NEW TABLE FOR USE WITH JACKSON AND GILLIS METHOD OF SUCROSE DETERMINATION.

By G. S. MOBERLY.

The present recommended method for carrying out the Jackson and Gillis polarization calls for the following procedure after the readings of P, P^1 and t have been made :—

1. Subtract P^1 from P.
2. Refer to Table IV* to find divisor corresponding with $P—P^1$.
3. Refer to Table V* to find temperature correction corresponding with t.
4. Subtract temperature correction from divisor.
5. Divide $P—P^1$ by corrected divisor to find clerget reading.
6. Refer to Table III* to find sucrose percentage corresponding with clerget reading.

The new table reduces steps 2, 3, 4 and 5 to one step, thereby saving time in reference and calculation, and obviating the use of a calculating machine.

TO USE THE TABLE.

The table must be used in conjunction with pencil and paper. The necessary decimal extensions cannot satisfactorily be done mentally. The information already obtained and available will be $P—P^1$ and t.

1. Find the figure at the intersection of the whole numbers of $P—P^1$ and t. Write this down.
2. In the column of the whole number of t, find the figure at the intersection of the line of "decimals of $P—P^1$" (at the foot of the table). Write this down below the previously found figure.
3. In the line of the whole number of $P—P^1$ find the figure at the intersection of the column of "decimals of temperature" (at the right of the table). Write this down below the two previously found figures.
4. Add up the three figures found as above. This is the clerget reading to two places of decimals. It may be reduced to the nearest first place of decimals before being used in connection with Table III* to find the sucrose percentage.

Example : $P—P^1 = 67.3$, $t = 21.8°C$.

1. Intersection of $P—P^1 = 67$ and $t = 21$	50.89
2. Intersection of $t = 21$ and decimal of $P—P^1 = 0.3$	0.23
3. Intersection of $P—P^1 = 67$ and decimal of temperature $= 0.8$...	0.17
	51.29
	= 51.3

As a contrast and a check the corresponding steps of the full recommended method are given :—

1. In Table IV* divisor of $P—P^1 = 65$	= 132.18
divisor of $P—P^1 = 70$	= 132.21
Interpolating for 67.3 divisor	= 132.19
2. In Table V* temperature correction for 21.8°C.	= 0.95
3. $132.19 - 0.95$	= 131.24
4. $67.3 \div 131.24$	= 51.28
	= 51.3

The fact that the table is calculated to two places of decimals assures its accuracy to the one place of decimals required by Table III.*

* Tables given in South African Sugar Technologists' Association Recommended Methods of Chemical Control.

TABLE FOR CALCULATING SACCHARIMETER READINGS WITH THE JACKSON AND GILLIS METHOD.

P—P¹	TEMPERATURE														P—P¹	DECIMALS OF TEMPERATURE									P—P¹
	17	18	19	20	21	22	23	24	25	26	27	28	29	30		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	
40	29.94	30.06	30.18	30.30	30.42	30.55	30.67	30.80	30.92	31.05	31.18	31.31	31.44	31.57	40	0.01	0.03	0.04	0.05	0.06	0.08	0.09	0.10	0.11	40
41	30.69	30.81	30.93	31.06	31.18	31.31	31.43	31.56	31.69	31.82	31.95	32.09	32.22	32.36	41	0.01	0.03	0.04	0.05	0.06	0.08	0.09	0.10	0.12	41
42	31.43	31.56	31.68	31.81	31.94	32.07	32.20	32.33	32.46	32.60	32.73	32.87	33.00	33.14	42	0.01	0.03	0.04	0.05	0.07	0.08	0.09	0.11	0.12	42
43	32.18	32.31	32.44	32.57	32.70	32.83	32.96	33.10	33.23	33.37	33 51	33.65	33.79	33.93	43	0.01	0.03	0.04	0.05	0.07	0.08	0.10	0.11	0.12	43
44	32.93	33.06	33.19	33.32	33.46	33.59	33.73	33.87	34.00	34.15	34.29	34.43	34.57	34.72	44	0.01	0.03	0.04	0.06	0.07	0.08	0.10	0.11	0.13	44
45	33.67	33.81	33.94	34.08	34.22	34.35	34.49	34.63	34.78	34.92	35.06	35.21	35.36	35.50	45	0 01	0.03	0.04	0.06	0.07	0.09	0.10	0.11	0.13	45
46	34.42	34.56	34.69	34.83	34.97	35.12	35.26	35.40	35.55	35.69	35.84	35.99	36.14	36.29	46	0 01	0 03	0.04	0.06	0.07	0.09	0.10	0.12	0.13	46
47	35.17	35.31	35.45	35.59	35.73	35.88	36.02	36.17	36.32	36.47	36.62	36.77	36.92	37.08	47	0 01	0.03	0.04	0.06	0.07	0.09	0.10	0.12	0.13	47
48	35.91	36.06	36.20	36.35	36.49	36.64	36.79	36.94	37.09	37.24	37.40	37.55	37.71	37.86	48	0 02	0.03	0.05	0.06	0.08	0.09	0.11	0.12	0.14	48
49	36.66	36.80	36.95	37.10	37.25	37.40	37.55	37.71	37.86	38 02	38.17	38.33	38.49	38.65	49	0.02	0.03	0.05	0.06	0.08	0.09	0.11	0.12	0.14	49
50	37.41	37.55	37.70	37.86	38.01	38.16	38.32	38.47	38.63	38.79	38.95	39.11	39.27	39.44	50	0.02	0.03	0.05	0.06	0.08	0.09	0.11	0.13	0.14	50
51	38.15	38.30	38.46	38.61	38.77	38.92	39.08	39.24	39.40	39.56	39.73	39.89	40.06	40.22	51	0.02	0.03	0 05	0 06	0.08	0.10	0.11	0.13	0.15	51
52	38.90	39.05	39.21	39.37	39.53	39.69	39.85	40.01	40.17	40 34	40.50	40.67	40.84	41.01	52	0.02	0.03	0.05	0.07	0.08	0.10	0.11	0.13	0.15	52
53	39.64	39.80	39.96	40.12	40.28	40.45	40.61	40.78	40.94	41.11	41.28	41.45	41.62	41.60	53	0.02	0 03	0.05	0.07	0.08	0.10	0.12	0.13	0.15	53
54	40.39	40.55	40.71	40.88	41.04	41.21	41.37	41.54	41.71	41.88	42.06	42.23	42.41	42.58	54	0.02	0.03	0 05	0.07	0.09	0.10	0.12	0.14	0.15	54
55	41.14	41.30	41.47	41.63	41.80	41.97	42.14	42.31	42.48	42.66	42.83	43.01	43.19	43.37	55	0.02	0.03	0.05	0.07	0.09	0.10	0.12	0.14	0.16	55
56	41.88	42.05	42.22	42.39	42.56	42.73	42.90	43.08	43.25	43.43	43.61	43.79	43.97	44.16	56	0 02	0.04	0.05	0.07	0.09	0.11	0.12	0.14	0.16	56
57	42.63	42.80	42.97	43.14	43.31	43.49	43.66	43.84	44.02	44.20	44.39	44.57	44.76	44.94	57	0.02	0.04	0.05	0.07	0.09	0.11	0.13	0.14	0.16	57
58	43.37	43.55	43.72	43.90	44.07	44.25	44.43	44.61	44.79	44.98	45.16	45.35	45.54	45.73	58	0 02	0 04	0.05	0.07	0.09	0.11	0.13	0.15	0.16	58
59	44.12	44.29	44.47	44.65	44.83	45.01	45.19	45.38	45.56	45.75	45.94	46.13	46.32	46.52	59	0.02	0.04	0.06	0.07	0.09	0.11	0.13	0.15	0.17	59
60	44.86	45.04	45.22	45.40	45.59	45.77	45.96	46.14	46.33	46.53	46.71	46.91	47.10	47.30	60	0.02	0.04	0.06	0.08	0.10	0.11	0.13	0.15	0.17	60
61	45.61	45.79	45.98	46.16	46.35	46.53	46.72	46.91	47.10	47.30	47.49	47.69	47.89	48.09	61	0 02	0 04	0 06	0 08	0.10	0.12	0.14	0.15	0.17	61
62	46.36	46.54	46.73	46.91	47.10	47.29	47.48	47.68	47.87	48.07	48.27	48.47	48.67	48.87	62	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18	62
63	47.10	47.29	47.48	47.67	47.86	48.05	48.25	48.44	48.64	48.84	49.04	49.25	49.45	49.66	63	0.02	0.04	0 06	0.08	0.10	0.12	0.14	0.16	0.18	63
64	47.85	48.04	48.23	48.42	48.62	48.81	49.01	49.21	49.41	49.62	49.82	50.03	50.24	50.45	64	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18	64
65	48.59	48.78	48.98	49.18	49.37	49.57	49.77	49.98	50.18	50.37	50.60	50.81	51.02	51.23	65	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18	65
66	49.33	49.53	49.73	49.93	50.13	50.33	50.54	50.74	50.95	51.16	51.37	51.58	51.80	52.01	66	0.02	0.04	0.06	0.08	0.10	0.12	0.15	0.17	0.19	66
67	50.08	50.28	50.48	50.68	50.89	51.09	51.30	51.51	51.72	51.93	52.15	52.36	52.58	52.80	67	0.02	0.04	0.06	0.08	0.11	0.13	0.15	0.17	0.19	67
68	50.83	51.03	51.23	51.44	51.64	51.85	52.06	52.28	52.49	52.71	52.92	53.14	53.36	53.59	68	0.02	0.04	0.06	0.09	0.11	0.13	0.15	0.17	0.19	68
69	51.57	51.77	51.98	52.19	52.40	52.61	52.82	53.04	53.26	53.48	53 70	53.92	54.14	54.37	69	0 02	0.04	0.07	0.09	0.11	0.13	0.15	0.17	0.20	69
70	52.31	52.52	52.73	52.95	53.16	53.37	53.59	53.81	54.03	54.25	54.47	54.70	54.93	55.16	70	0.02	0.04	0.07	0.09	0.11	0.13	0.15	0.18	0.20	70
71	53.06	53.27	53.48	53.70	53.91	54.13	54.35	54.57	54.80	55.02	55.25	55.48	55.71	55.94	71	0.02	0.04	0.07	0.09	0.11	0.13	0.16	0.18	0.20	71
72	53.80	54.02	54.23	54.45	54.67	54.89	55.11	55.34	55.56	55.79	56.02	56.25	56.49	56.73	72	0.02	0.05	0.07	0.09	0.11	0.14	0.16	0.18	0.20	72
73	54.55	54.77	54.99	55.21	55.43	55.65	55.86	56.11	56.34	56.57	56.80	57.04	57.27	57.51	73	0.02	0.05	0.07	0.09	0.12	0.14	0.16	0.18	0.21	73
74	55.29	55.51	55.74	55.96	56.18	56.41	56.64	56.87	57.10	57.34	57.57	57.81	58.05	58.30	74	0.02	0.05	0.07	0.09	0.12	0.14	0.16	0.19	0.21	74
75	56.04	56.26	56.48	56.71	56.94	57.17	57.40	57.63	57.87	58.11	58.35	58.59	58.83	59.08	75	0.02	0.05	0.07	0.09	0.12	0.14	0.17	0.19	0.21	75
76	56.78	57.01	57.24	57.47	57.70	57.94	57.17	58.40	58.64	58.88	59.13	59.37	59.62	59.87	76	0.02	0.05	0.07	0.10	0.12	0.14	0.17	0.19	0.22	76
77	57.53	57.76	57.99	58.22	58.45	58.69	58.93	59.17	59.41	59.65	59.90	60.15	60.40	60.65	77	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.19	0.22	77
78	58.27	58.50	58.73	58.97	59.22	59.45	59.69	59.93	60.18	60.42	60.67	60.92	61.18	61.43	78	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	78
79	59.02	59.25	59.49	59.73	59.97	60.21	60.45	60.70	60.95	61.20	61.45	61.70	61.96	62.22	79	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22	79

P—P¹	17	18	19	20	21	22	23	24	25	26	27	28	29	30	P—P¹	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	P—P¹
80	**59.76**	**60.00**	**60.24**	**60.48**	**60.72**	**60.97**	**61.21**	**61.46**	**61.71**	**61.97**	**62.22**	**62.48**	**62.74**	**63 00**	**80**	**0.03**	**0.05**	**0.08**	**0.10**	**0.13**	**0.15**	**0.18**	**0.20**	**0.23**	**80**
81	60.50	60.74	60.98	61.23	61.48	61.72	61.97	62.23	62.48	62.74	63.00	63.26	63.52	63.78	**81**	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23	**81**
82	61.25	61.49	61.74	61.99	62.23	62.49	62.74	62.99	63.25	63.51	63.77	64.04	64.30	64.57	**82**	0 03	0 05	0.08	0.10	0.13	0.15	0.18	0.21	0.23	**82**
83	61.99	62.24	62.49	62.74	62.99	63.24	63.50	63.76	64.02	64.28	64.55	64.81	65.08	65.35	**83**	0.03	0.05	0.08	0.10	0.13	0.16	0.18	0.21	0.23	**83**
84	62.73	62.98	63.23	63.49	63.74	64.00	64.26	64.52	64.78	65.05	65.32	65.59	65.86	66.14	**84**	0 03	0 05	0.08	0.11	0.13	0.16	0.19	0.21	0.24	**84**
85	**63.48**	**63.73**	**63.99**	**64.24**	**64.50**	**64.76**	**65.02**	**65.29**	**65.56**	**65.83**	**66.10**	**66.37**	**66.65**	**66.92**	**85**	**0.03**	**0.05**	**0.08**	**0.11**	**0.13**	**0.16**	**0.19**	**0.21**	**0.24**	**85**
86	64.22	64.48	64.73	64.99	65.26	65.52	65.78	66.05	66.32	66.59	66.87	67.15	67.42	67.71	**86**	0 03	0 05	0.08	0.11	0.14	0.16	0.19	0.22	0.24	**86**
87	64.96	65.22	65.48	65.74	66.01	66.28	66.54	66.82	67.09	67.36	67.64	67.92	68.20	68.49	**87**	0 03	0.06	0.08	0.11	0.14	0.16	0.19	0.22	0.25	**87**
88	65.71	65.97	66.24	66.50	66.77	67.04	67.31	67.58	67.86	68.14	68.42	68.70	68.99	69.28	**88**	0.03	0.06	0.08	0.11	0.14	0.17	0.19	0.22	0.25	**88**
89	66.45	66.72	66.98	67.25	67.52	67.79	68.07	68.35	68.63	68.91	69.19	69.48	69.77	70.06	**89**	0 03	0.06	0.08	0.11	0.14	0.17	0.20	0.22	0.25	**89**
90	**67.19**	**67.46**	**67.73**	**68.00**	**68.27**	**68.55**	**68.83**	**69.11**	**69.39**	**69.68**	**69.96**	**70.26**	**70.54**	**70.84**	**90**	**0.03**	**0.06**	**0.09**	**0.11**	**0.14**	**0.17**	**0.20**	**0.23**	**0.26**	**90**
91	67.94	68.21	68.48	68.75	69.03	69.31	69.59	69.87	70.16	70.45	70.74	71.03	71.32	71.62	**91**	0.03	0 06	0.09	0.11	0.14	0.17	0.20	0.23	0.26	**91**
92	68.68	68.95	69.23	69.51	69.79	70.07	70.35	70.64	70.93	71.22	71.51	71.81	72.10	72.40	**92**	0.03	0.06	0.09	0.12	0.14	0.17	0.20	0.23	0.26	**92**
93	69.42	69.70	69.98	70.26	70.54	70.83	71.11	71.40	71.69	72.00	72.28	72.58	72.87	73.19	**93**	0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.23	0.26	**93**
94	70.17	70.45	70.73	71.01	71.30	71.58	71.87	72.17	72.46	72.76	73.06	73.36	73.65	73.97	**94**	0 03	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.27	**94**
95	**70.91**	**71.19**	**71.48**	**71.76**	**72.05**	**72.34**	**72.63**	**72.93**	**73.23**	**73.53**	**73.83**	**74.14**	**74.43**	**74.76**	**95**	**0.03**	**0.06**	**0.09**	**0.12**	**0.15**	**0.18**	**0.21**	**0.24**	**0.27**	**95**
96	71.65	71.94	72.22	72.51	72.81	73.10	73.40	73.69	74.00	74.30	74.61	74.91	75.20	75.54	**96**	0.03	0 06	0.09	0.12	0.15	0.18	0.21	0.24	0.27	**96**
97	72.40	72.68	72.97	73.27	73.56	73.86	74.16	74.46	74.76	75.07	75.38	75.69	75.98	76.32	**97**	0 03	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.27	**97**
98	73.14	73.43	73.72	74.02	74.32	74.62	74.92	75.22	75.53	75.84	76.15	76.47	76.76	77.11	**98**	0.03	0.06	0.09	0.12	0.15	0.18	0.22	0.25	0.28	**98**
99	73.88	74.18	74.47	74.77	75.07	75.37	75.68	75.99	76.30	76.61	76.93	77.24	77.53	77.89	**99**	0.03	0.06	0.09	0.12	0.16	0.19	0.22	0.25	0.28	**99**
100	**74.63**	**74.92**	**75.22**	**75.52**	**75.83**	**76.13**	**76.44**	**76.75**	**77.07**	**77.38**	**77.70**	**78.02**	**78.31**	**78.67**	**100**	**0.03**	**0.06**	**0.09**	**0.13**	**0.16**	**0.19**	**0.22**	**0.25**	**0.28**	**100**

DECIMALS OF P—P¹.

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
0.1	**0.07**	**0.07**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.1**
0.2	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.16	**0.2**
0.3	0.22	0.22	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.24	**0.3**
0.4	0.30	0.30	0.30	0.30	0.30	0.30	0.31	0.31	0.31	0.31	0.31	0 31	0.31	0.31	**0.4.**
0.5	0.37	0.37	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.39	0.39	0.39	0.39	0.39	**0.5**
0.6	0.45	0.45	0.45	0.45	0.45	0.46	0.46	0.46	0.46	0.46	0.47	0.47	0.47	0.47	**0.6**
0.7	0.52	0.52	0.53	0.53	0 53	0 53	0.54	0 54	0 54	0.54	0.54	0.55	0.55	0.55	**0.7**
0.8	0.60	0.60	0.60	0.60	0.61	0.61	0.61	0 61	0.62	0.62	0.62	0.62	0.63	0.63	**0.8**
0.9	0.67	0.67	0.68	0.68	0.68	0.68	0.69	0.69	0.69	0.70	0.70	0.70	0.70	0.71	**0.9**