think an injunction should be granted in this matter. It is clear that the Defendant Company do not wilfully allow oil to escape, their business is to win oil, they would naturally adopt every means to prevent it escaping. If the leakage causes damage to the Plaintiff the Defendant is responsible in damages. No cause of action could possibly accrue as to the seepages, they are natural oozings of oil through the soil. The practical finding in the Court below is that the Plaintiff has suffered no damage by this leakage of oil, and I see no reason to differ from this finding.

As regards the pollution by salt water it appears that in drilling salt water is sometimes struck, which, by the pressure of gases and the forces of nature, is forced to the surface much in the same way as a gusher of oil. I think the same principle applies to salt water as to oil. To grant an injunction would be to stop all drilling, no one can ever say when salt water will be struck. It is true in the present case the Defendants after striking the salt water have pumped up the salt water which comes up with the oil, in some cases they have pumped up the salt water in order to get rid of it more quickly. It would in any event come to the surface and flow by natural gravitation to the Vance River. The flow of salt water will not continue for ever, if it continued for any considerable time most probably the company would shut down that well as it would be hopeless to continue to work it. Even if the well were shut down it is not clear whether there would not be still some flow of salt water. To my mind it is certainly not a case for an injunction, it is impossible to imagine that the Defendants could ever acquire rights by prescription to pump salt water and allow it to flow to the river. It was contended on the Appellant's behalf that although the Respondents would not be responsible for the oil and water coming up and not controlled

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*In the Appeal Court.*

No. 57. Judgment of Lucie Smith C.J., 4th Jan., 1916 —*continued.*

yet because the Appellants collect such oil and water and afterwards release the salt water they are responsible. I cannot agree with this argument, the salt water once it came up would naturally, by force of gravitation, descend on the Appellant; because it is delayed for some time to enable the Respondents to get their oil would not to my mind make the Respondents liable to an injunction. The injunction would I presume be that the Respondents do not collect the oil and water and afterwards let the water descend on the Appellant. It could not be an injunction to prevent the water going to the Appellant it would go naturally. The argument appears to be against the principles laid down in West Cumberland Iron and Steel Co. v. Kenyon 11 Ch. D. 788.

The Appellant's use of the land is the natural use of mineral lands, of oil lands. On the principle laid down in the cases of Wilson v. Waddell 2 Ap. C. 95 and Fletcher v. Rylands L.R. 3 H.L.C. 330 I have some doubt whether any action at all lies. It appears to me, to use the words of Erle C.J. in Baird v. Williamson 15 C.B., N.S. 390, that the Respondents have all the right to get all minerals (oil) therefrom provided they work with skill and in the usual manner " and if while the occupier of the higher mine (*i.e.* the " Respondents) exercises that right nature causes water to flow to a lower " mine he is not responsible for this operation of nature." In this case the Respondents can drill for oil, in the drilling oil and salt water comes up by operation of nature, and by operation of nature the water eventually finds its way to the Appellant's land. I have great doubt if the Respondents are liable at all. The finding of the Court below, however, is that this salt water has caused some damage to the Plaintiff for which the Defendant is responsible. I am not prepared to disagree with this finding.

It is contended on behalf of the Respondents that as most of the issues were decided in the Court below in their favour they are entitled to their costs with respect to those issues. It is hopeless for me to consider that question as I understand that Mr. Justice Blackwood Wright is of opinion that the appeal should be allowed with costs. My decision in the matter would have no effect.

I think the appeal should be dismissed with costs.

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*In the Appeal Court.*

No. 58. Judgment of Blackwood-Wright J., 4th Jan., 1916.

## No. 58.

## Judgment of Blackwood-Wright J.

This is an appeal from a judgment of Mr. Justice Russell. The action was brought by the Plaintiff as riparian proprietor on the banks of a stream known as the Vance River for obstruction of the waters and for its pollution with oil and salt. The learned Judge found that the Vance was a stream and that it had been polluted by the Defendant Company by pouring in salt water into the stream, and gave £50 damages but he refused to grant an injunction. The Plaintiff complained that this salt water corroded the boiler of his distillery and made the water undrinkable which had previously been drinkable. It was moreover proved that he had himself polluted the stream with oil. The Defendant Company maintained that if they were to work their oil wells it was necessary that they should be allowed to let the salt water pumped by them into the Vance for otherwise their business could not be carried on profitably or at all. The appeal is by the Plaintiff who seeks to have the Judge's order varied by giving him an injunction. It was admitted at the trial by Mr. Fowler, the manager of the Defendant Company, that the Defendant Company had sunk 22 wells in the area drained by the Vance and that salt water was only running of its own accord from two of these wells viz. Nos. 12 and 15 and that it was being pumped from the rest. He also admitted that the salt water was being pumped to make it rise quicker for the purpose of winning the oil which was below it or mixed with it. The learned Judge says in his judgment he "cannot "think it right that a Plaintiff, because he happens to be the lower riparian "owner, should prevent owners above from developing their lands in the "same way as he does himself or will certainly have to do. So long as he "abstains or is so fortunate as to escape the trouble causing the pollution, "he may be entitled to damages: even that seems doubtfully fair," and as a result gave the Plaintiff £50 damages for injury to his boiler by salt water, but refused him an injunction.

Quite apart from the question of the Plaintiff being a lower riparian owner the letting down salt water on his land seems to me to be a nuisance. As I understand the cases where either a nuisance is continuous or a right is infringed continuously and it is impossible to foresee to what future use a person may put his property to; then, though the damage may be trifling on any particular occasion, the Courts will grant an injunction, and it has also been decided in Young v. Bankier that if a person can only develop his property by infringing the rights of others he must abstain from so developing it. No one can for the purpose of enjoying his property to the full infringe the rights of others. The maxim "*sic utere tuo ut alienum non laedas*" applies and limits the rights of user of property. I do not think the granting of an injunction, although the granting of it is discretionary, depends on the views any particular Court may entertain as to how it should exercise its discretion in the particular case. Definite principles have been laid down for the exercise of this discretion which is judicial. Where there is a continuous infringement of the rights and substantial injury may be

RECORD.

*In the Appeal Court.*

No. 58. Judgment of Blackwood-Wright, J. 4th Jan., 1916 —*continued.*

caused by the action of the Defendant which it is impossible to assess once for all, a plaintiff is (as I understand the cases) entitled to an injunction. These principles seem to me to have already been laid down repeatedly and are clearly set forth in Mr. Justice Fry's Judgment in Pennington v. Brinsop Hall Coal Co. 5 C.D. 769.

I therefore think the Plaintiff is entitled to an injunction restraining the Defendant Company by artificial means (such as pumping) bringing up water from below and letting it down on Plaintiff's land or into the Vance River. I think that the Defendant Company are only entitled to let down on the Plaintiff's land such salt water as naturally springs up to the surface (see Young v. Bankier Distillery Co. 1895 A.C. 69) and therefore think the learned Judge's judgment should be varied accordingly.

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No. 59. Formal Judgment 4th Jan., 1916

## No. 59.

## Formal Judgment.

On the 4th day of January 1916.

Before their Honours The Chief Justice and Mr. Justice Blackwood Wright.

Upon Motion made unto the Court by way of appeal on the 3rd, 9th and 10th days of November 1915 for an order that so much of the Judgment herein of His Honour Mr. Justice Russell dated the 13th day of May as dismisses the Plaintiff's claim herein for the injunction claimed in paragraph 2(b) of the prayer for relief in the Plaintiff's Statement of Claim herein may be reversed and that instead thereof it should be adjudged that an injunction be granted against the Defendants their servants, agents and workmen in terms of the above-mentioned paragraph 2(b) and that the costs of this Appeal be paid by the Defendants to the Plaintiff Upon reading the said Notice of Motion the notes of evidence taken in the Court below and the Judgment of His Honour Mr. Justice Russell dated the 13th day of May 1915 filed herein And upon hearing Counsel for the Appellant and Counsel for the Respondent Company The Court did Order that the said Appeal do stand for judgment and the said Appeal standing for judgment in the paper this day

The Court doth order that the said Appeal be and the same is hereby dismissed with costs to be taxed and paid by the said Appellant to the said Respondent Company.

T. A. Thompson, Registrar.

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RECORD.

*In the Appeal Court.*

No. 60. Affidavit in support or Petition for leave to Appeal to His Majesty in Council. Sworn 20th Jan., 1916.

## No. 60.

## Affidavit in support of Petition for Leave to Appeal to His Majesty in Council.

I Charles Conrad Stollmeyer of the Town of Port of Spain in the Island of Trinidad Merchant make oath and say as follows :—

1. I say that the statements made in the petition dated the 20th day of January 1916 for leave to appeal to His Majesty in His Majesty's Privy Council against the Judgment of this Honourable Court dated the 4th day of January 1916 are true in substance and in fact.

2. The matter in issue in respect of which the said Judgment is given involves a claim or question respecting the Perseverance Estate situate in the Ward of La Brea and Guapo in this Island comprising 983 acres and containing valuable petroleum deposits.

3. The value of the said Perseverance Estate is not less than Two hundred and Fifty Thousand pounds sterling.

4. The Defendant Company have been polluting and still pollute the Vance River which flows through the said Perseverance Estate with large quantities of oil and salt.

5. I carry on an oil refinery business on the said Perseverance Estate which I am unable to develop properly because the continuous pollution of the waters of the said Vance River renders it impossible for me to get a supply of water fit for use in boilers.

6. I have a larger oil refinery plant than the one at present in use at Perseverance ready to be put up but I have not done so owing to the continuance of the said pollution.

7. The injury caused by the said pollution cannot be adequately compensated by damages and without an injunction to restrain the said pollution future damage will accrue and the value of the said Perseverance Estate is in consequence seriously depreciated and by a sum far in excess of £300 sterling.

Sworn by the deponent at No. 32 St. Vincent Street Port of Spain in the Island of Trinidad this 20th day of January 1916

CH. C. STOLLMEYER.

Before me
E. C. M. STONE,
Commissioner of Affidavits.

RECORD.

*In the Appeal Court.*

## No. 61.

### Petition for leave to appeal to His Majesty in Council.

No. 61. Petition for leave to appeal to His Majesty in Council, 20th Jan., 1916.

To His Honour the Chief Justice and their Honours the Puisne Judges of this Honourable Court.

The Humble Petition of the Plaintiff showeth as follows :—

1. That this action was commenced in this Honourable Court on the 17th day of September 1914 whereby the Plaintiff claimed damages for wrongfully diverting and abstracting water from certain ravines and streams flowing into the Vance River situate in the Ward of La Brea and Guapo in this Island and also for obstructing and polluting the same to the damage of the Plaintiff And for a perpetual injunction restraining the Defendants their servants agents and workmen :

A. From damming up the water in the said several ravines and streams so as to interrupt the flow of their waters into the said Vance River and so as to deprive the Plaintiff of the undiminished flow of the waters of the said River and from erecting or constructing any dams erections or works in the beds of the said ravines and streams so to interrupt and diminish or otherwise obstruct the natural flow of the waters of the said ravines and streams into the said river : and

B. From discharging from the Defendants' lands into the said ravines and streams salt water and oil and other noxious matter so as to pollute the waters thereof or render them unwholesome and unfit for use to the injury of the Plaintiff : and

C. Ordering the Defendants to remove forthwith all dams erections and works in the beds of the said ravines and streams placed there by them.

2. The Defendants duly appeared on the 28th day of September 1914.

3. Your Petitioner delivered his Statement of Claim on the 9th day of October 1914 ; the Defendants delivered their Statement of Defence on the 3rd day of November 1914 and Your Petitioner delivered his Reply on the 12th day of November 1914.

4. The action was heard before His Honour Mr. Justice Russell on the 9th, 10th, 15th, 18th, 23rd, 24th, 25th, and 29th days of March and the 1st and 14th days of April 1915.

5. On the 13th day of May 1915 His Honour Mr. Justice Russell ordered that Judgment be entered for the Plaintiff for £50 damages and costs And further ordered that leave be granted to the Plaintiff to bring further actions against the Defendant Company for further damages if and when they are sustained, or when the condition of matters has developed, if the circumstances justify it for an injunction.

6. On the 15th day of May 1915 your Petitioner appealed to the Full Court from so much of the Judgment herein of His Honour Mr. Justice Russell dated the 13th day of May 1915 as dismissed his claim herein for the injunction claimed in paragraph 2 (b) of the prayer for relief in the Statement of Claim.

7. On the 8th day of June 1915 the Defendants gave to the Plaintiff notice that at the hearing of the said appeal they intended to contend that the said Judgment of His Honour Mr. Justice Russell whereby it was adjudged that the Plaintiff should recover against the Defendants the sum of £50 should be reversed and that Judgment should be entered for the Defendants upon the several issues the claims wherein are set forth in paragraphs 1, 2 (a), 2 (b), and 3 of the prayer for relief in the Plaintiff's Statement of Claim.

8. On the 4th day of January 1916 the Full Court gave final Judgment herein and ordered that the Plaintiff's said Appeal be dismissed with costs.

9. Your Petitioner craves leave to refer to the said Statement of Claim and Statement of Defence and Reply, the evidence taken in the suit at the hearing thereof and the said judgment and all other proceedings in the said suit.

10. Your Petitioner feels himself aggrieved by the said final Judgment of the Full Court and is desirous of appealing therefrom to His Majesty in His Privy Council.

11. The said Judgment involves a claim or question respecting property of the value of three hundred pounds sterling and upwards.

12. The question involved in the appeal is one of great general importance.

Your Petitioner therefore prays :—

1. That this Honourable Court will be pleased to grant your Petitioner leave to appeal from the said Judgment to His Majesty in His Privy Council and that pending the said appeal the execution of the said Judgment may be suspended And your Petitioner be allowed to have a copy under Seal of this Honourable Court of all proceedings pleadings evidence instruments documents judgments and orders had or made in the said action.

2. That this Honourable Court will make such further or other order in the said premises as may seem just.

Dated this 20th day of January 1916.

CHAS. LEONIDAS DAVID,
Petitioner's Solicitor.

L. A. P. O'REILLY,
Counsel for the Petitioner.

This Petition is set down for hearing at the Court House Port of Spain in the Island of Trinidad on Tuesday the first day of February 1916.

Note : It is intended to serve this Petition on the Defendants at Brighton La Brea.

This Petition is presented by Mr. Charles Leonidas David of No. 32 St. Vincent Street in the Town of Port of Spain in the Island of Trinidad, Solicitor for the Plaintiff.

RECORD.

*In the Appeal Court.*

No. 62. Notice of hearing, 24th Jan., 1916.

## No. 62.

## Notice of hearing of Petition for leave to appeal to His Majesty in Council.

(Not printed.)

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No. 63. Order granting conditional leave to appeal to His Majesty in Council, dated 2nd Feb., 1916.

## No. 63.

## Order granting conditional leave to appeal to His Majesty in Council.

Entered the 28th day of February 1916.

On the 2nd day of February 1916.

Before their Honours The Chief Justice and Mr. Justice Russell.

Upon the petition of the above named Plaintiff, Charles Conrad Stollmeyer, filed herein the 20th day of January 1916 for leave to appeal to His Majesty in His Majesty's Privy Council against the first Judgment of this Honourable Court pronounced herein on the 4th day of January 1916, affirming the Judgment of His Honour Mr. Justice Russell LL.B. dated the 13th day of May 1915 coming on for hearing before the said Honourable Court whereupon and upon hearing read the said petition the notice of motion filed herein on the 25th day of January 1916, the affidavit of the said Charles Conrad Stollmeyer, the Plaintiff herein of the town of Port of Spain in the said Island, Merchant filed herein on the 20th day of January 1916, and upon hearing what was alleged by Emmanuel Scipio Pollard Esquire K.C. of Counsel for the said Petitioner, and William Blache-Wilson Esquire of Counsel for the Defendants. And it appearing to this Honourable Court that this is a proper case in which to allow such Appeal.

This Court doth Order that subject to the performance by the said Charles Conrad Stollmeyer of the conditions hereinafter mentioned and subject also to the final order of this Honourable Court upon the due performance thereof leave to appeal to His Majesty in His Majesty's Privy Council against the said Judgment be granted to the said Charles Conrad Stollmeyer.

And this Court doth further Order that the said Charles Conrad Stollmeyer do within the period of three months from this date, either give security in a bond of Five hundred pounds sterling with one or more sureties to the satisfaction of this Honourable Court, or pay into Court the sum of Five hundred pounds sterling, for the due prosecution of the said appeal and for the payment of such costs as may become payable to the Respondents in the event of the Appellant not obtaining an Order granting him final leave

No. 63. Order granting conditional leave to appeal to His Majesty in Council, dated 2nd Feb., 1916 —*continued.*

to appeal or of the Appeal being dismissed for non-prosecution as may be awarded by His Majesty His Heirs and Successors, or by the Judicial Committee of the Privy Council to the Respondents on such Appeal.

And this Court doth further Order that all costs of and occasioned by the said Appeal shall abide the event of the said Appeal to His Majesty in His Privy Council if the said Appeal shall be allowed or dismissed or shall abide the result of the said Appeal in case the said Appeal shall stand dismissed for want of prosecution.

And this Court doth further Order that the said Plaintiff Charles Conrad Stollmeyer be at liberty to apply within three months from this date for a final order for leave to appeal as aforesaid on the production of a certificate under the hand of the Registrar of the Supreme Court of due compliance on his part with this Order.

And this Court doth further Order that the execution of the said Judgment of the 4th day of January 1916 be suspended pending the said Appeal.

T. A. THOMPSON, Registrar.

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## No. 64.

No. 64. Certificate of Registrar of Supreme Court, 23rd March, 1916.

### Certificate of Registrar of Supreme Court.

I hereby certify that the above-named Charles Conrad Stollmeyer, the Plaintiff in this action, has complied with the conditions imposed upon him in pursuance of the Order of the Full Court bearing date the 2nd day of February 1916 granting him leave to appeal to His Majesty in His Privy Council against the Judgment of the Court of Appeal bearing date the 4th day of January 1916.

Dated this 23rd day of March 1916.

T. A. THOMPSON, Registrar.

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## No. 65.

No. 65. Affidavit in support of Motion for final leave to Appeal. 25th March, 1916.

### Affidavit in support of motion for final leave to appeal to His Majesty in Council.

(Not printed.)

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RECORD.

*In the Appeal Court.*

No. 66. Notice of Motion for final leave to Appeal. 25th March, 1916.

## No. 66.

### Notice of motion for final leave to appeal to His Majesty in Council.

(Not printed.)

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No. 67. Order granting final leave to appeal to His Majesty in Council, 4th April, 1916.

## No. 67.

### Order granting final leave to appeal to His Majesty in Council.

On the 4th day of April 1916.

Present: Their Honours Mr. Justice Russell and Mr. Justice Wright.

Upon Motion made unto the Court this day by Counsel for the Plaintiff Charles Conrad Stollmeyer for an order granting him final leave to appeal to His Majesty in His Privy Council against the Judgment herein, dated the 13th day of May 1915, and the Order of the Full Court dated the 4th day of January 1916, and upon reading the affidavit of Charles Leonidas David, bearing date the 25th day of March 1916 and the Certificate of the Registrar of the Supreme Court dated the 23rd day of March 1916 respectively filed herein.

The Court doth Order that final leave be granted to the said Plaintiff herein to appeal to His Majesty in His Privy Council against the said Judgments dated the 13th day of May 1915 and the 4th day of January 1916.

T. A. THOMPSON, Registrar.

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No. 68. Certificate of Registrar of Supreme Court verifying Transcript, 13th April, 1916.

## No. 68.

### Certificate of Registrar of Supreme Court verifying Transcript.

I certify that the foregoing Two hundred and sixty four pages contain a true copy of the documents relating to the Appeal selected by the legal agents of the Plaintiffs and Defendants to be forwarded to the Clerk to the Privy Council of the evidence of the witnesses at the trial, of the Judgments of the Courts and of the exhibits.

Dated this 13th day of April 1916.

T. A. THOMPSON, Registrar.

# In the Privy Council.

No. 47 of 1916.

*On Appeal from the Supreme Court of Trinidad and Tobago.*

BETWEEN

CHARLES CONRAD STOLLMEYER
(*Plaintiff*) *Appellant,*

AND

THE PETROLEUM DEVELOPMENT COMPANY, LIMITED
(*Defendants*) *Respondents.*

# RECORD OF PROCEEDINGS.

MAPLES, TEESDALE & CO.,
6, Frederick's Place,
Old Jewry, E.C.,
*Appellant's Solicitors.*

ASHURST, MORRIS, CRISP & CO.,
17, Throgmorton Avenue, E.C.,
*Respondents' Solicitors.*