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REPORT ON THE WEATHER AND STATE OF THE RIVER FOR JANUARY 1933.

The Weather.

The weather during January was on the whole cooler than usual for the first half of the month and very mild for the second half.

The depression which was situated over Cyprus at the end of December persisted until January 5, during which period rain, usually light, fell daily along the coast, while a few showers also occurred inland. Subsequently a high pressure system was established extending from the Black Sea to Egypt, and fresh to strong easterly winds with cooler weather prevailed. At Helwan the wind reached a velocity of 71 kilometres per hour on the 8th and very dense duststorms took place near Cairo on the morning of that day.

With the breakdown of the high pressure on the 10th the wind went round to the west. A depression appeared near Malta and deepened rapidly, and on the 12th there were in addition shallow depressions off Port Said, and over the Gulf of Suez. There was considerable low cloud and some mist, followed during the night by light but remarkably extensive showers, occurring as they did throughout Egypt, including the oases of the western desert, Upper Egypt as far as Aswân, and the northern part of the Red Sea, as well as Lower Egypt.

A rapid fall of temperature took place on the 17th when there was further rain throughout Lower Egypt. Even at Siwa Oasis the amount recorded on that day reached 12 millimetres. Conditions however rapidly improved and the weather became much milder, as Egypt came under the influence of a series of Mediterranean depressions and the wind was mostly southerly. On the 23rd, owing to the presence of a small shallow depression over Upper Egypt, very warm southeast winds reached Lower Egypt from the Red Sea, and the temperature rose to 7° or 8° C. above normal. The depression passed east on the following day and the weather became cooler, but another warm spell followed towards the end of the month.

For the month as a whole the barometric pressure was above normal over Lower Egypt, and below normal elsewhere, while the temperature was everywhere above normal, especially in the northern and central Sudan. Rainfall in Lower Egypt was much below normal. Light showers however were unusually frequent in Upper Egypt where they occurred on six occasions.

TABLE SHOWING THE DEPARTURES FROM NORMAL FOR JANUARY 1933.

DISTRICTS.	BAROMETRIC PRESSURE.		TEMPERATURE.						RAINFALL	
			MAXIMUM.		MINIMUM.		MAX.+MIN./2.			
	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal
	mb.	mb.	°C.	°C.	°C.	°C.	°C.	°C.	mm.	mm.
I. Mediterranean	1019·5	+1·2	18·9	+0·6	9·8	+0·1	14·4	+0·4	15	—27
II. Middle Egypt	1020·0	+0·4	19·4	+0·6	6·8	—0·3	13·1	+0·2	3	— 9
III. Upper Egypt	1018·4	—1·0	23·2	+0·7	9·0	+1·3	16·1	+1·0	3	+ 2
IV. North Sudan	1012·7	—1·8	32·7	+1·8	16·3	+2·2	24·5	+2·0	0	0
V. Red Sea*	1016·1	+0·5	27·0	—0·1	20·0	+0·2	23·5	0·0	9	+ 2
VI. Central Sudan	1010·5	—3·0	35·7	+2·2	16·6	+2·6	26·2	+2·4	0	0
VII. South Sudan	1009·6	—1·8	36·6	+1·0	19·9	+2·3	28·2	+1·6	2	+ 1

* Port Sudan only.

NOTE.—1,000 millibars is equivalent to 750·1 millietres at 0°C. and mean gravity.

L. J. SUTTON,
Director, Meteorological Service.

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Rocket Center, West Virginia
September 14, 1999

State of the River.

Lake Albert at Butiaba fell 13 centimetres during January. Its level on February 1, 1933, was 96 centimetres above the normal and 27 centimetres above that of the corresponding day of last year.

The levels in general throughout the river system and notably on the Sobat and White Nile were above both the normal and those of last year.

The Bahr el Jebel at Juba remained almost steady throughout the month.

The River Sobat at Nasser fell sharply throughout the month, the level which was 241 centimetres above normal at the beginning being only 37 centimetres above at the end. The fall of the Sobat this year has been about a month and a half later than usual.

The White Nile at Malakal fell slowly for the first three weeks and rapidly thereafter.

The Blue Nile at Roseires fell at normal rate the levels being throughout about 20 centimetres above normal. At Khartoum the Blue Nile fell slower than normally.

The Main Nile at Wadi Halfa fell almost identically with the normal for the first twelve days and slower than normally afterwards.

The differences of the mean levels in January 1933 from those of January 1932 and from the normal 1906–1930 were :—

STATION.	MEAN DIFFERENCES OF LEVELS.	
	Jan. 1933 Minus Jan. 1932.	Jan. 1933 Minus Normal.
	Metres.	Metres.
Juba	+ 0·16	+ 0·38
Nasser	+ 2·85	+ 1·98*
Malakâl	+ 2·01	+ 1·45
Roseires	+ 0·21	+ 0·23
Khartoum	+ 0·52	+ 0·35
Wadi Halfa	+ 0·33	+ 0·13

* Nasser Normal is for 1922–1930 only.

Discharges of the Nile during December, 1932.

Observed by the Irrigation Department.

U.S. Esna Barrage (Main Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
20	74·89	1050
27	74·86	1050

Aswân (Measured by Sluices). Aswân U.S. Gauge.

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	86·97	1570
2	86·82	1510
3	86·67	1380
4	86·52	1310
5	86·37	1250
6	86·22	1150
7	86·07	1050
8	86·06	1040
9	86·06	1040
10	86·03	1040
11	86·03	1030
12	86·02	1040
13	86·02	1040
14	86·14	1120
15	86·17	1130
16	86·13	1120
17	86·11	1120
18	86·14	1120
19	86·16	1120
20	86·11	1130
21	86·12	1130
22	86·10	1130
23	86·10	1130
24	86·08	1110
25	86·10	1120
26	86·10	1120
27	86·10	1130
28	86·10	1130
29	86·10	1130
30	86·10	1130
31	86·09	1120
Approx. Monthly Mean		1150
Normal Mean 1912-1931		1180

Halfa (Main Nile)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
4	3·02	2000
5	3·00	1890
6	2·98	1910
7	2·97	1900
10	2·91	1730
12	2·87	1760
13	2·83	1730
14	2·81	1710
15	2·81	1690
17	2·82	1750
18	2·83	1730
19	2·83	1730
20	2·83	1750
21	2·83	1700
Approx. Monthly Mean		1760
Normal Mean 1912-1931		1820

Kangarty (Main Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
21	134·40	1550
25	134·36	1540
26	134·35	1610
27	134·34	1660
28	134·34	1640
29	134·32	1640
31	134·27	1610
Approx. Monthly Mean		1760
Normal Mean 1912-1931		1820

River Atbara (Kilo 3).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	10·24	39
7	10·13	22
12	10·12	19
Approx. Monthly Mean		18
Normal Mean 1912-1931		15

Hassanab (Main Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	11·93	1710
6	11·84	1680
11	11·87	1670
17	11·78	1590
22	11·73	1580
27	11·70	1490
Approx. Monthly Mean		1610
Normal Mean 1912-1931		1610

Tamaniât (Main Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
5	11·83	1720
10	11·64	1700
15	11·55	1670
19	11·50	1610
26	11·41	1580
31	11·41	1540
Approx. Monthly Mean		1650
Normal Mean 1912-1931		1610

Khartoum (Blue Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
3	11·63	432
7	11·70	495
13	11·58	386
17	11·53	376
24	11·46	283
28	11·42	265
Approx. Monthly Mean		371
Normal Mean 1912-1931		556

Hillet Sherif (Blue Nile). (Sennar Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
3	10·94	517
5	10·84	495
7	10·81	454
10	10·70	401

Hillet Sherif (*contd.*)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
12	10·78	458
14	10·48	320
17	10·58	365
19	10·50	334
21	10·44	309
24	10·39	294
26	10·62	377
28	10·51	353
31	10·42	308
Approx. Monthly Mean		391
Normal Mean 1912-1931		521

Gezira Main Canal (Kilo 1·3).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	16·02	72
2	16·01	71
15	15·95	67
15	15·95	68
Approx. Monthly Mean		67
Normal Mean 1925-1931		56

Roseires (Blue Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	13·45	583
4	13·38	537
6	13·31	526
8	13·24	504
10	13·18	476
12	13·12	461
14	13·06	434
16	13·00	420
18	12·96	413
20	12·90	395
22	12·89	393
24	12·96	413
26	12·98	420
28	12·93	414
30	12·80	365
Approx. Monthly Mean		451
Normal Mean 1912-1931		492

Mogren (White Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
4	11·94	1240
8	11·98	1200
14	11·85	1160
18	11·80	1210
25	11·74	1220
29	11·68	1100
Approx. Monthly Mean		1190
Normal Mean 1912-1931		1070

Renk (White Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	12·06	1350
2	12·07	1330
3	12·07	1320
4	12·07	1310

Renk (*contd.*).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
25	12·14	1340
26	12·14	1370
27	12·14	1370
28	12·14	1330
30	12·16	1330
31	12·15	1340
Approx. Monthly Mean		1330

Malakâl (White Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
5	12.90	1460
10	12·92	1440
15	12·92	1460
20	12·91	1430
25	12·91	1440
30	12·91	1390
Approx. Monthly Mean		1440
Normal Mean 1912-1931		1080

Hillet Doleib (River Sobât).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
4	14·50	1060
9	14·50	1070
14	14·50	1070
19	14·49	1040
24	14·48	1040
29	14·46	992
Approx. Monthly Mean		1040
Normal Mean 1912-1931		608

River Sobât (At Head). (Nasser Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	10·62	673
3	10·60	647
5	10·56	617
6	10·54	618
7	10·53	614
8	10·51	622
10	10·50	596
12	10·47	579
13	10·45	569
15	10·42	567
17	10·37	552
19	10·34	532
20	10·31	528
21	10·29	522
22	10·26	518
24	10·23	529
26	10·19	518
27	10·16	509
29	10·10	491
31	10·03	462
Approx. Monthly Mean		563
Normal Mean 1929-1931		342

River Baro (6 Kms. U.S. Junction). (Pibor Mouth Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	9·42	223
3	9·37	198

Discharges of the Nile during December, 1932 (*continued*).

Observed by the Irrigatian Department.

River Baro (*contd.*).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
5	9·31	193
6	9·29	187
7	9·27	190
8	9·24	182
10	9·17	159
12	9·10	157
13	9·07	152
15	9·01	145
17	8·95	148
19	8·87	137
20	8·84	134
21	8·80	137
22	8·78	146
24	8·77	167
26	8·73	165
27	8·70	159
29	8·59	142
31	8·47	115
Approx. Monthly Mean		161
Normal Mean 1929-1931		175

Gambeila (River Baro).

3	10·26	143
8	10·18	129
13	10·08	119

River Pibor.

(6 Kms. U.S. Junction).
(Pibor Mouth Gauge).

1	9·42	289
3	9·37	291
5	9·31	294
6	9·29	298
7	9·27	297
8	9·24	296
10	9·17	309
12	9·10	311
13	9·07	312
15	9·01	315
17	8·95	314
19	8·87	315
20	8·84	318
21	8·80	315
22	8·78	315
24	8·77	313
26	8·73	309
27	8·70	310
29	8·59	301
31	8·47	313
Approx. Monthly Mean		307
Normal Mean 1929-1931		159

River Pibor.

(D.S. Makwai Junction).
(Makwai Gauge).

2	10·30	278
9	10·20	286
16	10·06	281
23	9·88	283
30	9·61	276
Approx. Monthly Mean		281
Normal Mean 1929-1931		150

Khor Makwai (At Mouth).

(Makwai Gauge).

2	10·30	202
9	10·20	188
16	10·06	171
23	9·88	155
30	9·61	120
Approx. Monthly Mean		168
Normal Mean 1929-1931		36

River Pibor.

(U.S. Makwai Junction).
(Makwai Gauge).

2	10·30	93
9	10·20	107
16	10·06	121
23	9·88	139
30	9·61	162
Approx. Monthly Mean		124
Normal Mean 1929-1931		116

River Pibor.

(D.S. Gila Junction).
(Gila Gauge).

14	10·29	181
28	10·02	151
Approx. Monthly Mean		180
Normal Mean 1929-1931		107

River Gila (At Mouth).

(Gila Gauge).

14	10·29	—47

River Pibor.

(U.S. Gila Junction).
(Gila Gauge).

14	10·29	239
28	10·02	166
Approx. Monthly Mean		236
Normal Mean 1929-1931		44

Akobo (River Pibor)

5	16·24	162
10	15·95	149
15	15·70	134
20	15·45	113
25	15·20	105
30	15·00	83
Approx. Monthly Mean		131
Normal Mean 1929-1931		11

Bahr el Zerâf (Kilo. 3).

(Gauge at Mouth).

8	13·30	172
18	13·30	171
28	13·30	173
Approx. Monthly Mean		172
Normal Mean 1912-1931		154

Abu Tong (White Nile).

(Tonga Gauge).

8	13·39	264
18	13·40	270
28	13·39	256
Approx. Monthly Mean		266
Normal Mean 1923-1931		293

Lake No (White Nile).

7	14·06	290
17	14·04	295
27	14·04	294
Approx. Monthly Mean		294
Normal Mean 1923-1931		292

Bahr el Ghazal (At Mouth).

(Suddite Factory Gauge).

7	14·14	25
17	14·12	12
27	14·10	17
Approx. Monthly Mean		19
Normal Mean 1923-1931		13

Bahr el Jebel (Kilo 3).

(Lake No Gauge).

7	14·06	279
17	14·04	292
27	14·04	289
Approx. Monthly Mean		286
Normal Mean 1923-1931		284

Jonglei (River Atem).

(Eastern Channel).
(Bahr el Jebel).

2	9·05	352
4	9·03	356
9	9·00	333
11	8·98	339
13	8·98	331
15	8·97	331
17	8·96	326
19	8·96	329
25	8·94	312
27	8·94	307
29	8·92	310
31	8·92	301
Approx. Monthly Mean		329

River Atem

(Western Channel).
(U.S. Jonglei Gauge).

Nov. 29	9·08	137
Dec. 9	9·00	131
11	8·98	133
13	8·98	131
15	8·97	130
17	8·96	130
19	8·96	128
25	8·94	126
27	8·94	128
29	8·92	124
31	8·92	128
Approx. Monthly Mean		130

Giggin (Bahr el Jebel).

(Western Channel).

3	29·37	253
Approx. Monthly Mean		247

Gemeiza (Bahr el Jebel).

(Eastern Channel).

2	29·08	750
Approx. Monthly Mean		729

Terrikaka (Bahr el Jebel)

1	13·73	1010
Approx. Monthly Mean		990

Mongalla (Bahr el Jebel).

1	12·22	1040
6	12·17	1020
11	12·12	981
16	12·10	972
21	12·10	996
26	12·05	969
Approx. Monthly Mean		992
Normal Mean 1912-1931		821

Occasional Discharges.

Observed by the Irrigation Department.

Date.	River.	Site.	Gauge. Reading. M.	Gauge. Site.	Disch. m^3. p.s.
		White Nile Tributaries.			
5-12-1932	Khor Adar	Offtake	12·61	Melut	—10
6-12-1932	Tonga Cut	At Junction with White Nile	13·39	Tonga	49
15-12-1932	,,	,, ,, ,,	13·40	,,	34
14-12-1932	Khor Lollé	At 7 Kms. U.S. Tail	19·20	Khor Lollé	57
15-12-1932	,,	U.S. Tonga Cut	13·40	Tonga	38
7-12-1932	Maya Sinyora	At Junction with White Nile	14·06	Lake No	12
16-12-1932	,,	,, ,, ,,	14·04	,,	13
6-12-1932	Khor Yergol	,, ,, ,,	14·43	Yergol	11
16-12-1932	,,	,, ,, ,,	14·42	,,	8
4-12-1932	Khor Atar	,, ,, ,,	13·62	Fenikang	—5
14-12-1932	Spill joining Khor Lollé at Tail.	Just U.S. its tail	19·20	Khor Lollé	7
		River Sobât Tributaries.			
13-12-1932	Khor Filus	Mouth	14·50	Hillet Doleib	17
		Bahr el Jebel and Tributaries.			
6-12-1932	Jebel	Bor	11·44	Bor	790
12-12-1932	Atem Western Channel	Close to Lagoon	8·98	Jonglei	212
28-12-1932	,,	,, ,,	8·93	,,	200
29-11-1932	,,	6 kms. U.S. Jonglei	9·08	,,	131
12-12-1932	,,	,, ,, ,,	8·98	,,	127
28-12-1932	,,	,, ,, ,,	8·93	,,	124
1-12-1932	,,	8 ,, D.S. ,,	9·06	,,	139
14-12-1932	,,	,, ,, ,,	8·97	,,	147
30-12-1932	,,	,, ,, ,,	8·92	,,	146
29-11-1932	Atem Eastern Channel	About 4 kms. U.S. Jonglei	9·08	,,	281
12-12-1932	,,	,, 4 ,, ,, ,,	8·98	,,	257
28-12-1932	,,	,, 4 ,, ,, ,,	8·93	,,	240
1-12-1932	,,	,, 8 ,, D.S. ,,	9·06	,,	239
14-12-1932	,,	,, 8 ,, ,, ,,	8·97	,,	230
30-12-1932	,,	,, 8 ,, ,, ,,	8·92	,,	219
14-12-1932	Atem	,, 11 ,, ,, ,,	8·97	,,	295

P. Phillips,

Director, Hydrological Service.

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Ministry of Public Works, Egypt.—Physical Department.

REPORT ON THE WEATHER AND STATE OF THE RIVER FOR FEBRUARY 1933.

The Weather.

Unusually fine and mild.

At the beginning of the month Egypt was under the influence of a depression situated over the eastern Mediterranean. Southerly winds prevailed and the weather was very warm and dry. In Cairo the temperature rose to 28° C., or 8° C. above normal. Following the passage of the depression to the east cool northwest winds blew across Egypt, bringing very light scattered showers. On the 4th another depression arrived north of Egypt, and a spell of cold weather ensured, with showers throughout Lower Egypt, lasting for four days. The weather improved on the 9th when Egypt became an area of relatively high pressure.

A shallow depression crossing Egypt from the Libyan desert on the 11th gave light showers in Upper Egypt, but the weather was generally settled until the 17th, when a remarkably deep depression appeared off the coast of Tripoli. Southerly winds and khamsin conditions quickly developed throughout Egypt, and severe sandstorms occurred in most localities. At Salum the wind reached a velocity of 90 kilometres per hour on the 17th and 83 kilometres per hour on the following day. In Alexandria and Cairo however the velocity did not exceed 50 kilometres per hour. Temperatures generally were from 7° C. to 10° C,, above the normal for the time of year. Abnormally hot weather prevailed also at this time throughout the Sudan. During the passage of this depression the barometric pressure at Helwan fell to a lower point than in any February since at least 1904 when the Observatory was installed. By the afternoon of the 19th the depression had passed to Syria and the arrival of westerly winds in Egypt brought an appreciable fall in temperature.

Mild settled weather followed, persisting until the end of the month, when a depression situated over the interior of Tripoli caused easterly winds in Egypt and a very sharp rise in temperature. Record temperatures for February were registered at this time in the Northern Sudan, 43°C. (109° F.) at Merowe and 42°C. at Atbara, compared with a normal value of 33°C.

For the month as a whole the barometric pressure was abnormally low in all districts. The mean pressure over Upper Egypt was lower than in any February for at least 25 years. Temperature was everywhere above normal, especially in Middle Egypt and the central Sudan. At Khartoum the daily maximum temperature averaged 36°C. (97° F.) which is the highest in February for the last 25 years. Rainfall was well below normal throughout Egypt.

TABLE SHOWING THE DEPARTURES FROM NORMAL FOR FEBRUARY 1933.

DISTRICTS.	BAROMETRIC PRESSURE.		TEMPERATURE.						RAINFALL	
			MAXIMUM.		MINIMUM.		MAX.+MIN./2.			
	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal
	mb.	mb.	°C.	°C.	°C.	°C.	°C.	°C.	mm.	mm.
I. Mediterranean	1015·3	—1·8	20·3	+1·4	11·7	+1·4	16·0	+1·4	15	—11
II. Middle Egypt	1015·4	—2·8	22·7	+2·2	9·3	+1·8	16·0	+2·0	4	— 3
III. Upper Egypt	1014·9	—3·4	26·9	+2·1	9·8	+1·1	18·4	+1·6	0	— 2
IV. North Sudan	1011·5	—1·9	34·5	+1·9	16·4	+1·6	25·4	+1·8	0	0
V. Red Sea*	1013·2	—1·6	27·8	+0·7	20·1	+1·1	24·0	+0·9	0	— 4
VI. Central Sudan	1009·5	—3·0	37·0	+2·0	17·0	+1·9	27·0	+2·0	0	0
VII. South Sudan	1008·8	—1·5	37·7	+0·9	21·0	+2·0	29·4	+1·4	10	+ 4

* Port Sudan only.

NOTE.—1,000 millibars is equivalent to 750·1 millietres at 0°C. and mean gravity.

L. J. SUTTON,
Director, Meteorological Service.

State of the River.

Lake Albert at Butiaba fell 9 centimetres during February. Its level on March 1, 1933 was 99 centimetres above the normal and 35 centimetres above that of the corresponding day of last year.

The levels in general throughout the river system were above both the normal and those of last year.

The Bahr el Jebel at Juba remained steady throughout the month.

The River Sobat at Nasser fell faster than normally for the first half of the month and remained almost steady thereafter.

The rapid fall of the White Nile at Malakal, which began towards the end of last month, continued until the 15th, and then slowed off for the rest of the month. The level, which was 124 centimetres above normal at the beginning of the month, was only 34 centimetres above it at the end.

The Blue Nile at Roseires fell rather slower than normally during the whole month.

At Khartoum the Blue Nile fell at normal rate until the 20th and rather faster thereafter.

The Main Nile at Wadi Halfa fell slower than normally during the month.

The differences of the mean levels in February 1933 from those of February 1932 and from the normal 1906–1930 were :—

STATION.	MEAN DIFFERENCES OF LEVELS.	
	Feb. 1933 Minus Feb. 1932.	Feb. 1933 Minus Normal.
	Metres.	Metres.
Juba	+ 0·20	+ 0·40
Nasser	+ 0·53	+ 0·08*
Malakâl	+ 0·99	+ 0·64
Roseires	+ 0·27	+ 0·22
Khartoum	+ 0·80	+ 0·58
Wadi Halfa	+ 0·85	+ 0·43

* Nasser Normal is for 1922–1930 only

Discharges of the Nile during January, 1933.

Observed by the Irrigation Department.

U.S. Esna Barrage
(Main Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
3	74·89	1080
10	75·01	1120
17	75·12	1270
24	75·20	1330
31	75·33	1350
Approx. Monthly Mean		122

Aswân
(Measured by Sluices).
Aswân D.S. Gauge.

1	86·16	1180
2	86·18	1180
3	86·18	1180
4	86·16	1170
5	86·16	1180
6	86·27	1240
7	86·26	1240
8	86·26	1240
9	86·26	1240
10	86·25	1240
11	86·24	1240
12	86·24	1250
13	86·34	1300
14	86·34	1300
15	86·34	1300
16	86·34	1300
17	86·33	1300
18	86·33	1310
19	86·33	1300
20	86·32	1310
21	86·38	1360
22	86·39	1360
23	86·44	1390
24	86·48	1410
25	86·48	1430
26	86·51	1440
27	86·52	1440
28	86·52	1440
29	86·51	1440
30	86·50	1430
31	86·48	1420
Approx. Monthly Mean		1310
Normal Mean 1912-1932		1110

Kangarty (Main Nile)

1	134·24	1610
2	134·24	1620
5	134·24	1640
6	134·19	1620
7	134·18	1610
8	134·16	1600
9	134·15	1580
10	134·13	1580
11	134·12	1530
12	134·13	1600
14	134·16	1560
15	134·16	1590
16	134·15	1560
17	134·15	1580

* Site transferred to Nasser.

Kangarty (*contd*).

18	134·15	1600
19	134·15	1550
21	134·13	1580
22	134·14	1560
23	134·10	1550
26	134·05	1530
29	134·03	1520
30	134·03	1540
31	134·01	1520
Approx. Monthly Mean		1570
Normal Mean 1912-1932		1370

Hassanab (Main Nile).

1	11·66	1530
6	11·65	1450
11	11·67	1500
16	11·65	1490
21	11·63	1500
26	11·62	1490
31	11·54	1460
Approx. Monthly Mean		1480
Normal Mean 1912-1932		1230

Tamaniât (Main Nile).

5	11·40	1500
10	11·42	1550
16	11·39	1570
20	11·35	1510
25	11·28	1470
31	11·25	1420
Approx. Monthly Mean		1510
Normal Mean 1912-1932		1210

Khartoum (Blue Nile).

3	11·13	296
8	11·39	295
8	11·39	247
14	11·36	274
18	11·35	228
23	11·32	268
29	11·19	208
Approx. Monthly Mean		246
Normal Mean 1912-1932		318

Hillet Sherif (Blue Nile).
(Sennar Gauge).

2	10·35	287
4	10·23	257
7	10·11	212
9	10·26	265
11	10·25	262
14	10·09	211

Hillet Sherif (*contd.*).

16	9·98	166
18	10·00	168
21	9·89	188
25	9·75	178
25	9·80	165
28	9·85	197
31	9·80	192
Approx. Monthly Mean		201
Normal Mean 1912-1932		208

Gezira Main Canal
(Kilo 1·3).

1	15·83	62
1	15·83	63
17	15·77	60
17	15·71	59
Approx. Monthly Mean		60
Normal Mean 1926-1932		43

Roseires (Blue Nile).

1	12·71	337
3	12·62	337
5	12·58	321
7	12·54	307
9	12·50	305
11	12·44	287
13	12·40	278
15	12·36	268
17	12·31	255
19	12·25	247
21	12·21	228
23	12·16	218
25	12·12	221
27	12·09	203
29	12·06	201
31	12·02	197
Approx. Monthly Mean		264
Normal Mean 1912-1932		284

Mogren (White Nile).

4	11·68	1170
9	11·70	1290
15	11·70	1120
19	11·69	1310
24	11·68	1340
30	11·55	1210
Approx. Monthly Mean		1219
Normal Mean 1912-1932		890

Renk (White Nile).

2	12·16	1340
3	12·16	1330
4	12·15	1370
5	12·16	1340
6	12·16	1330
7	12·16	1330

Renk (*cont'd.*).

9	12·17	1330
10	12·17	1330
11	12·17	1330
12	12·17	1350
13	12·15	1360
14	12·18	1340
16	12·18	1330
17	12·18	1370
18	12·19	1370
19	12·19	1360
20	12·18	1350
21	12·18	1370
23	12·17	1340
25	12·16	1330
26	12·15	1320
30	12·09	1250
31	12·07	1240
Approx. Monthly Mean		1340
Normal Mean 1928-1932		751

Malakâl (White Nile).

5	12·57	1300
10	12·53	1350
15	12·76	1310
20	12·52	1310
25	12·19	1210
30	12·11	986
Approx. Monthly Mean		1260
Normal Mean 1912-1932		731

Hillet Delelb (River Sobât).

4	11·40	966
9	11·21	891
14	11·23	827
19	11·06	725
24	10·78	522
29	13·76	302
Approx. Monthly Mean		712
Normal Mean 1912-1932		304

River Sobât (At Head).
(Nasser Gauge).

1	9·90	454
3	9·87	426
4	9·82	424
5	9·76	413
7	9·62	390
9	9·48	376
10	9·40	373
11	9·31	365
14	9·00	335
16	8·75	313
17	8·61	302
18	8·47	291
20	8·13	273
21	7·91	263
23	7·52	242
26	6·97	212*
29	6·35	156*
30	6·22	144*
31	6·09	131*
Approx. Monthly Mean		306
Normal Mean 1929-1932		147

Discharges of the Nile during January, 1933 (*continued*).

Observed by the Irrigation Department.

River Baro
(6 Kms. U.S. Junction).
(Pibor Mouth Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	8·41	115
3	8·27	103
4	8·20	94
5	8·13	90
7	8·00	86
9	7·87	85
10	7·81	96
11	7·73	93
14	7·46	79
16	7·26	71
17	7·17	79
18	7·09	82
20	6·87	65
21	6·74	66
23	6·45	59
Approx. Monthly Mean		—
Normal Mean 1929-1932		100

Gambeila (River Baro).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
Dec. 18	10·03	115
23	10·28	155
27	10·08	115
30	9·94	102
Approx. Monthly Mean		127
Normal Mean 1928-1931		147
Jan. 3	9·84	84
6	9·84	91
10	9·82	84
13	9·72	73

River Pibor.
(6 Kms. U.S. Junction).
(Pibor Mouth Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	8·41	313
3	8·27	307
4	8·20	302
5	8·13	302
7	8·00	280
9	7·87	282
10	7·81	274
11	7·73	258
14	7·46	245
16	7·26	228
17	7·17	222
18	7·09	210
20	6·87	190
21	6·74	180
23	6·45	154
Approx. Monthly Mean		—
Normal Mean 1929-1932		47

River Pibor.
(D.S. Makwai Junction).
(Makwai Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
6	9·20	274
13	8·60	208
19	8·00	184
Approx. Monthly Mean		—
Normal Mean 1931-1932		44

Khor Makwai (At Mouth).
(Makwai Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
6	9·20	82
13	8·60	27
19	8·00	17
Approx. Monthly Mean		—
Normal Mean 1931-1932		6

River Pibor.
(U.S. Makwai Junction).
(Makwai Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
6	9·20	191
13	8·60	169
19	8·00	154
Approx. Monthly Mean		—
Normal Mean 1931-1932		39

River Pibor.
(D.S. Gila Junction).
(Gila Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
12	9·48	137
Approx. Monthly Mean		—
Normal Mean 1931-1932		38

River Pibor.
(U.S. Gila Junction).
(Gila Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
12	9·48	99
Approx. Monthly Mean		—
Normal Mean 1931-1932		18

Bahr el Zerâf (Kilo. 3).
(Gauge at Mouth).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
8	13·26	174
18	13·15	192
28	12·88	168
Approx. Monthly Mean		179
Normal Mean 1912-1932		147

Abu Tong (White Nile).
(Tonga Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
8	13·35	283
18	13·28	315
28	13·06	357
Approx. Monthly Mean		312
Normal Mean 1923-1932		317

Lake No (White Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
7	14·02	279
17	14·02	306
27	14·00	300
Approx. Monthly Mean		296
Normal Mean 1923-1932		300

Bahr el Ghazal (At Mouth).
(Suddie Factory Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
7	14·09	—12
17	14·09	19
27	14·06	11
Approx. Monthly Mean		7
Normal Mean 1923-1932		17

Bahr el Jebel (Kilo 3).
(Lake No Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
7	14·02	289
17	14·02	287
27	14·00	291
Approx. Monthly Mean		289
Normal Mean 1923-1932		289

Jonglei (River Atem).
(Eastern Channel).
(Bahr el Jebel).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	8·91	298
10	8·88	301
12	8·88	298
14	8·88	297
16	8·87	291
20	8·87	297
22	8·87	291
24	8·86	287
26	8·86	285
28	8·84	283
Approx. Monthly Mean		295

River Atem
(Western Channel).
(U.S. Jonglei Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	8·91	123
10	8·88	125
12	8·88	122
14	8·88	123
16	8·87	123
20	8·87	122
22	8·87	122
24	8·86	122
26	8·86	122
28	8·84	121
Approx. Monthly Mean		123

Giggin (Bahr el Jebel).
(Western Channel).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
3	29·25	238
Approx. Monthly Mean		231
Normal Mean 1931-1932		184

Gemeiza (Bahr el Jebel).
(Eastern Channel).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	28·93	703
Approx. Monthly Mean		676
Normal Mean 1931-1932		590

Terrikaka (Bahr el Jebel).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	13·57	968
Approx. Monthly Mean		934
Normal Mean 1931-1932		785

Mongalla (Bahr el Jebel).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	12·03	979
6	12·01	958
11	11·99	1030
16	11·96	907
21	11·96	912
26	11·96	928
31	11·96	908
Approx. Monthly Mean		946
Normal Mean 1912-1932		741

Occasional Discharges.

Observed by the Irrigation Department.

Date.	River.	Site.	Gauge. Reading. M.	Gauge. Site.	Disch. m³. p.s.
		White Nile Tributaries.			
25–12–1932	Tonga Cut ...	At Junction	13·39	Tonga	30
6– 1–1933	,, ...	,, ...	13·36	,,	32
16– 1–1933	,, ...	,, ...	13·29	,,	51
25– 1–1933	,, ...	,, ...	13·12	,,	34
25–12–1932	Khor Lolle ...	U.S. Tonga Cut	13·39	,,	42
6– 1–1933	,, ...	,, ,, ,, ...	13·36	,,	38
16– 1–1933	,, ...	,, ,, ,, ...	13·29	,,	60
25– 1–1933	,, ...	,, ,, ,, ...	13·12	,,	58
24–12–1932	,, ...	1 Kilo U.S. Junction	19·19	Khor Lolle	85
4– 1–1933	,, ...	1 ,, ,, ,, ...	19·15	,,	90
14– 1–1933	,, ...	1 ,, ,, ,, ...	19·03	,,	94
24– 1–1933	,, ...	1 ,, ,, ,, ...	18·70	,,	95
24–12–1932	,, ...	7 Kms U.S. Junction	19·19	,,	61
4– 1–1932	,, ...	7 ,, ,, ...	19·15	,,	65
14– 1–1933	,, ...	7 ,, ,, ...	19·03	,,	84
24– 1–1933	,, ...	7 ,, ,, ...	18·70	,,	90
26–12–1932	Maya Sinyora ...	At Junction	14·04	Lake No.	8
7– 1–1933	,, ...	,, ...	14·02	,,	11
17– 1–1933	,, ...	,, ...	14·02	,,	11
26– 1–1933	,, ...	,, ...	14·00	,,	10
26–12–1932	Khor Yergol ...	,, ...	14·42	K. Yergol	4
6– 1–1933	,, ...	,, ...	14·40	,,	28
16– 1–1933	,, ...	,, ...	14·36	,,	12
26– 1–1933	,, ...	,, ...	14·27	,,	18
		River Sobât Tributaries.			
23–12–1932	Khor Filus ...	At Junction	14·48	H.Doleib	13
3– 1–1933	,, ...	,, ...	14·42	,,	34
13– 1–1933	,, ...	,, ...	14·25	,,	6
23– 1–1933	,, ...	,, ...	13·83	,,	14
		Bahr el Zeraf and Tributaries.			
18–12–1932	Zeraf	U.S. Tail Cut No. 1	28·53	TailC.No.1	58
18–12–1932	,, ...	Tail Cut No. 1	28·53	,,	67
18–12–1932	,, ...	Head Cut No. 1	12·18	H. C. No. 1	80
18–12–1932	,, ...	Head Cut No. 2	26·96	,, ,, 2	15
18–12–1932	,, ...	Tail Cut No. 2	26·86	Pole 53	14
18–12–1932	,, ...	200 mets. D.S. Pole 53	26·86	,, 53	170
19–12–1932	,, ...	100 ,, U.S. ,, 48	23·96	Khor Gurr	125
19–12–1932	Khor Niatil ...	200 ,, ,, Junction	23·96	,,	43
19–12–1932	,, Gurr	300 ,, ,, ,, ...	23·96	,,	103
19–12–1932	Zerâf	20 ,, ,, Pole 44	23·96	,,	162
19–12–1932	,, ...	1·5 Kms. D.S. Pole 44	23·96	,,	166
20–12–1932	Jerwel	200 mets. U.S. Junction	23·96	,,	18
20–12–1932	Khor Gang ...	3 Kms. ,, ,, ...	23·96	,,	32
20–12–1932	Zeraf	50 mts. D.S. Pole 40	23·96	,,	158
21–12–1932	,, ...	100 ,, U.S. Pole 35	21·46	Meshra Kwatch	156
21–12–1932	Khor Famyr ...	3 Kms. U.S. Junction	21·46	,,	7
21–12–1932	Zeraf	80 mts. D.S. Pole 29	18·96	Pole 29	180
22–12–1932	,, ...	80 mts. U.S. Pole 24	16·89	,, 19	156
22–12–1932	,, ...	15 mts. ,, ,, 19	16·89	,, 19	142
22–12–1932	,, ...	100 mts. U.S. Khor Nwezlyel	16·89	,, 199	184
22–12–1932	Khor Nwezlyel ...	1 Km. U.S. Junction	16·89	,, 1	1
24–12–1932	Zeraf	Fangak	12·40	Fangak	177
24–12–1932	,, ...	Pole 10	15·15	Pole 10	186
24–12–1932	,, ...	10 mts. D.S. Pole 5	15·15	,, 10	188

Occasional Discharges (*contd.*).

Observed by the Irrigation Department.

Date.	River.	Site.	Gauge. Reading.	Gauge. Site.	Disch. m.³ p.s.
			M.		
		Bahr el Jebel and Tributaries.			
8- 1-1933	Jebel	Bor	11·41	Bor	782
17- 1-1933	,, ...	,, ...	11·40	,,	761
31- 1-1933	,, ...	,, ...	11·49	,,	770
11- 1-1933	Atem (Western Ch.)	Close to Lagoon	8·88	Jonglei	193
27- 1-1933	,, ,, ,,	,, ,, ...	8·85	,,	186
11- 1-1933	,, ,, ,,	6 Kms. U.S. Jonglei	8·88	,,	118
27- 1-1933	,, ,, ,,	6 ,, ,, ,, ...	8·85	,,	116
13- 1-1933	,, ,, ,,	8 ,, D.S. ,, ...	8·88	,,	139
29- 1-1933	,, ,, ,,	8 ,, ,, ,, ...	8·84	,,	132
11- 1-1933	,, (Eastern ,,)	4 ,, U.S. ,, ...	8·88	,,	229
27- 1-1933	,, ,, ,,	4 ,, ,, ,, ...	8·85	,,	219
13- 1-1933	,, ,, ,,	8 ,, D.S. ,, ...	8·88	,,	221
29- 1-1933	,, ,, ,,	8 ,, ,, ,, ...	8·84	,,	209

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Ministry of Public Works, Egypt.—Physical Department.

REPORT ON THE WEATHER AND STATE OF THE RIVER FOR MARCH 1933.

1933.

The Weather.

On the first day of the month Egypt experienced the most severe khamsin of recent years, due to the passage across Lower Egypt of a depression arriving from the Libyan desert. The wind quickly rose from almost calm to the force of a whole gale, the highest velocity in Cairo being 90 kilometres per hour from the south. An unusually large amount of dust was raised, reducing visibility at one time to about a hundred metres. Considerable minor structural damage resulted. Maximum temperatures were about 32° C, *i.e.* from 10° C to 12° C above normal.

The depression travelled rapidly and by the following morning had arrived in Iraq, and the northwesterly winds of its cool sector had reached Egypt, causing a large drop in temperature and showers along the coast. This pronounced cool wave, which reduced the temperature in Cairo from 32°C on the 1st to only 16°C on the 3rd, advanced through Egypt and penetrated to the southern Sudan by the 5th.

Fine weather succeeded and prevailed for a week, but on the 10th a drepression appeared off Benghasi, with a secondary in the desert southwest of Siwa Oasis, and very light rain, accompanied in places by thunder and lightning, fell throughout the Delta during the night. The weather was warm and sandstorms of moderate intensity were widespread, but by the afternoon of the following day the depressions had crossed Egypt and the weather became cool and showery. At Salum the wind reached 90 kilometres per hour from the north; at Matruh the rain was very heavy, 27 millimetres being registered in less than four hours, while showers were general in Lower Egypt. The spell of cool weather lasted until the 17th, when it was broken by an invasion of warm easterly winds due to the arrival of a depression which however passed by the following day, when cool weather was again established.

There was another short burst of warm weather on the 27th and 28th, when a depression passed along the Mediterranean to Syria. At Salum the wind rose to 92 kilometres per hour. No rain followed this depression.

For the month as a whole the atmospheric pressure was everywhere unusually low except along the Mediterranean coast. In Egypt there were four separate spells of cool weather, alternating with short bursts of warm weather of the khamsin type, which brought the temperature for the month slightly above normal. Khamsin depressions with their associated sandstorms were more frequent than usual for the time of year, but temperatures were not very high. Throughout the Sudan the temperature as in the previous two months, was abnormally high.

Rainfall in Egypt was in defect, although there were a few heavy falls in the north.

TABLE SHOWING THE DEPARTURES FROM NORMAL FOR MARCH 1933.

DISTRICTS.	BAROMETRIC PRESSURE.		TEMPERATURE.						RAINFALL	
			MAXIMUM.		MINIMUM.		MAX.+MIN./2.			
	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal
	mb.	mb.	°C.	°C.	°C.	°C.	°C.	°C.	mm.	mm.
I. Mediterranean	1016·0	+0·2	20·2	—0·4	12·3	+0·3	16·2	0·0	9	— 4
II. Middle Egypt	1015·7	—0·7	24·1	+0·1	10·3	+0·5	17·2	+0·3	[1	— 4]
III. Upper Egypt	1014·2	—1·3	30·1	+0·5	13·1	+1·0	21·6	+0·8	0	0
IV. North Sudan	1009·8	—1·3	37·8	+1·6	19·8	+2·0	28·8	+1·8	0	0
V. Red Sea*	1012·4	—0·6	29·3	+0·7	20·5	+0·9	24·9	+0·8	0	— 1
VI. Central Sudan	1007·3	—2·7	39·8	+2·1	20·5	+2·6	30·2	+2·4	0	— 1
VII. South Sudan	1007·6	—1·4	38·9	+0·5	23·0	+1·8	31·0	+1·2	29	+ 7

* Port Sudan only.

NOTE.—1,000 millibars is equivalent to 750·1 millietres at 0°C. and mean gravity.

L. J. SUTTON,
Director, Meteorological Service.

79967

State of the River.

Lake Albert at Butiaba fell 12 centimetres during the month. Its level on April 1, 1933, was 97 centimetres above the normal and 23 centimetres above that of the corresponding day of last year.

The Bahr el Jebel at Juba remained steady throughout the month its levels were above both the normal and last year's.

The River Sobat at Nasser fell steadily until the 21st when it was 26 centimetres below normal. Thereafter a sharp rise took place until the 27th and at the end of the month the level was 27 centimetres above normal. The levels throughout were about half a metre above those of last year.

The White Nile at Malakal fell at normal rate until the 27th then rose slightly until the end of the month. The levels were continuously above both the normal and last year's.

The Blue Nile at Roseires fell until the 21st and then rose slightly for the rest of the month, the levels being above normal and last year's throughout. At Khartoum the Blue Nile fell faster than normally the level which was 33 centimetres above normal at the beginning of the month was 19 centimetres below it at the end.

The Main Nile at Wadi Halfa fell faster than normally throughout the month, the levels remaining above both the normal and those of last year.

The differences of the mean levels in March 1933 from those of March 1932 and from the normal for 1906–1930 were :—

STATION.	MEAN DIFFERENCES OF LEVELS.	
	March, 1933 minus March, 1932.	March, 1933 minus Normal.
	Metres.	Metres.
Juba	+ 0·15	+ 0·43
Nasser	+ 0·55	+ 0·03*
Malakâl	+ 0·53	+ 0·31
Roseires	+ 0·30	+ 0·17
Khartoum	+ 0·32	+ 0·09
Wadi Halfa	+ 0·67	+ 0·32

* Nasser Normal is for 1922–1930 only

Discharges of the Nile during February, 1933.

Observed by the Irrigation Department.

U.S. Esna Barrage
(Main Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
8	75·33	1360
21	75·10	1280
28	75·08	1240
Approx. Monthly Mean		1310

Aswân
(Measured by Sluices).
Aswân D.S. Gauge.

1	86·48	1420
2	86·48	1420
3	86·50	1440
4	86·50	1440
5	86·51	1440
6	86·50	1440
7	86·50	1430
8	86·49	1430
9	86·48	1420
10	86·46	1410
11	86·44	1390
12	86·42	1380
13	86·41	1370
14	86·38	1350
15	86·34	1330
16	86·32	1320
17	86·29	1310
18	86·29	1310
19	86·30	1310
20	86·30	1300
21	86·28	1300
22	86·28	1300
23	86·27	1290
24	86·28	1290
25	86·28	1290
26	86·28	1290
27	86·29	1310
28	86·28	1290
Approx. Monthly Mean		1360
Normal Mean 1912-1932		917

Kangarty (Main Nile)

1	134·00	1490
1	134·00	1490
1	134·00	1480
2	133·96	1460
4	133·96	1490
5	133·94	1490
6	133·92	1480
7	133·90	1450
8	133·88	1440
9	133·86	1410
11	133·83	1410
13	133·75	1400
14	133·74	1380
15	133·71	1370
16	133·72	1390
18	133·71	1370
19	133·70	1350
20	133·68	1340
21	133·67	1360
22	133·68	1350
23	133·70	1370
26	133·63	1290
27	133·58	1300
28	133·54	1290
Approx. Monthly Mean		1390
Normal Mean 1912-1932		989

Hassanab (Main Nile).

4	11·50	1330
7	11·51	1300
11	11·50	1280
15	11·49	1270
22	11·40	1260
26	11·30	1160
Approx. Monthly Mean		1270
Normal Mean 1912-1932		893

Tamaniât (Main Nile).

5	11·23	1390
9	11·23	1390
13	11·16	1320
17	11·13	1330
23	11·00	1180
28	10·87	1100
Approx. Monthly Mean		1300
Normal Mean 1912-1932		875

Khartoum (Blue Nile).

3	11·18	192
7	11·06	186
11	11·13	119
15	11·06	136
21	10·92	132
26	10·76	134
Approx. Monthly Mean		149
Normal Mean 1912-1932		206

Hillet Sherif (Blue Nile).
(Sennar Gauge).

2	9·86	153
4	9·86	153
6	9·86	147
8	9·86	150
11	9·88	155
13	9·90	168
15	9·90	166
18	9·90	162
20	9·90	164
22	9·89	166
25	9·89	161
27	9·89	161
Approx. Monthly Mean		158
Normal Mean 1912-1932		204

Gezira Main Canal
(Kilo 1·3).

1	15·77	59
1	15·77	58
16	15·94	65
16	15·94	66
Approx. Monthly Mean		63
Normal Mean 1926-1932		12

Roseires (Blue Nile).

2	12·00	186
4	11·98	189
6	11·96	180
12	11·89	164
14	11·89	171
16	11·90	171
18	11·87	169
20	11·85	163
22	11·90	172
24	11·89	173
26	11·87	169
28	11·85	169
Approx. Monthly Mean		173
Normal Mean 1912-1932		186

Mogren (White Nile).

4	11·50	1260
8	11·50	1220
12	11·49	1210
16	11·38	1120
22	11·24	1010
27	11·11	893
Approx. Monthly Mean		1120
Normal Mean 1912-1932		669

Renk (White Nile).

1	12·05	1240
3	12·00	1190
4	11·98	1180
6	11·93	1150
7	11·87	1120
8	11·83	1110
9	11·79	1110
10	11·74	1060
11	11·70	1070
14	11·49	981
15	11·43	947
16	11·37	904
17	11·32	919
18	11·25	881
20	11·14	875
21	11·10	850
22	11·04	834
23	11·00	781
24	10·96	784
25	10·92	769
27	10·82	759
28	10·78	729
Approx. Monthly Mean		976
Normal Mean 1928-1932		571

Malakâl (White Nile).

5	11.67	860
10	11·35	774
15	11·08	730
20	10·87	682
25	10·74	681
Approx. Monthly Mean		758
Normal Mean 1912-1932		647

Hillet Doleib (River Sobât).

4	12·88	160
9	12·46	111
14	12·18	87
19	11·97	82
24	11·85	86
Approx. Monthly Mean		110
Normal Mean 1912-1932		184

Nasser (River Sobât)

1	5·99	118
2	5·89	116
3	5·81	107
4	5·73	96
6	5·61	91
7	5·56	83
8	5·53	86
9	5·51	85
10	5·49	82
11	5·45	80
13	5·37	72
14	5·33	72
15	5·35	74
16	5·37	77
17	5·37	78
18	5·34	78
20	5·30	77
21	5·28	77
22	5·31	77
23	5·33	79
24	5·34	80
25	5·33	78
27	5·32	79
28	5·32	81
Approx. Monthly Mean		84
Normal Mean 1929-1932		87

Gambeila (River Baro).

Jan. 18	9·68	65
20	9·65	58
24	9·48	55
29	9·41	48
31	9·39	47
Approx. Monthly Mean		69
Normal Mean 1928-1932		84
Feb. 3	9·38	43
7	9·39	44

Discharges of the Nile during February, 1933 (*continued*)

Observed by the Irrigation Department.

Akobo (River Pibor)

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
Jan. 5	14·70	68
10	14·45	55
15	14·03	32
20	13·39	8
25	12·54	4
30	11·54	4
Approx. Monthly Mean		33
Normal Mean 1929-1932		4
Feb. 5	10·78	2
10	10·40	2
15	10·20	1
20	10·00	1
25	9·92	1
Approx. Monthly Mean		1
Normal Mean 1929-1932		1

Bahr el Zerâf (Kilo. 3).

(Gauge at Mouth).

8	12·42	205
18	12·11	208
28	11·97	207
Approx. Monthly Mean		203
Normal Mean 1912-1932		140

Abu Tong (White Nile).

(Tonga Gauge).

8	12·66	395
18	12·40	385
28	12·27	367
Approx. Monthly Mean		382
Normal Mean 1923-1932		310

Lake No (White Nile).

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
7	13·96	326
17	13·92	350
27	13·86	388
Approx. Monthly Mean		347
Normal Mean 1923-1932		305

Bahr el Ghazal (At Mouth).

(Suddite Factory Gauge).

7	14·03	29
17	14·00	38
27	13·95	47
Approx. Monthly Mean		35
Normal Mean 1923-1932		15

Bahr el Jebel (Kilo 3).

(Lake No Gauge).

7	13·96	300
17	13·92	312
27	13·86	315
Approx. Monthly Mean		307
Normal Mean 1923-1932		294

Jonglei (River Atem).

(Eastern Channel).

(Bahr el Jebel).

Day of Month.	Gauge Reading. m.	Disch. m^3 p.s.
4	8·83	278
6	8·82	272
8	8·82	278
10	8·82	275
12	8·81	270
17	8·81	278
19	8·81	264
21	8·81	287
23	8·82	276
25	8·82	281
Approx. Monthly Mean		276

River Atem

(Western Channel).

(U.S. Jonglei Gauge).

4	8·83	118
6	8·82	119
8	8·82	117
10	8·82	119
12	8·81	114
17	8·81	120
19	8·81	119
21	8·81	121
23	8·82	120
25	8·82	121
Approx. Monthly Mean		119

Giggin (Bahr el Jebel).

(Western Channel).

Day of Month.	Gauge Reading m.	Disch. m^3. p.s.
3	29·16	222
Approx. Monthly Mean		219
Normal Mean 1931-1932		168

Gemeiza (Bahr el Jebel).

(Eastern Channel).

2	28·86	643
Approx. Monthly Mean		650
Normal Mean 1931-1932		560

Terrikaka (Bahr el Jebel)

1	13·44	897
Approx. Monthly Mean		898
Normal Mean 1931-1932		743

Mongalla (Bahr el Jebel).

1	11·96	915
6	11·94	878
11	11·93	883
16	11·93	904
21	11·96	916
26	11·94	903
Approx. Monthly Mean		899
Normal Mean 1912-1932		690

Occasional Discharges.

Observed by the Irrigation Department.

Date.	River.	Site.	Gauge. Reading. M.	Gauge. Site.	Disch. m^3. p.s.
		White Nile Tributaries.			
6- 2-1933	Tonga Cut ...	At Tail	12·71	Tonga	40
16- 2-1933	,, ...	,, ...	12·46	,,	16
26- 2-1933	,, ...	,, ...	12·28	,,	6
6- 2-1933	Khor Lolle ...	U.S. Tonga Cut	12·71	,,	47
16- 2-1933	,, ...	,, ,, ,, ...	12·46	,,	19
26- 2-1933	,, ...	,, ,, ,, ...	12·28	,,	6
4- 2-1933	,, ...	1 Kilo. U.S. Junction	17·90	Khor Lolle	55
14- 2-1933	,, ...	1 ,, ,, ,, ...	17·31	,,	26
24- 2-1933	,, ...	1 ,, ,, ,, ...	17·01	,,	30
4- 2-1933	,, ...	7 Kilos. ,, ,, ...	17·90	,,	38
14- 2-1933	,, ...	7 ,, ,, ,, ...	17·31	,,	15
24- 2-1933	,, ...	7 ,, ,, ,, ...	17·01	,,	16
7- 2-1933	Maya Sinyora ...	At Junction	13·96	Lake No.	6
17- 2-1933	,, ...	,, ...	13·92	,,	5
27- 2-1933	,, ...	,, ...	13·86	,,	2
6- 2-1933	Khor Yergol ...	,, ...	14·07	K. Yergol	8
16- 2-1933	,, ...	,, ...	13·88	,,	8
26- 2-1933	,, ...	,, ...	13·77	,,	5
		River Sobât and Pibor Tributaries.			
3- 2-1933	Khor Filus ...	At Mouth	12·92	H.Doleib	9
13- 2-1933	,, ...	,, ...	12·23	,,	9
23- 2-1933	,, ...	,, ...	11·86	,,	7
10-11-1932	Lotilla...	Left Channel	—	—	59
10-11-1932	,, ...	Right ,, ...	—	—	43
14-11-1932	Pibor	Pibor Post	12·61	Pibor Post	179
16-11-1932	,, ...	,, ,, ...	12·28	,,	140
15-11-1932	Kangen	About 6 Kms. from Mouth	—	—	59
22-11-1932	Agwei	300 mts. U.S. Bonjak Village and U.S. Junction with R. Abara	—	—	102
23-11-1932	,, ...	About 8 Kms. D.S.R. Abara Junction	—	—	75
26-11-1932	Akobo...	,, 20 ,, U.S. Mouth	—	—	41
29-11-1932	Khor Twalor ...	,, 3 ,, from Junction with Sobât	—	—	238
		Bahr el Jebel and Tributaries.			
14- 2-1933	Jebel	Bor	11·46	Bor	768
28- 2-1933	,, ...	,, ...	11·46	,,	768
9- 2-1933	Atem (West. Ch.)	Close to Lagoon	8·82	Jonglei	185
24- 2-1933	,, ,,	,, ,, ...	8·82	,,	184
9- 2-1933	,, ,,	U.S. Jonglei	8·82	,,	113
11- 2-1933	,, ,,	8 Kms. D.S. Jonglei	8·82	,,	128
26- 2-1933	,, ,,	8 ,, ,, ,, ...	8·82	,,	141
9- 2-1933	,, (Eastern Ch.)	4 ,, U.S. ,, ...	8·82	,,	206
24- 2-1933	,, ,,	4 ,, ,, ,, ...	8·82	,,	209
11- 2-1933	,, ,,	8 ,, D.S. ,, ...	8·82	,,	203
26- 2-1933	,, ,,	8 ,, ,, ,, ...	8·82	,,	208

P. Phillips,

Director, Hydrological Service.

Government Press
11,715-1932-250 ex.

Ministry of Public Works, Egypt.—Physical Department.

REPORT ON THE WEATHER AND STATE OF THE RIVER FOR APRIL 1933.

The Weather.

Remarkably cool, the coolest April since 1914 at least.

At the beginning of the month a depression was situated near Cyprus and cool north-westerly winds prevailed. On the 4th a shallow depression crossed Upper Egypt from the western desert; winds strengthened and light showers occurred. The high pressure which followed was not maintained for long, as on the 7th a deeper depression appeared west of Siwa Oasis, and east winds blew throughout Lower Egypt. This depression rapidly passed to Upper Egypt and light showers were widespread. On the 10th a depression moving along the Mediterranean arrived north of Egypt causing southerly winds and a rise in temperature, but by the evening the depression had reached the coast of Syria, winds veered to northwest and the weather again became much cooler. The winds remained northwest until the 15th, when high pressure over the east central Mediterranean extending to western Egypt gave rise to northeast winds which however prolonged the abnormally cool spell.

These conditions were maintained with little modification until the 19th when a deep depression over Italy, with a secondary off Malta and a smaller secondary in the Libyan desert, caused southeasterly winds and mild khamsin conditions in Egypt, and for the first occasion in the month the temperature reached the normal for the time of year. The smaller depression passed over the Delta the following day, but mild weather was maintained until the evening of the 24th, when the northwest wind in the cool sectors of the Mediterranean depressions arrived in Egypt, causing a very pronounced fall in temperature, and light coastal showers followed. Subsequently temperatures gradually rose, and on the 28th the winds again became southerly with a return of khamsin conditions owing to the presence of a depression in the western desert. On the last day of the month this depression was passing over Cairo and the weather was much warmer.

Shortly after ten o'clock on the morning of the 28th an aerolite was seen from Cairo and elsewhere. The observer at Tor reported that it came from southeast, and about three seconds after the light stream was first seen the aerolite exploded over the Quarantine camp with a noise like thunder. It produced a trail consisting of a series of dense bluish-white clouds which persisted for half an hour. Further observations of this phenomenon are being collected.

For the month as a whole the atmospheric pressure was much above normal except in the central and southern Sudan, while the temperature was everywhere considerably below normal except in these two regions. In Cairo district the average night temperature was the lowest on record for April.

Rainfall was everywhere deficient.

TABLE SHOWING THE DEPARTURES FROM NORMAL FOR APRIL 1933.

DISTRICTS.	BAROMETRIC PRESSURE.		TEMPERATURE.						RAINFALL	
			MAXIMUM.		MINIMUM.		MAX.+MIN./2.			
	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal
	mb.	mb.	°C.	°C.	°C.	°C.	°C.	°C.	mm.	mm.
I. Mediterranean	1016·1	+2·1	21·5	—2·0	13·3	—1·2	17·4	—1·6	3	— 1
II. Middle Egypt	1015·8	+1·5	26·0	—2·5	10·3	—2·5	18·2	—2·5	0	— 3
III. Upper Egypt	1014·0	+1·3	31·8	—2·8	14·4	—2·3	23·1	—2·6	0	0
IV. North Sudan	1009·6	+1·0	39·3	—0·5	20·2	—1·2	29·8	—0·8	0	— 1
V. Red Sea*	1011·5	+0·4	30·0	—1·6	20·2	—1·3	25·1	—1·4	0	— 1
VI. Central Sudan	1007·6	—0·6	40·6	+0·5	20·9	—0·1	30·8	+0·2	0	— 5
VII. South Sudan	1008·2	—0·8	39·4	+1·6	23·4	+0·9	31·4	+1·2	43	—24

* Port Sudan only.

NOTE.—1,000 millibars is equivalent to 750·1 millimetres at 0°C. and mean gravity.

L. J. SUTTON,
Director, Meteorological Service.

State of the River.

Lake Albert at Butiaba fell 3 cms. during the month. Its level on May 1st 1933 was 92 cms. above the normal and 27 cms. above that of the corresponding day of last year.

Apart from a few minor fluctuations the Bahr el Jebel at Juba was steady throughout the month.

The River Sobat at Nasser fluctuated above normal for the first thirteen days and below it thereafter.

The White Nile at Malakal remained almost steady and rather less than half a metre above normal during the month.

The Blue Nile at Roseires fell gradually until the 25th when it was a few centimetres below normal. Thereafter, it rose sharply until the 29th but fell slightly on the last day of the month. At Khartoum the Blue Nile fell very slowly during the first half of the month, then rose slightly owing to the regulation of the Roseires reservoir and fell again during the last few days of the month.

The Main Nile at Wadi Halfa fell steadily during the month. The level which was 11 cms. above normal at the beginning of the month was 17 cms. below it at the end.

The differences of the mean levels in April 1933 from those of April 1932 and from the normal for 1906–1930 were :—

STATION.	MEAN DIFFERENCES OF LEVELS.	
	April, 1933 minus April, 1932.	April, 1933 minus Normal.
	Metres.	Metres.
Juba	+ 0·18	+ 0·33
Nasser	+ 0·51	— 0·09*
Malakâl	+ 0·46	+ 0·37
Roseires	+ 0·26	+ 0·06
Khartoum	+ 0·20	— 0·24
Wadi Halfa	+ 0·31	— 0·05

* Nasser Normal is for 1922–1930 only.

Discharges of the Nile during March, 1933.

Observed by the Irrigation Department.

U.S. Esna Barrage
(Main Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
7	75·00	1140
14	74·73	1030
21	74·42	815
28	74·21	764
Approx. Monthly Mean		966

Aswân
(Measured by Sluices).
Aswân D.S. Gauge.

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	86·26	1280
2	86·24	1280
3	86·23	1270
4	86·24	1260
5	86·20	1250
6	86·17	1240
7	86·14	1220
8	86·10	1190
9	86·05	1160
10	86·00	1140
11	85·96	1130
12	85·96	1120
13	85·94	1100
14	85·89	1080
15	85·84	1050
16	85·78	1020
17	85·68	970
18	85·62	940
19	85·57	908
20	85·52	883
21	85·47	855
22	85·42	841
23	85·40	826
24	85·38	817
25	85·36	801
26	85·34	795
27	85·33	788
28	85·32	782
29	85·28	764
30	85·28	764
31	85·27	764
Approx. Monthly Mean		1010
Normal Mean 1912-1932		749

Kangarty (Main Nile)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	133·53	1290
6	133·32	1200
7	133·29	1190
8	133·28	1180
9	133·28	1150
13	132·98	1050
14	132·94	1050
15	132·89	1030
16	132·85	1020
18	132·74	959
20	132·54	908
21	132·52	885
22	132·49	884
23	132·50	879
25	132·50	883

Kangarty (*contd*).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
27	132·37	814
28	132·30	794
29	132·27	762
30	132·24	775
Approx. Monthly Mean		1010
Normal Mean 1912-1932		731

Hassanab (Main Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	11·21	1090
7	11·05	903
11	10·99	893
18	10·86	797
23	10·75	707
27	10·74	708
Approx. Monthly Mean		834
Normal Mean 1912-1932		696

Tamaniât (Main Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
9	10·64	969
13	10·52	865
20	10·31	748
24	10·31	786
30	10·26	746
Approx. Monthly Mean		860
Normal Mean 1912-1932		702

Khartoum (Blue Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	10·68	152
7	10·51	153
11	10·48	163
18	10·28	129
22	10·19	140
28	10·12	108
Approx. Monthly Mean		142
Normal Mean 1912-1932		155

Hillet Sherif (Blue Nile).
(Sennar Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	9·99	189
4	9·98	186
6	9·97	187
8	9·97	186
11	9·79	138
13	9·78	136
15	9·78	134
18	9·77	134
20	9·76	133
22	9·67	108
25	9·66	107
27	9·66	107
29	9·65	107
Approx. Monthly Mean		140
Normal Mean 1912-1932		154

Gezira Main Canal
(Kilo 1·3).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	15·92	66
1	15·92	65
17	16·07	68
17	16·07	68
Approx. Monthly Mean		70
Normal Mean 1926-1932		47

Roseires (Blue Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	11·81	157
4	11·75	151
6	11·71	146
8	11·66	137
10	11·62	131
12	11·57	123
14	11·53	116
16	11·50	113
18	11·48	106
20	11·45	103
22	11·45	101
24	11·50	111
26	11·54	119
28	11·53	114
30	11·56	119
Approx. Monthly Mean		124
Normal Mean 1912-1932		131

Mogren (White Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
4	10·93	800
8	10·85	752
12	10·73	704
19	10·55	592
23	10·54	617
29	10·45	610
Approx. Monthly Mean		679
Normal Mean 1912-1932		552

Renk (White Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	10·75	732
Approx. Monthly Mean		—
Normal Mean 1928-1932		509

Malakâl (White Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	10.66	666
5	10·63	636
10	10·57	629
15	10·51	636
21	10·44	610
25	10·41	587
30	10·47	633
Approx. Monthly Mean		626
Normal Mean 1912-1932		575

Hillet Doleib (River Sobât)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	11·75	74
4	11·72	57
9	11·66	56
14	11·60	61
22	11·49	60
24	11·49	58
29	11·56	104
Approx. Monthly Mean		67
Normal Mean 1912-1932		123

Nasser (River Sobât).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	5·33	82
2	5·31	71
3	5·26	81
4	5·23	76
6	5·15	68
7	5·16	68
8	5·16	65
9	5·12	65
10	5·10	63
11	5·08	60
13	5·04	57
14	5·02	57
15	4·99	55
16	4·97	54
17	4·95	51
18	4·92	50
20	4·90	48
21	4·96	55
22	5·12	63
23	5·26	77
24	5·36	87
25	5·40	90
27	5·45	99
28	5·43	93
29	5·44	97
30	5·44	97
31	5·44	96
Approx. Monthly Mean		71
Normal Mean 1929-1932		63

Gambeila (River Baro).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
Feb. 10	9·37	47
14	9·43	53
18	9·45	54
21	9·44	58
24	9·47	62
28	9·42	53
Approx. Monthly Mean		51
Normal Mean 1928-1932		58
Mar. 3	9·40	52

Discharges of the Nile during March, 1933 (*continued*).

Observed by the Irrigation Department.

Akobo (River Pibor)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	9·92	0
5	9·88	0
10	9·85	0
15	9·65	0
20	9·65	0
25	9·94	0
30	10·04	0
Approx. Monthly Mean		0
Normal Mean 1929-1932		1

Bahr el Zerâf (Kilo. 3).

(Gauge at Mouth).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
8	11·92	213
19	11·86	210
28	11·80	197
Approx. Monthly Mean		207
Normal Mean 1912-1932		134

Abu Tong (White Nile).

(Tonga Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
8	12·20	359
18	12·14	355
28	12·10	347
Approx. Monthly Mean		355
Normal Mean 1923-1932		301

Lake No (White Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
7	13·80	360
17	13·78	363
27	13·73	334
Approx. Monthly Mean		355
Normal Mean 1923-1932		303

Bahr el Ghazal

(At Mouth).

(Suddite Factory Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
7	13·90	23
17	13·87	24
27	13·82	26
Approx. Monthly Mean		25
Normal Mean 1923-1932		12

Bahr el Jebel (Kilo 3).

(Lake No Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
7	13·80	320
17	13·78	322
27	13·73	327
Approx. Monthly Mean		323
Normal Mean 1923-1932		294

Jonglei (River Atem).

(Eastern Channel).

(Bahr el Jebel).

Day of Month.	Gauge Reading. m.	Disch. m³ p.s.
7	8·80	275
9	8·80	272
11	8·80	277
13	8·82	278
20	8·84	288
22	8·86	284
24	8·86	288
26	8·87	291
Approx. Monthly Mean		282

River Atem

(Western Channel).

(U.S. Jonglei Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³ p.s.
7	8·80	119
9	8·80	115
11	8·80	116
13	8·82	115
20	8·84	117
22	8·86	123
24	8·86	121
26	8·87	121
Approx. Monthly Mean		118

Giggin (Bahr el Jebel).

(Western Channel).

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
3	29·15	215
Approx. Monthly Mean		215
Normal Mean 1931-1932		174

Gemeiza (Bahr el Jebel).

(Eastern Channel).

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
2	28·80	658
Approx. Monthly Mean		657
Normal Mean 1931-1932		566

Terrakekka (Bahr el Jebel)

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	13·40	900
Approx. Monthly Mean		887
Normal Mean 1931-1932		754

Mongalla (Bahr el Jebel).

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	11·94	900
6	11·92	894
11	11·90	865
16	11·90	876
21	11·91	883
26	11·88	847
Approx. Monthly Mean		874
Normal Mean 1912-1932		667

Occasional Discharges,

Observed by the Irrigation Department.

Date.	River.	Site.	Gauge. Reading. M.	Gauge. Site.	Disch. m^3. p.s.
		River Sobât Tributaries.			
3-3-1933	Khor Filus ...	U.S. Tail	11·73	H.Doleib	7
13-3-1933	,, ...	,, ...	11·61	,,	6
23-3-1933	,, ...	,, ...	11·49	,,	6
		Bahr el Jebel and Tributaries.			
14-3-1933	Jebel	Bor	11·44	Bor	752
28-3-1933	,, ...	,, ...	11·43	,,	704
12-3-1933	Atem (West. Ch.)	Close to Lagoon	8·81	Jonglei	185
25-3-1933	,, ,,	,, ,, ...	8·87	,,	184
27-3-1933	,, ,,	D.S. Jonglei	8·87	,,	135
12-3-1933	,, (East. Cham)	U.S. ,, ...	8·81	,,	205
25-3-1933	,, ,,	,, ,, ...	8·87	,,	216
27-3-1933	,, ,,	D.S. ,, ...	8·87	,,	209

P. Phillips,

Director, Hydrological Service.

Govt. Press 1536–1933–250 ex.

Ministry of Public Works, Egypt.—Physical Department.

REPORT ON THE WEATHER AND STATE OF THE RIVER FOR MAY 1933.

The Weather.

Very changeable ; five depressions producing khamsin conditions affected Egypt, but temperatures were not unusually high. That of the 27th was associated with sandstorms and gales of exceptional severity.

At the beginning of the month anticyclonic conditions prevailed and the weather was rather warm. A depression from the Aegean reached Syria on the 6th and the northwesterly winds of its cool sector arriving in Egypt brought a decided fall in temperature.

On the 9th a depression appeared in the desert west of Siwa Oasis, and winds in Egypt went round to southeast. At Salum the northwest wind following the depression attained a velocity of 80 kilometres an hour. On the following day this depression traversed Middle Egypt, and dry hot southerly winds caused the temperature in Cairo to rise rapidly to 40° C (104° F). The depression passed in the afternoon, the arrival of the northwest wind being marked by a duststorm of moderate intensity, and by an abrupt fall in temperature ; on the next day the maximum temperature in Cairo was only 30° C. Cool weather however did not long prevail, as Egypt was again influenced by a depression on the 13th. On the 14th there were shallow depressions off the coast of the Delta and also near Cairo. The sky became completely overcast and very light showers occurred in many places in Lower Egypt. The depression passed in the afternoon of the following day, and cool weather followed. A shallow depression from the desert crossed Egypt on the 20th with some rise in temperature, its arrival being preceded by very light showers throughout Lower Egypt. On the 21st unusually cool northwest winds traversed Egypt and the temperature remained low for four days.

On the 25th a shallow depression was situated off Mersa Matruh, with a secondary west of Siwa Oasis. Khamsin conditions developed and the weather became unsettled. Lightning was seen in Cairo in the evening. Two days later the weather was disturbed to an unusual degree. The sky was overcast and the weather warm. In the afternoon a line squall struck Cairo and a severe sandstorm was experienced, the visibility at times being little over 100 metres. The sandstorms and strong winds were general in Egypt and the air was so full of sand in places that lamps had to be lit for ordinary work. In Cairo district the wind reached a velocity of 93 kilometres an hour from the north northwest, and extensive structural damage occurred. The destructive power of the wind seems to have been greater than in the case of many other winds of about the same velocity. A pronounced fall of temperature accompanied the arrival of this cold front, and the gale was followed in the evening by a thunderstorm. Showers occurred throughout Lower Egypt, those in the north and west taking place earlier in the day. The largest falls were 8 millimetres at Mersa Matruh and 6 millimetres at Atf. Thunder and lightning were reported from the north of Egypt to the Fayoum and Beni Suef.

Subsequently western Egypt became an area of high pressure and cool northwesterly winds with pleasant weather prevailed. At Salum the wind reached a velocity of 87 kilometres an hour on the 31st.

For the month as a whole the barometric pressure was slightly above normal in Egypt and below in the Sudan. On the Mediterranean coast the temperature was below normal ; it was normal in Middle Egypt, and above normal elsewhere, though not by large amounts except in the Central and Southern Sudan. Rainfall was above normal over the North and Central Sudan, but considerably below in the southern Sudan.

TABLE SHOWING THE DEPARTURES FROM NORMAL FOR MAY 1933.

DISTRICTS.	BAROMETRIC PRESSURE.		TEMPERATURE.						RAINFALL	
			MAXIMUM.		MINIMUM.		MAX.+MIN. ÷ 2.			
	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal
	mb.	mb.	°C.	°C.	°C.	°C.	°C.	°C.	mm.	mm.
I. Mediterranean	1014·0	+0·7	25·3	—0·8	16·9	—0·4	21·1	—0·6	2	+ 1
II. Middle Egypt	1013·3	+0·2	32·2	—0·2	16·3	+0·1	24·2	0·0	1	— 1
III. Upper Egypt	1011·2	0·0	38·6	+0·5	20·9	+0·1	29·8	+0·3	0	0
IV. North Sudan	1008·0	—0·2	42·4	+0·6	25·3	+0·4	33·8	+0·5	2	— 2
V. Red Sea*	1009·8	+0·3	36·1	+1·1	23·4	—0·3	29·8	+0·4	3	+ 2
VI. Central Sudan	1007·8	—1·0	40·3	+0·6	24·5	+1·5	32·4	+1·0	42	+18
VII. South Sudan	1010·1	—0·1	36·2	+0·8	23·6	+1·5	29·9	+1·2	80	—41

* Port Sudan only.

NOTE.—1,000 millibars is equivalent to 750·1 millimetres at 0°C. and mean gravity.

L. J. SUTTON,
Director, Meteorological Service.

State of the River.

Lake Albert at Butiaba was steady during the month. Its level on June 1, 1933, was 89 cms. above the normal and 15 cms. above that of the corresponding day of last year.

With the exception of two flushes on the 3rd and 23rd the Bahr el Jebel at Juba remained practically steady throughout the month. The levels were continuously above normal.

The River Sobat at Nasser fell during the first four days and rose steadily thereafter reaching about normal level on the 29th. It then fell away a little for the last two days. The rise was very similar to that of last year.

The White Nile at Malakal fell slightly during the first ten days and then rose rather faster than normally for the rest of the month.

The Blue Nile at Roseires fluctuated above normal during the first three weeks but fell below normal thereafter. At Khartoum the Blue Nile was steady and below normal during the first week and then fluctuated below normal until the end of the month.

The River Atbara at Khashm el Girba fluctuated about normal for the first eighteen days and fell steadily thereafter being 42 cms. below normal at the end of the month.

The Main Nile at Wadi Halfa was on the average a few centimetres below normal throughout the month but continuously above last year's levels.

In general the River has commenced its rise fairly normally.

The differences of the mean levels in May 1933 from those of May 1932 and from the normal 1906-30 were :—

STATION.	MEAN DIFFERENCES OF LEVELS.	
	May 1933 minus May 1932.	May 1933 minus Normal.
	Metres.	Metres.
Juba	— 0·04	+ 0·19
Nasser	+ 0·01	— 0·46*
Malakál	+ 0·25	+ 0·23
Roseires	— 0·23	+ 0·10
Khartoum	0·00	— 0·11
Khashm el Girba	— 0·09	— 0·10
Wadi Halfa	+ 0·34	— 0·12

* Nasser Normal is for 1922-1930 only.

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U. S. Weather Bureau
JUL 20 1938

Discharges of the Nile during April, 1933.

Observed by the Irrigation Department.

U.S. Esna Barrage (Main Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
4	74·07	727
11	74·05	694
18	71·12	732
25	71·15	825
Approx. Monthly Mean		749

Aswân (Measured by Sluices). Aswân D.S. Gauge.

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	85·22	730
2	85·19	729
3	85·18	730
4	85·18	730
5	85·18	725
6	85·18	724
7	85·18	724
8	85·18	724
9	85·18	723
10	85·17	723
11	85·24	752
12	85·24	751
13	85·24	750
14	85·22	750
15	85·23	749
16	85·22	748
17	85·20	749
18	85·20	748
19	85·21	750
20	85·20	749
21	85·36	829
22	85·37	829
23	85·36	830
24	85·36	830
25	85·36	832
26	85·38	827
27	85·38	832
28	85·38	828
29	85·36	829
30	85·36	830
Approx. Monthly Mean		768
Normal Mean 1912-1932		707

Kangarty (Main Nile)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	132·20	739
2	132·12	703
3	132·08	691
4	132·04	686
7	131·99	676
8	132·01	694
9	132·00	677
10	131·94	674
11	131·90	661
12	131·86	652
13	131·82	641
14	131·81	632
15	131·83	641
18	131·78	629
19	131·74	622
20	131·72	610
21	131·71	616
22	131·71	610
23	131·71	622
24	131·72	619
25	131·71	615
26	131·70	608
27	131·65	599
29	131·62	589
30	131·63	586
Approx. Monthly Mean		644
Normal Mean 1912-1932		607

Hassanab (Main Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	10·70	671
9	10·64	628
12	10·68	657
18	10·58	614
22	10·69	701
27	10·69	691
Approx. Monthly Mean		658
Normal Mean 1912-1932		606

Tamaniât (Main Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
3	10·19	700
12	10·13	646
15	10·12	663
20	10·28	780
24	10·27	749
29	10·18	706
Approx. Monthly Mean		706
Normal Mean 1912-1932		633

Khartoum (Blue Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	10·09	87
9	10·08	85
13	10·00	81
18	10·15	141
22	10·15	138
26	10·12	148
Approx. Monthly Mean		113
Normal Mean 1912-1932		127

Hillet Sherif (Blue Nile). (Sennar Gauge).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	9·65	105
3	9·70	113
5	9·69	112
8	9·68	111
10	9·67	110
12	9·94	174
15	9·93	173
18	9·90	164
20	9·83	145
22	9·80	136
24	9·78	134
26	9·77	135
29	9·51	80
Approx. Monthly Mean		131
Normal Mean 1912-1932		139

Gezira Main Canal (Kilo 1·3).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	16·33	79
2	16·33	79
Approx. Monthly Mean		—
Normal Mean 1926-1932		23

Roseires (Blue Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	11·53	111
3	11·50	109
5	11·47	104
7	11·41	90
9	11·41	93
11	11·36	89
13	11·42	98
15	11·40	97
17	11·36	91
19	11·29	79
21	11·23	72
23	11·19	69
25	11·17	68
27	11·54	118
29	11·70	142
Approx. Monthly Mean		95
Normal Mean 1912-1932		119

Mogren (White Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	10·41	575
10	10·40	575
14	10·31	516
19	10·47	574
23	10·44	558
27	10·41	548
Approx. Monthly Mean		565
Normal Mean 1912-1932		524

Malakâl (White Nile).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
5	10·47	594
10	10·48	636
15	10·46	580
20	10·44	618
25	10·36	603
30	10·34	632
Approx. Monthly Mean		610
Normal Mean 1912-1932		530

Hillet Doleib (River Sobât)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
4	11·57	106
9	11·58	108
14	11·56	111
19	11·55	105
24	11·45	82
30	11·41	92
Approx. Monthly Mean		101
Normal Mean 1912-1932		96

Nasser (River Sobât).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	5·45	99
3	5·47	100
4	5·52	104
6	5·50	101
7	5·43	99
8	5·37	89
10	5·42	95
11	5·52	106
12	5·57	99
13	5·59	109
14	5·59	107
15	5·53	95
17	5·40	89
18	5·31	78
19	5·23	78
20	5·18	74
21	5·17	76
22	5·22	78
24	5·29	84
25	5·38	94
26	5·41	94
27	5·37	91
28	5·31	87
29	5·22	78
Approx. Monthly Mean		92
Normal Mean 1929-1932		88

Gambeila (River Baro).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
Mar. 7	9·33	43
10	9·30	60
15	9·25	33
17	9·35	48
21	9·72	80
24	9·68	76
28	9·75	85
31	9·79	93
Approx. Monthly Mean		62
Normal Mean 1928-1932		44

Akobo (River Pibor)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
5	10·06	1
10	10·20	1
15	10·63	1
20	10·30	1
25	10·05	0
30	10·02	0
Approx. Monthly Mean		1
Normal Mean 1929-1932		1

Bahr el Zerâf (Kilo. 3). (Gauge at Mouth).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
8	11·79	190
18	11·74	180
29	11·63	172
Approx. Monthly Mean		
Normal Mean 1912-1932		

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Discharges of the Nile during April, 1933 (*continued*).

Observed by the Irrigation Department.

Abu Tong (White Nile).

(Tonga Gauge).

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
8	12·07	317
18	12·05	322
29	11·98	316
Approx. Monthly Mean		338
Normal Mean 1923-1932		299

Lake No (White Nile).

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
7	13·71	333
17	13·67	339
28	13·66	352
Approx. Monthly Mean		340
Normal Mean 1923-1932		302

Bahr el Ghazal

(At Mouth).

(Sudditc Factory Gauge).

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
7	13·0	—10
17	13·28	14
28	13·22	16
Approx. Monthly Mean		8
Normal Mean 1923-1932		12

Bahr el Jebel (Kilo 3).

(Lake No Gauge).

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
7	13·71	340
17	13·67	334
28	13·66	339
Approx. Monthly Mean		337
Normal Mean 1923-1932		292

Jonglei (River Atem).

(Eastern Channel).

(Bahr el Jebel).

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
2	8·84	278
4	8·82	280
6	8·82	275
8	8·82	277
10	8·81	277
16	8·80	276
18	8·80	276
20	8·80	277
22	8·80	273
Approx. Monthly Mean		276

River Atem

(Western Channel).

(U.S. Jonglei Gauge).

Day of Month.	Gauge Reading. m.	Disch. m^3 p.s.
2	8·84	118
4	8·82	116
6	8·82	117
8	8·82	114
10	8·81	116
16	8·80	115
18	8·80	119
20	8·80	114
22	8·80	115
Approx. Monthly Mean		115

Giggin (Bahr el Jebel).

(Western Channel).

Day of Month.	Gauge Reading. m.	Disch. m^3 p.s.
3	29·13	215
Approx. Monthly Mean		216
Normal Mean 1931-1932		182

Gemeiza (Bahr el Jebel).

(Eastern Channel).

Day of Month.	Gauge Reading m.	Disch. m^3. p.s.
2	28·78	656
Approx. Monthly Mean		657
Normal Mean 1931-1932		574

Terrakekka (Bahr el Jebel)

Day of Month.	Gauge Reading m.	Disch. m^3. p.s.
1	13·35	874
Approx. Monthly Mean		871
Normal Mean 1931-1932		769

Mongalla (Bahr el Jebel).

Day of Month.	Gauge Reading m.	Disch. m^3. p.s.
1	11·88	864
6	11·99	906
11	11·88	861
16	11·89	882
21	11·86	867
26	11·84	853
Approx. Monthly Mean		872
Normal Mean 1912-1932		712

Occasional Discharges.

Observed by the Irrigation Department.

Date.	River.	Site.	Gauge. Reading.	Gauge. Site.	Disch. m³. p.s.
			M.		
		White Nile Tributaries.			
28-3-1933	Khor Atar	Mouth	11·45	Fenikang	—
4-4-1933	,, ...	,, ...	11·46	,,	—
		River Sobât Tributaries.			
3-4-1933	Khor Filus ...	Mouth	11·57	H.Doleib	4
13-4-1933	,, ...	,, ...	11·57	,,	3
23-4-1933	,, ...	,, ...	11·48	,,	1
		Bahr el Jebel and Tributaries.			
11-4-1933	Jebel	Bor	11·43	Bor	740
25-4-1933	,, ...	,, ...	11·39	,,	739
9-4-1933	Atem (West. Ch.)	Close to Lagoon	8·81	Jonglei	182
21-4-1933	,, ,,	,, ,, ...	8·80	,,	187
23-4-1933	,, ,,	D.S. Jonglei	8·80	,,	136
9-4-1933	,, (East.Chan.)	U.S. ,, ...	8·81	,,	211
21-4-1933	,, ,,	,, ,, ...	8·80	,,	209
23-4-1933	,, ,,	D.S. ,, ...	8·80	,,	206

P. Phillips,

Director, Hydrological Service.

Govt. Press 2089-1933-250 ex.

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Ministry of Public Works, Egypt.—Physical Department.

REPORT ON THE WEATHER AND STATE OF THE RIVER FOR JUNE 1933.

The Weather.

The weather during June was remarkable on account of two short spells of phenomenally hot weather, during which all previous records for high temperature in Cairo district were broken.

For the first week the weather was cool, with northerly winds. On the 7th a depression was situated over the western Mediterranean, another off Benghasi and a secondary in the desert west of Siwa Oasis. Winds in Egypt veered to east, and then to south, and the temperature rose rapidly. By the following morning the depressions had approached, the first being off Benghasi, the second off Mersa Matruh, and the third near Siwa. The weather became much hotter—the temperature reaching 43° C at Matruh which is a record, and 45° C in Cairo—and owing to the lightness of the wind extremely oppressive particularly at night.

On the 9th the Mediterranean depressions were passing north of Egypt, the desert depression was approaching the Nile valley, and the hot weather reached its greatest intensity, the following temperatures being recorded :—

Ezbekia 45·4° C (113·7° F), Giza 46·9° C (116·4° F), Almaza 46·6° C (115·9° F). The relative humidity fell to 5 per cent. No temperatures as high as these had been recorded at these stations since their installation, as they slightly exceeded those reached on June 16th, 1915 when the previous highest records were established. For Abbassia the observations go back to 1869 ; so that this day was the hottest near Cairo for at least 64 years. The depressions passed in the evening, north winds arrived in Egypt, and there was a big fall in temperature.

Cool weather however lasted only for two days, when a heat wave even more intense than the last was experienced. On the 12th a depression appeared off Benghasi,travelling more quickly than its predecessors ; the wind veered to northeast, and in the morning of the 13th when the depression was off Alexandria, a scorshing southeast wind traversep Egypt. The temperatures on the coast were not strikingly high, but in Middle Egypt generally, all previous records were broken. The following temperatures were registered :—

Ezbekieh	46·6°C=115·9°F.
Tanta	46·8°C=116·2°F.
Almaza	47·1°C=116·8°F.
Qena	47·2°C=117·0°F.
Giza	47·4°C=117·3°F.
Helwan	47·5°C=117·5°F.
Kharga	48·0°C=118·4°F.
Wadi Halfa	49·0°C=120·2°F.
Asyût	50·0°C=122·0°F.

The cold front in the rear of this depression reached Cairo at 4 o'clock in the afternoon, and the temperature dropped by 14° C (25°F) within two hours. By the following morning this depression had reached the Syrian desert, and the cool northwest winds then blowing over Egypt brought the temperature below normal.

It is interesting to note that neither of these systems of depressions was accompanied in its passage by dust storms, which usually mark the approach or arrival of the cold front of khamsin depressions.

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JUN 30
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From the 16th to the end of the month, the temperature in Cairo was continuously above normal. Two more intense heat waves were experienced in Egypt, one on the 22nd and the other on the last day of the month.

For the month as a whole the mean atmospheric pressure was below normal everywhere except on the Red Sea Coast, while the temperature was above normal in all districts. This month was hottest experienced in Upper Egypt for at least twenty years.

The air in Cairo district was very dry, the mean relative humidity for the month at Helwan being 32 per cent compared with a normal of 41 per cent. The Sudan rainfall was generally deficient.

TABLE SHOWING THE DEPARTURES FROM NORMAL FOR JUNE 1933.

DISTRICTS.	BAROMETRIC PRESSURE.		TEMPERATURE.						RAINFALL	
			MAXIMUM.		MINIMUM.		MAX.+MIN./2.			
	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal
	mb.	mb.	°C.	°C.	°C.	°C.	°C.	°C.	mm.	mm.
I. Mediterranean	1012·0	—0·1	29·3	+1·1	20·1	—0·2	24·7	+0·4	0	0
II. Middle Egypt	1011·3	—0·5	37·3	+2·4	20·4	+1·4	28·8	+1·9	0	0
III. Upper Egypt	1008·4	—1·0	43·5	+3·4	24·0	+0·8	33·8	+2·1	0	0
IV. North Sudan	1007·2	—0·8	42·5	+0·6	25·7	—0·1	34·1	+0·2	8	— 2
V. Red Sea *	1006·8	+0·2	39·2	+0·4	26·1	+0·5	32·6	+0·4	·0	0
VI. Central Sudan	1008·4	—1·4	37·4	—0·1	23·3	+0·5	30·4	+0·2	52	— 2
VII. South Sudan	1010·6	—0 7	33·6	+0·4	22·0	+0·8	27·8	+0·6	118	—22

* Port Sudan only.

NOTE.—1,000 millibars is equivalent to 750·1 millimetres at 0°C. and mean gravity.

RAINFALL DATA FOR JUNE 1933.

STATION.	1933	Diff. from Normal.	STATION.	1933	Diff. from Normal.
	m/m.	m/m.		m/m.	m/m.
Juba	48	— 70	Adis Abâba	109	— 26
Wau	143	— 21	Roseires	87	— 39
Malakâl	162	+ 26	Wâd Medani	38	0
El Obeid	85	+ 48	Atbara	0	— 2
El Fasher	0	— 18	Kassala	17	— 12
Khartoum	17	+ 9	Port Sudan	0	0

REMARKS

MAHMOUD HAMID MOHAMED,
A/Director, Meteorological Service.

By Transfer
U. S. Weather Bureau
JUN 20 1938

State of the River.

Lake Albert at Butiaba fell 4 cms. during the month. Its level on July 1st 1933 was 82 cms. above normal and 13 cms. above that of the corresponding day of last year.

The general rise of the river during the month was slower than normal.

The Bahr el Jebel at Juba remained almost steady throughout the month. The levels were a few centimetres above the normal and practically the same as those of last year.

The river Sobat at Nasser rose very slowly. The level which was 29 cms. below normal at the beginning of the month was 118 cms. below at the end.

The White Nile at Malakal rose slower than normally but the levels remained above normal throughout.

The Blue Nile at Roseires fluctuated below both the normal and last year's levels with two prominent peaks on the 2nd and 21st 112 and 93 cms. respectively above normal. Except for the period 10th to the 14th the Blue Nile at Khartoum fluctuated below both the normal and last year's levels throughout the month.

The River Atbara at Khashm el Girba began to rise on the 19th when the level was 113 cms. below normal. The rise was very rapid and by the end of the month the level was 35 cms. above normal.

The Main Nile at Wadi Halfa fluctuated below normal with a general upward tendency after the 10th of the month.

The differences of the mean levels in June 1933 from those of June 1932 and from the normal for 1906-1930 were :—

STATION.	Mean Differences of Levels.	
	June 1933 minus June 1932.	June 1933 minus Normal.
	Metres.	Metres.
Juba	+ 0·02	+ 0·14
Nasser	— 0·59	— 0·75 *
Malakâl	— 0·06	+ 0·17
Roseires	— 0·31	— 0·08
Khartoum	— 0·24	— 0·19
Khashm el Girba	— 0·01	— 0·49
Wadi Halfa	0·00	— 0·16

* Nasser Normal is for 1922-1930 only.

Discharges of the Nile during May, 1933.

Observed by the Irrigation Department.

U.S. Esna Barrage (Main Nile).

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
2	74·17	798
9	74·14	758
16	74·31	946
23	74·55	1050
30	74·60	1090
Approx. Monthly Mean		926

Aswân (Measured by Sluices). Aswân D.S. Gauge.

1	85·38	844
2	85·37	841
3	85·37	842
4	85·37	843
5	85·37	841
6	85·37	842
7	85·34	840
8	85·34	841
9	85·34	842
10	85·35	843
11	85·54	950
12	85·55	951
13	85·54	948
14	85·54	948
15	85·56	950
16	85·56	958
17	85·55	944
18	85·55	947
19	85·58	957
20	85·58	959
21	85·77	1080
22	85·78	1070
23	85·79	1070
24	85·78	1070
25	85·78	1070
26	85·82	1100
27	85·82	1100
28	85·82	1100
29	85·83	1100
30	85·82	1090
31	85·80	1100
Approx. Monthly Mean		964
Normal Mean 1912-1932		789

Kangarty (Main Nile)

1	131·69	607
2	131·74	616
3	131·79	651
4	131·84	675
7	131·84	663
8	131·83	653
9	131·81	654
10	131·80	632
11	131·80	650
14	131·73	637
15	131·71	636
16	131·71	635
17	131·71	637
18	131·72	622
21	131·71	641
22	131·75	641
23	131·81	658
24	131·86	667
25	131·91	691
27	131·94	710
28	131·96	710
29	131·95	696
30	131·89	682
31	131·80	655
Approx. Monthly Mean		655
Normal Mean 1912-1932		577

Hassanab (Main Nile).

1	10·65	649
6	10·64	640
11	10·69	696
16	10·75	730
21	10·67	676
27	10·65	684
Approx. Monthly Mean		686
Normal Mean 1912-1932		639

Tamaniât (Main Nile).

3	10·19	728
8	10·29	748
13	10·35	817
18	10·24	761
23	10·19	685
29	10·40	837
Approx. Monthly Mean		762
Normal Mean 1912-1932		715

Khartoum (Blue Nile).

1	10·02	127
6	10·02	130
10	10·23	225
16	10·16	176
21	10·17	173
27	10·30	229
Approx. Monthly Mean		184
Normal Mean 1912-1932		191

Hillet Sherif (Blue Nile). (Sennar Gauge).

1	9·52	81
3	10·17	243
6	10·09	213
8	9·98	182
10	9·94	180
13	9·92	172
15	10·02	196
17	10·04	212
20	10·02	192
22	10·35	307
24	10·28	275
27	10·02	209
29	10·01	204
31	9·97	182
Approx. Monthly Mean		207
Normal Mean 1912-1932		240

Roseires (Blue Nile).

1	11·59	123
3	11·53	116
5	11·86	174
7	11·87	174
9	11·86	177
11	12·02	199
13	11·86	168
15	12·01	200
17	12·28	268
19	12·55	332
21	12·55	336
23	11·89	180
25	11·96	190
27	11·87	174
29	11·89	176
31	12·22	249
Approx. Monthly Mean		203
Normal Mean 1912-1932		274

Mogren (White Nile).

2	10·38	577
7	10·43	579
11	10·55	578
17	10·41	574
22	10·41	570
28	10·58	561
Approx. Monthly Mean		573
Normal Mean 1912-1932		544

Malakâl (White Nile).

5	10·29	571
10	10·26	582
15	10·40	605
20	10·49	649
25	10·60	657
30	10·68	700
Approx. Monthly Mean		625
Normal Mean 1912-1932		583

Hillet Doleib (River Sobât)

4	11·36	69
9	11·34	70
13	11·47	94
19	11·60	161
23	11·71	203
29	11·81	223
Approx. Monthly Mean		139
Normal Mean 1912-1932		165

Nasser (River Sobât).

1	5·10	70
2	5·05	63
3	5·02	59
4	5·02	62
5	5·09	72
6	5·25	86
8	5·53	107
9	5·64	117
10	5·69	123
11	5·71	127
12	5·76	133
13	5·83	140
15	5·82	139
16	5·88	145
17	6·05	168
18	6·14	176
19	6·19	185
20	6·25	189
22	6·28	195

Gambeila (River Baro).

Apr. 5	9·50	65
7	9·86	97
11	9·73	71
14	9·55	49
18	9·65	57
21	9·72	80
25	9·50	51
28	9·44	44
Approx. Monthly Mean		66
Normal Mean 1928-1932		91
May 2	9·77	88
5	9·94	112
9	9·96	108

Bahr el Zerâf (Kilo. 3). (Gauge at Mouth).

8	11·65	163
19	11·68	161
28	11·76	153
Approx. Monthly Mean		161
Normal Mean 1912-1932		123

Abu Tong (White Nile). (Tonga Gauge).

8	11·94	351
18	11·98	326
28	12·03	326
Approx. Monthly Mean		336
Normal Mean 1923-1932		292

Lake No (White Nile).

7	13·67	348
17	13·69	356
27	13·68	344
Approx. Monthly Mean		350
Normal Mean 1923-1932		302

Discharges of the Nile during May, 1933 (*continued*).

Observed by the Irrigation Department.

Bahr el Ghazal (At Mouth). (Suddite Factory Gauge).

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
7	13·76	23
17	13·78	28
27	13·77	20
Approx. Monthly Mean		22
Normal Mean 1923-1932		10

Bahr el Jebel (Kilo 3). (Lake No Gauge).

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
7	13·67	336
17	13·69	315
27	13·68	335
Approx. Monthly Mean		329
Normal Mean 1923-1932		293

Jonglei (River Atem). (Eastern Channel). (Bahr el Jebel).

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
2	8·80	279
4	8·84	290
6	8·84	288
8	8·84	288
14	8·84	288
16	8·85	293
18	8·86	298
20	8·87	294
30	8·90	303
Approx. Monthly Mean		293

River Atem (Western Channel). (U.S. Jonglei Gauge).

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
2	8·80	113
4	8·84	116
6	8·84	115
8	8·84	118
14	8·84	118
16	8·85	118
18	8·86	118
20	8·87	120
30	8·90	121
Approx. Monthly Mean		118

Giggin (Bahr el Jebel). (Western Channel).

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
3	29·13	218
Approx. Monthly Mean		224
Normal Mean 1931-1932		222

Gemeiza (Bahr el Jebel). (Eastern Channel).

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
2	28·77	659
Approx. Monthly Mean		660
Normal Mean 1931-1932		657

Terrakekka (Bahr el Jebel)

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
1	13·35	867
Approx. Monthly Mean		882
Normal Mean 1931-1932		923

Mongalla (Bahr el Jebel).

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
1	11·89	862
6	11·94	892
11	12·05	957
16	12·04	938
21	11·96	902
26	12·04	935
Approx. Monthly Mean		916
Normal Mean 1912-1932		867

Occasional Discharges.

Observed by the Irrigation Department.

Date.	River.	Site.	Gauge. Reading.	Gauge. Site.	Disch. m³. p.s.
			M.		
		River Sobât Tributaries.			
3-5-1933	Khor Filus ...	Mouth	11·37	H.Doleib	0
		Bahr el Jebel and Tributaries.			
9-5-1933	Jebel	Bor	11·44	Bor	784
23-5-1933	,, ...	,, ...	11·46	,,	790
7-5-1933	Atem (West. Ch.)	Close to Lagoon	8·84	Jonglei	190
19-5-1933	,, ,,	,, ,, ...	8·86	,,	196
21-5-1933	,, ,,	D.S. Jonglei	8·87	,,	151
7-5-1933	,, (East. Chan.)	U.S. ,, ...	8·84	,,	211
19-5-1933	,, ,,	,, ,, ...	8·86	,,	220
21-5-1933	,, ,,	D.S. ,, ...	8·87	,,	220

P. Phillips,

Director, Hydrological Service.

Govt. Press 3159-1933-250 ex.

Ministry of Public Works, Egypt.—Physical Department.

REPORT ON THE WEATHER AND STATE OF THE RIVER FOR JULY 1933.

The Weather.

Temperatures in July were on the whole slightly below normal. On the 6th a shallow depression which arrived from the western desert gave rise to an east wind and warm weather; a temperature of 39° C. being recorded in Cairo, which is 4° C. above normal.

The depression passed in the afternoon, but warm weather persisted until the next day. The arrival of the northeast wind in the rear of the depression was marked by a dust storm of moderate intensity which lasted for few hours. Strong northeast winds continued during the next day, but cool weather followed and lasted until about the middle of the month.

For three days commencing the 17th the temperature in Cairo was above normal, but fell again afterwards and the weather remained cool until the end of the month.

For the month as a whole the pressure was above normal except in the Central Sudan, while the mean temperature was below normal throughout Egypt and the Red Sea.

Generally the Sudan rainfall was in excess in the northern and southern Sudan and below normal elsewhere.

NOTE.

It may be of interest to compare the record high temperatures which occurred last month with similar records in other parts of the world: The highest shade temperature on record is 136° F.=57·7° C. at Azizia in Tripoli which is 2° F. higher than the maximum of 134° F=56·6° C. recorded at the famous station of Death Valley California. It has been suggested that the Azizia record is probably too high owing to the effect of radiation from the ground. A temperature of 130° F. =54·4° C. has been recorded at Insalah in the Sahara. All these high temperatures occur in the subtropical desert zone.

In the Sudan the thermometer once rose to 129° F.=53·9° C. at Tokar, while in Egypt, the highest maximum temperature ever recorded is 123·8° F.=51° C at Aswan in July 1918.

TABLE SHOWING THE DEPARTURES FROM NORMAL FOR JULY 1933.

DISTRICTS.	BAROMETRIC PRESSURE.		TEMPERATURE.						RAINFALL.	
			MAXIMUM.		MINIMUM.		MAX.+MIN. ÷ 2.			
	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.
	mb.	mb.	°C.	°C.	°C.	°C.	°C.	°C.	mm.	mm.
I. Mediterranean	1011·2	+2·0	28·4	—1·2	21·7	—0·6	25·0	—0·9	0	0
II. Middle Egypt	1010·7	+1·3	34·7	—0·7	20·4	—0·2	27·6	—0·4	0	0
III. Upper Egypt	1008·3	+0·5	39·8	—0·2	23·0	—0·9	31·4	—0·6	0	0
IV. North Sudan	1009·0	+0·1	40·0	+0·8	24·5	—0·3	32·2	+0·2	51	+ 6
V. Red Sea *	1006·6	+1·2	40·0	—0·9	27·2	—0·8	33·6	—0·8	0	— 6
VI. Central Sudan	1010·7	—0·5	34·9	+0·6	21·7	—0·1	28·3	+0·2	116	—12
VII. South Sudan	1012·4	+0·3	32·0	+0·5	21·6	+0·7	26·8	+0·6	187	+17

* Port Sudan only.

NOTE.—1,000 millibars is equivalent to 750·1 millimetres at 0°C and mean gravity.

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RAINFALL DATA FOR JULY 1933.

STATION.	1933	Diff. from Normal.	STATION.	1933	Diff. from Normal.
	m/m.	m/m.		m/m.	m/m.
Juba	236	+ 94	Adis Abâba	294	+ 14
Wau	189	+ 1	Roseires	199	+ 18
Malakâl	136	— 43	Wâd Medani	53	— 66
El Obeid	163	+ 70	Atbara	2	— 19
El Fasher	49	— 68	Kassala*	191	+ 96
Khartoum	10	— 41	Port Sudan	0	— 6

* For 30 days only.

MAHMOUD HAMID MOHAMED,
A/Director, Meteorological Service.

State of the River.

Lake Albert at Butiaba fell 1 centimetre during the month. Its level on August 1st, 1933, was 78 centimetres above normal but 2 centimetres below that of the corresponding day of last year.

North of Wadi Halfa the general rise of the river is about 8 days later than usual.

The Bahr el Jebel at Juba fluctuated above normal throughout the month but the levels were below last year's during the last 15 days.

The river Sobat at Nasser rose faster than normally during the month, the level which was 134 centimetres below normal at the beginning being only 53 centimetres below at the end.

The White Nile at Malakal rose rather faster than normally. The levels remained above normal throughout and were above those of last year for the last few days of the month.

The Blue Nile at Roseires fluctuated below normal until the 19th, thereafter a rapid rise took place and the levels were practically normal at the end of the month. At Khartoum the Blue Nile fluctuated below normal during the first 3 weeks and then rose rapidly in the last week.

The river Atbara at Khashm el Girba like the Blue Nile fluctuated below normal for the first 20 days and then improved rapidly thereafter.

At Wadi Halfa the Main Nile remained practically steady for the first 10 days and thereafter on the average rose at about normal rate. The levels throughout were below normal.

The differences of the mean levels in July 1933 from those of July 1932 and from the normal for 1906–1930 were :—

STATION.	MEAN DIFFERENCES OF LEVELS.	
	July 1933 minus July 1932.	July 1933 minus Normal.
	Metres.	Metres.
Juba	— 0·22	+ 0·12
Nasser	— 0·49	— 0·73 *
Malakâl	— 0·04	+ 0·06
Roseires	— 0·76	— 0·46
Khartoum	— 0·62	— 0·70
Khashm el Girba	— 0·59	— 0·56
Wadi Halfa	— 0·54	— 0·56

* Nasser Normal is for 1922–1930 only.

By Transfer
U. S. Weather Bureau
JUN 20 1933

Discharges of the Nile during June, 1933.

Observed by the Irrigation Department.

D.S. Esna Barrage
(Main Nile).

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
13	72·77	1160
20	72·71	1130
27	72·78	1110
Approx. Monthly Mean		—

U.S. Esna Barrage
(Main Nile).

6	74·63	1060
Approx. Monthly Mean		—

Aswân
(Measured by Sluices).
Aswân D.S. Gauge.

1	85·86	1120
2	85·86	1120
3	85·85	1120
4	85·86	1120
5	85·86	1120
6	85·86	1110
7	85·85	1120
8	85·90	1140
9	85·89	1140
10	85·90	1140
11	86·00	1180
12	86·03	1200
13	86·05	1220
14	86·04	1210
15	86·00	1190
16	86·00	1180
17	86·00	1180
18	86·00	1180
19	85·98	1190
20	86·00	1180
21	86·00	1190
22	85·98	1190
23	86·00	1190
24	86·02	1190
25	86·01	1190
26	86·00	1190
27	86·02	1200
28	86·00	1190
29	86.00	1190
30	86·00	1190
Approx. Monthly Mean		1170
Normal Mean 1912-1932		1020

Kangarty (Main Nile)

1	131·77	664
4	131·79	661
5	131·80	663
6	131·78	661
7	131·75	656
8	131·71	640
10	131·78	661
11	131·88	713
12	131·96	736
13	132·02	742
14	132·04	743

Kangarty (*contd.*).

15	132·01	737
18	131·92	703
19	131·90	697
20	131·93	717
21	131·93	698
24	132·20	834
25	132·39	900
26	132·55	954
27	132·61	989
28	132·68	1010
29	132·69	1010
Approx. Monthly Mean		758
Normal Mean 1912-1932		732

Hassanab (Main Nile).

3	10·82	792
6	10·75	768
11	10·75	731
17	11·12	1005
21	11·05	958
27	11·02	1050
Approx. Monthly Mean		893
Normal Mean 1912-1932		961

Tamaniât (Main Nile).

5	10·33	847
8	10·31	863
13	10·83	1130
19	10·69	1060
24	10·66	1020
28	11·01	1300
Approx. Monthly Mean		1020
Normal Mean 1912-1932		1110

Khartoum (Blue Nile).

3	10·25	297
6	10·23	285
11	10·86	473
17	10·73	403
21	10·82	450
26	10·84	459
Approx. Monthly Mean		390
Normal Mean 1912-1932		493

Hillet Sherif (Blue Nile).
(Old Sennar Gauge).

3	10·09	219
5	10·95	570
7	10·90	553
10	10·80	493
12	10·46	348
14	10·48	348
17	10·60	383
19	10·37	305
21	10·61	404
25	10·04	612*
28	10·69	473*
Approx. Monthly Mean		431
Normal Mean 1912-1932		596

Wad el Aies (Blue Nile)

8	6·27	560
10	5·93	415
12	5·70	326
14	6·12	489
16	5·87	378
18	5·82	378
20	5·84	350
22	6·85	751
25	6·17	483
27	5·93	401
29	·624	520
Approx. Monthly Mean		474
Normal Mean 1912-1932		668

Roseires (Blue Nile).

2	13·40	618
4	13·13	495
6	13·30	551
8	12·84	415
10	12·63	325
12	13·25	550
14	12·72	376
16	12·40	287
18	12·82	442
Approx. Monthly Mean		—
Normal Mean 1912-1932		668

Mogren (White Nile).

1	10·52	602
4	10·50	619
12	11·02	624
18	10·93	630
22	11·03	668
27	11·16	691
Approx. Monthly Mean		629
Normal Mean 1912-1932		625

Malakâl (White Nile).

5	10·52	733
11	10·50	757
15	10·94	763
20	10·99	756
25	11·06	767
27	11·05	795
28	11·05	782
29	11·08	804
30	11·10	817
Approx. Monthly Mean		757
Normal Mean 1912-1932		745

Hillet Doleib (River Sobât)

4	11·96	270
10	12·06	294
14	12·12	294
19	12·14	296
25	12·23	314
29	12·26	326
Approx. Monthly Mean		294
Normal Mean 1912-1932		337

River Sobât (at Head)
(Nasser Gauge).

May 25	6·52	223
27	6·62	245
28	6·80	277
30	6·98	282
31	6·97	577
Approx. Monthly Mean		162
Normal Mean 1929-1932		200
June 1	6·93	270
3	6·88	276
4	6·91	280
7	7·22	323
8	7·26	318
10	7·28	317
11	7·26	310
13	7·23	309
14	7·22	305
15	7·22	304
17	7·32	308
18	7·29	313
21	7·32	329
22	7·38	331
24	7·41	331
25	7·45	333
27	7·48	340
28	7·48	340
29	7·46	339
Approx. Monthly Mean		315
Normal Mean 1929-1932		423

River Baro
(6 Kms. U.S. Baro-Pibor Junction)
(Pibor Mouth Gauge)

May 25	6·14	179
27	6·30	231
28	6·50	248
30	6·33	231
31	6·48	225
Approx. Monthly Mean		—
Normal Mean 1929-1932		166
June 1	6·43	214
3	6·42	222
4	6·51	238
7	6·78	273
8	6·79	275
10	6·78	266
11	6·73	258
13	6·72	248
14	6·72	246
15	6·71	248
17	6·72	245
18	6·74	256
21	6·87	276
22	6·89	279
24	6·88	270
25	6·89	275
27	6·94	282
28	6·93	270
29	6·92	273
Approx. Monthly Mean		260
Normal Mean 1929-1932		375

* Site transferred to Sennar.

Discharges of the Nile during June, 1933 (*continued*).

Observed by the Irrigation Department.

Gambeila (River Baro).

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
May 12	9·84	97
17	10·26	152
20	10·19	150
24	10·45	189
26	10·87	344
30	10·57	197
Approx. Monthly Mean		157
Normal Mean 1928-1932		219
June 3	10·95	309
6	10·84	282
9	10·80	278
13	10·72	243
16	10·78	264
19	10·96	312

River Pibor
(6 Kms. U.S. Baro-Pibor Junction)
(Pibor Mouth Gauge)

May 25	6·14	44
27	6·30	33
28	6·50	36
30	6·53	53
31	6·48	51
Approx. Monthly Mean		—
Normal Mean 1929-1932		38
June 1	6·43	56
3	6·42	55
4	6·51	51
7	6·78	53
8	6·79	55
10	6·78	50
11	6·76	61
13	6·72	57
14	6·72	61
15	6·71	61
17	6·72	58
18	6·74	63
21	6·87	49
22	6·89	50
24	6·88	62
25	6·89	60
27	6·94	58
28	6·93	64
29	6·92	61
Approx. Monthly Mean		57
Normal Mean 1929-1932		54

River Pibor
(U.S. Makwai Junction)
Makwai Gauge)

May 29	6·83	49
Approx. Monthly Mean		—
Normal Mean 1931-1932		31
June 5	7·06	52
12	7·17	58
19	7·07	57
26	7·26	59
Approx. Monthly Mean		56
Normal Mean 1929-1932		60

Khor Makwai (at Mouth)
(Makwai Gauge)

May 29	6·83	14
Approx. Monthly Mean		—
Normal Mean 1931-1932		1
June 5	7·06	11
12	7·17	8
19	7·07	2
26	7·26	0
Approx. Monthly Mean		5
Normal Mean 1929-1932		—2

River Pibor
(U. S. Makwai Junction)
(Makwai Gauge)

May 29	6·83	48
Approx. Monthly Mean		—
Normal Mean 1931-1932		33
June 5	7·06	56
12	7·17	58
19	7·07	59
26	7·26	61
Approx. Monthly Mean		58
Normal Mean 1929-1932		67

River Pibor
(U.S. Gila Junction)
(Gila Gauge).

6	6·94	57
20	6·99	56
Approx. Monthly Mean		—
Normal Mean 1929-1832		76

River Gila (At Mouth).
(Gila Gauge).

6	6·94	60
20	6·99	56
Approx Monthly Mean		—
Normal Mean 1929-1932		72

River Pibor
(U.S. Gila Junction)
(Gila Gauge).

6	6·94	12
20	6·99	0
Approx. Monthly Mean		—
Normal Mean 1929-1932		8

Akobo (River Pibor).

May 5	10·00	0
10	10·34	1
15	10·65	2
20	10·92	2
25	11·10	2
30	11·30	2
Approx. Monthly Mean		1
Normal Mean 1929-1932		3

Bahr el Zerâf (Kilo. 3).
(Gauge at Mouth).

9	11·86	158
18	11·90	151
28	11·96	154
Approx. Monthly Mean		154
Normal Mean 1912-1932		121

Abu Tong (White Nile).
(Tonga Gauge).

9	12·11	342
18	12·14	321
28	12·20	322
Approx. Monthly Mean		329
Normal Mean 1923-1932		288

Lake No (White Nile).

8	13·69	350
17	13·70	339
27	13·72	343
Approx. Monthly Mean		344
Normal Mean 1923-1932		303

Bahr el Ghazal
(At Mouth).
(Suddite Factory Gauge).

8	13·78	—27
17	13·78	11
27	13·80	23
Approx. Monthly Mean		3
Normal Mean 1923-1932		9

Bahr el Jebel (Kilo 3).
(Lake No Gauge).

8	13·69	332
17	13·70	341
27	13·72	332
Approx. Monthly Mean		335
Normal Mean 1923-1932		297

Jonglie (River Atem).
(Eastern Channel).
(Bahr el Jebel).

1	8·90	300
3	8·89	298
5	8·90	308
13	8·87	301
15	8·87	297
17	8·88	295
19	8·88	294
26	8·89	291
28	8·87	291
30	8·86	286
Approx. Monthly Mean		296

River Atem
(Western Channel).
(U.S. Jonglie Gauge).

1	8·90	119
3	8·89	118
5	8·90	125
13	8·87	119
15	8·87	121
17	8·88	121
19	8·88	122
26	8·89	130
28	8·87	131
30	8·86	125
Approx. Monthly Mean		123

Giggin (Bahr el Jebel).
(Western Channel).

3	29·20	233
Approx. Monthly Mean		228
Normal Mean 1931-1932		236

Gemeiza (Bahr el Jebel).
(Eastern Channel).

2	28·85	661
Approx. Monthly Mean		661
Normal Mean 1931-1932		684

Terrakekka (Bahr el Jebel)

1	13·42	898
Approx. Monthly Mean		894
Normal Mean 1931-1932		914

Mongalla (Bahr el Jebel).

1	11·94	888
6	11·94	904
11	11·87	859
16	11·96	884
21	11·88	884
26	11·91	881
Approx. Monthly Mean		884
Normal Mean 1912-1932		841

Occasional Discharges.

Observed by the Irrigation Department.

Date.	River.	Site.	Gauge. Reading. M.	Gauge. Site.	Disch. m³. p.s.
		Bahr el Zerâf and Tributaries.			
3-6-1933	Zerâf	Pole 53	26·59	Pole 53	135
3-6-1933	Jebel-Zerâf Cuts	Tail Cut 2	26·73	H.C. 2	21
3-6-1933	,,	,, ,, 1	28·25	Tail C. 1	92
3-6-1933	Zerâf	U.S. Tail Cut 1	28·25	,,	19
		Bahr el Jebel and Tributaries.			
24-5-1933	Jebel	Bor	11·46	Bor	784
25-5-1933	,, ...	,, ...	11·46	,,	771
26-5-1933	,, ...	,, ...	11·46	,,	780
6-6-1933	,, ...	,, ...	11·47	,,	796
20-6-1933	,, ...	,, ...	11·42	,,	767
26-5-1933	,, ...	200 metres U.S. Unyam Kojie	11·46	,,	822
26-5-1933	Khor Unyam Kojie	Head	11·46	,,	— 41
26-5-1933	Jebel	U.S. Spill, Kilo 612...	—	—	719
26-5-1933	Spill out	Kilo 611, R.B. of Bahr el Jebel...	—	—	— 17
26-5-1933	Jebel	U.S. Aliab Tail, Kilo 603·2	—	—	698
26-5-1933	Aliab	Tail 1, Kilo 603, L.B. of Bahr el Jebel	—	—	68
26-5-1933	,, (Spill out)	Tail 2, Kilo 602·8 ,, ,, ,, ,, ...	—	—	— 13
26-5-1933	Jebel	D.S. Aliab Tail 2, Kilo 602·7	—	—	708
26-5-1933	,, ...	U.S. R.P. 120, Kilo 600·5	—	—	689
27-5-1933	,, ...	1 Km. D.S. R.P. 119	—	—	695
27-5-1933	,, ...	U.S. R.P. 118	—	—	663
27-5-1933	Atem	Head 4	—	—	— 26
27-5-1933	Jebel	D.S. Atem Head 1	—	—	627
27-5-1933	,, ...	0·5 Kilo U.S. R.P. 116, Kilo 580·5	—	—	638
27-5-1933	,, ...	0·3 Kilo U.S. R.P. 114	—	—	523
27-5-1933	,, ...	D.S. Atem Heads 2 A & B	—	—	478
28-5-1933	Khor Atem ...	D.S. Junction with Atem Head 3	—	—	171
27-5-1933	Atem Head 3 ...	Meath	—	—	— 54
1-6-1933	,, (West Chen)	Close to Lagoon	8·96	Jebel	204
16-6-1933	,, ,, ...	,, ,, ...	8·88	,,	239
18-6-1933	,, ,, ...	D.S. Jonglie	8·88	,,	154
1-6-1933	,, (East Chen)	U.S. ,, ...	8·90	,,	234
16-6-1933	,, ,, ...	,, ,, ...	8·88	,,	221
18-6-1933	,, ,, ...	D.S. ,, ...	8·88	,,	219
27-5-1933	Jebel	200 mts. D.S. Atem Head 3	—	—	355
27-5-1933	,, ...	U.S. Atem Head 4c	—	—	341
27-5-1933	,, ...	D.S. Atem Head 4c...	—	—	271
28-5-1933	,, ...	At R.P. 112	—	—	208
28-5-1933	,, ...	U.S. Lake Papiu	—	—	169
28-5-1933	Lake Papiu ...	Intake	—	—	321
28-5-1933	Jebel	D.S. Lake Papiu	—	—	475
28-5-1933	,, ...	Kilo 544	—	—	405
28-5-1933	,, ...	1 Km. U.S. Pole 108	—	—	381
28-5-1933	,, ...	Kilo 534	—	—	373
29-5-1933	,, ...	2 Kms. U.S. Pole 104	—	—	363
29-5-1933	,, ...	Kenisa...	11·68	Kenisa	319
29-5-1933	,, ...	Kilo 475·5	11·68	,,	372
30-5-1933	Awai	Head 1, Offtake at R.P. 92	—	—	— 78
30-5-1933	Jebel	200 mts. D.S. Awai Head 1	—	—	241
30-5-1933	,, ...	U.S. Awai Tails 1A & 2B	—	—	252
30-5-1933	,, ...	D.S. Awai Tails 1A & B	—	—	574
30-5-1933	Awai	Tail 2, Offtake	—	—	— 38
30-5-1933	Jebel	D.S. Awai Tail 2	—	—	462
31-5-1933	,, ...	U.S. Shambe Lagoon	11·87	Shambe	470
31-5-1933	,, ...	D.S. Shambe Lagoon	11·87	,,	554

Occasional Discharges (*contd.*).

Observed by the Irrigation Department.

Date.	River.	Site.	Gauge. Reading.	Gauge. Site.	Disch. m³. p.s.
			M.		
		Bahr el Jebel and Tributaries (*cont.*).			
31-5 1933	Awai	Head 2	—	—	25
31-5 1933	Jebel	U.S. R.P. 79	—	—	523
31-5 1933	,, ...	U.S. Awai Head 3	—	—	436
31-5 1933	Awai	Head 3	—	—	97
31-5 1933	Jebel	U.S. Awai Tail 3 A	—	—	317
31-5 1933	Awai	Tail 3 A	—	—	155
1-6 1933	,, ...	,, 3 B	—	—	63
1-6 1933	Jebel	Awai Tail Gauge	11·63	Awai Tail	500
1-6 1933	,, ...	R.P. 72, Kilo 362	—	—	500
1-6 1933	,, ...	U.S. Lake Nyong	—	—	199
1-6 1933	,, ...	D.S. Lake Nyong	—	—	563
1-6 1933	,, ...	Kilo 339·7	—	—	551
1-6 1933	,, ...	,, 334·8	—	—	519
1-6 1933	,, ...	R.P. 65	—	—	516
2-6 1933	Spill cut	On R.B. Kilo 319	—	—	23
2-6 1933	Jebel	U.S. Peake's Chan. 4 Spills	—	—	175
2-6 1933	,, ...	D.S. 5 Spills	—	—	371
2-6 1933	,, ...	Gharbet El Indirab Gauge	12·10	Gharbet El Indirab	107
2-6 1933	,, ...	U.S. Intake of L.B. Kilo 309	—	—	305
2-6 1933	Intake	Kilo 308·8	—	—	92
3-6 1933	Jebel	U.S. Zeraf Head Cut 1	11·13	H.C. 1	382
3-6 1933	Jebel-Zeraf Cuts	Head Cut 1	11·99	,,	98
3-6 1933	Jebel	U.S. Zeraf Head Cut 2	26·71	H.C. 2	299
3-6 1933	Jebel-Zeraf Cuts	Head Cut 2	26·73	,,	19
3-6 1933	Peake's Channel	Tail	—	—	121
3-6 1933	Jebel	D.S. Peake's Channel	—	—	387
4-6 1933	,, ...	U.S. Fell's Head Channel	—	—	353
4-6 1933	,, ...	D.S. Fell's Head Channel	—	—	364
4-6 1933	,, ...	R.P. 52	—	—	350
4-6 1933	,, ...	R.P. 51	—	—	287
4-6 1933	,, ...	R.P. 50	—	—	268
4-6 1933	,, ...	R.P. 49	—	—	273
4-6 1933	,, ...	R.P. 48	—	—	262
4-6 1933	,, ...	U.S. Fell's Tail, Kilo 222·1	—	—	253
4-6 1933	Fell's Channel ...	Tail	—	—	117
5-6 1933	Jebel	U.S. Gage's Channel	10·89	Hillet Nur	360
5-6 1933	,, ...	Adok	10·89	,,	354
5-6 1933	,, ...	R.P. 37	—	—	361
5-6 1933	,, ...	R.P. 30	—	—	354
6-6 1933	,, ...	Kilo 125	—	—	353
6-6 1933	,, ...	R.P. 19	—	—	348
6-6 1933	,, ...	R.P. 13	11·20	Buffalo Cape	341
7-6 1933	,, ...	R.P. 7	—	—	337
7-6 1933	,, ...	R.P. 4	—	—	336
7-6 1933	,, ...	Kilo 3	13·69	Lake No.	336
		White Nile Tributaries			
26-6 1933	Tonga Dredger Cut	Tail	12·20	Tonga	— 6

R. P. Black,

Acting Director, Hydrological Service.

Govt. Press 3955-1933-250 ex.

Ministry of Public Works, Egypt.—Physical Department.

REPORT ON THE WEATHER AND STATE OF THE RIVER FOR AUGUST 1933.

The Weather.

August like July, was on the whole a cool pleasant month.

The pressure distribution throughout the month was typical of the settled summer conditions, except on the 30th, when a shallow depression was centred off Matruh. Strong southwesterly winds prevailed on the western coast and were accompanied by abnormally high temperatures on that day. The temperature reached 36° C. at Sahum, and 39° C. at Matruh, the latter being 11° C. above normal and was the highest temperature ever recorded during August since the commencement of the observations at Matruh in 1919.

On the whole the month was remarkable for its cool nights, the minimum temperatures recorded at Siwa during the second week were abnormally low: the thermometer fell to 16° C. on the 8th and 9th. This is the lowest temperature ever known during August in the Oasis since 1911, while at Giza a minimum of 15° C. was registered on the 29th which is also a record.

For the month as a whole the mean atmospheric pressure was above normal everywhere except in Central and South Sudan, while the temperature was below normal in nearly all districts.

The atmosphere was damper than usual, thus at Alexandria, the mean relative humidity was 5 per cent above normal.

The Sudan rainfall was above the average in North and South Sudan and below the average elsewhere.

TABLE SHOWING THE DEPARTURES FROM NORMAL FOR AUGUST 1933.

DISTRICTS.	BAROMETRIC PRESSURE.		TEMPERATURE.						RAINFALL	
			MAXIMUM.		MINIMUM.		MAX.+MIN.÷2.			
	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal
	mb.	mb.	°C.	°C.	°C.	°C.	°C.	°C.	mm.	mm.
I. Mediterranean	1010·9	+1·2	29·5	−0·8	22·2	−0·7	25·8	−0·8	0	0
II. Middle Egypt	1010·6	+0·7	34·1	−0·7	20·2	−0·7	27·2	−0·7	0	0
III. Upper Egypt	1008·4	+0·2	39·1	−0·3	23·0	−1·1	31·0	−0·7	0	0
IV. North Sudan	1009·8	+0·4	38·1	+0·1	23·6	−1·1	30·8	−0·5	118	+54
V. Red Sea *	1006·8	+0·9	40·4	−0·2	28·8	+0·3	34·6	0·0	0	− 4
VI. Central Sudan	1010·8	−0·5	32·5	−0·7	21·3	+0·1	26·9	−0·3	136	−16
VII. South Sudan	1012·2	−0·1	30·2	−1·2	21·4	+0·6	25·8	−0·3	259	+83

* Port Sudan only.

NOTE.—1,000 millibars is equivalent to 750·1 millimetres at 0°C. and mean gravity.

RAINFALL DATA FOR AUGUST 1933.

STATION.	1933	Diff. from Normal.	STATION.	1933	Diff. from Normal.
	m/m.	m/m.		m/m.	m/m.
Juba	179	+ 62	Adis Abâba	361	+ 60
Wau	310	+ 98	Roseires	275	+ 63
Malakâl	289	+ 88	Wâd Medani	111	− 36
El Obeid	92	− 23	Atbara	48	+ 8
El Fasher	66	− 67	Kassala	294	+ 167
Khartoum	88	+ 15	Port Sudan	0	− 4

MAHMOUD HAMID MOHAMED,
A/Director, Meteorological Service.

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State of the River.

Lake Albert at Butiaba rose one centimetre during the month. Its level on September 1, 1933, was 71 centimetres above the normal but 7 centimetres below that of the corresponding day of last year.

The Bahr el Jebel at Juba rose with small fluctuations. The levels were about normal but below last year's throughout the month.

The River Sobat at Nasser rose at normal rate. Its levels were below both the normal and last year's throughout the month.

The White Nile at Malakal rose faster than normally and by the end of the month the levels were considerably above both the normal and last year's.

The Blue Nile at Roseires fell rapidly during the first three days then rose with sharp fluctuations until the end of the month, having three peaks on the 8th, 25th and 27th which were 116, 97 and 134 centimetres respectively above normal. At Khartoum the Blue Nile fluctuated below both the normal and last year's levels until the 25th and rose steadily thereafter. Except for the last two days the levels were below both the normal and those of last year.

The River Atbara at Khashm el Girba fluctuated below normal until the 23rd and rose rapidly thereafter. The level which was 150 centimetres below normal at the beginning of the month being 95 centimetres above normal at the end.

The Main Nile at Wadi Halfa remained steady during the first three days, rose sharply until the 20th, remained almost steady until the 28th and rose again sharply for the last three days. The levels were below both the normal and last year's throughout.

The differences of the mean levels in August 1933 from those of August 1932 and from the normal 1906–1930 were :—

STATION.	MEAN DIFFERENCES OF LEVELS.	
	August 1933 minus August 1932.	August 1933 minus Normal.
	Metres.	Metres.
Juba	— 0·50	— 0·02
Nasser	— 0·40	— 0·37 *
Malakâl	+ 0·31	+ 0·43
Roseires	— 0·42	— 0·15
Khartoum	— 0·51	— 0·34
Khashm el Girba	— 0·62	— 0·36
Wadi Halfa	— 1·32	— 0·87

* Nasser Normal is for 1923–1929 only.

By Transfer
U. S. Weather Bureau
JUN 20 1938

Discharges of the Nile during July, 1933.

Observed by the Irrigation Department.

D.S. Esna Barrage (Main Nile).

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
4	72·78	1130
11	72·92	1180
18	72·98	1240
25	73·11	1280
Approx. Monthly Mean		1290

Aswân (Gaâfra) (Measured by current-meter) Aswân D.S. Gauge.

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	86·00	1180
2	86·02	1190
4	86·02	1180
5	86·02	1180
6	86·12	1260
7	86·12	1260
8	86·12	1240
9	86·12	1250
10	86·11	1240
10	86·11	1250
11	86·12	1260
13	86·12	1260
14	86·18	1300
15	86·16	1290
16	86·18	1360
17	86·20	1320
18	86·22	1350
19	86·26	1360
20	86·30	1370
22	86·34	1400
23	86·34	1390
24	86·34	1410
25	86·36	1400
26	86·45	1470
27	86·55	1520
29	86·80	1710
Approx. Monthly Mean		1370
Normal Mean 1912-1932		1730

Aswân (Measured by Sluices).

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	86·00	1200
2	86·02	1210
3	86·02	1200
4	86·02	1210
5	86·02	1200
6	86·12	1270
7	86·12	1260
8	86·12	1270
9	86·12	1270
10	86·11	1260
11	86·12	1260
12	86·12	1270
13	86·12	1280
14	86·18	1310
15	86·16	1300
16	86·18	1310
17	86·20	1320
18	86·22	1330
19	86·26	1360
20	86·30	1380
21	86·32	1400
22	86·34	1420
23	86·34	1420
24	86·34	1420
25	86·36	1420
26	86·45	1480
27	86·55	1530
28	86·78	1650
29	86·80	1730
30	86·82	1820
31	87·02	1850
Approx. Monthly Mean		1384
Normal Mean 1912-1932		1750

Kangarty (Main Nile)

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	132·64	951
5	132·62	946
6	132·64	951
7	132·65	953
8	132·85	973
9	132·71	1000
10	132·79	1030
11	132·93	1110
12	133·20	1220
13	133·16	1320
14	133·04	1410
15	133·74	1460
16	133·76	1460
17	133·75	1470
18	133·72	1430
19	133·72	1460
20	133·73	1470
21	133·79	1490
22	133·90	1560
23	134·07	1620
24	134·23	1720
25	134·40	1820
26	134·52	1860
27	134·66	1980
Approx. Monthly Mean		1449
Normal Mean 1912-1932		1870

River Atbara (Kilo 3)

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
7	10·63	215
11	10·54	241
17	10·73	298
23	10·72	298
28	11·15	313
Approx. Monthly Mean		287
Normal Mean 1912-1932		658

Hassanab (Main Nile).

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	11·37	1080
6	11·50	1240
10	11·50	1180
16	11·91	1560
22	12·26	1950
27	12·37	1930
Approx. Monthly Mean		1630
Normal Mean 1912-1932		2324

Tamaniât (Main Nile).

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	11·01	1230
8	11·00	1280
12	11·46	1660
18	11·78	1960
24	11·80	1980
29	12·76	2980
Approx. Monthly Mean		1930
Normal Mean 1912-1932		2590

Khartoum (Blue Nile).

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	11·18	480
2	11·08	167
5	11·08	472
10	11·32	852
16	11·90	1090
22	11·96	1090
26	12·46	1740
Approx. Monthly Mean		1220
Normal Mean 1912-1932		2080

Sennar (Blue Nile).

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	5·59	531
3	5·58	562
6	6·21	988
8	6·56	1230
10	6·13	1010
12	6·52	1080
15	6·93	1420
17	6·18	1060
19	6·46	1050
22	6·72	1170
24	7·61	1430
27	8·75	2710
29	8·94	2750
31	9·97	3980
Approx. Monthly Mean		1440
Normal Mean 1912-1932		2210

Wad el Aies (Blue Nile)

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	6·24	530
3	6·33	603
5	6·94	847
7	7·46	1130
8	7·40	1090
9	7·18	970
10	7·11	955
11	7·22	1030
12	7·39	1160
13	7·63	1310
14	7·86	1470
15	7·80	1360
17	7·47	1180
19	7·78	1380
21	8·15	1650
23	8·80	2650
25	9·36	2890
27	10·25	3120
29	10·70	3640
31	11·38	4420
Approx. Monthly Mean		1720
Normal Mean 1912-1932		2300

Mogren (White Nile).

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
3	11·26	783
6	11·20	711
11	11·70	607
17	12·04	603
23	12·46	747
27	12·59	419
Approx. Monthly Mean		612
Normal Mean 1912-1932		583

Malakâl (White Nile).

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	11·13	815
2	11·13	826
3	11·11	808
4	11·15	814
5	11·15	804
6	11·15	856
7	11·18	849
8	11·20	837
9	11·22	836
10	11·25	870
11	11·25	862
12	11·28	842
13	11·28	860
14	11·32	857
15	11·33	880
20	11·46	956
25	11·54	974
30	11·59	989
Approx. Monthly Mean		902
Normal Mean 1912-1932		912

Hillet Doleib (River Sobât)

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	12·03	337
9	12·12	372
11	12·21	415
19	12·30	459
25	12·32	465
29	12·38	490
Approx. Monthly Mean		420
Normal Mean 1912-1932		496

River Sobât (at Head) (Nasser Gauge).

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	7·56	360
2	7·64	380
3	7·88	416
6	7·96	425
8	8·08	440
9	8·15	445
10	8·25	453
12	8·31	460
13	8·36	471
15	8·46	488
16	8·50	481
19	8·62	503
20	8·65	514
22	8·70	528
23	8·73	534
25	8·80	546
26	8·85	543
27	8·86	538
28	8·92	551
30	8·95	549
Approx. Monthly Mean		481
Normal Mean 1929-1932		578

Discharges of the Nile during July, 1933 (*continued*).

Observed by the Irrigation Department.

River Baro
(6 Kms. U.S. Baro-Pibor Junction)
(Pibor Mouth Gauge)

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	7·08	345
2	7·16	354
5	7·40	384
6	7·48	393
8	7·60	415
9	7·66	422
11	7·75	433
12	7·80	424
13	7·86	425
15	7·95	430
16	7·98	455
19	8·09	458
20	8·12	466
22	8·19	488
23	8·22	494
25	8·29	506
26	8·34	515
27	8·37	525
29	8·42	524
30	8·45	528
Approx. Monthly Mean		450
Normal Mean 1929-1932		523

Gambeila (River Baro).

June 24	10·95	334
27	10·91	396
29	11·22	415
Approx. Monthly Mean		360
Normal Mean 1928-1932		535
July 5	11·75	523
7	11·98	581
11	12·21	659
14	12·34	711
17	12·36	713
22	13·04	933
26	12·55	789
29	12·16	733
Approx. Monthly Mean		693
Normal Mean 1928-1932		759

River Pibor
(6 Kms. U.S. Baro-Pibor Junction)
(Pibor Mouth Gauge)

1	7·08	45
2	7·16	38
5	7·40	33
6	7·48	34
8	7·60	27
9	7·66	29
11	7·75	33
12	7·80	42
13	7·86	34
15	7·95	34
16	7·98	44
19	8·09	44
20	8·12	41
22	8·19	37
23	8·22	42
25	8·29	42
26	8·34	38
27	8·37	41
29	8·42	41
30	8·45	39
Approx. Monthly Mean		38
Normal Mean 1929-1932		70

River Pibor
(D.S. Makwai Junction)
(Makwai Gauge)

3	7·54	41
10	7·98	49
17	8·30	47
24	8·57	50
Approx. Monthly Mean		—
Normal Mean 1929-1932		80

Khor Makwai (at Mouth)
(Makwai Gauge)

3	7·51	— 4
10	7·98	— 18
17	8·30	— 18
24	8·51	— 8
Approx. Monthly Mean		—
Normal Mean 1929-1932		— 2

River Pibor
(U.S. Makwai Junction)
(Makwai Gauge)

3	7·51	53
10	7·98	51
17	8·30	57
24	8·51	63
Approx. Monthly Mean		—
Normal Mean 1929-1932		88

River Pibor
(U.S. Gila Junction)
(Gila Gauge).

4	7·17	56
18	7·88	66
Approx. Monthly Mean		—
Normal Mean 1929-1932		101

River Gila (At Mouth).
(Gila Gauge).

4	7·17	54
18	7·88	67
Approx Monthly Mean		—
Normal Mean 1929-1932		78

River Pibor
(U.S. Gila Junction)
(Gila Gauge).

4	7·17	7
18	7·88	— 9
Approx. Monthly Mean		—
Normal Mean 1929-1932		26

Akobo (River Pibor).

June 5	11·46	3
10	11·60	3
15	11·65	2
20	11·57	1
25	11·68	2
30	11·70	4
Approx. Monthly Mean		2
Normal Mean 1929-1932		8
July 5	11·76	3
10	12·00	5
15	12·30	3
20	12·49	3
25	12·68	3
30	12·83	2
Approx. Monthly Mean		3
Normal Mean 1929-1932		30

Bahr el Zerâf (Kilo. 3).
(Gauge at Mouth).

8	12·04	158
18	12·12	158
28	12·40	176
Approx. Monthly Mean		163
Normal Mean 1912-1932		129

Abu Tong (White Nile).
(Tonga Gauge).

8	12·25	330
18	12·31	324
28	12·56	314
Approx. Monthly Mean		323
Normal Mean 1923-1932		288

Lake No (White Nile).

7	13·71	342
17	13·76	337
27	13·82	321
Approx. Monthly Mean		334
Normal Mean 1923-1932		309

Bahr el Ghazal
(At Mouth).
(Suddite Factory Gauge).

7	13·83	9
17	13·84	22
27	13·90	5
Approx. Monthly Mean		13
Normal Mean 1923-1932		13

Bahr el Jebel (Kilo 3).
(Lake No Gauge).

7	13·74	331
17	13·76	324
27	13·82	319
Approx. Monthly Mean		325
Normal Mean 1923-1932		299

Jonglie (River Atem).
(Eastern Channel).
(Bahr el Jebel).

2	8·86	290
8	8·89	293
10	8·87	288
12	8·86	285
14	8·85	282
16	8·85	294
22	8·91	299
24	8·91	302
26	8·92	308
28	8·94	313
30	8·94	306
Approx. Monthly Mean		295

River Atem
(Western Channel).
(U.S. Jonglie Gauge).

2	8·86	125
8	8·89	128
10	8·87	128
12	8·86	125
14	8·85	131
16	8·85	131
22	8·91	139
24	8·91	135
26	8·92	138
28	8·94	141
30	8·94	139
Approx. Monthly Mean		132

Giggin (Bahr el Jebel).
(Western Channel).

3	29·16	220
Approx. Monthly Mean		225
Normal Mean 1931-1932		254

Gemeiza (Bahr el Jebel).
(Eastern Channel).

2	28·84	660
Approx. Monthly Mean		682
Normal Mean 1931-1932		718

Terrakekka (Bahr el Jebel)

1	13·41	890
Approx. Monthly Mean		918
Normal Mean 1931-1932		1050

Mongalla (Bahr el Jebel).

1	11·94	895
6	12·04	934
11	12·03	939
16	11·97	913
21	11·98	952
26	12·10	991
Approx. Monthly Mean		940
Normal Mean 1912-1932		911

Occasional Discharges.

Observed by the Irrigation Department.

Date.	River.	Site.	Gauge. Reading. M.	Gauge. Site.	Disch. m^3. p.s.
		River Sobât and Tributaries.			
30–6–1933	Baro	50 mts. D.S. Gambeila	—	—	412
1–7–1933	,, ...	U.S. Baro-Adura bifurcation	—	—	430
1–7–1933	,, ...	D.S. ,, ,, ,, ...	—	—	421
2–7–1933	,, ...	U.S. Khor Jokau	—	—	426
2–7–1933	Khor Jokau ...	Tail	—	—	7
3–7–1933	Baro	U.S. Khor Mechar Head	—	—	422
3–7–1933	Khor Mehar ...	Head	—	—	—48
3–7–1933	Baro	D.S. Khor Mechar Head	—	—	373
4–7–1933	,, ...	U.S. Baro-Adura Junction	—	—	372
4–7–1933	,, ...	D.S. ,, ,, ,, ...	—	—	393
4–7–1933	,, ...	U.S. Khor Makeir	—	—	392
4–7–1933	Khor Makeir ...	Head on River Baro	—	—	0
26–6–1933	Pibor	Akobo	11·72	Akobo	4
26–6–1933	Akobo...	Mouth	11·72	,,	1
26–6–1933	Pibor	D.S. Akobo Mouth	11·72	,,	5
27–6–1933	,, ...	U.S. Geni Junction	—	—	3
27–6–1933	Khor Geni... ...	Mouth	—	—	1
27–6–1933	Pibor	D.S. Geni Junction	—	—	3
27–6–1933	,, ...	U.S. Gila ,, ...	7·10	Gila	7
27–6–1933	Gila	Mouth	7·10	,,	62
27–6–1933	Pibor	D.S. Gila Mouth	7·10	,,	59
28–6–1933	,, ...	U.S. Makwai Junction	7·25	Makwai	61
28–6–1933	Khor Makwai	Mouth	7·25	,,	8
28–6–1933	Pibor	D.S. Makwai Junction	7·25	,,	59
6–7–1933	Khor Twalor ...	Head	7·97	Nasser	—4
7–7–1933	Khor Nyanding	Mouth	10·42	Mouth	4
7–7–1933	Sobât	D.S. Khor Nyanding Mouth	10·42	,,	383
9–7–1933	Khor Filus ...	Head	12·42	H.Doleib	—3
		Bahr el Zerâf and Tributaries.			
29–6–1933	Zerâf	U.S. Tail Cut 1	28·27	T. Cut 1	24
30–6–1933	,, ...	Pole 53	26·62	Pole 53	149
30–6–1933	,, ...	100 mts. U.S. R.P. 48	26·62	,,	116
29–6–1933	Jebel Zerâf Cuts	Head Cut 1	11·99	H. Cut 1	95
29–6–1933	,, ,, ,,	Tail Cut 1	28·27	T. ,, 1	90
30–6–1933	,, ,, ,,	Head Cut 2	26·76	H. ,, 2	19
30–6–1933	,, ,, ,,	Tail Cut 2	26·62	Pole 53	21
2–7–1933	Khor Gang... ...	Tail	21·14	M. Kwatch	7
2–7–1933	Zerâf	D.S. Khor Gang	21·14	,,	164
1–7–1933	Khor Gurr... ...	Tail	23·78	K. Gurr	67
1–7–1933	Zerâf	D.S. Khor Gurr	23·78	,,	162
5–7–1933	,, ...	Meshra Kwatch	21·14	M. Kwatch	155
6–7–1933	Khor Tithbel ...	Tail	—	—	3
6–7–1933	Zerâf	D.S. Khor Tithbel	—	—	155
6–7–1933	,, ...	Pole 29	18·43	Pole 29	157
7–7–1933	,, ...	,, 24	16·22	,, 19	161
7–7–1933	,, ...	,, 19	16·22	,, 19	167
7–7–1933	Khor Nwazlyel	Tail	16·22	,, 19	2
8–7–1933	Zerâf	Fangak	11·56	Fangak	166
8–7–1933	,, ...	Pole 10	14·20	Pole 10	165
8–7–1933	,, ...	,, 6	—	—	163
8–7–1933	,, ...	Kilo 3...	12·04	Mouth	163

Occasional Discharges (*contd.*).

Observed by the Irrigation Department.

Date.	River.	Site.	Gauge. Reading.	Gauge. Site.	Disch. m.³ p.s.
			M.		
		White Nile Tributaries			
6-7-1933	Tonga Dredger Cut	Head	12·25	Tonga	—
26-7-1933	,, ,, ,,	,, ...	12·53	,,	— 8
		Bahr el Jebel and Tributaries			
3-7-1933	Jebel	West. Channel U.S. Giggin disch. Site	29·16	Giggin	217
3-7-1933	,, ...	,, ,, D.S. ,, ,, ...	29·16	,,	221
3-7-1933	,, ...	,, ,, ,, ,, ,, ...	29·16	,,	213
4-7-1933	,, ...	Bor	11·43	Bor	782
18-7-1933	,, ...	,, ...	11·48	,,	796
1-7-1933	Atem (West Chan.)	Close to Lagoon	8·86	Jonglie	196
13-7-1933	,, ,,	,, ,, ...	8·86	,,	210
29-7-1933	,, ,,	,, ,, ...	8·94	,,	219
15-7-1933	,, ,,	D.S. Jonglie	8·85	,,	148
1-7-1933	,, (East Chan.)	U.S. ,, ...	8·86	,,	216
13-7-1933	,, ,,	,, ,, ...	8·86	,,	215
29-7-1933	,, ,,	,, ,, ...	8·94	,,	236
15-7-1933	,, ,,	D.S. ,, ...	8·85	,,	215
3-7-1933	Jebel	About 150 mts. U.S. R.P. 101	11·08	Kenisa	333
17-7-1933	,, ...	,, ,, ,, ,, ,, ...	11·05	,,	359
31-7-1933	,, ...	,, ,, ,, ,, ,, ...	11·10	,,	348

R. P. Black,

A/Director, Hydrological Service.

Govt. Press 6584-1933-250 ex.

Ministry of Public Works, Egypt—Physical Department

REPORT ON THE WEATHER AND STATE OF THE RIVER FOR SEPTEMBER 1933

The Weather

The abnormally cool weather which prevailed during July and August was even more marked in September, when the temperature remained considerably below normal for the greater part of the month, and about normal or slightly above it for a few days only. Although there were no individual days when the temperature was lower than previous records, yet the mean maximum temperature for the month was the lowest on record at Mersa Matruh and Ezbekieh (Cairo); and the mean monthly minimum temperature was a record at Gîza, Assiut and Kassala. Another outstanding feature was the frequency of strong northerly and north easterly winds at Salum where gale force (55–65 km./h.) was reached on ten different days and very strong winds (45–54 km./h) were registered on eleven days.

The month was also characterised by the complete absence of depressions crossing Egypt and also by the rarity of depressions traversing the Mediterranean. At the beginning of the month the pressure distribution was of the normal type but on the 3rd a shallow depression appeared near Malta and was situated to the north of Egypt on the, 4th, but had little effect on the weather beyond causing southerly or southwesterly winds on the coast. On the 6th one millimetre of rain fell at Salum. Settled weather conditions then prevailed except for occasional strong northerly winds near the coast due to the pressure gradient becoming steep at times. On 19th a depression appeared over the north of the Balkans but had no effect on the weather of Egypt which continued to be influenced chiefly by high pressure systems situated either over Egypt or over the central Mediterranean.

For the month as a whole pressure was normal over Middle Egypt and south Sudan, below normal over central Sudan and above normal elsewhere particularly over the Red Sea area. The mean temperature was considerably below normal throughout Egypt, slightly below it over north and central Sudan, normal over south Sudan and slightly above normal over the Red Sea area.

The relative humidity was above normal at Alexandria and Helwan and the rainfall was above normal in the northern Sudan, considerably so in the Central Sudan and much in deficit over the southern Sudan.

TABLE SHOWING THE DEPARTURES FROM NORMAL FOR SEPTEMBER 1933

DISTRICTS.	BAROMETRIC PRESSURE.		TEMPERATURE.						RAINFALL	
			MAXIMUM.		MINIMUM.		MAX.+MIN./2.			
	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal
	mb.	mb.	°C.	°C.	°C.	°C.	°C.	°C.	mm.	mm.
I. Mediterranean	1013·8	+0·6	28·1	—1·4	21·1	—0·8	24·6	—1·1	0	0
II. Middle Egypt	1013·2	0·0	30·6	—1·5	18·1	—1·0	24·4	—1·2	0	0
III. Upper Egypt	1011·1	+0·3	35·8	—1·4	20·9	—1·4	28·4	—1.4	0	0
IV. North Sudan	1009·7	+0·4	39·0	—0·7	24·9	—0·1	32·0	—0·4	28	+ 8
V. Red Sea *	1009·6	+1·4	38·2	+0·4	26·3	+0·1	32·2	+0·2	0	0
VI. Central Sudan	1010·6	—0·3	34·0	—0·9	21·2	+0·1	27·6	—0·4	109	+28
VII. South Sudan	1011·4	0·0	31·8	—0·9	21·9	+0·9	26·8	0·0	99	—41

* Port Sudan only.

NOTE.—1,000 millibars is equivalent to 750·1 millimetres at 0°C. and mean gravity.

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RAINFALL DATA FOR SEPTEMBER 1933

STATION	1933	Diff. from Normal	STATION	1933	Diff. from Normal
	m/m.	m/m.		m/m.	m/m.
Juba	82	— 29	Adîs Abâba	176	— 15
Wau	115	— 48	Roseires	241	+ 90
Malakâl	100	— 45	Wâd Medani	79	+ 13
El Obeid	75	0	Atbara	0	— 6
El Fasher	40	+ 8	Kassala	105	+ 50
Khartoum	5	— 12	Port Sudan	0	0

HASSAN FAHMY,
A/Director, Meteorological Service.

State of the River

Lake Albert at Butiaba rose nine cms. during September. Its level on October 1, 1933 was 73 cms. above the normal and 21 cms. below that of the corresponding day of last year.

The peak of the flood on the Main Nile has now passed. Levels in general were low until August the 20th, but sharp rises on the Blue Nile and River Atbara about this time completely altered the conditions and the peak at Aswan was eventually about half a metre above normal.

The Bahr el Jebel at Juba fluctuated above normal throughout the month, but the levels were in general below those of last year.

The River Sobat at Nasser rose at about normal rate but the levels were below both the normal and last year's.

The White Nile at Malakal rose at about normal rate. The levels throughout the month were above both the normal and last year's.

The Blue Nile at Rossieres fluctuated above normal during the first 13 days and about it during the rest of the month. At Khartoum the Blue Nile was above normal except for the period 20th. to 24th when it was slightly below.

The River Atbara at Khashm el Girba fell rapidly during the first ten days and normally thereafter. The levels were above normal during the first eleven days and normal thereafter.

The Main Nile at Wadi Halfa continued to rise until the sixth, fluctuated until the 13th and fell faster than normally thereafter. The levels were above normal throughout the month but a few centimetres below last year's.

The differences of the mean levels in September 1933 from those of September 1932 and from the normal 1906–1930 were :—

STATION.	MEAN DIFFERENCES OF LEVELS	
	Sept. 1933 minus September 1932	September 1933 minus Normal
	Metres	Metres
Juba	— 0·17	+ 0·37
Nasser	— 0·53	— 0·29 *
Malakâl	+ 0·35	+ 0·57
Roseires	— 0·26	+ 0·38
Khartoum	+ 0·03	+ 0·19
Khashm el Girba...	— 0·11	+ 0·11
Wadi Halfa	— 0·10	+ 0·42

* Nasser Normal is for 1922–1930 only.

By Transfer
U. S. Weather Bureau
JUN 20 1938

Discharges of the Nile during August, 1933.

Observed by the Irrigation Department.

Esna (D.S. Barrage)

(Main Nile)

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	73·82	1800
8	74·23	1880
15	76·54	4280
23	78·06	6400
29	78·09	6230
Approx. Monthly Mean		4280

Aswân

(Measured by Sluices)

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
1	87·18	2030
2	87·24	2090
3	87·28	2130
4	87·30	2150
5	87·28	2120
6	87·34	2180
7	87·44	2280
8	87·64	2470
9	88·01	2830
10	88·54	3380
11	88·88	3760
12	89·13	4040
13	89·37	4330
14	89·66	4640
15	89·85	4880
16	89·96	5030
17	90·02	5120
18	90·18	5290
19	90·47	5670
20	90·87	6240
21	91·15	6640
22	91·24	6760
23	91·26	6810
24	91·30	6860
25	91·33	6940
26	91·32	6910
27	91·28	6850
28	91·23	6750
29	91·15	6600
30	91·15	6600
31	91·30	6860
Approx. Monthly Mean		4750
Normal Mean 1912-1932		6370

Halfa (Main Nile)

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
6	3·82	2610
7	4·25	3040
8	4·70	3530
9	4·93	3970
11	5.31	4320
12	5·53	4760
13	5·70	5170
14	5·77	5200
15	5·79	5230
Approx. Monthly Mean		—
Normal Mean 1912-1932		7160

River Atbara (Kilo 3)

Day of Month.	Gauge Reading. m.	Disch. m³ p.s.
3	12·03	757
7	12·66	957
13	13·32	1290
18	13·53	1570
23	13·38	1120
28	14·43	3590
Approx. Monthly Mean		1580
Normal Mean 1912-1932		2100

Hassanab (Main Nile)

Day of Month.	Gauge Reading. m.	Disch. m³ p.s.
2	13·66	3180
6	14·33	4130
11	15·20	5300
16	15·44	5660
22	15·39	5840
26	16·10	6600
Approx. Monthly Mean		5340
Normal Mean 1912-1932		6070

Tamaniât (Main Nile)

Day of Month.	Gauge Reading. m.	Disch. m³ p.s.
3	13·67	4350
8	13·87	4460
14	14·59	5730
19	14·71	5940
23	14·74	5740
28	15·08	6380
Approx. Monthly Mean		5430
Normal Mean 1912-1932		6280

Khartoum (Blue Nile)

Day of Month.	Gauge Reading. m.	Disch. m³ p.s.
1	13·78	3860
6	14·07	3410
12	14·92	5190
16	15·02	4930
21	14·95	4750
26	15·09	5250
Approx. Monthly Mean		4750
Normal Mean 1912-1932		5700

Sennar (Blue Nile)

Day of Month.	Gauge Reading. m.	Disch. m³ p.s.
2	9·48	3580
5	9·37	3260
7	10·66	4460
10	11·10	5310
13	10·62	4550
15	10·69	4630
17	10·65	4450
19	10·30	4390
21	10·98	4810
23	10·47	4570
26	12·02	6600
28	12·26	7010
30	11·96	6930
Approx. Monthly Mean		4950
Normal Mean 1912-1932		5590

Gezira Main Canal

(Kilo. 1·3)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	16·84	113
1	16·84	116
16	15·74	55
16	15·74	54
Approx. Monthly Mean		59
Normal Mean 1925-1932		49

Wad el Aies (Blue Nile)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	10·79	3690
4	10·34	3210
6	11·46	4390
8	12·26	5560
10	11·74	4770
12	11·79	4850
14	11·83	4700
16	11·96	5080
18	11·58	4560
20	11·91	4960
22	11·62	4440
24	12·08	4920
26	13·00	6470
28	13·21	6900
30	12·71	5850
Approx. Monthly Mean		4980
Normal Mean 1912-1932		5590

Mogren (White Nile)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	13·83	231
7	14·00	674
13	14·91	846
17	15·05	1170
22	14·97	1270
27	15·17	960
Approx. Monthly Mean		875
Normal Mean 1912-1932		609

Malakâl (White Nile)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
5	11·88	1080
10	12·03	1120
15	12·14	1160
20	12·29	1250
25	12·41	1270
30	12·51	1330
Approx. Monthly Mean		1180
Normal Mean 1912-1932		1050

Hillet Doleib (River Sobât)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
4	13·15	563
9	13·37	617
15	13·50	597
19	13·67	686
25	13·84	759
29	13·95	772
Approx. Monthly Mean		657
Normal Mean 1912-1932		606

River Sobât (at Head)

(Nasser Gauge)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
13	9·36	599
16	9·44	619
17	9·45	617
18	9·56	616
20	9·58	633
21	9·60	610
22	9·61	644
23	9·62	624
24	9·63	623
26	9·65	630
27	9·67	632
28	9·67	635
29	9·69	641
Approx. Monthly Mean		606
Normal Mean 1929-1932		654

River Baro

(6 Kms. U.S. Baro-Pibor Junction)

(Pibor Mouth Gauge)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
11	8·80	517
13	8·82	533
16	8·88	560
17	8·89	546
18	8·94	543
20	8·96	568
21	8·99	566
22	8·99	563
23	9·00	556
24	9·02	547
26	9·03	538
27	9·05	552
28	9·05	550
29	9·06	562
Approx. Monthly Mean		540
Normal Mean 1929-1932		556

Gambeila (River Baro)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	12·04	612
4	12·65	801
7	12·40	731
8	12·46	744
11	12·47	747
15	12·36	703
19	12·80	863
22	12·72	835
25	13·41	1060
30	14·08	1310
Approx. Monthly Mean		871
Normal Mean 1928-1932		973

River Pibor

(6 Kms. U.S. Baro-Pibor Junction)

(Pibor Mouth Gauge)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
13	8·82	65
16	8·88	79
17	8·89	76
18	8·94	75

Discharges of the Nile during August, 1933 (*continued*).

Observed by the Irrigation Department.

River Pibor (*contd.*)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
20	8·96	78
21	8·99	87
22	8·99	81
23	9·00	79
24	9·02	85
26	9·03	88
27	9·05	91
28	9·05	93
29	9·06	91
Approx. Monthly Mean		71
Normal Mean 1929-1932		102

River Pibor
(D.S. Makwai Junction)
(Makwai Gauge)

14	9·12	73
Approx. Monthly Mean		76
Normal Mean 1929-1932		119

Khor Makwai (at Mouth)
(Makwai Gauge)

14	9·12	—13
Approx. Monthly Mean		— 9
Normal Mean 1929-1932		27

River Pibor
(U. S. Makwai Junction)
(Makwai Gauge)

14	9·12	83
Approx. Monthly Mean		83
Normal Mean 1929-1932		99

River Pibor
(D.S. Gila Junction)
(Gila Gauge)

15	8·84	94
Approx. Monthly Mean		94
Normal Mean 1929-1932		130

River Gila (At Mouth)
(Gila Gauge)

15	8·84	76
Approx Monthly Mean		75
Normal Mean 1929-1932		49

River Pibor
(U.S. Gila Junction)
(Gila Gauge)

15	8·84	18
Approx. Monthly Mean		19
Normal Mean 1929-1932		87

Akobo (River Pibor)

5	13·09	3
10	13·38	12
15	13·49	16
20	13·72	5
25	13·97	31
30	14·12	31
Approx. Monthly Mean		15
Normal Mean 1929-1932		87

Bahr el Zerâf (Kilo. 3)
(Gauge at Mouth)

8	12·63	193
18	12·84	188
28	12·98	209
Approx. Monthly Mean		194
Normal Mean 1912-1932		145

Abu Tong (White Nile)
(Tonga Gauge)

8	12·72	320
18	12·96	338
28	13·06	313
Approx. Monthly Mean		323
Normal Mean 1923-1932		296

Lake No (White Nile)

7	13·88	324
17	13·95	321
27	13·97	316
Approx. Monthly Mean		321
Normal Mean 1923-1932		311

Bahr el Ghazal
(At Mouth)
(Suddite Factory Gauge)

7	13·94	12
17	14·02	23
27	14·04	16
Approx. Monthly Mean		17
Normal Mean 1923-1932		24

Bahr el Jebel (Kilo 3)
(Lake No Gauge)

7	13·88	306
17	13·95	302
27	13·97	307
Approx. Monthly Mean		305
Normal Mean 1923-1932		290

Jonglie (River Atem)
(Eastern Channel)
(Bahr el Jebel)

5	8·94	321
7	8·96	320
9	8·98	328
11	8·98	326
13	8·98	324
19	9·01	328
21	9·03	351
23	9·06	344
25	9·08	360
27	9·06	365
Approx. Monthly Mean		334

River Atem
(Western Channel)
(U.S. Jonglie Gauge)

5	8·94	140
7	8·96	142
9	8·98	145
11	8·98	144
13	8·98	145
19	9·01	149
21	9·03	150
23	9·06	152
25	9·08	155
27	9·06	153
Approx. Monthly Mean		147

Bor (Bahr el Jebel)

1	11·48	780
15	11·50	796
29	11·52	803
Approx. Monthly Mean		794
Normal Mean 1912-1932		763

Giggin (Bahr el Jebel)
(Western Channel)

3	29·27	231
Approx. Monthly Mean		242
Normal Mean 1931-1932		329

Gemeiza (Bahr el Jebel)
(Eastern Channel)

2	28·97	709
Approx. Monthly Mean		739
Normal Mean 1931-1932		804

Terrakekka (Bahr el Jebel)

1	13·50	948
Approx. Monthly Mean		1030
Normal Mean 1931-1932		1210

Mongalla (Bahr el Jebel)

1	11·97	923
6	12·04	951
11	12·06	994
16	12·02	975
21	12·12	1010
26	12·20	1040
Approx. Monthly Mean		1010
Normal Mean 1912-1932		1040

Occasional Discharges

Observed by the Irrigation Department

Date	River	Site	Gauge		Disch. m³. p.s.
			Reading M.	Site	
		River Sobât and Tributaries			
8-8-1933	Baro	50 kms. D.S. Gambeila	—	—	701
8-8-1933	,, ...	U.S. Baro-Adura bifurcation	—	—	705
8-8-1933	Adura	Head	—	—	101
8-8-1933	Baro	D.S. Baro-Adura bifurcation...	—	—	584
9-8-1933	,, ...	U.S. Khor Jokau Tail	—	—	582
9-8-1933	Khor Jokau ...	Tail	—	—	18
9-8-1933	Baro	D.S. Khor Jokau Tail	—	—	590
9-8-1933	,, ...	U.S. Khor Mechar Head	—	—	557
9-8-1933	Khor Mechar ...	Head	—	—	—74
9-8-1933	Baro	D.S. Khor Mechar Head	—	—	473
10-8-1933	,, ...	U.S. Baro-Adura Junction	—	—	465
10-8-1933	Adura	Mouth	—	—	88
10-8-1933	Baro	D.S. Baro-Adura Junction	—	—	551
11-8-1933	,, ...	U.S. Khor Makeir Head	—	—	553
11-8-1933	Khor Makeir ...	Head on River Baro	—	—	—11
11-8-1933	Baro	D.S. Khor Makeir Head...	—	—	538
8-8-1933	Khor Filus ...	Mouth	13·33	H.Doleib	32
15-8-1933	,, ...	,, ...	13·50	,,	14
28-8-1933	,, ...	,, ...	13·94	,,	78
		White Nile Tributaries			
26-8-1933	Tonga Dredger Cut	Mouth	13·04	Tonga	19
		Bahr el Jebel and Tributaries			
10-8-1933	Atem (East. Chan.)	U.S. Jonglie	8·98	Jonglie	241
26-8-1933	,, ,,	U.S. ,, ...	9·07	,,	270
10-8-1933	Atem (West. Chan.)	Close to Lagoon	8·98	,,	238
26-8-1933	,, ,,	,, ,, ...	9·07	,,	269
12-8-1933	,, ,,	D.S. Jonglie	8·98	,,	159
12-8-1933	,, (East. Chan.)	,, ,, ...	8·98	,,	246
14-8-1933	Jebel	About 150 mts. U.S. R.P. 101	11·14	Kenisa	368
28-8-1933	,, ...	,, ,, ,, ,, ,, ...	11·22	,,	373
3-8-1933	,, ...	West. Channel U.S. Giggin disch. Site	29·27	Giggin	223
3-8-1933	,, ...	,, ,, D.S. ,, ,, ...	29·27	,,	232
3-8-1933	,, ...	,, ,, ,, ,, ,, ...	29·27	,,	230

R. P. Black,

A/Director, Hydrological Service.

Government Press.
7967-1933-250-ox.

Ministry of Public Works, Egypt.—Physical Department

REPORT ON THE WEATHER AND STATE OF THE RIVER FOR OCTOBER 1933

The Weather

The spell of abnormally cool weather which had prevailed since the beginning of July extended almost to the end of October.

On the 8th of the month light showers occurred at a few coastal places, and on the 17th very light rain fell in the Delta. Otherwise the weather was settled, with cool winds mainly from the north, until the 19th, when a shallow depression near Crete caused the winds near the coast of Egypt to blow from the south, and for the first time for a month the temperature reached the normal value for the time of year. Within two days however the depression had passed to the east, winds went round to northwest, and the temperature fell considerably. On the 23rd there were heavy showers on the coast in the west. The weather remained abnormally cool until the 26th. In the early morning of the 25th the temperature at Giza fell to 10°C, which is the lowest reading of air temperature there in October for over 30 years.

These conditions broke down by the 27th, when high pressure systems over western Egypt and Syria caused northeasterly winds in Egypt, at times reaching gale strength. The weather warmed up gradually day by day, the temperature at Helwan on the 29th reaching 35°C (7°C above normal) which is higher than the temperature recorded there on any day since 5th September. Morning mists were frequent, but after their dissipation the sky was practically cloudless.

For the month as a whole the atmospheric pressure was unusually high in Egypt especially along the Mediterranean coast, while throughout the Sudan it was below normal. The temperature was much below normal in Egypt, and normal or slightly above, in the Sudan. In Lower Egypt it was the coolest October for sixteen years,—a contrast to last October, which was the warmest for at least twenty-five years.

Rainfall was deficient in Egypt, and in excess in the Sudan. Reports of phenomenal rain at Port Sudan (150 millimetres in forty-eight hours), await confirmation.

TABLE SHOWING THE DEPARTURES FROM NORMAL FOR OCTOBER 1933

DISTRICTS.	BAROMETRIC PRESSURE.		TEMPERATURE.						RAINFALL	
			MAXIMUM.		MINIMUM.		MAX.+MIN. 2.			
	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal
	mb.	mb.	°C.	°C.	°C.	°C.	°C.	°C.	mm.	mm.
I. Mediterranean	1018·3	+2·3	26·6	—1·2	18·6	—1·1	22·6	—1·2	1	— 6
II. Middle Egypt	1017·6	+1·5	28·4	—1·2	15·5	—1·3	21·9	—1·3	0	— 1
III. Upper Egypt	1014·4	+0·8	32·9	—1·7	18·3	—1·2	25·6	—1·4	0	0
IV. North Sudan	1009·2	—0·6	40·0	+0·6	24·6	+1·1	32·3	+0·9	2	— 2
V. Red Sea *	1012·2	+0·4	33·1	—0·6	24·7	+0·1	28·9	—0·3	156	+14
VI. Central Sudan	1009·0	—1·1	36·6	—0·5	21·4	+0·5	29·0	0·0	18	+ 2
VII. South Sudan	1009·7	—0·9	33·0	—1·1	22·0	+1·0	27·6	+0·1	120	+18

* Port Sudan only.

NOTE.—1,000 millibars is equivalent to 750·1 millimetres at 0°C. and mean gravity.

L. J. SUTTON,
Director, Meteorological Service.

Library of Congress

State of the River

Lake Albert at Butiaba rose 8 cms. during the month. Its level on November 1st, 1933, was 74 cms. above the normal, but 24 cms. below that of the corresponding day of last year.

The Bahr el Jebel at Juba fluctuated above normal throughout the month, but except on the 23rd and 25th the levels were below last year's.

The River Sobat at Nasser rose faster than normally. The level which was 24 cms. below normal at the beginning of the month was only 5 cms. below it at the end.

The White Nile at Malakal continued to rise at almost normal rate. The levels throughout the month were considerably above normal and a little above those of last year.

The Blue Nile at Roseires fell rapidly during the first three days, fluctuated about normal until the 11th and then above normal until the 19th after which it fell more rapidly than usual but the level at the end of the month was still 62 cms. above normal. At Khartoum the Blue Nile fell faster than normally for the first 15 days, then remained almost steady until the 25th and fell at normal rate thereafter.

The River Atbara at Khashm el Girba was almost identical with the normal and last year's levels for the first week and above them afterwards.

The Main Nile at Wadi Halfa fell at almost normal rate, the levels being continuously above normal throughout the month.

The Differences of the mean levels in October 1933 from those of October 1932 and from the normal for 1906-30 were:—

STATION.	MEAN DIFFERENCES OF LEVELS	
	Oct. 1933 minus Oct. 1932	Oct. 1933 minus Normal
	Metres	Metres
Juba	— 0·28	+ 0·25
Nasser	— 0·48	— 0·11*
Malakâl	+ 0·10	+ 0·54
Roseires	+ 0·28	+ 0·60
Khartoum	+ 0·12	+ 0·21
Khashm el Girba...	+ 0·23	+ 0·16
Wadi Halfa	— 0·11	+ 0·25

* Nasser normal is for 1922-1930 only

By Transfer
U.S. Weather Bureau
JUN 20 1936

Discharges of the Nile during September, 1933.

Observed by the Irrigation Department.

(Esna D.S. Barrage)
(Main Nile)

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
5	79·38	9090
19	79·34	8520
26	79·00	7580
Approx. Monthly Mean		8300

Aswân
(Measured by Sluices)
Aswân D.S. Gauge.

1	91·67	7480
2	92·06	8310
3	92·29	8750
4	92·37	8840
5	92·42	8980
6	92·50	9150
7	92·60	9340
8	92·58	9360
9	92·46	9100
10	92·35	8910
11	92·33	8840
12	92·39	8930
13	92·50	9150
14	92·51	9310
15	92·49	9260
16	92·43	9150
17	92·35	8980
18	92·30	8750
19	92·27	8630
20	92·24	8490
21	92·20	8420
22	92·16	8320
23	92·11	8180
24	92·03	8050
25	91·94	7920
26	91·86	7730
27	91·81	7580
28	91·73	7440
29	91·61	7300
30	91·48	7110
Approx. Monthly Mean		8530
Normal Mean 1912-1932		7790

River Atbara (Kilo 3)

4	14·35	2260
7	14·73	2130
12	14·31	1680
17	13·86	1150
22	13·42	1090
27	13·16	798
Approx. Monthly Mean		1510
Normal Mean 1912-1932		1360

Hassanab (Main Nile)

3	16·55	7060
6	16·57	6920
11	16·53	7170
16	16·31	6530
21	15·88	6540
25	15·54	5880
Approx. Monthly Mean		6550
Normal Mean 1912-1932		6560

Tamaniât (Main Nile)

5	15·70	7120
9	15·65	7320
13	15·74	7650
19	15·32	6460
23	15·00	6180
28	14·96	6080
Approx. Monthly Mean		6860
Normal Mean 1912-1932		6720

Khartoum (Blue Nile)

2	15·75	6700
6	16·02	6710
11	15·93	6840
16	15·82	6030
20	15·36	4880
26	15·26	5040
Approx. Monthly Mean		5840
Normal Mean 1912-1932		5540

Sennar (Blue Nile)

3	12·70	7260
5	11·65	5750
9	11·83	6320
11	11·92	6390
13	11·62	6070
16	10·47	4550
18	10·17	4280
20	10·18	4290
23	10·30	4610
25	10·21	4490
27	10·56	4800
30	10·18	4610
Approx. Monthly Mean		5380
Normal Mean 1912-1932		5010

Gezira Main Canal
(Kilo. 1·3)

1	14·45	11
1	14·45	12
17	14·72	18
17	14·72	18
Approx. Monthly Mean		32
Normal Mean 1925-1932		45

Wad el Aies (Blue Nile)

1	13·20	6670
3	13·28	6660
5	12·66	5680
7	12·67	5570
9	12·86	5710
11	12·95	5960
13	12·75	5690
15	12·04	4730
17	11·68	4230
19	11·58	4110
21	11·58	4140
23	11·90	4420
25	11·73	4210
27	12·20	4750
29	11·96	4470
Approx. Monthly Mean		5090
Normal Mean 1912-1932		4850

Mogren (White Nile)

4	15·90	886
7	15·94	1600
12	15·94	822
17	15·79	1550
21	15·38	1830
27	15·25	1300
Approx. Monthly Mean		1320
Normal Mean 1912-1932		1140

Malakâl (White Nile)

5	12·55	1260
10	12·56	1310
15	12·61	1310
20	12·64	1340
25	12·67	1330
30	12·74	1380
Approx. Monthly Mean		1320
Normal Mean 1912-1932		1150

Hillet Doleib (River Sobât)

4	13·98	757
9	14·01	739
14	14·05	757
19	14·10	778
24	14·10	773
29	14·17	770
Approx. Monthly Mean		762
Normal Mean 1912-1932		692

River Sobât (at Head)
(Nasser Gauge)

Aug.30	9·72	638
31	9·72	645
Approx. Monthly Mean		606
Normal Mean 1929-1932		654
Sep.16	9·96	635
17	9·97	655
18	10·00	663
21	10·04	650
22	10·04	643
23	10·06	681
24	10·06	664
26	10·12	672
27	10·13	678
30	10·17	670
Approx. Monthly Mean		651
Normal Mean 1929-1932		704

River Baro
(6 Kms. U.S. Baro-Pibor Junction)
(Pibor Mouth Gauge)

Aug.30	9·07	557
„ 31	9·08	559
Approx. Monthly Mean		540
Normal Mean 1929-1932		556

River Baro (*contd.*).

Sep.12	9·20	564
16	9·24	557
17	9·24	557
18	9·28	552
21	9·28	556
22	9·29	535
23	9·29	541
24	9·30	567
26	9·32	547
27	9·34	541
Approx Monthly Mean		555
Normal Mean 1929-1932		554

Gambeila (River Baro)

1	13·98	1280
6	13·59	1070
8	13·20	975
12	13·58	1110
15	13·80	1190
19	13·62	1130
23	14·24	1400
26	14·44	1470
29	13·96	1270
Approx. Monthly Mean		1210
Normal Mean 1928-1932		1140

River Pibor
(6 Kms. U.S. Baro-Pibor Junction)
(Pibor Mouth Gauge)

Aug.30	9·07	93
31	9·08	93
Approx. Monthly Mean		71
Normal Mean 1929-1932		102
Sep.16	9·24	105
17	9·24	111
18	9·28	110
21	9·28	102
22	9·29	110
23	9·29	101
24	9·30	97
26	9·32	98
27	9·34	105
Approx. Monthly Mean		103
Normal Mean 1929-1932		130

River Pibor
(D.S. Mokwai Junction)
(Mokwai Gauge)

13	9·51	112
20	9·60	118
28	9·66	121
Approx. Monthly Mean		112
Normal Mean 1929-1932		153

Discharges of the Nile during September, 1933 (*continued*).

Observed by the Irrigation Department.

Khor Mokwai (at Mouth)
(Mokwai Gauge)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
13	9·51	5
20	9·60	14
28	9·66	5
Approx. Monthly Mean		6
Normal Mean 1929-1932		70

River Pibor
(U. S. Mokwai Junction)
(Mokwai Gauge)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
13	9·51	102
20	9·60	110
28	9·66	110
Approx. Monthly Mean		104
Normal Mean 1929-1932		88

River Pibor
(D.S. Gila Junction)
(Gila Gauge)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
14	9·58	117
29	9·90	139
Approx. Monthly Mean		121
Normal Mean 1929-1932		150

River Gila (At Mouth)
(Gila Gauge)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
14	9·58	72
29	9.90	48
Approx Monthly Mean		65
Normal Mean 1929-1932		31

River Pibor
(U.S. Gila Junction)
(Gila Gauge)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
14	9.58	46
29	9·90	92
Approx. Monthly Mean		57
Normal Mean 1929-1932		122

Akobo (River Pibor)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
5	14·20	22
10	14·25	24
15	14·25	20
20	14·31	23
25	14·56	66
30	14·73	48
Approx. Monthly Mean		33
Normal Mean 1929-1932		91

Bahr el Zerâf (Kilo. 3)
(Gauge at Mouth)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
8	13·07	211
18	13·13	212
28	13·20	211
Approx. Monthly Mean		211
Normal Mean 1912-1932		160

Abu Tong (White Nile)
(Tonga Gauge)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
8	13·16	299
18	13·22	305
28	13·31	339
Approx. Monthly Mean		312
Normal Mean 1923-1932		306

Lake No (White Nile)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
7	14·02	329
17	14·04	306
27	14·08	316
Approx. Monthly Mean		317
Normal Mean 1923-1932		311

Bahr el Ghazal
(At Mouth)
(Suddite Factory Gauge)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
7	14·10	39
17	14·12	30
27	14·16	48
Approx. Monthly Mean		37
Normal Mean 1923-1932		39

Bahr el Jebel (Kilo 3)
(Lake No Gauge)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
7	14·02	292
17	14·04	285
27	14·08	280
Approx. Monthly Mean		287
Normal Mean 1923-1932		277

Jonglie (River Atem)
(Eastern Channel)
(Bahr el Jebel)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
4	9·02	322
6	9·02	336
8	9·02	327
10	9·02	330
16	9·06	344
18	9·07	345
20	9·08	356
22	9·10	355
24	9·12	362
30	9·14	370
Approx. Monthly Mean		345

River Atem
(Western Channel)
(U.S. Jonglie Gauge)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
4	9·02	135
6	9·02	134
8	9·02	133
10	9·02	131
16	9·06	132
18	9·07	134
20	9·08	135
22	9·10	135
24	9·12	139
30	9·14	138
Approx. Monthly Mean		135

Bor (Bahr el Jebel)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
12	11·54	805
26	11·58	812
Approx. Monthly Mean		807
Normal Mean 1912-1932		764

Gigging (Bahr el Jebel)
(Western Channel)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
3	29·43	256
Approx. Monthly Mean		28[illegible]
Normal Mean 1931-1932		334

Gemeiza (Bahr el Jebel)
(Eastern Channel)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
2	29·13	776
Approx. Monthly Mean		821
Normal Mean 1931-1932		834

Terrakekka (Bahr el Jebel)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	13·97	1120
Approx. Monthly Mean		1140
Normal Mean 1931-1932		1210

Mongalla (Bahr el Jebel)

Day of Month.	Gauge Reading. m.	Disch. m³. p.s.
1	12·49	1210
6	12·46	1160
11	12·62	1260
16	13·01	1480
21	12·94	1400
26	12·88	1380
Approx. Monthly Mean		1310
Normal Mean 1912-1932		1050

Occasional Discharges

Observed by the Irrigation Department

Date	River	Site	Gauge		Disch. m^3. p.s.
			Reading	Site	
			M.		
		River Sobât Tributaries			
7-9-1933	Baro	50 kms. D.S. Gambela	—	—	1130
8-9-1933	,, ...	U.S. Baro-Adura bifurcation	—	—	824
8-9-1933	Adura	Head	—	—	139
8-9-1933	Baro	D.S. Baro-Adura bifurcation	—	—	81
9-9-1933	,, ...	U.S. Khor Jokau Tail	—	—	610
9-9-1933	Khor Jokau ...	Tail	—	—	20
9-9-1933	Baro	D.S. Khor Jokau Tail	—	—	619
10-9-1933	,, ...	U.S. Khor Machar Head	—	—	558
10-9-1933	Khor Machar ...	Head	—	—	—62
10-9-1933	Baro	D.S. Khor Machar Head	—	—	451
11-9-1933	,, ...	U.S. Baro-Adura Junction	—	—	467
11-9-1933	Adura	Mouth	—	—	174
11-9-1933	Baro	D.S. Baro-Adura Junction	—	—	630
12-9-1933	,, ...	U.S. Khor Makeir Head	9·20	Pibor M.	587
12-9-1933	Khor Makeir ...	Head	9·20	,,	—22
12-9-1933	Baro	D.S. Khor Makeir Head	9·20	,,	571
4-9-1933	Khor Fullus ...	Mouth	14·98	H.Doleib	47
13-9-1933	,, ,, ...	,, ...	14·05	,,	54
24-9-1933	,, ,, ...	,, ...	14·10	,,	26
		White Nile and Tributaries			
6-9-1933	Tonga Cut	At Tail	13·15	Tonga	21
15-9-1933	,, ...	,, ...	13·21	,,	42
25-9-1933	,, ...	,, ...	13·28	,,	67
6-9-1933	Khor Lolle	U.S. Tonga Cut	13·15	,,	29
15-9-1933	,, ...	,, ,, ,, ...	13·21	,,	37
25-9-1933	,, ...	,, ,, ,, ...	13·28	,,	56
8-9-1933	,, ...	1 Km. U.S. Junction	18·85	Khor L.	133
14-9-1933	,, ...	1 ,, ,, ,, ...	18·89	,,	118
9-9-1933	,, ...	7 ,, ,, ,, ...	18·85	,,	117
14-9-1933	,, ...	7 ,, ,, ,, ...	18·89	,,	122
19-9-1933	White Nile	D.S. Khor Lolle	18·93	,,	553
16-9-1933	Maya Sinyora ...	At Junction	14·05	Lake No	20
26-9-1933	,, ...	,, ...	14·08	,,	10
26-9-1933	Khor Yergol ...	,, ...	14·38	K.Yergol	22
		Bahr el Jebel and Tributaries			
5-9-1933	Atem (East.Chan.)	U.S. Jonglie	9·02	Jonglie	257
19-9-1933	,, ,,	U.S. ,, ...	9·08	,,	259
5-9-1933	Atem(West.Chan.)	Close to Lagoon	9·02	,,	222
19-9-1933	,, ,,	,, ,, ...	9·08	,,	228
7-9-1933	,, ,,	D.S. Jonglie	9·02	,,	165
7-9-1933	,, (East. Chan.)	,, ,, ...	9·02	,,	237
11-9-1933	Jebel	About 150 mts. U.S. R.P. 101	11·20	Kenisa	326
25-9-1933	,, ...	,, ,, ,, ,, ,, ...	11·24	,,	337
3-9-1933	,, ...	West. Channel U.S. Gigging disch. site	29·43	Gigging	222
3-9-1933	,, ...	,, ,, D.S. ,, ,, ...	29·43	,,	245
3-9-1933	,, ...	,, ,, ,, ,, ,, ...	29·43	,,	258

P. Phillips,

Director, Hydrological Service.

Govt. Press 8893-1933-150 ex.

Ministry of Public Works, Egypt.—Physical Department.

REPORT ON THE WEATHER AND STATE OF THE RIVER FOR NOVEMBER 1933

The Weather

Abnormally warm. The heat wave which began towards the end of October continued into November and with varying intensity persisted for a month.

In the early part of the month Egypt was an area of high pressure, with light winds chiefly from the northeast, mild settled weather, and frequent morning mists, which on occasions were very thick. On the 9th the weather began to grow steadily warmer owing to the presence of a shallow depression off the coast in the west, causing southerly winds in Egypt. By the 12th temperatures were 8° or 9° C. above the normal for the time of the year. The depression passed on the following day but a deeper depression was then approaching off Benghasi and hot easterly winds traversed Lower Egypt. On the 15th the depression was over Crete. The winds were between east and south on the Egyptian coast, while inland there was very little wind, and the weather became hotter, the temperature rising to 10° or 12° C. above normal. At Heliopolis the temperature reached 37.1° C (99°F), equalling the previous record for November, made in 1919, and at most localities near Cairo the temperature approached within half a degree of the highest reading made since 1869 when records began at Abbassia. The weather remained hot for three days but with the arrival of the depression over Palestine on the 18th the temperature fell appreciably.

For three mornings fog was widespread, and on the 20th there was an unusually heavy dew. High pressure extending from the Balkans towards Egypt caused northeast winds of moderate strength, but on the 24th winds again went round to the south, with some rise in temperature.

On the 28th there were two very shallow depressions off the coast of Egypt; warm southerly winds resulted, and a minor duststorm occurred in the afternoon. On the following day a cold front struck Egypt, with winds from the northwest. Heavy rain fell along the coast, showers occurred throughout the Delta, and for the first time for more than a month, the temperature fell below normal.

For the month as a whole the barometric pressure was everywhere below normal except along the Mediterranean coast. The mean temperature was above normal throughout Egypt and the Sudan, especially in Middle and Upper Egypt; in these districts the mean temperature was the highest for at least twenty-four years; earlier comparable records for districts do not exist. The mean temperature at Khartoum was the highest for November since 1902 at least.

The wind movement during the month was much smaller than usual; anemometer records at Helwan show that it was the calmest November since 1914. Mists were accordingly frequent; there were thirteen misty mornings in Cairo district.

Rainfall in Egypt was much below normal. (The phenomenally heavy rainfall at Port-Sudan—150 millimetres on October 30th and 31st—has been confirmed).

TABLE SHOWING THE DEPARTURES FROM NORMAL FOR NOVEMBER 1933

DISTRICTS	BAROMETRIC PRESSURE.		TEMPERATURE.						RAINFALL	
			MAXIMUM.		MINIMUM.		MAX.+MIN./2.			
	1933.	Difference from Normal	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal
	mb.	mb.	°C.	°C.	°C.	°C.	°C.	°C.	mm.	mm.
I. Mediterranean	1017·8	+0·4	27·3	+2·9	17·1	+0·8	22·2	+1·8	4	—21
II. Middle Egypt	1017·5	—0·2	29·5	+4·0	14·9	+1·4	22·2	+2·7	4	— 2
III. Upper Egypt	1015·4	—0·9	34·2	+4·8	16·1	+1·9	25·2	+3.4	0	0
IV. North Sudan	1010·7	—1·1	37·1	+1·5	21·6	+1·8	29·4	+1·6	1	+ 1
V. Red Sea *	1014·5	+1·0	30·6	—0·4	22·7	—0·9	26·6	—0·6	36	— 8
VI. Central Sudan	1009·1	—1·9	36·8	+0·5	19·6	+1·6	28·2	+1·0	11	+ 9
VII. South Sudan	1008·8	—1·7	35·4	0·0	21·2	+1·8	28·3	+0·9	20	+ 1

* Port Sudan only.

NOTE.—1,000 millibars is equivalent to 750·1 millimetres at 0°C. and mean gravity.

L. J. SUTTON,
Director, Meteorological Service.

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State of the River

Lake Albert at Butiaba fell 7 cms. during the month. Its level on December 1, 1933 was 60 cms. above the normal but 35 cms. below that of the corresponding day of last year.

The levels of the Bahr el Jebel at Juba were practically identical with the normal throughout the month.

The River Sobat at Nasser reached its maximum level on the 7th, remained steady until the 18th and fell very slowly thereafter. The levels were below last year's throughout but above normal after the first seven days.

The White Nile at Malakal remained steady for the first 10 days and then fell very slowly until the end of the month. The levels were well above normal throughout.

The Blue Nile at Roseires fell at almost normal rate the levels being considerably above normal throughout the month. At Khartoum the Blue Nile also fell at normal rate the levels being above both the normal and those of last year.

The River Atbara at Khashm el Girba was identical with the normal for the first 10 days and a little above it afterwards.

The Main Nile at Wadi Halfa rose slightly on the first of the month and fell at normal rate thereafter. The levels were above both the normal and last year's throughout.

The differences of the mean levels in November 1933 from those of November 1932 and from the normal 1906-30 were:—

STATION.	MEAN DIFFERENCES OF LEVELS	
	Nov. 1933 minus Nov. 1932	November 1933 minus Normal
	Metres	Metres
Juba	— 0·27	+ 0·05
Nasser	— 0·34	+ 0·20 *
Malakal	— 0·03	+ 0·54
Roseires	+ 0·44	+ 0·56
Khartoum	+ 0·43	+ 0·24
Khashm el Girba...	+ 0·32	+ 0·16 †
Wadi Halfa	+ 0·60	+ 0·56

* Nasser normal is for 1922-1930 only.

By Transfer
U. S. Weather Bureau
JUN 20 1938

Discharges of the Nile during October, 1933.

Observed by the Irrigation Department.

Esna (D.S. Barrage)
(Main Nile)

Day of Month.	Gauge Reading m.	Disch. m³. p.s.
3	78·41	6450
10	78·28	6480
17	77·92	5790
24	77·26	4810
31	76·80	4540
Approx. Monthly Mean		5710

Aswân
(Measured by Sluices)
Aswân D.S. Gauge.

1	91·39	7000
2	91·35	6940
3	91·32	6880
4	91·28	6770
5	91·25	6680
6	91·23	6600
7	91·21	6530
8	91·18	6430
9	91·16	6380
10	91·16	6380
11	91·14	6300
12	91·08	6210
13	90·97	6110
14	90·86	5900
15	90·74	5750
16	90·62	5650
17	90·53	5520
18	90·44	5380
19	90·34	5240
20	90·24	5190
21	90·14	5050
22	90·06	4860
23	90·00	4790
24	89·92	4700
25	89·86	4600
26	89·80	4600
27	89·74	4550
28	89·72	4540
29	89·68	4500
30	89·65	4450
31	89·61	4400
Approx. Monthly Mean		5640
Normal Mean 1912-1932		5450

Halfa (Main Nile)

15	6·37	5630
16	6·29	5540
17	6·19	5380
18	6·08	5230
20	5·93	4970
21	5·85	5030
22	5·81	4890
24	5·65	4700
25	5·61	4620
26	5·59	4630
28	5·53	4560
30	5·46	4530*
Approx. Monthly Mean		5620
Normal Mean 1912-1932		5660

River Atbara (Kilo. 3)

2	13·04	644
8	12·57	396
13	12·26	361
18	12·20	298
22	11·97	299
27	11·99	268
Approx. Monthly Mean		364
Normal Mean 1912-1932		275

Hassanab (Main Nile)

1	15·46	5380
7	15·03	5380
12	14·60	4910
17	14·27	4600
21	14·16	4220
25	14·21	4290
Approx. Monthly Mean		4709
Normal Mean 1912-1932		4480

Tamaniât (Main Nile)

3	15·00	6220
9	14·38	5100
14	13·98	4380
18	13·86	4250
23	13·84	4230
28	13·54	3800
Approx. Monthly Mean		4670
Normal Mean 1912-1932		4380

Khartoum (Blue Nile)

1	15·27	5160
7	14·74	3770
11	14·28	2950
16	14·02	2770
21	13·94	2810
25	13·94	2850
Approx. Monthly Mean		3160
Normal Mean 1912-1932		2980

Sennar (Blue Nile)

3	9·42	3550
5	9·60	3710
7	8·76	2780
10	9·09	2990
12	8·45	2570
14	8·75	2750
16	8·55	2640
18	8·29	2390
21	8·89	2920
23	8·52	2630
25	8·22	2420
28	7·54	1700
30	7·30	1480
Approx. Monthly Mean		2700
Normal Mean 1912-1932		2590

Gezira Main Canal
(Kilo 1·3)

1	16·45	91
1	16·45	92
15	16·46	90
15	16·46	89
Approx. Monthly Mean		86
Normal Mean 1925-1932		73

Wad el Aies (Blue Nile)

1	11·46	3880
3	10·89	3250
5	11·26	3670
7	10·18	2680
9	10·34	2970
11	10·13	2620
13	10·08	2670
15	10·29	2860
17	9·90	2460
19	10·30	2930
21	10·34	2930
23	9·93	2470
25	9·72	2300
27	9·37	2010
29	9·12	1800
Approx. Monthly Mean		2660
Normal Mean 1912-1932		2400

Roseires (Blue Nile)

15	16·60	2600
17	16·46	2490
19	17·25	3070
21	16·82	2750
23	16·48	2490
25	16·17	2290
27	15·80	1890
29	15·53	1680
31	15·41	1620
Approx. Monthly Mean		2660
Normal Mean 1912-1932		2400

Mogren (White Nile)

2	15·30	1300
8	14·78	1630
12	14·40	1600
17	14·16	1360
22	14·10	1300
26	13·98	1370
Approx. Monthly Mean		1430
Normal Mean 1912-1932		1390

Malakâl (White Nile)

5	12·74	1370
10	12·74	1340
15	12·76	1390
21	12·81	1420
25	12·83	1400
30	12·84	1450
Approx. Monthly Mean		1390
Normal Mean 1912-1932		1230

Hillet Doleib (River Sobât)

3	14·18	758
9	14·19	756
14	14·21	777
20	14·28	754
24	14·28	804
29	14·29	803
Approx. Monthly Mean		774
Normal Mean 1912-1932		760

River Sobât (at Head)
(Nasser Gauge)

24	10·42	717
25	10·43	706
30	10·46	702
31	10·46	703
Approx. Monthly Mean		697
Normal Mean 1929-1932		750

River Baro
(6 Kms. U.S. Baro-Pibor Junction)
(Pibor Mouth Gauge)

23	9·48	537
24	9·49	543
25	9·49	544
30	9·50	532
31	9·51	517
Approx Monthly Mean		538
Normal Mean 1929-1932		520

Gambeila (River Baro)

3	13·30	1040
7	12·96	901
10	13·02	892
14	13·19	942
17	12·92	888
21	12·96	874
24	12·41	684
27	11·98	569
31	11·70	511
Approx. Monthly Mean		836
Normal Mean 1928-1932		742

River Pibor
(6 Kms. U.S. Baro-Pibor Junction)
(Pibor Mouth Gauge)

24	9·49	125
25	9·49	118
30	9·50	130
31	9·51	128
Approx. Monthly Mean		118
Normal Mean 1929-1932		163

* Received by telegraph only.

Discharges of the Nile during October, 1933 (*continued*)

Observed by the Irrigation Department.

Akobo (River Pibor)

Day of Month.	Gauge Reading. m.	Disch. m^3. p.s.
5	14·68	42
10	14·64	47
15	14·58	38
20	14·60	42
25	14·66	51
30	14·72	55
Approx. Monthly Mean		46
Normal Mean 1929-1932		92

Bahr el Zerâf (Kilo. 3)

(Gauge at Mouth)

8	13·24	211
19	13·29	222
28	13·33	222
Approx. Monthly Mean		217
Normal Mean 1912-1932		162

Abu Tong (White Nile)

(Tonga Gauge)

8	13·36	326
18	13·38	351
28	13·41	348
Approx. Monthly Mean		341
Normal Mean 1923-1932		316

Lake No (White Nile)

7	14·10	306
17	14·12	300
27	14·16	334
Approx. Monthly Mean		313
Normal Mean 1923-1932		312

Bahr el Ghazal

(At Mouth)

(Suddite Factory Gauge)

7	14·17	49
17	14·20	51
27	14·23	48
Approx. Monthly Mean		49
Normal Mean 1923-1932		43

Bahr el Jebel (Kilo 3)

(Lake No Gauge)

7	14·10	282
17	14·12	253
27	14·16	282
Approx. Monthly Mean		273
Normal Mean 1923-1932		272

Jonglie (River Atem)

(Eastern Channel)

(Bahr el Jebel)

2	9·16	384
4	9·17	391
6	9·20	403
8	9·25	429
14	9·30	457
16	9·33	457
18	9·34	458
20	9·32	451
22	9·30	436
28	9·20	403
30	9·17	378
Approx. Monthly Mean		423

River Atem

(Western Channel)

(U.S. Jonglie Gauge)

2	9·16	146
4	9·17	148
6	9·20	150
8	9·25	157
14	9·30	160
16	9·33	160
18	9·34	162
20	9·32	161
22	9·30	157
28	9·20	151
30	9·17	144
Approx. Monthly Mean		154

Bor (Bahr el Jebel)

10	11·59	809
24	11·56	801
Approx. Monthly Mean		807
Normal Mean 1912-1932		746

Gigging (Bahr el Jebel)

(Western Channel)

3	29·67	322
Approx. Monthly Mean		305
Normal Mean 1931-1932		306

Gemeiza (Bahr el Jebel)

(Eastern Channel)

2	29·30	876
Approx. Monthly Mean		850
Normal Mean 1931-1932		811

Terrakekka (Bahr el Jebel)

1	14·17	1160
Approx. Monthly Mean		1130
Normal Mean 1931-1932		1160

Mongalla (Bahr el Jebel)

1	12·50	1160
6	12·23	1050
11	12·22	1040
16	12·44	1130
21	12·64	1200
26	12·76	1270
Approx. Monthly Mean		1140
Normal Mean 1912-1932		1030

Occasional Discharges

Observed by the Irrigation Department

Date	River	Site	Gauge		Disch. m³. p.s.
			Reading	Site	
			M.		
		River Sobât Tributaries			
18-10-1933	Baro	50 kms. D.S. Gambeila	—	—	950
19-10-1933	,, ...	U.S. Baro-Adura bifurcation	—	—	757
19-10-1933	Adura	Head	—	—	139
19-10-1933	Baro	D.S. Baro-Adura bifurcation...	—	—	618
20-10-1933	,, ...	U.S. Khor Jokau Tail	—	—	668
20-10-1933	Khor Jokau ...	Tail	—	—	23
20-10-1933	Baro	D.S. Khor Jokau Tail	—	—	707
21-10-1933	,, ...	U.S. Khor Machar Head	—	—	556
21-10-1933	Khor Machar ...	Head	—	—	—65
21-10-1933	Baro	D.S. Khor Machar Head	—	—	477
22-10-1933	,, ...	U.S. Baro-Adura Junction	—	—	458
22-10-1933	Adura	Mouth	—	—	290
22-10-1933	Baro	D.S. Baro-Adura Junction	—	—	697
23-10-1933	,, ...	U.S. Khor Makeir Head	—	—	608
23-10-1933	Khor Makeir ...	Head	—	—	—29
23-10-1933	Baro	D.S. Khor Makeir Head...	—	—	572
2-10-1933	Khor Fullus ...	Mouth	14·18	H.Doleib	22
13-10-1933	,, ,, ...	,, ...	14·21	,,	24
24-10-1933	,, ,, ...	,, ...	14·28	,,	23
		White Nile and Tributaries			
5-10-1933	Tonga Cut... ...	At Tail	13·35	Tonga	63
15-10-1933	,, ...	,, ...	13·38	,,	57
25-10-1933	,, ...	,, ...	13·44	,,	70
5-10-1933	Khor Lolle... ...	U.S. Tonga Cut	13·35	,,	57
15-10-1933	,, ...	,, ,, ,, ...	13·38	,,	60
25-10-1933	,, ...	,, ,, ,, ...	13·44	,,	58
8-10-1933	White Nile	D.S. Khor Lolle	19·02	K. Lolle	580
6-10-1933	Maya Sinyora ...	At Junction	14·10	Lake NO	18
17-10-1933	,, ...	,, ...	14·12	,,	20
26-10-1933	,, ...	,, ...	14·16	,,	18
6-10-1933	Khor Yergol ...	,, ...	14·42	K.Yergol	19
16-10-1933	,, ...	,, ...	14·44	,,	26
26-10-1933	,, ...	,, ...	14·49	,,	29
3-10-1933	Khor Atar	At Tail	13·46	Fenikang	19
14-10-1933	,, ...	,, ...	13·48	,,	42
28-10-1933	,, ...	,, ...	13·58	,,	26
		Bahr el Jebel and Tributaries			
3-10-1933	Atem (East.Chan.)	U.S. Jonglie	9·16	Jonglie	298
17-10-1933	,, ,,	,, ,, ...	9·34	,,	346
31-10-1933	,, ,,	,, ,, ...	9·16	,,	297
3-10-1933	Atem(West.Chan.)	Close to Lagoon	9·16	,,	253
17-10-1933	,, ,,	,, ,, ...	9·34	,,	314
31-10-1933	,, ,,	,, ,, ...	9·16	,,	287
5-10-1933	,, ,,	D.S. Jonglie	9·18	,,	176
5-10-1933	,, (East. Chan.)	,, ,, ...	9·18	;,	262
9-10-1933	Jebel	About 150 mts. U.S. R.P. 101	11·34	Kenisa	319
23-10-1933	,, ...	,, ,, ,, ,, ,, ...	11·44	,,	315
3-10-1933	,, ...	West. Channel U.S. Gigging disch. site	29·67	Gigging	227
3-10-1933	,, ...	,, ,, D.S. ,, ,, ...	29·67	,,	306
3-10-1933	,, ...	,, ,, ,, ,, ,, ...	29·67	,,	268

P. Phillips,

Director, Hydrological Service.

Government Press

9412-1933-250 ex.

Ministry of Public Works, Egypt—Physical Department

REPORT ON THE WEATHER AND STATE OF THE RIVER FOR DECEMBER 1933

The Weather

Very warm for the first three weeks, abnormally cold during the last week.

At the beginning of the month an extensive depression was situated over the central Mediterranean, and a mild southerly breeze prevailed in Egypt. The depression arrived north of the Delta on the 3rd, the weather became cloudy but remained mild, and showers were general for some days. A high pressure system was then established over Egypt, and the weather became settled and warmer.

A shallow depression crossed Middle Egypt on the 12th, causing warm southerly winds. Subsequently a series of drepressions traversed the Mediterranean and a prolonged hot spell resulted. On the 16th record high temperatures for December were registered at Matruh and Siwa in the west. With the passage of small depressions along the eastern Mediterranean, the heat wave in Egypt intensified, particularly in Middle and Upper Egypt. At Aswan the temperature reached 37°C (99°F) on three successive days 18, 19, 20, surpassing the normal by 12°C and being the highest temperature recorded there in December since observations started 33 years ago. Record high temperatures for the month were also made at Assiut, Kharga and Dakhla. On the 18th and 20th the temperature at Helwan Observatory did not fall below 20°C (68°F), these being the warmest nights on record there for December. It is interesting to note that at Helwan on the 19th, with the wind from east or southeast the warmest part of the twenty-four hours was at midnight, when the temperature was 25·5°C (78°F) and the humidity only 19 per cent.

After the 18th the heat wave rapidly weakened, and on 21st, when the last of the depressions was approaching the Syrian coast, a current of cold air from southern Europe arrived in Egypt, and the temperature fell abruptly. Fresh westerly and northwesterly winds traversed Egypt; on the coast the winds reached gale force and rough conditions prevailed over the eastern Mediterranean. At Salum the wind velocity reached 98 kilometres per hour. In Middle Egypt the cold wave was most intense on the 25th and 26th, when the highest temperature in Cairo was only 15°C (59°F)—a striking contrast to that of a week previously, when the temperature was 29°C (84°F). The cold current penetrated to the extreme south of the Sudan.

Heavy rain fell near the coast, and showers were widespread in Lower Egypt. At Mersa Matruh 67 millimetres were registered from the 23rd to 26th; at Alexandria 33 millimetres fell on the 24th and 12 millimetres on the following day.

By the 28th the weather had become settled, with anticyclonic conditions; the weather during the daytime became warmer, but the nights remained cool. At Siwa Oasis the temperature fell below freezing point on the last three nights of the month, the lowest temperature recorded being 3°C below freezing point.

At the end of the month the weather was again becoming warmer owing to the prevalence of southeast winds caused by the approach of a depression off the coast.

For the month as a whole the mean pressure was below normal and the temperature above in all districts. At Helwan the relative humidity was only 49 per cent compared with a normal value of 60 per cent. Along the Mediterranean coast the rainfall was slightly above normal, but elsewhere it was deficient.

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TABLE SHOWING THE DEPARTURES FROM NORMAL FOR DECEMBER 1933

DISTRICTS	BAROMETRIC PRESSURE.		TEMPERATURE.						RAINFALL	
			MAXIMUM.		MINIMUM.		MAX.+MIN./2.			
	1933.	Difference from Normal	1933.	Difference from Normal.	1933.	Difference from Normal.	1933.	Difference from Normal	1933.	Difference from Normal
	mb.	mb.	°C.	°C.	°C.	°C.	°C.	°C.	mm.	mm.
I. Mediterranean	1017·5	—0·5	21·3	+1·1	12·3	+0·6	16·8	+0·8	44	+ 9
II. Middle Egypt	1017·9	—1·2	22·2	+1·7	10·4	+1·4	16·3	+1·6	2	— 3
III. Upper Egypt	1017·1	—1·8	26·6	+2·6	10·4	+0·9	18·5	+1·8	0	— 3
IV. North Sudan	1012·0	—2·1	34·7	+2·3	18·3	+2·0	26·5	+2·2	0	0
V. Red Sea *	1015·0	—0·2	29·3	+0·9	22·3	+1·0	25·8	+1·0	7	—20
VI. Central Sudan	1010·5	—2·5	35·4	+1·3	16·3	+1·4	25·8	+1·4	0	0
VII. South Sudan	1009·7	—1·5	34·9	—0·8	18·7	+1·1	26·8	+0·2	13	+ 8

* Port Sudan only.

NOTE.—1,000 millibars is equivalent to 750·1 millimetres at °C. and mean gravity.

L. J. SUTTON,
Director, Meteorological Service.

State of the River

Lake Albert at Butiaba fell seven centimetres during the month. Its level on January 1st, 1934 was 62 centimetres above normal but 38 centimetres below that of the corresponding day of last year.

The Bahr el Jebel at Juba remained almost steady throughout the month the levels being above normal but below last year's.

The River Sobat at Nasser fell faster than normally but the levels remained above normal throughout the month though below those of last year.

The White Nile at Malakal fell at normal rate. The levels though below last year's remained above normal throughout.

The Blue Nile at Roseires fell at normal rate the levels being about 40 centimetres above normal throughout. At Khartoum the Blue Nile also fell at nonal rate the levels throughout the month being above both the normal and those of last year.

The River Atbara at Khashm el Girba which was 39 centimetres above normal at the beginning of the month fell to normal level on the 20th.

The Main Nile at Wadi Halfa fell normally the levels being about 30 centimetres above normal throughout the month.

The differences of the mean levels in December 1933 from those of December 1932 and from the normal for 1906–1930 were :—

STATION.	MEAN DIFFERENCES OF LEVELS	
	Dec. 1933 minus Dec. 1932	Dec. 1933 minus Normal
	Metres	Metres
Juba	— 0·24	+ 0·14
Nasser	— 1·03	+ 0·56 *
Malakal	— 0·31	+ 0·60
Roseires	+ 0·15	+ 0·41
Khartoum	+ 0·23	+ 0·19
Khashm el Girba...	+ 0·19	+ 0·07
Wadi Halfa	+ 0·45	+ 0·34

* Nasser normal is for 1922-1930 only.

By Transfer
U. S. Weather Bureau.
JUN 20 1938

Discharges of the Nile during November, 1933

Observed by the Irrigation Department.

Esna (D.S. Barrage)
(Main Nile)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
7	76·56	4030
14	75·45	3000
21	74·32	2020
28	73·64	1630
Approx. Monthly Mean		2890

Aswân
(Measured by Sluices)
Aswân D.S. Gauge.

Day of Month	Gauge Reading m.	Disch. m³. p.s.
1	89·57	4350
2	89·59	4310
3	89·62	4380
4	89·62	4370
5	89·56	4270
6	89·50	4210
7	89·35	4060
8	89·21	3980
9	89·03	3490
10	88·90	3440
11	88·75	3300
12	88·59	3140
13	88·43	2960
14	88·31	2890
15	88·16	2720
16	88·00	2550
17	87·85	2430
18	87·70	2270
19	87·54	2140
20	87·40	2090
21	87·30	1980
22	87·20	1880
23	87·10	1830
24	87·00	1740
25	86·89	1650
26	86·86	1650
27	86·84	1630
28	86·96	1740
29	86·96	1740
30	86·97	1740
Approx. Monthly Mean		2830
Normal Mean 1912-1932		2800

Halfa (Main Nile)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
2	5·52	4500
3	5·47	4410
4	5·40	4340
9	5·01	3820
10	4·91	3730
11	4·81	3580
12	4·72	3490
13	4·63	3390
14	4·55	3360
15	4·47	3220
17	4·34	3140
18	4·27	3010
19	4·19	2970
20	4·13	2890
21	4·06	2790
22	4·00	2780
24	3·92	2670
25	3·88	2610
26	3·88	2540
27	3·83	2560
28	3·81	2570
29	3·76	2500
30	3·71	2490
Approx. Monthly Mean		3350
Normal Mean 1912-1932		2930

River Atbara (Kilo. 3)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
2	11·40	161
7	11·07	139
12	10·81	118
17	10·70	110
21	10·61	104
26	10·66	86
Approx. Monthly Mean		115
Normal Mean 1912-1932		63

Hassanab (Main Nile)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
1	13·71	3800
6	13·22	3190
11	12·91	2970
15	12·72	2960
20	12·55	2360
25	12·40	2160
Approx. Monthly Mean		2760
Normal Mean 1912-1932		2370

Tamaniât (Main Nile)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
4	12·92	3090
8	12·68	2800
13	12·38	2520
17	12·28	2470
22	12·12	2260
27	12·00	2060
Approx. Monthly Mean		2550
Normal Mean 1912-1932		2310

Khartoum (Blue Nile)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
1	13·32	1860
6	12·96	1510
11	12·65	1190
15	12·50	1090
20	12·32	879
25	12·20	828
Approx. Monthly Mean		1140
Normal Mean 1912-1932		1100

Sennar (Blue Nile)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
1	7·23	1470
4	7·00	1250
6	6·87	1220
8	6·68	1080
11	6·60	1040
13	6·45	963
15	6·35	905
18	6·23	854
20	6·21	837
22	6·16	801
25	6·00	713
27	6·04	739
29	6·06	757
Approx. Monthly Mean		980
Normal Mean 1912-1932		1030

Gezira Main Canal
(Kilo 1·3)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
2	16·13	72
2	16·13	72
16	15·85	59
16	15·85	64
Approx. Monthly Mean		64
Normal Mean 1925-1932		63

Roseires (Blue Nile)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
2	15·23	1490
4	15·07	1400
6	14·95	1330
8	14·96	1290
13	14·62	1120
15	14·50	1060
17	14·45	1040
19	14·42	1120
21	14·30	972
23	14·25	934
25	14·26	948
27	14·16	901
29	14·07	871
Approx. Monthly Mean		1130
Normal Mean 1912-1932		1000

Mogren (White Nile)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
2	13·47	1530
7	13·12	1470
12	12·82	1370
16	12·74	1390
21	12·54	1370
26	12·40	1450
Approx. Monthly Mean		1420
Normal Mean 1912-1932		1210

Malakâl (White Nile)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
5	12·85	1400
10	12·83	1430
15	12·80	1370
20	12·78	1410
25	12·75	1360
30	12·73	1370
Approx. Monthly Mean		1390
Normal Mean 1912-1932		1220

Hillet Doleib (River Sobât)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
3	14·30	796
9	14·30	799
14	14·26	788
20	14·23	792
24	14·21	751
29	14·19	769
Approx. Monthly Mean		789
Normal Mean 1912-1932		778

River Sobât (at Head)
(Nasser Gauge)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
1	10·46	702
12	10·51	712
13	10·51	706
14	10·51	717
18	10·51	690
19	10·50	684
20	10·50	677
22	10·48	639
23	10·47	658
25	10·44	633
26	10·42	626
27	10·41	623
30	10·35	602
Approx. Monthly Mean		682
Normal Mean 1929-1932		654

River Baro
(6 Kms. U.S. Baro-Pibor Junction)
(Pibor Mouth Gauge)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
1	9·52	537
11	9·54	525
12	9·54	532
13	9·54	528
14	9·53	513
18	9·46	474
19	9·44	456
20	9·41	442
22	9·34	400
23	9·32	374
25	9·25	374
26	9·22	375
27	9·18	369
30	9·08	344
Approx Monthly Mean		467
Normal Mean 1929-1932		370

Gambeila (River Baro)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
3	11·42	464

River Pibor
(6 Kms. U.S. Baro-Pibor Junction)
(Pibor Mouth Gauge)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
1	9·52	126
12	9·54	151
13	9·54	154
14	9·53	163
18	9·46	178
19	9·44	182
20	9·41	192
22	9·34	197
23	9·32	194
25	9·25	203
26	9·22	219
27	9·18	217
30	9·08	228
Approx. Monthly Mean		171
Normal Mean 1929-1932		208

Discharges of the Nile during November, 1933 (*continued*)

Observed by the Irrigation Department

River Pibor
(D.S. Mokwai Junction)
(Mokwai Gauge)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
15	9·96	172
21	9·89	193
28	9·76	204
Approx. Monthly Mean		175
Normal Mean 1929-1932		220

Khor Mokwai (at Mouth)
(Mokwai Gauge)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
15	9·96	87
21	9·89	97
28	9·76	89
Approx. Monthly Mean		81
Normal Mean 1929-1932		125

River Pibor
(U. S. Mokwai Junction)
(Mokwai Gauge)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
15	9·96	98
21	9·89	107
28	9·76	127
Approx. Monthly Mean		106
Normal Mean 1929-1932		104

River Pibor
(D.S. Gila Junction)
(Gila Gauge)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
16	9·96	126
29	9·92	130
Approx. Monthly Mean		—
Normal Mean 1929-1932		158

River Gila (At Mouth)
(Gila Gauge)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
16	9·96	49
29	9·92	62
Approx Monthly Mean		—
Normal Mean 1929-1932		28

River Pibor
(U.S Gila Junction)
(Gila Gauge)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
16	9.96	89
29	9·92	77
Approx. Monthly Mean		—
Normal Mean 1929-1932		134

Bahr el Zerâf (Kilo. 3)
(Gauge at Mouth)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
8	13·32	226
19	13·27	231
28	13·24	229
Approx. Monthly Mean		228
Normal Mean 1912-1932		159

Abu Tong (White Nile)
(Tonga Gauge)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
8	13·45	327
19	13·40	332
28	13·35	312
Approx. Monthly Mean		331
Normal Mean 1923-1932		292

Lake No (White Nile)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
7	14·16	322
18	14·12	321
27	14·11	322
Approx. Monthly Mean		322
Normal Mean 1923-1932		300

Bahr el Ghazal
(At Mouth)
(Suddite Factory Gauge)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
7	14·22	42
18	14·21	34
27	14·18	31
Approx. Monthly Mean		36
Normal Mean 1923-1932		23

Bahr el Jebel (Kilo 3)
(Lake No Gauge)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
7	14·16	283
18	14·12	293
27	14·11	298
Approx. Monthly Mean		290
Normal Mean 1923-1932		280

Jonglie (River Atem)
(Eastern Channel)
(Bahr el Jebel)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
1	9·14	378
3	9·11	380
5	9·09	376

River Atem
(Western Channel)
(U.S. Jonglie Gauge)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
1	9·14	142
3	9·11	140
5	9·09	111

Bor (Bahr el Jebel)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
7	13·56	829

Gigging (Bahr el Jebel)
(Western Channel)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
3	29·56	282
Approx. Monthly Mean		254
Normal Mean 1931-1932		258

Gemeiza (Bahr el Jebel)
(Eastern Channel)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
2	29·23	819
Approx. Monthly Mean		764
Normal Mean 1931-1932		748

Terrakekka (Bahr el Jebel)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
1	13·90	1090
Approx. Monthly Mean		1010
Normal Mean 1931-1932		1010

Mongalla (Bahr el Jebel)

Day of Month	Gauge Reading m.	Disch. m³. p.s.
1	12·28	1070
6	12·11	989
11	12·03	930
16	12·06	964
21	12·01	928
26	11·97	909
Approx. Monthly Mean		953
Normal Mean 1912-1932		953

Occasional Discharges

Observed by the Irrigation Department

Date	River	Site	Gauge		Disch. m³ p.s.
			Reading M.	Site	
		River Sobât Tributaries			
6-11-1933	Baro	50 kms. D.S. Gambeila	—	—	431
7-11-1933	,, ...	U.S. Baro-Adura bifurcation	—	—	413
7-11-1933	Adura	Head	—	—	24
7-11-1933	Baro	D.S. Baro-Adura bifurcation...	—	—	405
8-11-1933	,, ...	U.S. Khor Jokau Tail	—	—	465
8-11-1933	Khor Jokau ...	Tail	—	—	13
8-11-1933	Baro	D.S. Khor Jokau Tail	—	—	508
9-11-1933	,, ...	U.S. Khor Machar Head	—	—	439
9-11-1933	Khor Machar ...	Head	—	—	—43
9-11-1933	Baro	D.S. Khor Machar Head	—	—	387
10-11-1933	,, ...	U.S. Baro-Adura Junction	—	—	456
10-11-1933	Adura	Mouth	—	—	201
10-11-1933	Baro	D.S. Baro-Adura Junction	—	—	647
11-11-1933	,, ...	U.S. Khor Makeir Head	—	—	604
11-11-1933	Khor Makeir ...	Head	—	—	—29
11-11-1933	Baro	D.S. Khor Makeir Head...	—	—	566
2-11-1933	Khor Fullus ...	U.S. Tail	14·30	H.Doleib	22
13-11-1933	,, ,, ...	,, ...	14·27	,,	19
23-11-1933	,, ,, ...	,, ...	14·22	,,	17
		White Nile Tributaries			
5-11-1933	Tonga Cut... ...	U.S. Tail	13·46	Tonga	67
16-11-1933	,, ...	,, ...	13·41	,,	70
25-11-1933	,, ...	,, ...	13·36	,,	63
5-11-1933	Khor Lolle... ...	U.S. Tonga Cut	13·46	,,	57
16-11-1933	,, ...	,, ,, ,, ...	13·41	,,	63
25-11-1933	,, ...	,, ,, ,, ...	13·36	,,	57
6-11-1933	Maya Sinyora ...	U.S. Tail	14·16	Lake NO	15
17-11-1933	,, ...	,, ...	14·12	,,	11
26-11-1933	,, ...	,, ...	14·11	,,	11
5-11-1933	Khor Yergol ...	,, ...	14·50	K.Yergol	28
16-11-1933	,, ...	,, ...	14·47	,,	28
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3-11-1933	Khor Atar	,, ...	13·58	Fenikang	68
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2-11-1933	Atem(West.Chan.)	D.S. Jonglie	9·12	Jonglie	165
2-11-1933	Atem (East.Chan.)	,, ,, ...	9·12	,,	261
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3-11-1933	,, ,,	,, 5 Kms. U.S. Gigging	29·56	Gigging	219
3-11-1933	,, ,,	,, 3 ,, D.S. ,, ...	29·56	,,	264
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10,103–1933–250 ex.