Table I-14 Calculation of Discharge Required for Navigation

Place	Depth (m)	A (m2)	P (m)	$R=\frac{A}{P}$ (m)	$R^{\frac{2}{3}}$	V (m/sec)	Q (m3/sec)	Remarks
Kurungan Nyawa	1.50	151.36	163.90	0.923	0.948	0.58	87.8	n=0.035
	1.00	71.18	151.30	0.470	0.604	0.37	26.3	$I=\frac{1}{2200}$
	0.75	38.39	74.30	0.517	0.644	0.39	15.0	
Menanga Tengah	1.50	88.69	126.00	0.704	0.791	0.48	42.6	
	1.00	34.68	64.40	0.539	0.662	0.40	13.9	
	0.75	20.52	44.00	0.466	0.601	0.37	7.6	
Suka Bumi	1.50	51.18	57.50	0.890	0.925	0.56	28.7	
	1.00	29.30	45.00	0.651	0.751	0.46	13.5	
	0.75	18.85	40.00	0.471	0.605	0.37	7.0	
Tanjung Lubuk	1.50	108.83	111.80	0.973	0.982	0.60	65.3	
	1.00	53.98	103.70	0.521	0.647	0.39	21.1	
	0.75	29.10	88.30	0.330	0.477	0.29	8.4	

b) Domestic use

There have been traditional and definitive water right for domestic use in the downsream reach of Kurungan Nyawa, though there is no legislation concerning water right. Domestic water use is tentatively assumed to be 25 m^3/sec, which was estimated from the minimum daily streamflow of 25.4 m^3/sec at Martapura in October 1972.

Therefore, 25 m^3/sec is employed for maintenance flow because it can cover the water required for navigations.

1.3.2 Water Balance

1) Calculation of Water Balance

Calculation for the monthly water balance was made for 27 years from 1952 to 1978.

ii) Results of Water Balance

According to these table, the streamflow of the Komering river is not sufficient to meet the water requirements. As shwon in Table I-16, total monthly water deficit reaches its maximum in 1967. Such water deficit would be anticipated in any drough year in future.

In order to supply sufficient quantity of irrigation water to the proposed irrigable area, the streamflow of the Komering should be augmented for the dry season use by regulating the steamflow during rainy season.

According to Mass curve, effective reservoir capacity of about 622 x 10^6 is required to be provided for the comprehensive basin development in future.

Table I-15 Quantities of Monthly Water Supply

	Irrigation Requirements	Maintenance Flow	Total
Jan.	19.34	25.00	44.34
Feb.	12.66	25.00	37.66
Mar.	39.67	25.00	64.67
Apr.	46.55	25.00	71.55
May	66.75	25.00	91.75
Jun.	90.99	25.00	115.99
Jul.	96.55	25.00	121.55
Aug.	90.50	25.00	115.50
Sep.	51.34	25.00	76.34
Oct.	50.25	25.00	75.25
Nov.	58.67	25.00	83.67
Dec.	48.59	25.00	73.59

Table I-16 Total Monthly Water Deficit

Year	Total Monthly Water Deficit ($10^6 m^3$)
1952	19
1953	75
1954	-
1955	-
1956	-
1957	-
1958	56
1959	121
1960	37
1961	99
1962	70
1963	272
1964	208
1965	-
1966	-
1967	286
1968	-
1969	-
1970	-
1971	61
1972	203
1973	-
1974	125
1975	-
1976	-
1977	-
1978	-

Table I-17 Mean Monthly Discharge at Martapura (C.A.=4260 km2) (Unit : m3/sec)

YEAR	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	MEAN
1952	334.7	245.9	333.3	295.6	187.7	123.8	102.6	89.3	119.7	176.5	240.1	248.9	208.2
1953	367.9	280.7	340.5	270.4	269.4	142.5	105.5	65.8	56.0	58.6	160.3	160.3	189.8
1954	217.1	303.9	306.6	177.6	197.3	208.2	149.4	160.9	110.6	111.5	211.2	267.6	201.8
1955	314.3	298.7	307.3	372.5	193.8	201.2	160.7	286.5	168.4	238.2	213.0	302.1	254.7
1956	295.5	309.3	342.1	394.2	239.8	158.1	149.9	193.3	158.0	238.5	227.8	182.1	240.7
1957	324.7	226.9	291.4	263.9	330.8	144.3	156.7	164.0	113.1	100.7	176.5	327.1	218.6
1958	304.9	432.8	378.0	429.6	269.4	140.0	84.3	139.8	182.8	180.7	192.2	385.3	260.0
1959	153.9	441.8	465.1	351.7	240.1	218.8	137.9	69.0	30.4	69.0	164.3	379.5	226.8
1960	351.9	215.5	265.7	272.7	182.8	102.1	91.5	213.9	69.0	89.9	228.5	398.9	206.9
1961	200.8	385.3	342.7	323.8	281.1	165.8	104.4	63.9	49.1	45.5	82.6	321.4	197.2
1962	209.4	295.7	441.4	313.8	225.5	156.4	168.7	145.3	111.4	162.7	185.3	285.0	216.7
1963	209.0	265.9	336.5	284.1	236.4	100.0	52.3	53.6	51.9	54.2	36.5	101.4	148.5
1964	288.5	288.2	282.5	373.5	119.7	97.4	80.5	79.1	47.6	86.2	100.7	249.1	174.4
1965	279.7	249.5	222.7	262.0	221.5	141.1	88.4	192.1	57.0	61.5	67.9	202.9	170.5
1966	196.8	119.7	319.5	123.7	294.3	211.0	131.9	139.9	103.5	56.4	239.7	255.6	182.7
1967	253.2	220.8	174.1	295.9	410.3	97.5	96.4	38.1	26.7	27.4	131.0	266.7	169.4
1968	283.2	164.7	286.7	336.3	244.3	194.6	178.8	228.6	157.4	159.0	147.8	306.0	224.0
1969	339.6	293.4	358.5	415.8	241.9	204.0	258.8	133.7	135.8	120.1	198.5	293.5	249.5
1970	334.9	282.5	448.6	317.2	294.4	215.5	124.7	176.9	151.0	129.8	207.8	199.5	240.2
1971	295.6	156.4	196.8	392.9	221.9	135.9	89.0	87.2	90.9	188.2	263.1	288.9	200.6
1972	333.1	318.8	312.3	410.3	449.1	196.7	83.0	61.1	48.2	31.9	63.9	188.0	208.0
1973	242.1	299.2	238.8	314.0	290.8	215.2	102.9	121.8	281.4	223.2	227.4	225.6	231.8
1974	105.0	(66.3)	111.2	280.1	(155.8)	(49.0)	84.5	(165.9)	(250.7)	(294.8)	(240.4)	232.4	169.7
1975	261.4	379.7	184.3	(297.1)	(204.5)	(168.2)	(226.9)	223.4	231.8	(232.9)	304.3	200.0	242.9
1976	(308.8)	290.1	(372.5)	437.8	(288.4)	(181.6)	144.6	161.4	(141.4)	372.4	(359.6)	380.9	286.6
1977	(417.5)	(469.3)	343.8	(567.2)	349.3	(352.0)	(294.0)	(202.5)	216.0	152.9	175.8	371.3	326.0
1978	119.3	(384.0)	(600.0)	399.0	(486.8)	(275.8)	(293.2)	(231.7)	(281.2)	(286.8)	(387.4)	(513.9)	379.9
Mean	283.2	280.9	318.6	332.3	264.0	170.2	138.6	144.0	127.4	146.1	193.8	279.0	223.2

Total year : 27 years

Table I - 18 Mean Daily Discharge at Batu Raja CA = 2096 Km^2

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1971	179.56	116.43	143.56	325.31	121.69	73.36	81.61	54.60	48.84	99.90	108.15	215.49
1972	173.01	196.57	233.75	285.13	250.55	96.38	33.20	32.55	24.94	17.68	26.37	84.93
1973	97.61	169.52	170.57	219.27	187.49	119.96	51.55	60.34	228.47	129.17	110.74	147.88
1974	50.54	102.71	84.08	320.36	163.65	53.64	50.32	87.77	159.46	125.17	122.18	156.03
1975	184.18	238.18	121.72	174.55	63.53	42.74	37.22	66.27	82.92	100.65	169.24	84.47
1976	96.31	77.64	190.84	198.05	79.48	43.74	30.35	31.64	29.66	146.94	233.11	220.69
1977	201.24	124.64	79.88	258.52	102.47	121.23	81.37	50.62	57.24	14.59	49.85	82.04
1978	94.98	98.53	24.88	87.04	168.97	37.62	95.42	31.65	97.22	75.98	99.35	150.92
Total	1077.43	1124.22	1049.28	1868.23	1137.83	588.67	461.04	415.44	728.75	710.08	918.99	1142.45
Average	134.7	140.5	131.16	233.5	142.2	73.6	57.6	51.9	91.1	88.8	114.9	142.8
Specific discharge ($m^3/sec/km^2$)	0.064	0.067	0.063	0.111	0.068	0.035	0.027	0.025	0.043	0.042	0.055	0.068

Table I - 19 Mean Daily Discharge at Tanjung Rambang CA = 1318 Km^2

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1972	-	-	-	47.30	15.32	5.89	2.24	1.67	3.03	1.70	1.64	13.50
1973	24.00	45.00	45.57	51.87	26.41	25.80	5.43	7.06	54.16	16.27	8.63	20.93
1974	27.50	53.81	24.74	-	26.12	3.72	-	2.88	7.07	12.26	30.18	63.14
1975	73.56	58.75	48.48	54.68	19.84	5.48	3.88	4.28	10.50	16.87	39.86	20.04
1976	52.54	22.23	59.78	56.62	6.48	3.63	2.16	2.65	2.27	11.71	85.32	74.53
1977	65.68	90.76	76.60	59.10	16.82	24.00	-	2.07	5.78	2.35	3.30	69.52
1978	75.56	66.99	76.40	58.18	44.65	11.43	10.08	3.30	15.09	26.12	58.75	78.60
Total	318.84	337.54	331.57	327.75	155.64	79.95	23.79	23.91	97.90	87.28	227.68	340.26
Average	53.1	56.3	55.3	54.6	22.2	11.4	4.8	3.4	14.0	12.5	32.5	48.6
Specific discharge ($m^3/sec/Km^2$)	0.040	0.043	0.042	0.041	0.017	0.009	0.004	0.003	0.011	0.009	0.025	0.037

Fig. I-I.

LOCATION MAP OF HYDRO METEOROLOGICAL STATION

Skala : 1 : 500.000.

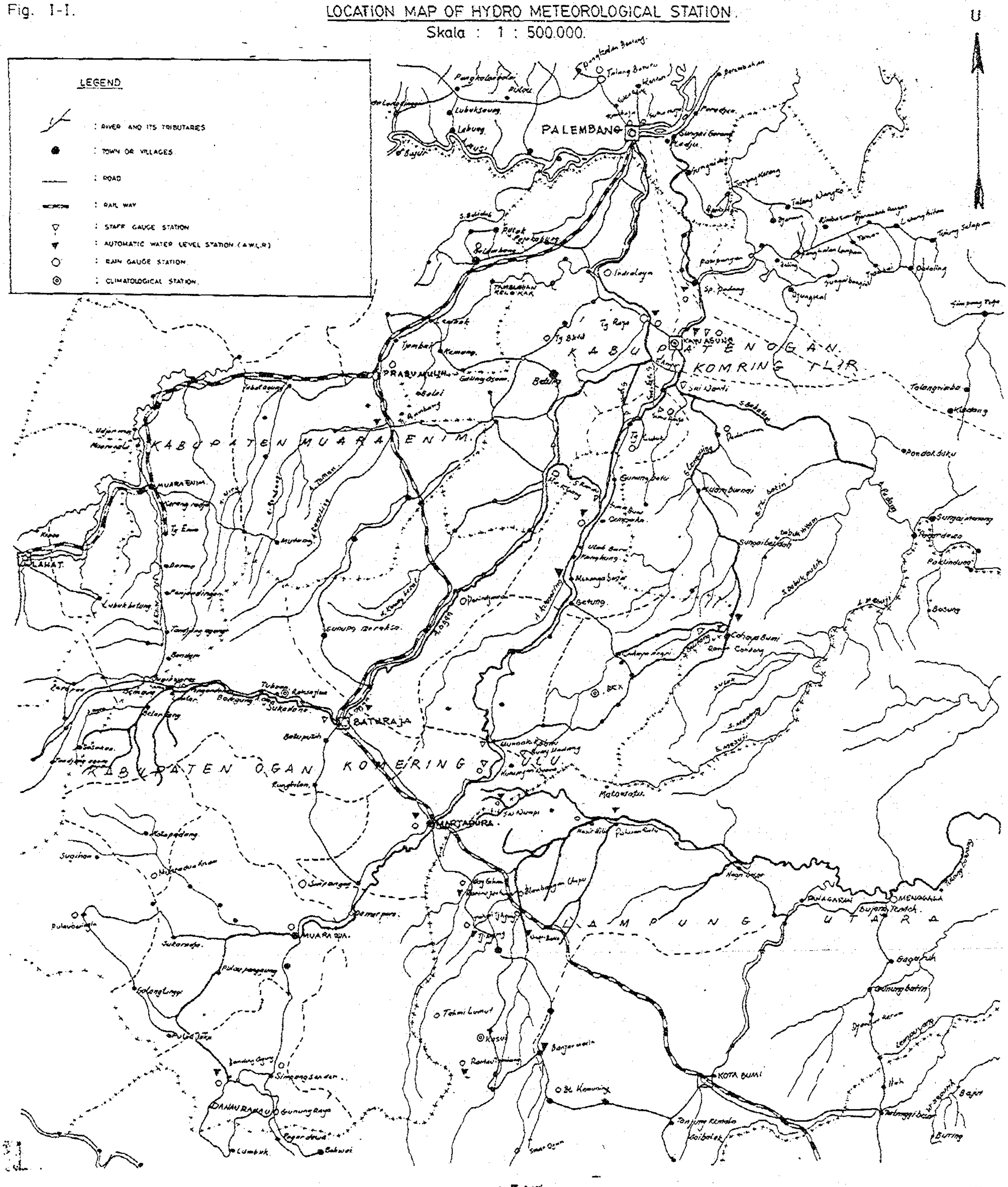


FIG 1-2 LOCATION MAP OF RIVERS CONNECTING FROM THE KOMERING TO THE OGAN

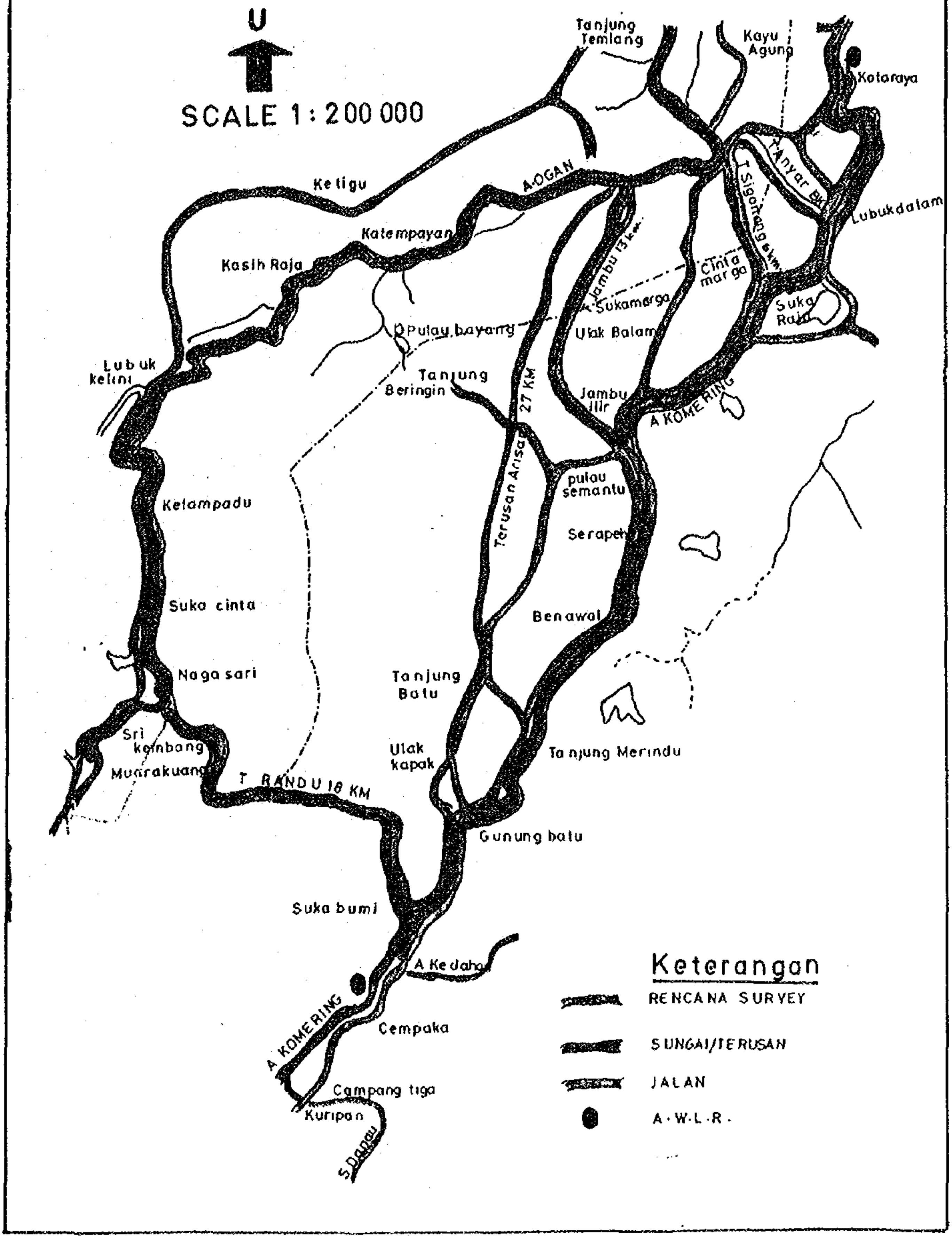
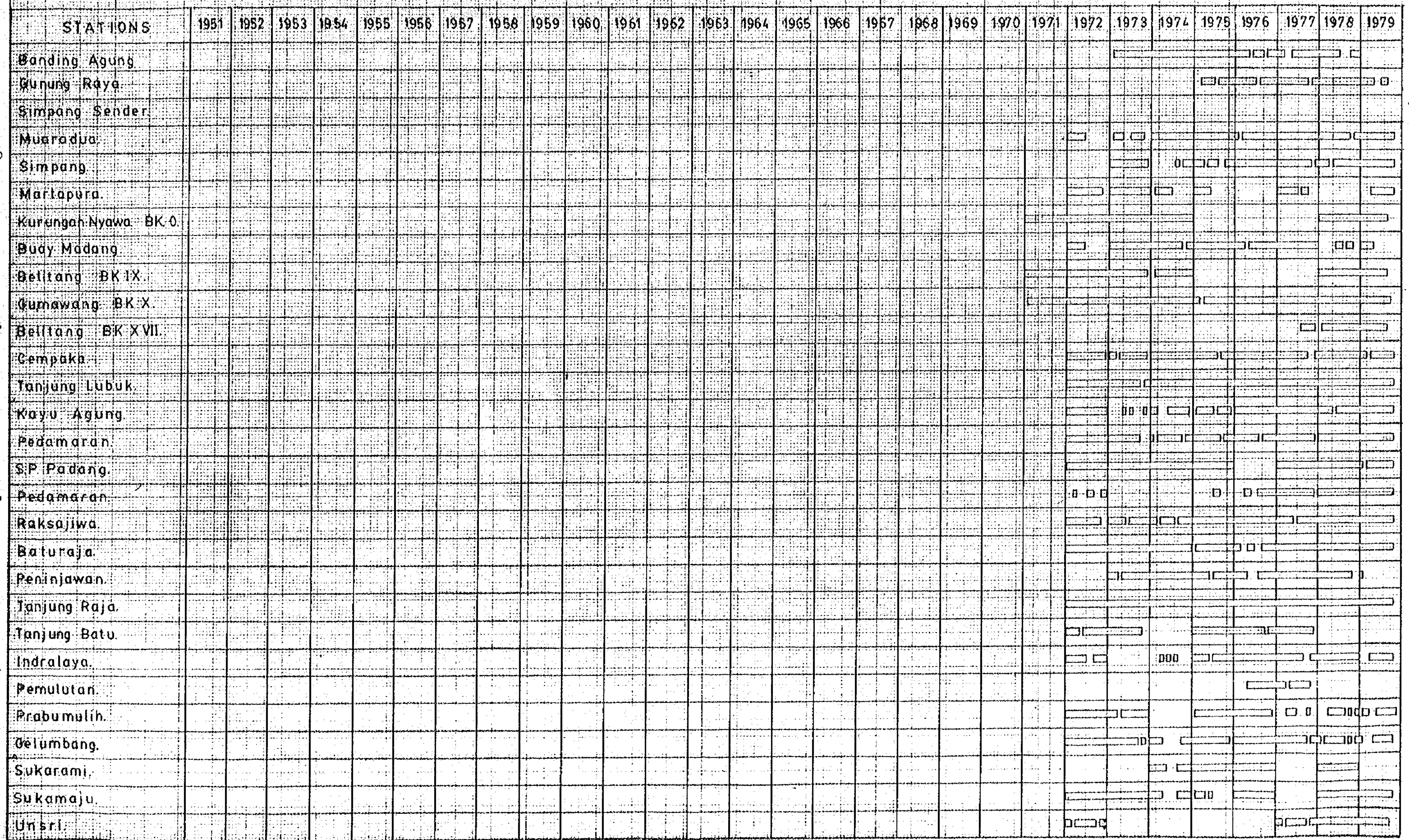


Fig. I - 3 AVAILABLE DAILY RAINFALL DATA



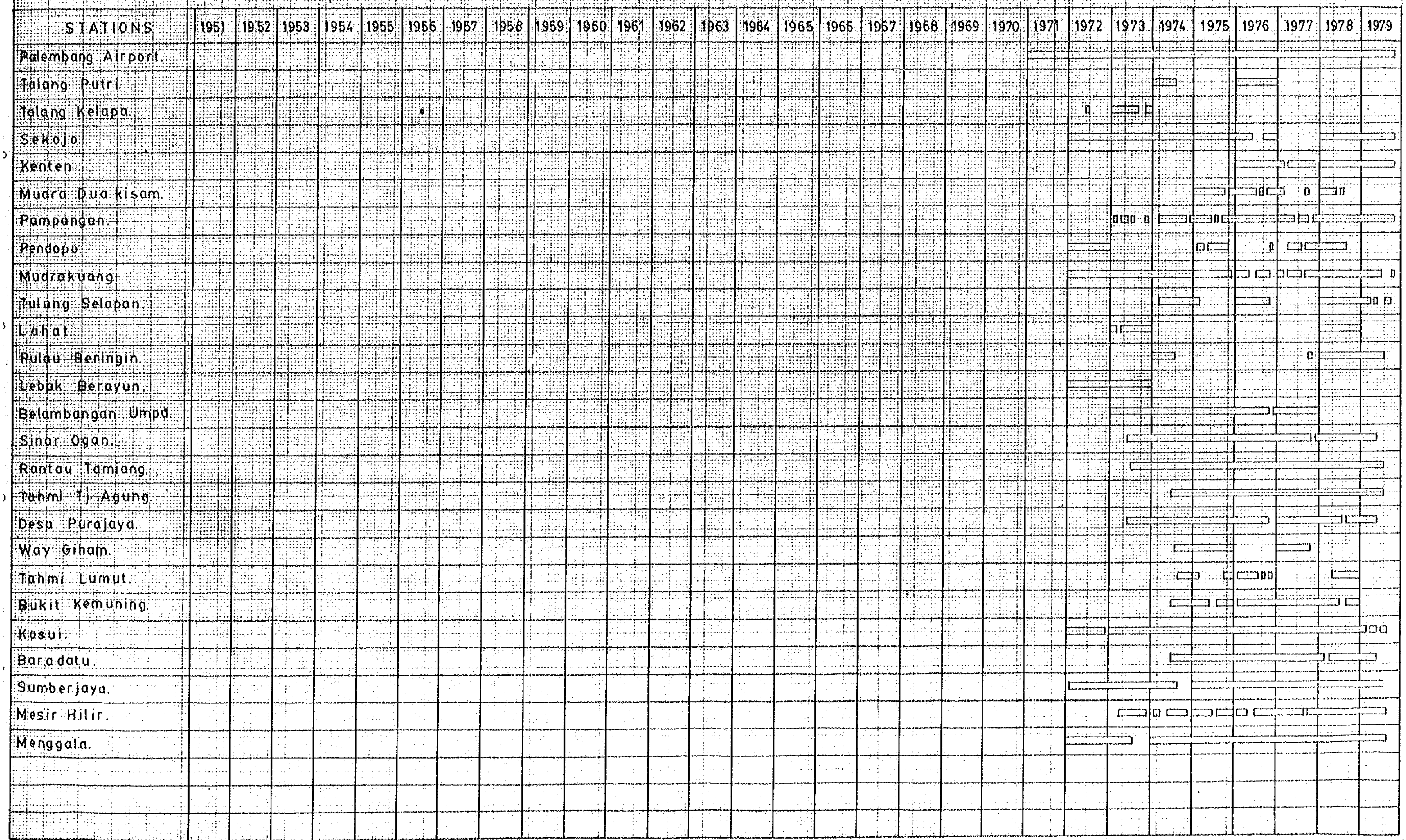
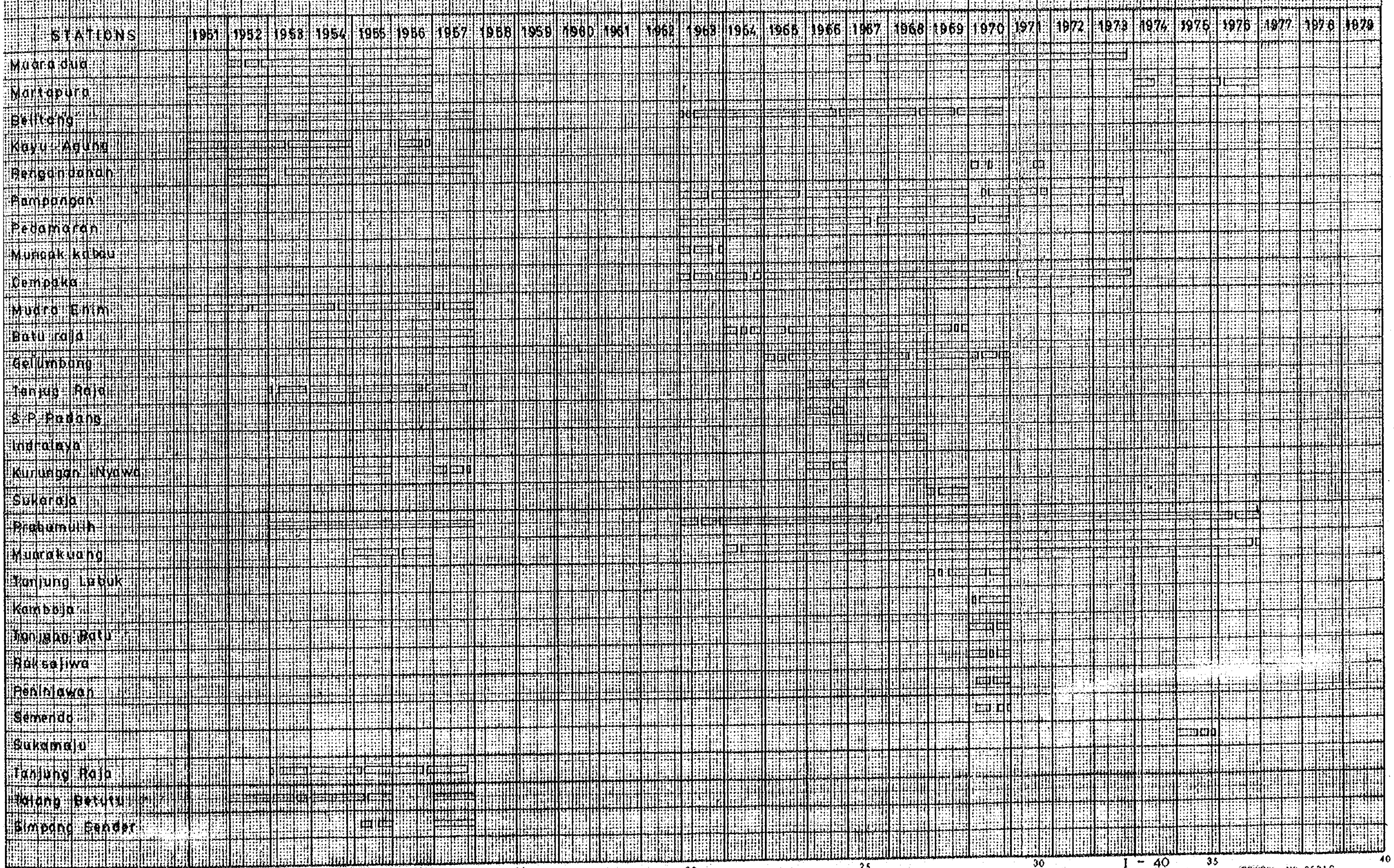

STATIONS
1951
1952
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
Palembang Airport.
Talang Putri
Talang Kelapa.
Sekojo.
Kenten.
Mudra Dua kisam.
Pampangan.
Pendopo.
Mudrakuang.
Tulung Selapan.
Lahat.
Pulau Beningin.
Lebak Berayun.
Belambangan Umpu.
Sinar Ogan.
Rantau Tamiang.
Tahmi Tj. Agung.
Desa Purajaya.
Way Giham.
Tahmi Lumut.
Bukit Kemuning.
Kasui.
Baradatu.
Sumberjaya.
Mesir Hilir.
Menggala.

Fig. I-4 AVAILABLE MONTHLY RAINFALL DATA



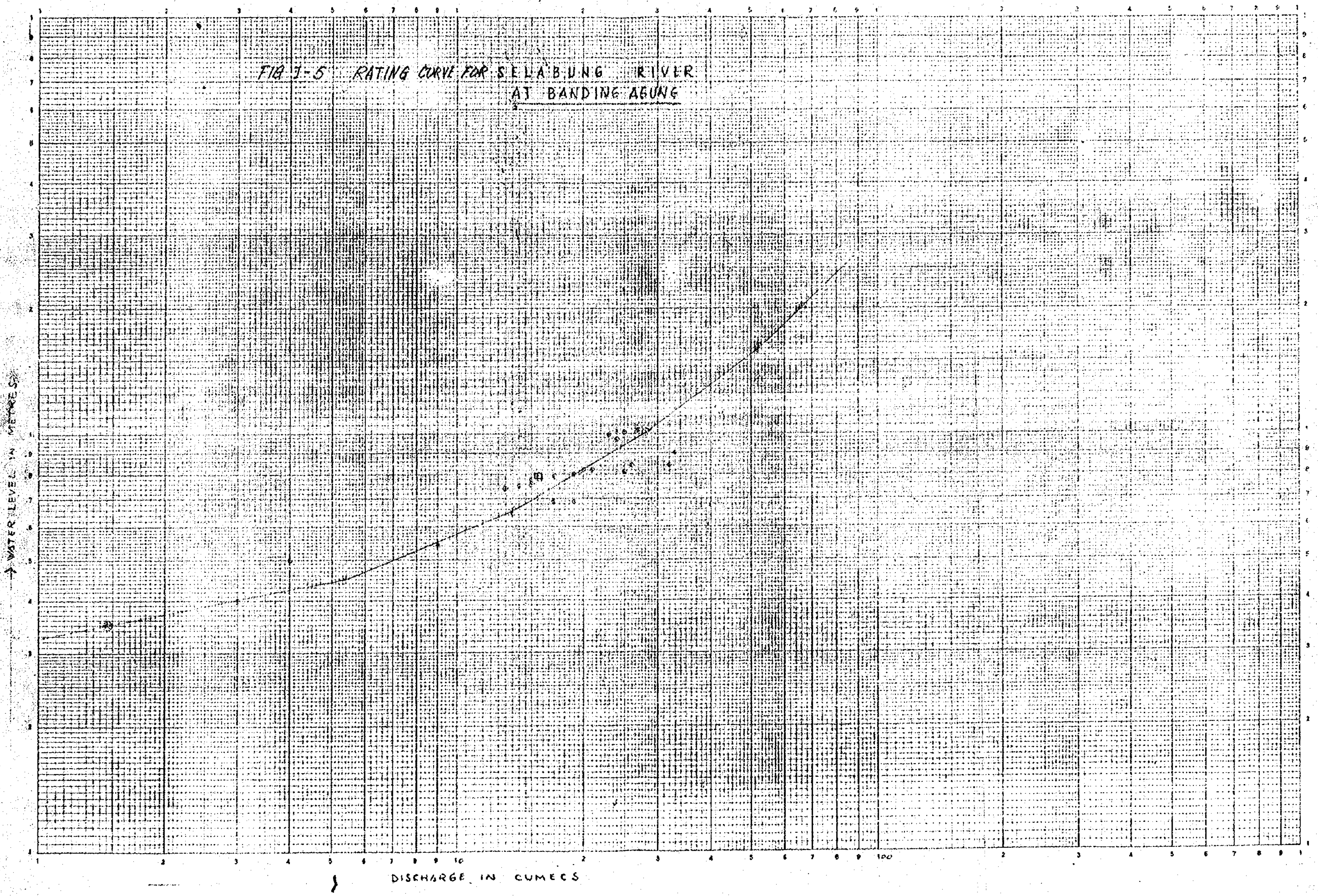
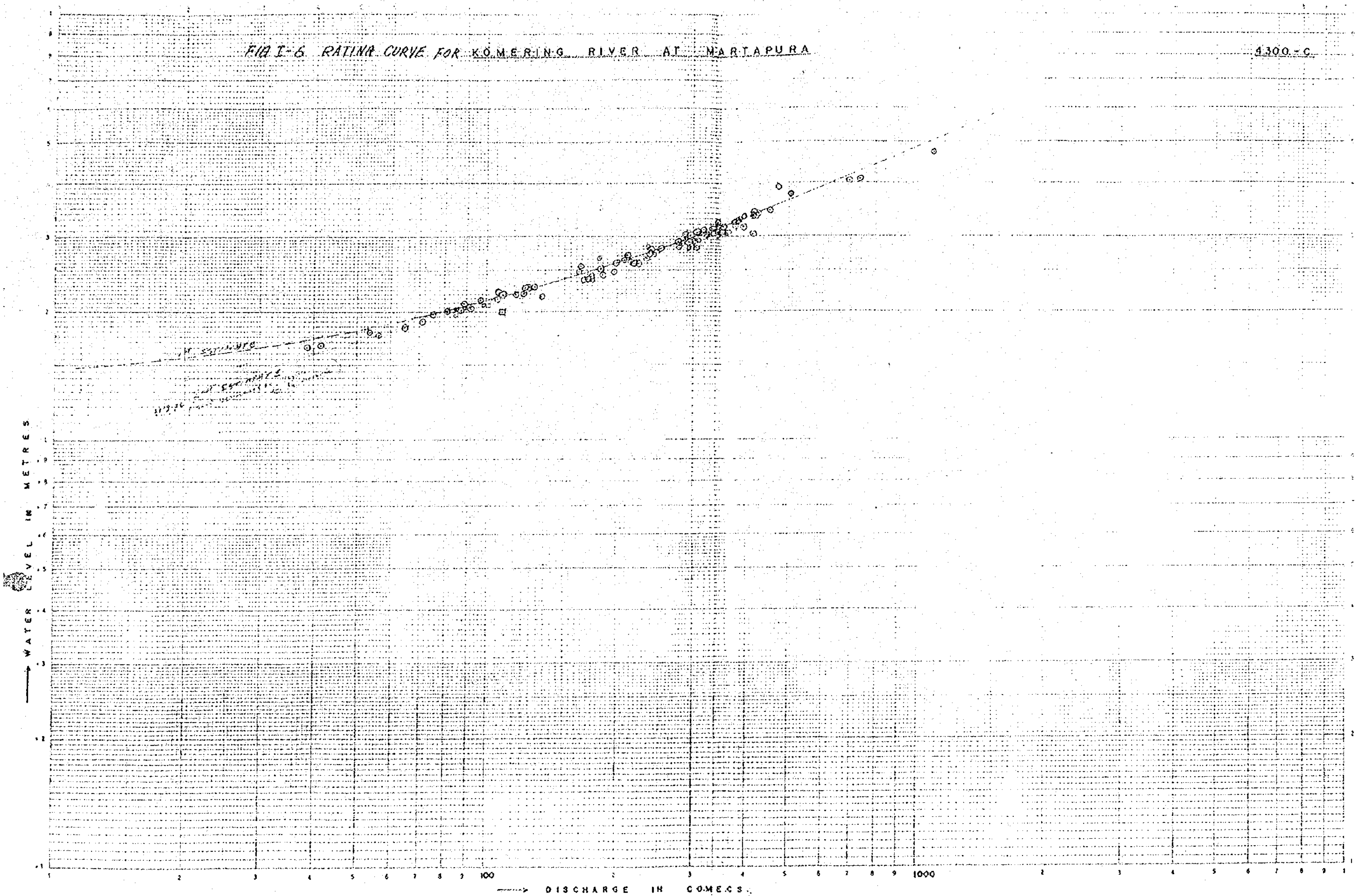


FIG I-5 RATING CURVE FOR SELABUNG RIVER
AT BANDING AGUNG
WATER LEVEL IN METRES
DISCHARGE IN CUMECS

FIG I-6 RATING CURVE FOR KOMERING RIVER AT MARTAPURA

4300 - C



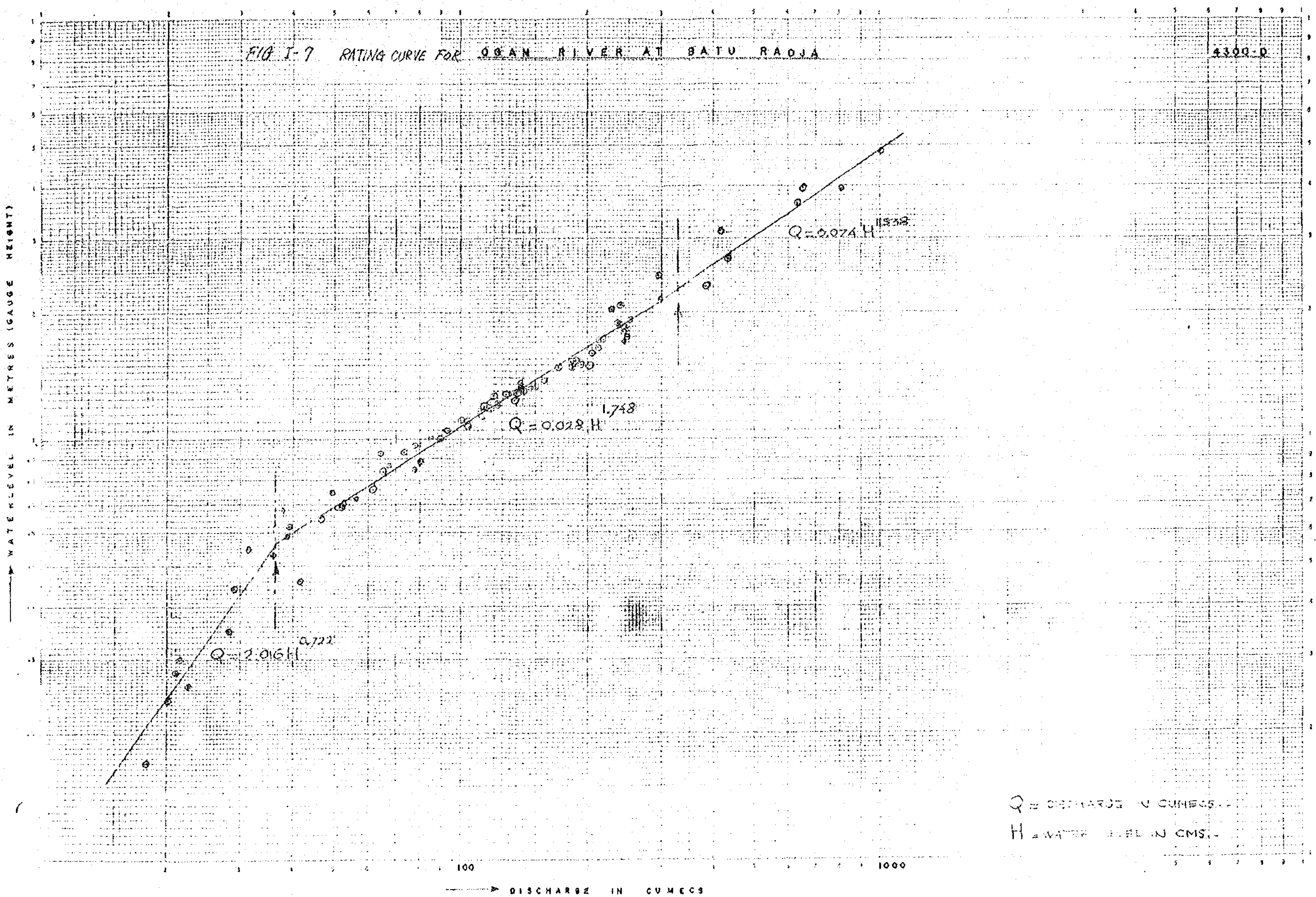


FIG I-7 RATING CURVE FOR OGAN RIVER AT BATU RADJA
4300-D
Q = 0.074 H 1.538
Q = 0.028 H 1.748
Q = 2.016 H 0.722
100
1000
WATER LEVEL IN METRES (GAUGE HEIGHT)
DISCHARGE IN CUMECS
Q = DISCHARGE IN CUMECS
H = WATER LEVEL IN CMS.

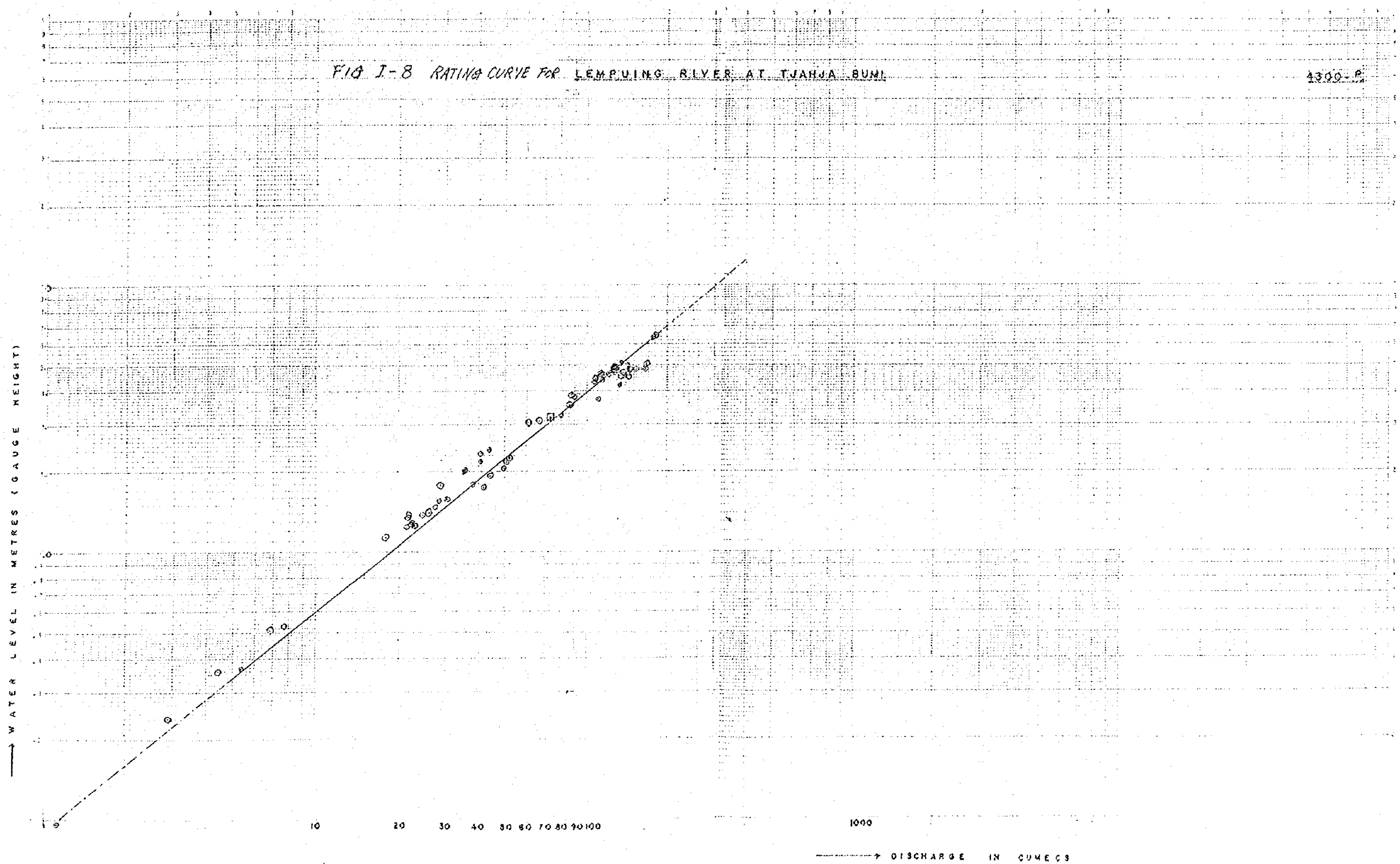


FIG I-8 RATING CURVE FOR LEMPUING RIVER AT TJAHJA BUMI
4300-P
WATER LEVEL IN METRES (GAUGE HEIGHT)
10
20
30
40
50 60 70 80 90 100
1000
DISCHARGE IN CUMECS

FIG I-9 CORRELATION OF RAINFALLS BETWEEN MUARADUA AND RESIDUAL BASIN

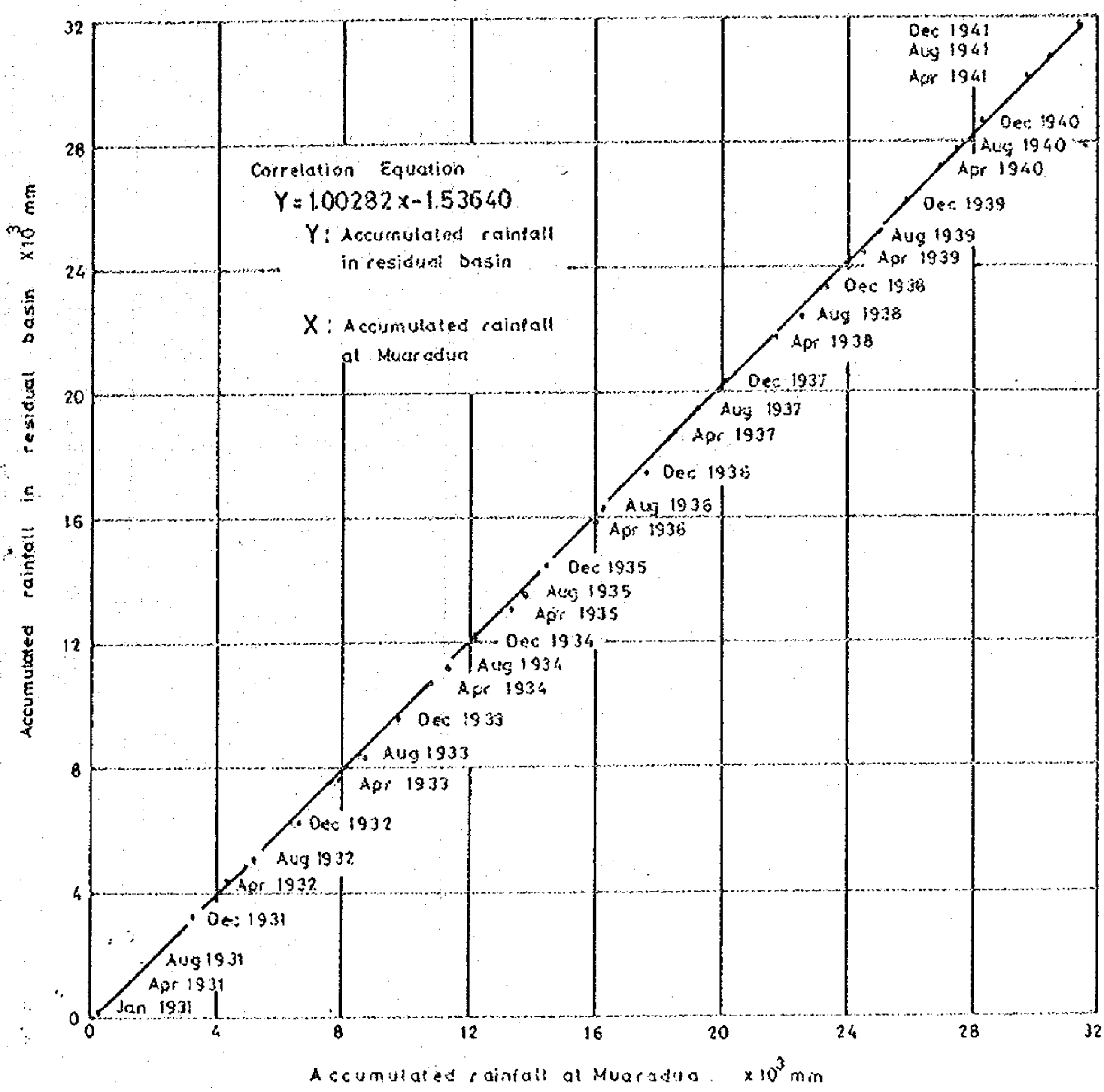


Fig I-10 CORRELATION BETWEEN BASIN RAINFALL AND LOSS RAINFALL

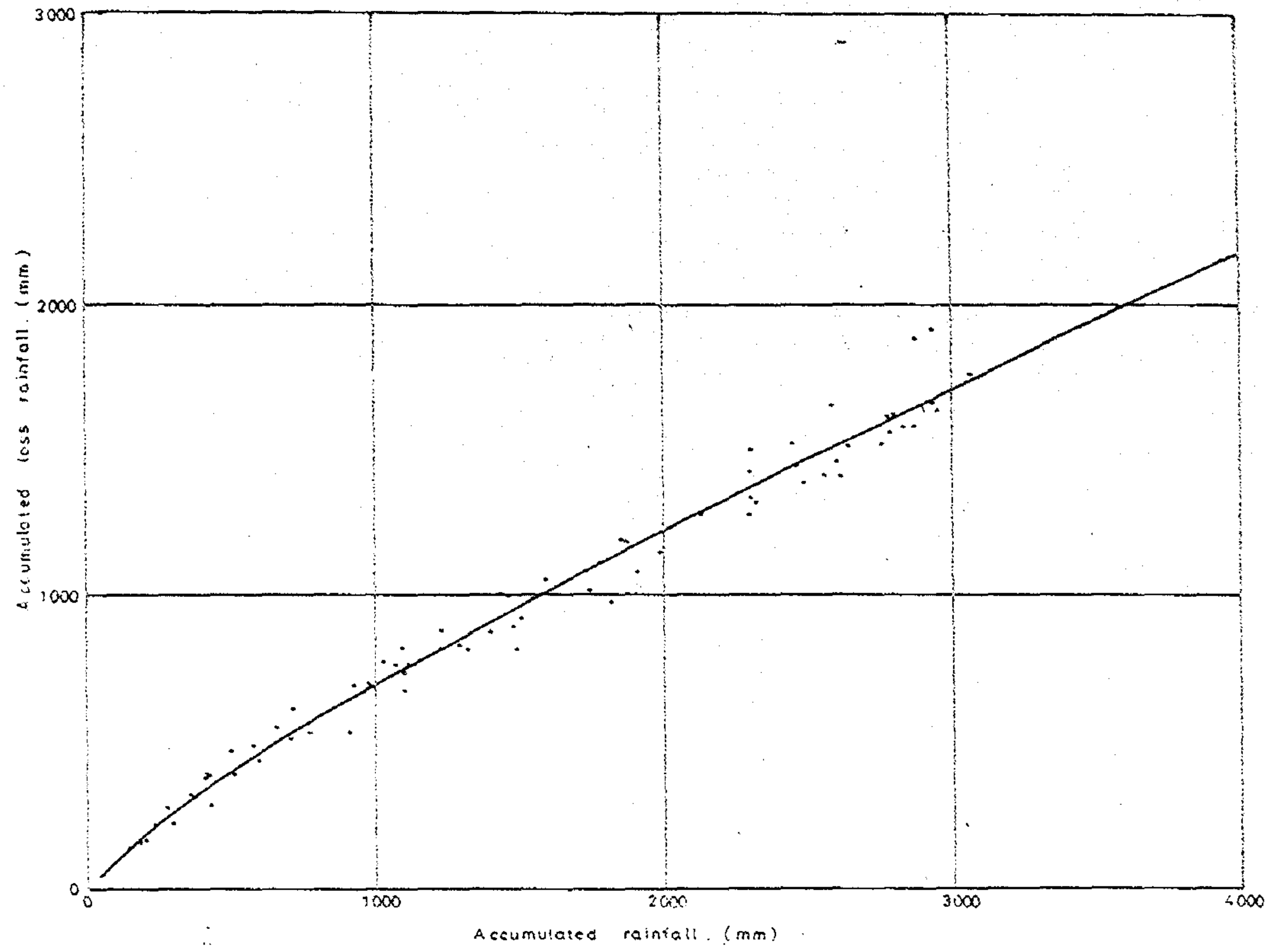


Fig I-11 CORRELATION OF STREAMFLOWS BETWEEN WHOLE BASIN AND RESIDUAL BASIN

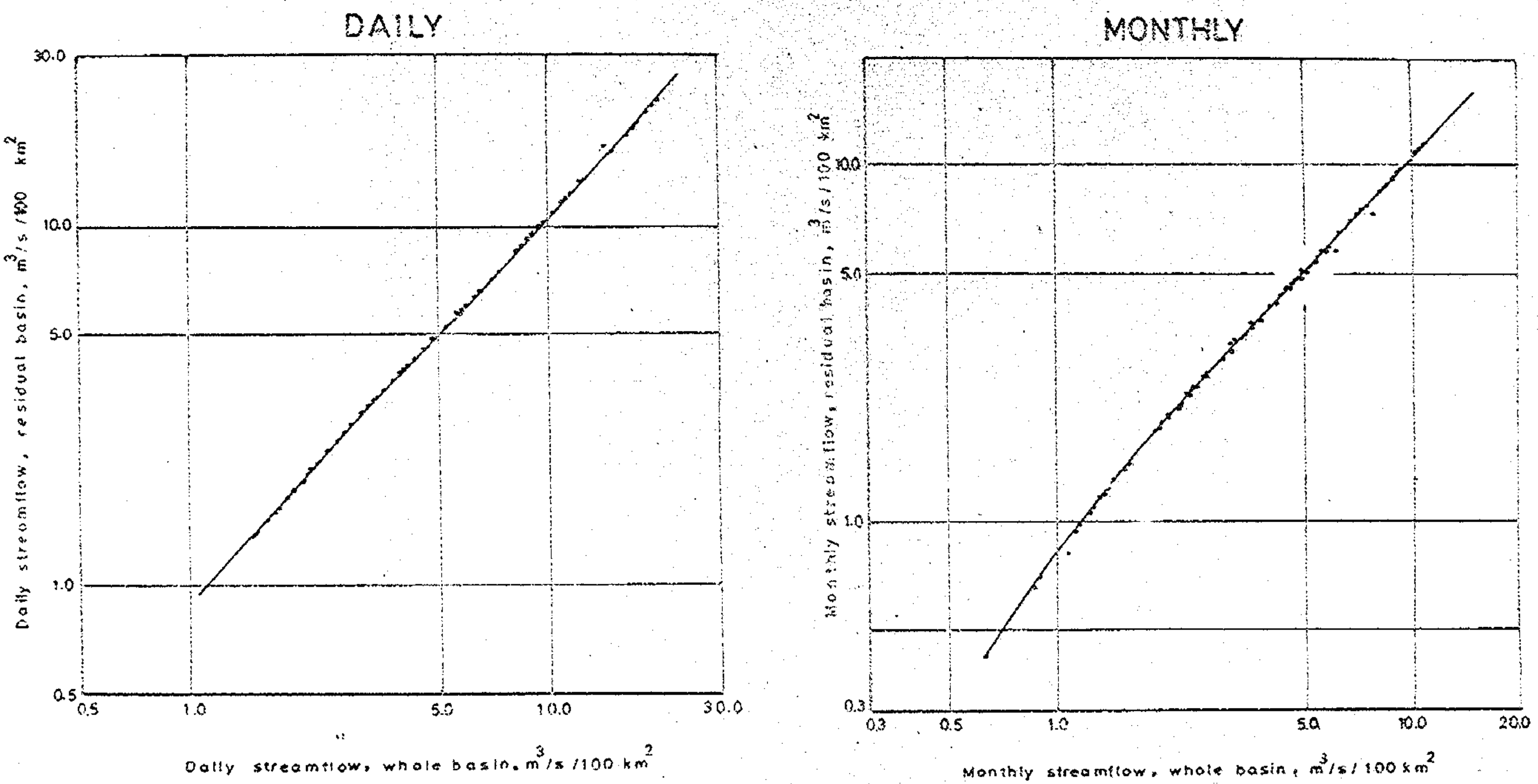


FIG II-12 HYDROGRAPH AT MARTAPURA GAUGE STATION (1952-1957)

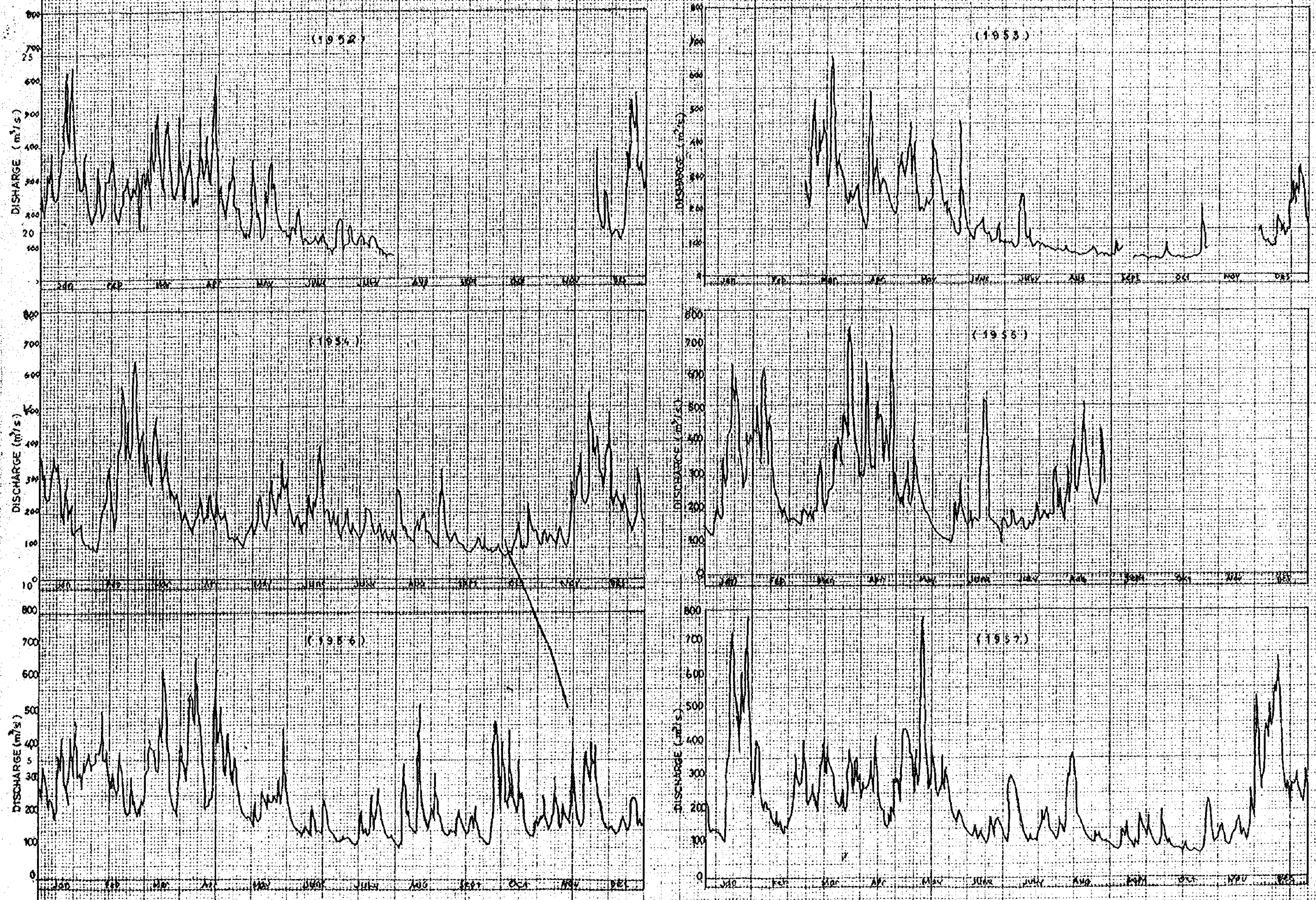


FIG. I-13 HYDROGRAPH AT MARTAPURA GAUGE STATION (1958 - 1963)

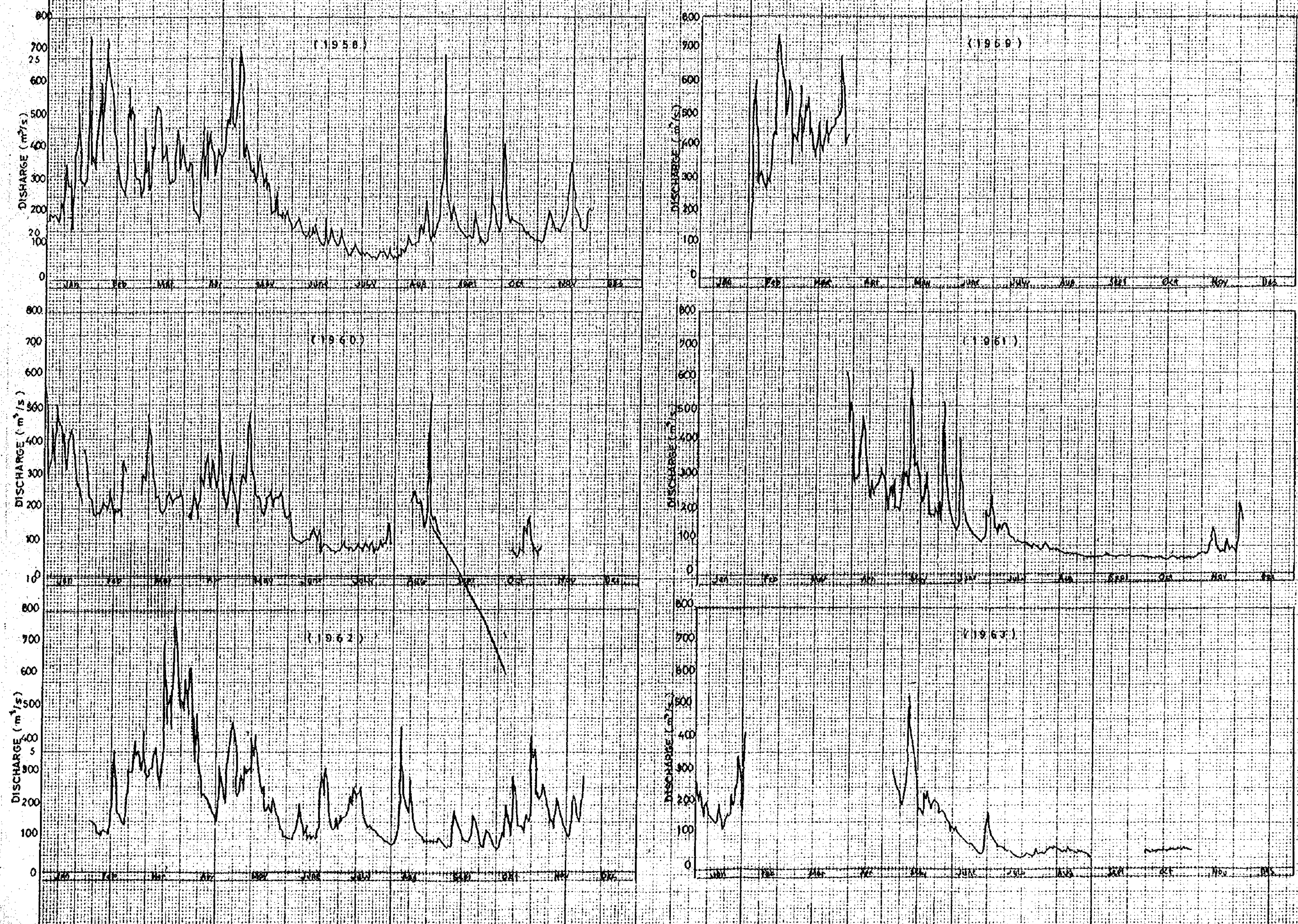


FIG II-14 HYDROGRAPH AT MARTAPURA GAUGE STATION (1964-1969)

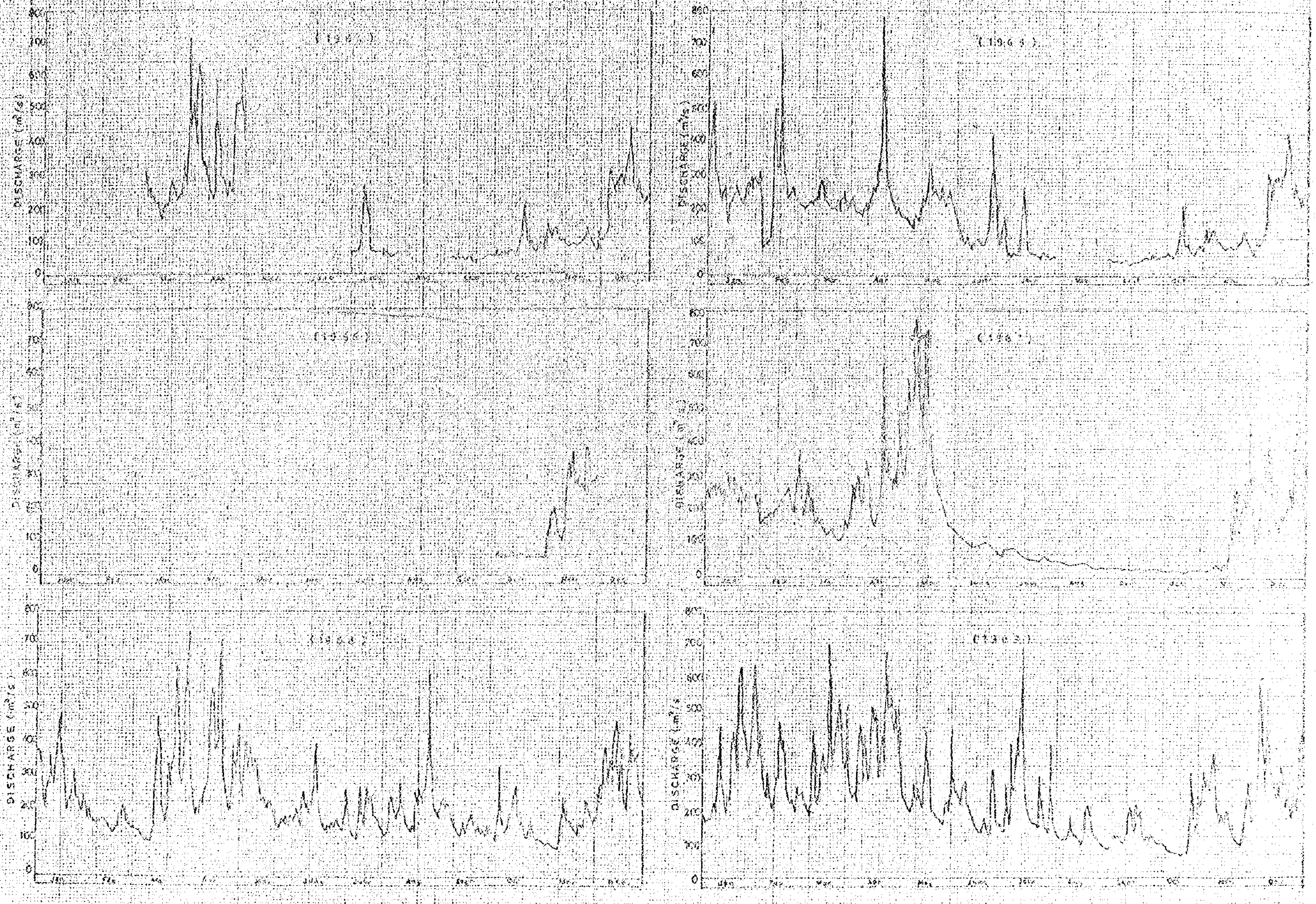


FIG I-15 HYDROGRAPH AT MARTAPURA GAUGE STATION (1970-1971)

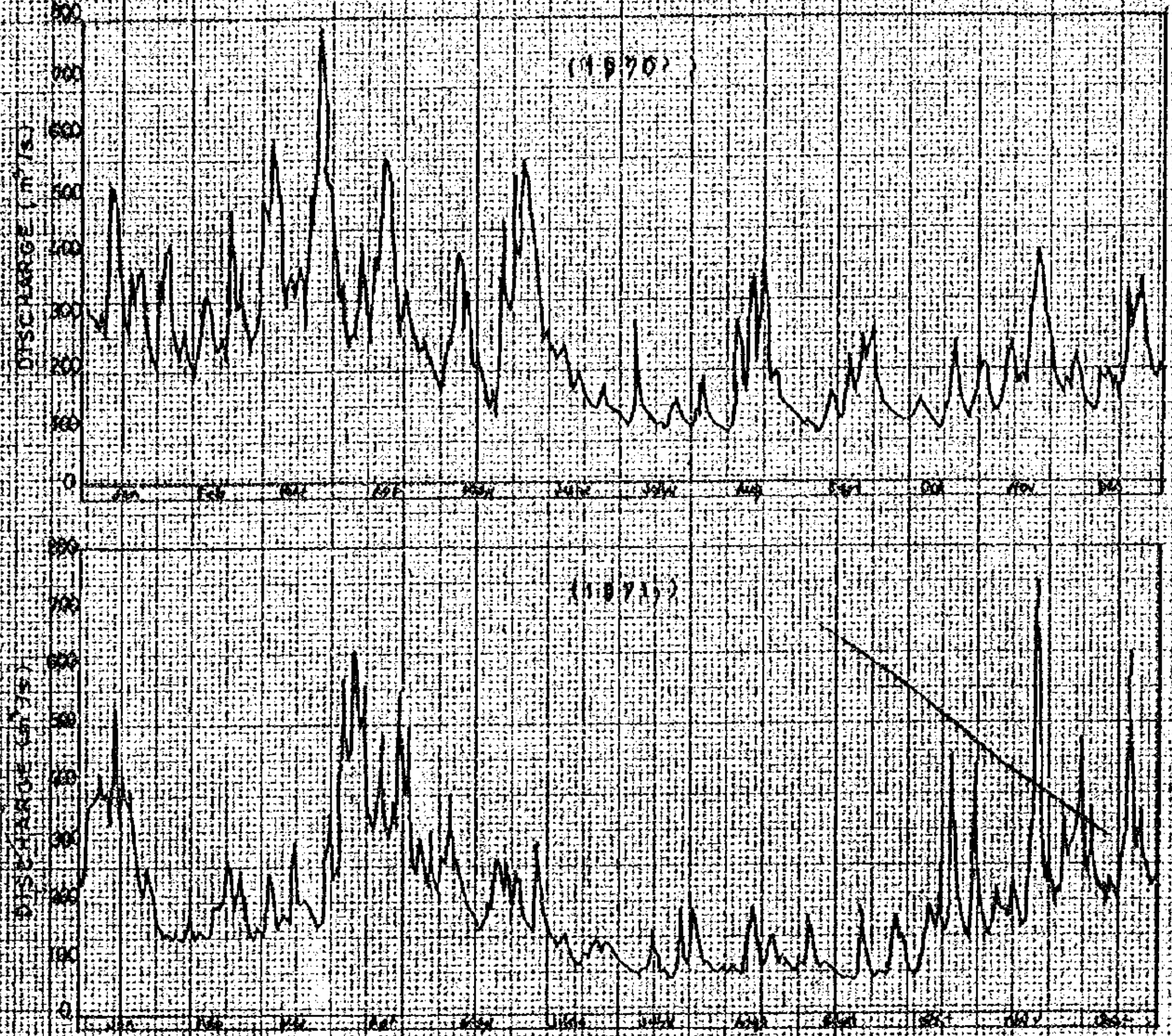


FIG 1-16 HYDROGRAPH AT MARTAPURA GAUGE STATION (1972-1977)

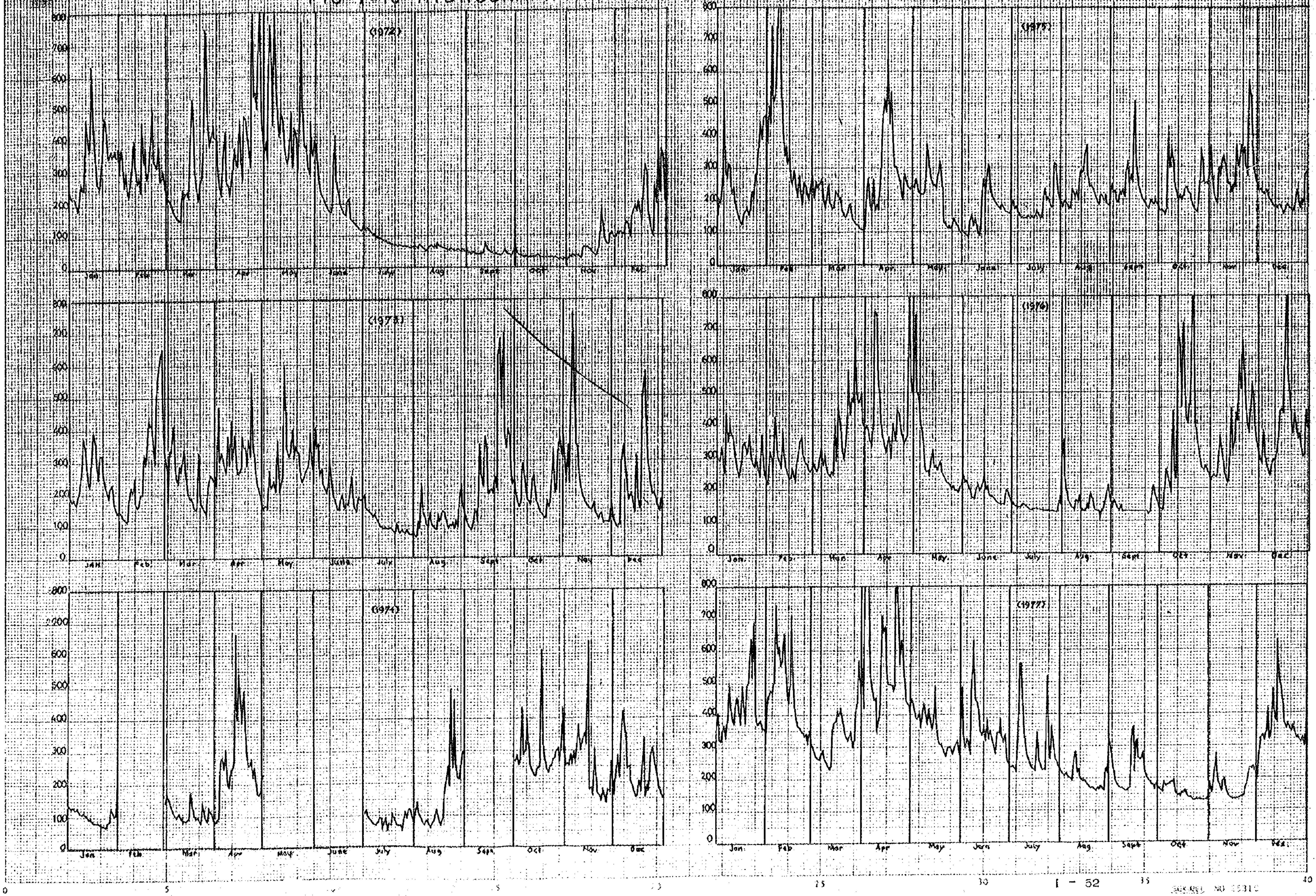
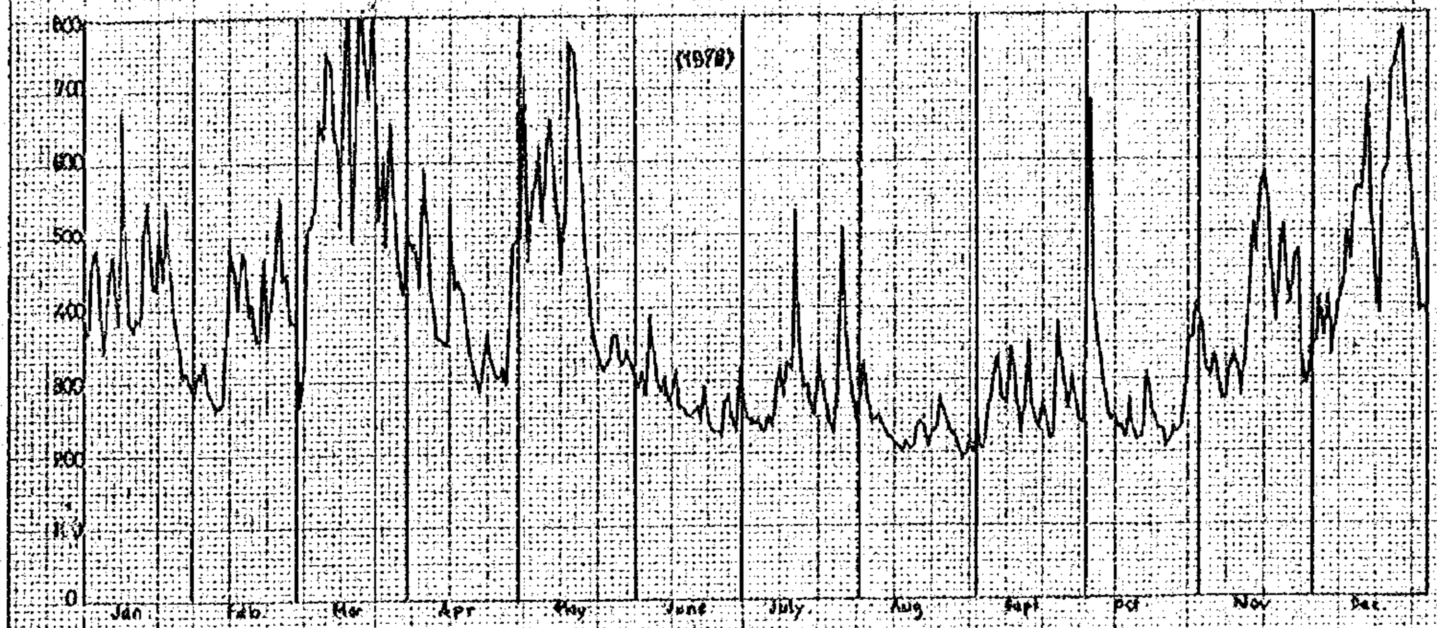
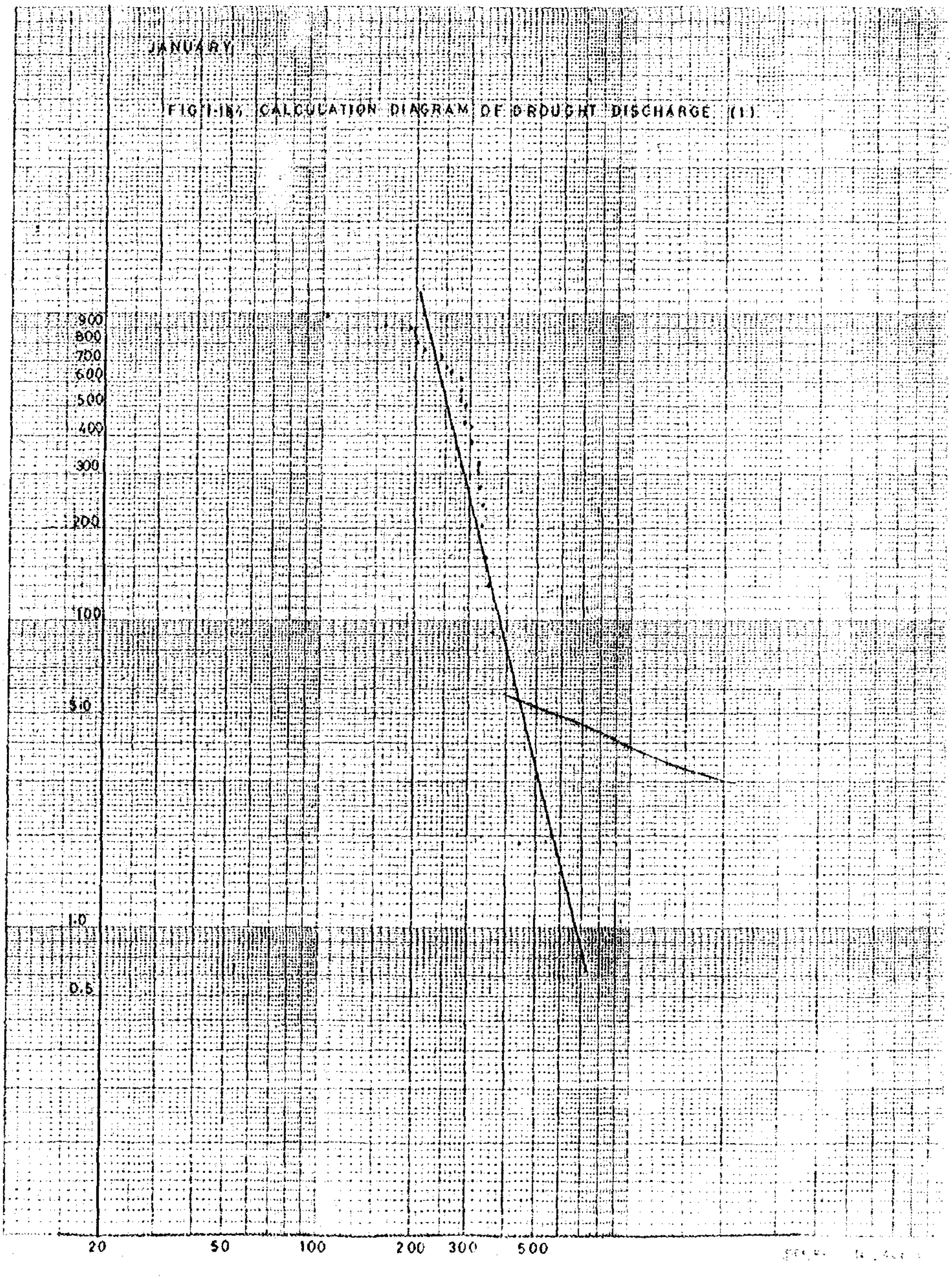
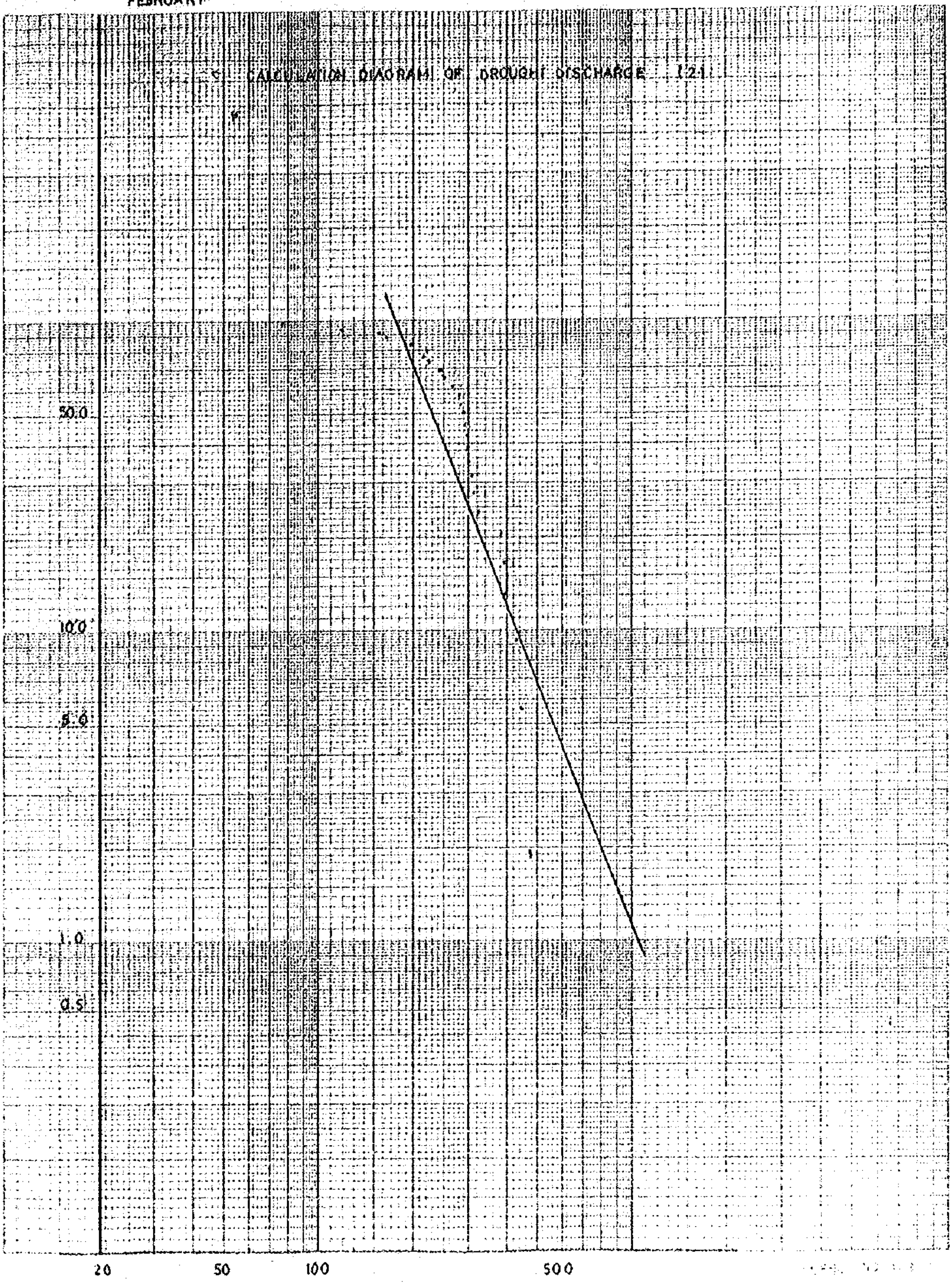


FIG I-17 HYDROGRAPH AT MARTAPURA GAUGE STATION (1978)

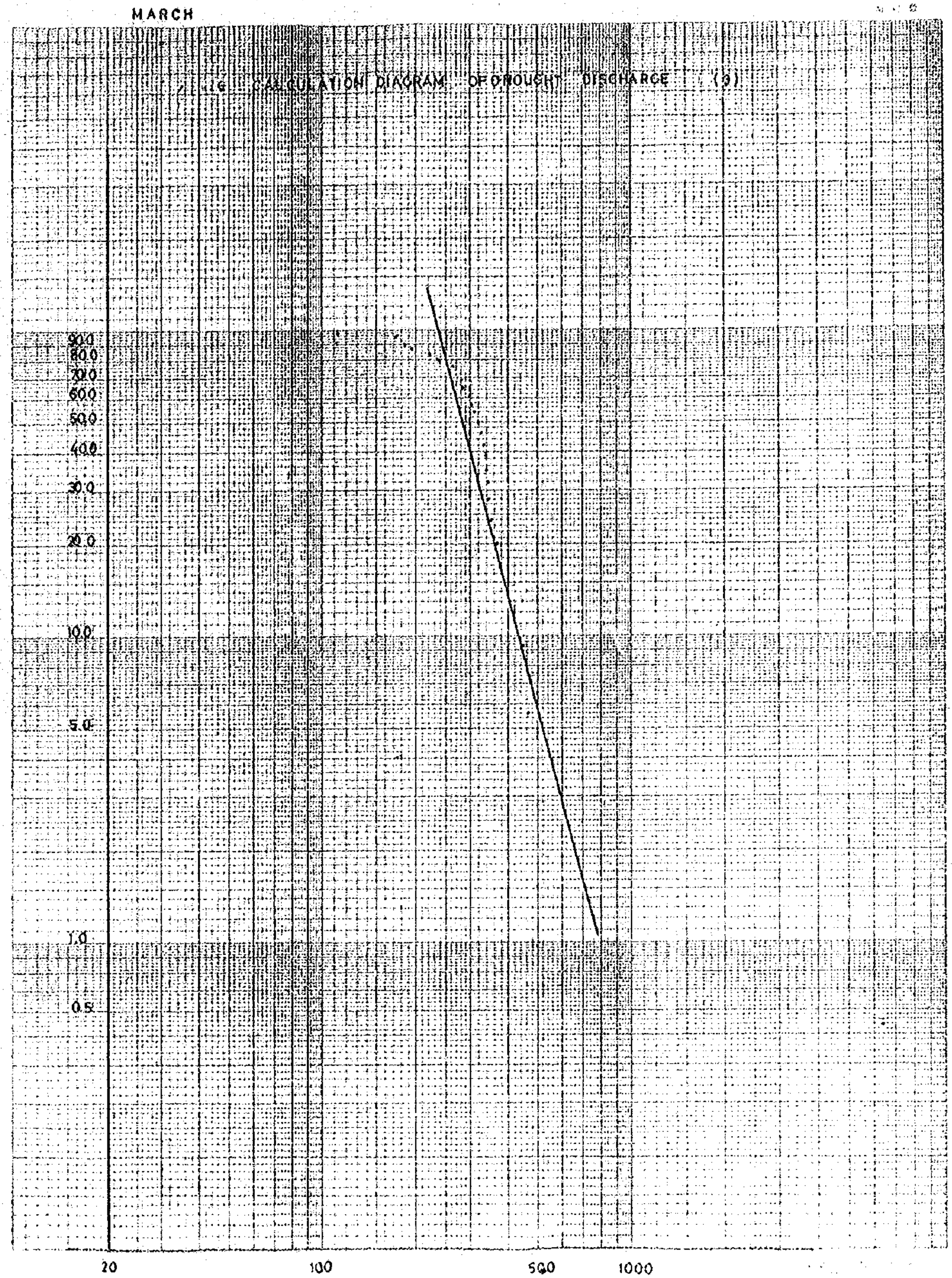


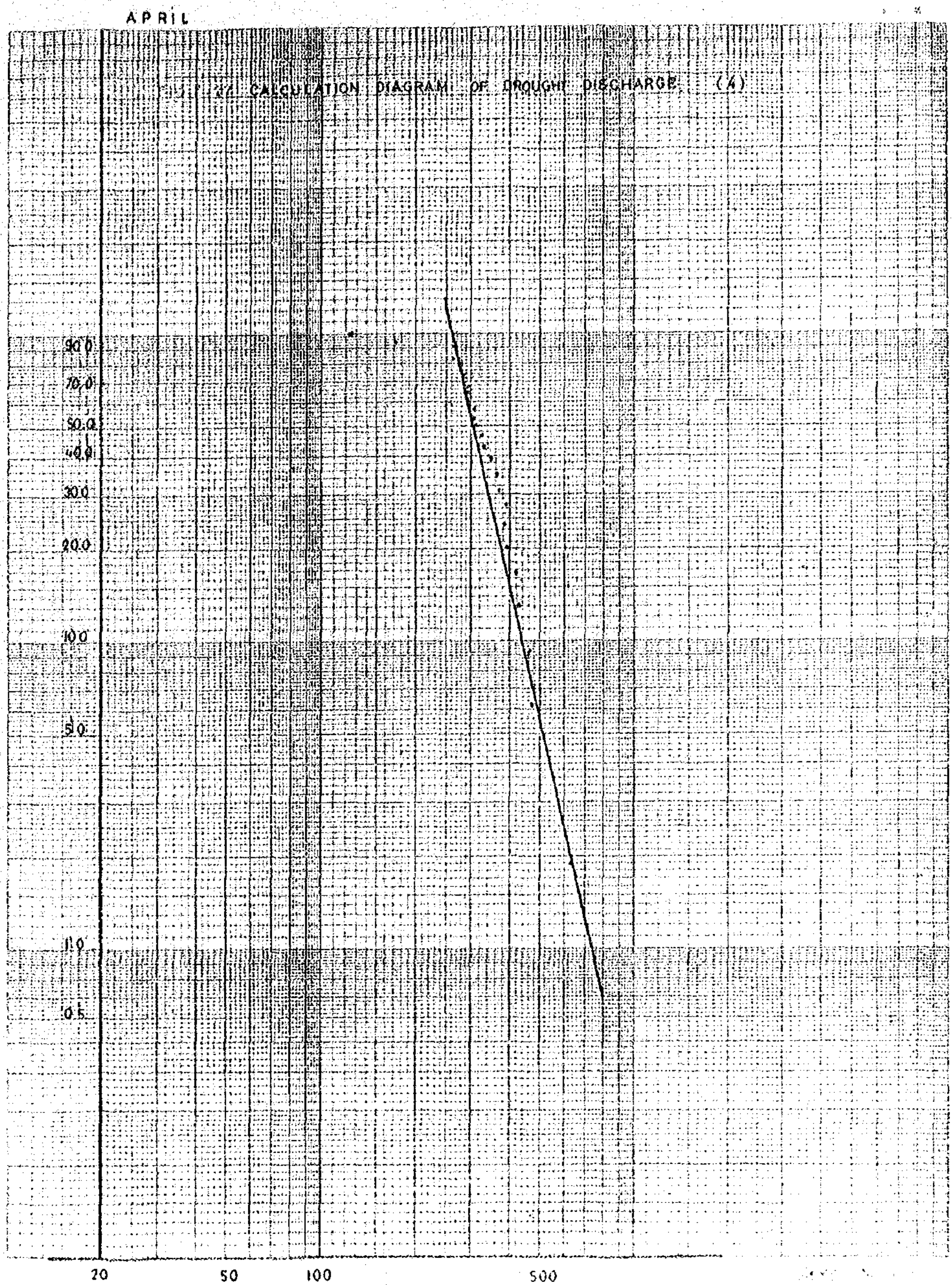

JANUARY
FIG. I-18 CALCULATION DIAGRAM OF DROUGHT DISCHARGE (1)
900
800
700
600
500
400
300
200
100
50
1.0
0.5
20
50
100
200
300
500

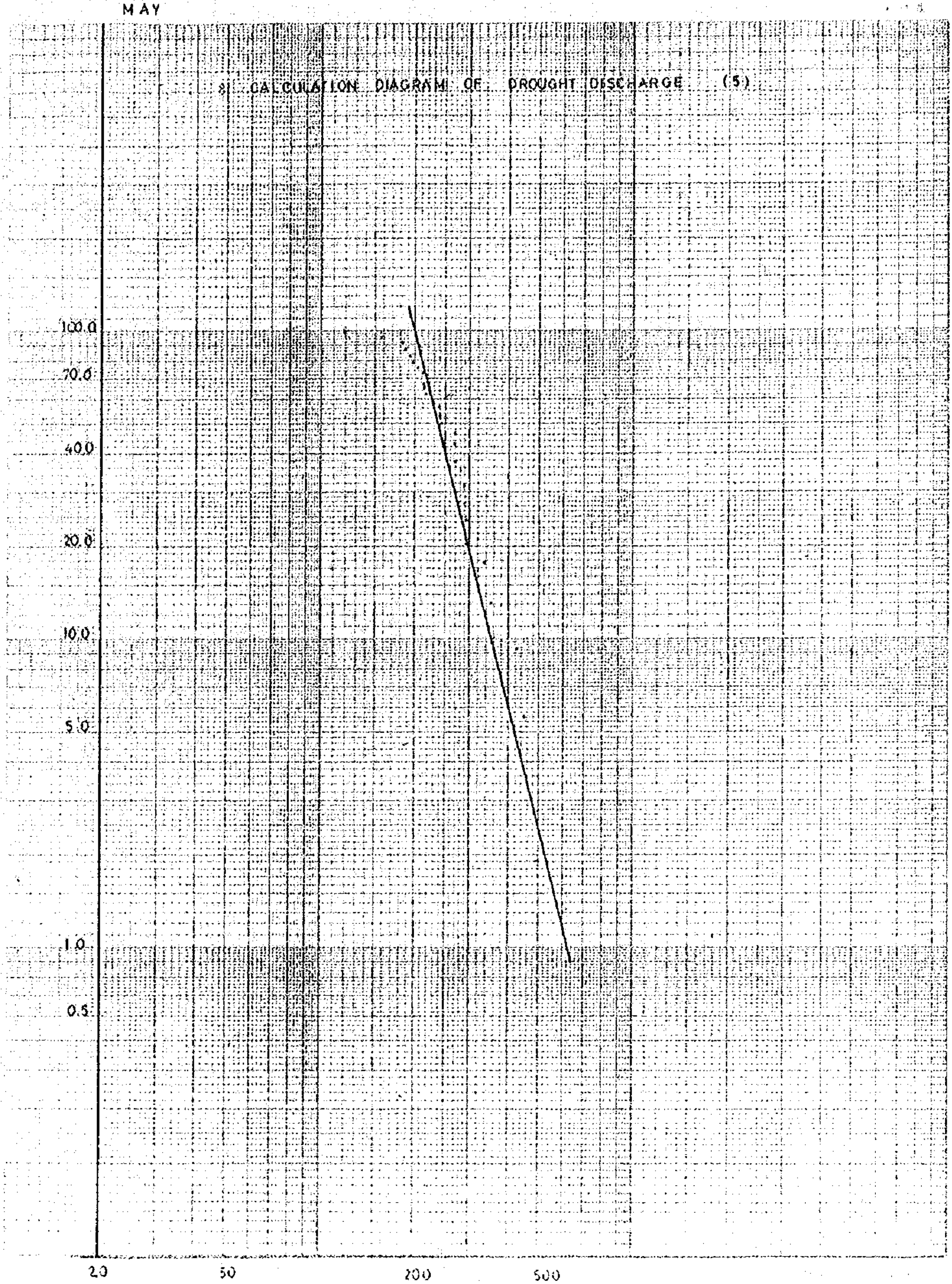
FEBRUARY



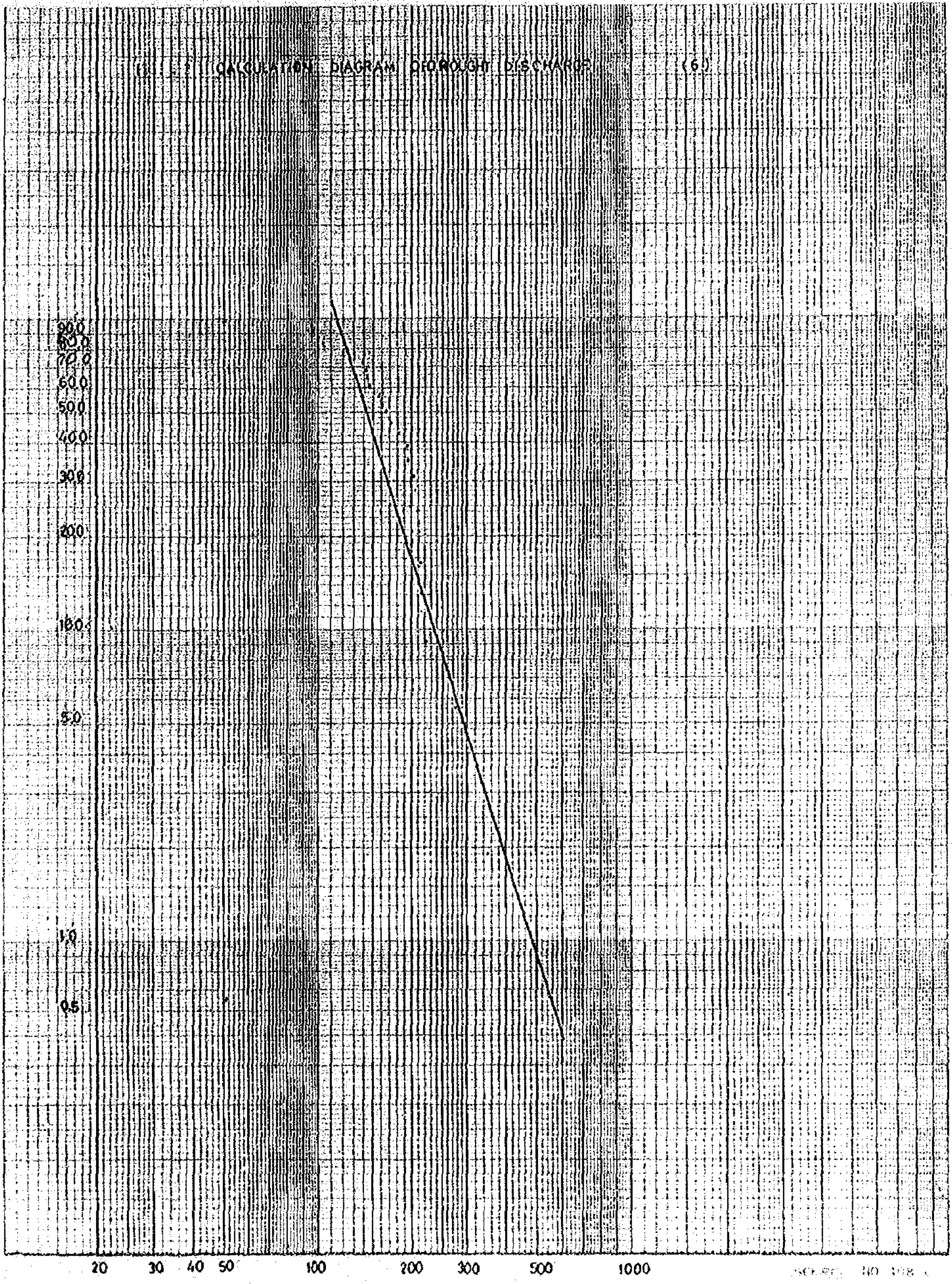
CALCULATION DIAGRAM OF DROUGHT DISCHARGE
50.0
10.0
5.0
1.0
0.5
20
50
100
500

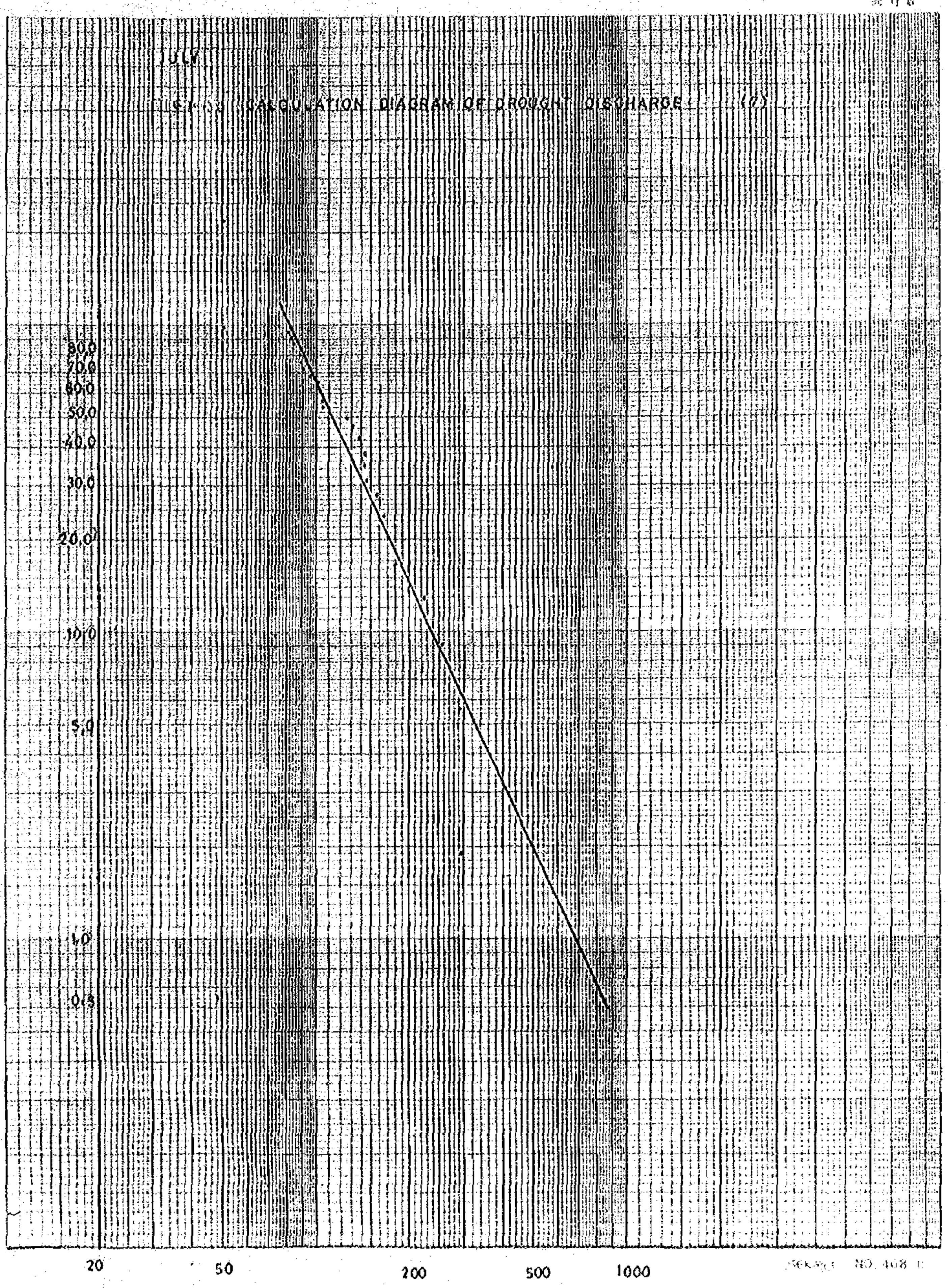

MARCH
CALCULATION DIAGRAM OF DROUGHT DISCHARGE (3)
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
5.0
1.0
0.5
20
100
500
1000

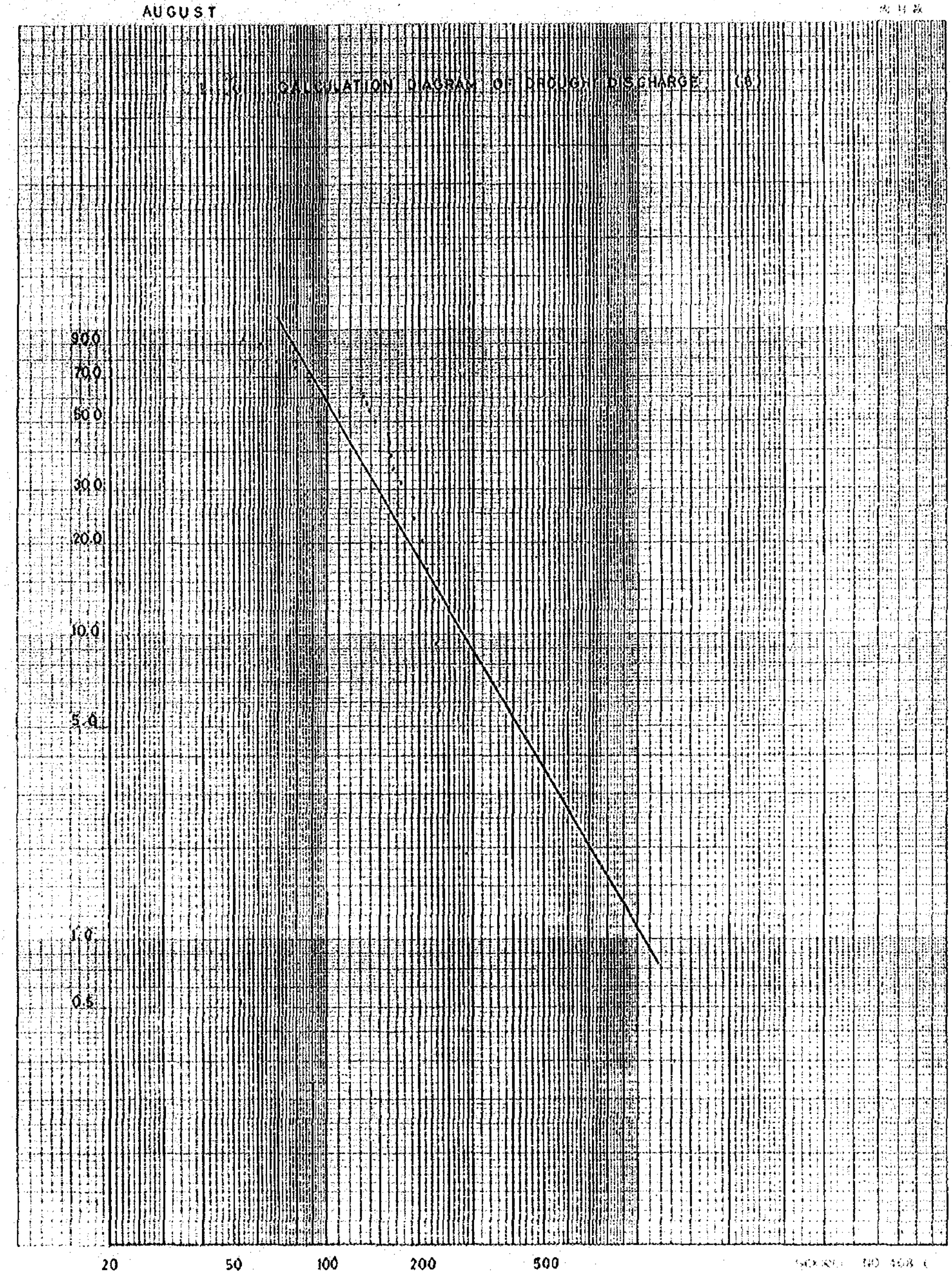

APRIL
CALCULATION DIAGRAM OF DROUGHT DISCHARGE (4)
90.0
70.0
50.0
40.0
30.0
20.0
10.0
5.0
1.0
0.5
20
50
100
500


8 CALCULATION DIAGRAM OF DROUGHT DISCHARGE (5)
100.0
70.0
40.0
20.0
10.0
5.0
1.0
0.5
20
50
200
500

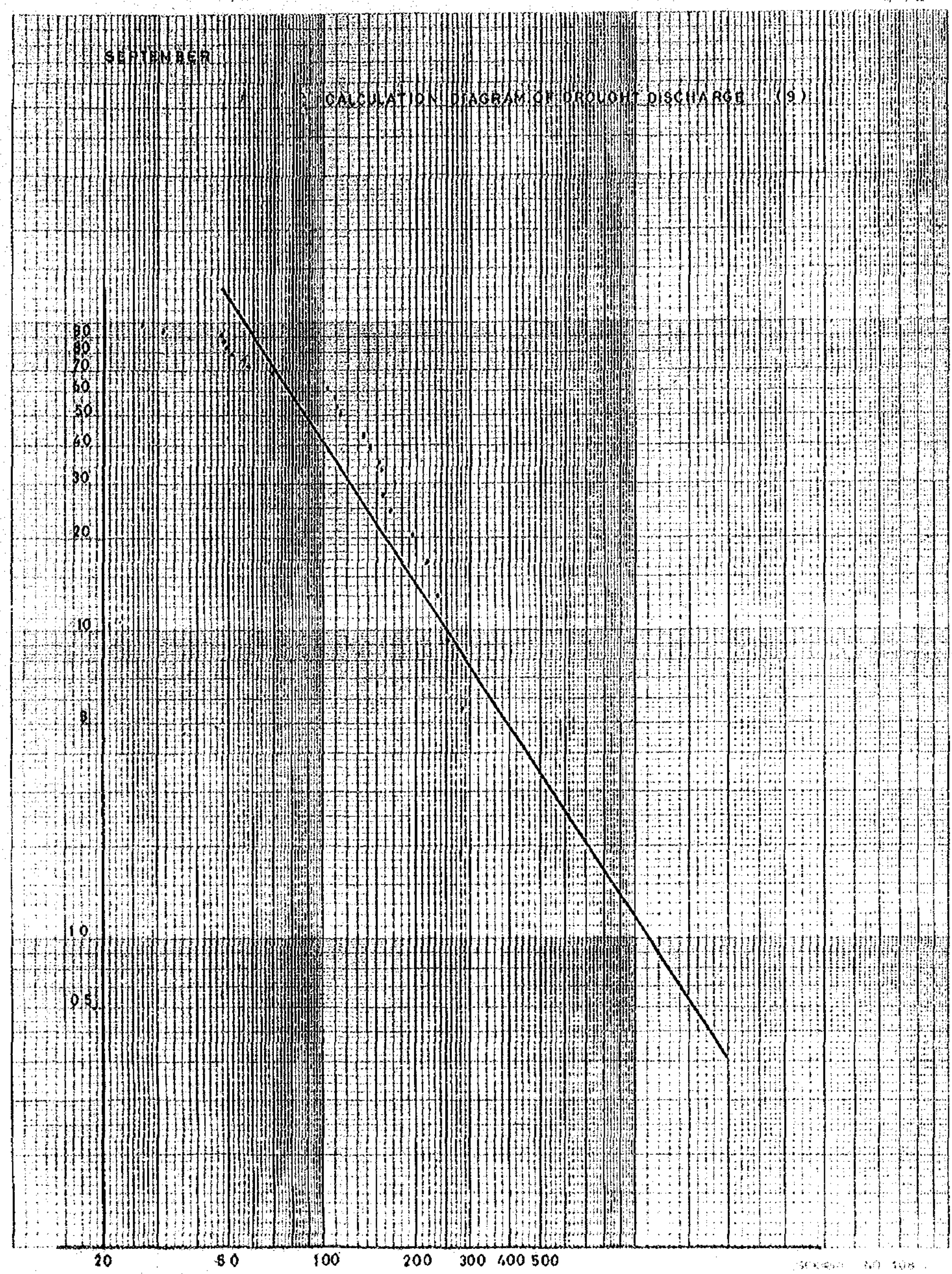
JUNI

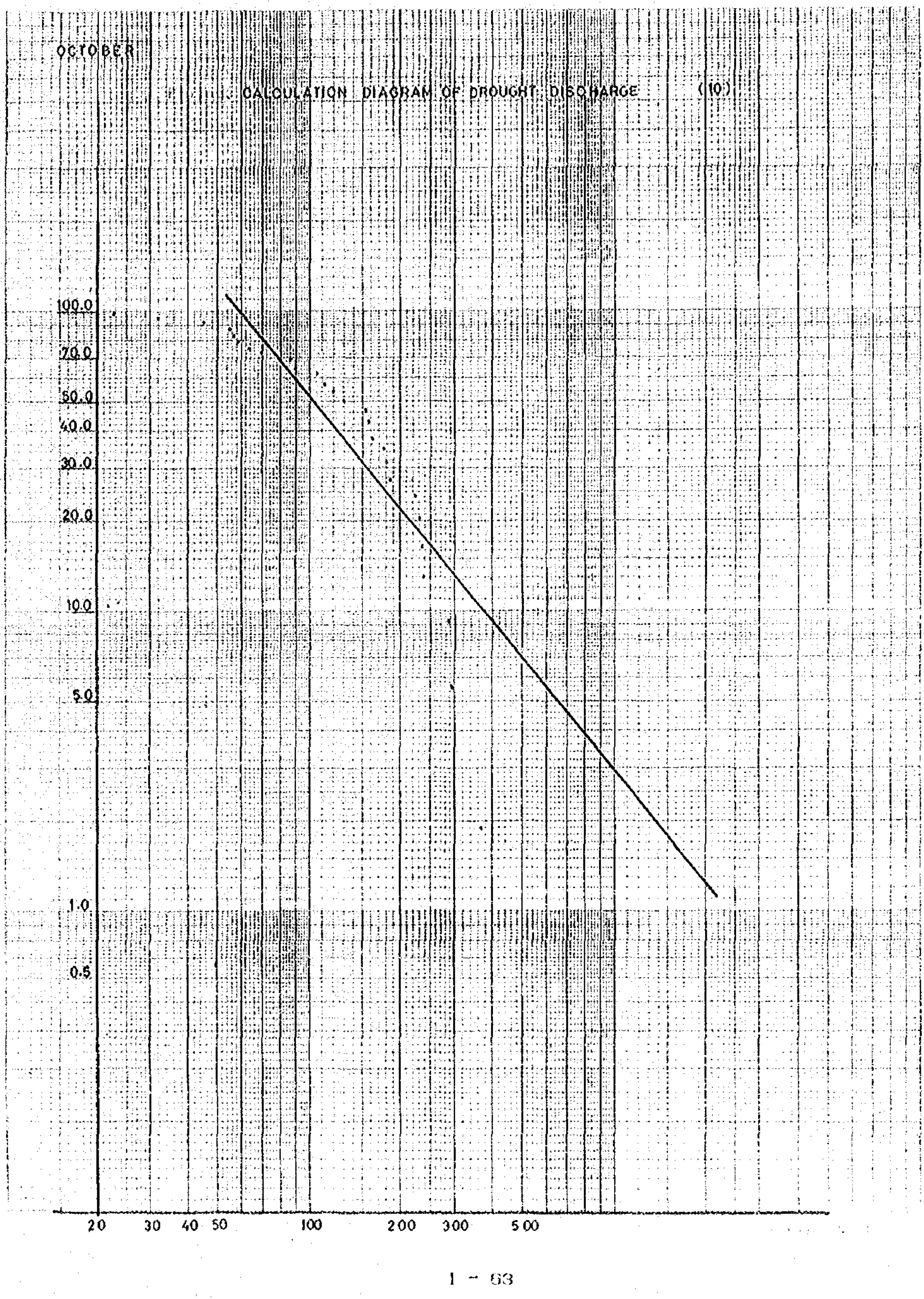

CALCULATION DIAGRAM OF DROUGHT DISCHARGE
(6)
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
5.0
1.0
0.5
20
30
40
50
100
200
300
500
1000

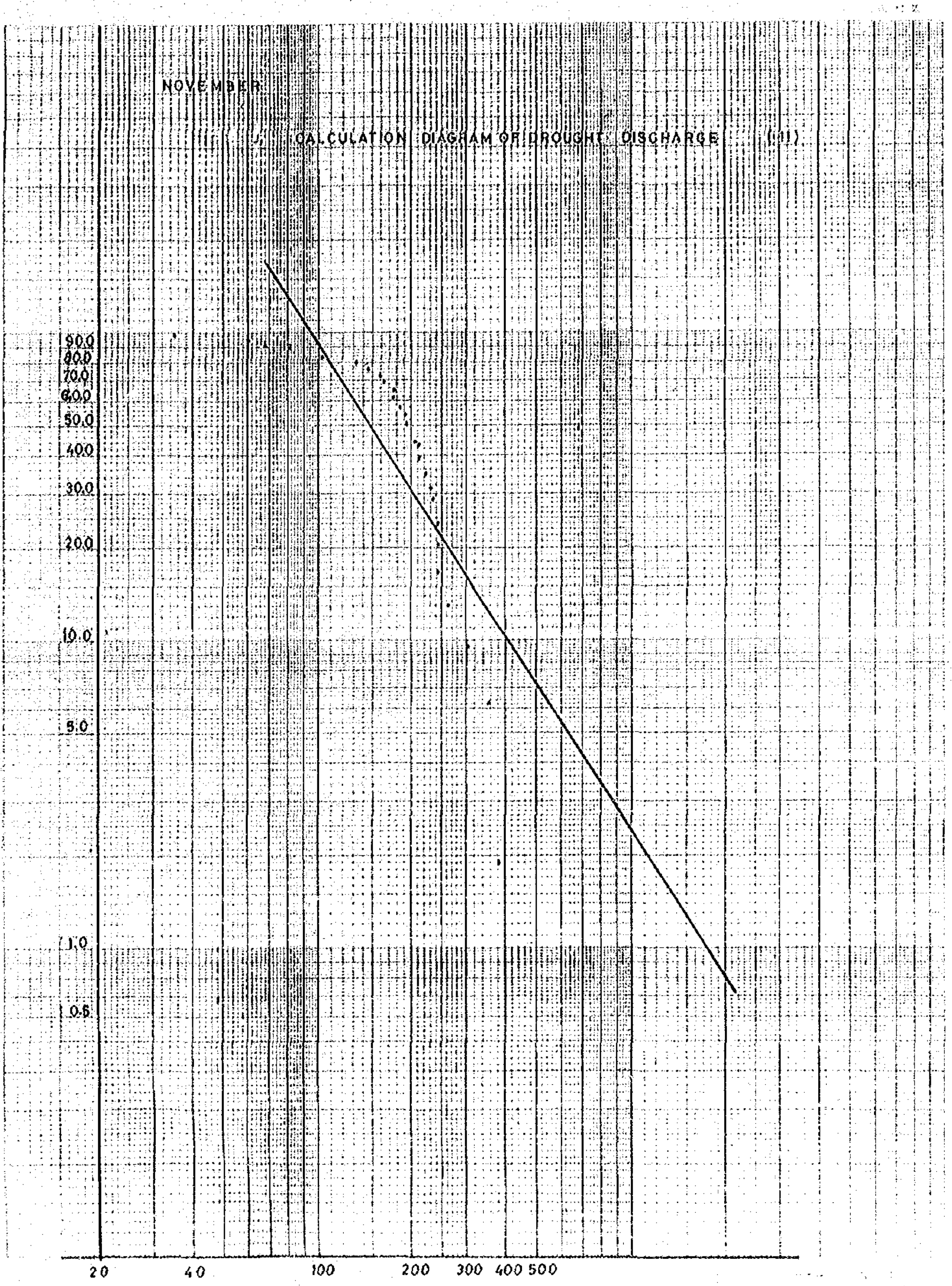

JULY
CALCULATION DIAGRAM OF DROUGHT DISCHARGE (2)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
5.0
1.0
0.5
20
50
200
500
1000

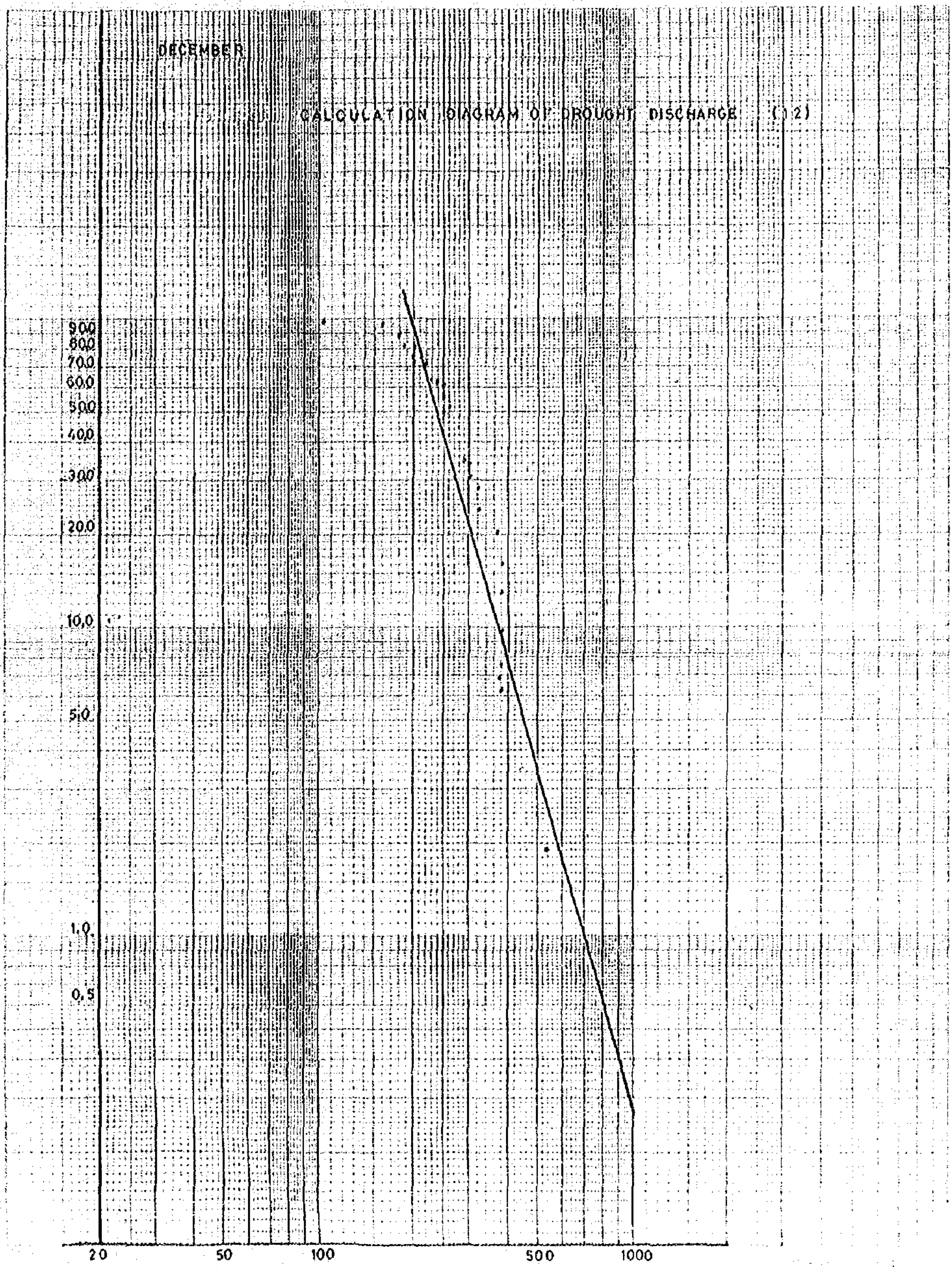


AUGUST
CALCULATION DIAGRAM OF DROUGHT DISCHARGE (8)
90.0
70.0
50.0
30.0
20.0
10.0
5.0
1.0
0.5
20
50
100
200
500


SEPTEMBER
CALCULATION DIAGRAM OF DROUGHT DISCHARGE (9)
90
80
70
60
50
40
30
20
10
1.0
0.5
20
50
100
200
300 400 500


OCTOBER
CALCULATION DIAGRAM OF DROUGHT DISCHARGE (10)
100.0
70.0
50.0
40.0
30.0
20.0
10.0
5.0
1.0
0.5
20
30
40
50
100
200
300
500


NOVEMBER
CALCULATION DIAGRAM OF DROUGHT DISCHARGE (11)
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
5.0
1.0
0.5
20
40
100
200
300
400
500


DECEMBER
CALCULATION DIAGRAM OF DROUGHT DISCHARGE (12)
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
5.0
1.0
0.5
20
50
100
500
1000

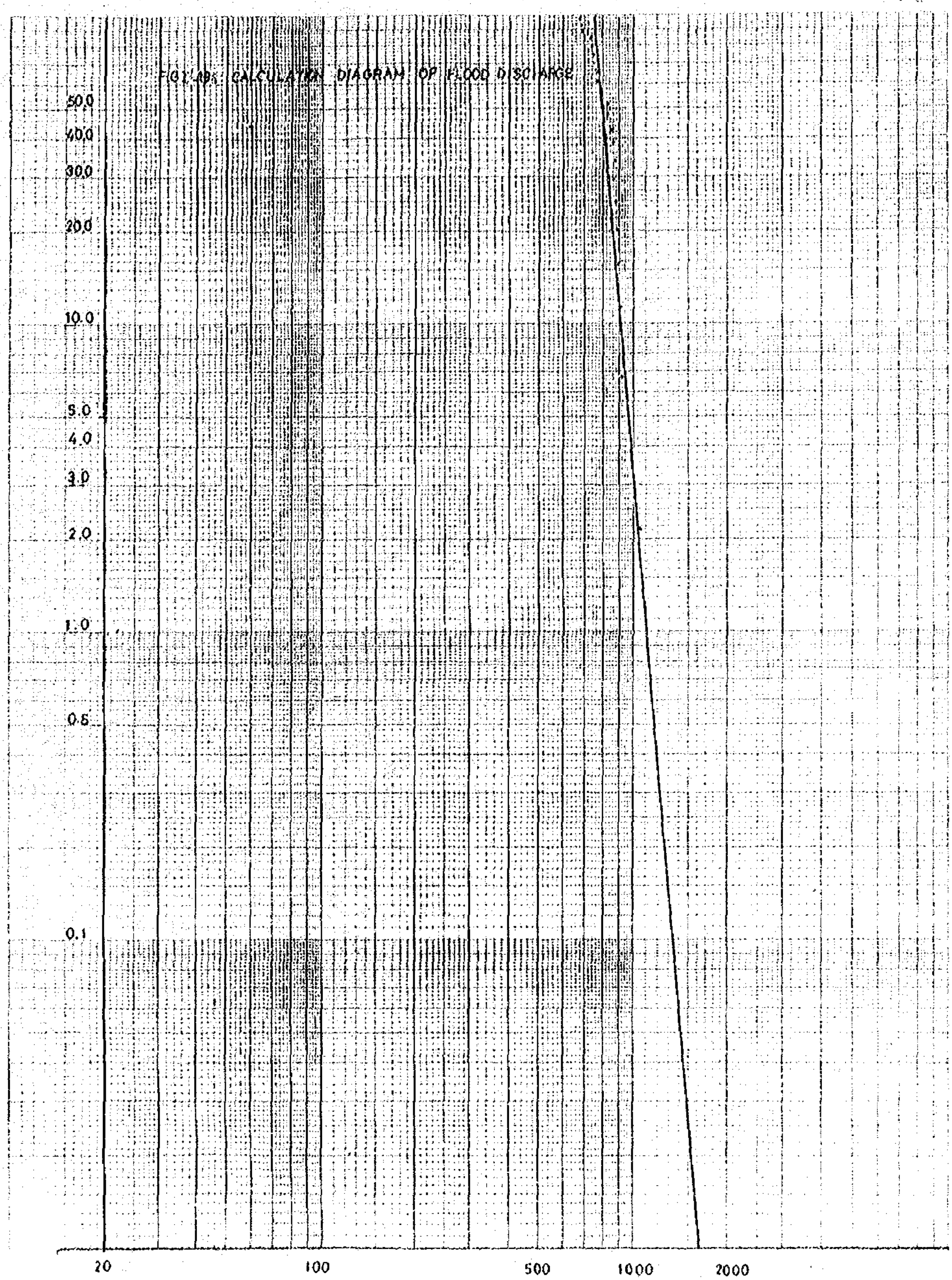
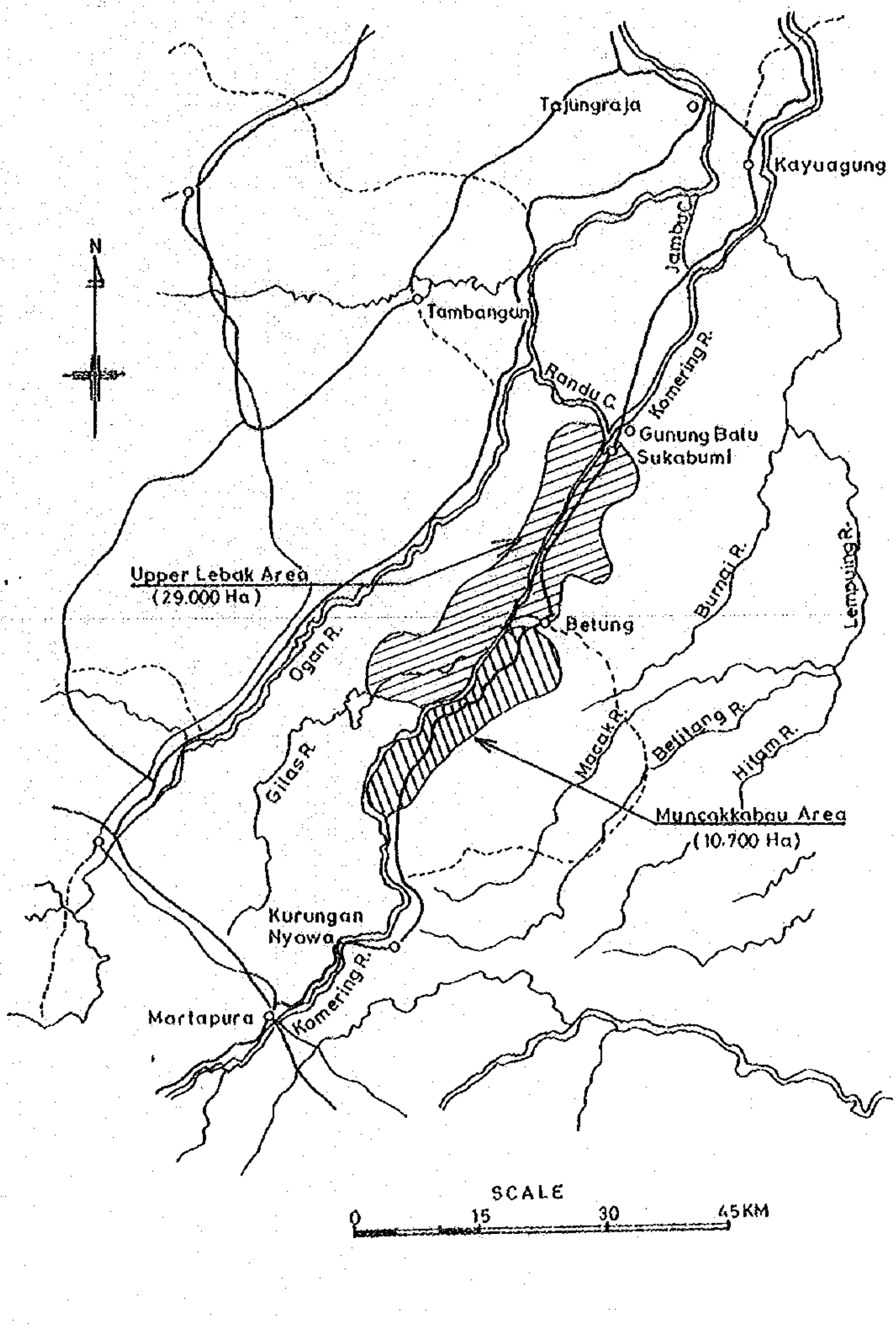

CALCULATION DIAGRAM OF FLOOD DISCHARGE
50.0
40.0
30.0
20.0
10.0
5.0
4.0
3.0
2.0
1.0
0.5
0.1
20
100
500
1000
2000

Fig. 1.20 STUDY AREA OF RETURN FLOW



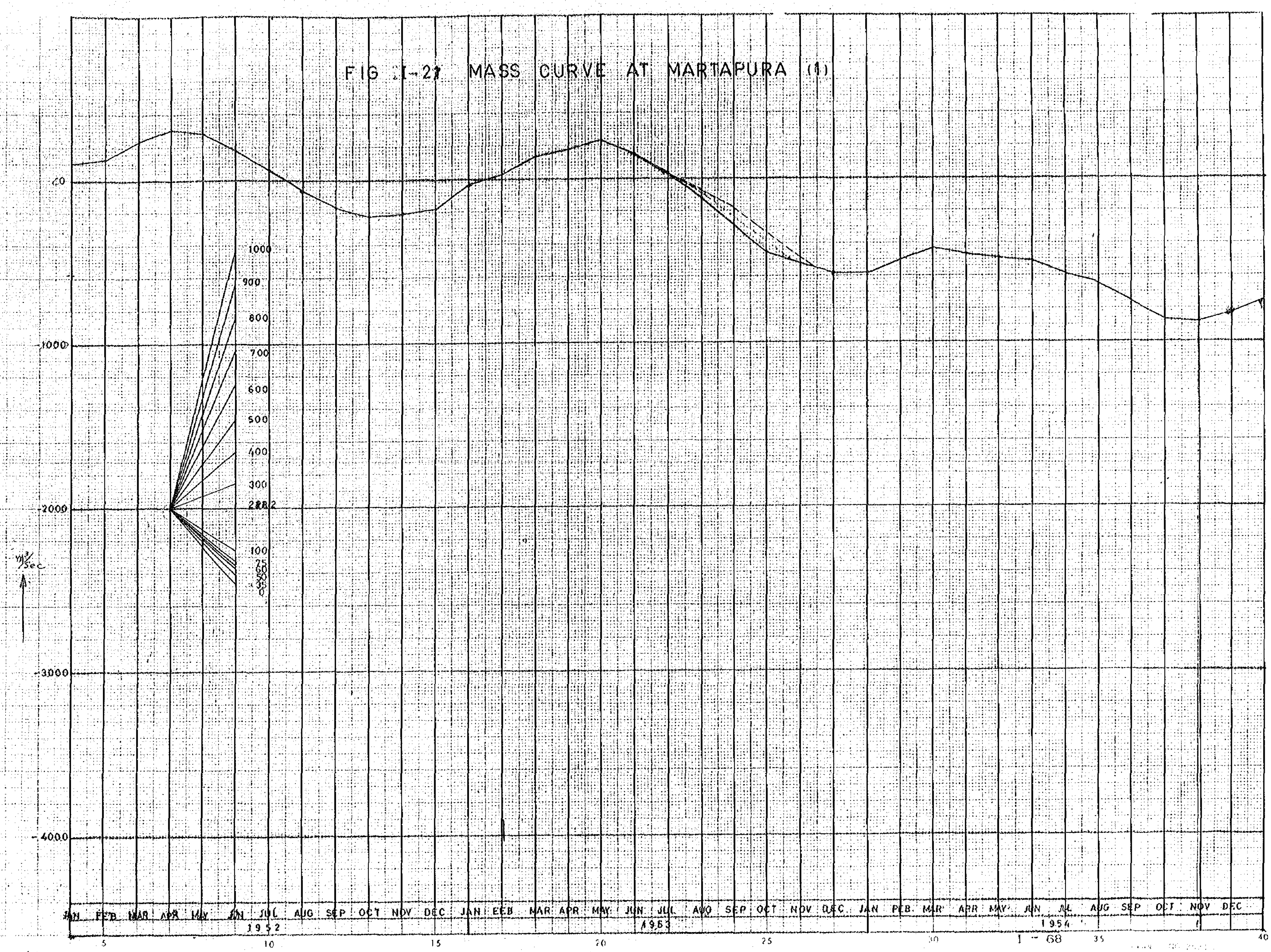
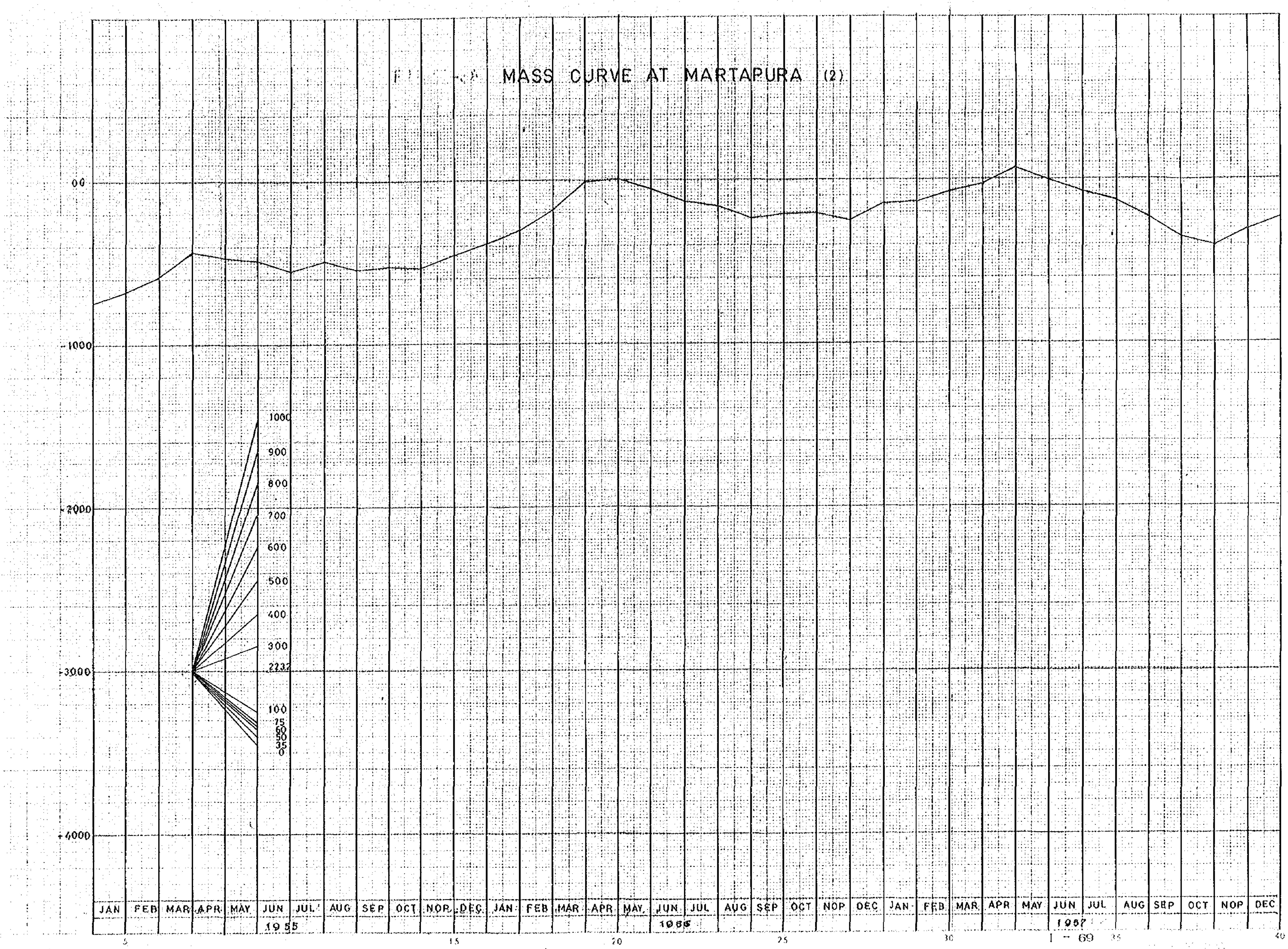
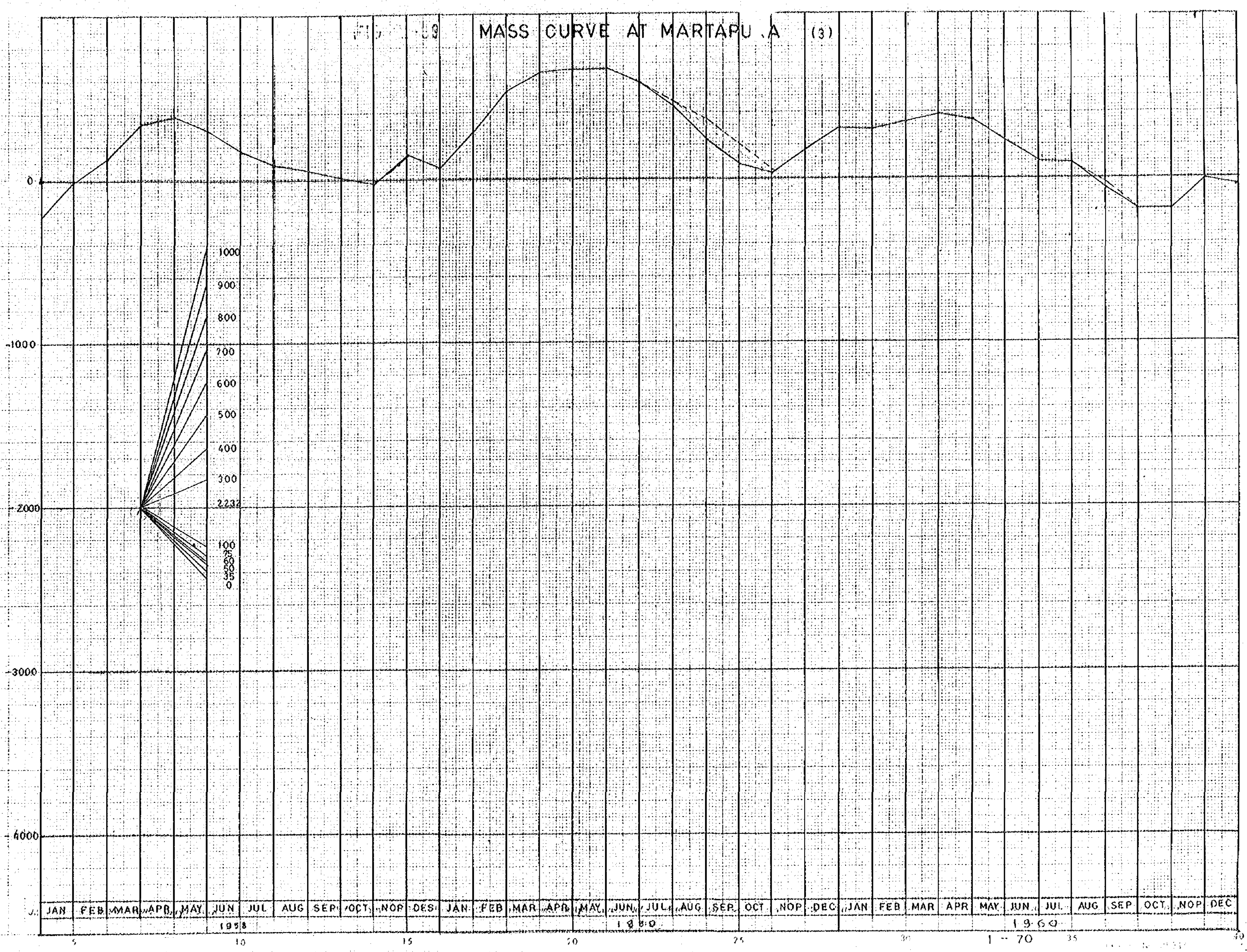


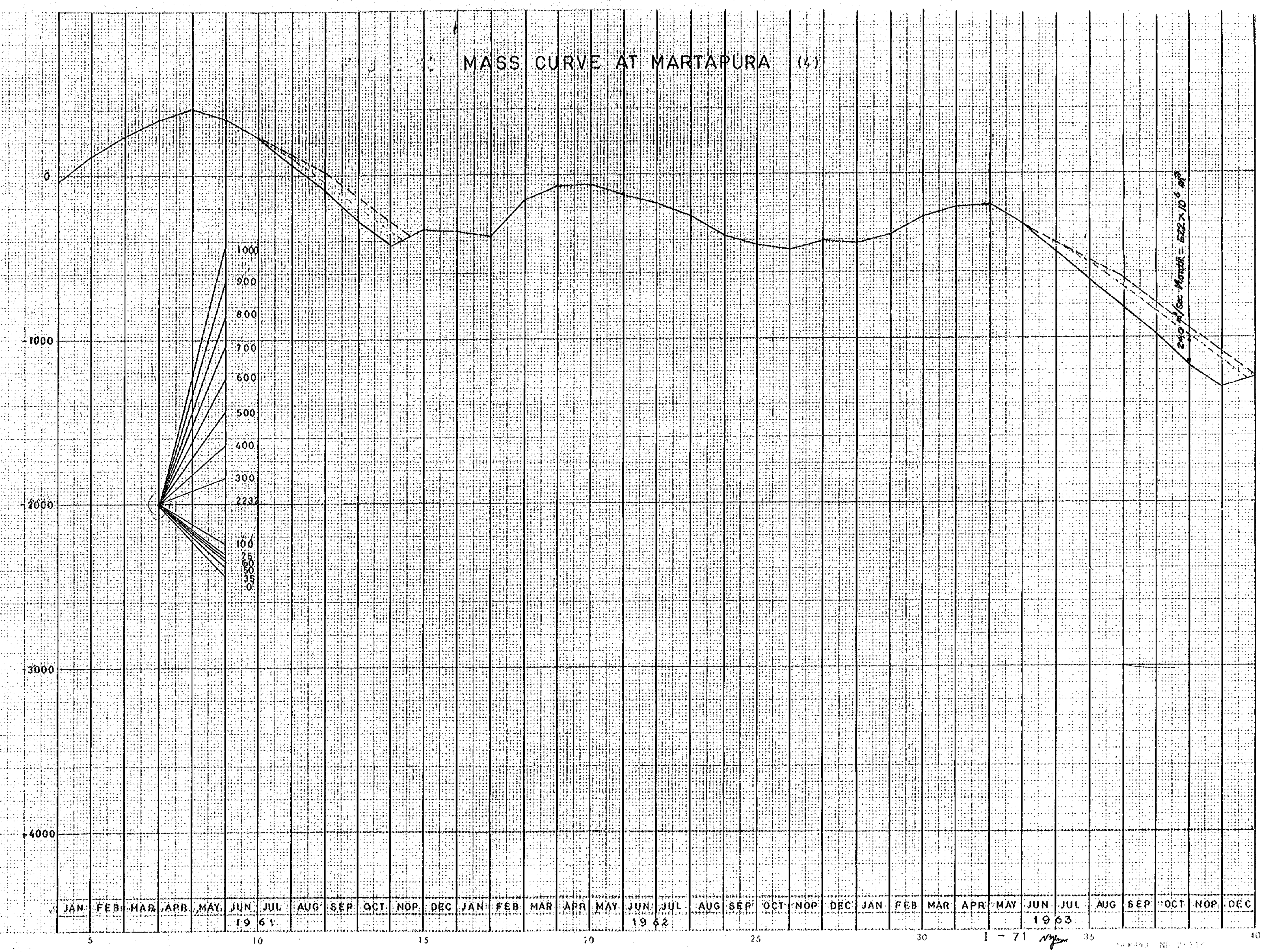
FIG I-27 MASS CURVE AT MARTAPURA (1)
0
1000
2000
3000
4000
m³/sec
1000
900
800
700
600
500
400
300
100
75
60
50
35
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1952
1953
1954
5
10
15
20
25
30
35
40

MASS CURVE AT MARTAPURA (2)

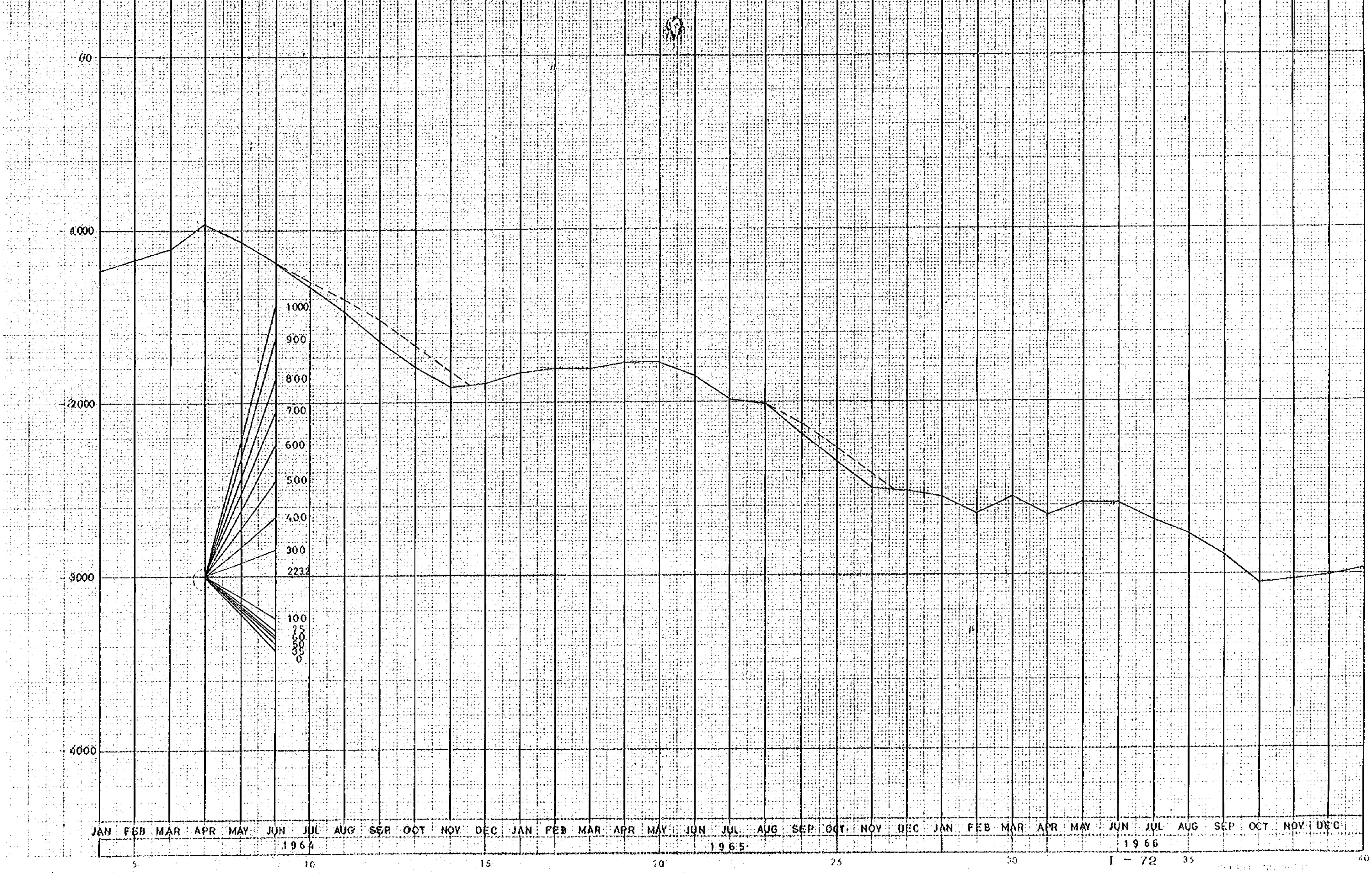


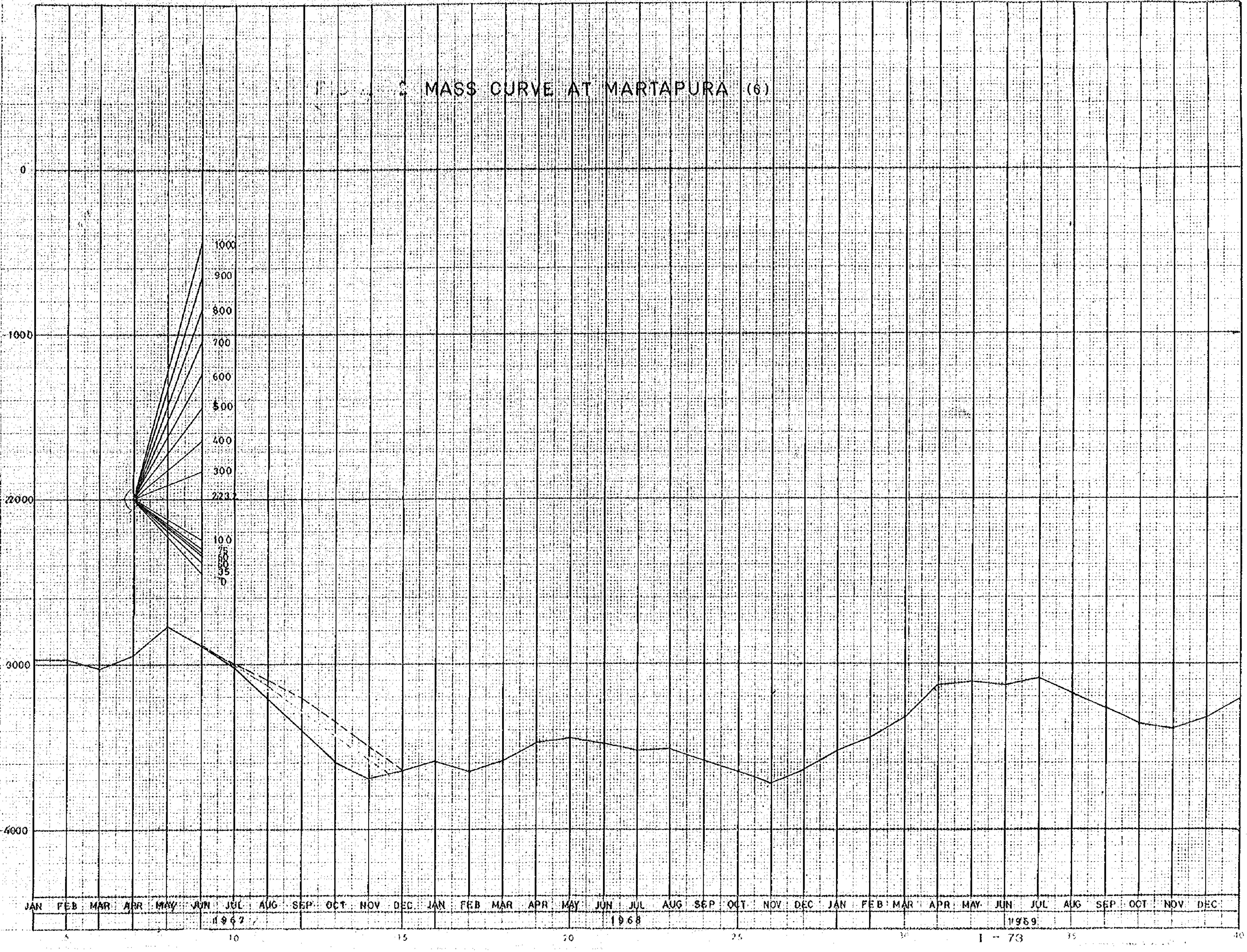


MASS CURVE AT MARTAPU A (3)
0
-1000
-2000
-3000
-4000
1000
900
800
700
600
500
400
300
2232
100
75
60
50
35
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOP DES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOP DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOP DEC
1958
1960
5 10 15 20 25 30 35 40
1 - 70

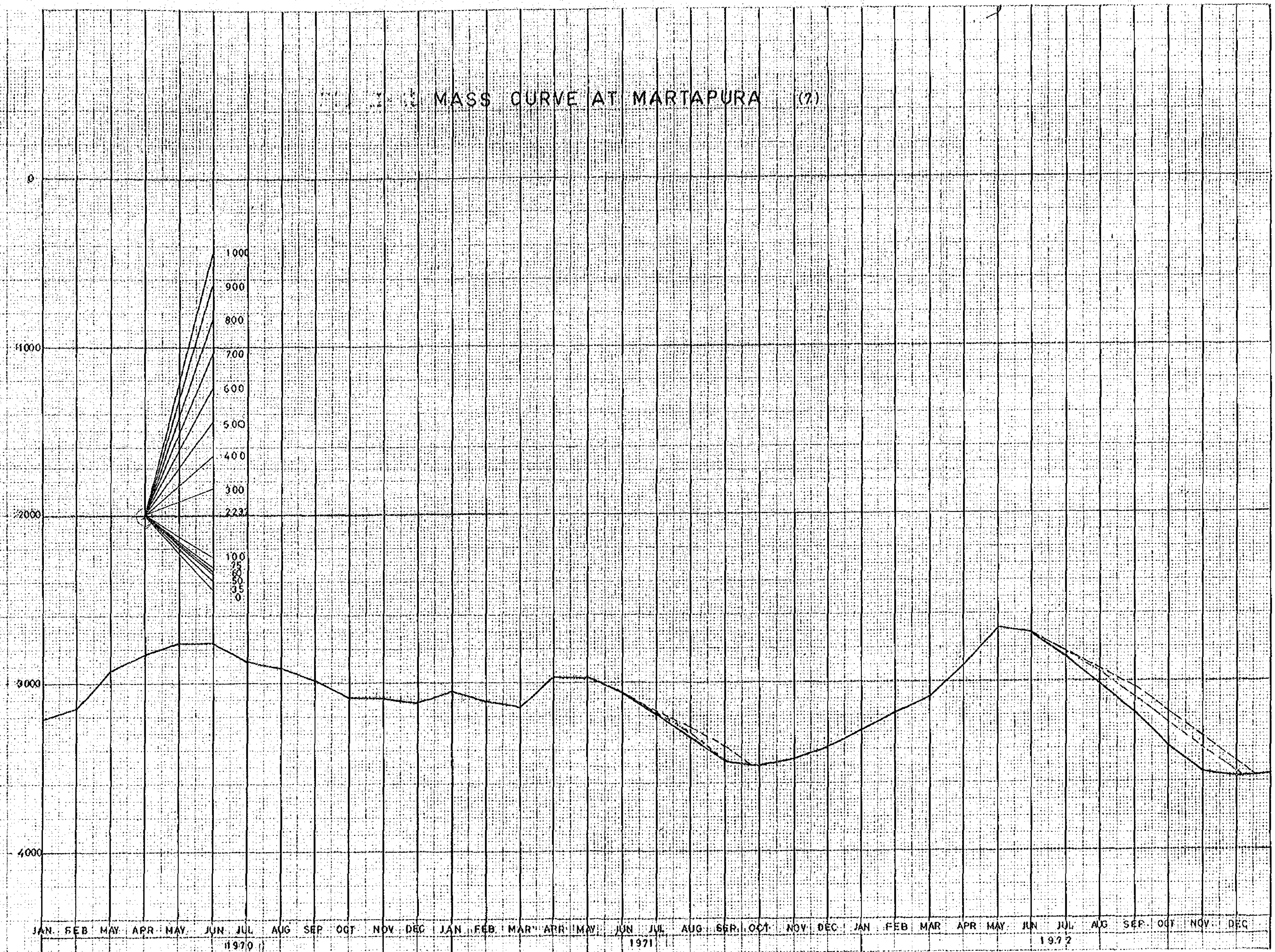

MASS CURVE AT MARTAPURA (4)
0
1000
2000
3000
4000
1000
900
800
700
600
500
400
300
223.2
100
75
60
50
35
0
240 m³/sec·Month = 622 × 10⁶ m³
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOP DEC
1961
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOP DEC
1962
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOP DEC
1963
5
10
15
20
25
30
35
40

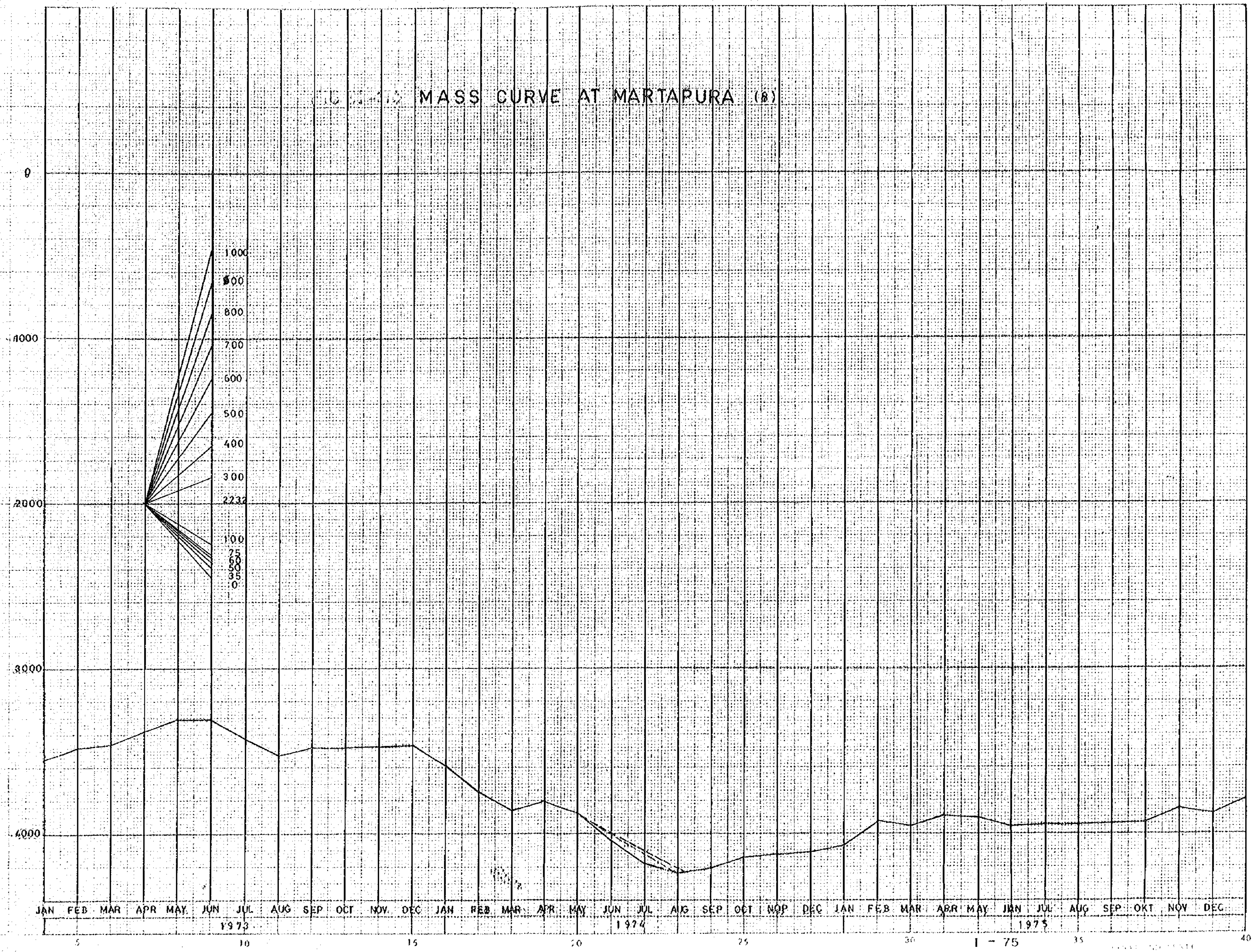
[illegible] MASS CURVE AT MARTAPURA (5)

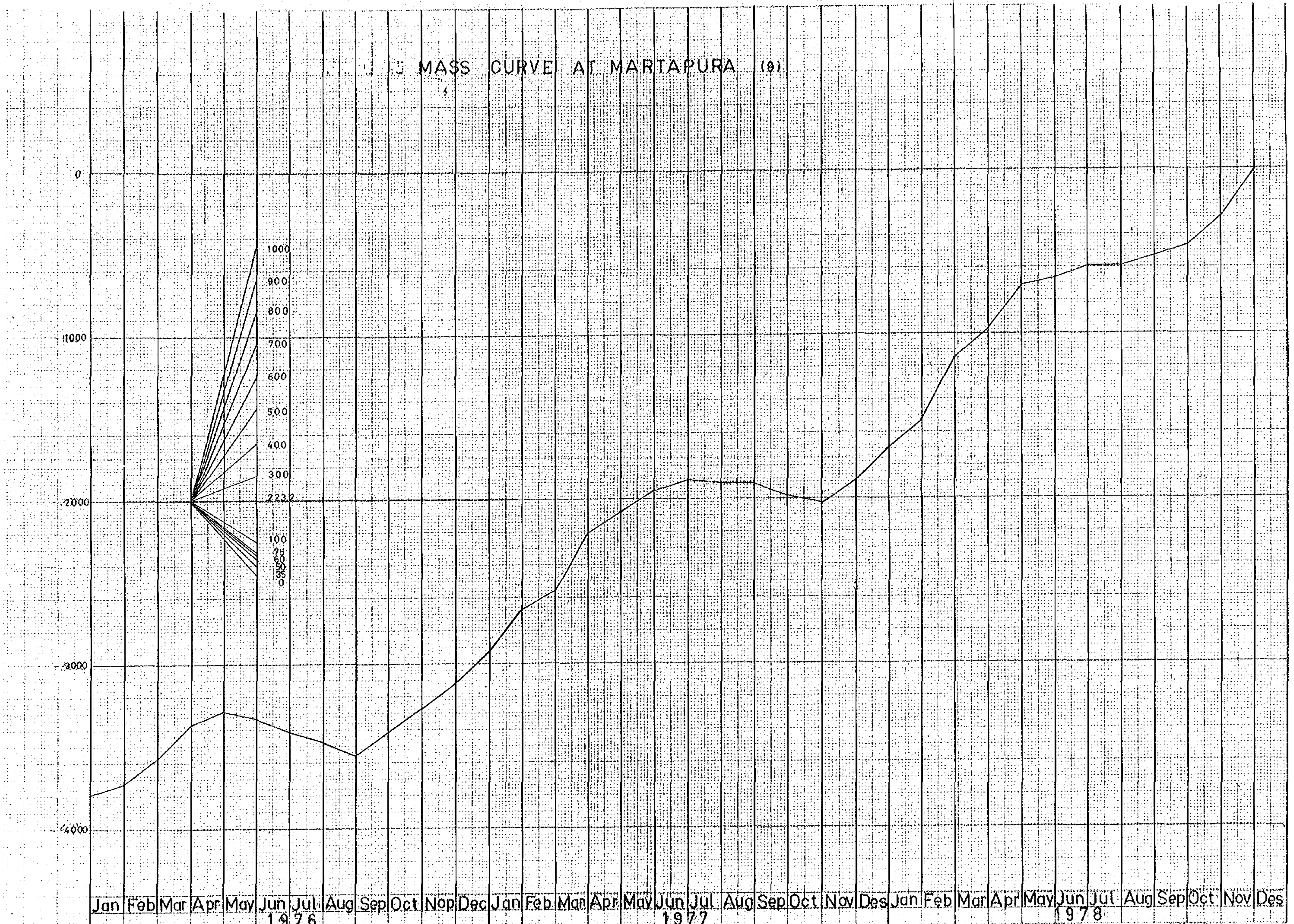




MASS CURVE AT MARTAPURA (6)


MASS CURVE AT MARTAPURA (7)
0
1000
2000
3000
4000
1000
900
800
700
600
500
400
300
223.7
100
75
60
50
35
0
JAN. FEB MAY APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1970
1971
1972
5
10
15
20
25
30
35
40


MASS CURVE AT MARTAPURA (8)
0
1000
2000
3000
4000
1000
900
800
700
600
500
400
300
2232
100
75
60
50
35
0
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1973
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOP DEC
1974
JAN FEB MAR APR MAY JUN JUL AUG SEP OKT NOV DEC
1975
5
10
15
20
25
30
35
40


MASS CURVE AT MARTAPURA (9)
0
1000
2000
3000
4000
1000
900
800
700
600
500
400
300
223.2
100
75
60
50
35
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nop Dec
1976
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Des
1977
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Des
1978
5
15
20
25
30
35
40