

Report No. EPGs-DOM.9-85MPA

Vitrinite reflectance (Ro) of  
dispersed organics in Mobil-Gulf  
Adolphus D-50.

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GEOLOGICAL SURVEY  
OTTAWA

Vitrinite reflectance (Ro) of dispersed organics in Mobil-Gulf Adolphus D-50.

"Quotation in full or in part from this report must be with the prior approval of the Eastern Petroleum Geology Subdivision of the Atlantic Geoscience Centre, Dartmouth, Nova Scotia".

G.S.C. Locality No: D141Location: 46°59'03.06"N, 48°22'28.86"WR.T. Elevation: 98'Sample Interval: 1110 - 12090'Total Depth: 12093'Water Depth: 377'Release Date: January 5, 1977Interval Studied: 4440 - 12030'Depth Units: Feet referenced to R.T.

Vitrinite reflectance has been determined on 17 samples (Table II) from the Mobil-Gulf Adolphus D-50, which was classified as a wildcat well and is located on the Grand Banks, approximately 338km (210mi) east-southeast of St. John's, Newfoundland.

Data acquisition and manipulation for this report utilized the Zeiss Photomultiplier III Zonax microcomputer system with improvements in software to provide a dynamic histogram display as readings are acquired. Sample preparation followed the procedures listed in Appendix I. The analysis of the well revealed the thermal maturation intervals given in Table I. Specific maturation levels, as set out in this report, were based on those of Dow (1977, Appendix II) with modified terminology.

Table I  
Inferred Thermal Maturation Levels

Determined

Above 4788'	0.2 - 0.4	% Ro	immature
4788-6303'	0.4 - 0.5	% Ro	immature approaching maturity
6303-7541'	0.5 - 0.6	% Ro	marginally mature
7541'	0.6	% Ro	onset of significant oil generation
9494'	0.8	% Ro	peak of oil generation
11009'	1.0	% Ro	onset of significant wet gas generation
12093' T.D.	1.17	% Ro	within oil window

Projected

12247'	1.2	% Ro	onset of significant dry gas generation
13046'	1.35	% Ro	oil floor

### Remarks

The sample coverage of vitrinite reflectance data (Figure 1, Table II) was adequate over most of the well. Samples were available down to approximately T.D. because Adolphus D-50 was drilled 'off structure' and did not bottom in rebeds and salt as had Adolphus 2k-41 (Avery, 1984).

The line through the data points represents the best fit established by the least squares method

Due to significant cavings (interpreted from caliper log) over most of the well selecting the indigenous population from the vitrinite reflectance histogram plots was very difficult. This led to two interpretations of the maturation profile for this well. A traditional interpretation which selected the most likely populations even though some cavings influence probably exists in some of the samples has been made (Figure 1). The significant maturation levels presented in this report are based on this first interpretation.

A maturation depth curve was also prepared for vitrinite reflectance values obtained from cuttings samples collected over intervals where contamination from cavings was likely to be minimal (Figure 2). The five samples chosen also have well-developed populations of vitrinite reflectance measurements (see histograms). The resulting maturation profile (Figure 2) could be validated by data from sidewall cores, but these are not available. It implies more rapid maturation with depth than the conventional linear regression plot.

In an earlier study, (Bujak, 1977) TAI values have been reported as 2 - 2+ (0.6 - 0.9 Ro equivalent) at T.D.

Whichever interpretation is preferred, these maturation data provide evidence indicating that the thermal regime at Adolphus D-50 was suitable for the generation of oil and gas. However no oil or gas shows were recorded. This may indicate lack of source rocks in the drilled section.

### References

- Avery, M.P., 1984. Vitrinite reflectance (Ro) on dispersed organics in the Mobil Gulf Adolphus 2K-41. Report No. EPGS-DOM.32-84MPA.
- Bujak, J.P., 1976. Kerogen type and thermal alteration index of Mobil Gulf Flying Foam I-13, Grand Banks. Report No. EPGS-DOM.28-76JPB.
- Dow, W.G., 1977. Kerogen studies and geological interpretations. Journal of Geochemical Exploration, no. 7, p. 79-99.

Wade, J.A., 1977. Stratigraphic picks Mobil Gulf Adolphus D-50. Report No. EPGs-STRAT.32-77JAW, 1p. (revised in 1980).

June 26, 1985

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Eastern Petroleum Geology

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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	K0278A	4440-4470	.37(+.06)	50	31
2	K0278B	5010-5040	.42(+.08)	45	30
3	K0278C	5460-5490	.47(+.08)	46	32
4	K0279A	5730-5760	.48(+.07)	47	33
5	K0279B	6180-6210	.48(+.06)	44	36
6	K0279C	6630-6660	.54(+.05)	56	45
7	K0280A	6990-7020	.51(+.06)	44	36
8	K0280B	7410-7440	.57(+.08)	45	27
9	K0280C	7800-7830	.59(+.09)	80	60
10	K0281A	8100-8130	.58(+.05)	45	38
11	K0281B	8800-8830	.79(+.07)	61	10
12	K0281C	9100-9130	.82(+.11)	51	9
13	K0282A	9500-9530	.85(+.11)	58	12
14	K0282B	10000-10030	.98(+.08)	74	47
15	K0282C	11400-11430	1.07(+.1)	83	45
16	K0283A	11700-11730	1.04(+.1)	18	11
17	K0283B	12000-12030	1.10(+.1)	44	24

Note: All samples are Kerogen Type.

Table III  
Formation Tops (Wade '77)

Depth	Formation
in casing	Banquereau
8725'	Wyandot
9552'?	Dawson Canyon
10026-10182'	Petrel Mbr
10182'	Shortland Shale or equiv.
12093'	T.D.

LOT 1 11.37.08 WED 18 JUN, 1985 JOB-ROHC:11, BEDFORD INSTITUTE DISSPLA VER 8.2

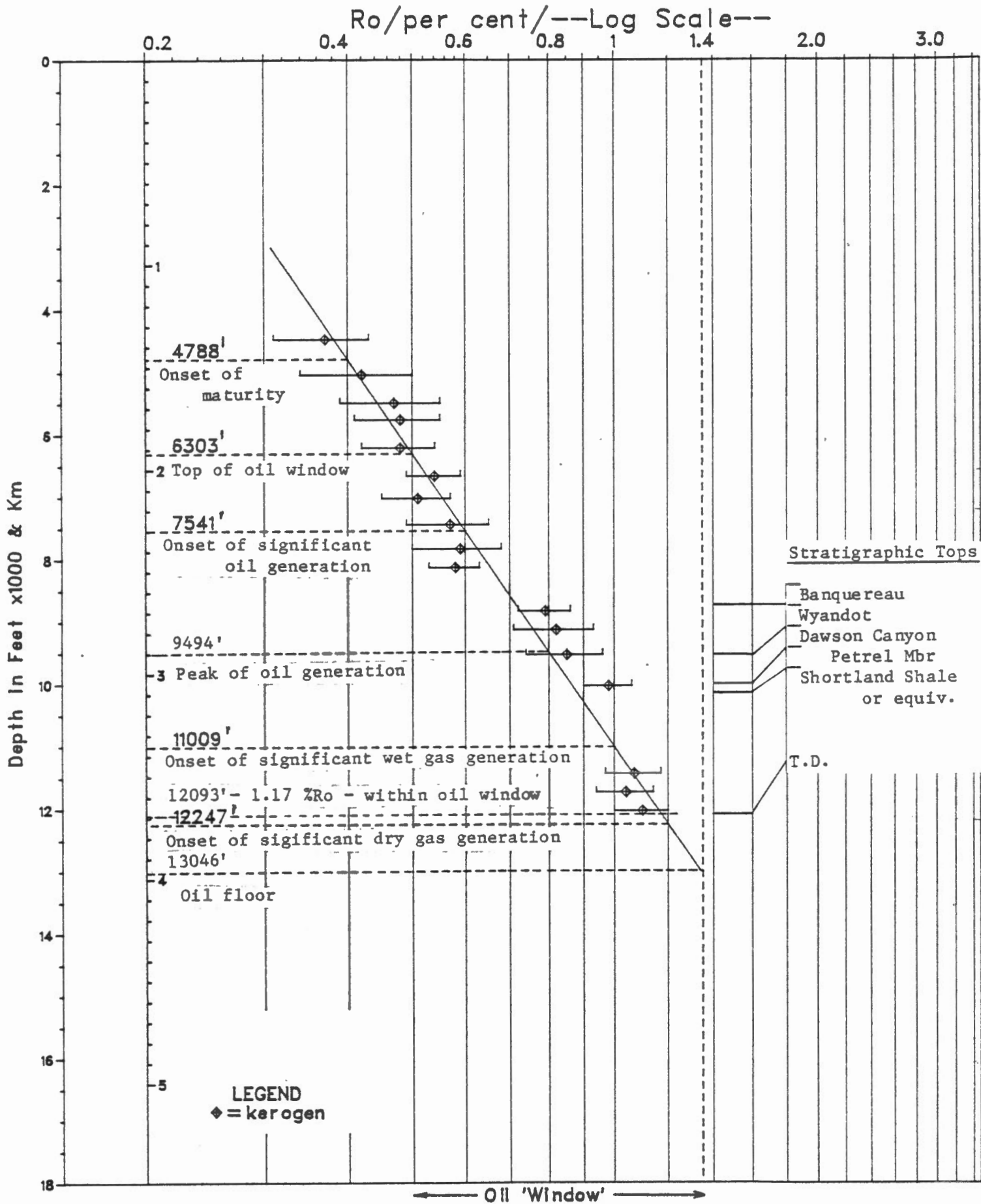


Fig. 1 Adolphus D-50

LOT 1 12.02.55 WED 19 JUN, 1985 JOB-ROK1111, BEDFORD INSTITUTE DISSPLA VER 8.2

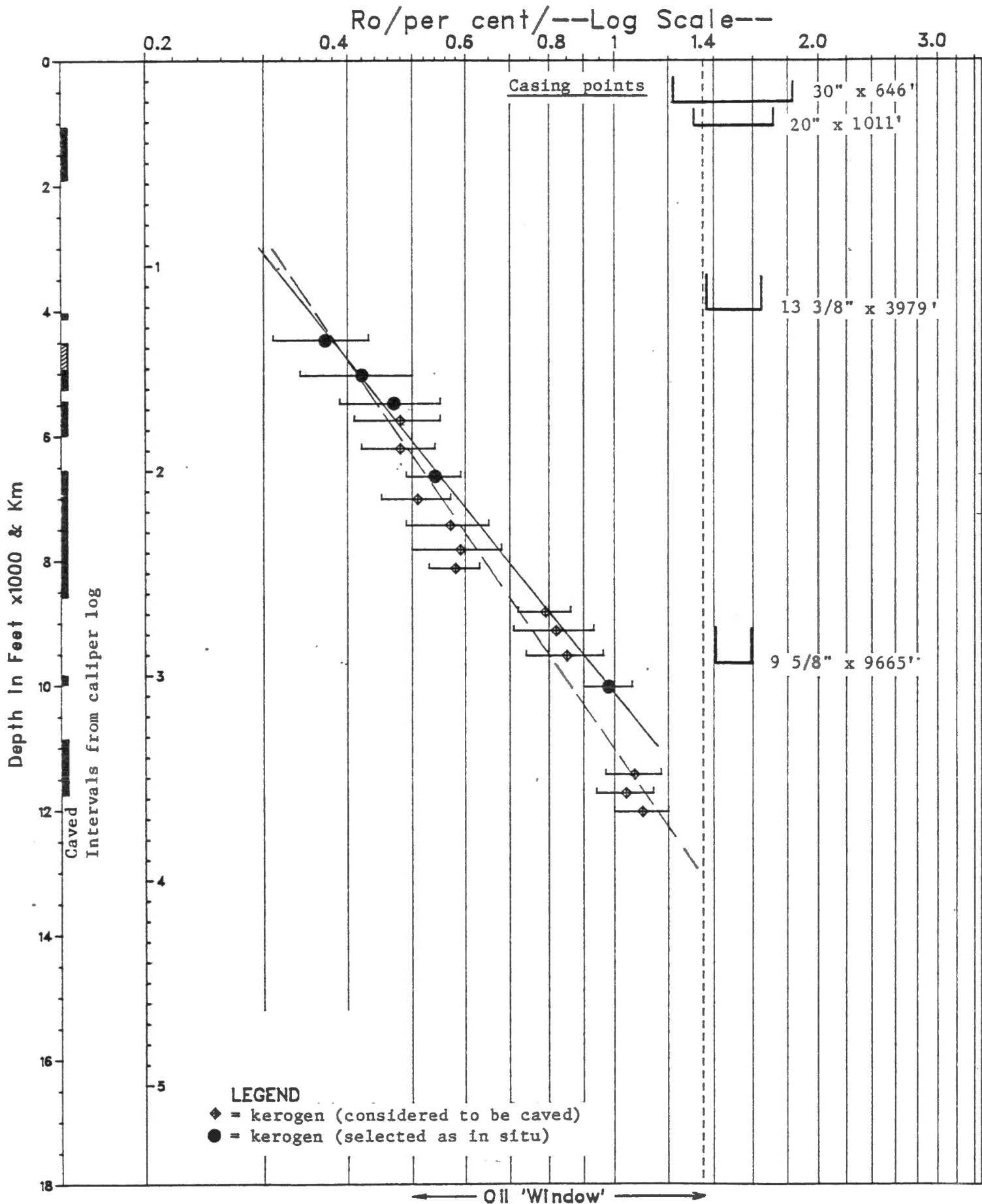


Fig. 2 Adolphus D-50 alternate

APPENDIX I

Sample Preparation Method

COGLA Lab preparation

Preliminary Wash

Samples dried in oven

Split: a. all of coarse to Petrology Lab

b. 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.

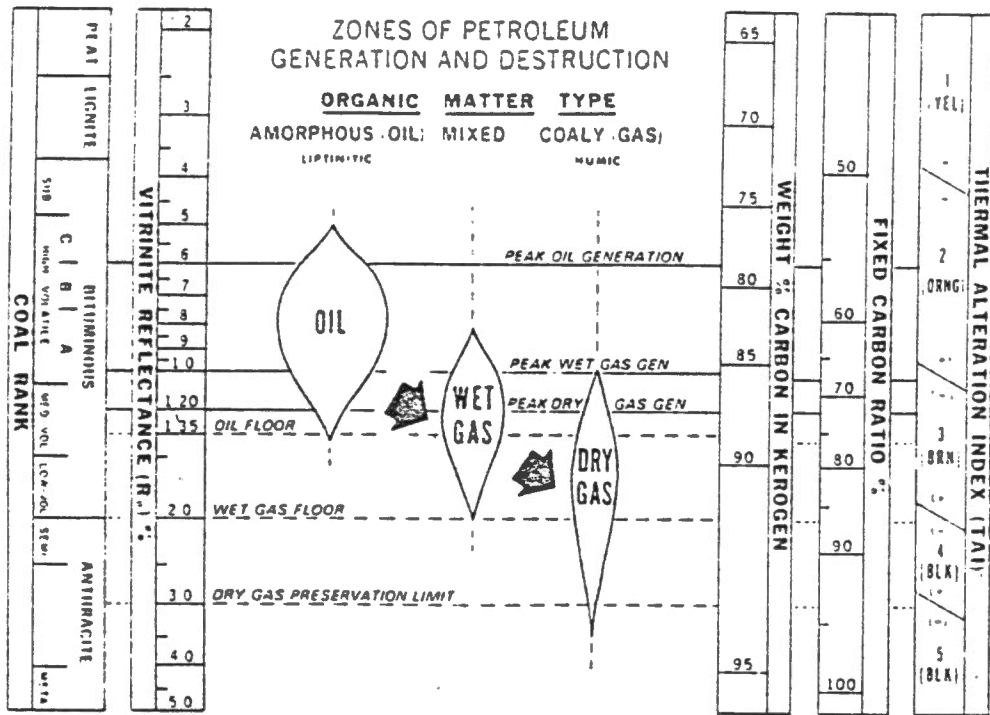
Mounted using epoxy resin (EPO-TEK 301) in predrilled plastic stubs.

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 Ro is now used as the 'peak of oil generation'.

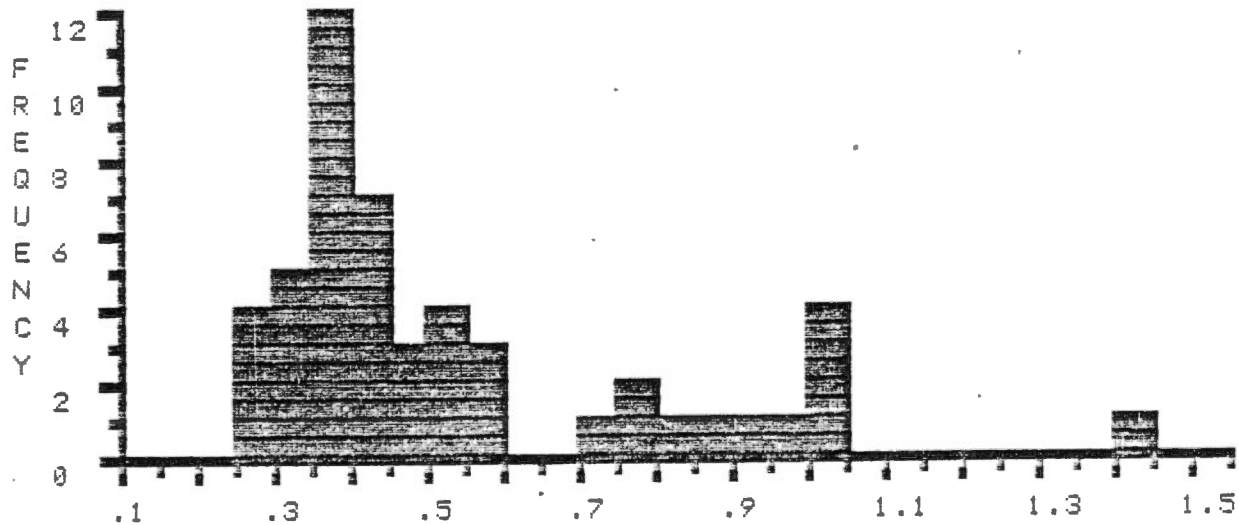
Vitrinite Reflectance Histograms

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 DEPTH 4440-4470', ADOLPHUS D-50, MIKE AVERY, APR-29-85

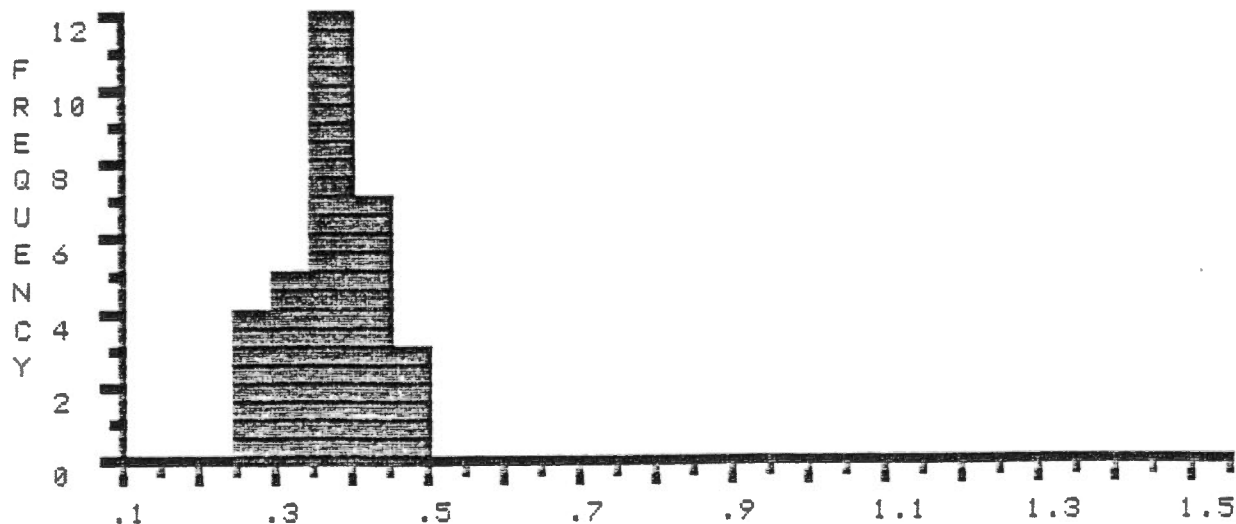
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2	*.38	*.39	*.4	*.4	*.4	*.41	*.41	*.41	*.43	*.47
3	*.47	*.48	.51	.51	.52	.54	.56	.57	.58	.73
4	.75	.78	.81	.87	.92	.96	1	1.01	1.02	1.04
5	1.43									

	SUM	NUMBER	MIN	MAX	MEAN	STAND. DEV.
TOTAL >	26.57	50	.26	1.43	.53	.26
*EDIT >	11.46	31	.26	.48	.37	.06

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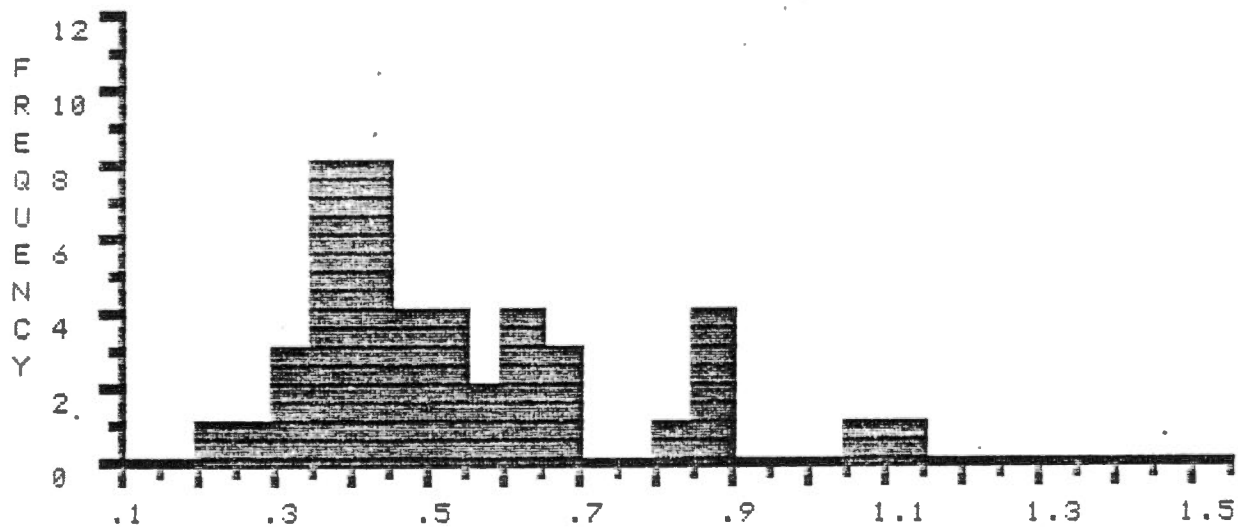


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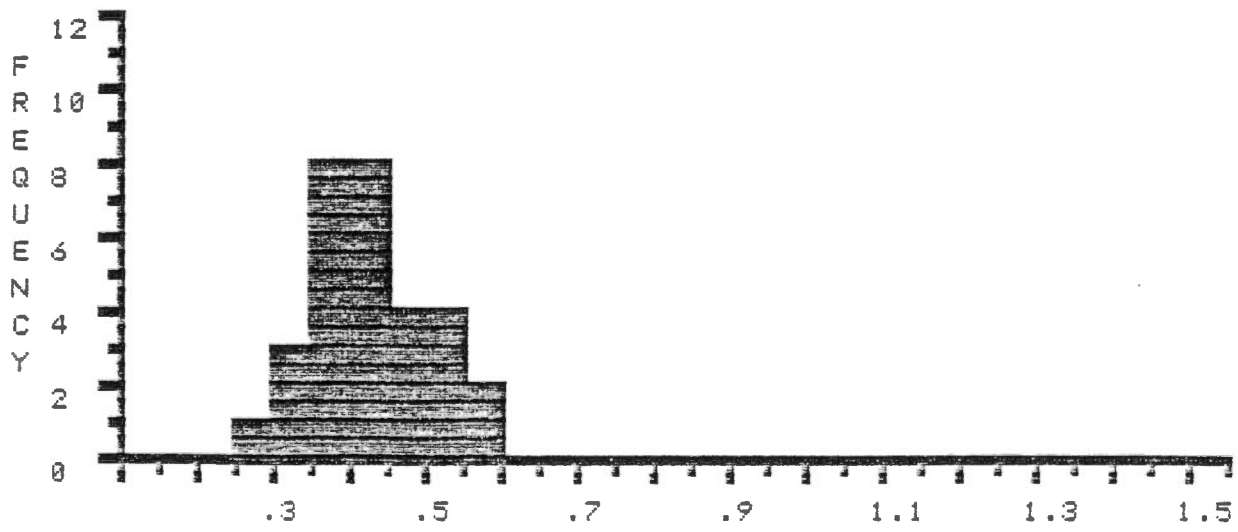
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1	*.38	*.38	*.38	*.38	*.4	*.4	*.4	*.4	*.41	*.41
2	*.42	*.44	*.45	*.46	*.46	*.48	*.5	*.52	*.54	*.54
3	*.55	*.57	.62	.64	.64	.64	.65	.65	.69	.84
4	.86	.86	.87	.89	1.09	1.13				

	SUM	NUMBER	MIN	MAX	MEAN	STAND. DEV.
TOTAL >	23.82	45	.23	1.13	.53	.21
*EDIT >	12.52	30	.28	.57	.42	.08

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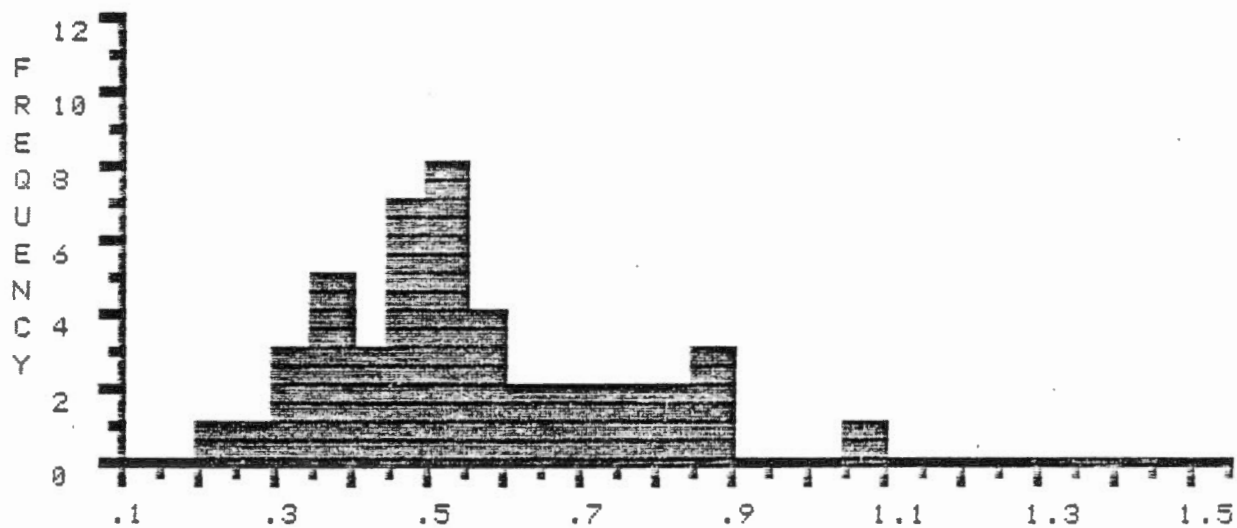


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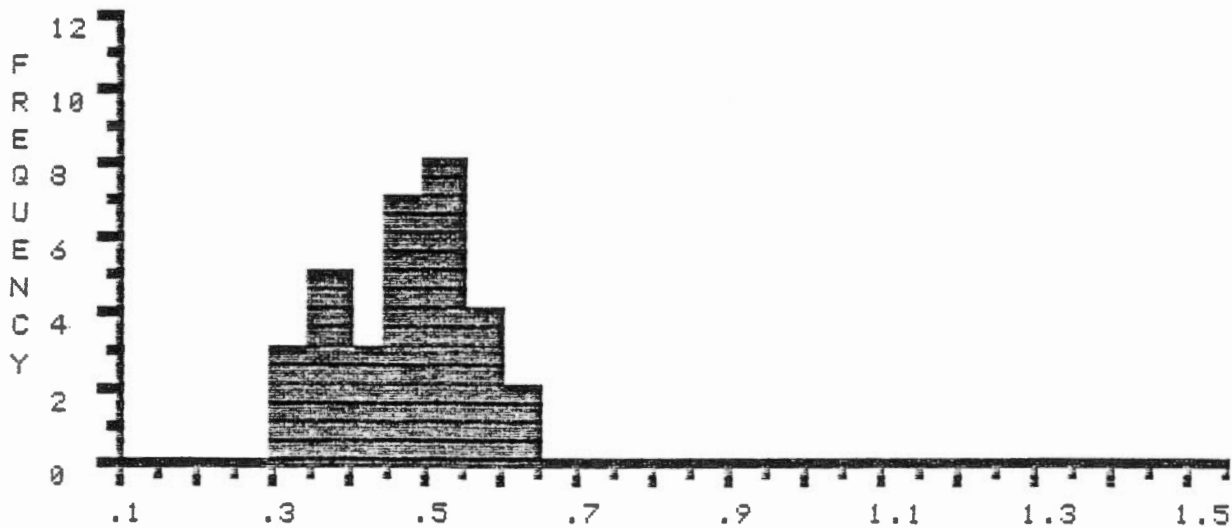
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ROW		.23	.29	*.33	*.34	*.34	*.38	*.38	*.38	*.39
1	*.39	*.41	*.43	*.44	*.45	*.46	*.46	*.47	*.48	*.49
2	*.49	*.5	*.5	*.5	*.5	*.51	*.53	*.53	*.53	*.55
3	*.57	*.57	*.58	*.61	*.64	.67	.68	.7	.73	.76
4	.79	.8	.8	.85	.89	.89	1.09			

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	25.3	46	.23	1.09	.55	.18
*EDIT >	15.13	32	.33	.64	.47	.08

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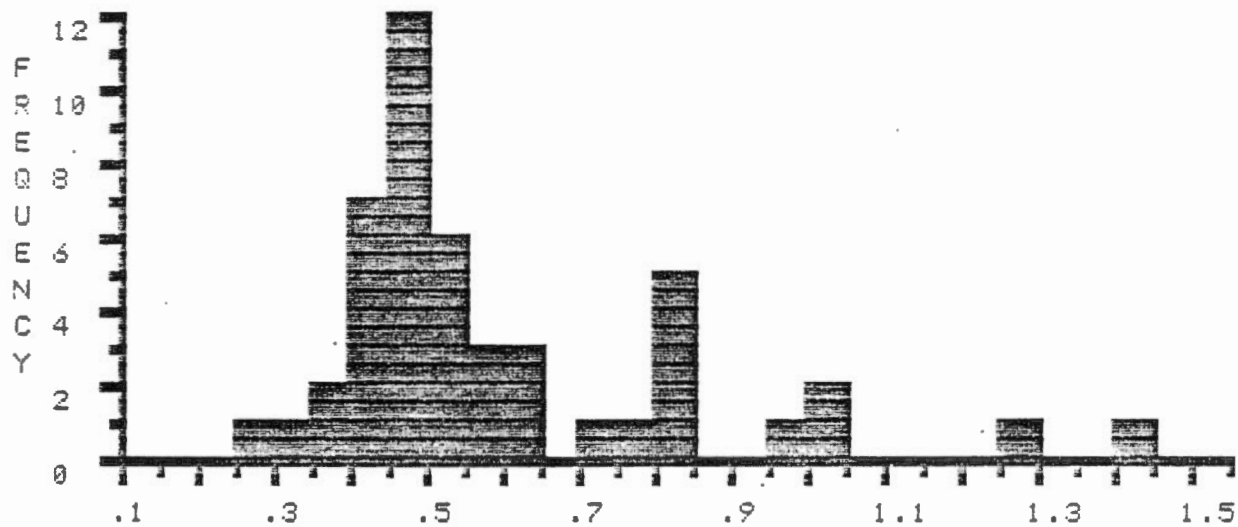


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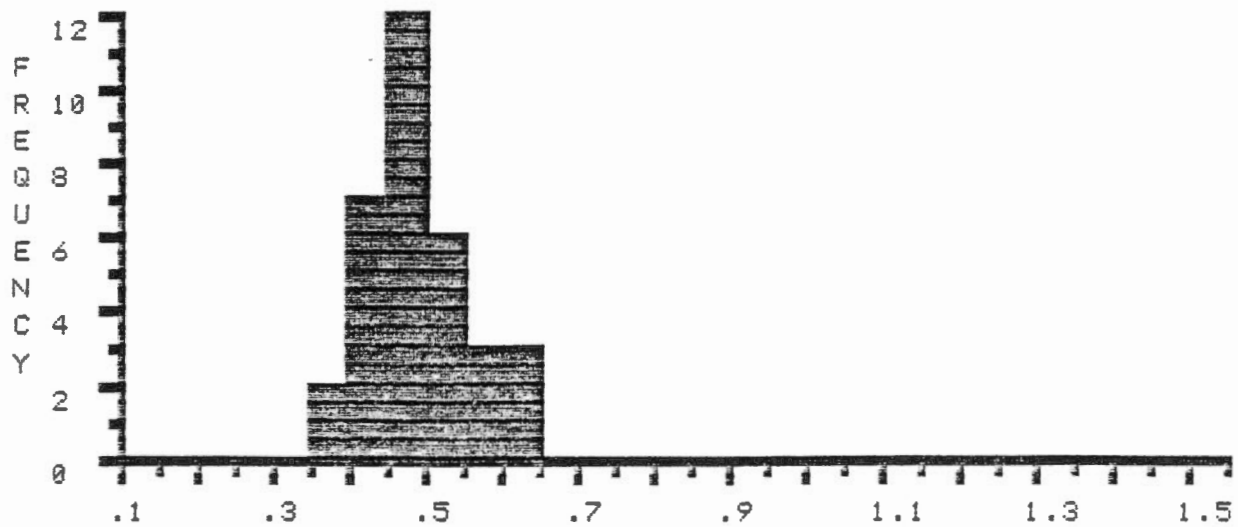
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ROW		.27	.31	*.37	*.38	*.4	*.41	*.41	*.43	*.43
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2	*.47	*.48	*.48	*.49	*.5	*.51	*.51	*.52	*.52	*.54
3	*.55	*.56	*.56	*.6	*.63	*.63	.73	.79	.81	.82
4	.83	.84	.84	.99	1	1.04	1.25	1.41		

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	27.88	47	.27	1.41	.59	.24
*EDIT >	15.95	33	.37	.63	.48	.07

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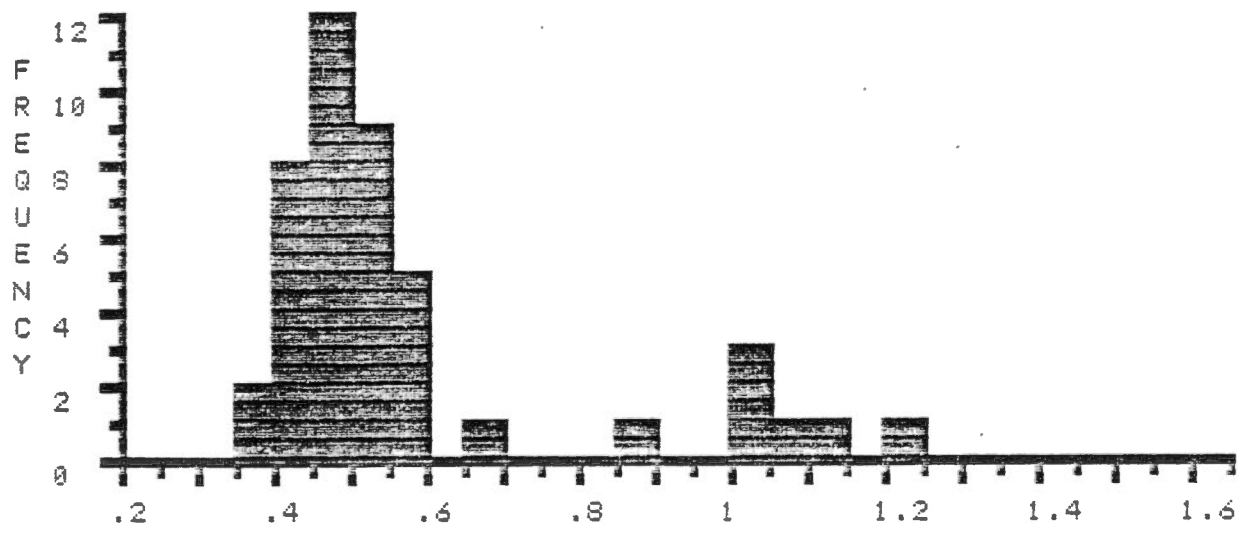


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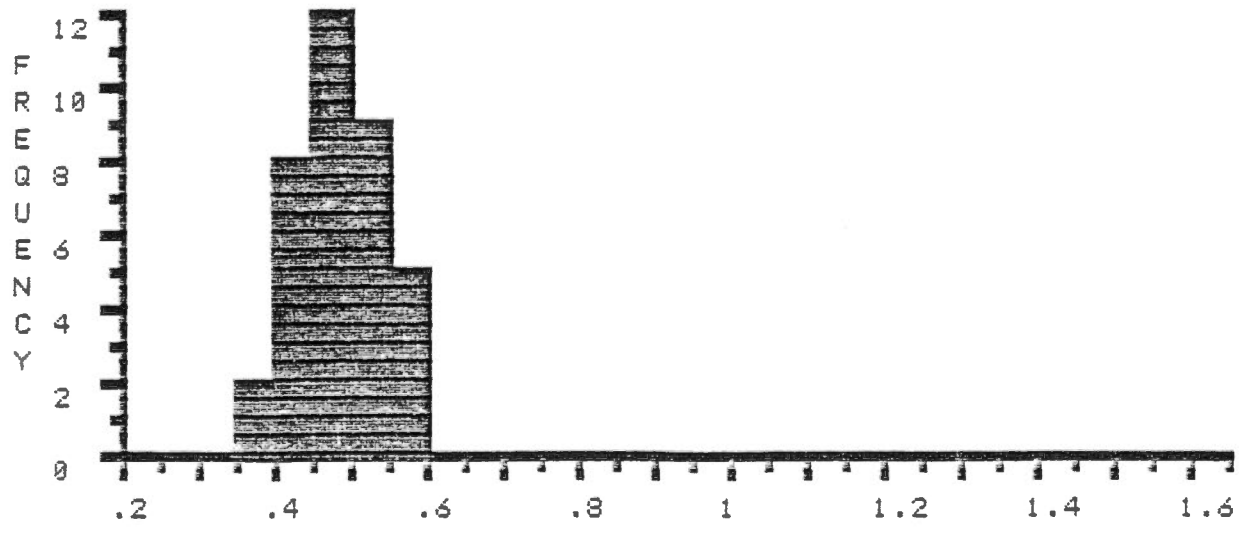
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ROW		*.35	*.39	*.4	*.41	*.42	*.42	*.43	*.43	*.43
1	*.44	*.45	*.45	*.46	*.46	*.43	*.47	*.47	*.48	*.48
2	*.48	*.49	*.49	*.5	*.5	*.51	*.51	*.53	*.53	*.54
3	*.54	*.54	*.55	*.55	*.57	*.57	*.58	.69	.85	1.02
4	1.03	1.04	1.06	1.12	1.23					

	SUM	NUMBER	MIN	MAX	MEAN	STAND. DEV.
TOTAL >	25.32	44	.35	1.23	.57	.22
*EDIT >	17.28	36	.35	.58	.48	.06

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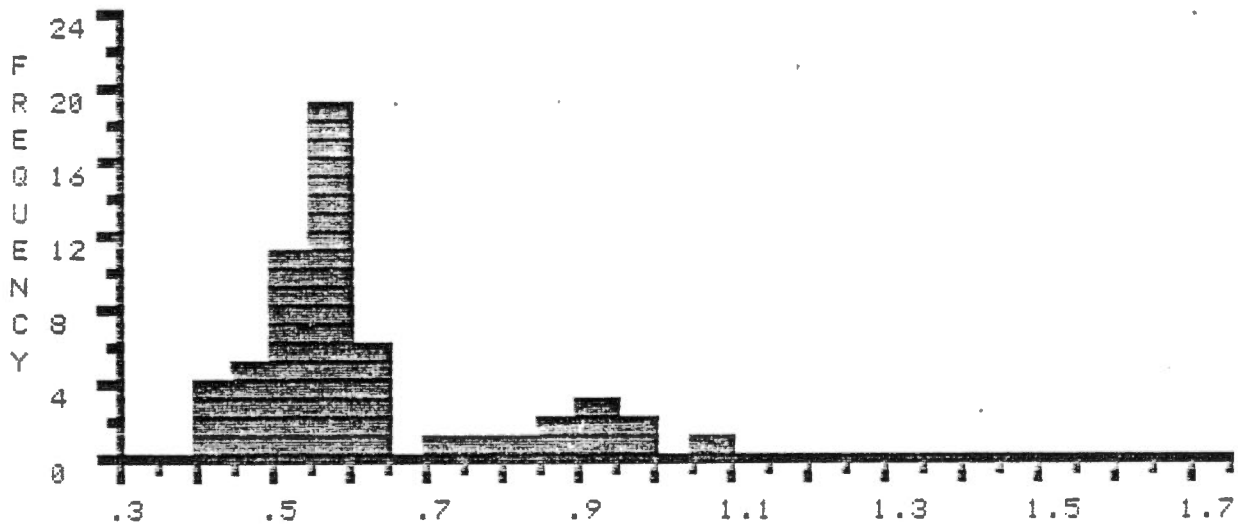


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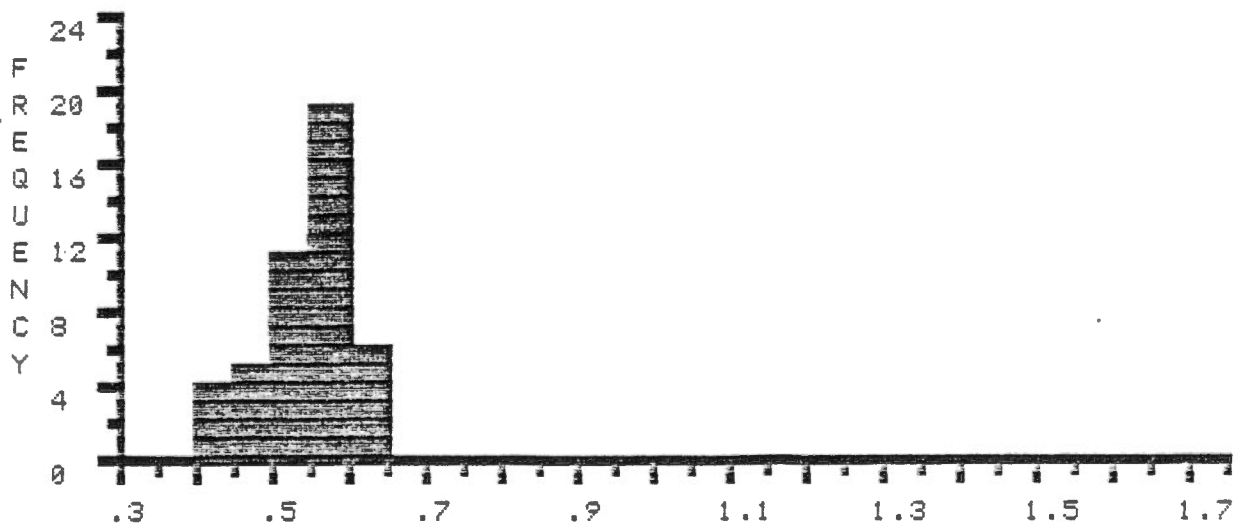
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3	*.57	*.57	*.58	*.58	*.58	*.58	*.58	*.59	*.59	*.59
4	*.6	*.6	*.6	*.6	*.6	*.62	.74	.77	.81	.85
5	.86	.93	.93	.94	.95	.95	1.09			

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	34.08	56	.4	1.09	.61	.16
*EDIT >	24.26	45	.4	.62	.54	.05

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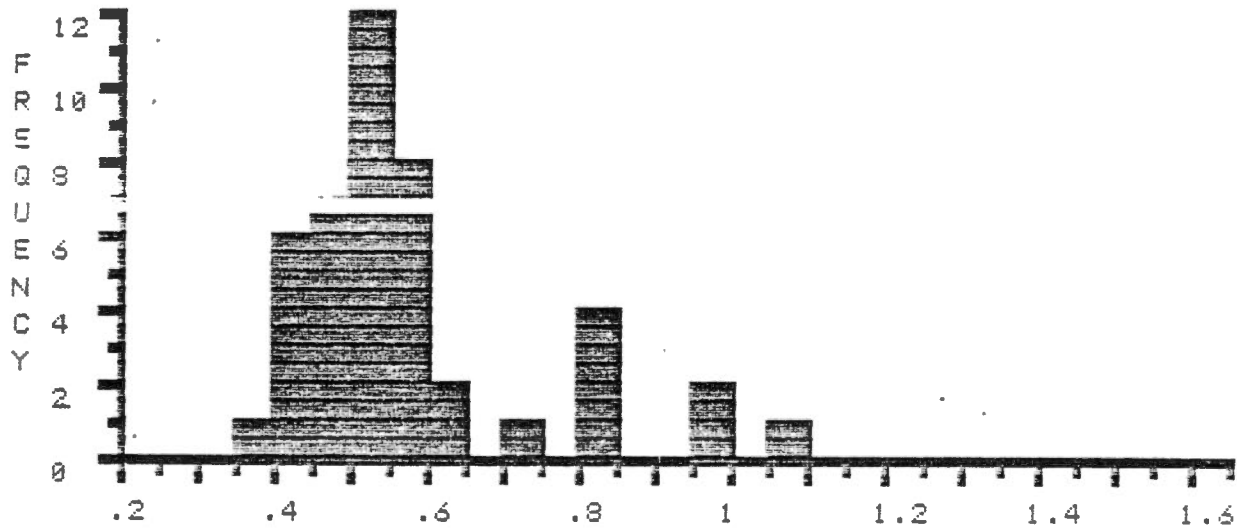


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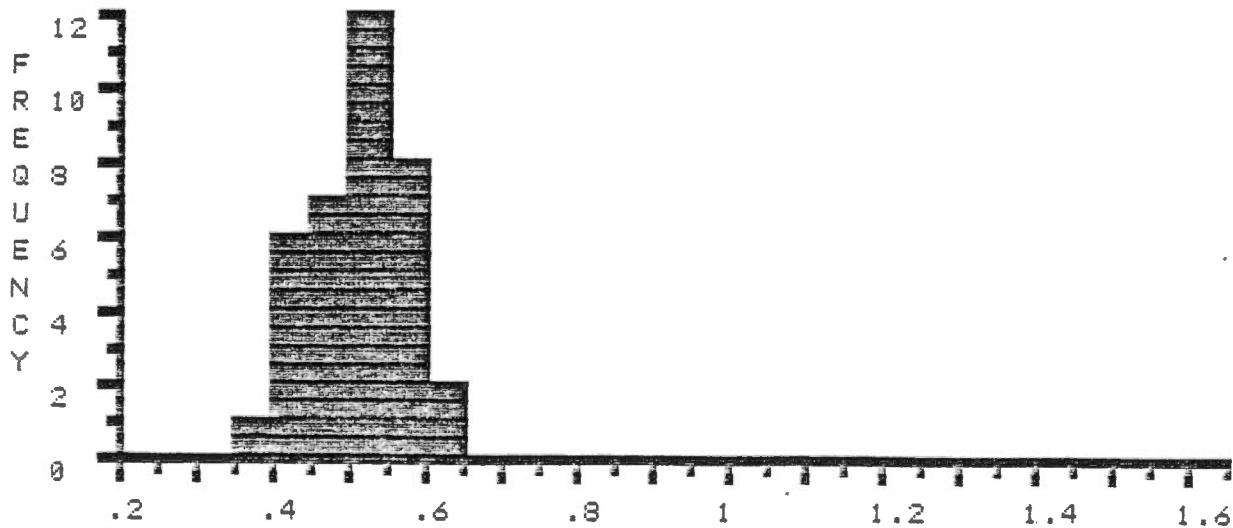
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2	*.52	*.53	*.53	*.53	*.53	*.54	*.54	*.55	*.55	*.55
3	*.55	*.56	*.58	*.58	*.58	*.6	*.62	.74	.8	.82
4	.83	.83	.95	.97	1.05					

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	25.24	44	.39	1.05	.57	.16
*EDIT >	18.25	36	.39	.62	.51	.06

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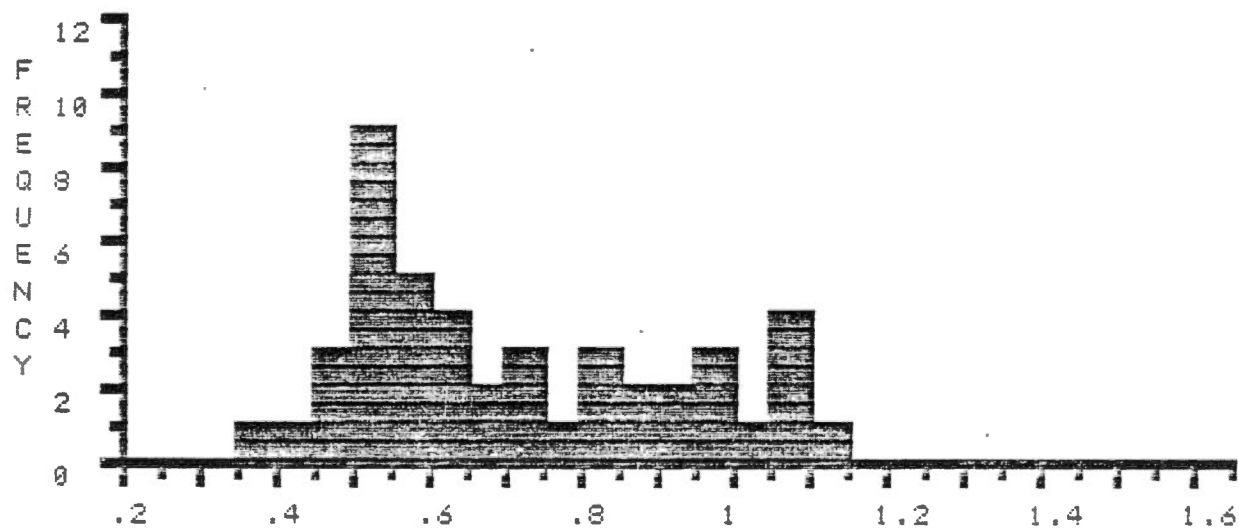


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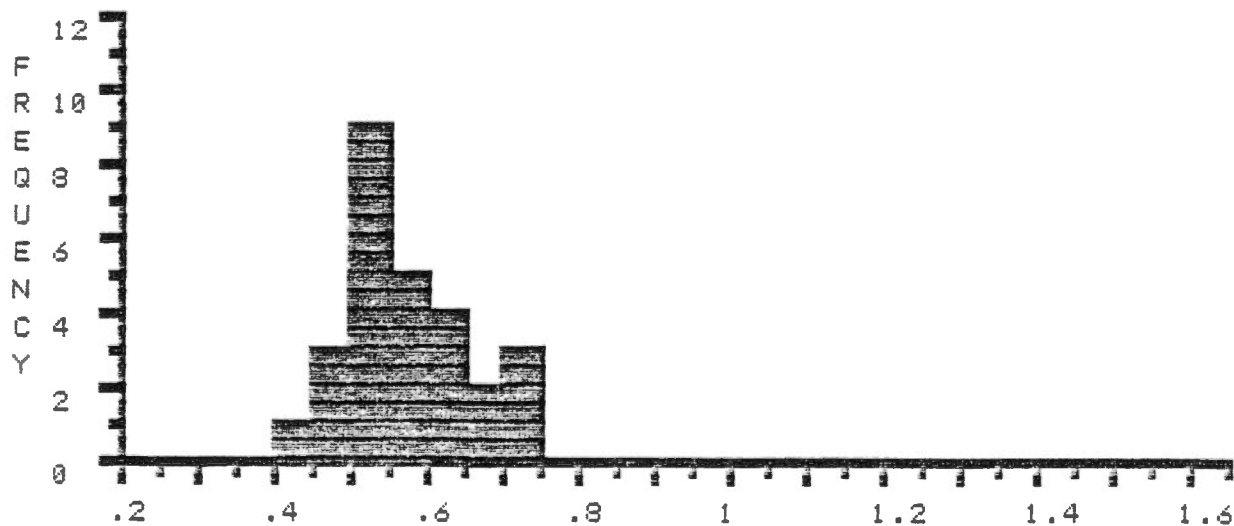
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2	*.61	*.61	*.63	*.64	*.65	*.69	*.7	*.71	*.74	.78
3	.8	.82	.82	.85	.86	.9	.93	.96	.97	.99
4	1	1.06	1.07	1.08	1.09	1.1				

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	31.81	45	.39	1.1	.71	.21
*EDIT >	15.34	27	.43	.74	.57	.08

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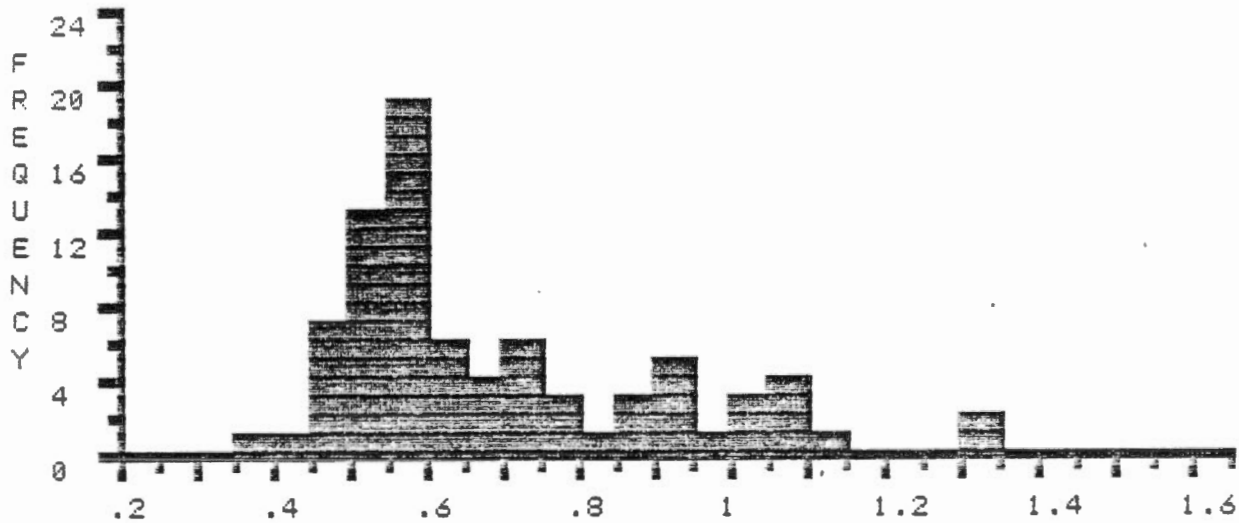


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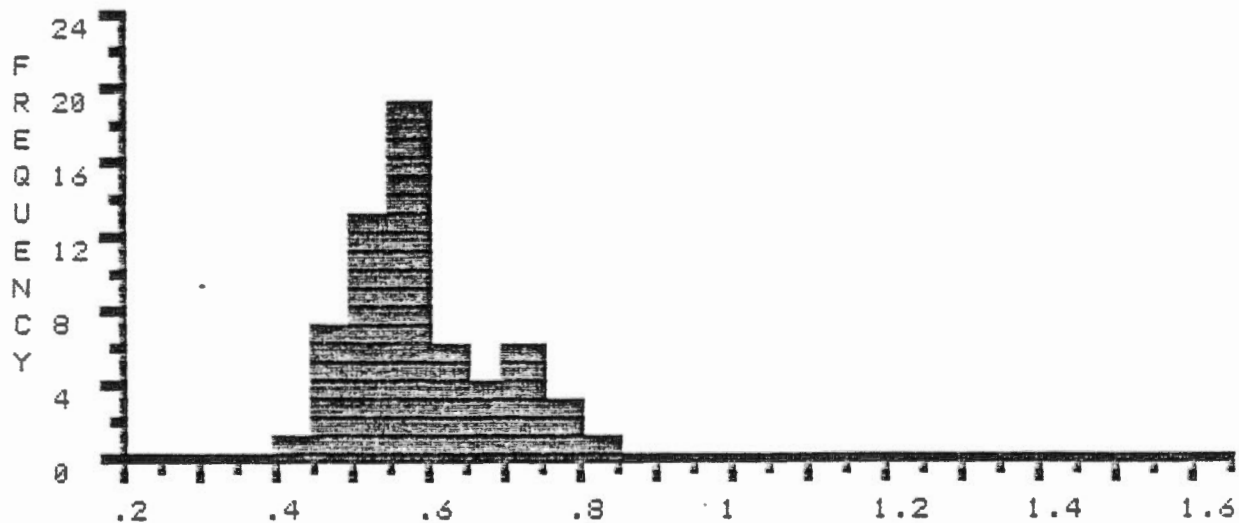
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.39	*.43	*.45	*.46	*.48	*.48	*.49	*.49	*.49
1	*.5	*.51	*.51	*.53	*.53	*.54	*.54	*.54	*.54	*.54
2	*.54	*.54	*.54	*.55	*.55	*.55	*.55	*.55	*.56	*.56
3	*.56	*.56	*.56	*.56	*.57	*.57	*.57	*.57	*.57	*.58
4	*.59	*.59	*.6	*.6	*.61	*.61	*.64	*.64	*.65	*.66
5	*.68	*.69	*.71	*.73	*.74	*.74	*.74	*.74	*.77	*.78
6	*.79	*.81	.85	.87	.87	.9	.91	.92	.93	.94
7	.97	1	1.01	1.03	1.05	1.05	1.06	1.09	1.1	1.33
8	1.34									

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	54.93	80	.39	1.34	.69	.21
*EDIT >	35.32	60	.43	.91	.59	.09

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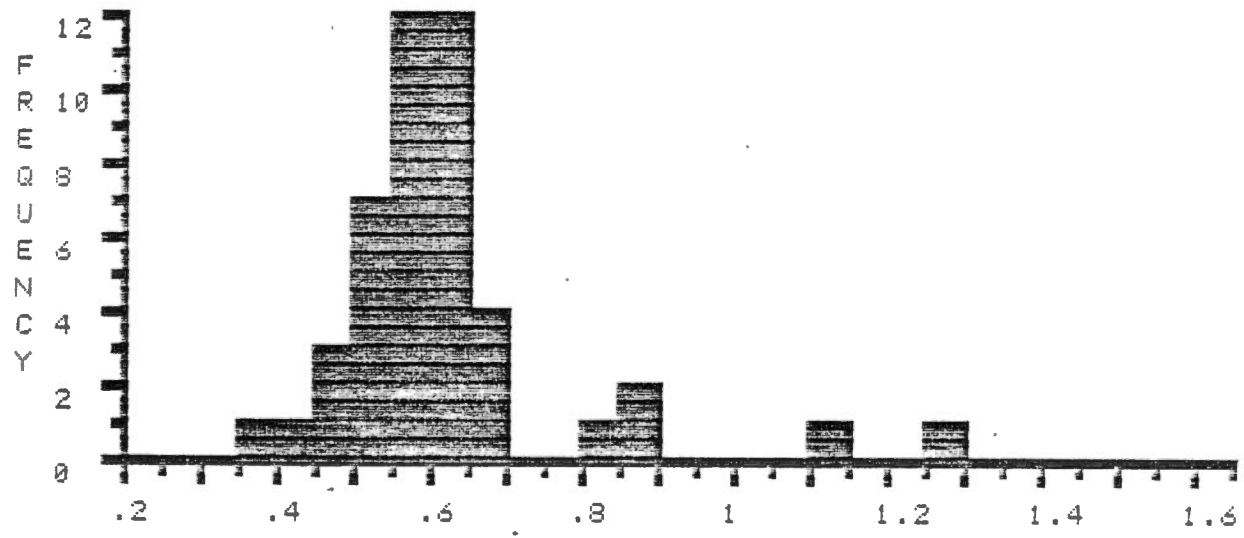


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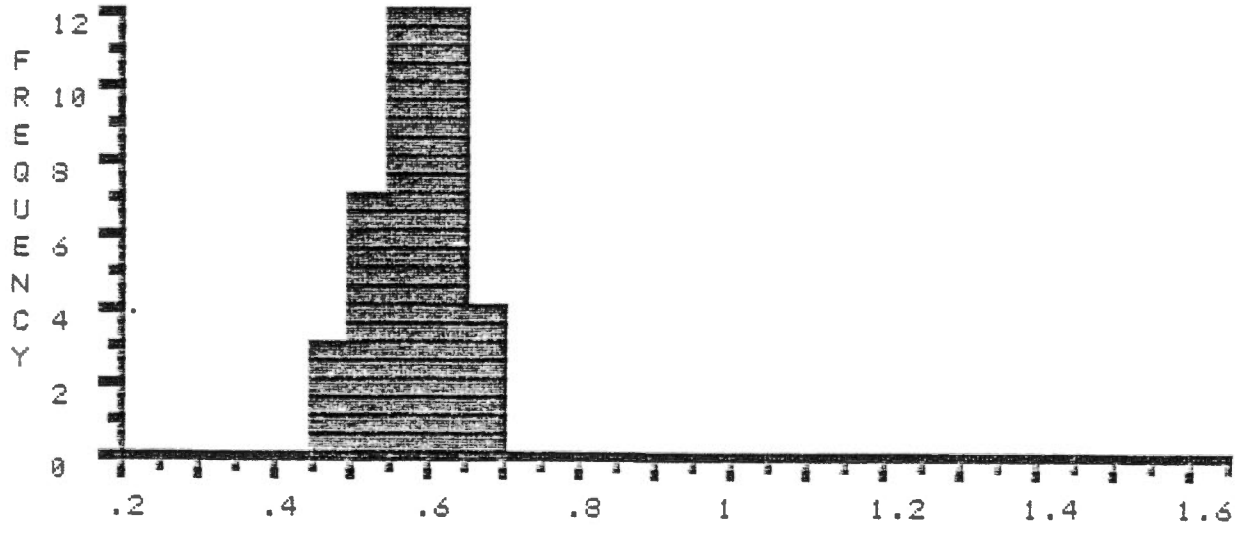
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ROW		.37	.44	*.48	*.49	*.49	*.5	*.51	*.52	*.54
1	*.54	*.54	*.54	*.55	*.55	*.56	*.56	*.56	*.56	*.56
2	*.57	*.58	*.59	*.59	*.59	*.6	*.6	*.6	*.61	*.61
3	*.61	*.61	*.62	*.62	*.62	*.63	*.64	*.65	*.67	*.69
4	*.69	.82	.87	.87	1.11	1.29				

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	27.81	45	.37	1.29	.62	.16
*EDIT >	22.04	38	.48	.69	.58	.05

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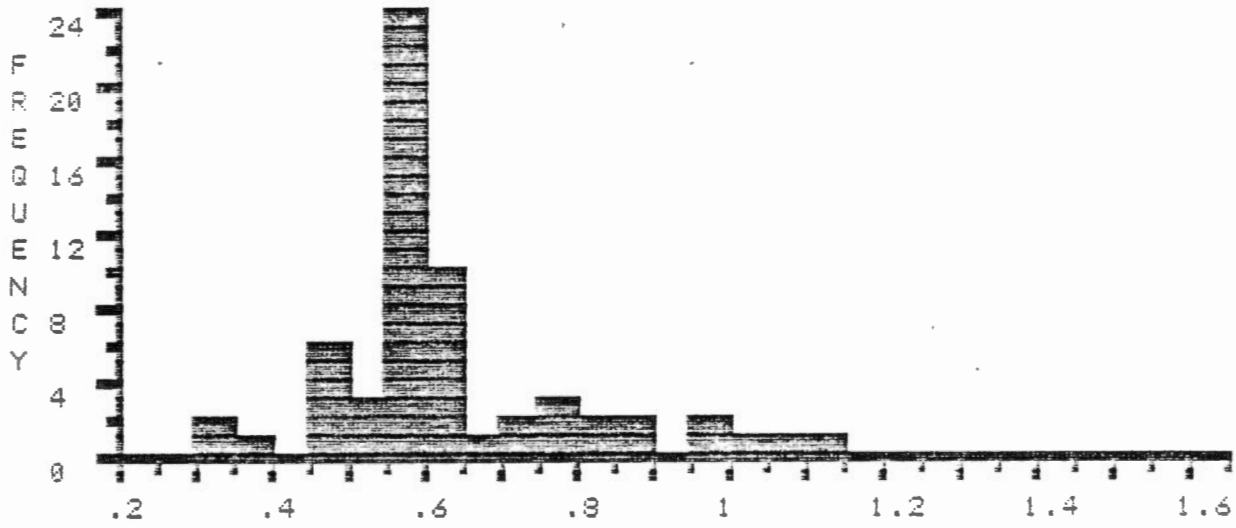


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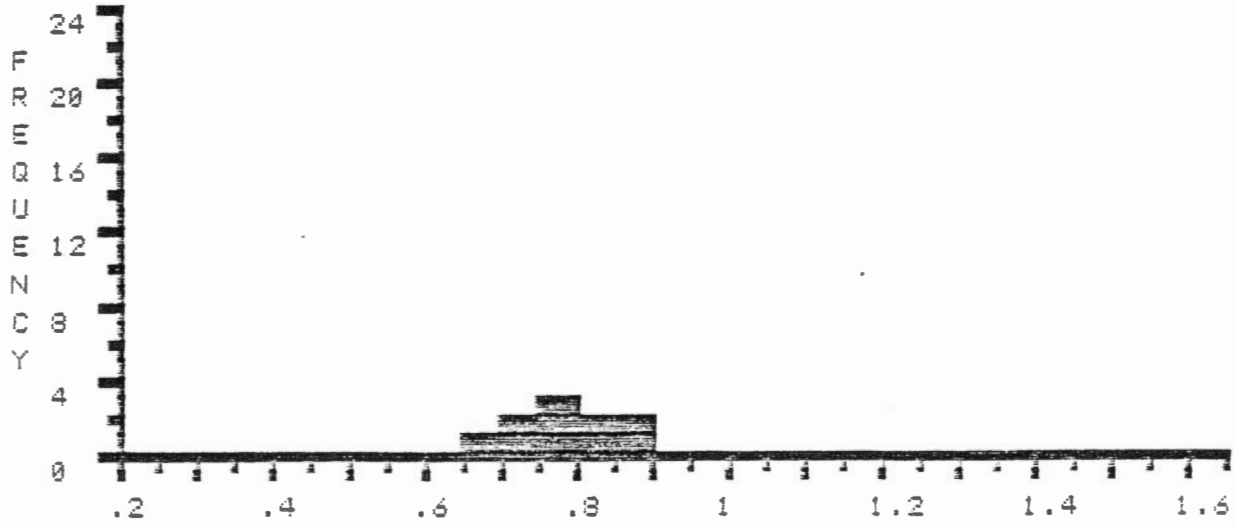
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.3	.31	.38	.47	.47	.48	.49	.49	.49
1	.51	.51	.53	.55	.55	.55	.55	.56	.56	.56
2	.57	.57	.57	.57	.57	.57	.57	.57	.58	.58
3	.58	.58	.58	.58	.59	.59	.59	.6	.61	.61
4	.61	.61	.61	.62	.62	.63	.63	*.69	*.7	*.73
5	*.75	*.78	*.79	*.84	*.84	*.86	*.89	.95	.99	1.03
6	1.09	1.1								

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	38.3	61	.3	1.1	.63	.17
*EDIT >	7.87	10	.69	.89	.79	.07

% R E F L E C T A N C E



% R E F L E C T A N C E \* \* E D I T E D \* \*

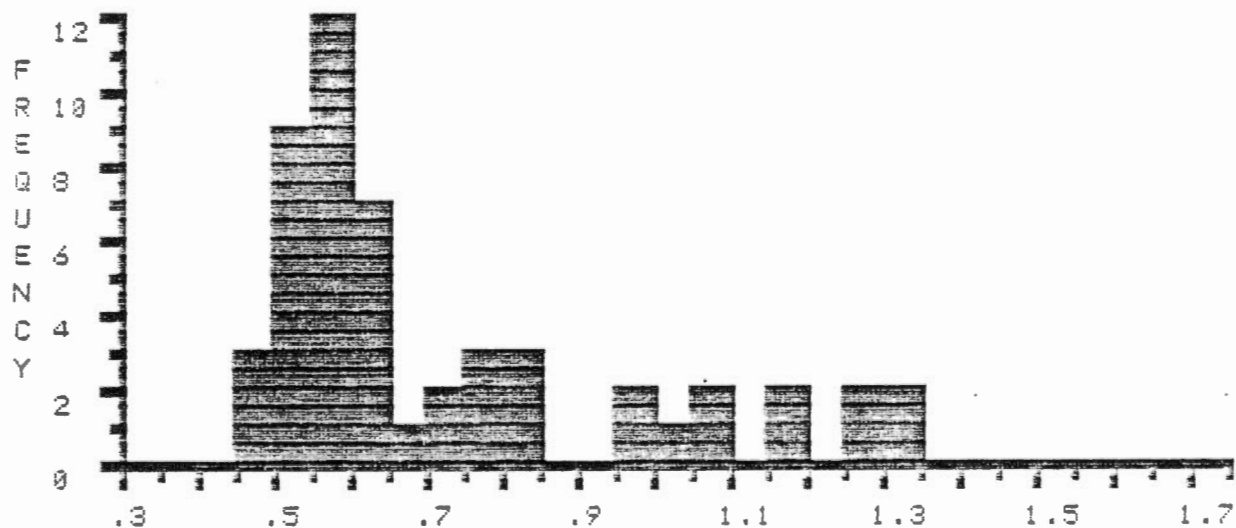


FILE >> K0281C DESCRIPTION FOLLOWS :  
 DEPTH 9100-9130', ADOLPHUS D-50. MIKE AVERY. MAY-9-85

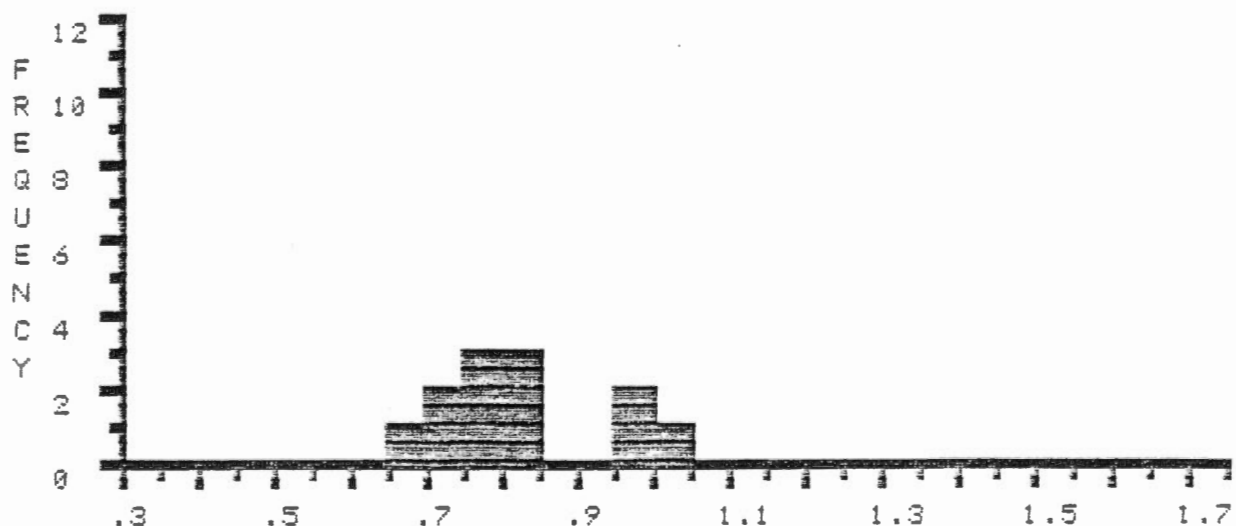
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.49	.49	.49	.5	.5	.5	.51	.51	.51
1	.51	.52	.54	.55	.55	.56	.56	.57	.57	.57
2	.57	.58	.58	.58	.59	.6	.6	.61	.62	.62
3	.62	.62	*.68	*.71	*.72	*.75	*.76	*.77	*.81	*.84
4	*.84	*.95	*.96	*1.02	1.06	1.08	1.18	1.18	1.26	1.27
5	1.3	1.33								

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	36.66	51	.49	1.33	.72	.25
*EDIT >	9.81	12	.68	1.02	.82	.11

% REFLECTANCE



% REFLECTANCE \*\* EDITED \*\*

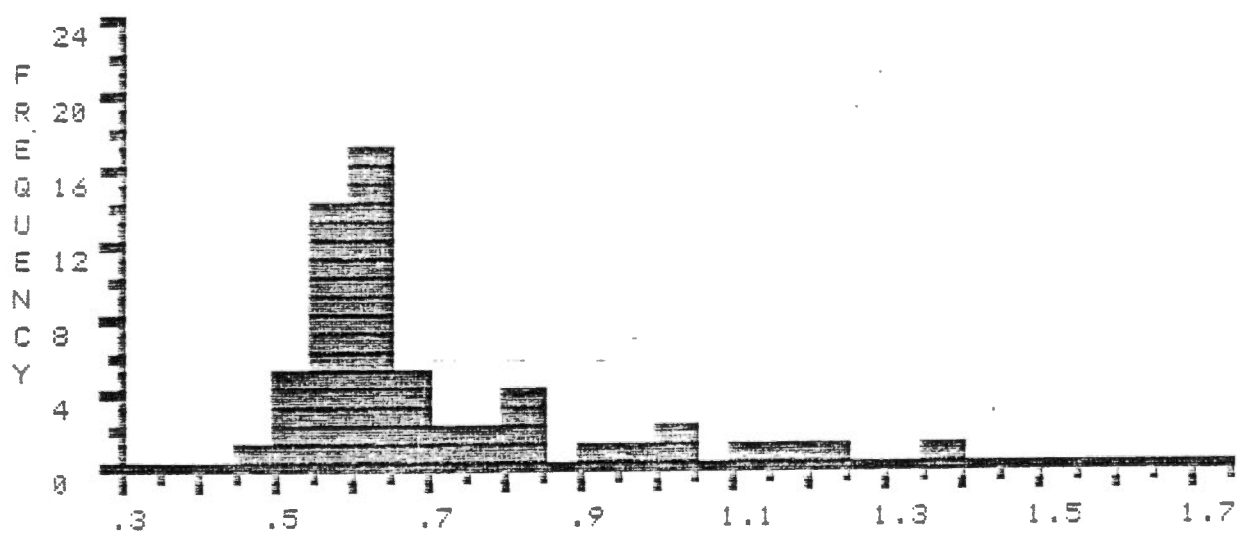


FILE >> K0282A DESCRIPTION FOLLOWS :  
DEPTH 9500-9530', ADOLPHUS D-50, MIKE AVERY, MAY-16-85

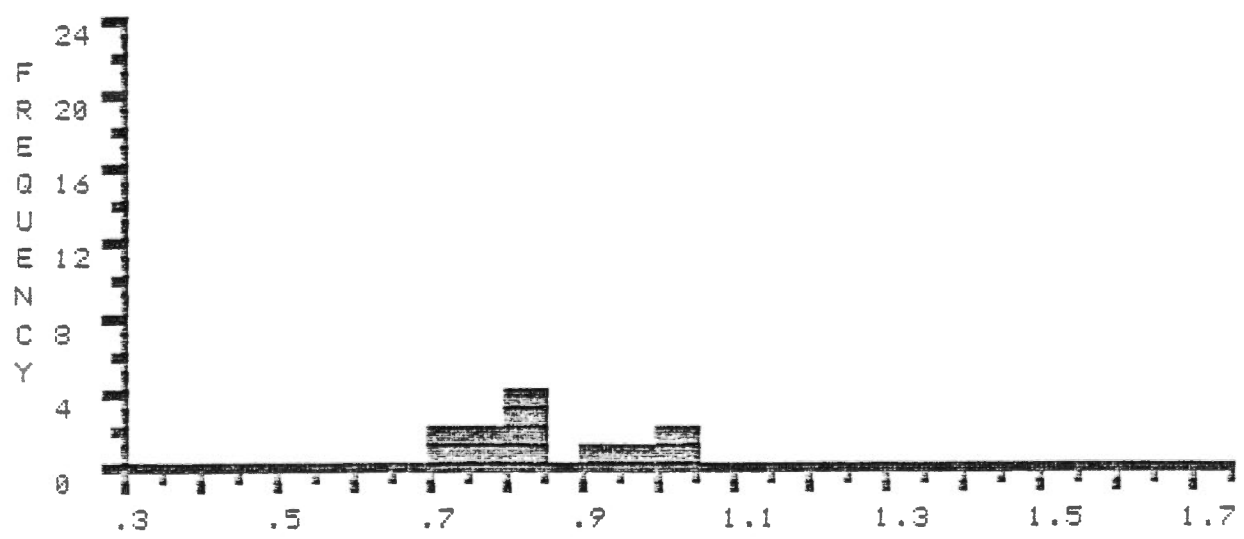
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.49	.52	.53	.53	.53	.54	.56	.56	.56
1	.56	.57	.57	.57	.57	.57	.58	.58	.59	.59
2	.59	.6	.6	.6	.6	.61	.61	.61	.61	.61
3	.62	.62	.62	.63	.63	.63	.63	.64	.65	.65
4	.66	.67	.68	*.72	*.72	*.76	*.78	*.81	*.82	*.83
5	*.83	*.93	*.95	*1.02	*1.03	1.11	1.18	1.24	1.35	

	SUM	NUMBER	MIN	MAX	MEAN	STAND. DEV.
TOTAL >	40.02	58	.49	1.35	.69	.19
*EDIT >	10.2	12	.72	1.03	.85	.11

% R E F L E C T A N C E



% R E F L E C T A N C E \* \* E D I T E D \* \*

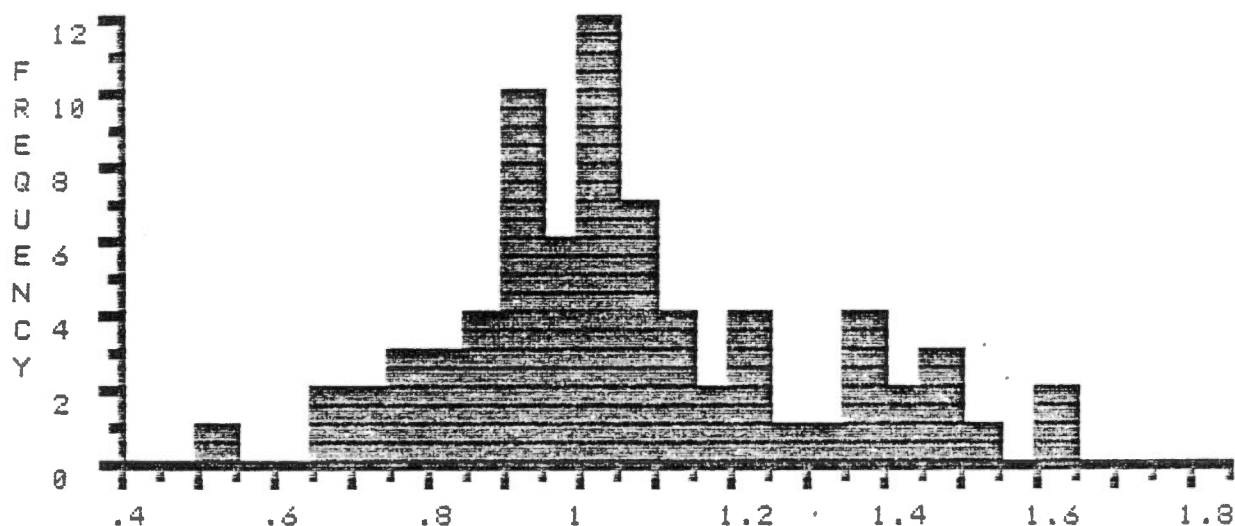


FILE >> K0282B DESCRIPTION FOLLOWS :  
 DEPTH 10000-10030', ADOLPHUS D-50, MIKE AVERY, MAY-22-85

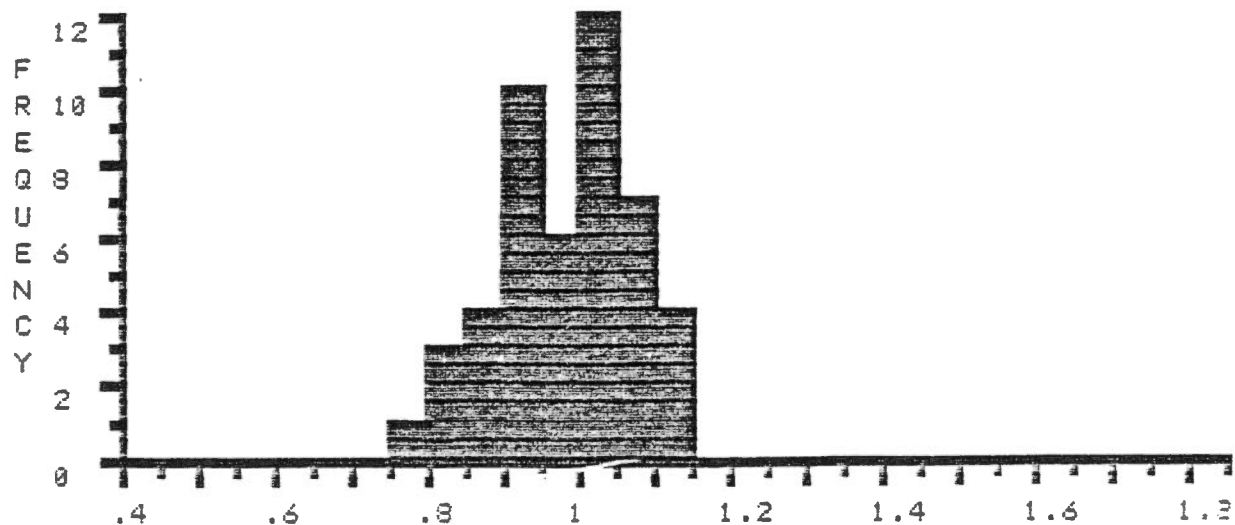
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.53	.67	.67	.71	.71	.75	.75	*.76	*.83
1	*.84	*.84	*.85	*.87	*.89	*.89	*.91	*.91	*.92	*.92
2	*.93	*.93	*.93	*.94	*.94	*.94	*.95	*.96	*.97	*.99
3	*.99	*.99	*1.01	*1.01	*1.01	*1.01	*1.01	*1.01	*1.02	*1.02
4	*1.02	*1.02	*1.02	*1.04	*1.05	*1.05	*1.05	*1.06	*1.08	*1.08
5	*1.09	*1.1	*1.11	*1.12	*1.12	1.17	1.19	1.2	1.21	1.23
6	1.24	1.26	1.33	1.38	1.39	1.39	1.39	1.4	1.43	1.45
7	1.45	1.48	1.5	1.6	1.6					

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	78.08	74	.53	1.6	1.06	.23
*EDIT >	46	47	.76	1.12	.98	.08

% R E F L E C T A N C E



% R E F L E C T A N C E \* \* E D I T E D \* \*



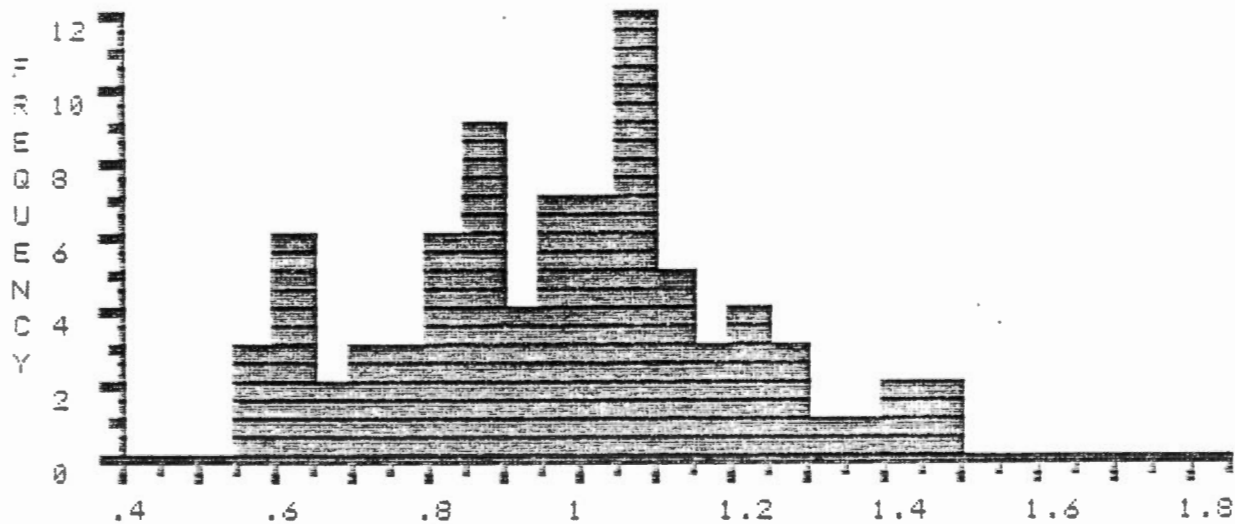


FILE >> K0282C DESCRIPTION FOLLOWS :  
 DEPTH 11400-11430', ADOLPHUS D-50, MIKE AVERY, MAY-22-85

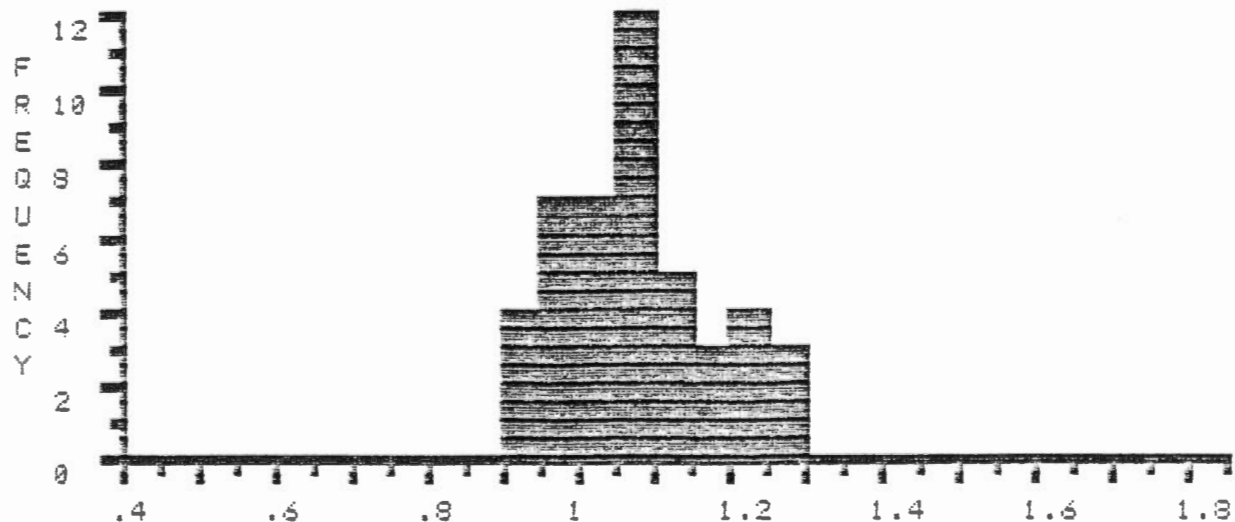
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.56	.57	.58	.6	.61	.64	.64	.64	.64
1	.67	.68	.72	.72	.74	.78	.79	.79	.8	.82
2	.83	.83	.83	.84	.85	.85	.85	.86	.86	.86
3	.87	.88	.89	*.9	*.91	*.91	*.94	*.95	*.96	*.97
4	*.98	*.98	*.99	*.99	*1	*1	*1.01	*1.01	*1.01	*1.02
5	*1.03	*1.05	*1.06	*1.06	*1.07	*1.07	*1.08	*1.08	*1.08	*1.09
6	*1.09	*1.09	*1.09	*1.1	*1.12	*1.13	*1.14	*1.14	*1.16	*1.19
7	*1.19	*1.22	*1.23	*1.23	*1.24	*1.25	*1.26	*1.27	1.32	1.36
8	1.4	1.42	1.45	1.48						

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	80.86	83	.56	1.48	.97	.22
*EDIT >	48.34	45	.9	1.27	1.07	.1

% R E F L E C T A N C E



% R E F L E C T A N C E \* \* E D I T E D \* \*

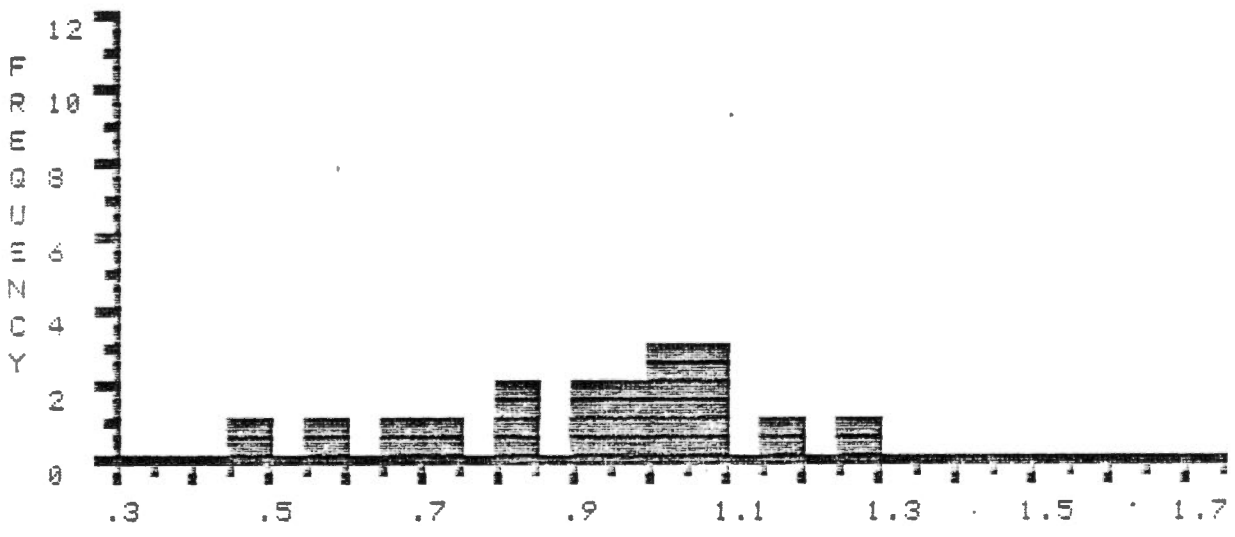


FILE >> K0293A DESCRIPTION FOLLOWS :  
DEPTH 11700-11730', ADOLPHUS D-50, MIKE AVERY, MAY-22-85

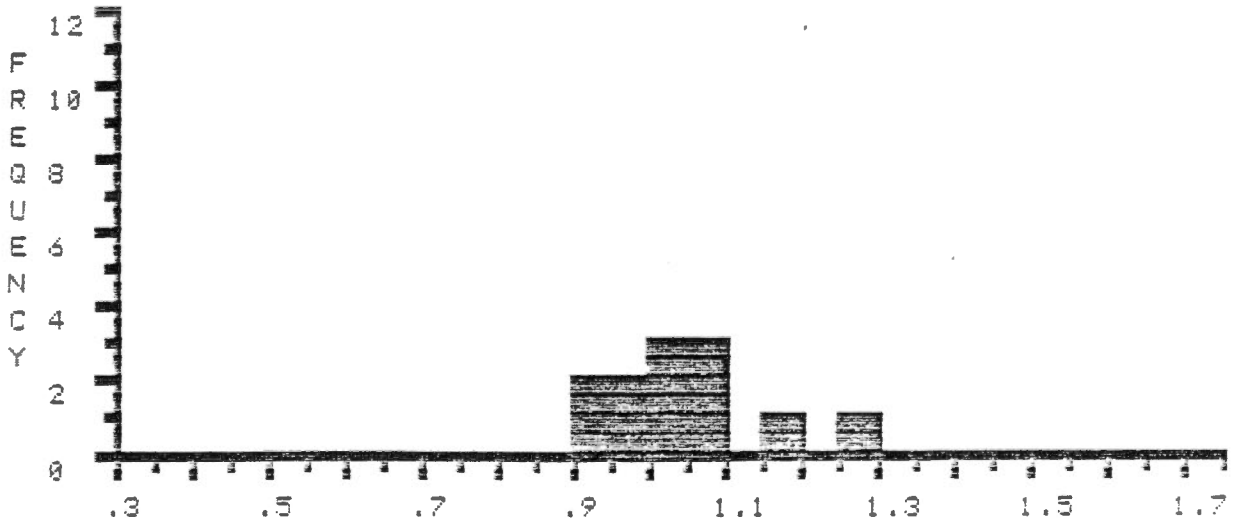
COL>	0	1	2	3	4	5	6	7	8	9
ROW		.48	.55	.69	.74	.84	.84	*.93	*.94	*.96
1	*.97	*1	*1.02	*1.03	*1.05	*1.05	*1.09	*1.13	*1.29	

	SUM	NUMBER	MIN	MAX	MEAN	STAND. DEV.
TOTAL >	16.62	18	.48	1.29	.92	.2
*EDIT >	12.48	12	.93	1.29	1.04	.1

% R E F L E C T A N C E S



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

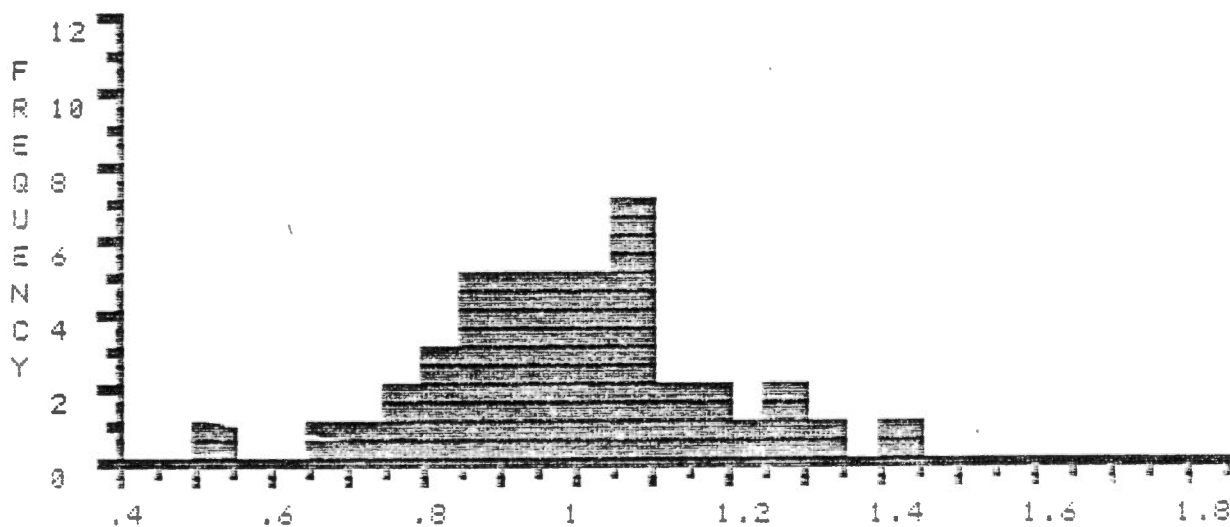


FILE >> K0283B DESCRIPTION FOLLOWS :  
DEPTH 12000-12030', ADOLPHUS D-50, MIKE AVERY, MAY-22-85

COL>	0	1	2	3	4	5	6	7	8	9
ROW		.52	.67	.71	.75	.78	.8	.81	.84	.85
1	.87	.87	.87	.88	.91	.91	.93	.94	.94	.97
2	.97	.98	*.99	*.99	*1.02	*1.03	*1.03	*1.03	*1.04	*1.05
3	*1.05	*1.05	*1.06	*1.06	*1.07	*1.09	*1.11	*1.14	*1.15	*1.17
4	*1.22	*1.26	*1.27	*1.34	1.43					

	SUM	NUMBER	MIN	MAX	MEAN	STAND.DEV.
TOTAL >	43.42	44	.52	1.43	.99	.18
*EDIT >	24.22	22	.99	1.34	1.1	.1

% R E F L E C T A N C E



% R E F L E C T A N C E \* \* E D I T E D \* \*

