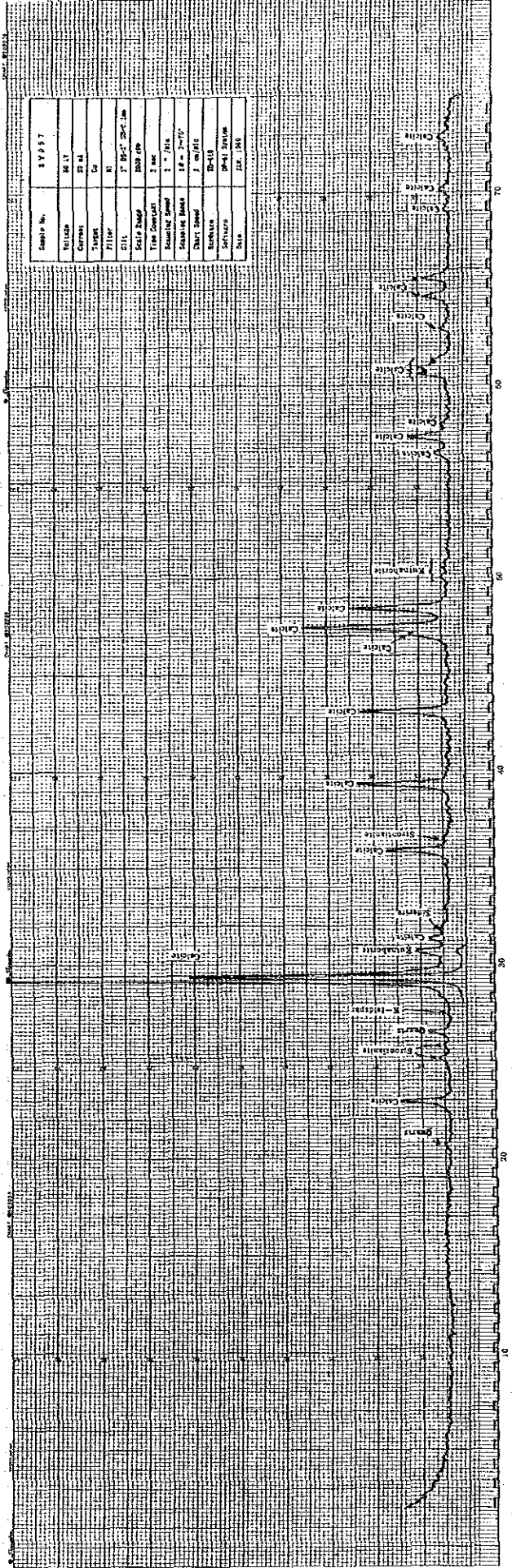
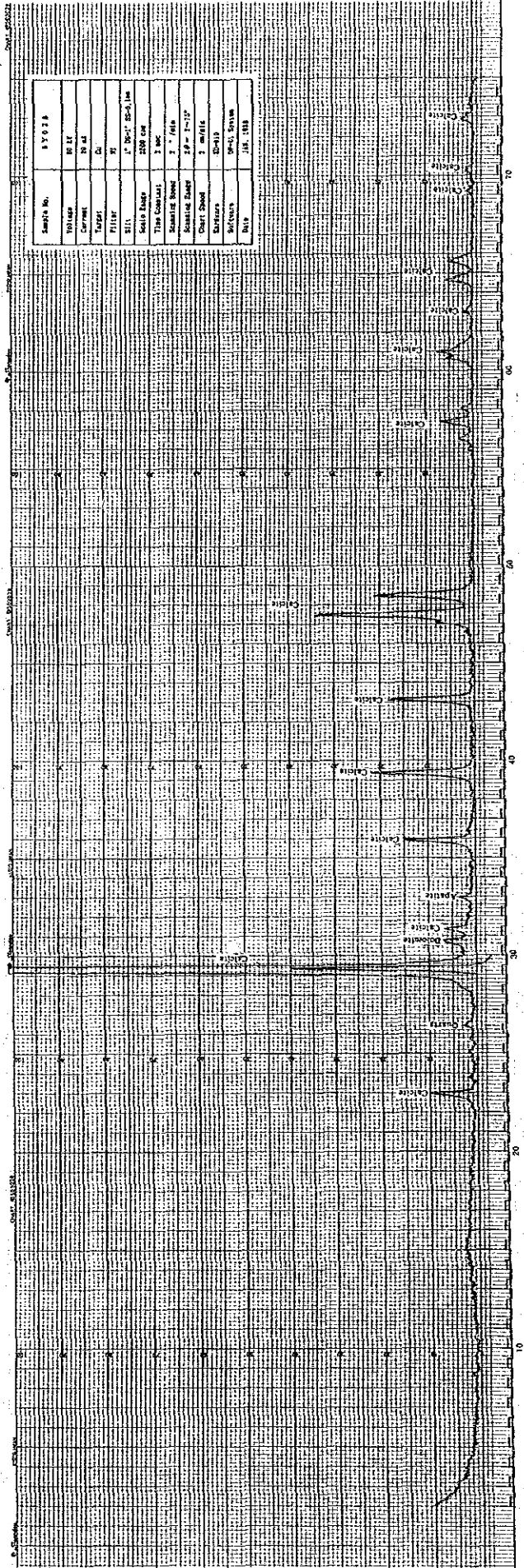
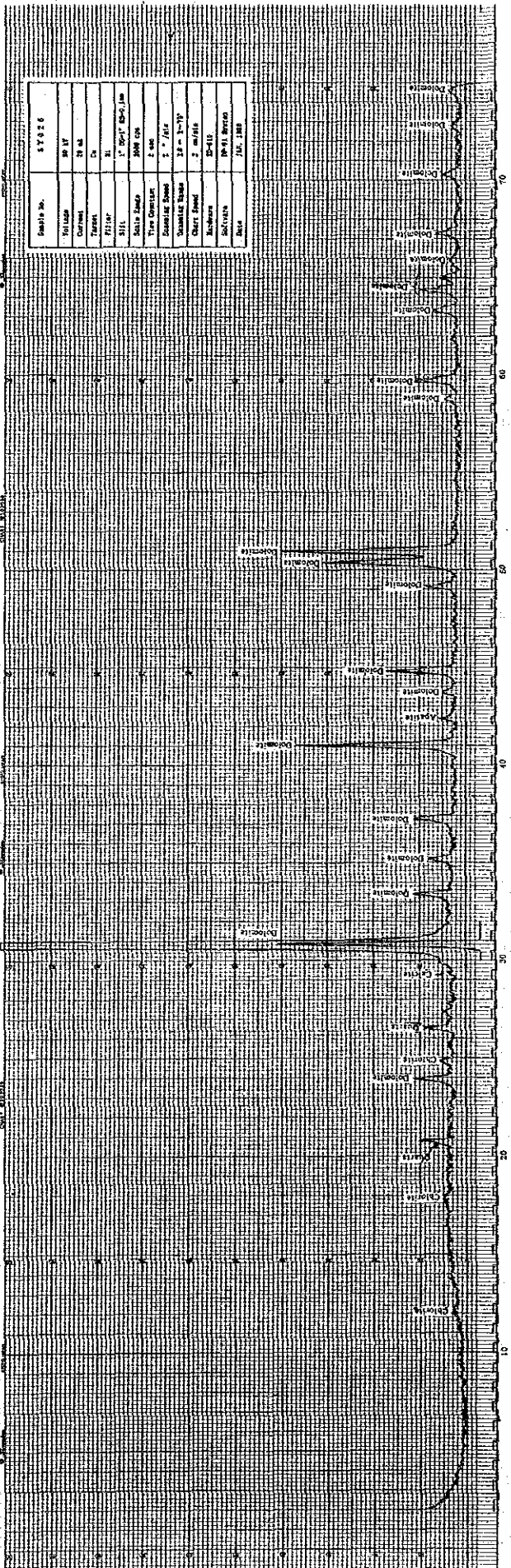
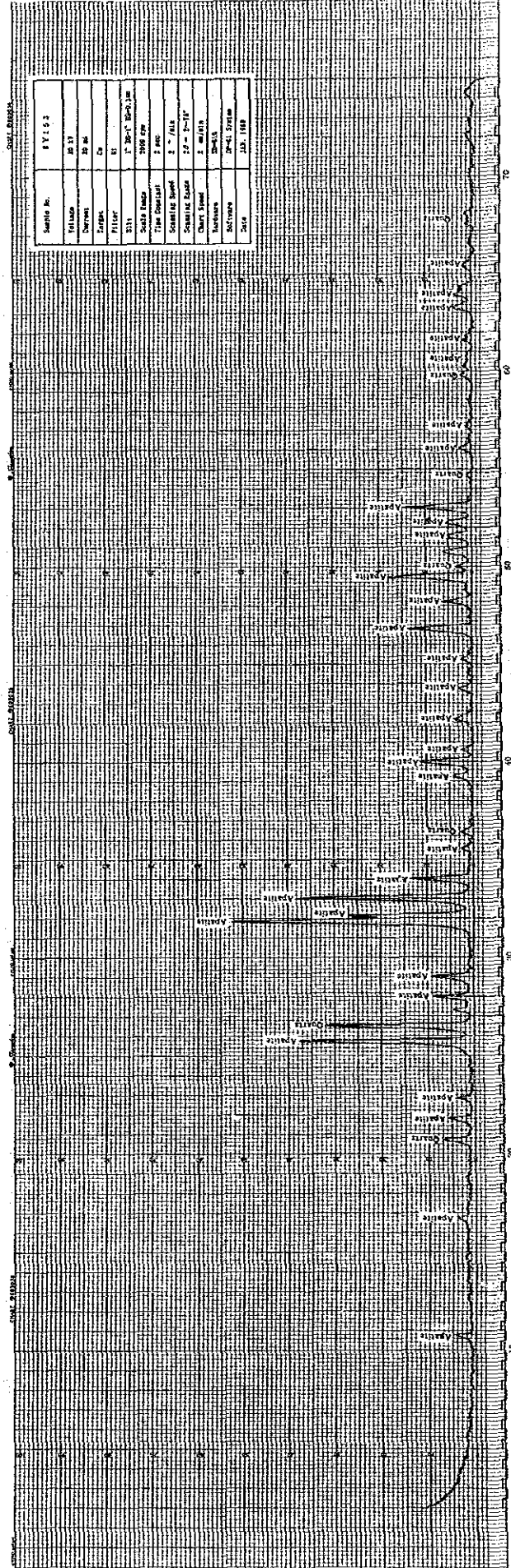
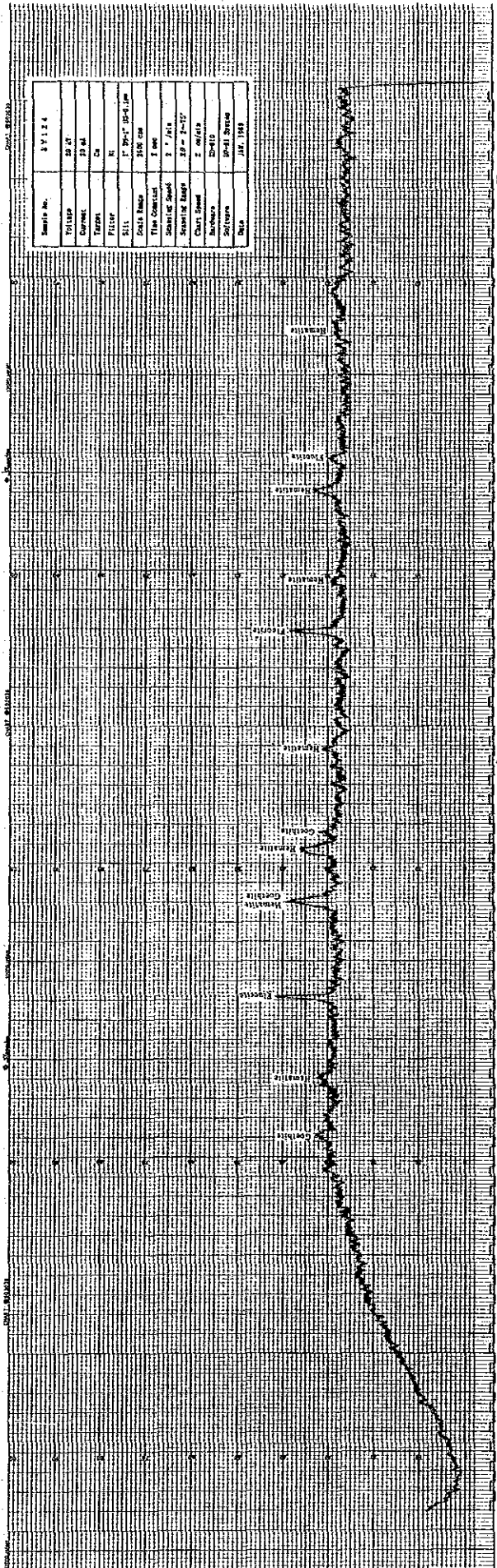


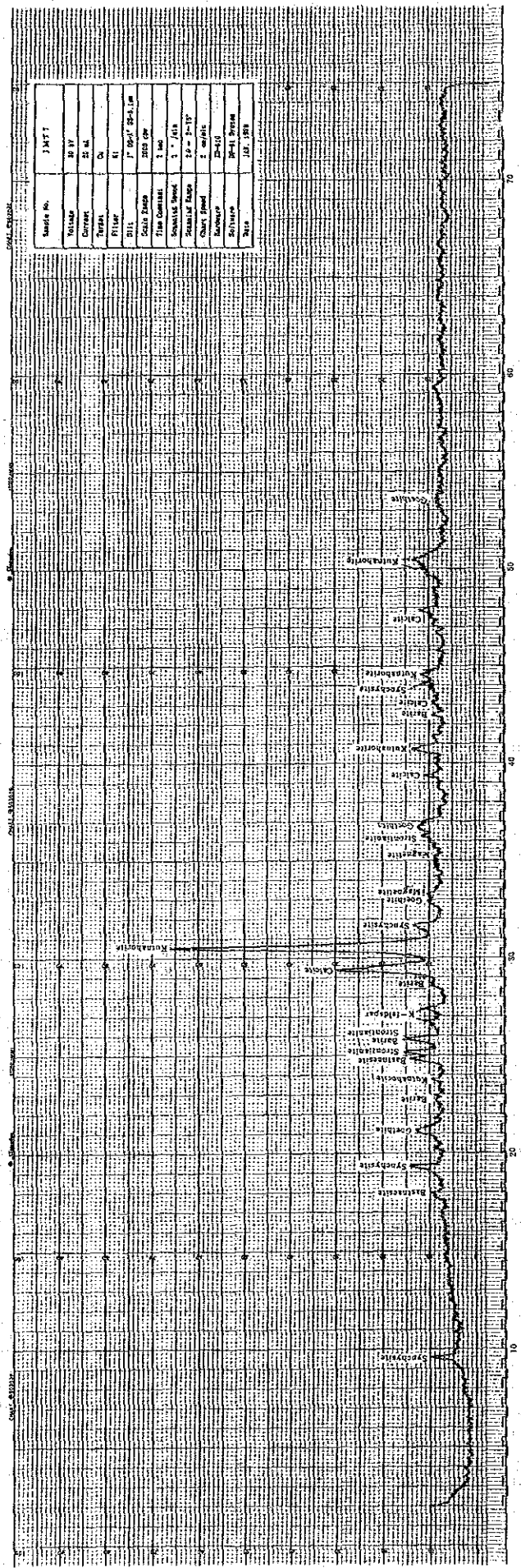
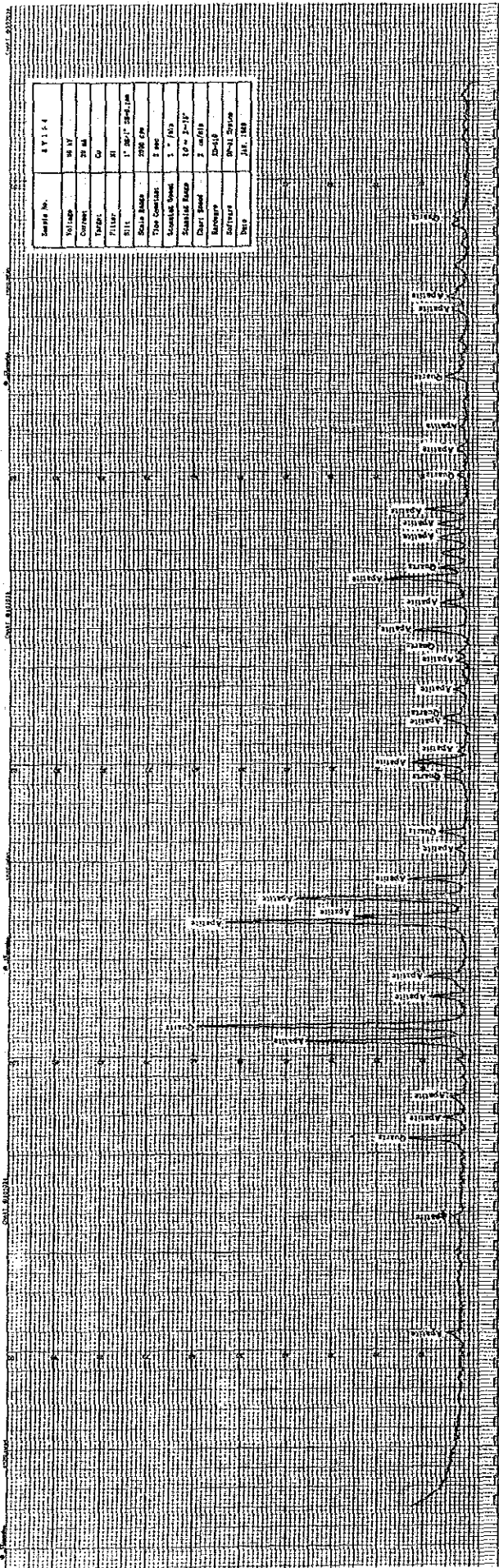
Sample No.	72503
Rolls	38 17
Current	35 44
Target	20
Filter	81
Scale Range	1" 25" 20" 10"
Time Constant	1 sec
Chart Speed	2" / 100
Chart Date	10-1-57
Operator	J. M. H. S.
Station	20-41
Date	Jan. 1957

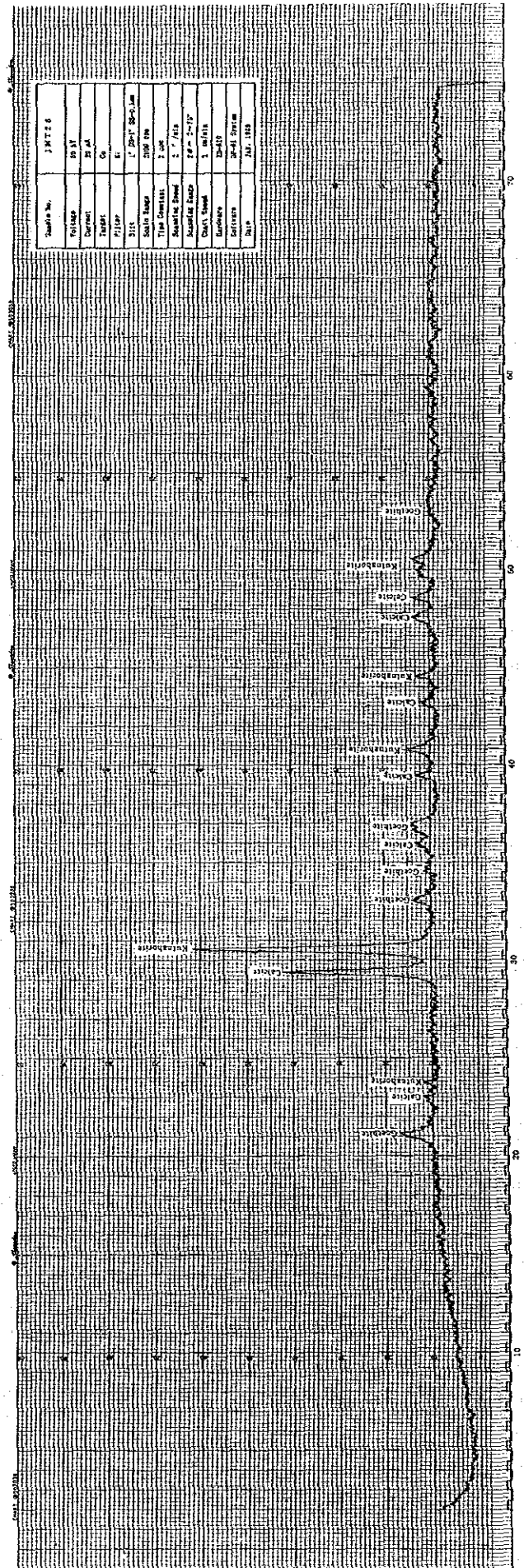
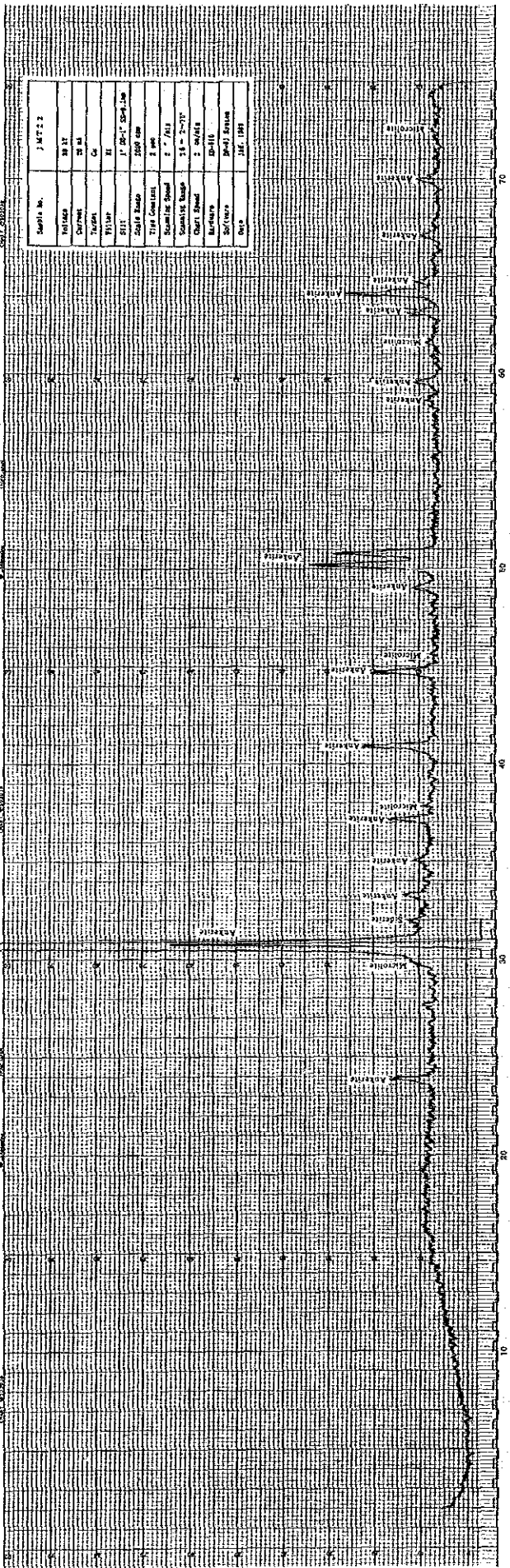


Sample No.	72507
Rolls	38 17
Current	35 44
Target	20
Filter	81
Scale Range	1" 25" 20" 10"
Time Constant	1 sec
Chart Speed	2" / 100
Chart Date	10-1-57
Operator	J. M. H. S.
Station	20-41
Date	Jan. 1957









Appendix 5

Result of EPMA Analysis

Procedure of the quantitative analysis

The quantitative analysis has been carried out as the following experimental procedure;

(1) High quality standard samples of pyrochlore, monazite, Y-stabilized zircon (artificial) were obtained, which were checked these homogeneous qualities by an electron microprobe analyzer.

(2) Quantitative analyses of REE in these standard samples were taken by means of sequential type inductively coupled argon plasma/optical emission spectrophotometer (ICP).

(3) Polished sections of three standard samples were made for EPMA standard.

(4) Target points of REE minerals in the present specimens for the REE qualitative analyses were selected by means of optical microscopy method and X-ray deffraction method.

(5) On the basis of standard sample data [process (2) and (3)], selected target points [process (4)] were analyzed by EPMA method.

Remarks: Results of quantitative analysis for standard samples are the following;

#1(Pyrochlore)

Ca 1.1 wt.%
Ti 1.0 wt.%
Nb 52.9 wt.%
Ta 0.3 wt.%

#2(Y-stabilized zircon, artificial)

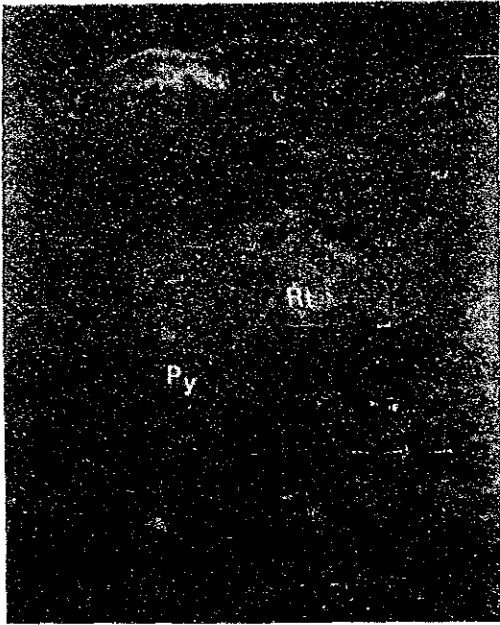
Y 35.0 wt.%
Zr 49.6 wt.%

#3(Monazite)

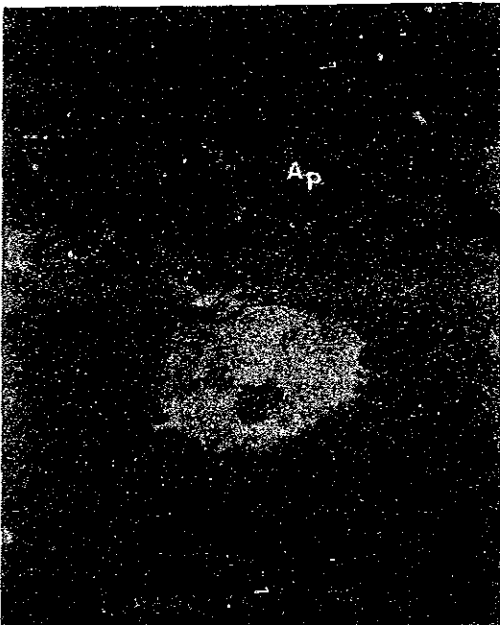
Al 2300 ppm
Ca 3.7 wt.%
Y 2.7 wt.%
Zr 1300 ppm
Nb 1.2 wt.%
La 8.2 wt.%
Ce 23.6 wt.%
Sm 4.3 wt.%
Eu 250 ppm
Gd 2.6 wt.%
Dy 1.0 wt.%
Er 1400 ppm
Yb 280 ppm
Lu 43 ppm
Th 1.1 wt.%

Result of quantitative EPMA analysis

No.	Sample No.	Sector	Locality	Rock name	Mineral	Element (wt %)													
						La	Ce	Sm	Gd	Dy	Nb	Y	Na	Ca	Ti	Th	Zr		
1	C1306	Chilwa Island	JMC-13 30.2m	Apatite sövite	Rutil	0	9.68	0	0	0	4.43	0	0.14	1.19	69.6	0	0.29		
2	C1306	"	"	"	Apatite	7.12	13.7	0	0.29	0	0	2.44	0.12	0.83	0	1.21	1.56		
3	C3211	"	-32 47.4m	Sövite	Pyrochlore	0	2.76	0	0	0	47.4	2.50	1.06	14.0	1.70	0	4.13		
4	S1604	Songwe	JMS-4 14.0m	Iron oxide ore	Bastnaesite (?)	38.5	29.3	5.39	0.58	0	0.16	0	0.21	9.91	0	0.01	0		
5	T2501	Tundulu	JMT-15 3.2m	Apatite rock	Pyrochlore	0	0.53	2.76	0	1.62	18.7	1.28	4.07	6.32	1.21	0	2.19		
6	T2501	"	"	"	Bastnaesite	9.62	14.1	2.58	0.69	0	1.21	0	0.19	7.66	0	0	0		
7	T2607	"	MJT-26 28.9m	Apatite rock	Pyrochlore	0	0.16	0.59	0	0.32	19.1	0.82	0.61	6.22	0.90	0	1.44		
8	T2607	"	"	"	Bastnaesite	15.0	17.1	4.67	0.20	0	0	0	0	5.99	0	0.19	0		
9	8Y058	Chilwa Island	Surface	Sövite	Pyrochlore	0	1.33	3.90	0	0	37.8	1.82	1.03	11.0	1.68	0	3.26		
10	8Y058	"	"	"	Pyrochlore	0	1.69	0	0.84	0	33.1	3.01	1.06	12.8	1.28	0	3.70		

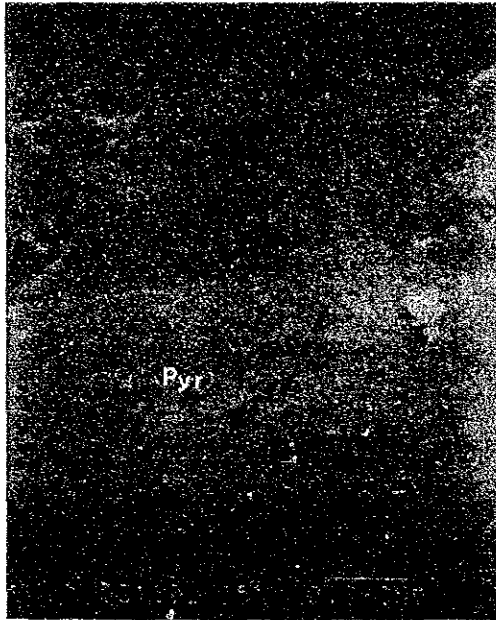


Sample No. : C 1306
Rock Name : Apatite sovite
Sector : Chilwa Is.

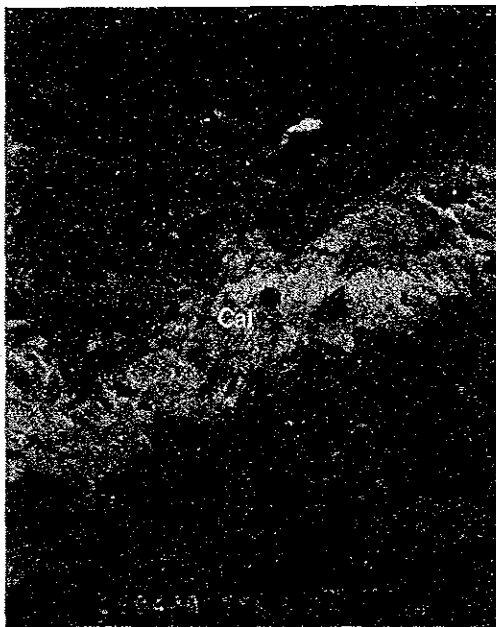
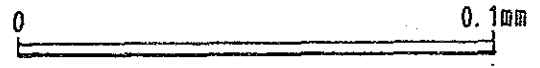


Sample No. : C 1306
Rock Name : Apatite sovite
Sector : Chilwa Is.

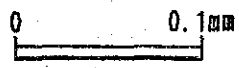




Sample No. : C 3211
Rock Name : Sovite
Sector : Chilwa Is.



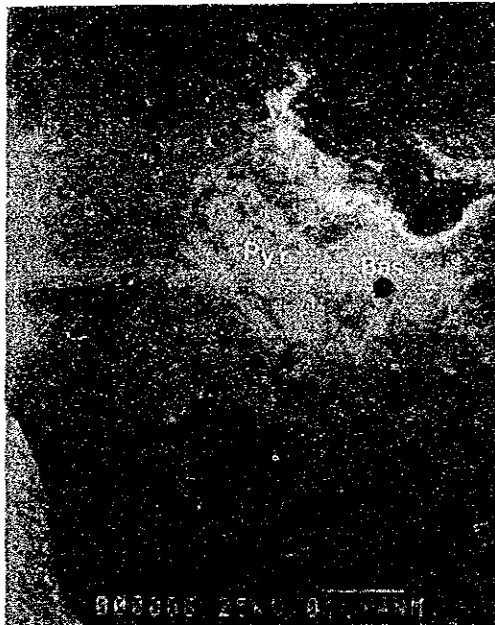
Sample No. : S 1604
Rock Name : Iron oxide ore
Sector : Songwe





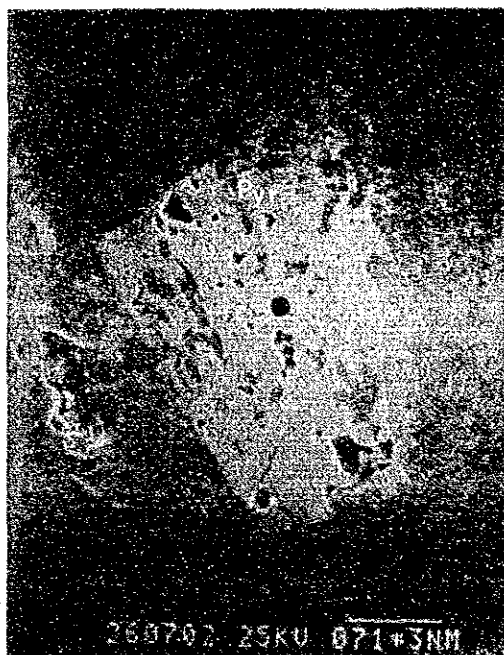
Sample No. : T 2501
Rock Name : Apatit rock
Sector : Tundulu

0 0.03mm



Sample No. : T 2501
Rock Name : Apatit rock
Sector : Tundulu

0 0.5mm



Sample No. : T 2607
Rock Name : Apatit rock
Sector : Tundulu

0 0.3mm

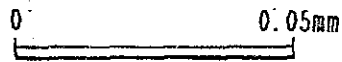


Sample No. : T 2607
Rock Name : Apatit rock
Sector : Tundulu

0 0.1mm



Sample No. : 8Y 058
Rock Name : Sovite
Sector : Chilwa Is.



Sample No. : 8Y 058
Rock Name : Sovite
Sector : Chilwa Is.



Appendix 6

Summarized operational data

Working Time of Each Drill Hole

Songwe

Drill Hole	Drilling		Shift of Workers		Number of Workers		Working Time									
	Length Drilled	Core Length	Drilling Shift	Oil Shift	Engineer	Worker	Drilling	Out Drilling	Regain of Accident	Sub Total	Const- ruct	Take to Pieces	Moving of Water	Reted Others	Grand Total	
																m
JMS																
12	50.20	46.10	5	11	25	345	37'00"	18'00"	-	55'00"	38'00"	-	56'00"	21'00"	225'00"	
13	50.10	47.70	5	7	7	248	42'00"	13'00"	-	55'00"	36'00"	-	60'00"	9'00"	215'00"	
14	50.10	48.00	5	7	7	166	41'30"	18'30"	-	60'00"	-	20'00"	60'00"	2'00"	202'00"	
15	50.10	49.70	5	9	9	234	40'00"	15'00"	-	55'00"	18'00"	-	60'00"	16'00"	204'00"	
16	50.10	49.50	4	7	7	177	31'30"	12'30"	-	44'00"	27'00"	-	48'00"	5'00"	168'00"	
17	50.10	28.40	6	8	8	197	43'30"	22'30"	-	66'00"	20'00"	-	70'00"	8'00"	230'00"	
18	50.20	42.70	5	8	8	217	30'00"	16'00"	-	46'00"	28'00"	-	60'00"	6'00"	186'00"	
19	50.30	48.20	4	7	7	200	30'30"	13'30"	-	44'00"	27'00"	-	48'00"	7'00"	170'00"	
Total	401.20	360.30	39	64	78	1784	296'00"	129'00"	-	425'00"	194'00"	20'00"	462'00"	74'00"	1600'00"	

Working Time of Each Drill Hole

Thundulu

Drill Hole	Drilling		Shift of Workers		Number of Workers		Working Time								
	Length Drilled	Core Length	Drilling Shift	Oil Shift	Engineer	Worker	Drilling	Out Drilling	Regain of Accident	Sub Total	Const- ruct	Take to Pieces	Moving of Water	Reted Others	Grand Total
JMS															
25	50.30	45.30	4	6	6	134	31'30"	12'30"	-	44'00"	18'00"	-	48'00"	6'00"	160'00"
26	50.20	44.90	4	12	16	384	32'30"	11'30"	-	44'00"	64'00"	-	48'00"	50'00"	250'00"
27	50.20	47.90	4	8	8	249	32'00"	12'00"	-	44'00"	54'00"	-	48'00"	6'00"	196'00"
Total	150.70	138.10	12	26	30	767	96'00"	36'00"	-	132'00"	136'00"	-	144'00"	62'00"	606'00"

Working Time of Each Drill Hole

Chilwa

Drill Hole	Drilling		Shift of Workers		Number of Workers		Working Time								Grand Total
	Length Drilled	Core Length	Drilling Shift	Oil Shift	Engineer	Worker	Drilling	Out Drilling	Regain of Accident	Sub Total	Const- ruct	Take to Pieces	Moving of Water	Reted Others	
JMS	m	m	S	S	mam	man	H	H	H	H	H	H	H	H	
20	50.20	49.20	5	8	8	188	35°00'	20°00'	-	55°00'	27°00'	-	-	8°00'	90°00'
21	50.30	45.80	5	9	9	204	29°30'	25°30'	9°00'	64°00'	27°00'	-	-	9°00'	100°00'
22	50.20	49.00	5	9	9	195	30°30'	24°30'	-	55°00'	36°00'	-	-	9°00'	100°00'
23	50.10	39.70	5	9	9	175	29°30'	25°30'	-	55°00'	36°00'	-	-	9°00'	100°00'
24	50.30	44.30	5	7	7	145	35°30'	19°30'	-	55°00'	18°00'	-	-	7°00'	80°00'
25	50.10	47.20	5	7	7	141	36°30'	18°30'	-	55°00'	18°00'	-	-	7°00'	80°00'
26	50.20	47.25	5	9	9	215	39°00'	16°00'	9°00'	64°00'	27°00'	-	-	9°00'	100°00'
27	50.20	48.70	4	6	6	174	27°00'	17°00'	-	44°00'	27°00'	-	-	6°00'	77°00'
28	50.20	48.40	5	8	7	170	31°30'	23°30'	-	55°00'	27°00'	-	-	7°00'	89°00'
29	50.30	48.40	4	8	8	164	23°30'	20°30'	-	44°00'	36°00'	-	-	8°00'	88°00'
30	50.20	45.30	5	8	8	215	34°00'	11°00'	-	45°00'	27°00'	-	-	8°00'	80°00'
31	50.20	35.00	5	7	7	195	31°30'	23°30'	-	55°00'	27°00'	-	-	7°00'	89°00'
32	50.10	46.40	5	8	7	170	32°00'	23°00'	-	55°00'	27°00'	-	-	7°00'	89°00'
Total	1606.40	1391.85	153	258	256	6402	1040°00'	614°00'	18°00'	1672°00'	939°00'	-	-	398°00'	3009°00'