REPORT OF THE MOISTURE COMMITTEE

The Moisture Committee continued the work of last year and has confined its efforts to a further test of the Bidwell-Sterling Moisture Method.

Fifty-seven collaborators signified their intention to work with this committee. Six samples of cottonseed meal were sent out during six months by the Smalley Foundation to these collaborators. These samples were to be tested for moisture by the Bidwell-Sterling method. The results have been tabulated and are given herewith:

Results on First Sample

B—S	B—S	B—S	B—S	Oven
7.70	9.27	7.80	6.53	7.00
7.44	8.18	7.20	7.46	6.50
7.58	7.15	7.84	7.59	6.16
7.50	7.26	7.87	8.30	6.40
6.40	7.87	6.45	7.30	7.47
7.40	7.74	6.00	7.50	7.06
5.90	7.30	7.83	7.50	6.57
7.80	6.10	6.52	7.20	

Results on Second Sample

B—S	Oven	B—S	Oven	B—S
8.39	8.35	8.80	7.42	7.44
8.08	8.21	9.83	7.60	8.80
8.26	8.00	8.33	8.36	9.08
8.16	8.03	8.60	8.66	8.52
8.74	8.36	8.26	8.15	8.40
8.60	8.54	8.06	8.30	7.18
7.39	7.48	8.43	7.90	9.05
8.11	7.60	8.62	8.17	
8.40	8.28	8.57	8.21	
8.47	7.67			

Results on Third Sample

B—S	Oven	B—S	Oven	B—S	Oven
7.60	7.60	9.28	7.80	7.75	7.36
7.45	7.72	7.44	7.51	7.72	7.45
7.92	7.56	7.68	7.26	8.40	7.52
10.26	6.96	6.53	7.13	7.33	7.37
7.60	7.20	7.62	6.75	7.60	7.72
8.20	7.86	7.50	7.50	8.20	7.70
7.71	7.55	7.28	7.82	7.66	7.20
8.20	6.72	7.05	7.02	7.00	6.70
7.84	7.22				

Results on Fourth Sample

B—S	Oven	B—S	Oven	B—S	Oven	B—S	Oven
7.73	7.40	8.40	8.00	8.21	8.30	8.36	7.80
7.60	7.94	8.21	7.71	9.40	8.10	7.92	7.89
8.56	7.78	8.00	7.80	7.00	7.68	9.80	7.63
7.95	8.09	8.53	8.32	8.10	7.96	7.80	7.37
8.92	7.04						

Results on Fifth Sample

B—S	Oven	B—S	Oven	B—S	Oven
8.44	7.92	8.40	8.00	7.80	7.79
8.56	8.06	8.26	8.02	8.28	7.98
8.04	7.56	8.53	8.36	8.25	7.85
8.35	7.71	8.39	7.90	7.35	8.20
7.15	7.24	7.60	7.38		

Results on Sixth Sample

B—S	Oven	B—S	Oven	B—S	Oven
9.50	8.97	9.20	9.30	9.92	9.36
8.80	8.89	9.30	9.40	8.70	8.82
9.33	8.97	9.40	9.35	9.65	8.96
9.00	8.90	9.70	9.73	9.00	8.76
9.36	8.86				

Seventy per cent of the collaborators reported on the first sample, fifty per cent reported on the second sample, forty-four per cent on the third sample, thirty per cent on the fourth, twenty-five per cent on the fifth and twenty-two per cent on the sixth. You will note that the results are far from being satisfactory. You will also note that many of the collaborators gave up the work in its early stages, rendering it impossible for your committee to draw the conclusion that would have been possible had the collaborators "stuck to the ship." We are all aware of the importance of the moisture determinations and the large discrepancies which often occur when different laboratories report moisture on the same sample.

Your committee knows of no other analytical process in which we are concerned that needs greater special attention than moisture determination, as shown by our moisture results on check meal work and on our past year's work using the Bidwell-Sterling method, and these results also show conclusively that many of our laboratories are not equipped with a uniform and constant temperature oven.

In sending out instructions for the use of the Bidwell-Sterling apparatus, your chairman said that no special training in technique is required for manipulating this apparatus as several analysts, unacquainted with the method, after simple explanation were able to obtain entirely satisfactory results at the start. It would seem, however, that many of the collaborators took too seriously the wording of the original instructions sent out by this committee; for it was not our intention to restrict the time of the method to one hour, but to distill until all the moisture is over. The rate of distillation is relative and does not need to be adhered to exactly. The idea is to keep the condensed water from getting too high in the condenser as to make its removal difficult.

The disagreement between the distillation and oven methods is to be expected as it has been thoroughly proven that the drying oven results at atmospheric pressure run consistently lower than those obtained by the distillation method. It is probable that the difficulty was not in getting all of the moisture out of the sample, but rather in not getting all of the moisture from the condenser into the receiving tube.

Dr. G. L. Bidwell, Bureau of Chemistry, Washington, D. C., gives in detail exactly how he manipulates the determination in his laboratory:

"It might possibly help to detail how we manipulate the determination in this laboratory. Clean the receiving tube and condenser with fresh

sulphuric-chromic acid mixture, rinse with water and alcohol and dry in an oven. Add sufficient dry sand to cover the bottom of the flask and 50-75 cc. of toluene. Weigh out sample and transfer to flask as rapidly as possible. Connect and distill slowly for about one-half hour keeping the uncondensed column of toluene and water vapors from getting more than an inch up into the condenser. Wash down by pouring about 5-10 cc. of toluene through the condenser. Repeat this process every five minutes until no more droplets of moisture come over. If it is necessary use the brush near the end of the process. If drops adhere to the side of the tube push them down with a rubber band wrapped around a piece of wire.

"We prefer a condenser with the condensing tube of not over 3/8 in. diameter, as we have found those of larger diameter less satisfactory. We also bevel the tip of the condenser, and draw the tip down to a fine point."

Some of the collaborators found increased moisture yield upon extending the time of distillation to one and one-half hours and even to two hours.

Very diversified opinions exist among our collaborators as to the merits and demerits of the Bidwell-Sterling Moisture Method. Among those who express themselves we quote the following:

"We believe that the method is about the most scientific devised so far, and are willing to continue the experimental work if the other collaborators are willing to do the same."

"Although our results have not been particularly good, we think that it is only a question of becoming adjusted to the method before results obtained will be close enough to justify using this as an official method."

"We are arranging to follow the work closely on sample six, but up to the present time we have not found the method satisfactory."

"It is a good method and has wide application. We are using it here every day for moisture of various kinds as it can be used on material where oven drying is absolutely inapplicable."

"I feel sure that part of the non-uniformity in the results is due to the fact that some laboratories use a small sample and follow the method exactly, while others use larger samples and vary the method to suit conditions."

"We are inclined to believe that some of the rather low results can be explained by the implicit faith of some of the collaborators in the oven method and the consequent attempt to obtain agreement between the two methods."

"I am of the opinion that results obtained so far do not warrant a recommendation of the method as it stands. I do not believe, however, that a distillation method which will give satisfactory results can be worked out and believe it very desirable to have such a method."

It was the hope of this committee at the outset that it would be in position to report something definite at this time with reference to the employment, for official purposes, of the Bidwell-Sterling Moisture Method. We do, however, recommend that this method be further studied.

The chairman wishes to thank the members of the committee as well as the other members of the American Oil Chemists' Society for their hearty cooperation during the year. I wish especially to thank Drs. G. L. Bidwell and W. F. Sterling, of the C. F. & G. I. Laboratory, Washington, D. C., for their sincere cooperation.

P. S. TILSON, Chairman.
S. L. INGERSOL.
W. H. IRWIN.
J. P. LONG.
R. C. HATTER.

REPORT OF THE RESOLUTIONS COMMITTEE

Whereas, It has pleased God in His infinite wisdom to take from our midst one of our most beloved and valued members, and

Whereas, In the sudden death of David Schwartz in Houston, Texas, February 3, 1926, it is fitting that we his friends and associates who have known him for so many years should express our very great sorrow and a deep appreciation of our own loss.

David Schwartz was a man of the very highest type of gentleman and scholar. Born in Boston, Mass., March, 1876, he was educated in the schools of that city and entered the Massachusetts Institute of Technology, from which institution he was graduated in 1897. In the same year he entered the employ of the Southern Cotton Oil Company and remained in their employ for a term of twenty-seven years, or until 1924. During this time he rapidly advanced in position, finally becoming General Manager of Refineries. At the time of his death he was Vice-President and General Manager of Refinery of the South Texas Cotton Oil Company.

There were few men in the United States who had attained higher distinction in the scientific side of the Cotton Oil Industry and he was regarded by many as having no superior in his knowledge of refining and compound manufacture. He was known to be the first man to make use of carbon black in the refinery.

Therefore, Be it resolved that our Secretary be instructed to extend our sympathy to his bereaved family and that a copy of this resolution be sent to his widow and sons.

P. S. TILSON.
L. F. HOYT.
E. R. BARROW.