藥液直浸	一四五·五〇	二一四五〇	二三八·〇〇	二五四·五〇
清水直浸	二一五·〇〇	二一五·五〇	三一〇·五〇	二八五·五〇
二十四時間硬化後清水浸漬	二一五·五〇	二一五·五〇	二四七·〇〇	二八七·五〇

備考　せめんとぶりーけーとハ成形後直ニ脫型シテ水中ニ浸ストキハ崩壞シテ用ヲ爲サス又數時間ヲ經テ硬化シ始メタルモノハ藥液ニ浸スモ毫モ其作用ヲ減セサルコトヲ實驗セリ依テ脫型後三十分ヲ以テ淺水ヲ始メ爾後三十分ヲ經ルニ直ニ試沈シ其耐否ヲ試ミ二時間半ノモノニ至リテ甫メテ淺水ニ耐ユルモノヲ得タリ表中直淺トハ之レヲ指ス(完)

工學士　森垣龜二郎

會誌第一卷第四號ニ茂庭學士ノ述ヘラレタルせめんとト藥灰汁ノ關係ハ頗ル興味ヲ以テ拜讀致候爾來藥汁カせめんとノ硬化及強力ニ及ホス關係及範圍ニ關シ短日ナカラ試驗ヲ了シタルヲ以テ其結果ヲ左ニ申述候

一　藥五平方尺其重量二百六十九瓦ヲ一、二寸ニ切斷シ六五りーとるノ蒸溜水ニテ四時間煮沸シテ得タル四·一りーとるニ更ニ水ヲ加ヘテ六·五りーとるトナシ之ヲ第一液ト稱ス

一　前同樣ノ藥ノ重量三百三瓦ヲ六五りーとるノ蒸溜水中ニ約十七時間浸漬シタル液五·七りーとるヲ得タリ之ヲ第二液ト稱ス

右二液ノ比重ハ何レモ一·〇〇三ニシテ之ヲ混和液トシ農商務省告示せめんと試驗法ニヨリ凝結

試驗ヲ施シタルニ次ノ成績ヲ得タリ但シ使用せめんとハ何レモ淺野せめんと株式會社製品トス

使用セル混和水	混和水量%	試驗當時ノ室内温度 攝氏	始發凝ノ時間	終發凝ノ時間
淡水	25	17·5	4時31分	8時43分
第一液	〃	〃	6·13	10·32
第二液	〃	〃	6·10	11·06

即チ凝汁ヲ以テ混和セルモノハ淡水ヲ使用セルモノニ比シ始結時間ニ於テ一時間三十九分乃至一時間四十二分ヲ終結時間ニ於テ一時間四十九分乃至二時間二十三分ノ增加ヲ示セリ

次ニ淡水及前記二液ヲ混捏水トシテ純せめんとぶりけっとヲ及せめんと一砂三ノ配合ノ膠泥ぶりけっとヲ造リ之ヲ淡水第一第二液中ニ浸漬シ其耐伸及耐壓强ヲ試驗シタルニ次ノ結果ヲ得タリ但シ膠泥ニ使用セシ砂ハ農商務省告示標準砂ニシテ試驗片ハ各種六個ヲ作リ四個ノ平均ヲ示ス

(二) 淡水ニ浸漬セルモノ

混和水	週間	耐伸强 純せめんと 水量	強度	增加	もるたる 水量	強度	增加	耐壓强 もるたる 水量	強度	增加
淡水	一週	13%	50.20 kg.		6%	16.90 kg.		7%	79.50 kg.	
	二週	〃	61.15	10.95 kg.	〃	19.65	2.75 kg.	〃		
	四週	〃	74.05	12.90	〃	23.15	3.50	〃	129.75	50.25 kg.
第一	一週	〃	46.85		〃	14.60		〃	71.75	

一	二 週	〃	49.30	2.45	〃	16.75	2.15	〃		
液	四 週	〃	64.65	15.35	〃	22.15	5.40	〃	113.00	
第	一 週	〃	40.80		〃	13.50		〃	70.00	
二	二 週	〃	54.10	13.30	〃	17.25	3.75	〃		
液	四 週	〃	67.10	13.00	〃	22.30	5.05	〃	106.25	36.25

(11) 第1液ヲ煮沸セルモノ

混泥水	週間	耐	強					耐	壓	強
		純せめんと			もるたる			もるたる		
		水量	強度	増加	水量	強度	増加	水量	強度	増加
淡	一 週	13 %	52.75 kg.		6 %	16.15 kg.		7 %	95.50 kg.	
	二 週	〃	60.20	7.45 kg.	〃	19.45	3.30 kg.	〃		
水	四 週	〃	70.65	10.45	〃	21.60	2.15	〃	157.25	61.75
第	一 週	〃	40.25		〃	14.05		〃	79.25	
一	二 週	〃	51.70	11.45	〃	16.45	2.40	〃		
液	四 週	〃	62.65	10.95	〃	19.45	3.00	〃	78.50	−0.75
第	一 週	〃	46.70		〃	15.70		〃	79.00	
二	二 週	〃	55.65	8.95	〃	17.80	2.10	〃		

液	四週	,,	65.15	9.50	,,	21.10	3.30	,,	91.25	12.25

(ロ) 第二液ニ浸漬セルモノ

混淫水	週間	耐伸強 純せめんと 水量	強度	増加	耐伸強 もるたる 水量	強度	増加	耐壓強 もるたる 水量	強度	増加
淡水	一週	13 %	55.35 Kg.		6 %	17.25 Kg.		7 %	79.75 Kg.	
	二週	,,	61.45	6.10 Kg.	,,	19.25	2.00 Kg.	,,		
	四週	,,	71.65	10.20	,,	22.50	3.25	,,	165.00	85.25
第一液	一週	,,	42.95		,,	14.10		,,	69.50	
	二週	,,	51.75	8.80	,,	16.95	2.85	,,		
	四週	,,	63.20	11.45	,,	20.80	3.85	,,	101.50	32.00
第二液	一週	,,	45.75		,,	14.65		,,	69.00	
	二週	,,	54.15	8.40	,,	17.95	3.30	,,		
	四週	,,	65.65	11.50	,,	21.50	3.55	,,	95.75	26.75

前記結果ヲ對比ニ便セン爲メニ淡水ヲ以テ混淫シ一週間淡水ニ浸漬セシモノヲ一〇〇トシ其他ヲ百分率ヲ以テ表ハセハ左ノ如シ

(イ) 純せめんと耐伸張（百分率）

浸漬用水	混涅水	一週 %	二週 %	四週 %
淡水	淡水	100.00	121.80	147.50
	第一液	93.30	98.20	128.80
	第二液	81.30	107.80	133.70
第一液	淡水	105.10	119.90	140.70
	第一液	80.20	103.20	124.80
	第二液	93.00	110.90	129.80
第二液	淡水	110.30	122.40	142.70
	第一液	85.60	103.10	125.90
	第二液	91.10	107.90	130.80

(二) せめんと膠泥耐伸强（百分率）

但シ混涅水ハ淡水ヲ用ヒ淡水ニ浸漬シ一週間經過セシモノヲ100トス

浸漬用水	混涅水	一週 %	二週 %	四週 %
淡水	淡水	100.00	116.30	137.00
	第一液	86.40	99.10	131.10
	第二液	79.90	102.10	132.00

201

第一液	淡水	95.60	115.10	127.80
	第一液	83.10	97.30	115.10
	第二液	92.90	105.30	124.90
第二液	淡水	102.10	113.90	133.10
	第一液	83.40	100.30	123.10
	第二液	86.70	106.20	127.20

(三) せめんと膠泥耐壓强 (百分率)　但シ混捏水ハ淡水ヲ用ヒ淡水ニ浸漬シ一週間ヲ經過セシモノヲ 100 トス

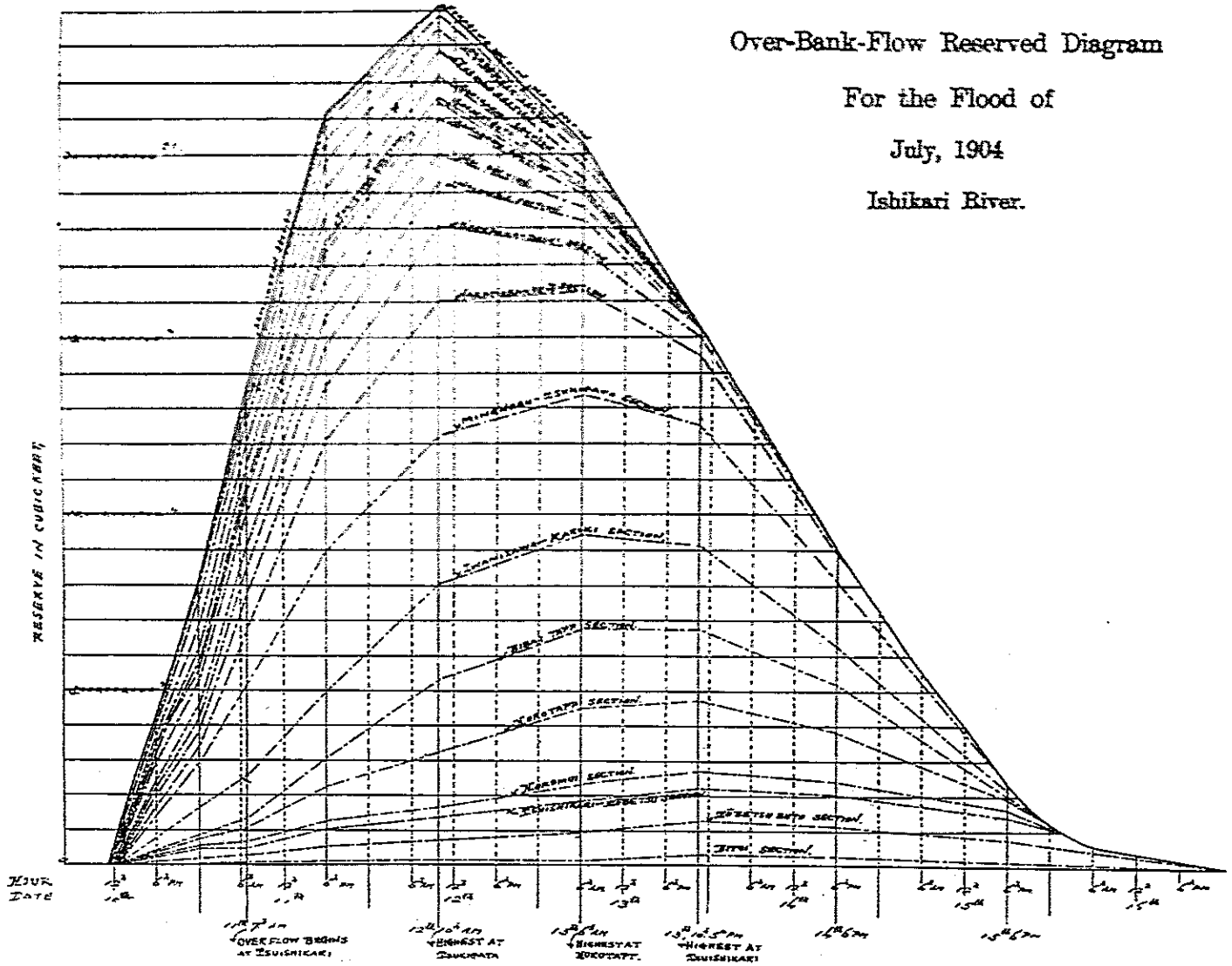
浸漬用水	混捏水	一週 %	二週 %	四週 %
淡水	淡水	100.00		163.20
	第一液	90.30		142.10
	第二液	88.10		133.60
第一液	淡水	120.10		197.80
	第一液	99.70		98.70
	第二液	99.40		114.80
第	淡水	100.30		207.50

Over-Bank-Flow Reserved Diagram

For the Flood of

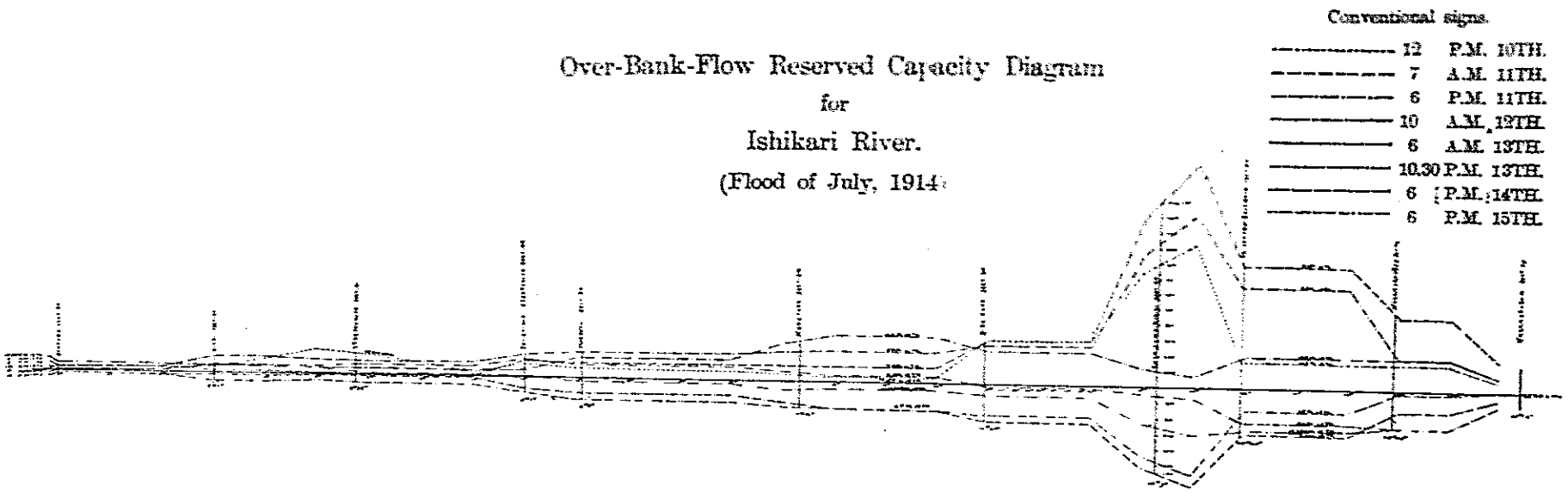
July, 1904

Ishikari River.

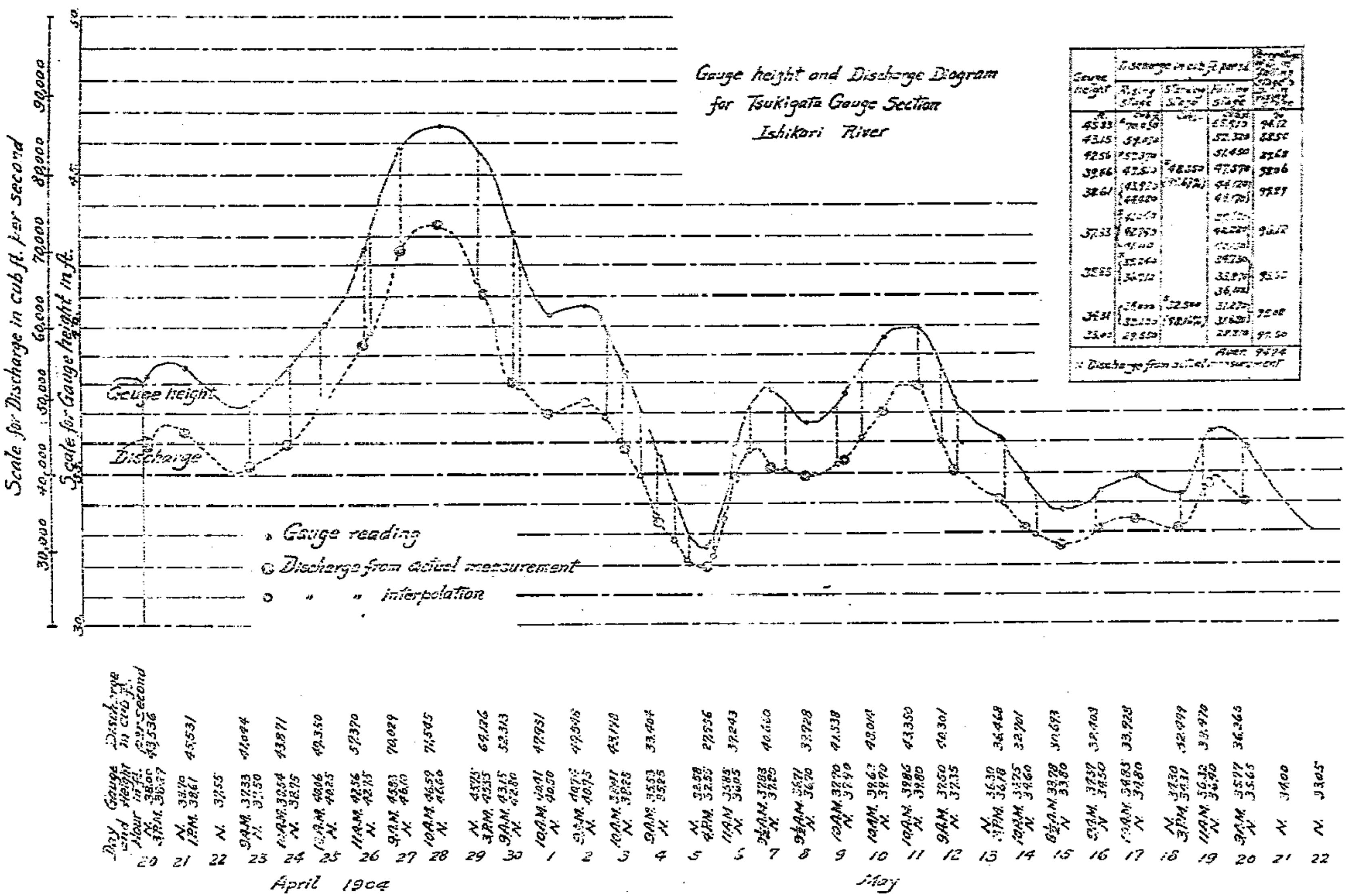


第二圖版

Over-Bank-Flow Reserved Capacity Diagram
for
Ishikari River.
(Flood of July, 1914)

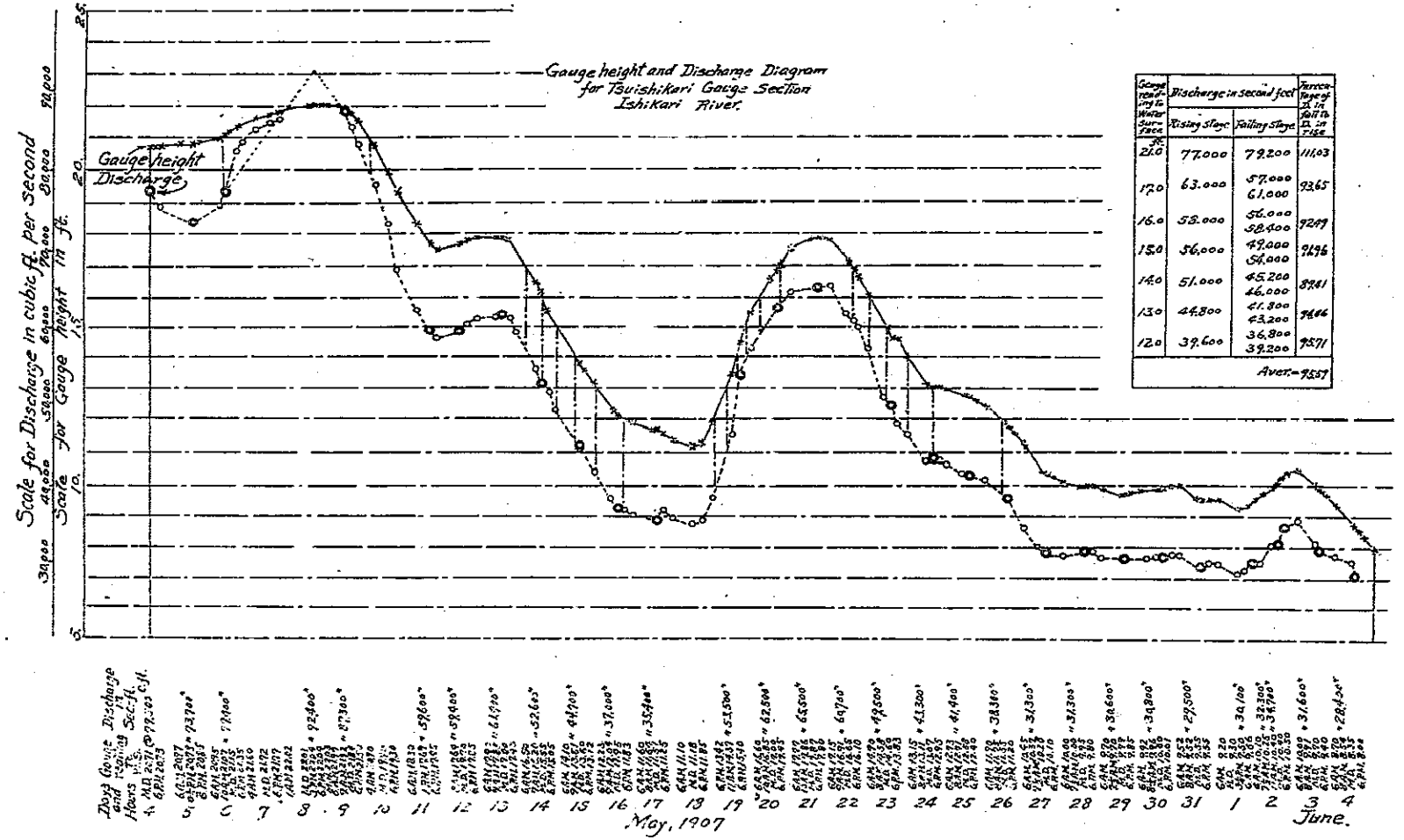


第三圖版



Gauge height and Discharge Diagram
for Tsukigata Gauge Section
Ishikari River
Scale for Discharge in cub ft. per second
30,000 40,000 50,000 60,000 70,000 80,000 90,000
Scale for Gauge height in ft.
30 35 40 45 50
Gauge height
Discharge
Gauge reading
Discharge from actual measurement
" " interpolation
Gauge height
Discharge in cub ft. per sec.
Rising Stage
Standing Stage
Falling Stage
Discharge from actual measurement
Day and Hour / Gauge Height in ft. / Discharge in cub ft. per second
20 N. 38.00 3P.M. 38.37 43,536
21 N. 38.70 1P.M. 38.61 45,531
22 N. 37.55
23 9A.M. 37.33 N. 37.50 41,094
24 10A.M. 38.54 N. 38.75 43,871
25 10A.M. 40.06 N. 40.25 49,350
26 11A.M. 42.56 N. 42.75 57,370
27 9A.M. 45.83 N. 46.10 70,029
28 10A.M. 46.59 N. 46.60 71,545
29 N. 45.75 3P.M. 45.35 64,136
30 9A.M. 43.15 N. 42.80 52,313
1 10A.M. 40.41 N. 40.50 47,951
2 9A.M. 40.76 N. 40.75 49,546
3 10A.M. 38.41 N. 38.25 43,140
4 9A.M. 35.53 N. 35.25 33,404
5 N. 32.58 4P.M. 32.55 27,536
6 11A.M. 35.85 N. 36.05 37,243
7 9½A.M. 37.83 N. 37.80 40,660
8 9½A.M. 36.71 N. 36.70 37,728
9 10A.M. 37.70 N. 37.90 41,338
10 10A.M. 39.63 N. 39.70 43,014
11 10A.M. 39.86 N. 39.80 43,350
12 9A.M. 37.50 N. 37.35 40,301
13 N. 36.30 3P.M. 36.18 36,468
14 10A.M. 34.75 N. 34.60 32,701
15 8½A.M. 33.78 N. 33.80 30,693
16 9A.M. 34.37 N. 34.50 32,403
17 10A.M. 34.85 N. 34.80 33,928
18 N. 34.30 3P.M. 34.31 32,999
19 11A.M. 36.32 N. 36.40 33,970
20 9A.M. 35.77 N. 35.65 36,265
21 N. 34.00
22 N. 33.05
April 1904
May

第四圖版



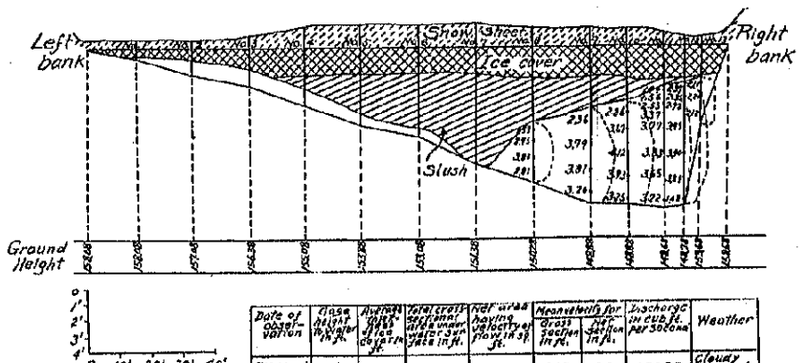
Gauge reading in Water Surface	Discharge in second feet		Percentage of A in fall B in 7156
	Rising Stage	Falling Stage	
Ft. 21.0	77.000	79.200	111.03
17.0	63.000	57.000 61.000	93.65
16.0	58.000	56.000 58.400	92.49
15.0	56.000	49.000 54.000	91.96
14.0	51.000	45.200 46.000	89.81
13.0	44.800	41.800 43.200	94.86
12.0	39.600	36.800 39.200	95.71
			Aver.=93.57

第五版圖

圖一第

Gage Section at Fukagawa

March 13, 1908

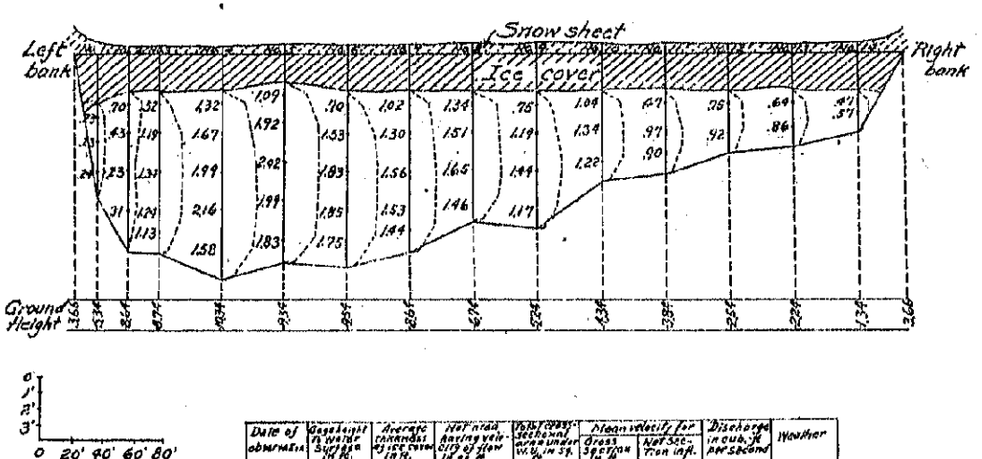


Date of observation	Gage Height in Water Surface in Ft.	Area of Section in Sq. Ft.	Total cross-section area under water in Sq. Ft.	Net area having velocity of flow in Sq. Ft.	Mean velocity for Gross Section in Ft.	Mean velocity for Net Section in Ft.	Discharge in cub. ft. per Second	Weather
P.M. March 11, 1908	158'58	1.8	1,021.0	480.3	1.22	2.60	1,248.2	Cloudy N. Wind
A.M. March 12, 1908	158'56	1.8	1,021.0	439.2	1.09	2.54	1,114.3	Snowy N. Wind
A.M. March 13 1908	158'69	1.8	1,021.0	468.4	1.17	2.47	1,195.6	Snowy W. Wind

圖二第

Gage Section at Tsuishikari

Feb. 25, 1908

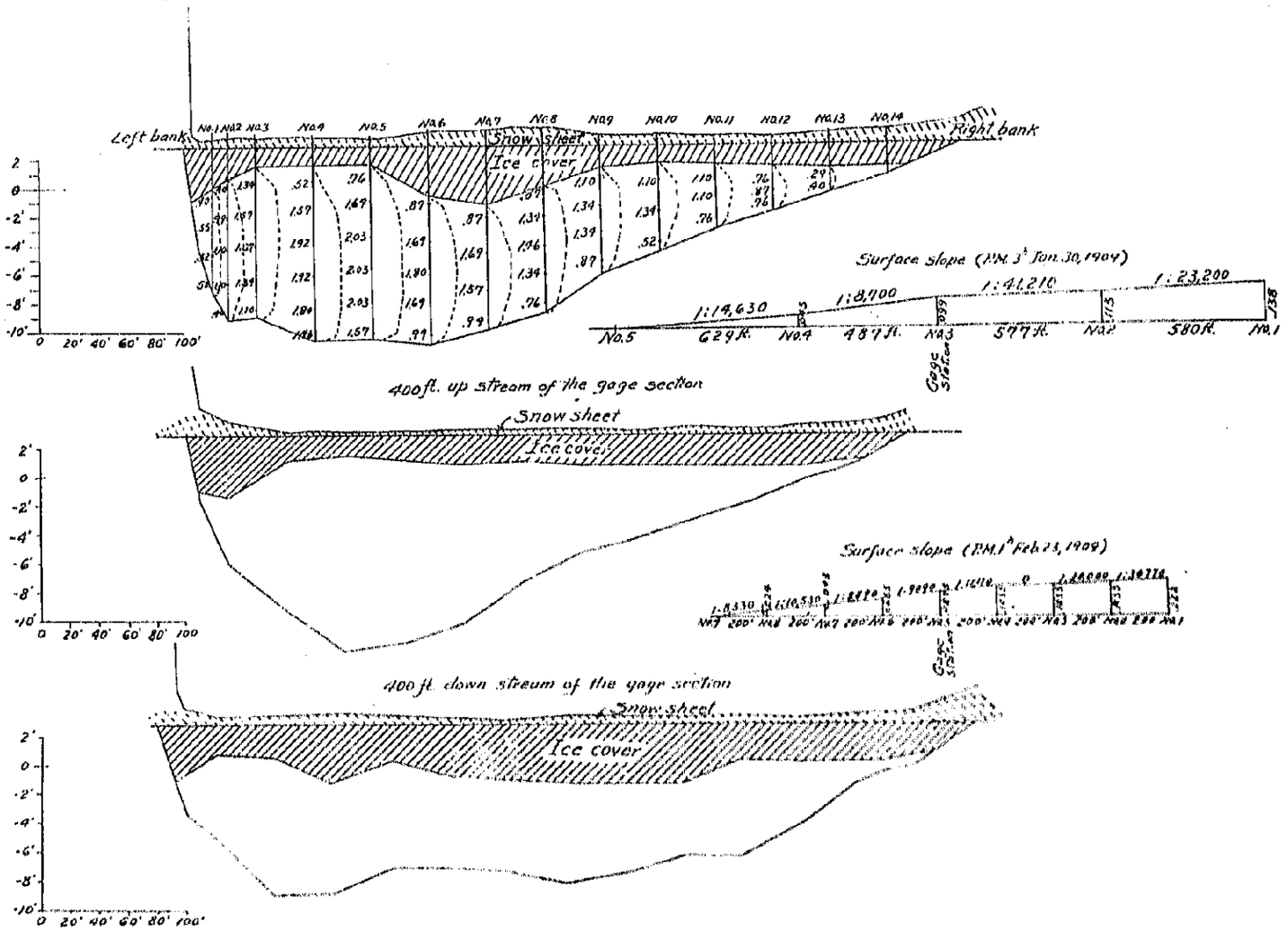


Date of observation	Gage Height in Water Surface in Ft.	Average thickness of ice cover in Ft.	Net area having velocity of flow in Sq. Ft.	Total cross-section area under W. S. in Sq. Ft.	Mean velocity for Gross Section in Ft.	Mean velocity for Net Section in Ft.	Discharge in cub. ft. per Second	Weather
A.M. Feb. 22, 1908.	3.64	2.0	3693.0	5006.5	0.94	1.28	4,723.7	Fine Calm
A.M. Feb. 23, 1909	3.92	"	3732.3	5056.8	0.93	1.26	4,718.8	Cloudy W. Wind
A.M. Feb. 24, 1908	3.80	"	3568.0	5036.8	0.83	1.17	4,180.9	Fine W. Wind
A.M. Feb. 25. 1908	3.66	"	3658.5	5006.5	0.93	1.27	4,639.9	Fine calm
P.M. March 16, 1908	3.95	"	3422.8	4936.0	0.99	1.26	4,336.2	" "
" "	3.48	"	3281.3	4936.0	0.87	1.31	4,317.9	" "

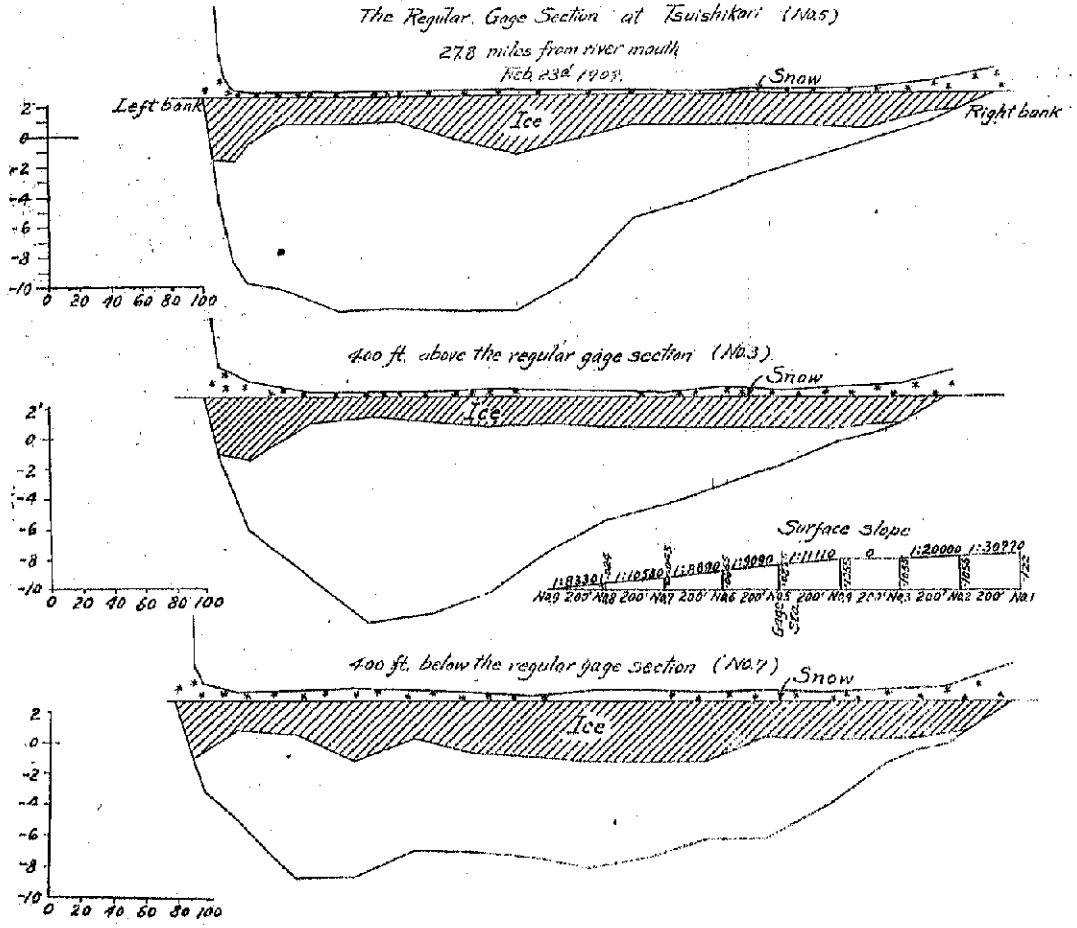
圖三第

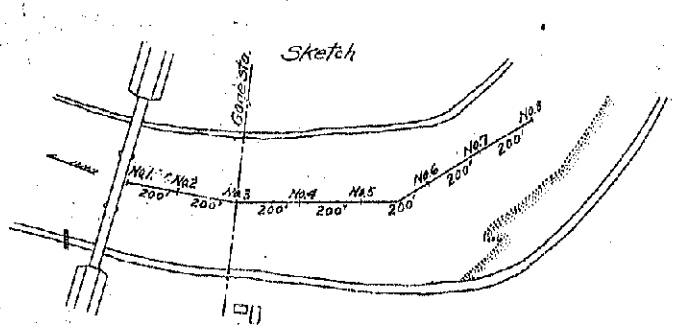
Gage Section at Tsuishikari

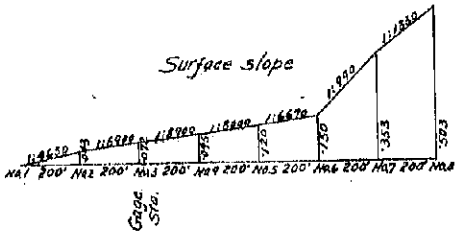
Jan. 30, 1909



第六圖版







At Tsuishikari

Area of cross-section having velocity of flow at the section	No. 5	3,303 sq. ft.
" " " " " " "	No. 7	2,930 "
	Average A =	3,160 "
Length of contact between the flowing water and the river bottom	No. 5	470 ft.
" " " " " " "	No. 7	484 "
	Average P =	477 "
Length of contact between the flowing water and the ice	No. 5	466 "
" " " " " "	No. 7	480 "
	Average P' =	473 "
Real discharge		Q = 4,715 cub. ft. per second
Hydraulic gradient really observed (No. 4—No. 9)		S = 1 : 9,480

$$\frac{Q}{A}=C\sqrt{RS} \qquad \frac{4,115}{3,160}=C\sqrt{\frac{3,160}{477+473}\times\frac{1}{9,480}} \qquad C=69.51$$

Coefficient of roughness for ice and river bottom combined n = .0202

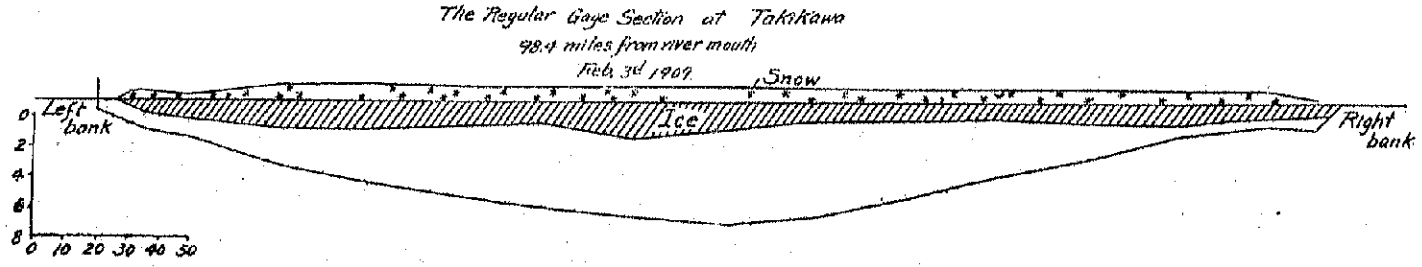
Notice. Hydraulic gradient above section No. 4 is considerably different from that below. On that account the cross-sectional area of No. 3 was not taken into the computation.

At Takikawa Gage Station

Area of cross-section having velocity of flow	A = 1,455 sq. ft.
Length of contact between the flowing water and the river bottom	P = 411 ft.
" " " " " " the ice	P' = 408 "
Real discharge	Q = 1,702 cub. ft. per second
Hydraulic gradient really observed (No. 1—No. 6)	S = 1 : 6,667

$$\frac{Q}{A}=C\sqrt{RS} \qquad \frac{1,702}{1,455}=C\sqrt{\frac{1,455}{411+408}\times\frac{1}{6,667}} \qquad C=71.67$$

Coefficient of roughness for ice and river bottom combined n = .0219



第一表

Discharge Measurements under Ice Condition for Ishikari River and its Tributaries. 1908—1909.

River name	Gage station	Date of observation	Temperature Centigrado. At noon at the site.	Temperature Centigrado. Average of day & night total dr. area.	Weather	Gage reading to W. S. in ft.	Thickness of ice in ft. Max.	Thickness of ice in ft. Mean.	Thickness of ice in ft. Min.	Snow depth over ice cover in ft.	Width of stream in ft.	Gross sectional area under water surface in sq. ft.	Mean depth in ft.	Net sectional area having velocity in sq. ft.	Ratio of net to gross sectional area per cent.	Mean velocity in ft. Gross area	Mean velocity in ft. Net area	Actual discharge in cub. ft. per second.	Ratio of mean to mid depth velocity. No. of vertical velocity curves.	Ratio of mean to mid depth velocity. percent.	Length of river up stream of gage station in miles.	Drainage area up stream of gage station in sq. miles.	Discharge per sq. mile in cub. ft. per sec.	Discharge from open water discharge curve in cub. ft. per sec.	Ratio of actual to open water discharge percent.	Remarks
Ishikari	Bannaguro (2ft 90 Left bank).	A.M. 11h Feb. 15, 1908	3°	−1.°5	Cloudy W. High wind	2.11	5.0	1.7	1.0	0.5	641.0	11,867.0	18.5	7,421.3	63	0.38	0.61	4,495.2	7	93	219.6	5,023.8	0.81			The portion lower than the plane 19.7 ft. below W.S. is stagnant salt W
,,	,,	,, 10h ,, 16, ,,	−2	−5.0	,, intermit snow fall ,,	2.21	5.0	1.7	1.0	0.5	,,	11,923.0	18.6	5,192.0	44	0.22	0.50	2,581.5	8	88	,,	,,	0.45			Do. (Flow tide).
,,	,,	,, 11h ,, 17, ,,	−3	−0.6	,, W. strong wind.	1.96	5.5	1.9	1.2	0.5	,,	11,800.4	18.4	7,605.0	64	0.42	0.65	4,920.0	12	87	,,	,,	0.87			Do. 21.5 ft. below W.S. is salt W. (,,)
,,	,,	,, 11h ,, 18, ,,	−4	−0.5	Snow S.E. Brisk wind.	1.61	5.0	2.1	1.5	0.5	,,	11,008.2	18.1	7,008.0	68	0.51	0.74	5,191.1	13	89	,,	,,	1.00			Do. 21.6 ft. below ,, ,, (Ebb tide).
,,	Tsuishikari Gage Station.	A.M. 10h Feb. 22, 1908	2	1.7	Fine Calm.	3.60	3.2	2.6	1.9	0.5	625.0	5,005.5	9.5	3,683.0	74	0.94	1.28	4,723.7	12	85	200.7	5,891.1	0.87			
,,	,,	,, ,, ,, 23, ,,	−3	−5.2	Cloudy W. storm.	3.92	3.0	2.6	1.9	0.5	,,	5,050.8	9.6	3,732.3	74	0.93	1.26	4,718.8	,,	86	,,	,,	,,			
,,	,,	,, ,, ,, 24, ,,	0	−5.3	Fine W. Brisk wind.	3.80	3.2	2.8	2.5	0.5	,,	5,050.8	9.6	3,608.0	71	0.83	1.17	4,180.8	10	87	,,	,,	0.77			
,,	,,	,, ,, ,, 25, ,,	4	−4.8	,, Calm.	3.66	3.2	2.8	2.5	0.5	,,	5,005.5	9.5	3,658.5	73	0.93	1.27	4,639.0			,,	,,	0.86			
,,	,,	P.M. 2h Mar. 10, ,,	−2	−3.7	,, ,,	3.46	3.2	2.7	2.5	0.6	,,	4,980.0	9.3	3,422.8	68	0.88	1.28	4,386.2	11	87	,,	,,	0.81			
,,	,,	,, 5h ,, ,, ,,	−2	−3.7	,, ,,	3.48	3.2	2.7	2.5	0.6	,,	4,936.0	9.3	3,281.3	66	0.87	1.31	4,328.0	,,	85	,,	,,	0.81			
,,	,,				Mean	3.05											Mean	4,486.2						8,380.0	53	
,,	,,	P.M. 3h Jan. 27, 1909	−7.5	−5.3	,, ,,	2.90	3.7	1.9	1.1	0.8	530.0	4,715.0	8.0	3,087.0	78	0.95	1.22	4,496.0	—	—	,,	,,	0.83			
,,	,,	A.M. 11h ,, 28, ,,	−3	−6.7	,, ,,	2.87	4.3	2.0	1.1	0.8	,,	4,723.0	8.9	3,647.0	77	0.92	1.19	4,357.2	—	—	,,	,,	0.81			
,,	,,	,, ,, ,, 30, ,,	−7	−9.5	,, N. Brisk wind.	2.76	4.1	1.9	1.2	0.8	,,	4,562.5	8.6	3,535.0	,,	0.94	1.22	4,297.8	—	—	,,	,,	0.79			
,,	,,	,, ,, Feb. 5, ,,	−6	−10.1	Cloudy N.W. Strong Wind.	3.06	4.1	2.0	1.3	1.0	,,	4,536.0	8.6	3,478.0	,,	0.92	1.20	4,183.4	—	—	,,	,,	0.78			Ebb tide 24° F.
,,	,,	,, ,, ,, 23, ,,	−4	−6.7	Snow.	2.60	4.2	2.5	1.2	0.4	,,	4,711.0	8.0	3,393.0	72	0.87	1.21	4,115.2	—	—	,,	,,	0.70			High tide 10° F.
,,	,,	P.M. 11h ,, ,, ,,	−4	−6.7	Fine Calm.	2.73	4.3	2.4	1.2	0.4	,,	4,808.5	9.1	3,512.5	73	0.74	1.02	3,570.2	—	—	,,	,,	0.60			Ebb tide 2° F.
,,	,,	A.M. 5h ,, 24, ,,	−3	−4.1	,, ,,	2.63	4.8	2.4	1.2	0.4	,,	4,759.0	9.0	3,471.0	,,	,,	1.02	3,523.0	—	—	,,	,,	0.65			
,,	,,	P.M. 1h Mar. 23, ,,	2	1.7	,, ,,	2.84	4.6	2.4	1.5	0.7	,,	4,628.0	8.7	3,318.0	72	0.96	1.33	4,436.0	—	—	,,	,,	0.82			
,,	,,				Mean	2.80											Mean	4,123.5						6,722.0	61	
,,	Tsukigata Gage Station.	P.M. 1h Feb. 28, 1908	—	−0.5	Fine Calm.	25.35	6.0	3.0	3.1	1.2	433.0	3,901.4	9.0	2,586.7	66	0.69	1.04	2,695.5	10	79	166.0	3,665.5	0.74			
,,	,,	A.M. 10h ,, 29, ,,	—	−6.5	,, ,,	25.36	3.0	3.0	3.1	1.1	,,	3,909.0	9.0	2,546.1	65	0.67	1.02	2,606.8	12	80	,,	,,	0.71			
,,	,,	,, ,, Mar. 1, ,,	—	−4.5	Snow N. wind.	25.36	3.0	3.0	3.1	1.1	,,	,,	9.0	2,604.0	67	0.69	1.08	2,807.0	13	,,	,,	,,	0.77			
,,	,,	,, 8h ,, 2, ,,	—	−3.0	,, N. Brisk wind.	25.30	3.0	3.0	3.1	1.1	,,	3,859.4	8.9	2,521.0	65	0.71	,,	2,729.0	13	81	,,	,,	0.74			
,,	,,				Mean	25.34											Mean	2,709.0						10,400.0	26	
,,	400 ft. up stream of highway bridge at Takikawa.	P.M. 1h Mar. 3, 1908	3	−4.7	Snow Breeze.	75.31	2.0	2.1	0.4	0.7	408.0	2,266.3	5.6	1,587.0	70	0.86	1.22	1,942.3	11	80	134.2	2,259.5	0.86			
,,	,,	A.M. 10h ,, 4, ,,	1	−6.0	Cloudy Brisk wind.	75.32	2.8	2.1	1.0	0.7	,,	2,270.3	,,	1,566.0	69	0.83	1.21	1,889.1	10	84	,,	,,	0.81			
,,	,,	P.M. 2h ,, 5, ,,	−2	−5.4	,, Breeze.	75.25	2.8	2.1	1.0	0.7	,,	,,	,,	1,539.0	68	0.81	1.20	1,842.0	9	81	,,	,,	0.82			
,,	,,				Mean	75.29											Mean	1,891.1						5,108.0	37	
,,	,,	P.M. 2h Feb. 1, 1909	2	−1.9	Cloudy Calm.	74.70	1.0	1.3	0	0.9	412.5	1,966.9	4.8	1,423.9	72	0.77	1.06	1,509.8	—	—	,,	,,	0.67			
,,	,,	,, ,, ,, 8, ,,	1	−3.9	,, ,,	74.88	1.8	1.4	0	0.9	,,	2,022.8	4.9	1,455.5	,,	0.84	1.17	1,702.3	—	—	,,	,,	0.75			
,,	,,	,, ,, ,, 18, ,,	4	−5.3	Fine ,,	75.10	2.4	1.8	0	0.3	,,	2,083.9	5.1	1,344.0	64	0.75	1.16	1,560.5	—	—	,,	,,	0.69			
,,	,,	,, ,, Mar. 19, ,,	3	−2.1	Snow.	75.10	3.1	2.1	0	1.1	,,	2,170.5	5.3	1,290.0	60	0.66	1.11	1,433.2	—	—	,,	,,	0.64			
,,	,,				Mean	75.00											Mean	1,550.7						4,500.0	34	
,,	Fukagawa Gage Station.	P.M. 2h Mar. 11, 1908	0	−4.2	Cloudy N. Brisk wind.	158.58	2.1	1.8	0.6	1.1	204.0	1,021.0	5.0	480.3	47	1.22	2.60	1,248.2	5	83	105.6	1,401.2	0.89			
,,	,,	A.M. 10h ,, 12, ,,	−1	−3.4	,, N. Strong wind.	158.56	2.1	1.8	0.6	1.1	,,	,,	,,	439.2	43	1.09	2.54	1,116.3	,,	81	,,	,,	0.79			
,,	,,	,, ,, ,, 13, ,,	0	−1.6	Snow W. Brisk wind.	158.68	2.1	1.8	0.6	1.1	,,	,,	,,	448.4	44	1.17	2.67	1,195.5	,,	83	,,	,,	0.80			
,,	,,				Mean	158.61											Mean	1,186.7						2,290.0	52	
Toyohira	60 ft. down stream of Tsuishikari Bridge.	P.M. 1h Feb. 23, 1908	−3	−5.2	Snow W. Strong wind.	5.05	2.0	2.1	1.7	0.5	110.5	494.1	4.5	273.7	55	0.53	0.96	263.3	4	85	50.3	320.2	0.82			
,,	,,	A.M. 8h ,, 24, ,,	0	−5.9	Fine W. Brisk wind.	4.95	2.0	2.1	1.7	0.5	,,	483.6	4.4	263.2	54	0.52	0.94	249.6	—	—	,,	,,	0.77			
,,	,,	P.M. 1h ,, 25, ,,	4	−4.8	,, Calm.	4.95	2.5	1.9	1.4	0.5	,,	,,	,,	271.6	56	0.55	0.98	260.4	—	—	,,	,,	0.81			
,,	,,	A.M. 10h Mar. 15, ,,	—	−3.7	,, ,,		3.2	2.8	2.5	0.5	,,	513.5	4.6	274.7	53	0.54	1.01	279.4	5	86	,,	,,	0.87			
,,	,,	P.M. 1h Jan. 28, 1909	−3	−6.7	,, ,,	—	1.8	1.4	1.0	0.9	111.0	383.0	3.5	224.0	58	0.48	0.82	184.7	—	—	,,	,,	0.58			
,,	,,	,, 9h ,, 29, ,,	−4.5	−6.9	,, ,,	—	1.9	1.5	1.1	0.9	,,	383.8	,,	212.4	55	0.55	0.99	210.8	—	—	,,	,,	0.66			
,,	,,	,, 2h Feb. 5, ,,	−6	−10.1	,, N. W. Breeze.	—	2.2	1.7	1.1	1.0	,,	385.1	,,	194.0	51	0.38	0.75	144.9	—	—	,,	,,	0.45			
,,	,,	,, 1h ,, 22, ,,	−2	−5.9	Snow N.W. Strong wind.	—	2.1	1.6	1.1	0.4	,,	388.1	,,	210.3	54	0.44	0.80	169.0	—	—	,,	,,	0.53			
,,	,,	,, 3h Mar. 23, ,,	2	−1.7	Fine warm day.	—	2.3	1.7	1.1	0.3	,,	404.0	3.7	213.0	53	0.52	0.99	209.8	—	—	,,	,,	0.66			
,,	180 ft. down stream of Adsuma Bridge.	A.M. 11h Feb. 10, ,,	2.5	0.7	,, ,, ,,	—	5.3	2.3	1.1	0.8	105.0	541.8	5.2	290.5	54	0.27	0.50	143.9	—	—	38.0	259.6	0.57			
Ebetsu	120 ft. up stream of Ebetsu Bridge.	P.M. 3h Feb. 25, 1908	—	−4.8	Fine Calm.	6.22	2.4	2.0	1.6	0.5	189.5	1,077.5	5.8	682.1	63	0.76	1.19	816.0	6	85	112.8	932.7	0.87			
,,	,,	A.M. 9h ,, 26, ,,	—	−6.0	Snow W. wind.	6.16	2.4	2.0	1.6	0.5	,,	1,059.6	5.8	678.2	64	0.85	1.33	912.2	4	79	,,	,,	0.97			
,,	,,	,, 10h Mar. 15, ,,	—	−3.7	Fine Calm.	6.33	2.2	2.0	1.6	0.5	,,	1,103.0	5.8	631.4	57	0.98	1.72	1,089.2	7	85	,,	,,	1.18			
,,	,,	P.M. 1h Jan. 29, 1909	—	−5.9	,, ,,	6.64	1.8	1.3	0.4	0.7	193.5	1,056.1	5.5	811.1	77	0.91	1.19	965.0	—	—	,,	,,	1.03			
,,	,,	M. ,, 31, ,,	—	−7.9	Snow.	5.98	1.7	1.2	0.4	0.7	,,	1,002.9	5.2	769.5	,,	0.70	0.92	705.0	—	—	,,	,,	0.76			
,,	,,	,, Feb. 4, ,,	—	−5.4	Cloudy very cold.	5.63	1.8	1.4	0.6	0.8	,,	1,032.6	5.3	772.0	75	0.85	1.13	880.1	—	—	,,	,,	0.94			
,,	,,	A.M. 9h ,, 22, ,,	—	−5.9	Cloudy intermit snow.	5.52	1.9	1.5	0.9	0.3	,,	1,027.6	,,	732.3	71	0.73	1.02	747.8	—	—	,,	,,	0.80			
Yûbari	Kutlari Gage Station.	A.M. 10h Feb. 20, 1908	−1	−3.0	Snow W. Strong wind.	48.22	3.2	2.7	0.2	1.0	113.0	570.0	5.0	302.5	53	0.26	0.50	150.4	—	—	87.2	448.8	0.34	1,300.0	12	Notice. Gage reading to water surface is done, when the water rises through the hole in the ice and becomes stationary.
Horomui	60 ft. down stream of Horomui Bridge.	P.M. 2h Feb. 26, 1908	−6	−8.0	Snow W. Strong wind.	7.71	3.5	3.0	2.5	0.5	99.5	934.1	10.3	664.7	71	0.14	0.20	132.2	—	—	28.0	233.3	0.57			
Bibai	72 ft. down stream of the crossing of Minenobu Tsukigata road.	P.M. ,, Feb. 27, 1908	—	−0.5	Fine, Calm.	2.45	2.9	1.5	0	0.3	31.1	105.5	3.4	57.0	54	0.39	0.72	41.3	—	—	31.0	69.0	0.60			
Shibetsu	Mouth to Ishikari river.	P.M. 1h Mar. 1, 1908	−2	−4.0	Snow, Calm.	25.30	0	0	0	0	21.0	15.2	0.7	15.2	100	1.73	1.73	26.3	—	—	14.0	22.0	1.19			
Sorachi	120 ft. up stream of railway bridge.	P.M. 3h Mar. 3, 1908	−2	−4.7	Fine, Calm.	70.09	2.5	2.1	1.8	0.9	181.5	770.0	5.7	331.0	43	0.91	2.10	697.4	3	82	110.7	1,058.9	0.66			
,,	,,	,, 1h ,, 5, ,,	0	−5.4	Cloudy Strong wind.	70.05	2.5	2.1	1.8	0.9	,,	,,	,,	294.8	38	0.82	2.12	634.5	2	70	,,	,,	0.60			
,,	,,				Mean	70.07											Mean	666.0						3,200.0	21	
,,	,,	P.M. 1h Feb. 2, 1909	1	−0.7	Fine, Calm.	78.81	3.7	2.2	0.7	0.8	208.0	737.0	3.7	295.2	40	0.89	2.23	658.5	—	—	,,	,,	0.62			
,,	,,	A.M. 10h ,, 3, ,,	1	−3.9	,, after fog.	78.85	2.4	2.1	0.7	0.8	,,	741.9	,,	309.2	42	0.91	2.17	672.4	—	—	,,	,,	0.64			
,,	,,	,, 11h ,, 19, ,,	4	−2.1	,, Calm.	79.31	7.7	5.5	0.2	0.6	140.0	1,147.7	7.9	347.3	30	0.52	1.71	594.8	—	—	,,	,,	0.56			
,,	,,	,, ,, Mar. 19, ,,	0	−3.4	Snow.	79.10	4.8	4.7	0	2.3	,,	1,096.8	7.5	414.8	38	0.46	1.22	505.7	—	—	,,	,,	0.48			
Uriu	Kofugi Gage Station.	P.M. 9h Mar. 6, 1908	1	−5.9	Cloudy W. Brisk wind.	114.74	3.8	2.9	2.0	1.7	172.0	1,212.5	7.0	713.0	60	0.31	0.53	380.0	7	84	113.8	650.0	0.59			
,,	,,	A.M. 9h ,, 7, ,,	−1	−8.9	Fine Calm.	114.77	3.8	2.9	2.0	1.7	,,	1,202.6	,,	718.0	,,	,,	0.52	375.8	,,	,,	,,	,,	0.57			
,,	,,				Mean	114.76											Mean	378.0						700.0	64	

第一液	87.40		127.70
第二液	86.80		120.40

以上ノ結果ニ由ッテ見レハ第一、第二液ヲ以テ混和セルモノハ淡水ヲ使用セシモノニ比シ強度低減セラレ凝結時間ノ遅延ヲ來ス事明ナリ蓋シ藥汁中ノ溶解性不純物ハせめんと-各分子ノ凝結力ヲ減殺セシムルノ傾向ヲ有スルカ如シ今試ニ藥片ヲ採リ之ヲ五時間煮沸スルニ液中ニ溶解シ去リタルモノハ重量ハ約六.八ぺるせんとニシテ液ハ褐黒濁狀ヲ呈シ藥ノ特臭ヲ有シ反應中性ニシテ空氣中ニ放置スレハ醱酵シテ炭酸瓦斯ヲ發シ液面ニハ容易ニ黴ヲ生ス今本液ヲ蒸發乾燥セシメテ有機物質ヲ燒却シタル後重量ヲ計レハ無機物質ハ約一.二三ぺるせんとニシテせめんとノ硬化ニハ著シキ障碍ヲ及ホスモノトハ認メ難キモ前記ノ如キ褐黒色ヲ呈スル有機性物質ノ含有スル液ヲ混用スル場合ニ在リテハ膠泥又ハ混凝土ノ硬化及強度上ニハ注意スヘキ障害ヲ生スルモノタルハ疑フ可カラス

然レトモ混凝土工事ニ於ケル藥莚ノ使用ハ日光又ハ寒氣ノ影響ヲ緩和スルノ方法トシテ表面ノ被覆ニ留ルヲ以テ前記ノ如キ著シキ障害ヲ存スヘキモノニ非ラサルハ勿論藥莚ノ如キ價格比較的低廉ニシテ之ヲ得ルニ容易ニ其取扱利便ナルモノハ他ニ之ヲ求メ難キヲ以テ前記理由ニヨリテ直ニ之ヲ排斥スヘキモノニアラス唯藥莚ヲ使用スル場合ニ在リテハ混凝土ノ未タ硬化ヲ終ラサルニ過度ノ撒水其他ニヨリ藥汁ノ混凝土内ニ著シク滲透スルカ如キハ之ヲ避ケサル可カラス又鐵筋混凝土工事ニ在リテハ使用鐵筋材ノ爲メニ往々藥片ノ型枠内ニ飛散スルカ爲ニ此部ニ於ケル混凝土ヲシテ著シク多孔ナラシムルヲ免レサルヲ以テ鐵筋混凝土工ノ如キハ專ロ帆布類ヲ使用スルヲ以テ便ナリトス(完)