

Report No. EPGs-DOM.10-85MPA

Vitrinite reflectance (Ro) of  
dispersed organics in Mobil-Gulf  
Dominion 0-23.

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### Remarks

The sample coverage of vitrinite reflectance data (Figure 1, Table II) was adequate over most of the well except for the important last 1600'. The line through the data points represents the best fit established by the least squares method.

Within the upper section of the well 4 samples had such poorly preserved vitrinite particles that the reflectance values they produced were considered unreliable and they were therefore excluded from the dataset.

This profile is the second determination of vitrinite reflectance on this set of samples (Ervine, 1984, Figure 2). This study results in significant changes in the profile in the upper and lower section of the well. A single best fit line has now been interpreted for the well. The upper section now intersects the 0.21 Ro value at surface which is more consistent with normal well profiles (Dow, 1977). The lowest section has been interpreted as having major cavings influence, although caliper logs were not available below 9789'. For example the deepest available sample was dominated by a large population (0.6 Ro) while the second largest population (0.74 Ro) was considered to be the primary reflectance population. In general, the mid section of the profile yielded similar results compared to the previous study.

There are insufficient vitrinite reflectance measurements above and below the Avalon Unconformity (10,410 ft.R.T.), to indicate how much section might have been eroded.

An organic geochemistry study of the well (Rashid, 1975) states that the sedimentary section below 8000' shows a high degree of maturation in gaseous hydrocarbons but that the C<sub>15+</sub> study does not provide support for this conclusion. The report also states that the organic matter is mostly derived from terrestrial source and would require greater maturation to form oil and gas.

In an earlier study, (Bujak, 1976) TAI values have been reported as 2- (0.44 Ro equivalent) at T.D.

These maturation data provide evidence indicating that the thermal regime at Dominion 0-23 was suitable for the generation of oil within the drilled section.

### References

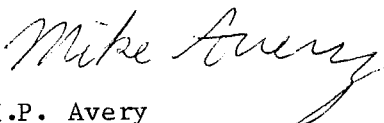
- Bujak, J.P., 1976. Kerogen Type and Thermal Alteration Index of Mobil Gulf Dominion 0-23, Grand Banks. Report No. EPGs-DOM.29-76JPB.
- Dow, W.G., 1977. Kerogen studies and geological interpretations. Journal of Geochemical Exploration, no. 7, p. 79-99.

Ervine, W.B., 1984. Vitrinite Reflectance (Ro) on the dispersed organics in the Mobil Gulf Dominion O-23 well. Report no. EPGs-DOM.23-84WBE.

Rashid, M.A., 1975. Geochemical history of organic matter associated with subsurface sedimentary strata of Mobil-Gulf Dominion O-23, northern Grand Banks. Atlantic Geoscience Centre (GSC) Internal Report.

Wade, J.A., 1977. Stratigraphic picks Mobil Gulf Dominion O-23. Report No. EPGs-STRAT.33-77JAW, 1p. (revised in 1980).

July 23, 1985



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Table II

Summary of kerogen - based vitrinite reflectance

Seq. #	Sample #	Depth in feet	Mean Ro (SD) non-rotated	Number of Total	readings Edited
1	K0308A	1830-1860	.24(+.04)	32	17
2	K0308B	2100-2130	.26(+.05)	29	22
3	K0308C	2850-2880	.27(+.05)	30	17
4	K0309B	3480-3510	.33(+.05)	54	36
5	K0310A	4470-4500	.32(+.05)	33	24
6	K0310C	6360-6390	.44(+.07)	39	25
7	K0311B	7270-7300	.46(+.06)	65	40
8	K0311C	7670-7700	.46(+.05)	28	20
9	K0312A	7970-8000	.55(+.08)	75	47
10	K0312B	8270-8300	.54(+.06)	38	28
11	K0312C	8570-8600	.53(+.04)	39	22
12	K0313A	8970-9000	.57(+.05)	42	31
13	K0313B	9370-9400	.58(+.05)	34	21
14	K0313C	9770-9800	.59(+.06)	33	29
15	K0314A	10070-10100	.6 (+.05)	43	29
16	K0314B	10380-10410	.57(+.04)	54	41
17	K0314C	11490-11520	.74(+.05)	99	22

Note: All samples are Kerogen Type.

Table III  
Formation Tops (Wade '77)

Depth	Formation
in casing	Banquereau
10278-10410'	Paleocene Chalk
10410'	Avalon UNCONFORMITY
10410'	Verrill Canyon
13116'	T.D.

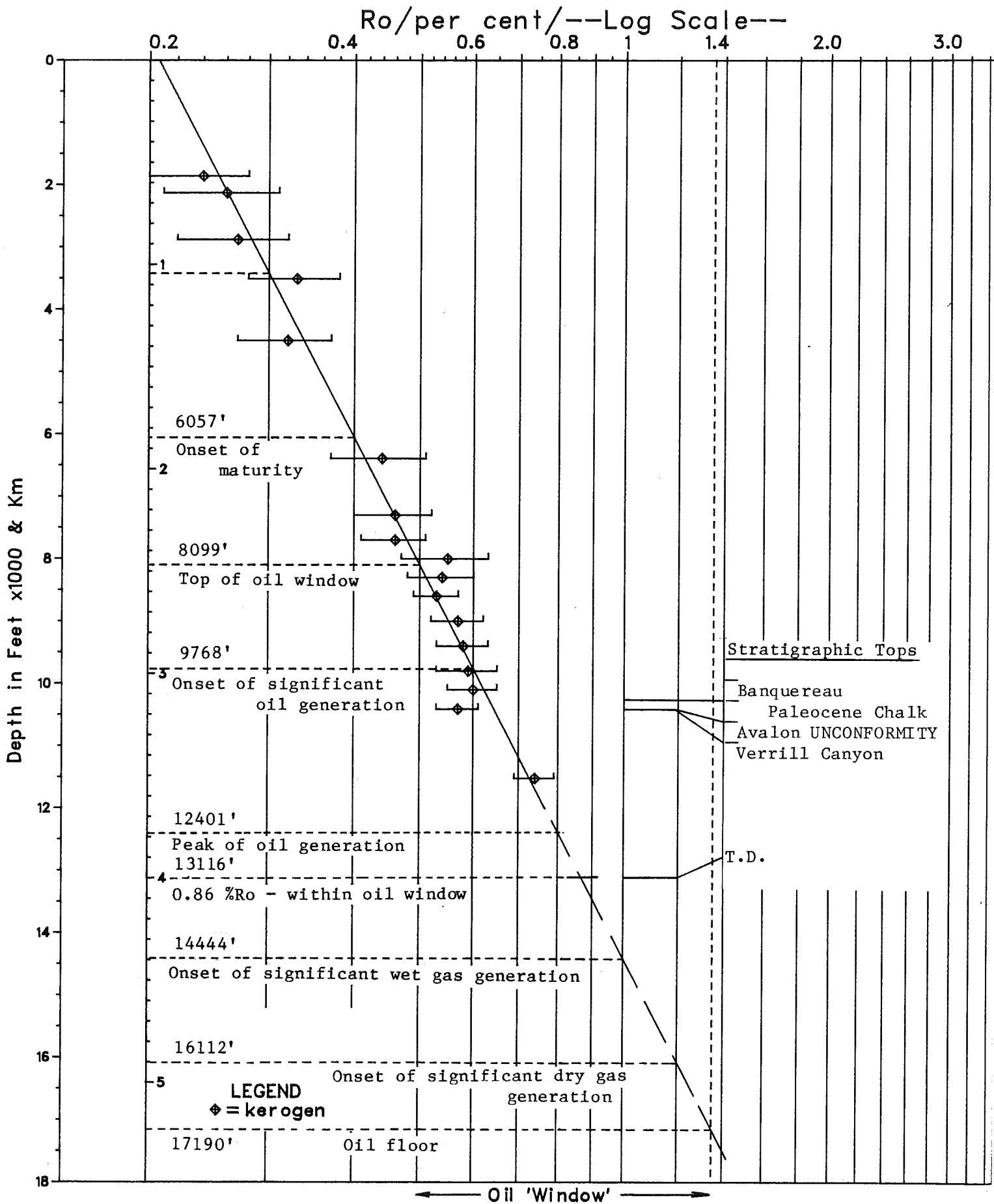
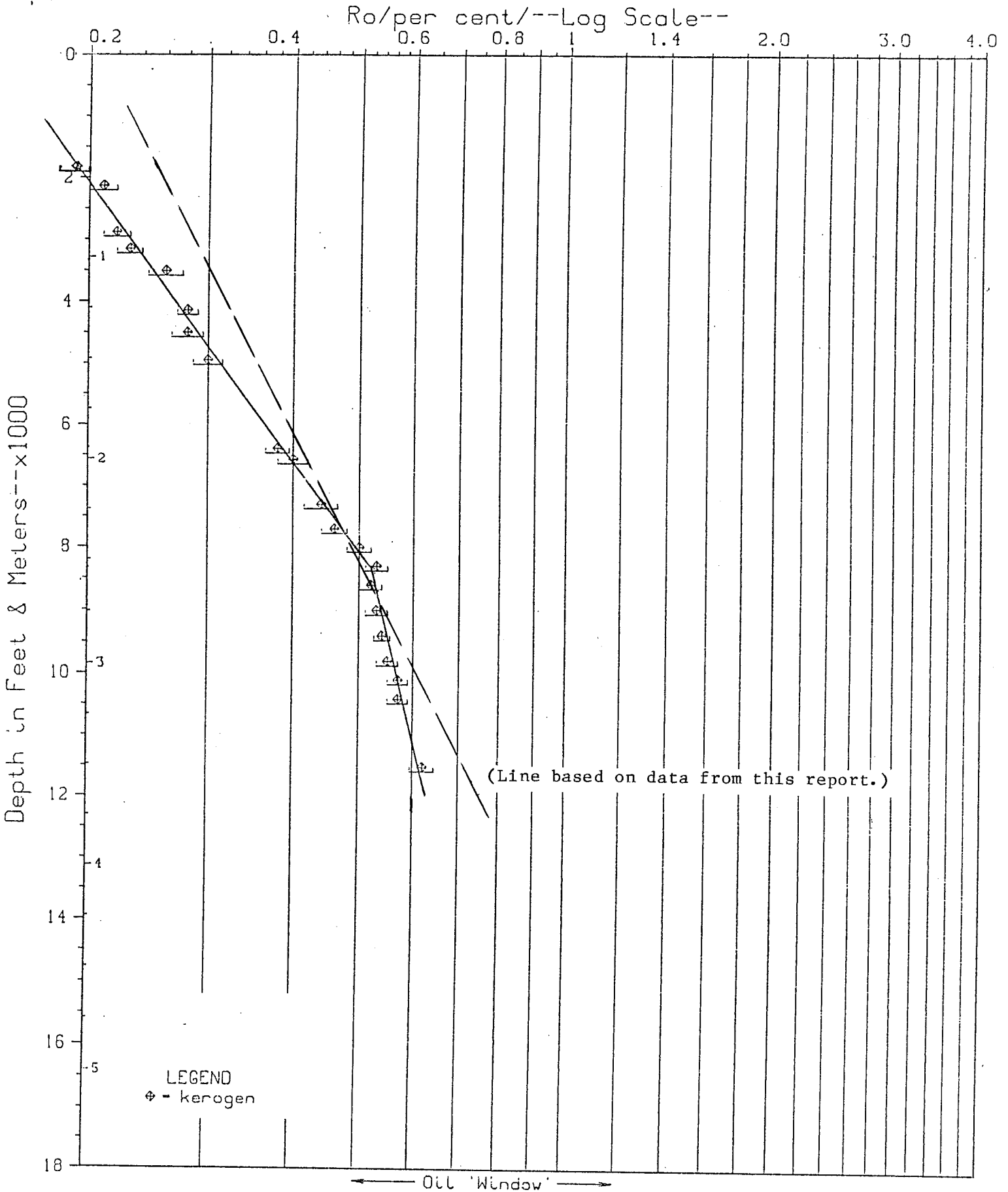


Fig. 1 Dominion O-23

JOB-HARV: : , BEDFORD INSTITUTE DISSPLA VER 8.2  
 MON 15 JUL, 1965  
 12.23.35



Dominion 0-23

FIGURE 2 (Ervin 1984)

## APPENDIX I

### Sample Preparation Method

#### COGLA Lab preparation

Preliminary Wash

Samples dried in oven

Split: a. all of coarse to Petrology Lab

b.  $\frac{1}{2}$  medium to Palynology Lab

c. rest of medium and all of fine combined for Micropaleo Lab

Split "b" is delivered to Palynology Lab and treated as follows:

#### PALYNOLOGY Lab preparation

20-30 grams placed in 250ml plastic beaker.

Add 10% HCl till reaction ceases (removes carbonates).

Washed (rinsed) 3 times.

Conc. HF overnight (removes silicates).

Washed (rinsed) 3 times.

Heated (60-65°C) conc. HCl (remove fluorides caused by HF).

Washed 3 times.

Then put into 15ml test tube with 4-5ml 4% Alconox.

Differential centrifuge at 1500rpm for 90 sec.

Decant.

Wash 3 times with centrifuging.

Float off organic fraction using 2.0 S.G. Znbr solution.

Centrifuge 1000rpm, 8 min.

Float fraction into second test tube.

Wash 3 times with centrifuging.

Kerogen smear slide made.

Remaining kerogen material delivered to Vitrinite Reflectance Lab.

#### VITRINITE REFLECTANCE Lab preparation

Excess water pipetted off.

Freeze dried.

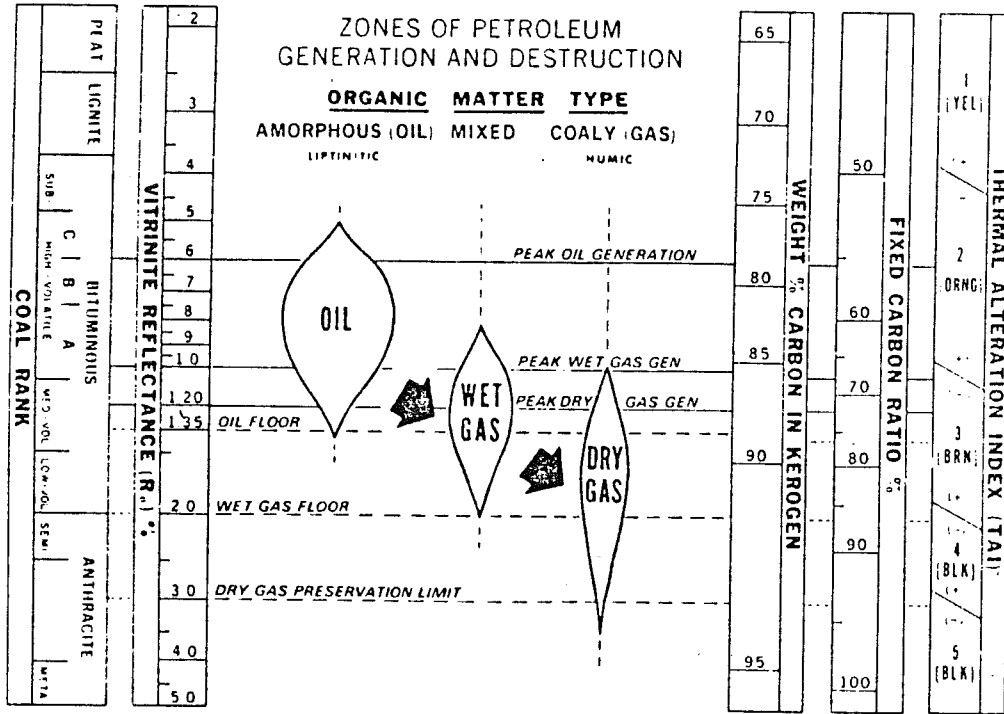
Mounted using epoxy resin (EPO-TEK 301) in predrilled plastic stubs.

Polished using modified coal petrology polishing methods.

Examined under oil lens at approximately 800x mag'n.



Appendix II (Dow, 1977)



Note that the terminology describing the various maturation levels has been modified. The 'peak' designation has been changed to 'onset of significant' and 0.8 R<sub>o</sub> is now used as the 'peak of oil generation'.

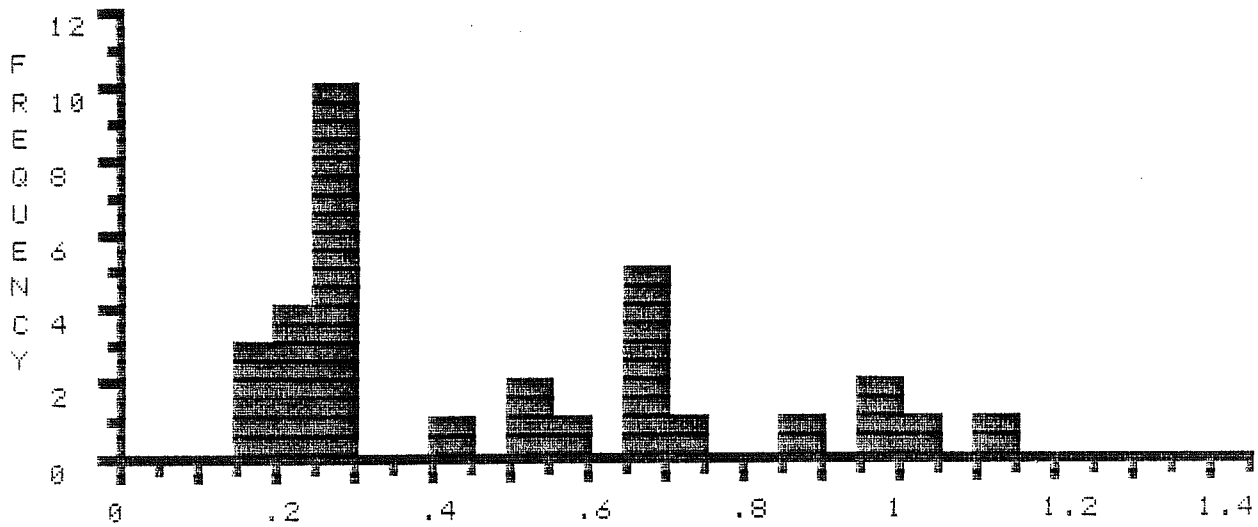
Vitrinite Reflectance Histograms

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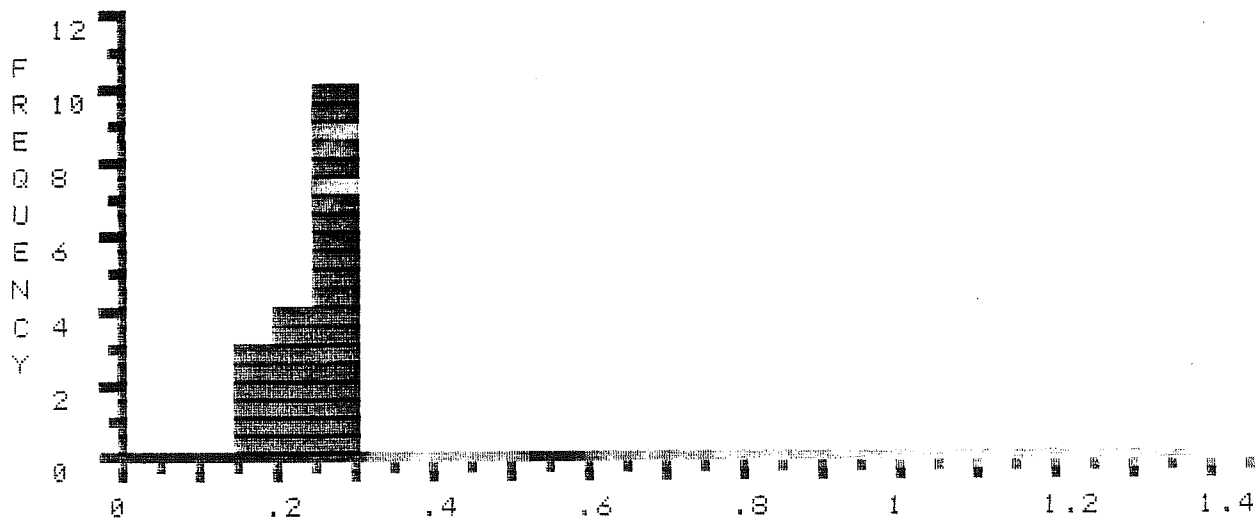
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2	.54	.59	.65	.67	.67	.68	.69	.72	.86	.96
3	.98	1.02	1.1							

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	15.15	32	.16	1.1	.47	.29
*EDIT >	4.11	17	.16	.28	.24	.04

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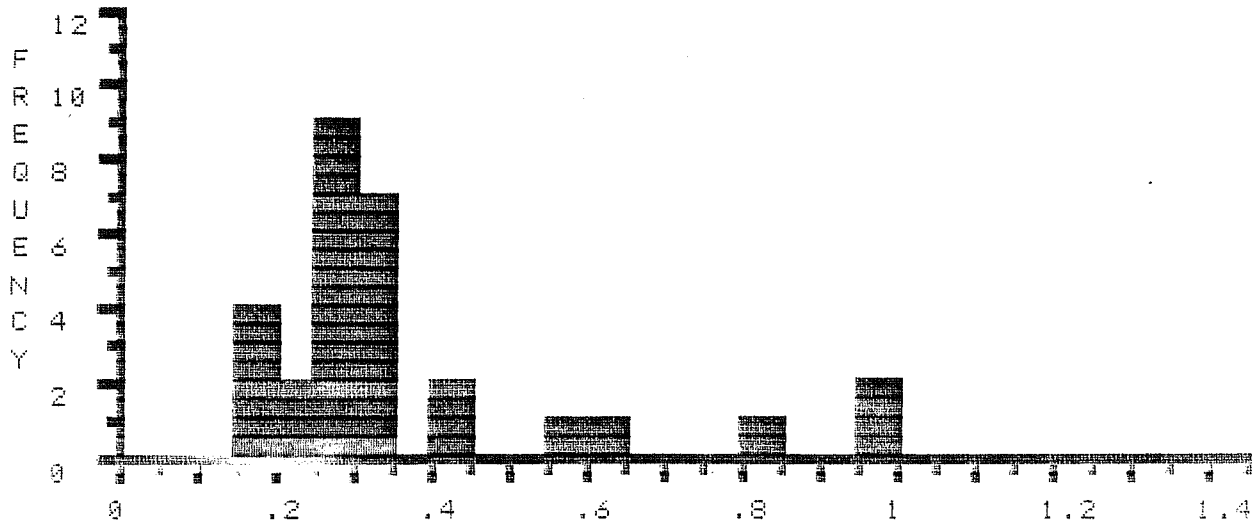
% R E F L E C T A N C E \* \* EDITED \* \*



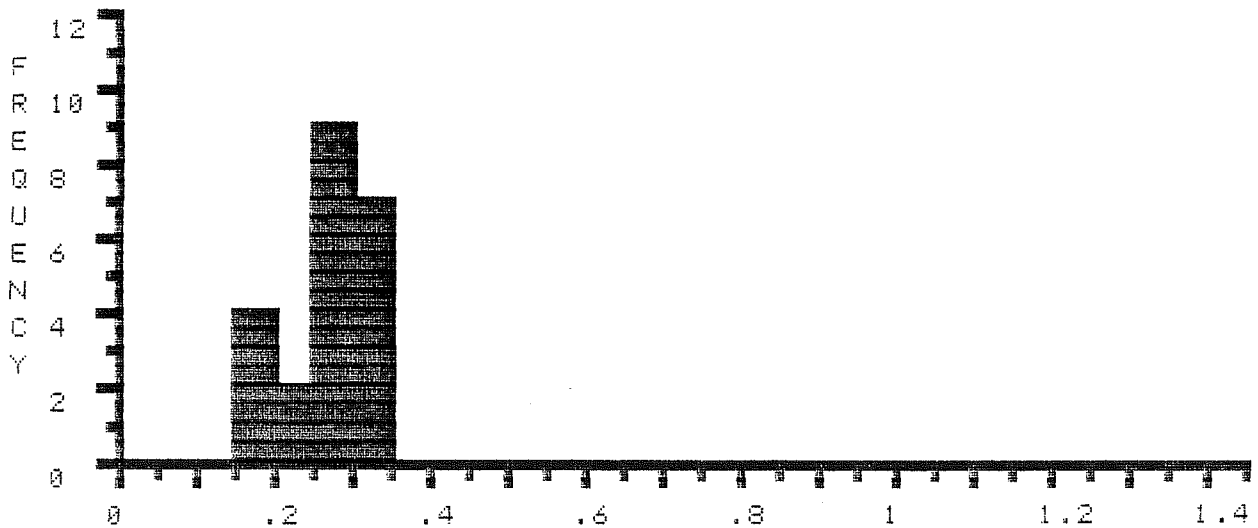
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1	*.27	*.27	*.28	*.28	*.28	*.29	*.3	*.3	*.3	*.3
2	*.31	*.33	*.33	.4	.4	.55	.63	.83	.98	.99
	SUM	NUMBER			MIN	MAX	MEAN	STAND.DEV.		
TOTAL >	10.57	29			.17	.99	.36	.22		
*EDIT >	5.79	22			.17	.33	.26	.05		

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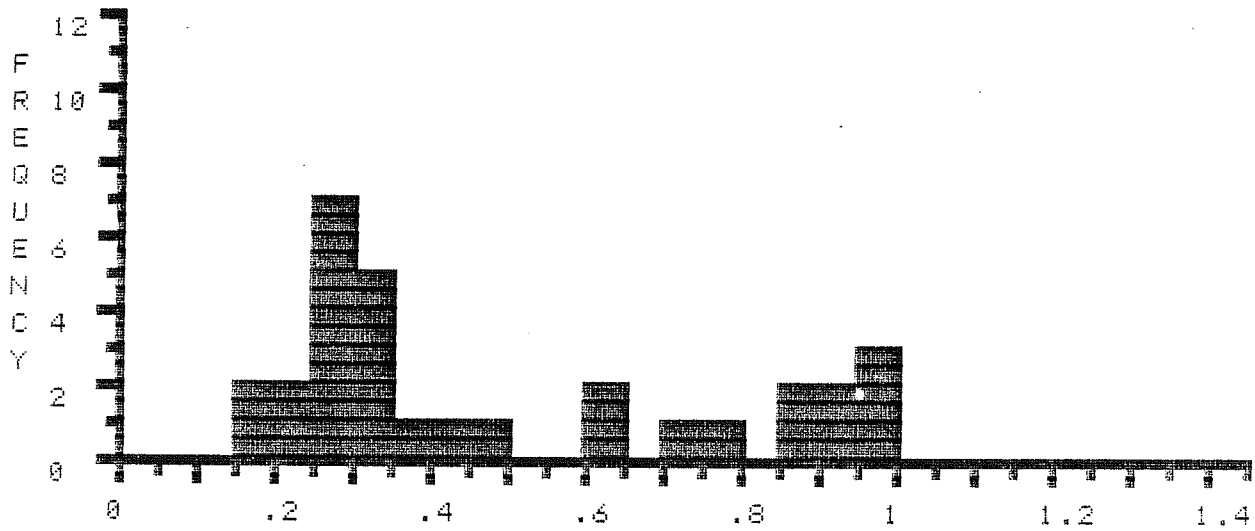


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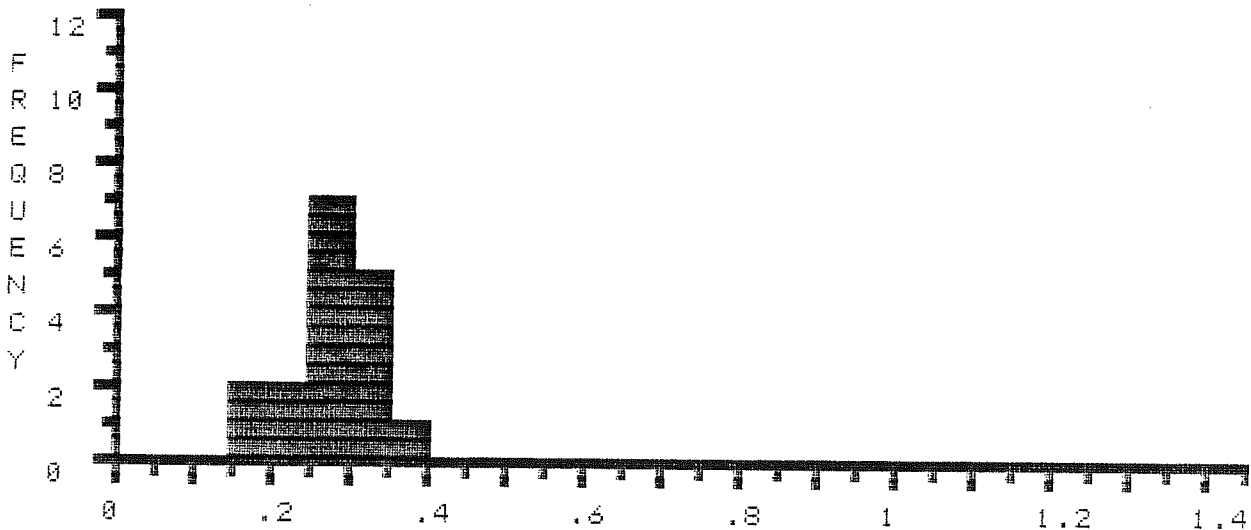
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ROW		*.19	*.19	*.2	*.2	*.26	*.26	*.27	*.28	*.28
1	*.28	*.29	*.3	*.31	*.32	*.33	*.33	*.35	.41	.45
2	.6	.64	.74	.78	.88	.88	.9	.92	.96	.99
3	.99									

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	14.78	30	.19	.99	.49	.29
*EDIT >	4.64	17	.19	.35	.27	.05

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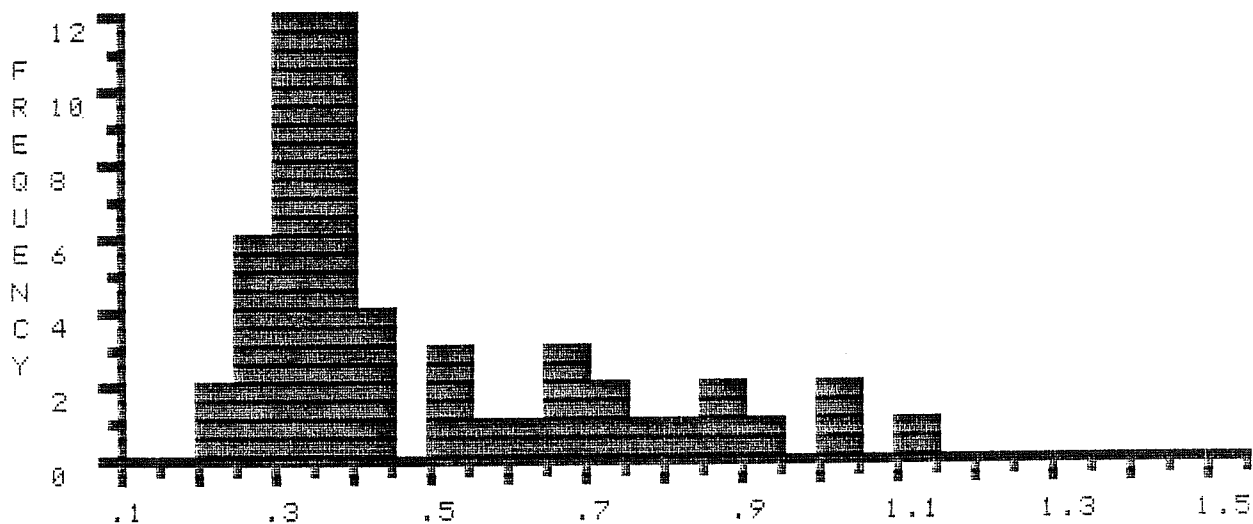


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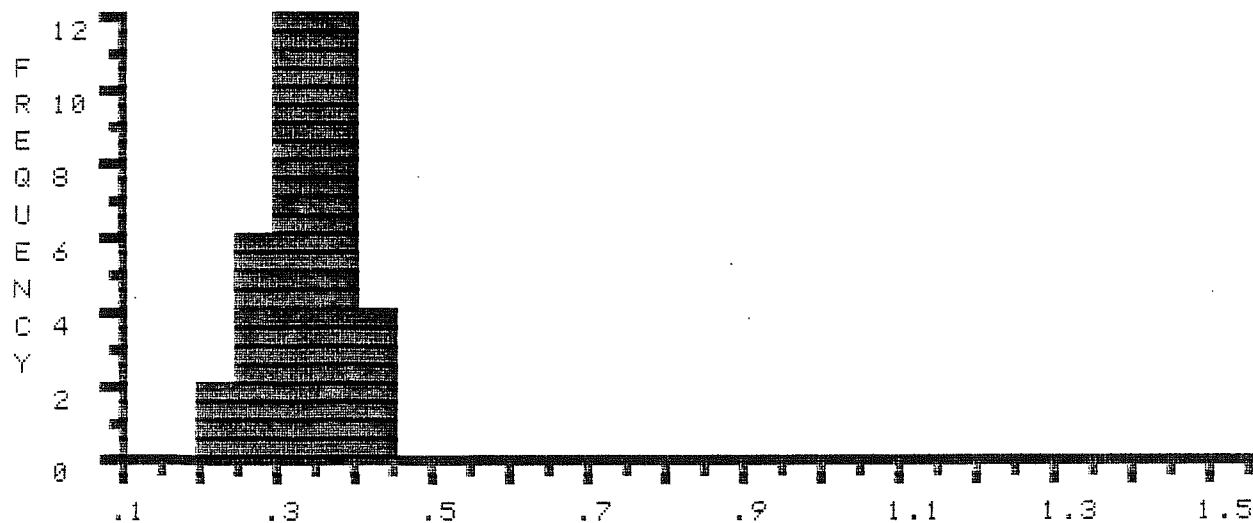
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ROW		*.2	*.24	*.25	*.26	*.27	*.27	*.28	*.29	*.3
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2	*.34	*.35	*.35	*.36	*.36	*.37	*.37	*.37	*.37	*.37
3	*.38	*.39	*.39	*.4	*.41	*.43	*.44	.51	.53	.54
4	.58	.62	.66	.67	.67	.71	.74	.79	.81	.85
5	.88	.93	1	1.01	1.12					

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	25.68	54	.2	1.12	.47	.23
*EDIT >	12.06	36	.2	.44	.33	.05

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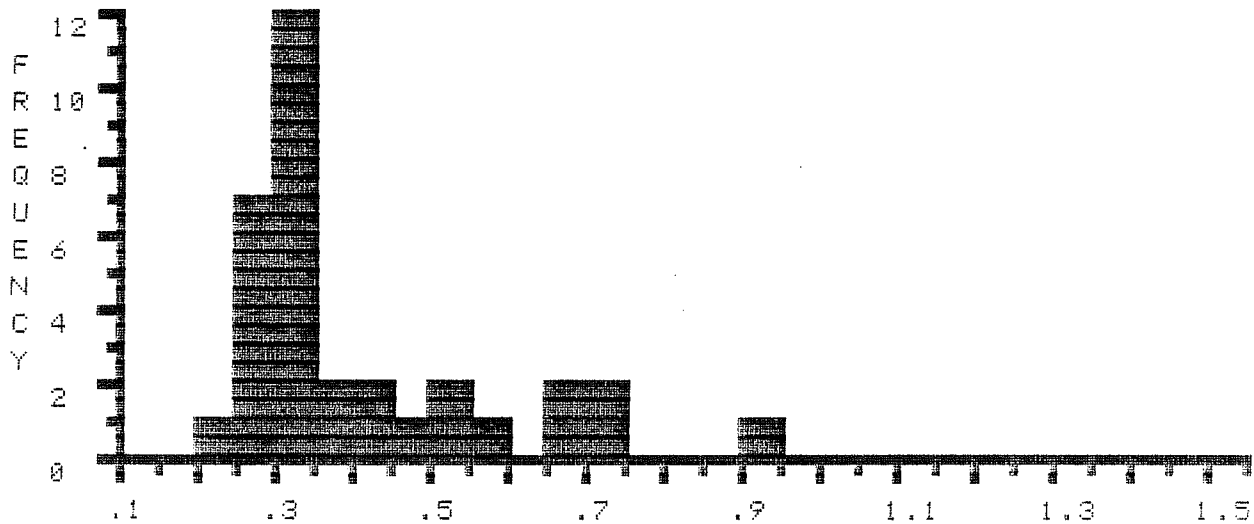


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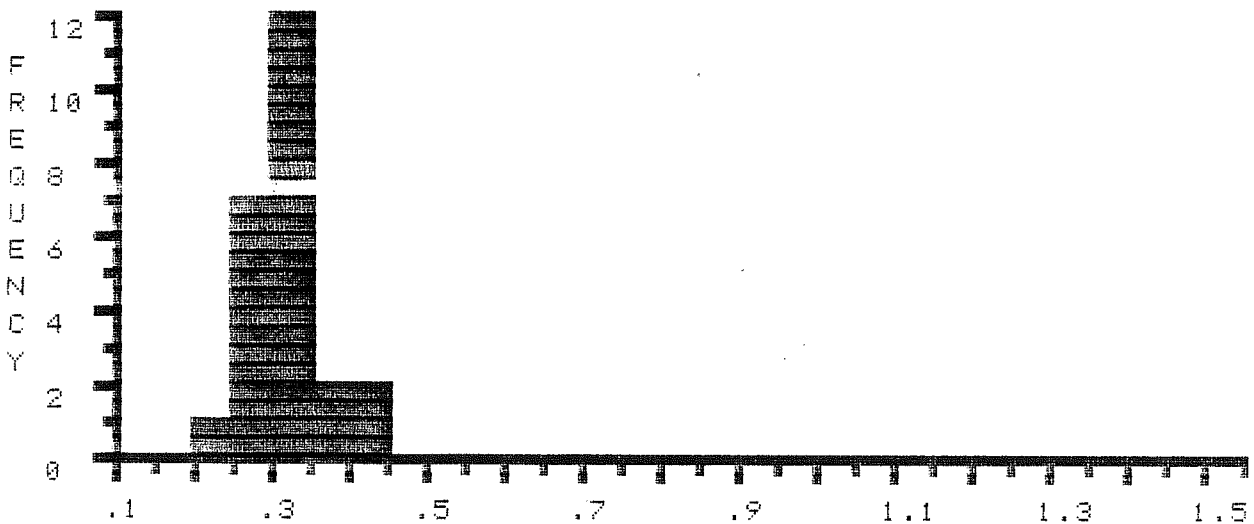
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ROW		*.24	*.26	*.26	*.26	*.27	*.27	*.28	*.29	*.3
1	*.3	*.31	*.32	*.32	*.33	*.33	*.34	*.34	*.34	*.34
2	*.34	*.36	*.37	*.41	*.44	.48	.52	.52	.56	.65
3	.69	.71	.73	.91						

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	13.39	33	.24	.91	.4	.16
*EDIT >	7.62	24	.24	.44	.32	.05

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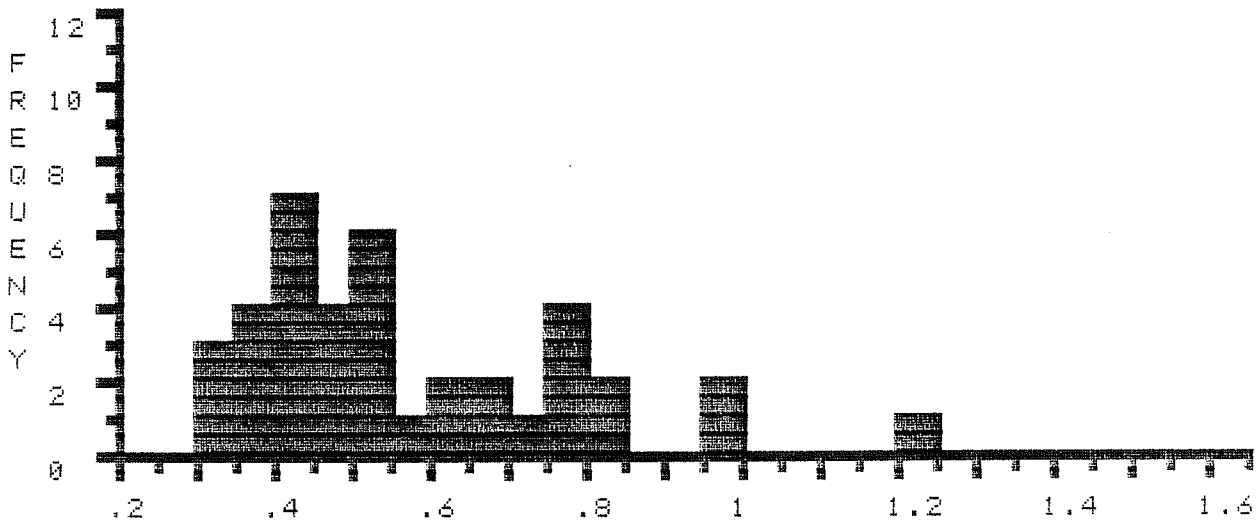


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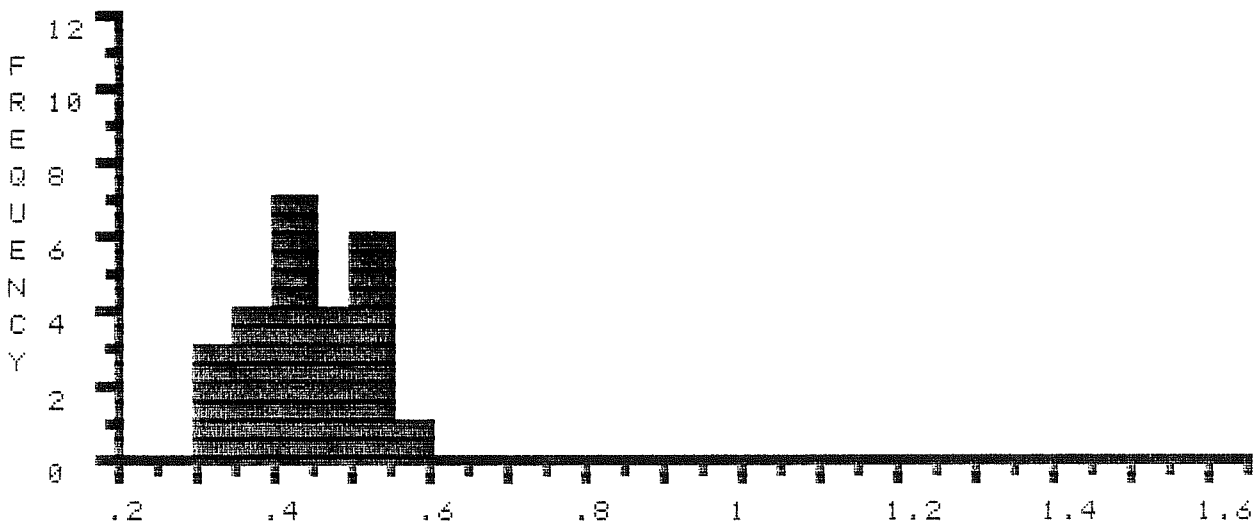
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.31	*.32	*.34	*.37	*.38	*.38	*.39	*.4	*.41
1	*.43	*.43	*.44	*.44	*.44	*.47	*.47	*.48	*.49	*.5
2	*.51	*.52	*.52	*.53	*.54	*.57	.64	.64	.65	.67
3	.72	.76	.76	.77	.78	.83	.84	.98	.99	1.22

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	22.33	39	.31	1.22	.57	.21
*EDIT >	11.08	25	.31	.57	.44	.07

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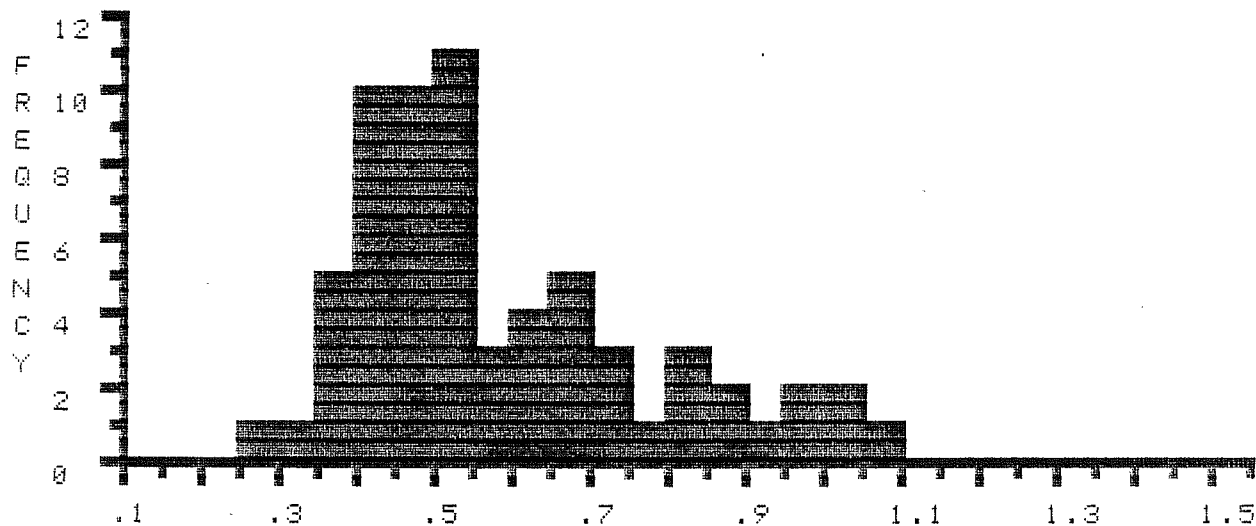


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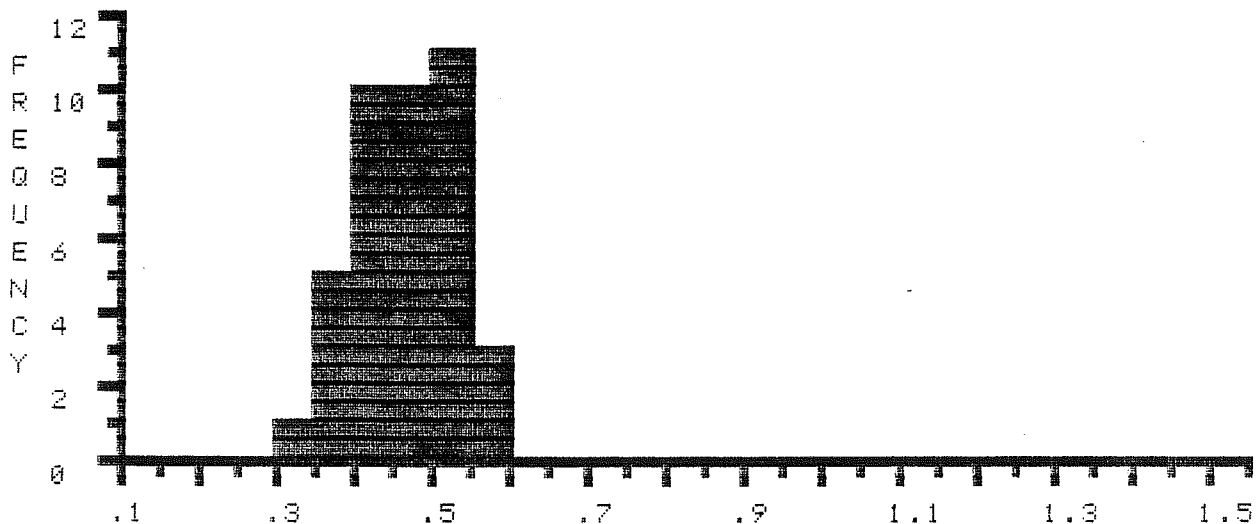
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ROW		.28	*.33	*.36	*.37	*.38	*.38	*.39	*.4	*.41
1	*.41	*.42	*.42	*.43	*.43	*.43	*.44	*.44	*.45	*.45
2	*.46	*.47	*.48	*.48	*.49	*.49	*.49	*.49	*.5	*.5
3	*.5	*.5	*.51	*.52	*.52	*.53	*.53	*.53	*.54	*.55
4	*.56	*.59	.62	.62	.63	.64	.66	.67	.67	.68
5	.68	.71	.72	.73	.77	.81	.82	.82	.85	.89
6	.91	.96	.99	1.04	1.04	1.05				

	SUM	NUMBER	MIN	MAX	MEAN	STAND. DEV.
TOTAL >	37.83	65	.28	1.05	.58	.19
*EDIT >	18.57	40	.33	.59	.46	.06

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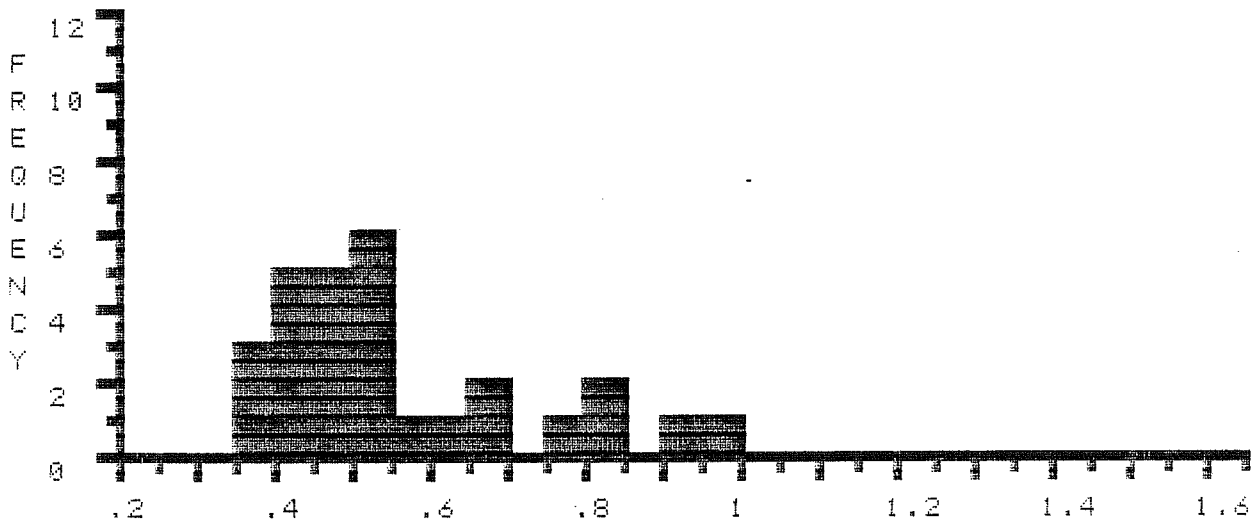


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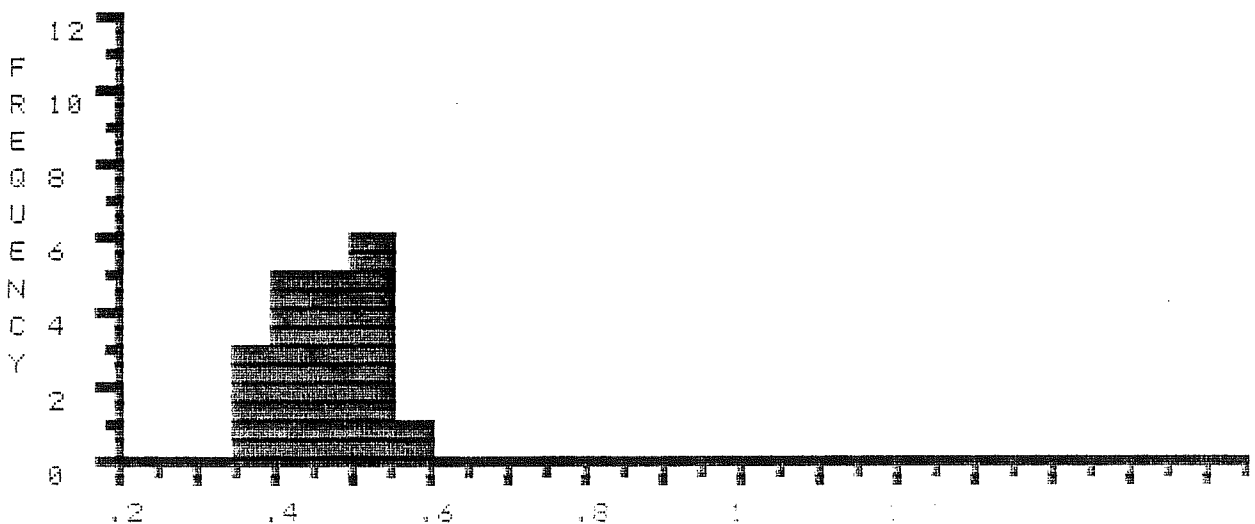
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.36	*.39	*.39	*.42	*.42	*.42	*.43	*.44	*.45
1	*.45	*.45	*.47	*.49	*.5	*.5	*.5	*.52	*.53	*.53
2	*.55	.62	.67	.67	.79	.81	.84	.94	.97	

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	15.52	28	.36	.97	.55	.17
*EDIT >	9.21	20	.36	.55	.46	.05

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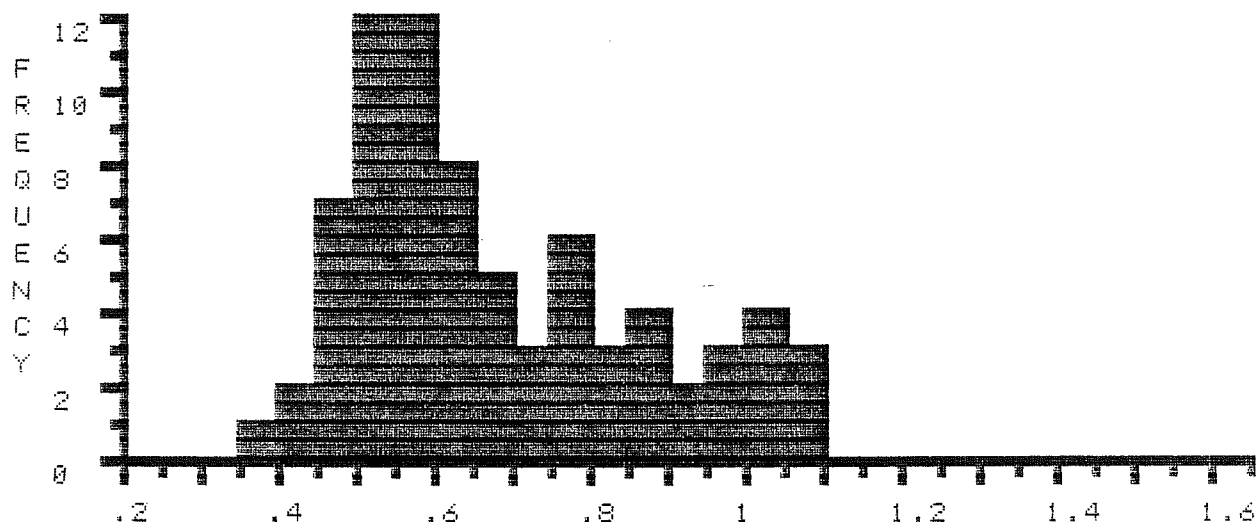


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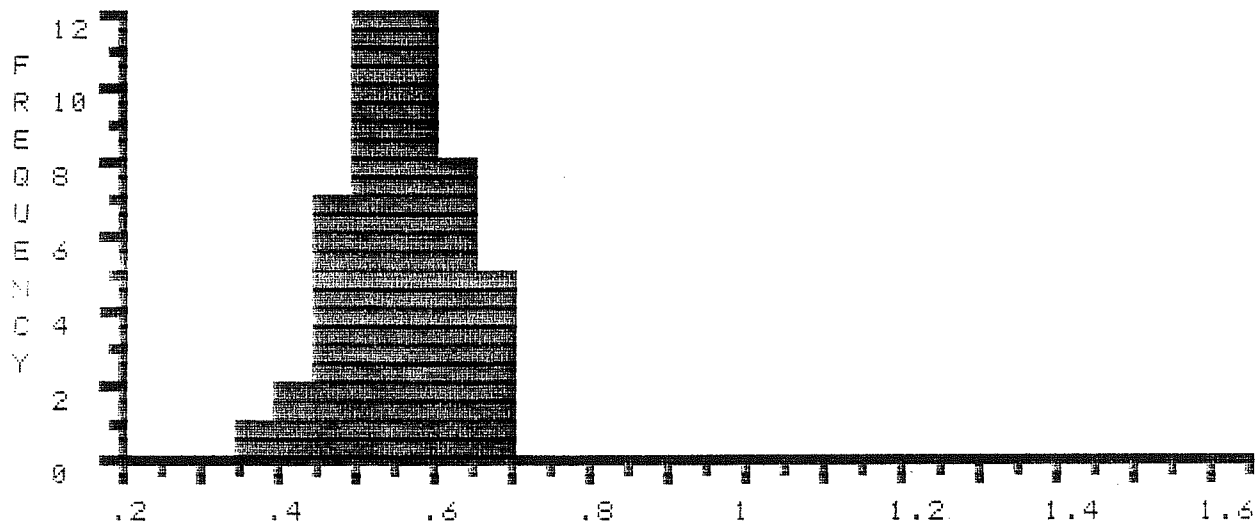
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.36	*.41	*.41	*.45	*.47	*.48	*.48	*.49	*.49
1	*.49	*.5	*.5	*.5	*.5	*.5	*.51	*.51	*.51	*.51
2	*.53	*.53	*.54	*.55	*.55	*.55	*.55	*.55	*.55	*.56
3	*.56	*.57	*.57	*.57	*.57	*.6	*.6	*.6	*.62	*.63
4	*.64	*.64	*.64	*.67	*.67	*.69	*.69	*.69	.74	.74
5	.74	.75	.76	.76	.77	.78	.79	.8	.83	.83
6	.86	.87	.88	.88	.91	.93	.96	.98	.99	1.03
7	1.04	1.04	1.04	1.06	1.08	1.09				

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	50.68	75	.36	1.09	.67	.19
*EDIT >	25.75	47	.36	.69	.55	.08

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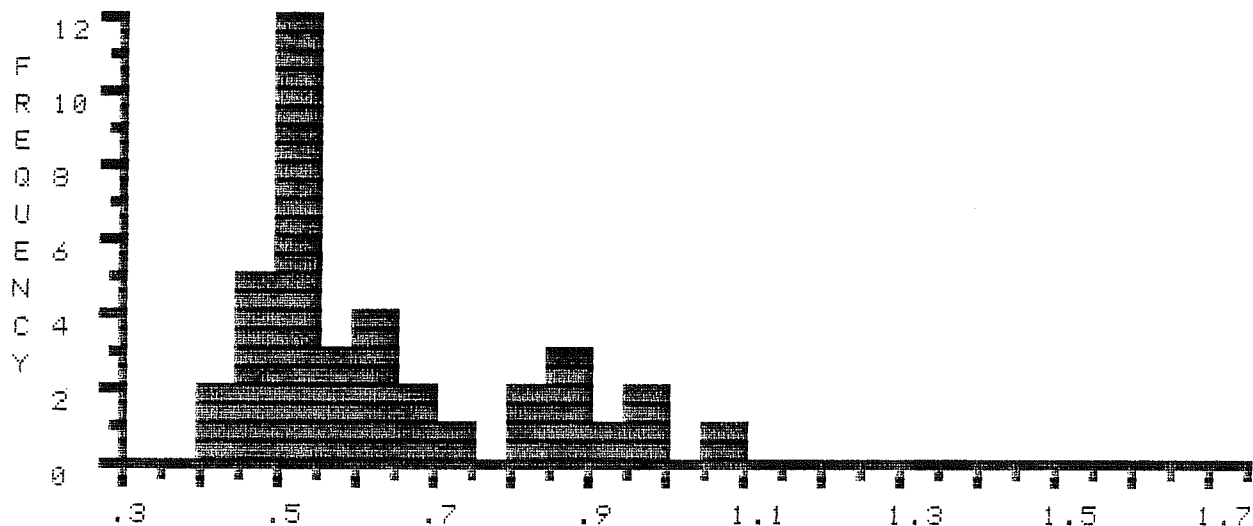


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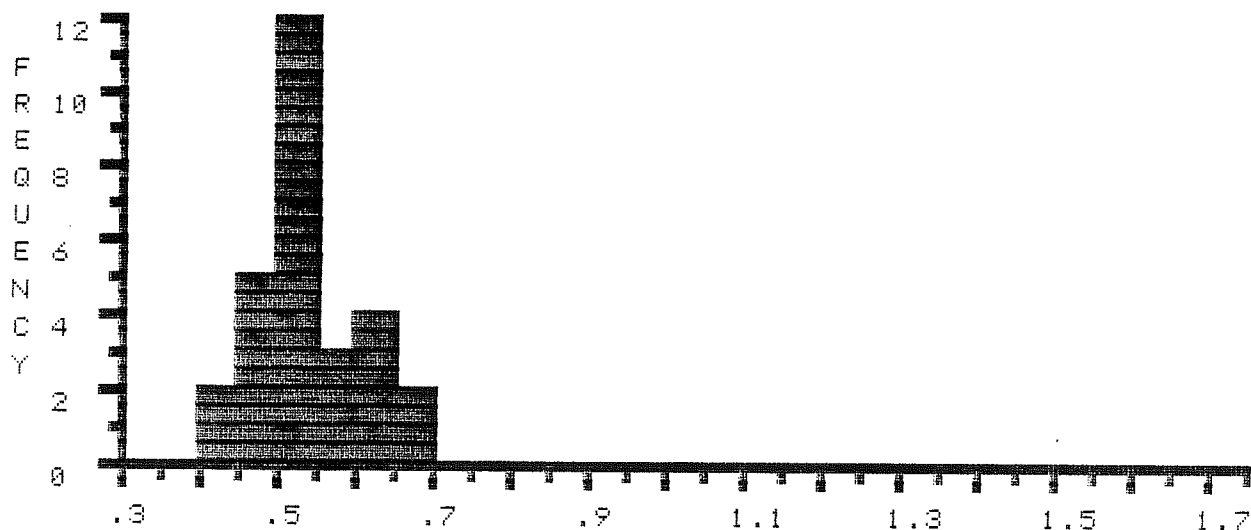
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.43	*.44	*.46	*.48	*.49	*.49	*.49	*.5	*.5
1	*.5	*.5	*.51	*.51	*.52	*.52	*.53	*.53	*.53	*.54
2	*.55	*.58	*.59	*.6	*.61	*.63	*.64	*.66	*.66	.7
3	.83	.83	.85	.86	.86	.93	.97	.97	1.07	

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	23.86	38	.43	1.07	.62	.17
*EDIT >	14.99	28	.43	.66	.54	.06

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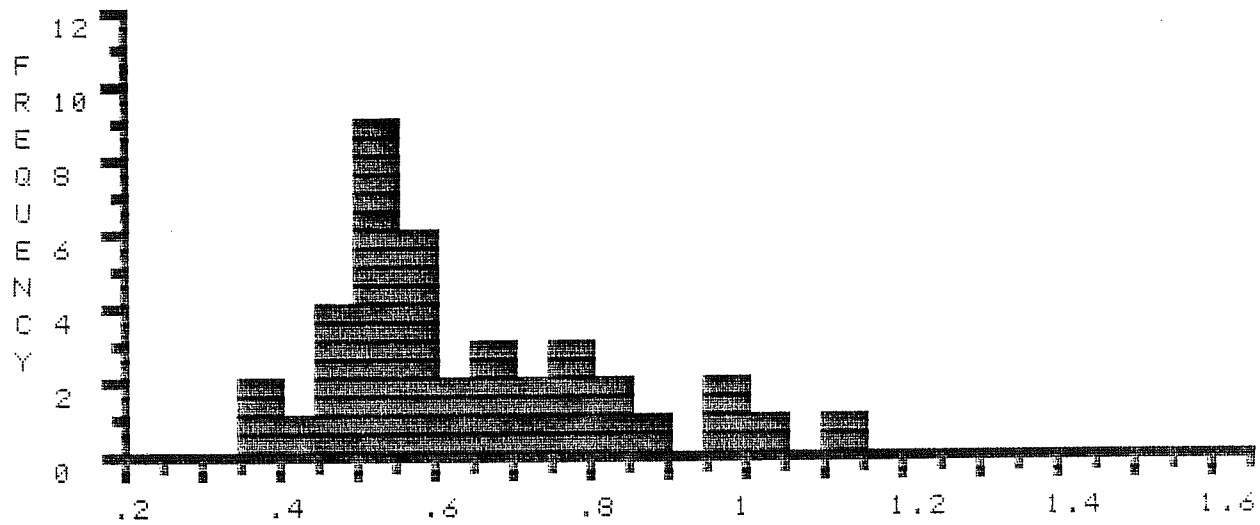
% R E F L E C T A N C E \* \* EDITED \* \*



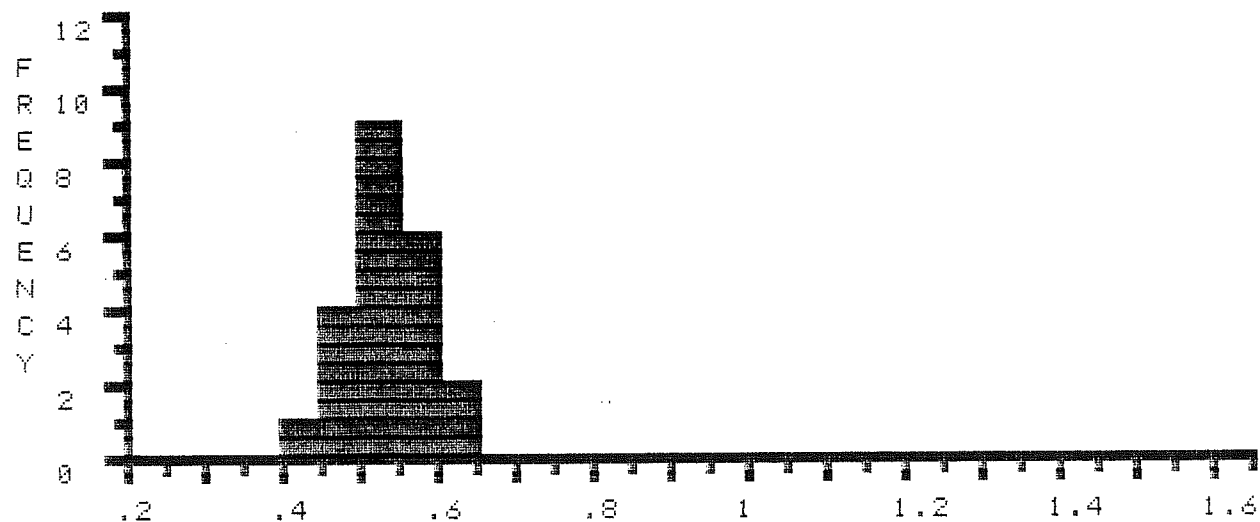
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COL>	0	1	2	3	4	5	6	7	8	9
ROW		.38	.39	*.44	*.47	*.47	*.49	*.49	*.5	*.51
1	*.51	*.52	*.52	*.53	*.53	*.54	*.54	*.55	*.56	*.56
2	*.56	*.56	*.57	*.6	*.63	.66	.67	.68	.7	.72
3	.75	.76	.77	.81	.84	.87	.95	.99	1.01	1.12
	SUM	NUMBER		MIN	MAX	MEAN	STAND.DEV.			
TOTAL >	24.72	39		.38	1.12	.63	.18			
*EDIT >	11.65	22		.44	.63	.53	.04			

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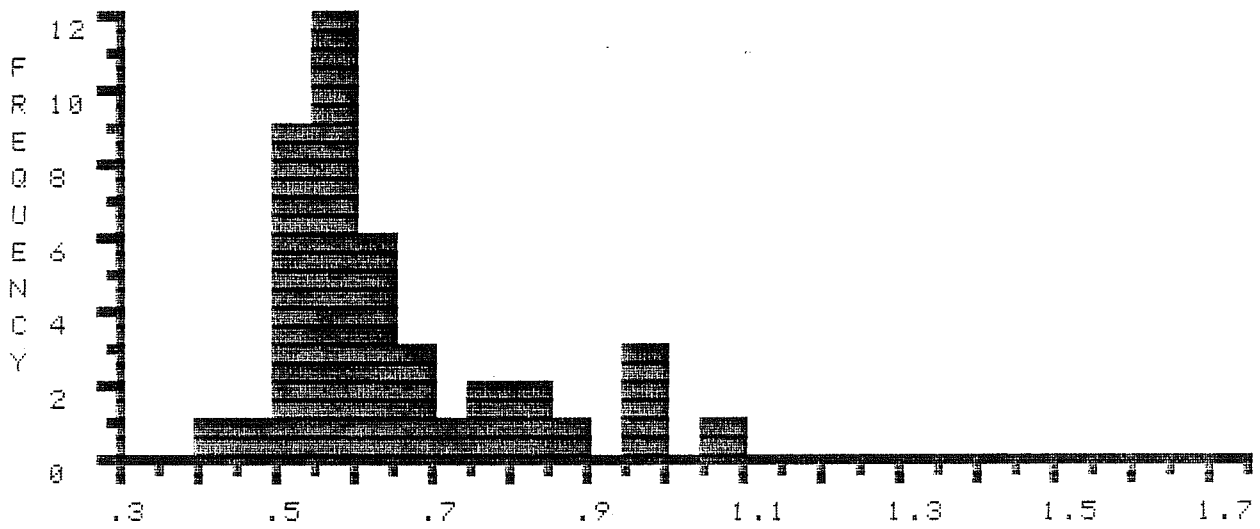


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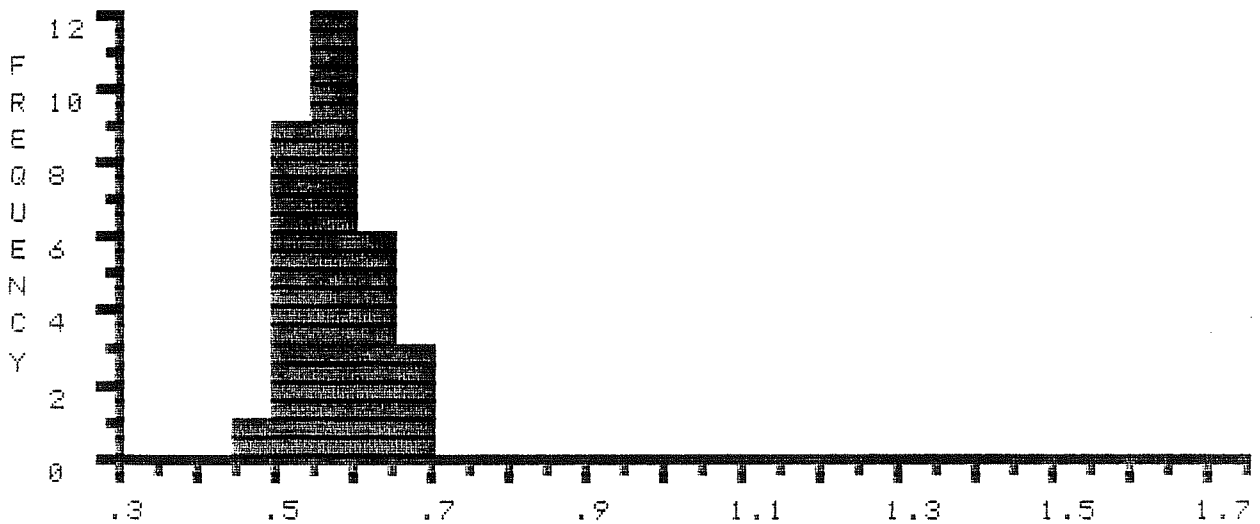
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.41	*.47	*.5	*.51	*.52	*.53	*.53	*.54	*.54
1	*.54	*.54	*.55	*.55	*.57	*.57	*.57	*.58	*.58	*.58
2	*.58	*.58	*.58	*.59	*.6	*.6	*.61	*.61	*.62	*.63
3	*.65	*.65	*.66	.71	.75	.79	.81	.84	.85	.96
4	.97	.98	1.07							

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	26.87	42	.41	1.07	.64	.15
*EDIT >	17.73	31	.47	.66	.57	.05

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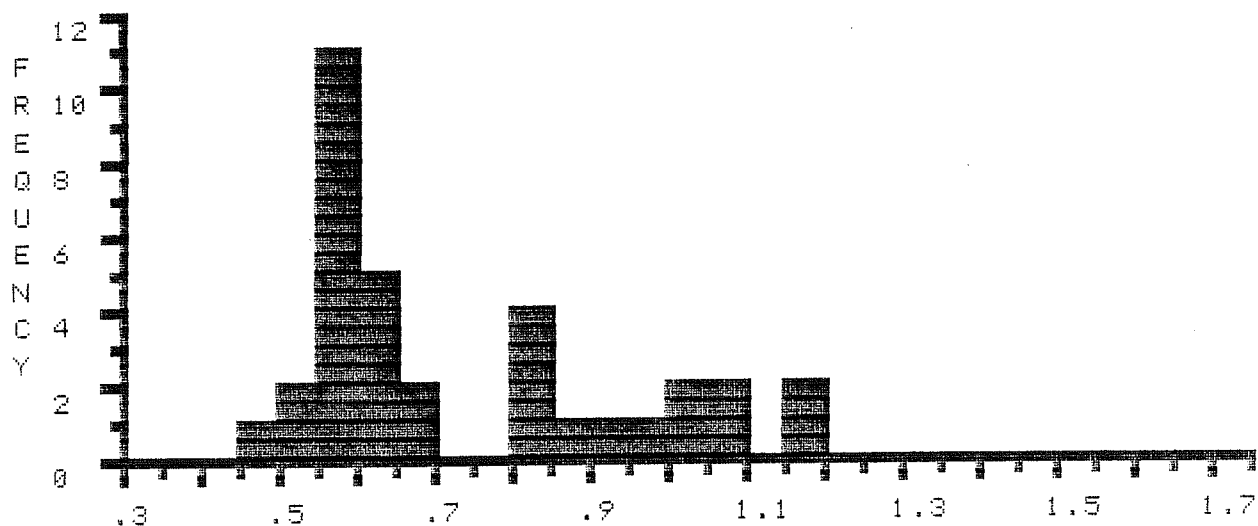


FILE >> KM313B DESCRIPTION FOLLOWS :  
 DEPTH 9370-9400', DOMINION 0-23, MIKE AVERY, JUNE-17-85

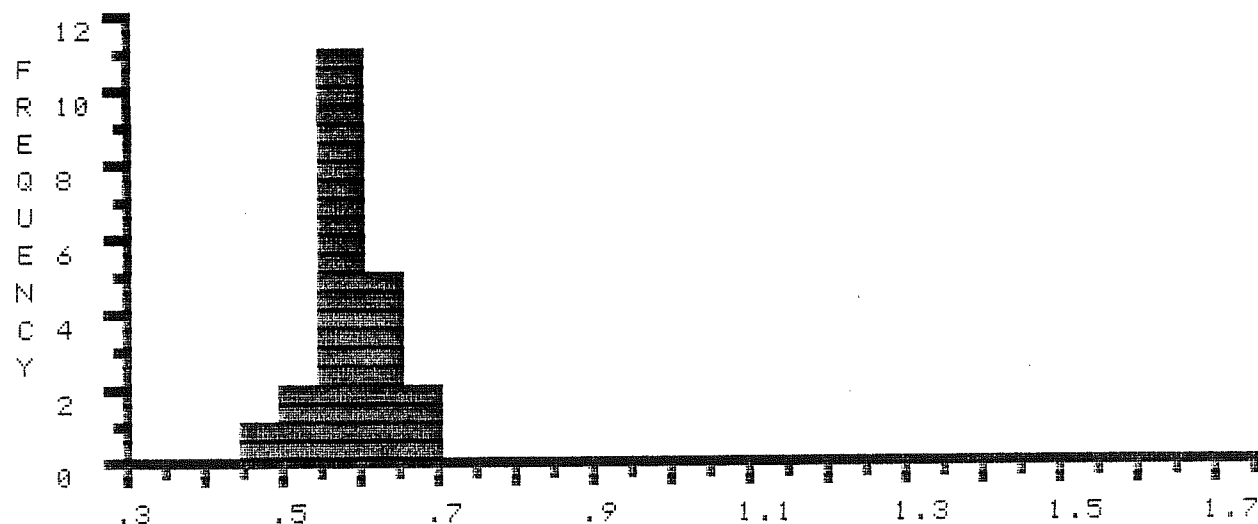
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.49	*.5	*.54	*.55	*.55	*.55	*.56	*.56	*.57
1	*.57	*.57	*.58	*.59	*.59	*.6	*.61	*.63	*.64	*.64
2	*.65	*.66	.8	.8	.81	.83	.88	.91	.96	1.02
3	1.04	1.07	1.09	1.15	1.19					

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	24.75	34	.49	1.19	.73	.21
*EDIT >	12.2	21	.49	.66	.58	.05

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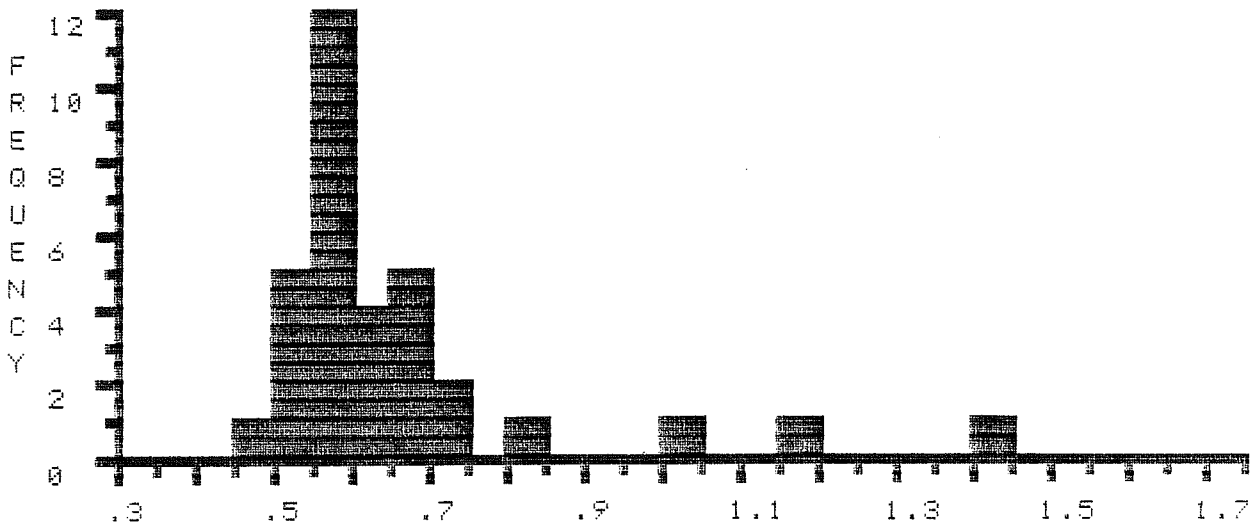


FILE >> KM313C DESCRIPTION FOLLOWS ;  
 DEPTH 9770-9800', DOMINION 0-23, MIKE AVERY, JUNE-21-85

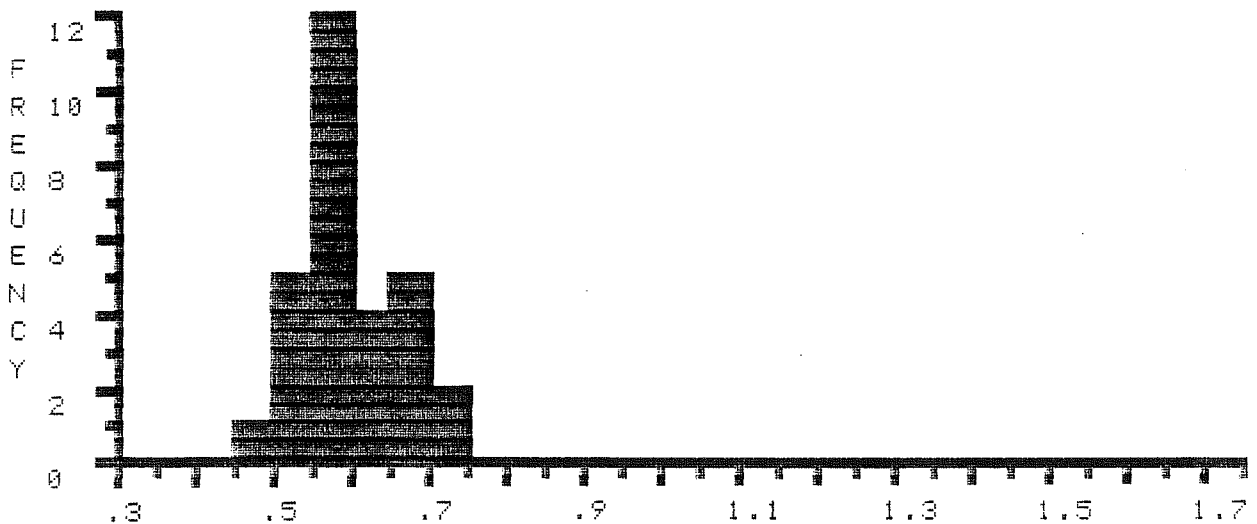
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.49	*.5	*.52	*.53	*.54	*.54	*.55	*.55	*.55
1	*.55	*.56	*.56	*.56	*.56	*.56	*.57	*.58	*.59	*.6
2	*.61	*.63	*.64	*.66	*.66	*.67	*.67	*.68	*.7	*.73
3	.84	1.04	1.18	1.43						

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	21.6	33	.49	1.43	.65	.2
*EDIT >	17.11	29	.49	.73	.59	.06

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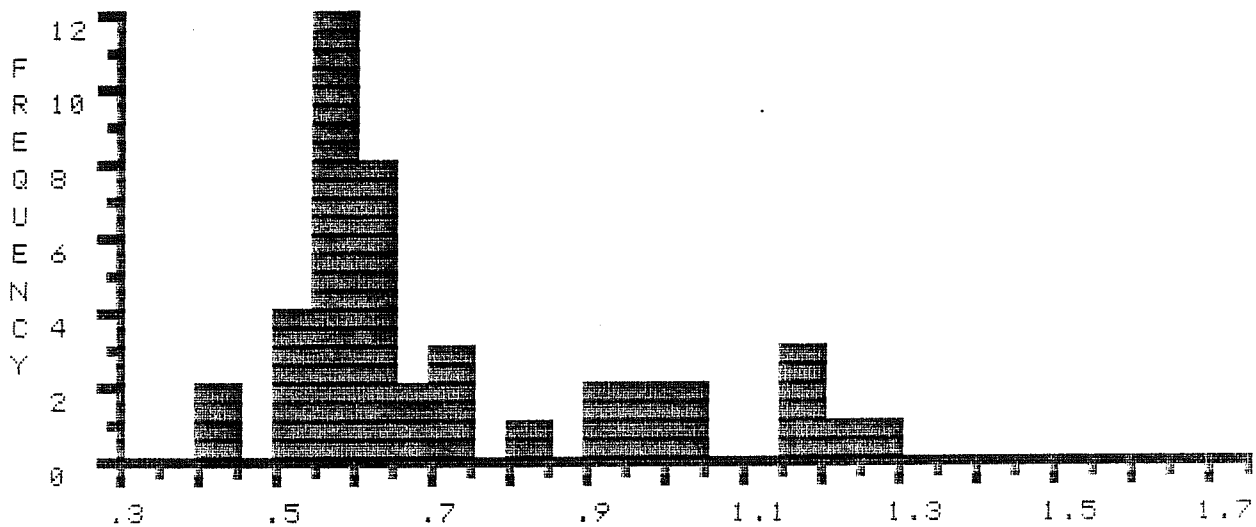


FILE >> KM314A DESCRIPTION FOLLOWS :  
 DEPTH 10070-10100', DOMINION 0-23, MIKE AVERY, JUNE-17-85

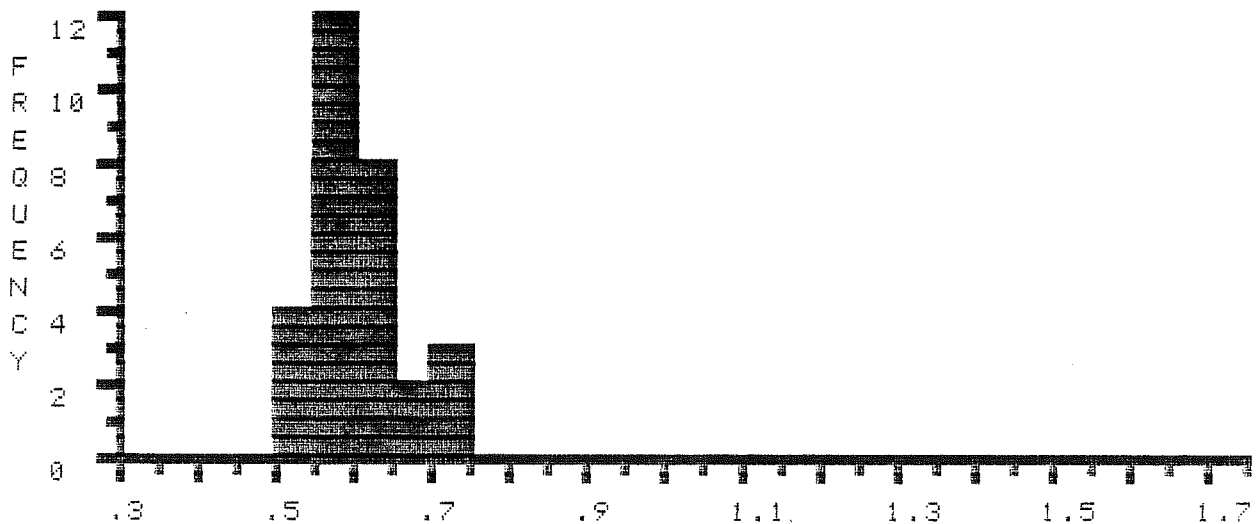
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.41	.44	*.52	*.53	*.53	*.54	*.55	*.55	*.56
1	*.56	*.57	*.57	*.58	*.58	*.58	*.58	*.59	*.59	*.6
2	*.6	*.6	*.61	*.62	*.62	*.62	*.64	*.65	*.67	*.7
3	*.71	*.73	.81	.92	.94	.96	.99	1	1.01	1.15
4	1.15	1.17	1.2	1.28						

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	30.78	43	.41	1.28	.71	.23
*EDIT >	17.35	29	.52	.73	.6	.05

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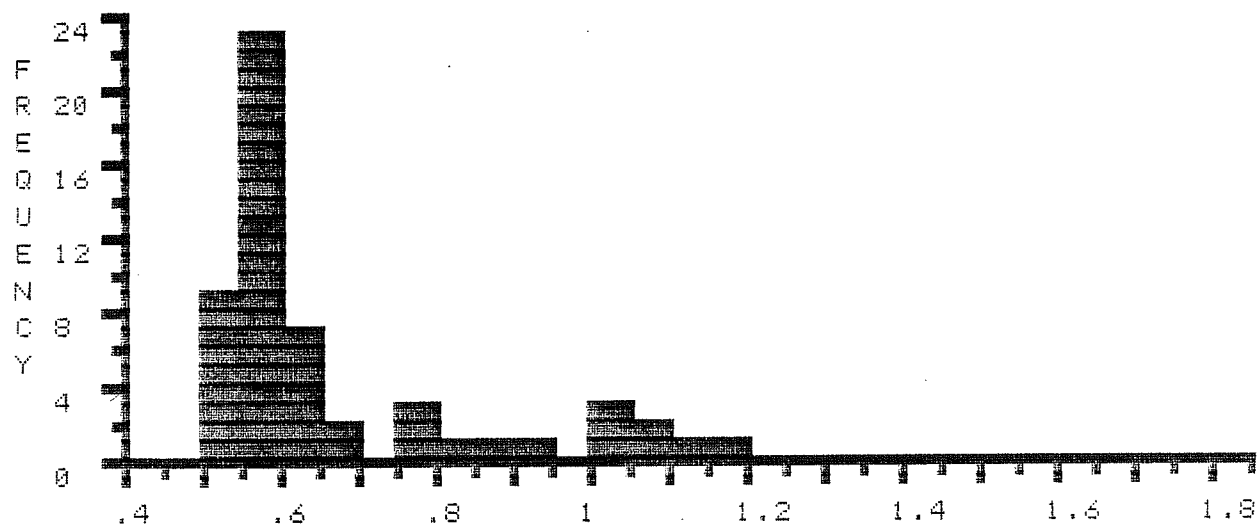


FILE >> KM3148      DESCRIPTION FOLLOWS :  
 DEPTH 10380-10410', DOMINION 0-23, MIKE AVERY, JUNE-18-85

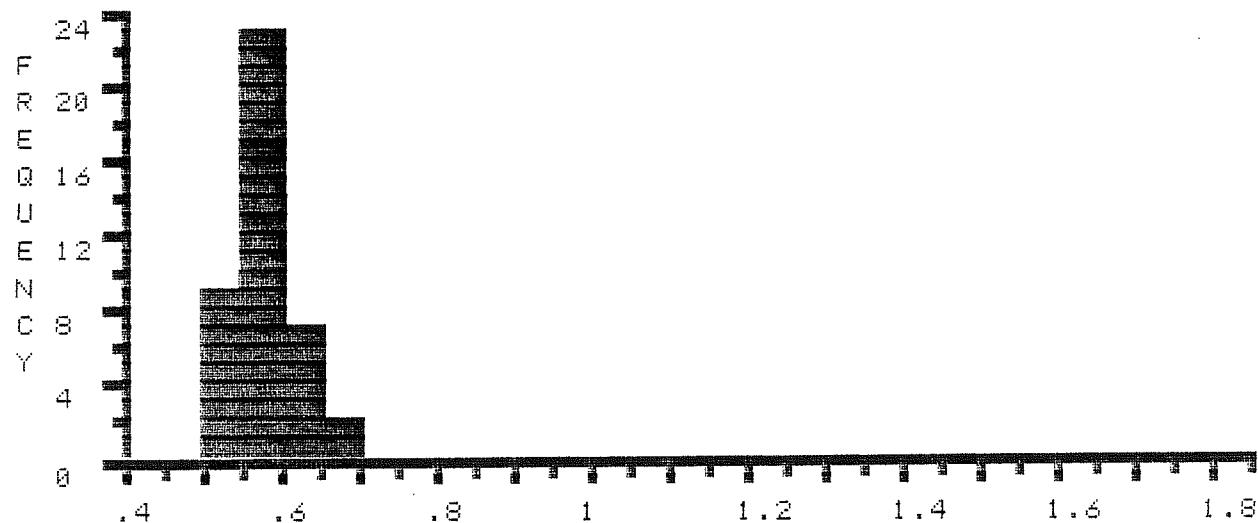
COL>	0	1	2	3	4	5	6	7	8	9
ROW		*.5	*.5	*.5	*.52	*.53	*.54	*.54	*.54	*.54
1	*.55	*.55	*.55	*.55	*.55	*.55	*.56	*.56	*.56	*.57
2	*.57	*.57	*.57	*.58	*.58	*.58	*.59	*.59	*.59	*.59
3	*.59	*.59	*.59	*.6	*.61	*.61	*.62	*.62	*.62	*.63
4	*.68	*.68	.75	.75	.77	.82	.87	.9	1	1.01
5	1.04	1.08	1.09	1.1	1.16					

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	35.85	54	.5	1.16	.66	.18
*EDIT >	23.51	41	.5	.68	.57	.04

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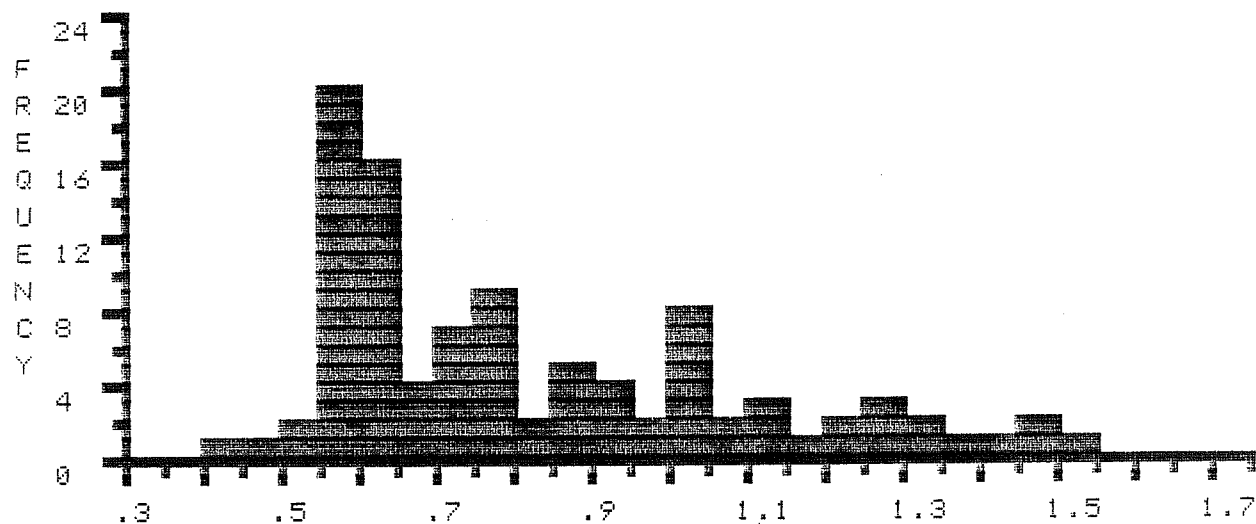


FILE >> KM3140      DESCRIPTION FOLLOWS :  
 DEPTH 11490-11520', DOMINION 0-23, MIKE AVERY, JUNE-17-65

COL>	0	1	2	3	4	5					
ROW		.41	.45	.54	.54	.55	.55	.55	.55	.55	.55
1	.55	.55	.56	.56	.56	.57	.58	.58	.58	.58	.58
2	.58	.59	.59	.59	.59	.6	.6	.6	.6	.6	.6
3	.61	.61	.61	.62	.62	.62	.63	.63	.64	.64	.64
4	.64	*.66	*.67	*.67	*.68	*.7	*.71	*.72	*.72	*.74	*.74
5	*.74	*.74	*.75	*.75	*.76	*.77	*.77	*.77	*.78	*.79	*.79
6	*.79	*.8	*.84	.85	.85	.87	.89	.89	.9	.92	.92
7	.93	.93	.97	.99	1	1	1.03	1.03	1.03	1.04	1.04
8	1.04	1.04	1.05	1.06	1.11	1.13	1.13	1.15	1.22	1.23	1.23
9	1.26	1.29	1.29	1.32	1.34	1.36	1.44	1.45	1.46	1.53	1.53

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	80.51	99	.41	1.53	.81	.27
*EDIT >	16.32	22	.66	.84	.74	.05

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