FUEL RESEARCH INSTITUTE OF SOUTH AFRICA.

TECHNICAL MEMORANDUM NO. 6 OF 1960.

CONFIDENTIAL.

A REPORT OF THE RESULTS OF TWO TESTS CARRIED OUT ON THE "NORWALT" DENSE-MEDIUM PLANT AT CARNARVON ANTHRACITE COLLIERY ON 5TH. FEBRUARY, 1960.

BY: B. VAN ECK.

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INTRODUCTION:

The Fuel Research Institute of South Africa was approached by Messrs. Nortons Tividale S.A. (Pty.) Limited, with the request to carry out certain tests on a dense medium washer supplied by them to the Carnarvon Anthracite Colliery. This washer was put into commission during December, 1959. It is a two-product separator with a nominal capacity of 100 t.p.h. when treating 60mm x 6mm raw coal.

TEST PROCEDURE:

Two tests, each of one hour's duration were carried out. The test procedure for both tests was virtually the same except that in the first test it was endeavoured to affect the separation between washed coal and discard at approximately 1.5 specific gravity whereas in the second test the separating gravity was lowered to 1.43.

The raw coal (60mm x 6mm) feed rate to the washer was estimated to be 60-65 t.p.h. in each case. This was the

maximum .../

maximum rate which could be obtained from the vibro-feeder. The washer appeared capable of handling an appreciably higher load. As no facilities for weighing the products from the washer were available, it was mutually agreed that the respective yields of washed coal and discards were to be derived from an ash balance.

SAMPLING PROCEDURE:

The sampling procedure was the same in both the tests. The various products were sampled in the following manner:

A. Raw Coal: Duplicate samples of the feed to the washer were taken for each test. Increments were obtained by shovelling across the coal stream on the moving raw coal conveyor at fifteen-second intervals throughout each test period. The duplicate samples were taken at different points on the conveyor.

B. Washed Coal: The washed coal is discharged onto one section of a split screen for draining, rinsing and dewatering. The full discharge from this section of the screen was collected by means of a special container at thirty-second intervals throughout each test period. In this manner 120 increments of approximately 10-14 lb. each were collected for each test.

C. Discard: This material is discharged on the remaining section of the draining, rinsing and dewatering screen and was sampled in the same manner as the washed coal. A hundred and twenty increments of approximately 10-14 lb. each were collected during each test. Samples of the medium feed to the separating vessel, the effluent from the plant and the underflow from the thickener-

cyclone .../

cyclone were also taken during each test period.

TREATMENT OF SAMPLES:

All the samples taken during the test periods were transported by road to the laboratories of the Fuel Research Institute at Pretoria.

On arrival, the product samples were sorted and were then air-dried. The air-dry weight of each was determined and a screen analysis was then carried out on each. The results of these screen analyses are shown in Tables IA and IB. (Note: All tables in this report marked A refer to the first test, while all tables marked B refer to the second test.)

The size fractions arising from the screening of the samples were then treated in the following manner:

(a) Raw Coal: Each size fraction arising from Sample No.IA and Sample No. IB was individually prepared for laboratory analyses on a whole coal basis.

Each size fraction arising from Sample No.2A and Sample No. 2B, with the exception of the -6mm size fractions, was subjected to individual detailed float and sink analyses on a fractional basis at 0.02 specific gravity intervals in the s.g. range 1.36 to 1.70.

The ash content of each specific gravity fraction was determined. These results are reported in Tables 2A and 2B.

(b) Washed Coal: The +35mm size fractions from each test were subdivided by means of a standard method into three equal sub-samples. One of these sub-samples was in each case prepared for laboratory analyses on a whole coal basis. The remaining two sub-samples were in each case re-combined and the resultant samples were then subjected

to .../

to detailed float and sink analyses at the same s.g. as the corresponding size fraction of the raw coal.

The -35mm +20mm, -20mm +12mm and -12mm +6mm size fractions from each test were individually divided into two sub-samples by means of a standard method. One of each of these sub-samples was prepared for whole coal laboratory analyses while the other one was subjected to detailed float and sink analyses at the same s.g. as the preceeding size fractions.

Only ash determinations were carried out on the -6mm size fractions.

The ash contents of all specific gravity fractions were determined

These results are reported in Tables 3A, 4A, 5A and 6A for the first test and Tables 3B, 4B, 5B and 6B for the second test.

(c) Discards: The +35mm and -12mm +6mm size fractions from each test were treated in the same manner as the +35mm size fractions of the washed coals.

The -35mm +20mm, -20mm +12mm and -6mm size fractions from each test were treated in the same manner as the corresponding size fractions of the washed coals.

The ash contents of all specific gravity fractions arising from the first test were determined.

In the case of the second test some of the higher s.g. fractions were re-combined before ash determinations were carried out.

The results of these analyses are also reported in Tables 3A, 4A, 5A, and 6A for the first test and in Tables 3B, 4B, 5B and 6B for the second test.

WHOLE ..../

WHOLE COAL ANALYSES:

The whole coal samples from each size fraction were analysed for ash, volatile matter, inherent moisture and total sulphur contents. These results are reported in Tables 7A and 7B for the two tests respectively.

YIELDS OF PRODUCTS:

The percentage yield of the washed coal for each individual size fraction in each of the two tests was calculated from the equation:

$$Y = \frac{\text{Raw coal ash} - \text{Discard ash}}{\text{Washed coal ash} - \text{Discard ash}} \times 100$$

For the calculation of these yields the ash values obtained from the analyses of the whole coal samples were used.

The respective yields of washed coal for the two tests are shown in Tables 8A and 8B.

EVALUATION OF THE RESULTS:

Using the yield values in Tables 8A and 8B and the corresponding data in Tables 3 - 6, the analyses of the feed coal to the plant during each test were reconstituted. Washability curves of the reconstituted feed coal for each size fraction during each test were drawn and these curves are shown in Figures 1A - 4A for the first test and 1B - 4B for the second test. The Tromp Distribution Coefficients were calculated for each size fraction and Tromp Distribution Curves were then drawn for each separation.

These curves are shown in Figures 5A - 8A for the first test and 5B - 8B for the second test.

From these curves the specific gravity of separation for each size fraction in each of the tests was obtained.

The .../

The probable errors for the various separations were also obtained. Error areas were measured for each separation. (These are expressed in square inches, the scales employed being the following:-

1 inch = 10 units on the distribution axis.

1 inch = 0.025 units on the specific gravity axis.)

These results are shown in Table 9A for the first test and in Table 9B for the second test.

The 'cut points' were also determined by means of Needham's method and are included in Tables 9A and 9B.

The 'ash-errors' were determined by Needham's method. The values obtained for some of these ash-errors, were negative. Although a satisfactory explanation for these seemingly impossible values cannot be advanced, their significance should not be over-stressed. The actual separation affected by the washer approached the accuracy of laboratory float and sink separations and small errors in sampling and analyses can easily be responsible for these discrepancies. In the cases where negative ash errors were obtained, these were recalculated using the fractional ashes derived from the respective reconstituted feed coals.

The ash-errors are reported in Tables 9A and 9B. The efficiency of each separation was calculated from the formula:

$$E = \frac{\text{Actual yield of washed coal}}{\text{Theoretical yield of washed coal at the same ash content as that of the washed coal.}} \times 100$$

These values are shown in Tables 9A and 9B.

Near .../

Near gravity material: The percentage of ±0.1 s.g. material on either side of the Tromp cut-points were obtained from the washability curves in Fig. 1 - 4 for each separation. These values are given in Tables 9A and 9B.

Analyses of the Medium Samples: The medium samples were analysed for the following:

(a) Specific gravity.
(b) Size analysis of solids.
(c) Magnetic content of solids.
(d) Viscosity - using a Stormer Viscosimeter.
(e) Stability - by means of an electro-magnetic balance.
(f) Yield value.

These analyses are reported in Table 10.

Analysis of Effluent: The effluent sample was analysed for the following:

(a) Solids content.
(b) Magnetic contents of the solids.

These results are shown in Table 11.

Analysis of Cyclone-underflow: This sample was analysed for the following:

(a) Solids content.
(b) Magnetic contents of solids.

These results are shown in Table 12.

DISCUSSION OF RESULTS OBTAINED:

The washability characteristics of the raw coal (Tables 2A & 2B) show that, even by South African standards, this is a difficult coal to wash at the specific gravities where the tests were carried out. The data in Tables 9A and 9B nevertheless indicate that very good separations were made.

The tendency...../

The tendency for the specific gravity of separation to increase with decrease in coal size, was less pronounced in the second test than in the first. The corresponding probable errors also show an improvement over those obtained in the first test - especially in the case of the smaller size fractions. The relatively poorer performance in the first test was probably caused by the admission of too much medium through the bottom inlet of the separating vessel.

The influence of near-gravity material on the amount of "misplaced" - or wrongly classified material in the products is clearly evident by comparing the relevant values obtained in the two tests. Although the separations in the second test were generally superior to those of the first test, the corresponding percentages of misplaced material were nevertheless greater in the second test. This can only be attributed to the increased amounts of near-gravity material present at the specific gravities of separation in the second test.

The analyses of the samples taken during these tests suggest that when performance tests are conducted on washers making very efficient separations, the normal specifications for sampling for float and sink analysis, may give rise to certain anomalies in results. In order to ensure that such anomalies do not occur, the weights of gross samples may, however, have to be increased so much that testing of such washers becomes impracticable.

The duration of these tests was limited to one hour per test by factors not concerned with the washing plant. The author has no doubt that, had these tests been extended

over a...../

over a full shift, the results would not have been materially affected.

It is unfortunate that facilities were not available for weighing the products entering and leaving the washery.

CONCLUSION:

The washer has proved itself capable of making very good separations on a coal having difficult washability characteristics.

(Sgd) B. VAN ECK.

SENIOR TECHNICAL OFFICER.

PRETORIA
18TH MARCH, 1960.
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TABLE IA.

SCREEN ANALYSES OF SAMPLES - TEST 1.

Size Fraction	RAW COAL				WASHED PRODUCT		DISCARD	
	Sample 1A		Sample 2A					
	Weight lb.	Yield %	Weight lb.	Yield %	Weight lb.	Yield %	Weight lb.	Yield %
+35mm.	401.25	43.43	456.00	39.81	641.25	39.27	752.50	44.05
-35mm.) +20mm.)	266.75	28.87	346.75	30.28	517.25	31.68	553.75	32.42
-20mm.) +12mm.)	137.00	14.83	190.25	16.61	282.50	17.30	280.00	16.39
-12mm.) + 6mm.)	74.50	8.06	92.50	8.08	146.25	8.96	86.75	5.08
-6mm.	38.75	4.19	50.25	4.39	45.50	2.79	33.25	1.94
Loss.	5.75	0.62	9.50	0.83	0.00	0.00	2.00	0.12
TOTAL:	924.00	100.00	1143.25	100.00	1632.75	100.00	1708.25	100.00

TABLE IB

SCREEN ANALYSES OF SAMPLES - TEST 2.

Size Fraction	RAW COAL				WASHED PRODUCT		DISCARD	
	Sample 1B		Sample 2B					
	Weight lb.	Yield %	Weight lb.	Yield %	Weight lb.	Yield %	Weight lb.	Yield %
+35mm.	422.75	46.55	530.00	44.35	523.75	39.28	789.00	43.92
-35mm.) +20mm.)	253.50	27.91	332.50	27.82	415.00	31.12	570.75	31.77
-20mm.) +12mm.)	122.75	13.52	178.25	14.92	228.00	17.10	293.00	16.31
-12mm.) + 6mm.)	67.25	7.40	91.75	7.68	125.00	9.37	103.50	5.76
- 6mm.	38.00	4.18	51.00	4.27	38.25	2.87	34.25	1.91
Loss	4.00	0.44	11.50	0.96	3.50	0.26	6.00	0.33
TOTAL:	908.25	100.00	1195.00	100.00	1333.50	100.00	1796.50	100.00

TABLE 3 A

FLOAT AND SINK ANALYSES OF WASHED PRODUCT AND DISCARD OF +35mm. SIZE FRACTION - TEST 1.

S.G.	WASHED PRODUCT.					DISCARD.					RECONSTITUTED FEED*				
	Fract. Yield lb.	Fract Yield %	Cum Yield %	Fract Ash %	Cum Ash %	Fract Yield lb.	Fract Yield %	Cum Yield %	Fract Ash %	Cum Ash %	Fract Yield %	Cum Yield %	Fract Ash %	Cum Ash %	Tromp Dist.Coef.
F.1.36	11.60	2.71	2.71	6.0	6.00						1.63	1.63	6.00	6.00	100.0
1.36 - 1.38	68.50	16.02	18.73	7.3	7.11						9.61	11.24	7.30	7.11	100.0
1.38 - 1.40	114.70	26.82	45.55	8.4	7.87						16.09	27.33	8.40	7.87	100.0
1.40 - 1.42	115.70	27.05	72.60	10.1	8.70						16.23	43.56	10.10	8.70	100.0
1.42 - 1.44	47.80	11.18	83.78	12.4	9.19	0.00	0.00	0.00	-	-	6.71	50.27	12.40	9.19	100.0
1.44 - 1.46	30.70	7.18	90.96	15.1	9.66	0.19	0.04	0.04	12.4	12.40	4.32	54.59	15.09	9.66	99.8
1.46 - 1.48	24.30	5.68	96.64	17.0	10.09	0.85	0.12	0.16	16.4	15.40	3.46	58.05	16.99	10.10	98.6
1.48 - 1.50	13.40	3.13	99.77	18.3	10.35	19.70	3.93	4.09	19.4	19.28	3.45	61.50	18.80	10.59	54.5
1.50 - 1.52	0.51	0.12	99.89	15.8	10.36	30.90	6.17	10.26	20.8	20.19	2.54	64.04	20.66	10.99	2.8
1.52 - 1.54	0.49	0.11		19.8	10.37	26.40	5.27	15.53	22.3	20.91	2.17	66.21	22.23	11.36	2.8
1.54 - 1.56	0.00	0.00				21.60	4.31	19.84	24.8	21.76	1.72	67.93	24.80	11.70	0.0
1.56 - 1.58						17.70	3.54	23.38	26.6	22.56	1.42	69.35	26.60	12.01	
1.58 - 1.60						21.60	4.32	27.70	28.6	23.50	1.73	71.08	28.60	12.41	
1.60 - 1.62						29.30	5.85	33.55	31.1	24.83	2.34	73.42	31.10	13.01	
1.62 - 1.64						20.00	3.99	37.54	32.9	25.69	1.60	75.02	32.90	13.43	
1.64 - 1.66						22.10	4.41	41.95	34.2	26.58	1.76	76.78	34.20	13.91	
1.66 - 1.68						17.00	3.40	45.35	36.0	27.29	1.36	78.14	36.00	14.29	
1.68 - 1.70						15.10	3.02	48.37	38.2	27.97	1.21	79.35	38.20	14.66	
S 1.70						285.80	51.63		47.0		20.65		47.00		
Total	427.70	100.00			10.37	500.67	100.00			37.79	100.00			21.34	

*Obtained by using the relevant yield figure in Table 8A.

TABLE 3 B

FLOAT AND SINK ANALYSES OF WASHED PRODUCT AND DISCARD + 35 mm. SIZE FRACTION - TEST II.

S.G.	WASHED PRODUCT.					DISCARD.					RECONSTITUTED FEED*				
	Fract. Yield lb.	Fract. Yield %	Cum. Yield %	Fract. Ash %	Cum Ash %	Fract. Yield lb.	Fract. Yield %	Cum. Yield %	Fract. Ash %	Cum Ash %	Fract. Yield %	Cum. Yield %	Fract. Ash %	Cum. Ash %	Tromp Dist. Coef.
F 1.36	47.50	13.71	13.71	6.7	6.7	Nil	Nil	Nil	-	-	6.86	6.86	6.70	6.70	100.0
1.36 - 1.38	115.20	33.24	46.95	8.0	7.62	Nil	Nil	Nil	-	-	16.62	23.48	8.00	7.62	100.0
1.38 - 1.40	111.50	32.18	79.13	9.5	8.38	0.31	0.06	0.06	8.5	8.5	16.12	39.60	9.50	8.38	99.8
1.40 - 1.42	63.00	18.18	97.31	10.4	8.76	2.80	0.53	0.59	13.5	12.99	9.36	48.96	10.49	8.79	97.1
1.42 - 1.44	8.90	2.57	99.88	11.2	8.82	28.10	5.35	5.94	14.4	14.26	3.93	52.89	13.27	9.10	32.6
1.44 - 1.46	0.27	0.08	99.96	11.9	8.82	40.20	7.65	13.59	15.6	15.01	3.87	56.76	15.56	9.54	1.0
1.46 - 1.48	0.13	0.04		12.8	8.82	28.70	5.46	19.05	17.9	15.84	2.75	59.51	17.87	9.92	0.7
S 1.48	Nil	-				425.40	80.95		36.9		40.49		36.90		0.0
TOTAL	346.50	100.00	100.00		8.82	525.51	100.00	100.00		32.89	100.00	100.00		20.86	

*Obtained by using the relevant yield figure in Table 8B.

TABLE 4 A

FLOAT AND SINK ANALYSES OF WASHED PRODUCT DISCARD -35mm + 20 mm SIZE FRACTION - TEST I.

S.G.	WASHED PRODUCT. Fract. Yield lb.	Fract. Yield %	Cum. Yield %	Fract. Ash %	Cum. Ash %	DISCARD Fract. Yield lb.	Fract Yield %	Cum Yield %	Fract Ash %	Cum Ash %	RECONSTITUTED FEED* Fract Yield %	Cum Yield %	Fract Ash %	Cum Ash %	Tromp Dist.Coef.
F 1.36	14.00	5.37	5.37	5.7	5.70						3.25	3.25	5.70	5.70	100.0
1.36 - 1.38	47.40	18.17	23.54	7.1	6.78						11.00	14.25	7.10	6.78	100.0
1.38 - 1.40	73.40	28.14	51.68	8.8	7.88						17.03	31.28	8.80	7.88	100.0
1.40 - 1.42	59.40	22.77	74.45	10.6	8.71	0.00	0.00	0.00	-	-	13.78	45.06	10.60	8.71	100.0
1.42 - 1.44	30.10	11.54	85.99	13.0	9.29	0.18	0.07	0.07	11.5	11.50	7.01	52.07	12.99	9.29	99.6
1.44 - 1.46	18.20	6.98	92.97	15.3	9.74	0.16	0.06	0.13	14.8	13.02	4.24	56.31	15.30	9.74	99.5
1.46 - 1.48	11.40	4.37	97.34	17.1	10.07	0.71	0.26	0.39	17.4	15.94	2.74	59.05	17.11	10.08	96.4
1.48 - 1.50	5.30	2.03	99.37	19.0	10.25	7.50	2.71	3.10	19.7	19.23	2.30	61.35	19.33	10.43	53.5
1.50 - 1.52	1.50	0.58	99.95	18.7	10.30	12.90	4.66	7.76	20.9	20.23	2.19	63.54	20.55	10.78	16.0
1.52 - 1.54	0.09	0.04	99.99	21.5	10.30	17.60	6.36	14.12	22.3	21.16	2.54	66.08	22.29	11.22	1.2
1.54 - 1.56	0.03	0.01	100.00	23.7	10.30	14.40	5.20	19.32	24.4	22.03	2.06	68.14	24.40	11.61	0.5
1.56 - 1.58	0.00	0.00				14.40	5.20	24.52	26.5	22.98	2.05	70.19	26.50	12.05	0.0
1.58 - 1.60						15.20	5.49	30.01	28.2	23.93	2.17	72.36	28.20	12.53	
1.60 - 1.62						14.00	5.06	35.07	30.2	24.83	2.00	74.36	30.2	13.00	
1.62 - 1.64						14.50	5.24	40.31	32.3	25.80	2.07	76.43	32.3	13.53	
1.64 - 1.66						10.00	3.61	43.92	33.9	26.47	1.43	77.86	33.9	13.90	
1.66 - 1.68						13.40	4.84	48.76	37.4	27.55	1.91	79.77	37.4	14.46	
1.68 - 1.70						15.80	5.71	54.47	40.7	28.93	2.25	82.02	40.7	15.18	
S 1.70						126.00	45.53		47.0		17.98		47.0		
TOTAL	260.82	100.00	100.00		10.30	276.75	100.00	100.00		37.16	100.00	100.00		20.90	

*Obtsined by using the relevant yield figure in Table 8A.

TABLE 4 B.

FLOAT AND SINK ANALYSES OF WASHED PRODUCT AND DISCARD-35mm. + 20mm. SIZE FRACTION - TEST II.

S.G.	WASHED PRODUCT.					DISCARD					RECONSTITUTED FEED*				
	Fract. Yield lb.	Fract Yield %	Cum. Yield %	Fract. Ash %	Cum. Ash %	Fract. Yield lb.	Fract. Yield %	Cum. Yield %	Fract. Ash %	Cum. Ash %	Fract Yield %	Cum. Yield %	Fract Ash %	Cum. Ash %	Tromp. Dist.Coef.
F. 1.36	38.70	18.72	18.72	6.1	6.1	Nil	Nil	Nil	-	-	9.60	9.60	6.1	6.10	100.0
1.36 - 1.38	72.50	35.06	53.78	8.1	7.40	0.08	0.03	0.03	8.5	8.5	17.99	27.59	8.1	7.40	99.9
1.38 - 1.40	60.00	29.02	82.80	9.8	8.24	0.30	0.11	0.14	9.6	9.36	14.92	42.51	9.8	8.24	99.7
1.40 - 1.42	30.10	14.56	97.36	11.0	8.65	2.50	0.87	1.01	12.9	12.41	7.89	50.40	11.1	8.69	94.6
1.42 - 1.44	5.30	2.56	99.92	12.4	8.75	20.10	7.02	8.03	13.9	13.71	4.73	55.13	13.5	9.10	27.7
1.44 - 1.46	0.17	0.08	100.00	15.2	8.76	24.20	8.45	16.48	16.2	14.99	4.16	59.29	16.2	9.60	1.0
S.1.46	Nil	Nil		-		239.20	83.52		35.1		40.71		35.1		0.0
TOTAL	206.77	100.00	100.00		8.76	286.38	100.00	100.00		31.79	100.00	100.00		19.99	

*Obtained by using the relevant yield figure in Table 8B.

TABLE 5 B.

FLOAT AND SINK ANALYSES OF WASHED PRODUCT AND DISCARD -20mm.+ 12mm. SIZE FRACTION - TEST II.

S.G.	WASHED PRODUCT.					DISCARD.					RECONSTITUTED FEED.				
	Fract. Yield lb.	Fract. Yield %	Cum. Yield %	Fract Ash %	Cum Ash %	Fract Yield lb.	Fract Yield %	Cum Yield %	Fract. Ash %	Cum Ash %	Fract Yield %	Cum Yield %	Fract. Ash %	Cum Ash %	Tromp. Dist.Coef.
F.1.36	26.60	22.98	22.98	6.0	6.0	0.05	0.04	0.04	6.0	6.0	11.91	11.91	6.00	6.00	99.8
1.36 - 1.38	38.80	33.51	56.49	8.1	7.25	0.13	0.09	0.13	7.8	7.25	17.37	29.28	8.10	7.25	99.8
1.38 - 1.40	32.30	27.90	84.39	10.3	8.26	0.23	0.16	0.29	9.6	8.55	14.51	43.79	10.30	8.26	99.4
1.40 - 1.42	14.40	12.44	96.83	11.8	8.71	1.80	1.23	1.52	12.5	11.75	7.02	50.81	11.86	8.75	91.6
1.42 - 1.44	3.40	2.94	99.77	13.3	8.85	9.10	6.23	7.75	14.4	13.88	4.53	55.34	14.03	9.19	33.6
1.44 - 1.46	0.21	0.81	99.95	15.3	8.86	11.60	7.95	15.70	15.8	14.85	3.93	59.27	15.79	9.62	2.3
1.46 - 1.48	0.04	0.03	99.98	17.8	8.86	7.90	5.41	21.11	18.1	15.68	2.63	61.90	18.10	9.98	0.8
1.48 - 1.50	0.03	0.02	100.00	25.1	8.86	8.40	5.75	26.86	19.9	16.58	2.79	64.69	19.95	10.41	0.4
S.1.50	Nil	Nil				106.80	73.14		37.7		35.31		37.70		0.0
TOTAL	115.78	100.00	100.00		8.86	146.01	100.00	100.00		32.03	100.00	100.00	20.05		

*Obtained by using the relevant yield figure in Table 8B.

TABLE 6 B.

FLOAT AND SINK ANALYSES OF WASHED PRODUCT AND DISCARD -12mm.+ 6mm. SIZE FRACTION - TEST II.

S.G.	WASHED PRODUCT.					DISCARD.					RECONSTITUTED FEED*				
	Fract. Yield lb	Fract. Yield %	Cum. Yield %	Fract Ash %	Cum. Ash %	Fract Yield lb.	Fract Yield %	Cum Yield %	Fract Ash %	Cum Ash %	Fract Yield %	Cum Yield %	Fract Ash %	Cum Ash %	Tromp Dist.Coef.
F.1.36	16.20	26.16	26.16	5.6	5.6	0.05	0.07	0.07	6.8	6.8	15.52	15.52	5.60	5.60	99.8
1.36 - 1.38	20.30	32.78	58.94	8.0	6.93	0.22	0.30	0.37	6.7	6.72	19.52	35.04	7.99	6.93	99.4
1.38 - 1.40	14.30	23.10	82.04	10.1	7.82	0.51	0.71	1.08	9.4	8.48	13.96	49.00	10.09	7.83	97.9
1.40 - 1.42	7.40	11.95	93.99	12.0	8.35	1.10	1.52	2.60	11.6	10.30	7.69	56.69	11.97	8.39	91.9
1.42 - 1.44	3.10	5.01	99.00	13.9	8.63	4.20	5.82	8.42	14.4	13.13	5.35	62.04	14.12	8.88	55.5
1.44 - 1.46	0.39	0.63	99.63	16.5	8.68	5.30	7.34	15.76	15.8	14.37	3.36	65.40	15.88	9.24	11.0
1.46 - 1.48	0.13	0.21	99.84	18.4	8.70	5.20	7.21	22.97	18.0	15.51	3.06	68.46	18.02	9.63	3.9
1.48 - 1.50	0.04	0.07	99.91	20.2	8.71	5.50	7.62	30.59	20.3	16.70	3.15	71.61	20.30	10.10	1.3
1.50 - 1.52	0.02	0.03	99.94	22.8	8.71	3.60	4.99	35.58	22.0	17.44	2.06	73.67	22.01	10.43	1.0
1.52 - 1.54	0.02	0.03	99.97	23.5	8.71	4.00	5.54	41.12	24.0	18.32	2.28	75.95	24.00	10.83	0.9
1.54 - 1.56	0.02	0.03	100.00	24.1	8.71	2.50	3.46	44.58	25.8	18.90	1.43	77.38	25.78	11.11	1.4
S.1.56	Nil	Nil		-		40.00	55.42		40.1		22.62		40.10		0.0
TOTAL	61.92	100.00	100.00		8.71	72.18	100.00	100.00		30.65	100.00	100.00		22.14	

*Obtained by using the relevant yield figure in Table 8B.

TABLE 7 A

ANALYSES OF WHOLE COAL SAMPLES - TEST 1.

Size Fraction.	RAW COAL				WASHED PRODUCT				DISCARD
	Ash %	H_2O %	Vol. Mat. %	Total S %	Ash %	H_2O %	Vol. Mat. %	Total S %	Ash %
+ 35 mm.	21.1	1.6	9.9	2.15	10.1	1.6	10.2	1.53	37.6
-35mm.+ 20mm	19.6	1.7	9.8	2.20	9.9	1.5	10.3	1.45	37.0
-20mm.+ 12mm	19.5	1.6	9.9	2.09	9.9	1.5	10.1	1.54	37.0
-12mm.+ 6mm.	17.3	1.4	10.5	2.03	9.6	1.4	10.6	2.40	37.0
- 6mm.	18.1	1.3	11.4	-	10.5	1.3	11.1	-	32.6

TABLE 7 B

ANALYSES OF WHOLE COAL SAMPLES - TEST II.

Size Fraction.	RAW COAL			WASHED PRODUCT			DISCARD
	Ash %	H_2O %	Vol. Mat. %	Ash %	H_2O %	Vol. Mat. %	Ash
+ 35 mm.	21.0	1.5	11.5	8.8	1.3	11.0	33.2
-35mm + 20mm	20.3	1.5	10.8	8.6	1.2	11.3	32.6
-20mm + 12mm	19.8	1.6	11.2	8.6	1.2	11.6	31.8
-12mm + 6 mm	17.6	1.4	10.9	8.5	1.1	11.2	30.8
- 6 mm	17.2	1.4	11.7	8.9	1.1	11.9	27.5

TABLE 8 A.

YIELDS OF PRODUCTS CALCULATED FROM ASH-BALANCE - TEST I.

Size Fraction.	Yield of Washed Coal % of size fraction in feed coal.	Yield of Discard % of size fraction in feed coal.
+ 35 mm.	60.00	40.00
-35mm + 20 mm	60.52	39.48
-20mm + 12 mm	64.58	35.42
-12mm + 6 mm	71.90	28.10

TABLE 8 B

YIELDS OF PRODUCTS CALCULATED FROM ASH-BALANCE - TEST 2.

Size Fraction	Yield of Washed Coal % of size fraction in feed coal.	Yield of Discard % of size fraction in feed coal.
+ 35 mm	50.00	50.00
-35mm + 20 mm	51.25	48.75
-20mm + 12 mm	51.72	48.28
-12mm + 6 mm	59.19	40.81

TABLE 9A

SUMMARY OF PERFORMANCE DATA - TEST I.

SIZE	CUT POINTS		WASHED COAL		DISCARD Ash %	± 0.1 S.G. Material %	Prob. Error	ERROR AREAS*			Mean Error (Needham) % of R.C. Feed	Ash Error	Efficiency
	Tromp	Needham	Yield %	Ash %				Washed Coal lost	Discard Gained	Total			
+ 35 mm	1.490	1.490	60.0	10.37	37.79	50.6	0.003	0.93	0.88	1.81	0.72	0.028**	99.7
-35mmx20mm	1.491	1.492	60.5	10.30	37.16	48.9	0.006	1.42	2.36	3.78	0.77	0.034**	99.5
-22mmx12mm	1.498	1.500	64.6	10.25	37.22	42.0	0.010	2.97	2.94	5.91	0.85	0.030	99.4
-12mmx 6mm	1.510	1.507	71.9	10.10	36.15	31.6	0.016	3.96	±5.2	±9.2	1.37	0.124	98.9

TABLE 9B.

SUMMARY OF PERFORMANCE DATA - TEST II.

	CUT POINTS		WASHED COAL		DISCARD Ash %	± 0.1 S.G. Material %	PROB. ERROR	ERROR AREAS*			Mean Error (Needham) % of R.C Feed.	Ash Error	Efficiency
	Tromp	Needham	Yield %	Ash %				Washed coal lost	Discard gained	Total			
+ 35 mm	1.429	1.425	50.0	8.82	32.89	65.9	0.002	1.20	0.48	1.68	0.90	0.056**	
-35mmx20mm	1.428	1.424	51.3	8.76	31.79	68.4	0.004	1.40	1.90	2.49	1.05	0.057**	
-20mmx12mm	1.428	1.424	51.7	8.86	32.03	66.8	0.006	1.81	1.38	3.19	1.21	0.67**	
-12mmx6mm	1.432	1.428	59.2	8.71	30.65	72.4	0.009	2.70	2.47	5.17	1.95	0.135**	

*Error areas drawn to scale: 1 inch = 10 units on distribution axis & 1" = 0.025 units on s.g. axis.

**These values were obtained by using the fractional ash values of the reconstituted feeds.

TABLE 10

ANALYSES OF MEDIUM SAMPLES.

Test No.	S.G. of Suspension	Solids / 200 B.S.S. %	Magnetics in Solids %	Viscosity	Yield Value Fo	Settling Rate cm/sec
1	1.48	3.38	91.58	1.3 c.p	1.8	0.029
2	1.42	3.52	90.95			0.046

TABLE 11.

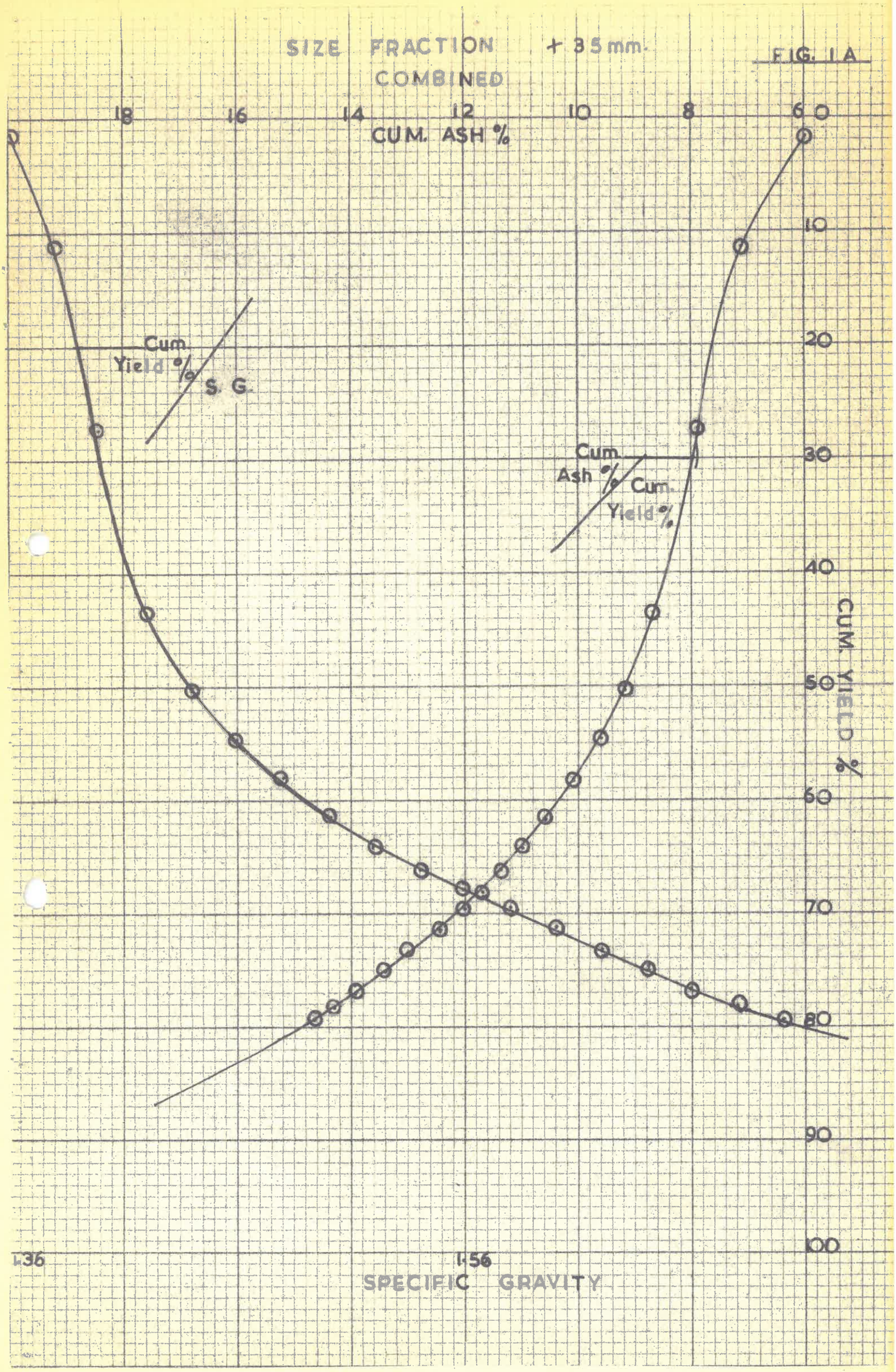
ANALYSES OF EFFLUENT SAMPLE.

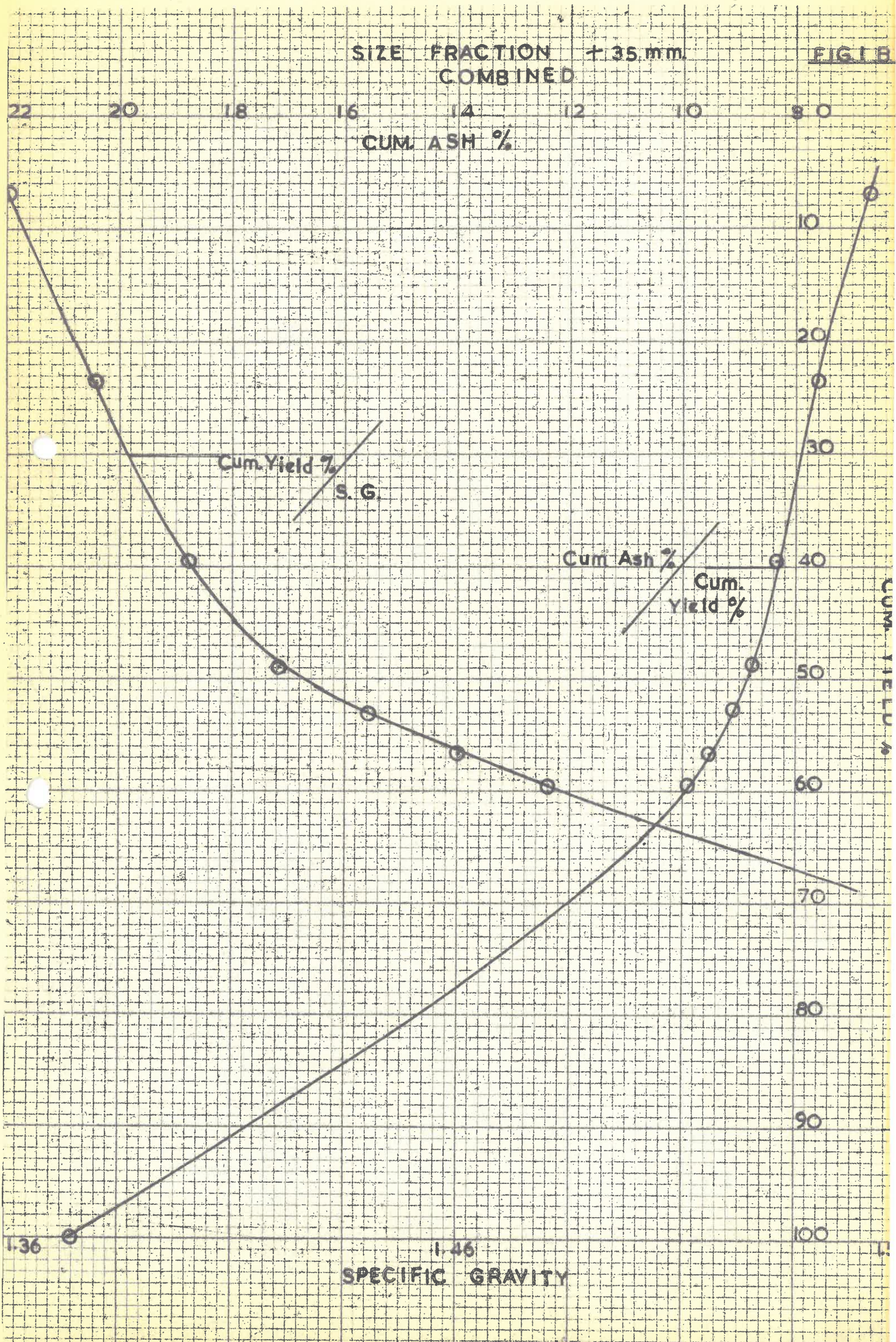
Volume of effluent from plant gals/hr	Solid content of effluent lb/gal.	Magnetic material in solids %	Magnetic loss lb/gal.
1,800	0.16	1.0	0.0016

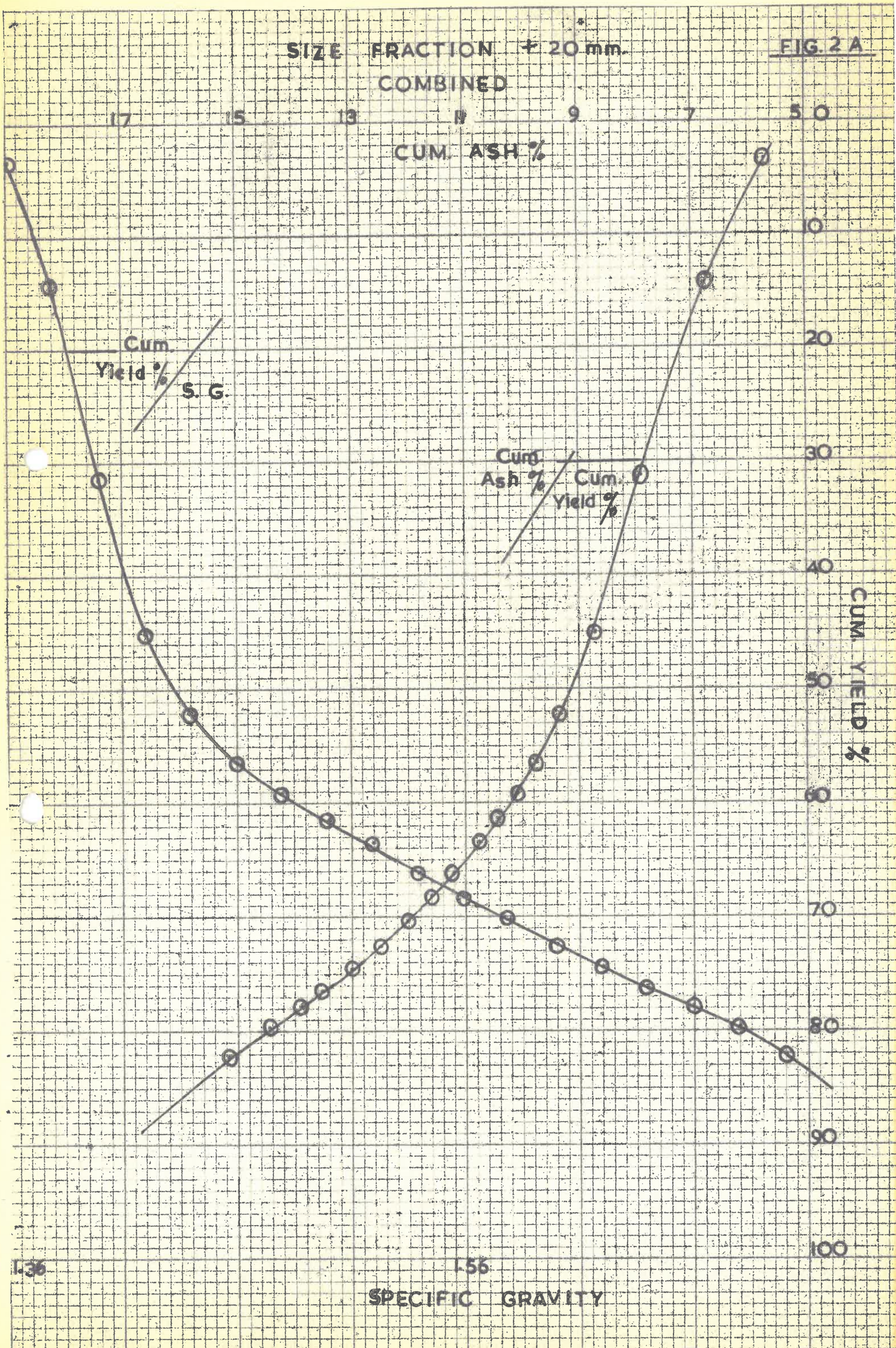
TABLE 12.

ANALYSES OF SLURRY FROM MEDIUM CYCLONE

Volume of Slurry from plant gal/hr	Solids content of Slurry lb/ gal.	Magnetic Material in Solids % Wght	Magnetic Loss lb/gal.
60 - 70	6.93	3.0	0.021


SIZE FRACTION + 3.5 mm.
COMBINED
FIG. 1A
CUM. ASH %
18
16
14
12
10
8
6
0
10
20
30
40
50
60
70
80
90
100
CUM. YIELD %
Cum. Yield %
S. G.
Cum. Ash %
Cum. Yield %
1.36
1.56
SPECIFIC GRAVITY


SIZE FRACTION +35 mm.
COMBINED
FIG I B
22
20
18
16
14
12
10
8 0
CUM. ASH %
10
20
30
40
50
60
70
80
90
100
Cum. Yield %
S. G.
Cum Ash %
Cum.
Yield %
1.36
1.46
SPECIFIC GRAVITY


SIZE FRACTION + 20 mm.
COMBINED
FIG. 2 A
17
15
13
11
9
7
5
CUM. ASH %
0
10
20
30
40
50
60
70
80
90
100
CUM. YIELD %
Cum. Yield % / S. G.
Cum. Ash % / Cum. Yield %
1.36
1.56
SPECIFIC GRAVITY

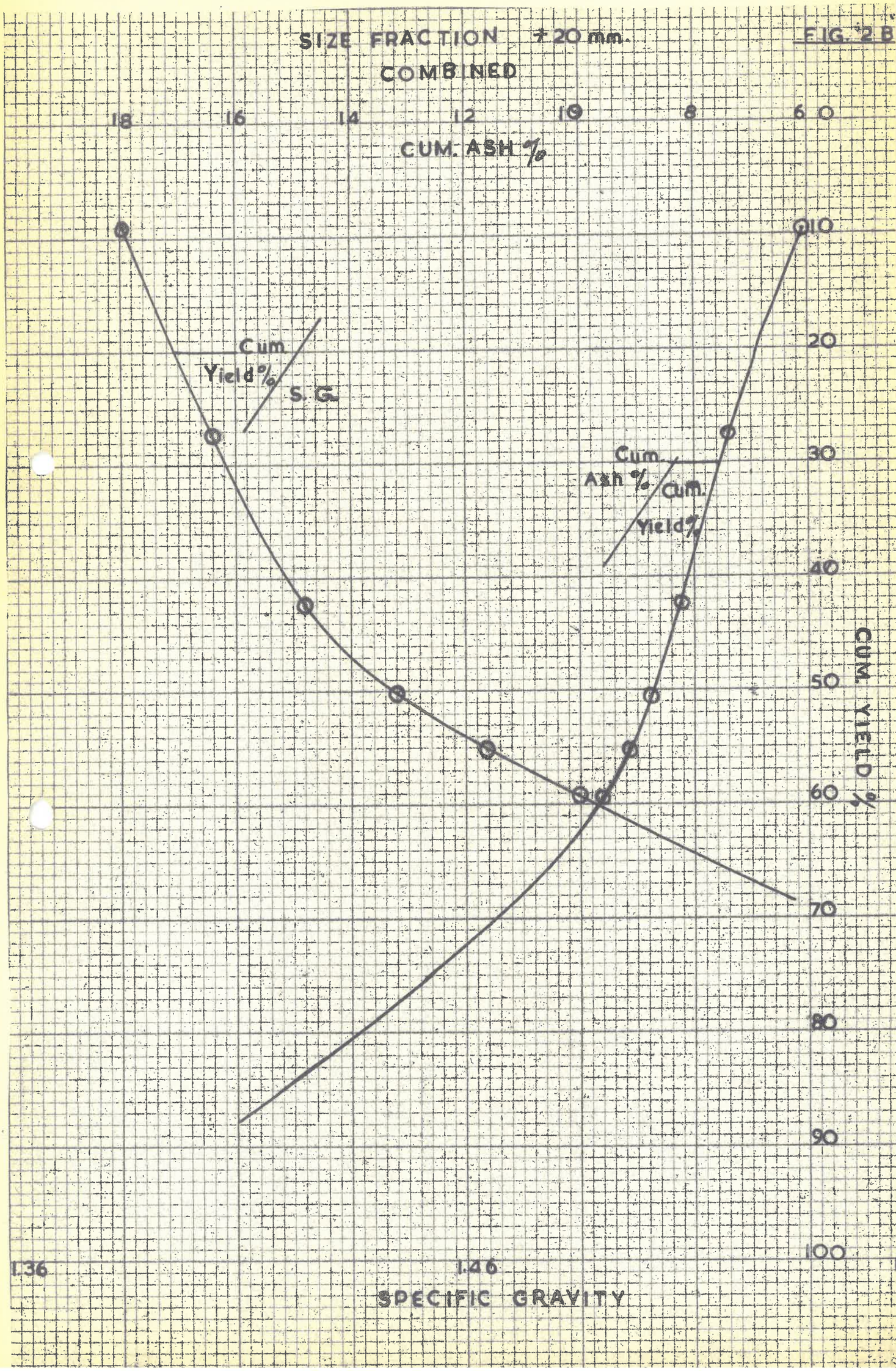
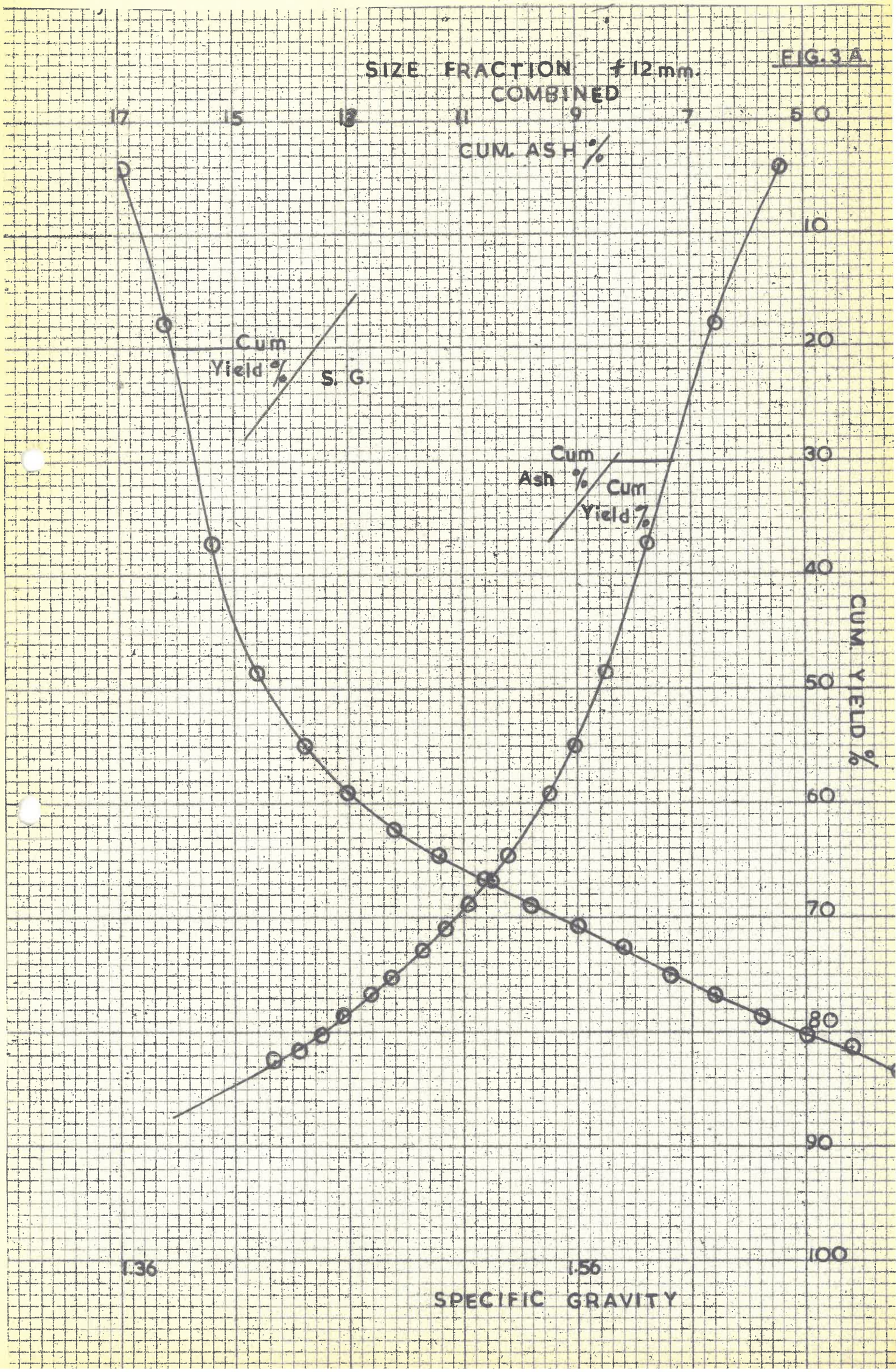

SIZE FRACTION +20 mm.
COMBINED
FIG. 2 B
18
16
14
12
10
8
6 0
CUM. ASH %
10
20
30
40
50
60
70
80
90
100
Cum.
Yield %
S. G.
Cum.
Ash %
Cum.
Yield %
CUM. YIELD %
1.36
1.46
SPECIFIC GRAVITY

FIG. 3 A


SIZE FRACTION + 12 mm.
COMBINED
17
15
13
11
9
7
5
CUM. ASH %
10
20
30
40
50
60
70
80
90
100
CUM. YIELD %
Cum
Yield %
S. G.
Cum
Ash %
Cum
Yield %
1.36
1.56
SPECIFIC GRAVITY

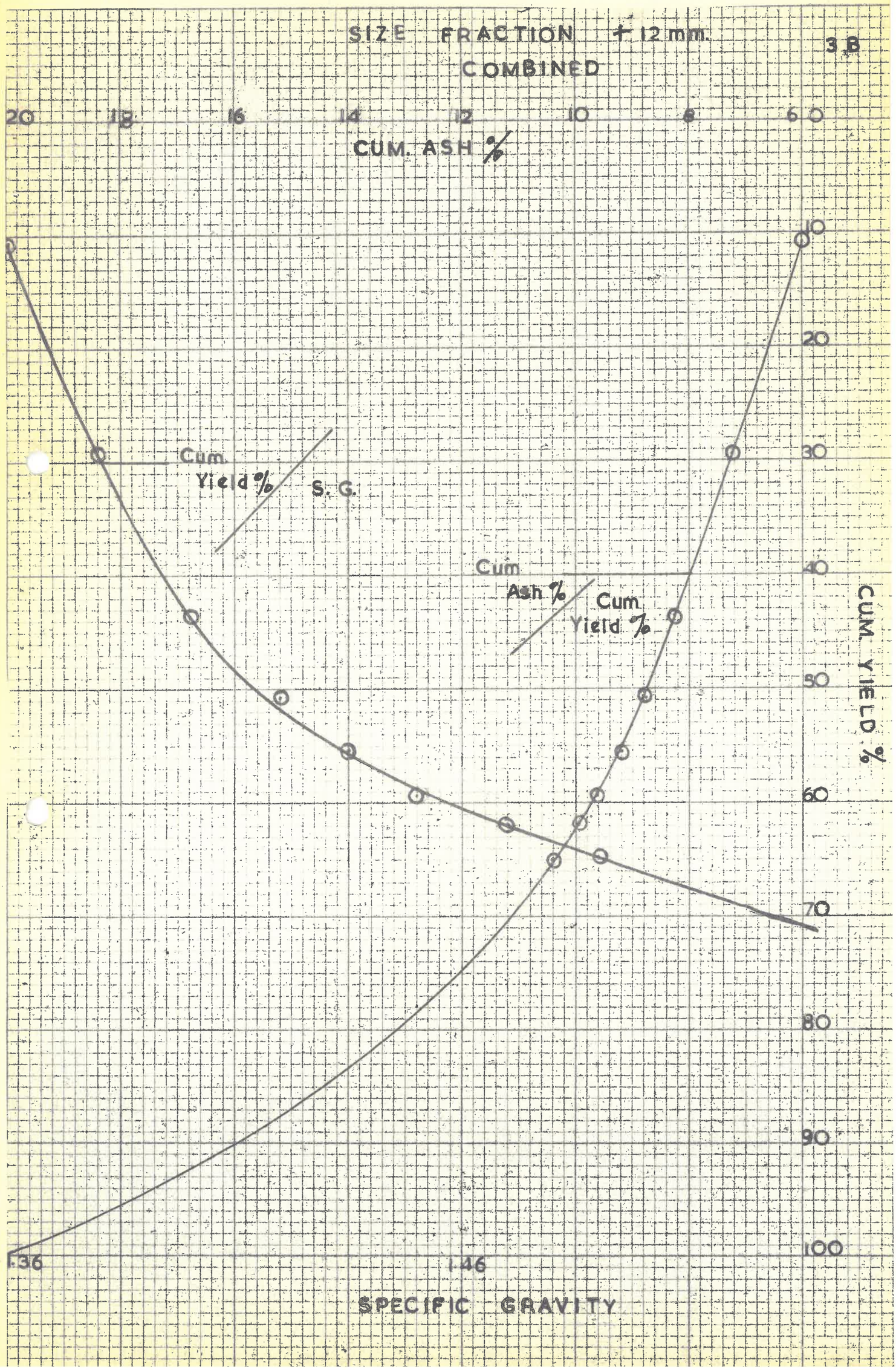

SIZE FRACTION + 12 mm.
COMBINED
3 B
20
18
16
14
12
10
8
6
CUM. ASH %
0
10
20
30
40
50
60
70
80
90
100
CUM. YIELD %
Cum. Yield %
S. G.
Cum Ash %
Cum Yield %
1.36
1.46
SPECIFIC GRAVITY

FIG. 4 A

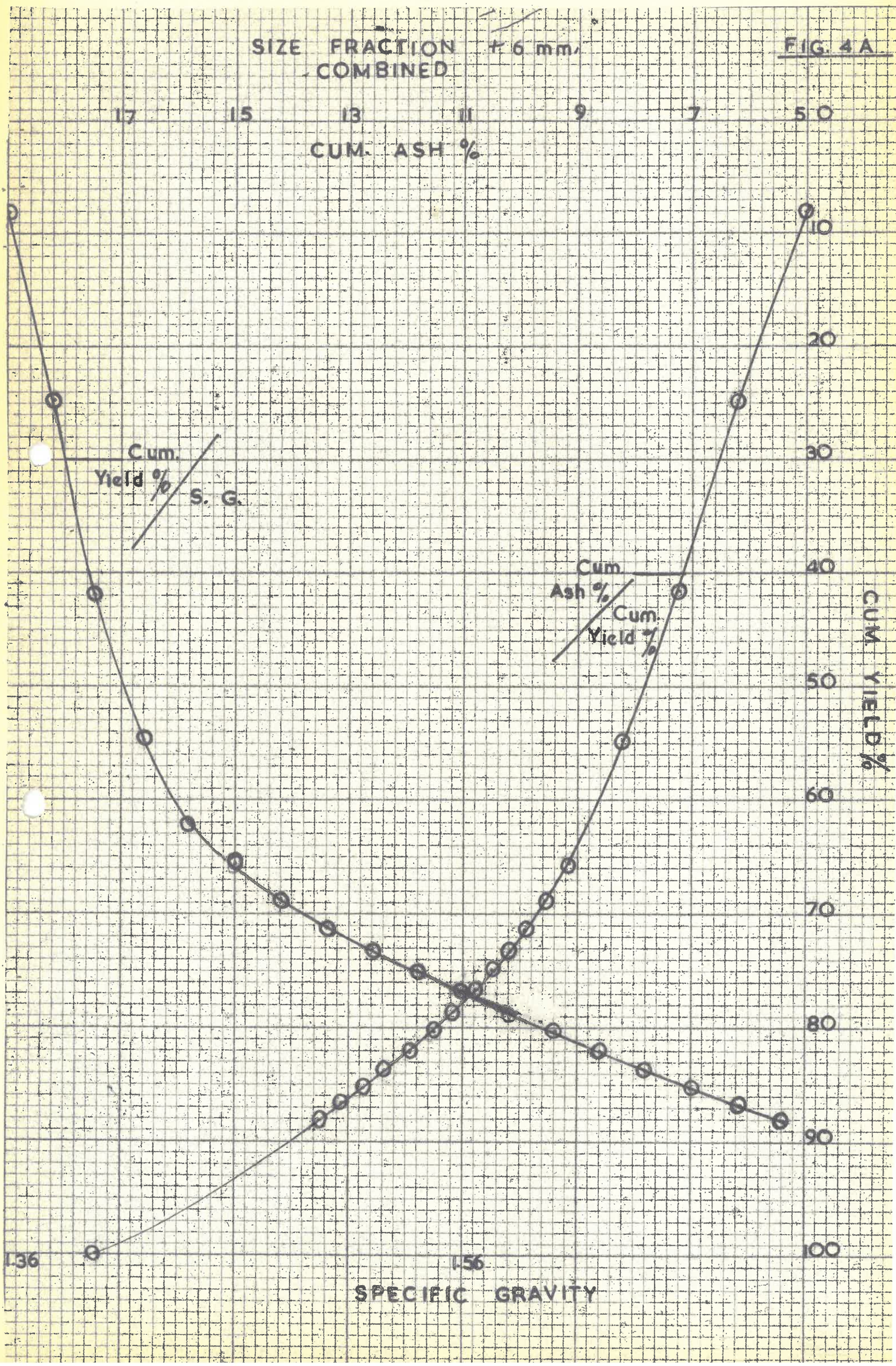

SIZE FRACTION +6 mm.
COMBINED
17
15
13
11
9
7
5 0
CUM. ASH %
10
20
30
40
50
60
70
80
90
100
CUM. YIELD %
Cum. Yield % / S. G.
Cum. Ash % / Cum. Yield %
1.36
1.56
SPECIFIC GRAVITY

FIG. 4B

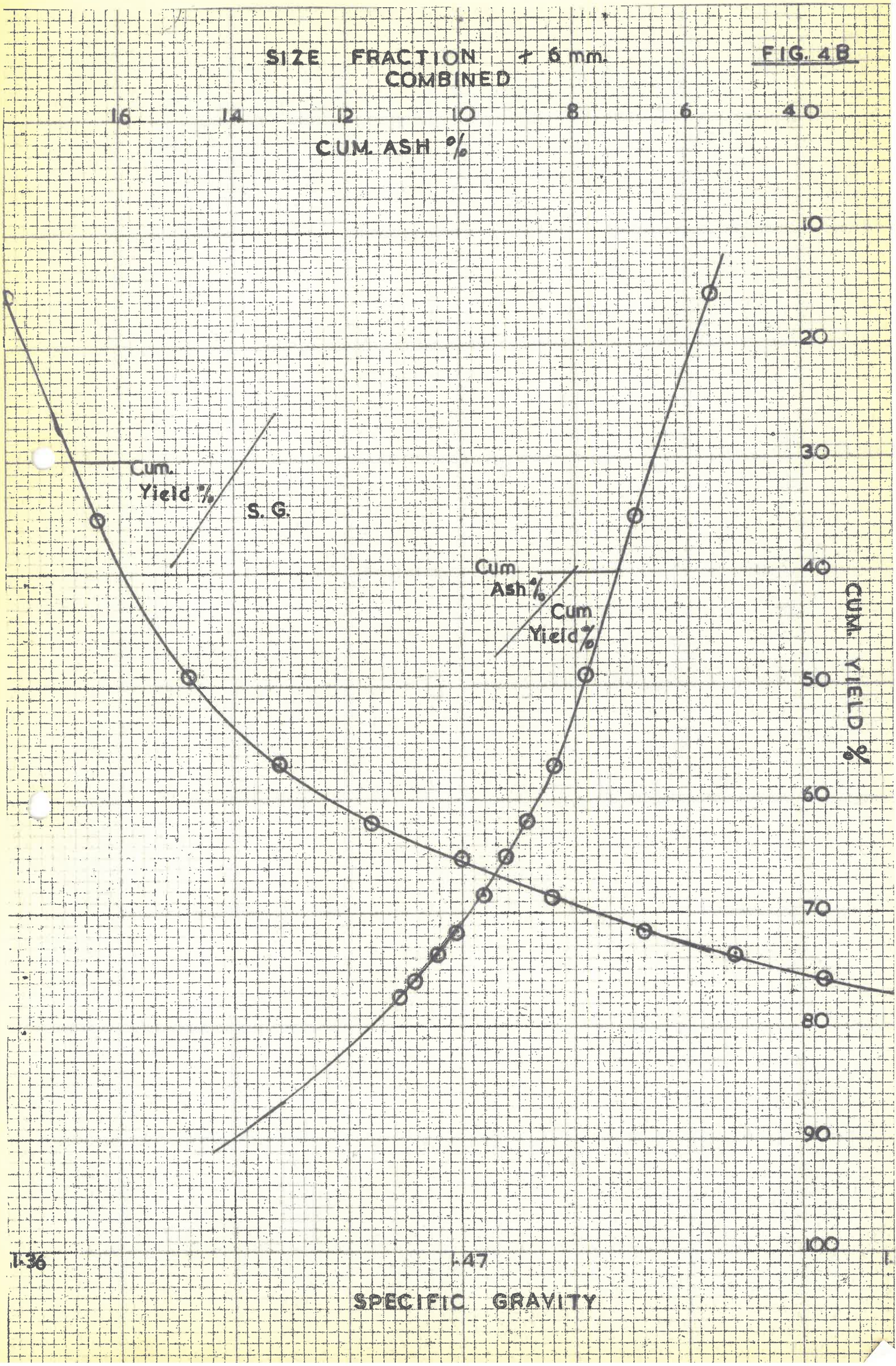

SIZE FRACTION + 6 mm.
COMBINED
16
14
12
10
8
6
4
CUM. ASH %
10
20
30
40
50
60
70
80
90
100
CUM. YIELD %
Cum. Yield %
S. G.
Cum. Ash %
Cum Yield %
1.36
1.47
SPECIFIC GRAVITY

FIG. 5.A

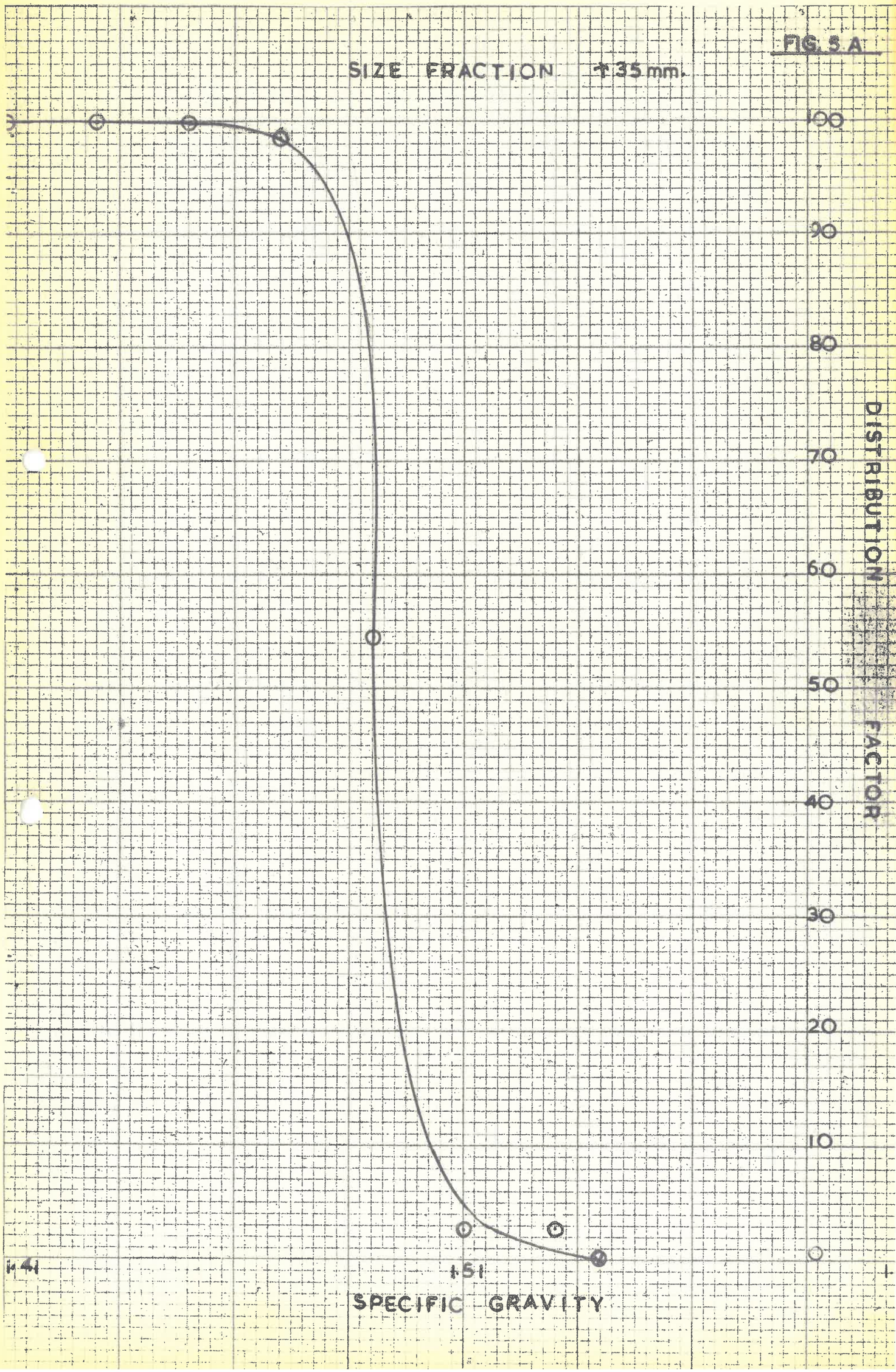

SIZE FRACTION +35 mm.
100
90
80
70
60
50
40
30
20
10
DISTRIBUTION FACTOR
1.41
1.51
SPECIFIC GRAVITY

FIG. 5B

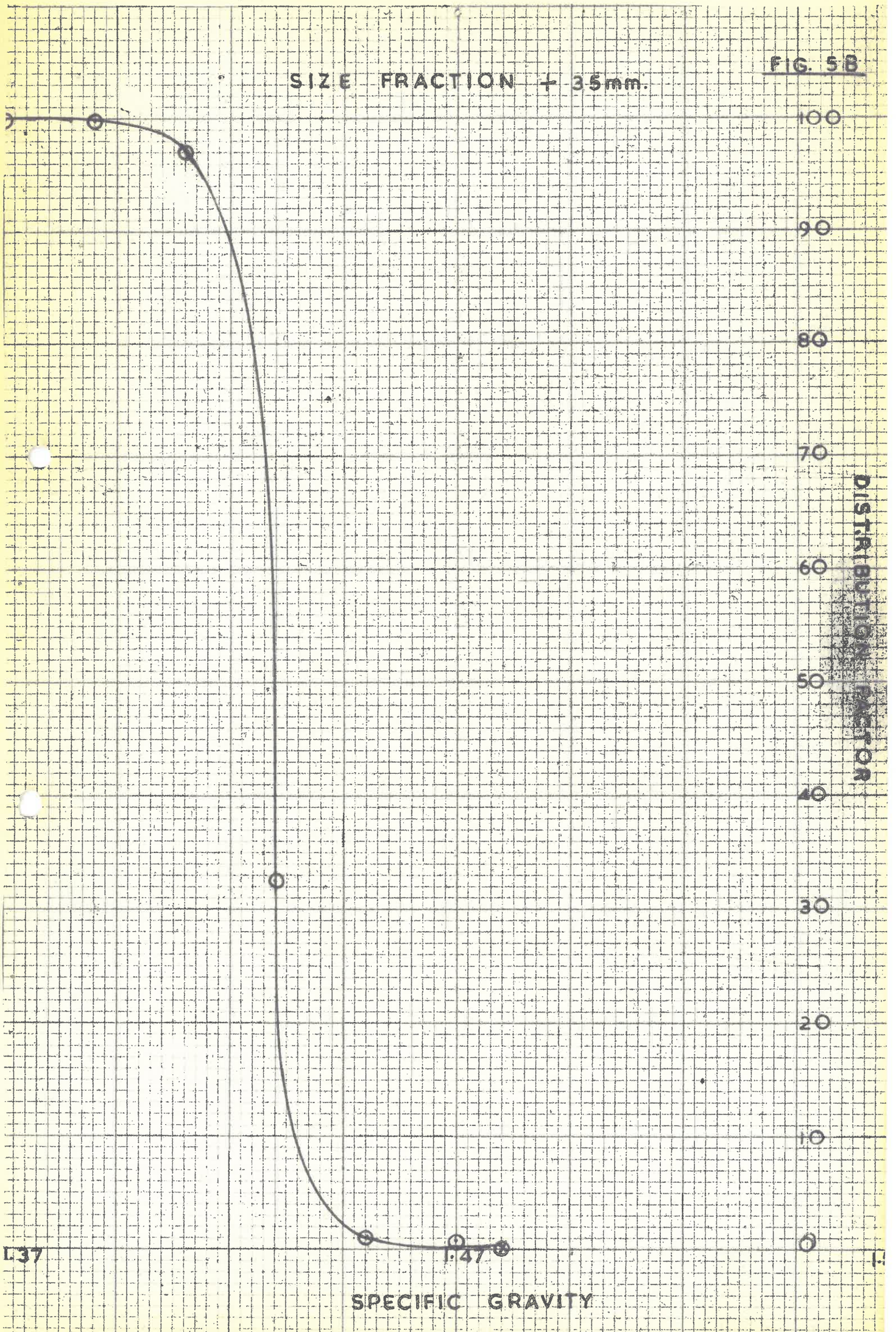

SIZE FRACTION + 3.5mm.
100
90
80
70
60
50
40
30
20
10
0
DISTRIBUTION FACTOR
1.37
1.47
SPECIFIC GRAVITY

FIG. 6 A

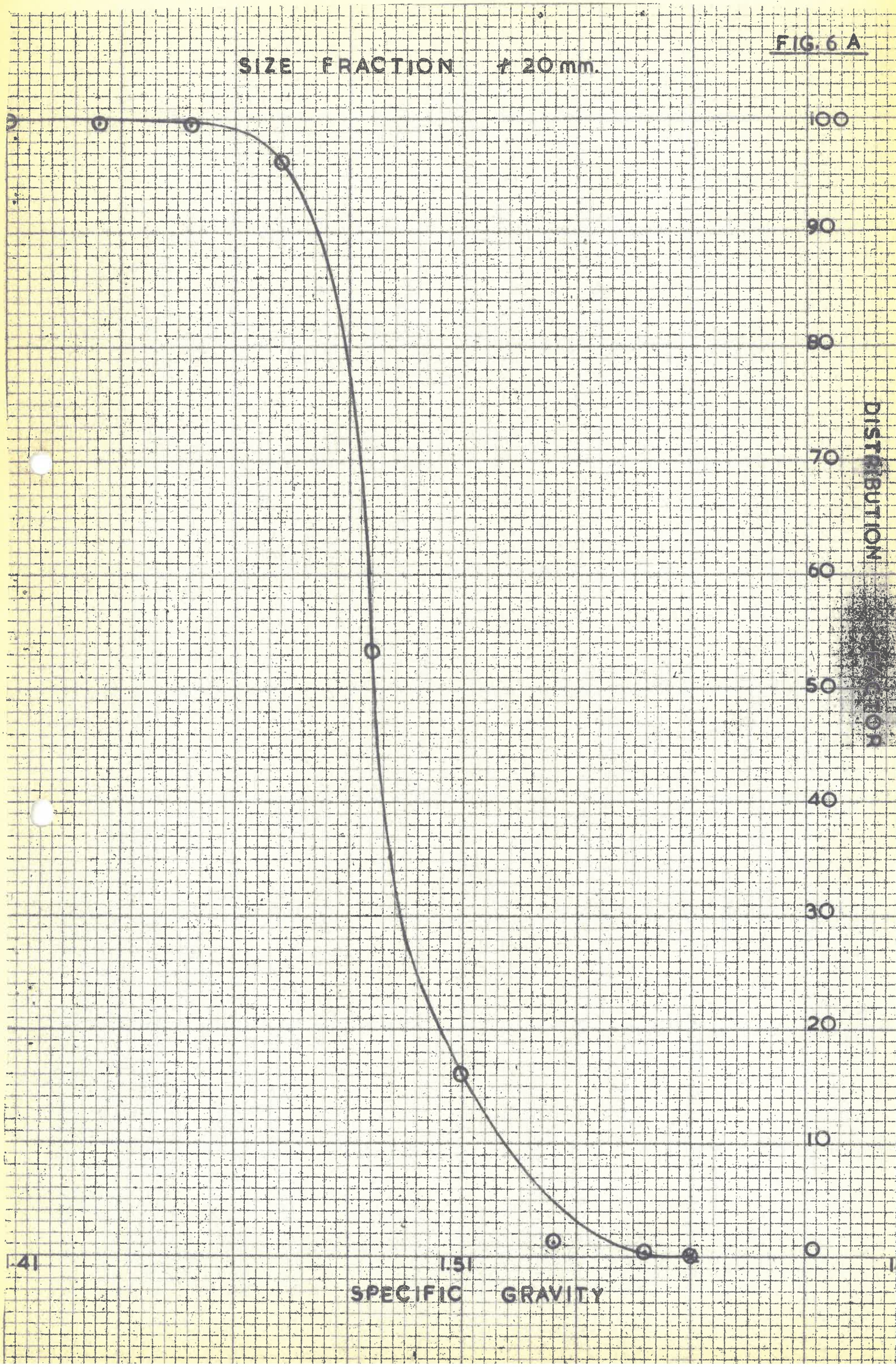
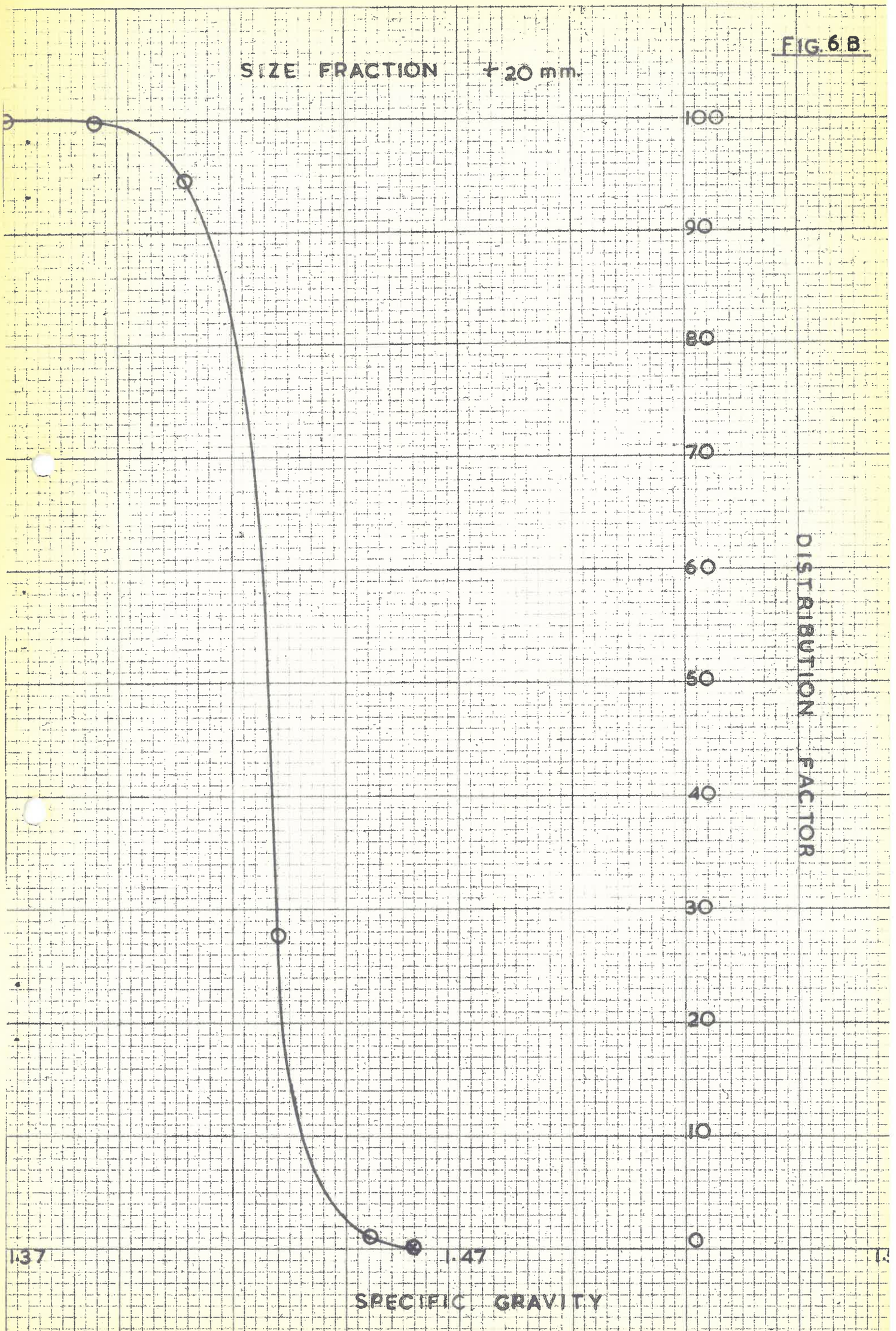

SIZE FRACTION + 20mm.
100
90
80
70
60
50
40
30
20
10
0
DISTRIBUTION
1.41
1.51
SPECIFIC GRAVITY

FIG. 6 B


SIZE FRACTION +20 mm.
100
90
80
70
60
50
40
30
20
10
0
DISTRIBUTION FACTOR
1.37
1.47
SPECIFIC GRAVITY

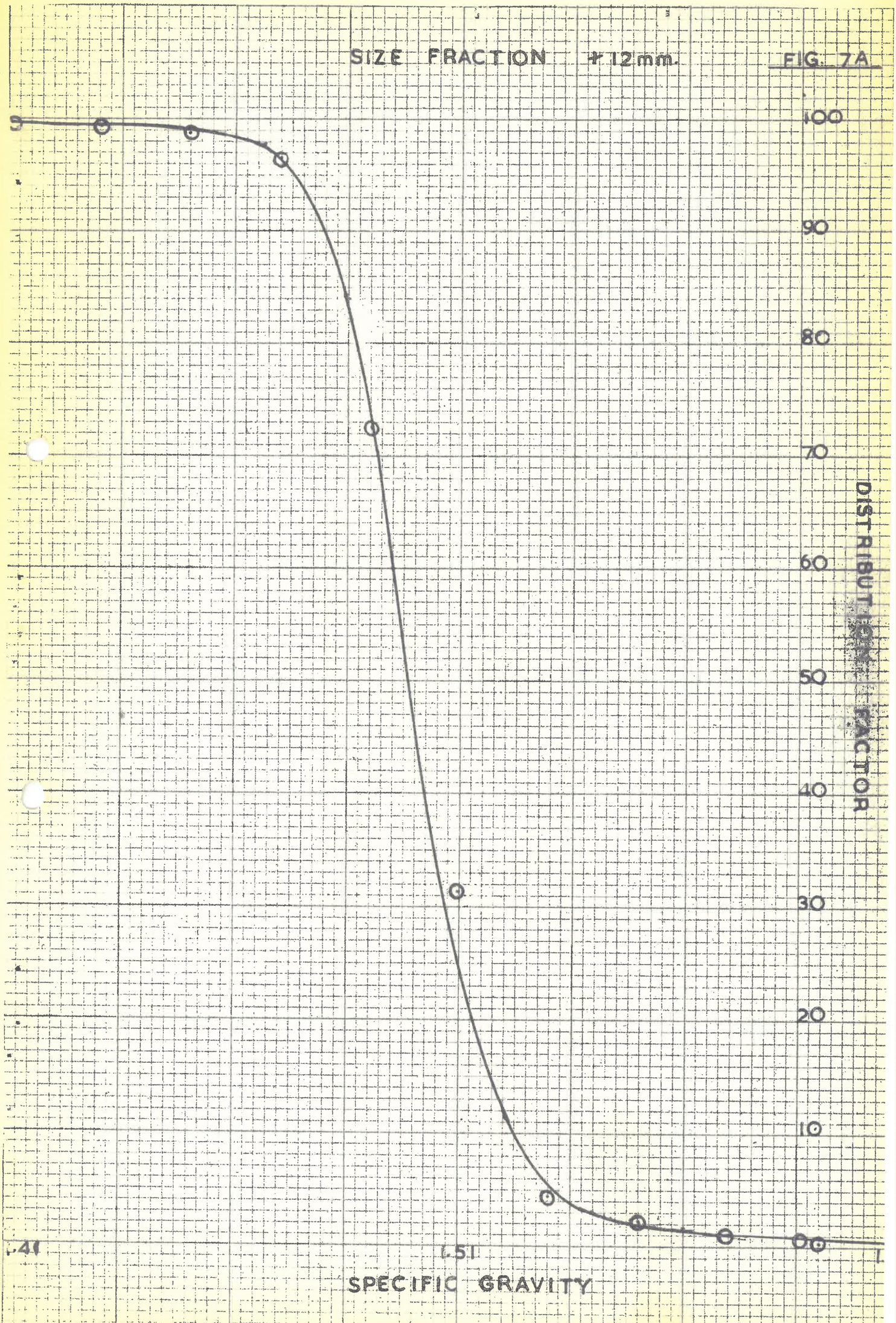

SIZE FRACTION +12mm.
FIG. 7A
100
90
80
70
60
50
40
30
20
10
0
DISTRIBUTION FACTOR
1.41
1.51
SPECIFIC GRAVITY

FIG.7 B

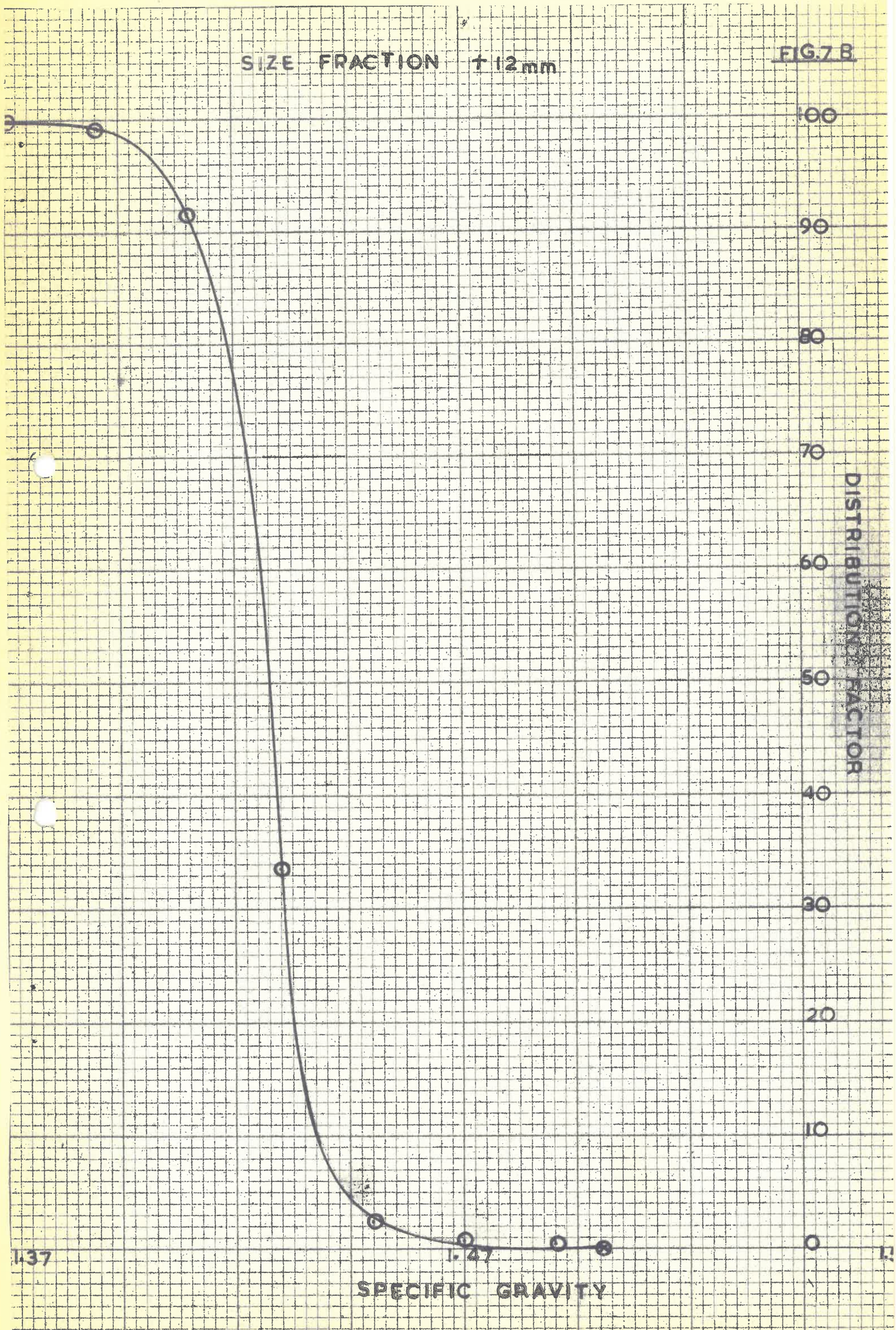

SIZE FRACTION +12mm
100
90
80
70
60
50
40
30
20
10
0
DISTRIBUTION FACTOR
1.37
1.47
SPECIFIC GRAVITY

FIG. 8A

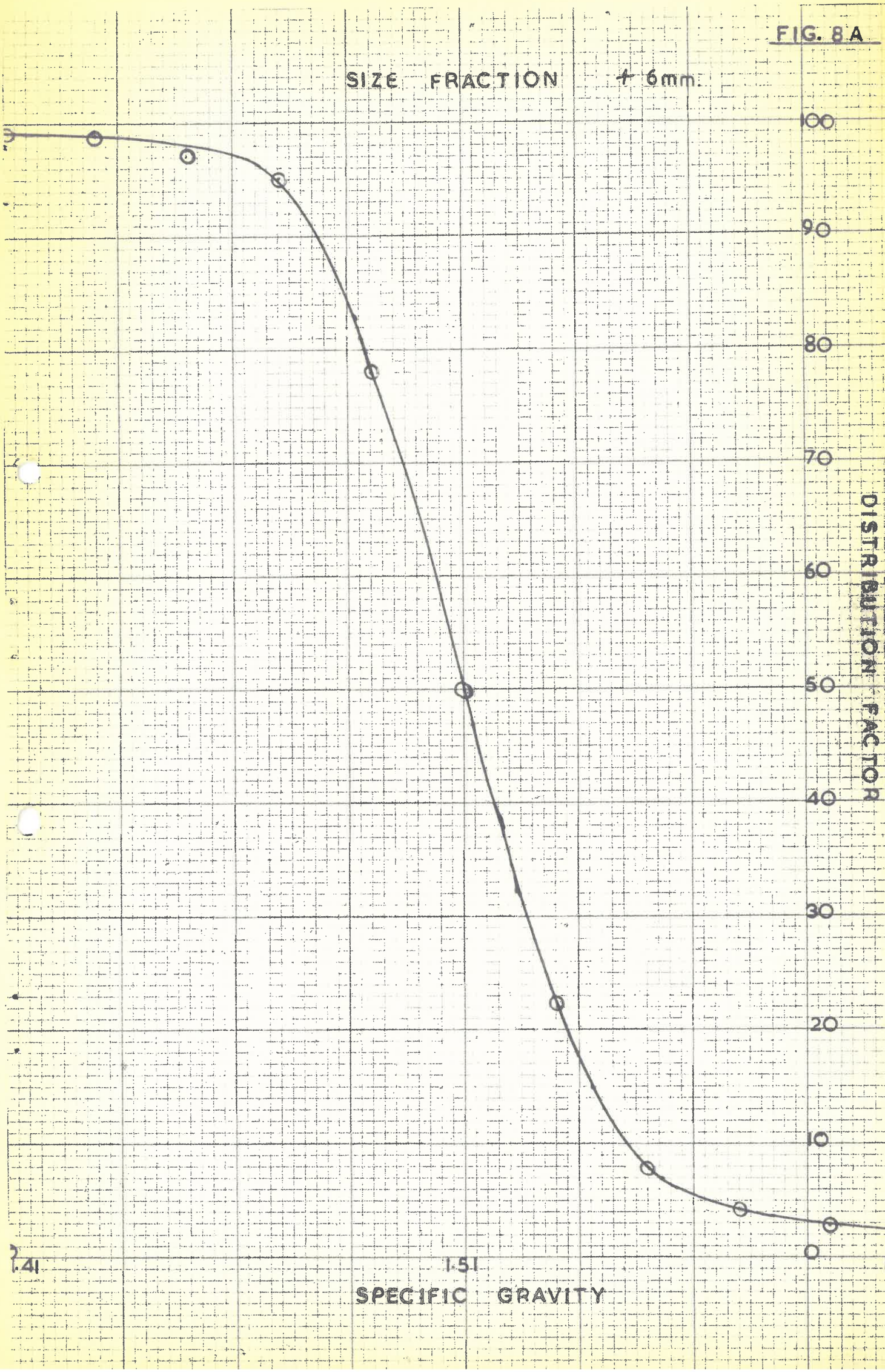
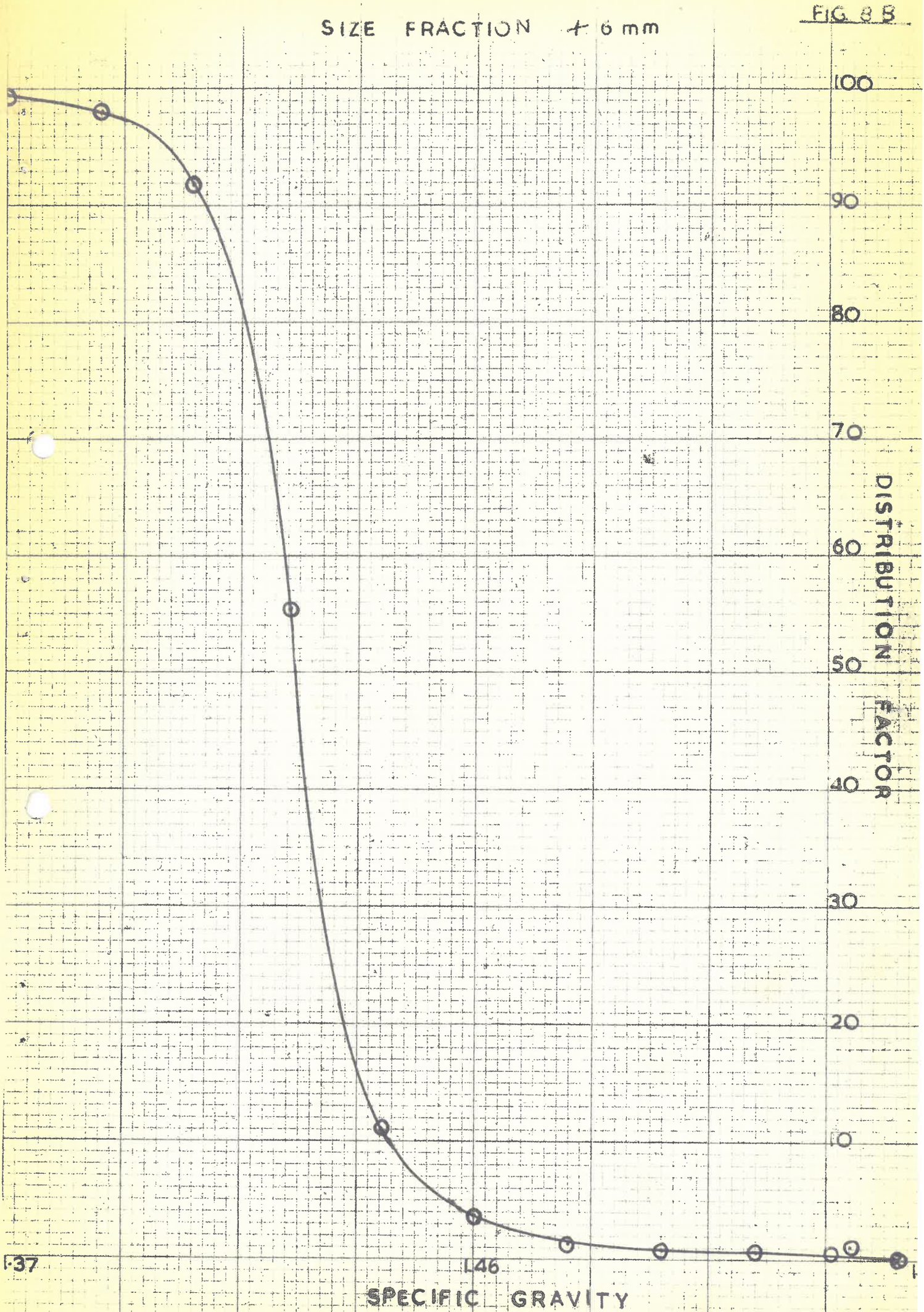

SIZE FRACTION + 6mm.
100
90
80
70
60
50
40
30
20
10
0
DISTRIBUTION FACTOR
1.41
1.51
SPECIFIC GRAVITY

FIG 8 B


SIZE FRACTION + 6 mm
100
90
80
70
60
50
40
30
20
10
DISTRIBUTION FACTOR
1.37
1.46
SPECIFIC GRAVITY

TABLE

FLOAT AND SINK ANALYSES OF

S. G.	+35mm. Size Fraction					-35mm. +20mm. Size Fract			
	Fract. Yield lb.	Fract. Yield %	Fract. Ash %	Cum. Yield %	Cum. Ash %	Fract. Yield lb.	Fract. Yield lb.	Fract. Ash %	Cum. Yield %
F 1.36	3.30	0.72	5.8	0.72	5.8	3.70	1.08	5.4	1.08
1.36-1.38	38.75	8.48	6.8	9.20	6.72	32.70	9.53	6.6	10.61
1.38-1.40	63.50	13.89	8.4	23.09	7.73	54.50	15.88	8.1	26.49
1.40-1.42	67.75	14.82	9.8	37.91	8.54	55.00	16.02	10.1	42.51
1.42-1.44	42.50	9.30	11.6	47.21	9.14	27.50	8.01	11.9	50.52
1.44-1.46	21.10	4.62	14.0	51.83	9.57	18.40	5.36	14.3	55.88
1.46-1.48	15.60	3.41	16.3	55.24	9.99	11.90	3.47	16.4	59.35
1.48-1.50	13.90	3.04	18.5	58.28	10.43	9.20	2.68	18.3	62.03
1.50-1.52	13.30	2.91	20.2	61.19	10.89	8.50	2.48	20.4	64.51
1.52-1.54	13.30	2.91	22.1	64.10	11.40	9.30	2.71	22.5	67.22
1.54-1.56	10.60	2.32	24.1	66.42	11.84	7.30	2.13	23.9	69.35
1.56-1.58	8.00	1.75	25.7	68.17	12.20	6.90	2.01	26.0	71.36
1.58-1.60	7.50	1.64	27.4	69.81	12.56	7.70	2.24	28.5	73.60
1.60-1.62	8.20	1.79	30.2	71.60	13.00	6.30	1.84	30.5	75.44
1.62-1.64	9.70	2.12	31.7	73.72	13.54	6.70	1.95	31.8	77.39
1.64-1.66	8.30	1.82	33.9	75.54	14.03	5.20	1.52	33.6	78.91
1.66-1.68	7.00	1.53	35.3	77.07	14.45	4.40	1.28	36.8	80.19
1.68-1.70	10.30	2.25	39.5	79.32	15.16	11.30	3.29	40.8	83.48
S 1.70	94.50	20.68	45.8			56.70	16.52	47.3	
TOTAL:	457.10	100.00		100.00	21.50	343.20	100.00		100.00

RAW COAL SAMPLES - TEST I.

ion	-20mm. +12mm. Size Fraction					-12mm. +6mm. Size Fraction.				
Cum. Ash %	Fract. Yield lb.	Fract. Yield %	Fract. Ash %	Cum. Yield %	Cum. Ash %	Fract. Yield lb.	Fract. Yield %	Fract. Ash %	Cum. Yield %	Cum. Ash %
5.4	6.50	3.44	5.4	3.44	5.4	5.80	6.26	4.9	6.26	4.9
6.48	19.90	10.53	6.5	13.97	6.23	11.30	12.20	6.3	18.46	5.83
7.45	30.30	16.03	8.2	30.00	7.28	17.30	18.68	8.2	37.14	7.02
8.45	30.30	16.03	10.2	46.03	8.30	13.20	14.25	10.5	51.39	7.98
9.00	14.30	7.56	12.7	53.59	8.92	7.90	8.53	12.9	59.92	8.68
9.51	8.90	4.71	14.5	58.30	9.37	4.40	4.75	15.3	64.67	9.17
9.91	5.70	3.02	16.6	61.32	9.73	3.10	3.35	17.1	68.02	9.56
10.27	5.50	2.91	18.9	64.23	10.15	2.40	2.59	19.5	70.61	9.92
10.66	4.00	2.12	20.8	66.35	10.49	2.50	2.70	21.8	73.31	10.36
11.14	3.90	2.06	22.2	68.41	10.84	2.00	2.16	23.5	75.47	10.74
11.53	4.00	2.12	24.2	70.53	11.24	1.70	1.84	25.5	77.31	11.09
11.94	4.00	2.12	26.4	72.65	11.68	1.50	1.62	27.4	78.93	11.42
12.44	3.70	1.96	28.3	74.61	12.12	1.50	1.62	28.9	80.55	11.77
12.88	3.70	1.96	30.3	76.57	12.59	1.60	1.73	30.5	82.28	12.16
13.36	3.90	2.06	31.8	78.63	13.09	1.50	1.62	32.2	83.90	12.55
13.75	3.50	1.85	34.1	80.84	13.51	1.10	1.19	33.9	85.09	12.85
14.12	2.30	1.22	36.2	81.70	13.91	1.40	1.51	36.5	86.60	13.26
15.17	6.00	3.17	39.9	84.87	14.88	2.20	2.38	40.6	88.98	13.99
	28.60	15.13	46.7			10.20	11.02	46.8		
20.48	189.00	100.00		100.00	19.69	92.60	100.00		100.00	17.61

TABL

FLOAT AND SINK ANALYSES

S. G.	+35mm. Size Fraction.					-35mm.+20mm Size		
	Fract. Yield lb.	Fract. Yield %	Fract. Ash %	Cum. Yield. %	Cum. Ash %	Fract. Yield lb.	Fract. Yield %	Fract. Ash %
F. 1.36	11.50	2.18	5.9	2.18	5.9	12.20	3.68	5.6
1.36-1.38	80.00	15.17	7.4	17.35	7.21	52.50	15.83	7.2
1.38-1.40	76.00	14.41	9.0	31.76	8.02	53,50	16.13	9.3
1.40-1.42	71.50	13.56	10.6	45.32	8.79	40.20	12.12	10.8
1.42-1.44	30.10	5.71	12.8	51.03	9.24	23.60	7.12	13.2
1.44-1.46	19.80	3.75	15.2	54.78	9.63	12.30	3.71	15.2
1.46-1.48	21.40	4.06	17.1	58.84	10.15	9.30	2.80	17.4
1.48-1.50	17.90	3.39	19.6	62.23	10.66	9.50	2.86	19.2
1.50-1.52	14.90	2.82	21.2	65.05	11.12	7.40	2.23	21.1
1.52-1.54	11.60	2.20	23.2	67.25	11.52	7.50	2.26	23.3
1.54-1.56	12.00	2.28	25.2	69.53	11.97	6.20	1.87	24.5
1.56-1.58	7.70	1.46	26.6	70.99	12.27	4.70	1.42	26.6
1.58-1.60	8.00	1.52	28.7	72.51	12.61	4.70	1.42	27.8
1.60-1.62	9.00	1.71	30.9	74.22	13.03	4.40	1.33	30.4
1.62-1.64	5.80	1.10	33.4	75.32	13.33	5.50	1.66	32.0
1.64-1.66	10.40	1.97	34.6	77.29	13.87	4.30	1.30	34.1
1.66-1.68	5.20	0.98	36.0	78.27	14.15	4.50	1.36	36.8
1.68-1.70	15.90	3.01	38.9	81.28	15.07	10.80	3.26	40.0
S. 1.70	98.75	18.72	46.9			58.50	17.64	47.6
TOTAL:	527.45	100.00		100.00	21.03	331.60	100.00	

E 2B.

OF RAW COAL SAMPLES - TEST II.

Fraction.		-20mm.+12mm. Size Fraction					-12mm. +6mm. Size Fraction				
Cum. Yield %	Cum. Ash %	Fract. Yield lb.	Fract. Yield %	Fract. Ash %	Cum. Yield %	Cum. Ash %	Fract. Yield lb.	Fract. Yield %	Fract. Ash %	Cum. Yield %	Cum. Ash %
3.68	5.6	10.80	6.08	5.4	6.08	5.4	9.50	10.30	5.1	10.30	5.1
19.51	6.90	29.70	16.72	7.2	22.80	6.72	16.20	17.57	7.1	27.87	6.36
35.64	7.99	25.90	14.58	9.2	37.38	7.69	13.30	14.42	9.1	42.29	7.29
47.76	8.70	19.10	10.76	11.0	48.14	8.43	9.30	10.09	10.9	52.38	7.99
54.88	9.28	11.90	6.70	13.1	54.84	9.00	6.60	7.16	12.9	59.54	8.58
58.59	9.65	6.40	3.60	15.5	58.44	9.40	4.20	4.55	15.4	64.09	9.06
61.39	10.00	4.60	2.59	17.4	61.03	9.74	2.60	2.82	17.3	66.91	9.41
64.25	10.41	5.50	3.10	19.0	64.13	10.19	2.80	3.04	19.3	69.95	9.84
66.48	10.77	3.50	1.97	21.7	66.10	10.53	1.90	2.06	21.1	72.01	10.16
68.74	11.18	4.20	2.37	23.1	68.47	10.97	2.10	2.28	22.7	74.29	10.54
70.61	11.53	2.80	1.58	25.1	70.05	11.29	1.70	1.84	26.3	76.13	10.92
72.03	11.83	3.30	1.86	26.6	71.91	11.69	1.50	1.63	24.7	77.76	11.21
73.45	12.14	3.00	1.69	28.9	73.60	12.09	1.60	1.73	28.5	79.49	11.59
74.78	12.46	2.70	1.52	30.3	75.12	12.46	1.30	1.41	30.1	80.90	11.91
76.44	12.88	2.90	1.63	32.2	76.75	12.88	1.40	1.52	31.9	82.42	12.28
77.74	13.23	2.90	1.63	34.3	78.38	13.33	1.40	1.52	33.7	83.94	12.67
79.10	13.64	3.60	2.03	36.8	80.41	13.92	1.50	1.63	35.9	85.57	13.11
82.36	14.68	5.90	3.32	39.8	83.73	14.95	2.20	2.39	39.0	87.96	13.81
		28.90	16.27	47.4			11.10	12.04	46.6		
100.00	20.49	177.60	100.00		100.00	20.22	92.20	100.00		100.00	17.76

TABLE

FLOAT AND SINK ANALYSES OF WASHED PRODUCT AND DIS

S. G.	WASHED PRODUCT.						
	Fract. Yield lb.	Fract. Yield %	Cum. Yield %	Fract. Ash %	Cum. Ash %	Fract. Yield lb.	Fract. Yield %
F. 1.36	8.90	6.20	6.20	5.4	5.40	0.01	0.01
1.36-1.38	30.70	21.39	27.59	6.9	6.56	0.05	0.04
1.38-1.40	43.00	29.96	57.55	8.9	7.78	0.05	0.04
1.40-1.42	25.10	17.49	75.04	11.0	8.53	0.09	0.06
1.42-1.44	14.30	9.96	85.00	12.9	9.04	0.11	0.08
1.44-1.46	9.10	6.34	91.34	15.2	9.47	0.22	0.16
1.46-1.48	6.90	4.81	96.15	17.3	9.86	0.43	0.30
1.48-1.50	3.70	2.58	98.73	19.3	10.11	2.50	1.77
1.50-1.52	1.40	0.97	99.70	21.5	10.22	5.50	3.88
1.52-1.54	0.21	0.15	99.85	22.7	10.24	8.70	6.14
1.54-1.56	0.10	0.07	99.92	24.8	10.25	7.20	5.09
1.56-1.58	0.04	0.03	99.95	26.3	10.25	7.70	5.44
1.58-1.60	0.03	0.02	99.97	26.6	10.25	9.50	6.71
1.60-1.62	0.02	0.01	99.98	34.4	10.25	6.30	4.45
1.62-1.64	0.03	0.02	100.00	34.2	10.25	7.80	5.51
1.64-1.66	0.00	0.00				6.00	4.24
1.66-1.68						5.00	3.53
1.68-1.70						8.40	5.93
S. 1.70						66.00	46.62
TOTAL:	143.53	100.00	100.00		10.25	141.56	100.00

*Obtained by using the relevant yield figure in Table 8A.

5A

CARD -20mm +12mm SIZE FRACTION - TEST I.

DISCARD			RECONSTITUTED FEED *				
Cum. Yield %	Fract. Ash %	Cum. Ash %	Fract. Yield lb.	Cum. Yield %	Fract. Ash %	Cum. Ash %	Tromp Dist. Coef.
0.01	5.2	5.20	4.00	4.00	5.40	5.40	100.0
0.05	6.3	6.08	13.82	17.82	6.90	6.56	99.9
0.09	9.3	7.51	19.36	37.18	8.90	7.78	99.9
0.15	11.1	8.95	11.32	48.50	11.00	8.53	99.8
0.23	12.4	10.15	6.46	54.96	12.90	9.04	99.5
0.39	14.4	11.89	4.15	59.11	15.19	9.48	98.6
0.69	17.3	14.24	3.22	62.33	17.30	9.88	96.6
2.46	19.3	17.88	2.30	64.63	19.30	10.21	72.6
6.34	20.9	19.73	2.01	66.64	21.09	10.54	31.3
12.48	22.7	21.19	2.27	68.91	22.70	10.94	4.4
17.57	24.9	22.26	1.84	70.75	24.90	11.31	2.2
23.01	26.7	23.31	1.95	72.70	26.70	11.71	1.0
29.72	28.9	24.57	2.39	75.09	28.89	12.26	0.4
34.17	30.5	25.34	1.59	76.68	30.52	12.63	0.6
39.68	32.2	26.29	1.96	78.64	32.21	13.12	0.5
43.92	34.0	27.03	1.50	80.14	34.00	13.51	0.0
47.45	36.2	27.71	1.25	81.39	36.20	13.86	
53.38	39.5	29.02	2.10	83.49	39.50	14.50	
	46.6		16.51		46.60		
100.00		37.22	100.00	100.00		19.80	

T A

FLOAT AND SINK ANALYSES OF WASHED P

S. G.	WASHED PRODUCT						
	Fract. Yield lb.	Fract. Yield %	Cum. Yield %	Fract. Ash %	Cum. Ash %	Fract. Yield lb.	
F. 1.36	8.00	11.19	11.19	5.0	5.00	0.03	
1.36-1.38	16.60	23.23	34.42	6.8	6.21	0.06	
1.38-1.40	16.70	23.37	57.79	8.8	7.26	0.13	
1.40-1.42	12.90	18.05	75.84	11.2	8.20	0.21	
1.42-1.44	7.20	10.07	85.91	13.3	8.80	0.21	
1.44-1.46	3.30	4.62	90.53	15.3	9.13	0.20	
1.46-1.48	3.20	4.48	95.01	17.5	9.52	0.35	
1.48-1.50	1.80	2.52	97.53	19.4	9.78	1.03	
1.50-1.52	0.97	1.36	98.89	21.3	9.94	2.00	
1.52-1.54	0.41	0.57	99.46	23.4	10.01	2.90	
1.54-1.56	0.13	0.18	99.64	24.2	10.04	3.10	
1.56-1.58	0.08	0.11	99.75	26.0	10.06	3.60	
1.58-1.60	0.05	0.07	99.82	25.6	10.07	3.40	
1.60-1.62	0.02	0.03	99.85	25.8	10.07	3.70	
1.62-1.64	0.03	0.04	99.89	28.6	10.08	3.50	
1.64-1.66	0.03	0.04	99.93	27.6	10.09	3.00	
1.66-1.68	0.02	0.03	99.96	25.2	10.09	2.80	
1.68-1.70	0.02	0.03	99.99	29.6	10.10	2.90	
S. 1.70	0.01	0.01		26.3		24.60	
TOTAL:	71.47	100.00	100.00		10.10	57.51	1

*Obtained by using the relevant yield figure in Table

B L E 6A.

RODUCT AND DISCARD -12mm.+6mm. SIZE FRACTION - TEST I.

DISCARD				RECONSTITUTED FEED.*				
Fract. Yield %	Cum Yield %	Fract. Ash %	Cum. Ash %	Fract. Yield lb.	Cum. Yield %	Fract. Ash %	Cum. Ash %	Tromp. Dist. Coef.
0.05	0.05	5.1	5.10	8.06	8.06	5.00	5.00	99.9
0.10	0.15	6.7	6.17	16.73	24.79	6.80	6.21	99.8
0.22	0.37	8.6	7.61	16.86	41.65	8.80	7.26	99.6
0.36	0.73	10.9	9.23	13.08	54.73	11.21	8.20	99.2
0.35	1.08	12.8	10.39	7.33	62.06	13.29	8.85	98.8
0.35	1.43	14.7	11.44	3.42	65.48	15.28	9.14	97.1
0.61	2.04	17.1	13.13	3.39	68.87	17.48	9.55	95.0
1.79	3.83	19.0	15.87	2.32	71.19	19.31	9.87	78.0
3.48	7.31	21.1	18.36	1.96	73.15	21.20	10.18	50.0
5.04	12.35	22.5	20.05	1.83	74.98	22.70	10.47	22.4
5.39	17.74	24.6	21.43	1.64	76.62	24.57	10.78	7.9
6.26	24.00	26.4	22.73	1.84	78.46	26.38	11.15	4.3
5.91	29.91	28.8	23.93	1.71	80.17	28.74	11.52	2.9
6.43	36.34	30.6	25.11	1.83	82.00	30.55	11.94	1.1
6.09	42.43	32.8	26.21	1.74	83.74	32.73	12.38	1.7
5.22	47.65	34.4	27.11	1.50	85.24	34.26	12.76	2.0
4.87	52.52	35.9	27.93	1.39	86.63	35.75	13.13	1.4
5.04	57.56	38.0	28.81	1.44	88.07	37.88	13.54	1.4
42.44		46.1		11.93		46.08		
00.00	100.00		36.15	100.00	100.00		17.42	