cu. ft. of gas per hour, or at the rate of 2,800 lbs. per hour, 9,000 cu. ft. per ton.

4. *Power.* 8 k.w. per 2,250 lbs. or 11 k.w. per hour at 2,800 lbs. of oil.
   When two or more units are operating, the power consumption is reduced to 6.5 k.w. per ton of oil.
5. *Water.* 3,000 to 4,000 gallons per hour. 2,400 to 3,200 gallons per 2,240 lbs.
6. *Labor.* Two men can attend as many as four units without any difficulty since the whole operation is practically automatic. The operators must be able to judge the flavor of the oil produced, take temperature readings regularly, and make free fatty acid determinations.
7. *Yield.* In refining, only the actual weight of the free fatty acid removed is lost. The distillate contains 95 per cent free fatty acid. The process eliminates black oil since the distilled fatty acid is water-white. There is no caustic used, consequently no loss of oil in foots.

The oils which are very satisfactorily refined and deodorized by this plant are: palm kernel, cocoanut, soya bean, olive, palm, peanut, and tea seed. The success attained in refining and deodorizing cottonseed oil, corn oil, and tallows has been variable. Difficulties encountered in treating these oils have been due to inability to bleach the oils sufficiently before subjecting to the process, and inability to completely remove albuminous and other colloidal materials which interfere with the production of a highly satisfactory oil. As a continuous deodorizer, however, this plant will satisfactorily handle oils from practically any source.

Summary

Equipment and process for the continuous and simultaneous refining and deodorizing of oils has been described. Ease of operation and low operating cost indicate that this method should find more and more use in the preparation of edible oils and fats.

More work is necessary before the process can be applied in its entirety to certain fats, but these difficulties are technical rather than basic.

As a continuous deodorizer, the equipment described furnishes the best known method in use and brings fat and oil technologists a workable method which has been long desired.

Permission to describe this method was courteously granted by Mr. W. B. Allbright, Sr., of the Allbright-Nell Company, the American agent for the equipment.

Smalley Foundation Committee Reports

A. W. PUTLAND, *Chairman*

THE tables attached to this report summarize the results of the cooperative analytical program of the Smalley Foundation for the past year. The program was concluded, as usual, with thirty samples. There were 80 collaborators participating, as compared to 99 for the season 1930-1931, and 96 for the season 1929-1930.

In Table No. 1 we show the standing of the 50 collaborators who reported oil determinations on all samples. In the two preceding years 45 reported oil determination on all the samples.

Table No. 2 shows the standing of the 62 collaborators who reported ammonia results on all samples. This number compares with 71 and 75, respectively, for the two preceding seasons.

Table No. 3 gives the average for both oil and ammonia for the 50 collaborators who reported on both oil and ammonia on all samples. In the two preceding seasons 45 collaborators reported oil and ammonia on all samples.

The winning collaborators are as follows:

The Battle Cup for the highest efficiency in the determination of both oil and ammonia on all samples is awarded to Analyst No. 18, Mr. I. N. Pless, Royal Stafolife Mills, Memphis, Tenn., whose average is 99.896 per cent. The average efficiency is slightly higher than that of last year obtained by Dr. W. F. Hand with an average efficiency of 99.889 per cent. The

certificate for second place goes to Analyst No. 27, T. L. Rettger, Memphis, Tenn., with an efficiency of 99.878.

The certificate for the highest efficiency in determination of the oil only is awarded to Analyst No. 18, Mr. J. N. Pless, Royal Stafolife Mills, Memphis, Tenn., whose average is 99.876 per cent. The certificate for second place goes to Geo. W. Gooch Laboratories, Los Angeles, Calif., Analyst No. 41, with an efficiency of 99.870. The percentage of the winner last year was 99.866 and for second place 99.804.

The certificate for the highest efficiency in the determining of ammonia is awarded to Analyst No. 43, Mr. Geo. K. Redding, the Larrowe Milling Company, Rossford, Ohio, with an average of 99.945 per cent. The certificate for second place goes to No. 66, A. G. Hayes, Memphis, Tenn., with an efficiency of 99.940 per cent. Mr. Redding received a certificate for the highest efficiency in ammonia last year also.

The foregoing comparisons show that the percentage efficiency for oil is higher than last year, while the percentage efficiency for ammonia is less. The percentage efficiency for the combined oil and ammonia work is higher than last year.

There have been comparatively few complaints from the collaborators regarding the samples this year. This in spite of the fact that some abnormal meal samples were sent out. The few complaints were registered against including the results of the samples which contained an unusually high oil content. A vote of the committee was taken on sample No. 23, as to their wishes in including the sample in the final results. Since the sample, as all samples, was carefully prepared and represents a type of sample which may be encountered, the committee ruled that the sample be included and the accepted average, calculated as on all other samples, was shown on report of sample No. 30. This will place in the hands of the collaborators a constant check on their work over the whole year, instead of just during the busy months.

Your committee also wishes to recommend that the practice of accepting results by telegraph be discontinued.

TABLE NO. I

Analyst No.	Points Off	Per cent Efficiency	Analyst No.	Points Off	Per cent Efficiency
18	25	99.876	26	108	99.462
41	26	99.870	8	109	99.457
12	28	99.861	4	110	99.451
42	28	99.861	11	113	99.436
27	30	99.851	6	121	99.397
35	30	99.851	54	121	99.397
66	42	99.791	20	122	99.392
13	43	99.786	63	129	99.357
52	48	99.761	72	135	99.327
59	52	99.741	50	136	99.323
45	53	99.735	30	141	99.297
2	56	99.720	7	147	99.267
64	57	99.716	39	150	99.252
14	66	99.671	71	151	99.248
25	70	99.652	3	151	99.246
62	75	99.626	56	154	99.233
51	76	99.622	19	155	99.227
70	77	99.616	75	164	99.182
24	91	99.547	5	178	99.113
40	92	99.541	77	191	99.047
47	92	99.541	67	201	98.998
10	101	99.496	44	203	98.988
33	101	99.496	21	215	98.928
61	101	99.496	9	218	98.914
22	105	99.477	1	244	98.784

TABLE NO. II

Analyst No.	Points Off	Per cent Efficiency	Analyst No.	Points Off	Per cent Efficiency
43	11	99.945	13	60	99.700
66	12	99.940	49	64	99.681
45	16	99.921	14	65	99.676
18	17	99.915	4	66	99.670
2	18	99.910	22	66	99.670
27	19	99.906	19	70	99.651
59	23	99.885	30	70	99.651
35	29	99.855	21	77	99.616
70	30	99.850	8	77	99.615
64	31	99.846	51	77	99.615
20	36	99.820	33	83	99.585
12	38	99.811	69	85	99.576
3	38	99.810	1	90	99.550
25	38	99.810	61	90	99.550
41	38	99.810	47	94	99.531
68	38	99.810	56	96	99.520
75	40	99.801	63	98	99.510
52	47	99.765	11	99	99.505
42	47	99.765	74	106	99.471
10	47	99.766	71	110	99.449
5	49	99.756	77	112	99.441
38	49	99.756	72	113	99.435
6	50	99.750	37	114	99.430
24	50	99.750	53	128	99.360
40	51	99.745	9	144	99.280
62	53	99.735	29	156	99.220
26	55	99.726	32	159	99.205
54	55	99.726	15	164	99.181
39	56	99.720	44	188	99.059
50	59	99.705	67	255	98.725
7	60	99.700	57	391	98.045

TABLE NO. III

Analyst No.	Per cent Efficiency	Analyst No.	Per cent Efficiency
18	99.896	54	99.562
27	99.878	4	99.561
66	99.866	33	99.541
35	99.853	8	99.536
41	99.840	47	99.536
12	99.836	3	99.528
45	99.828	61	99.523
2	99.815	50	99.514
42	99.813	75	99.492
59	99.813	39	99.486
64	99.781	7	99.484
52	99.763	30	99.474
13	99.743	11	99.470
70	99.733	19	99.439
25	99.731	5	99.435
62	99.680	63	99.434
14	99.674	72	99.381
24	99.649	56	99.377
40	99.643	71	99.349
10	99.631	21	99.272

51	99.618	77	99.244
20	99.606	1	99.167
26	99.594	9	99.079
6	99.574	44	99.023
22	99.574	67	98.862

No reference in this report has been made to the moisture results. We, however, feel that the moisture determination still requires considerable work on the part of the Moisture committee.

In concluding this report your committee feels that the Society owes again to Mr. Thos. C. Law a tremendous debt for his care and attention in preparing and mailing the samples.

Personnel of Committee: Messrs. G. W. Agee, C. A. Butt, L. B. Forbes, N. C. Hamner, L. C. Haskell, G. K. Witmer, A. W. Putland, Chairman.

The following figures showing comparative exports of fish oils from Newfoundland were submitted by Vice Consul Cobb at St. John's, Newfoundland:

	1929	1930	1931
	Gals.	Gals.	Gals.
Cod oil	676,096	860,160	1,026,818
Cod liver oil....	162,048	198,448	158,323
Seal oil	594,436	596,322	305,680

Report of The Referee Board

W. H. IRWIN, *Chairman*

DURING the year 1931-32, the Referee Board of the American Oil Chemists' Society granted only one new Referee Certificate, that to A. G. Hayes, Memphis, Tenn. The Referee Board re-certified the following laboratories:

1. E. G. Williams, New Orleans, La.

W. H. Irwin, Chairman of Referee Board

2. Curtis & Tompkins, San Francisco, Cal.
3. Battle Laboratories, Montgomery, Ala.
4. Southwestern Laboratories, Dallas, Tex.
5. Fort Worth Laboratories, Fort Worth, Tex.
6. Texas Testing Laboratories, Dallas, Tex.
7. Law & Company, Atlanta, Ga.
8. Shuey & Co., Savannah, Ga.
9. Houston Laboratories, Houston, Tex.
10. L. B. Forbes Laboratory, Little Rock, Ark.
11. H. M. Shilstone, New Orleans, La.
12. Barrow-Agee Laboratories, Shreveport, La.
13. Southwestern Laboratories, San Antonio, Tex.
14. G. W. Gooch Laboratories, Los Angeles, Cal.
15. J. C. P. Helm, New Orleans, La.
16. Chas. W. Rice & Co., Columbia, S. C.
17. General Laboratories, Oklahoma City, Okla.
18. Industrial Laboratories, Fort Worth, Tex.
19. N. E. Katz, Meridian, Miss.
20. Barrow-Agee Laboratories, Memphis, Tenn.