

Problems of the Oil Refiner

A Discussion of His Relations to Buyers and Chemists

BY G. G. FOX

SEVERAL weeks ago the president of the American Oil Chemists' Society requested me to talk before the Society on the experiences of the Refiners' Division of the industry during the past season, and it occurred to me that there were many interesting things which we might discuss. From time to time different thoughts have passed through my mind concerning a means of presenting problems which have confronted us recently, and, while I seem to have discarded them one after the other, I still think, from a few bits of information collected from the industry, that some interesting results may be registered with you, and I hope may be of some assistance in your future plans for meeting the technical problems of the industry.

It seems only fitting at this time that we should approach the subject matter first by reviewing the past, and it is very gratifying to me today to look over this assembled group and visualize the progress and development which has taken place since the organization of this Society. It seems but a few years ago when an effort was made by just a few chemists connected with the industry in different capacities to devise a means of exchanging ideas which might be helpful, and I believe it was in Louisville when some eight or ten chemists met and discussed problems of that day, finishing with the thought and belief that a society could be organized and maintained

thru the support of the Interstate Association, and be of great assistance in its field of endeavor. The following year in Memphis, your Society was instituted, first known as the Cotton Products Analysts Society and later to be known in a broader way as the American Oil Chemists Society. The co-ordinated efforts and contact of the members resulted in a wonderful understanding and a systematizing of methods and activities, which gave this organization a national standing and made it one of the most important divisions of the Interstate Association.

Much work has been done in the standardization of methods for the analysis of the various products of the crushing industry, not to speak of the unselfish and tireless efforts of your members in relation to perplexing problems which have come up from time to time in the Association, and the wonderful way in which this Society has grown and the manner in which each member is contributing is deserving of much credit, and I congratulate you today on your achievements.

Another branch of the Association, the Refiners Group, should also be reviewed, in relation to progress, in order that we may approach the present contact of chemist and refiner in a clarified way.

It is generally conceded that cottonseed oil is the most valuable product of the crushing industry, and the greatest outlet for this commodity is in the manufacture of shortening. It is interesting to

go back into the history of the shortening industry and to note how this outlet was developed and through what means it has reached its present stage. Therefore, I am going to relate the result of a survey on this subject, which I made a short time ago, and, while the statements may not be exactly accurate, in relation to dates, yet in a broad way it serves to tell the story of shortening.

In the early eighties the N. K. Fairbanks Company operated a large refinery in Chicago, in which it received prime steam lard purchased on the Chicago Board of Trade, which it subsequently refined, packed and shipped to the various markets of the world under its private brands. During this time, it was also the practice to press prime steam lard, utilizing the lard stearine for blending with prime steam and shipping to the tropics, and selling the prime lard oil to the railroads and signal oil blenders. This development suggested the use of a vegetable oil, and refined cottonseed oil found its way into pure lard, and various blends were made to satisfy the consuming demand in relation to texture, so that our first product involving the use of cottonseed oil was commercially known as "lard compound," in which oleo stearine was later used, about the time when oleo stock was pressed to produce oleo oil, to satisfy different market demands.

About 1884 the use of oleo fats in lard compound, together with cottonseed oil, attracted the packing industry, and in this year Armour and Company equipped its refinery with a shortening plant to become compounders of lard, cottonseed oil and oleo stearine. Some ten years following, other large

packers entered this industry, which brings us up to 1894, from which time the manufacture of shortening increased tremendously, until we are brought up to date.

There were many problems in the early days for the chemist and refiner, in preparing cottonseed oil properly for this edible food product, and some of the old records in Chicago bear the names of Mr. Eckstein, who is credited with having developed methods of bleaching cottonseed oil, with Dr. Wesson, who has probably done more in the development of present day refining, bleaching and deodorizing methods than any other one person in the industry. It, therefore, appears that the development work in those days was done through personal endeavor, and not on an organized basis of the present day.

It was the custom of the compounders to purchase refined cottonseed oil, delivered at Chicago in barrels, and later in tank cars. The trade customs were quite different than those which obtain today. Our own company contracted for their requirements of refined cottonseed oil with a prominent refiner on a cost plus basis, and there was no specification to set up the grade; but it was understood that cottonseed oil tenderable on the contract should be equal to the normal expectancy of the trade at that time, in relation to flavor and odor, and, if the refining loss exceeded the average refining loss for the season, the buyer was entitled to a reasonable claim which was made and paid.

It was the duty of the broker negotiating the transaction to supervise the movement of the seed to the crushing establishment and the oil to the refiner and to insure a fair average quality of oil. It

wasn't until 1896 that the first Association meeting was held, at which time suggestions were made to expedite trading through the adoption of a few so-called rules, even though no attempt was made to establish maximum refining losses.

About this time we are told that the industry was greatly agitated over the report of measuring the color of cottonseed oil with the use of a tintometer, which set up the utilization of color standards. Having established the refining loss and color standards, the rules were amplified to include them in establishing the grades which should be traded in, and to simplify means of setting up values for different grades. Later the rules disclosed the specifications for prime crude cottonseed oil, but a difficulty arose at this time, owing to the fact that a mill purchasing seed and desiring to sell the oil to be made from the seed for a future delivery was disappointed to find that the seed when crushed did not make a prime crude as defined by the rules, and therefore, a basis prime crude was presented for trading purposes.

The popularity of this custom caused the pendulum to swing the other way, and the refiner found that he was obliged to take anything that ran through a press, even though he had originally purchased a prime crude cottonseed oil, which was to make a prime summer yellow bleachable refined oil the basis or standard for vegetable shortening.

Again the refiner and chemist got together and thrashed out the difficulties surrounding the industry, in view of this broad ruling, and it was found necessary to establish a limit of grade for a basis prime tender. When this

was accomplished, it seemed as though transactions would move smoothly, until we experienced a bad growing season, when off oil was produced quite generally throughout the belt, and our immediate problems were twofold: first, to establish the proper grade on a refined basis of this off crude, and second, to arrive at the proper value of the refined oil thus produced.

Again the chemist was asked to contribute, and you will recall much check work was attempted in the handling of these off oils that brought out an emergency plan for trading, whereby certain code words in the Yopp's Code Book set forth grades and settlement plans to expedite trading. We gradually come up to the next big movement in the Association's affairs, which has to do with the experience of the past season, whereby transactions were made on a debit and credit basis, or a premium for choice oil.

This involved considerable thought and study, and the plan was officially adopted—but the most important feature of the season was not contemplated when the rule was passed; that is, it was not expected that such choice oil would be made throughout the belt as seems to have been made this past season. Because the rules prescribed that a chemist's certificate (a member of this Society) should be rendered the seller upon the receipt of each tank of crude refined, it caused some members of the Society to handle a great deal more oil than ever before, and particularly choice oil, which they were not called upon to handle in the past.

In the early months of the season, the discrepancies reported between the chemists and the refiners

were so alarming that they promised to be extremely serious, for, officially, the refiner was obliged to pay for the oil on the basis of the chemist's certificate, and the chemist was reporting results which could not be obtained by the refiner. While this spread in the wrong direction for the refiner, it was somewhat lessened as the season progressed, it called for some emergency action, which was taken last November, and it resulted in a

recommendation by the Chemists' Committee that the prescribed caustic treatment be reduced in strength to eighty per cent of the maximum given in the official method. This was doubtless a step in the right direction, but it would appear from some of the reports of the refiners that we might step further in this direction before approaching the economic status of this problem. Progress is expected this year.

Report of the Chevreul Prize Committee

BY DAVID WESSON, CHAIRMAN

THESE prizes were established in 1926, and named in honor of the great French Chemist Chevreul, who discovered that the vegetable and animal fats and oils consist of combinations of Fatty Acids and Glycerin.

They were offered for the three best original articles appearing in the Oil and Fat Industries Journal during the season 1926-1927.

At the meeting of the American Oil Chemists Society at Memphis 1927, it was decided to extend the time until April, 1928.

The Committee has decided that articles received up to April 1 but published at a later date would be eligible.

To be considered the articles must have practical bearing on the fat and oil industry and be of use to the same.

The competition is open to non-members of the society.

The judges selected are:

Dr. C. A. Browne, Chief, Bureau of Chemistry, United States De-

partment of Agriculture; Dr. Charles H. Herty, Chemical Advisor, Chemical Foundation, New York, New York; Dr. Allen Rogers, Prof. Industrial Chemistry, Pratt Institute, Brooklyn, New York.

The prizes are as follows:

The first prize	\$150
The second prize	100
The third prize	50

Referee Applicants

The following have applied for Certificates as Referee Chemists of The American Oil Chemists' Society; (second publication):

W. J. Bramblett, Texas Testing Laboratories, Fort Worth, Texas.

Industrial Laboratories, by H. M. Bulbrook and F. C. Schilling, Fort Worth, Texas.

A. H. Preston, Southwestern Laboratories, San Antonio, Texas.

H. M. Shilstone, New Orleans, Louisiana.

J. H. Sorrels, Terrell's Laboratories, Fort Worth, Texas.