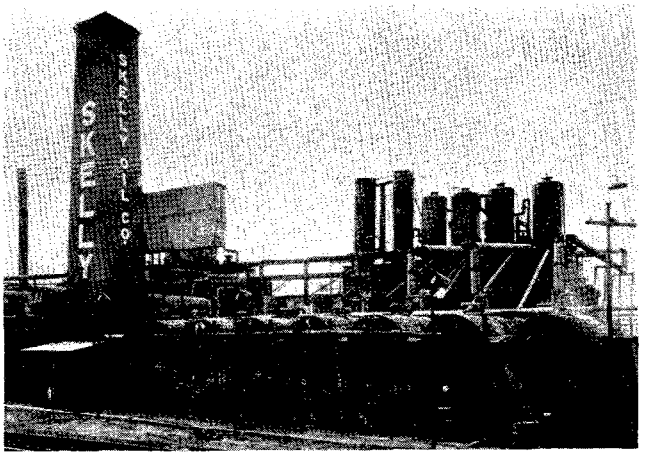
The Vital 50 Years of the Oil and Fat Industry

ALTHOUGH everyone is familiar with the fact that it is from small acorns that the mighty oaks grow, it hardly seems possible that during only the past 50 years, or within the lifetime of a single generation, the great and dynamic American Oil Chemists' Society as we know it today has developed from informal discussion between only a "handful" of technologists who were attending an annual meeting of another, though related, organization. But such is the case! And in like fashion Skelly Oil Company, which today ranks within the top twenty petroleum companies in the United States, had its humble beginning on October 2, 1919, at El Dorado, Kans., with the little, 2,000-barrels-per-day refinery pictured on this page, which long since has been antiquated by developments in the industry.



Original Battery of Stills—Now Auxiliary Equipment

When one thinks of the "oil and fat" industry, there first is brought to mind manufacturing plants and activities connected with vegetable and animal oils, fats, and waxes. And so it was some 50 years ago. But now, as a result of scientific and technological developments, the manufacturing plants and activities of the "mineral oil" or petroleum industry very properly are related to, if not actually a part of, the great oil and fat industry; this is true not only because the petroleum industry supplies heavy oils, lubricants, gasolines, and gases that are required in operating power plants, driers, trucks, automobiles, and other equipment of the industry but also because it provides a number of the primary materials, such as glycerine, wax, and detergents, with which the oil and fat industry is concerned.

Natural gas, petroleum and mineral oil tars have been known since earliest times, but the origin of the petroleum industry really dates from the oil well drilled by Edwin L. Drake for the Pennsylvania Rock Oil Company on August 23, 1859, at Oil Creek, Pa. However the large-scale development of the industry, with the consequent shifting of the center of activities from the eastern to the midcontinent fields, began in 1901 with the bringing in of a large "gusher" by A. F. Lucas at the famous Spindle Top oil field near Beaumont, Tex.

Thus it is seen that when Skelly Oil Company was formed in 1919, it took its place in an industry which then was only in the making. Prior to that there had been, instead of an organized industry, a variety of companies, individuals, small refiners, brokers, jobbers, and "curb" pumpers, along with a scattered assortment of crude oil producers and land men who hardly thought of themselves as part of an industry. There was little unity of purpose, no broad leadership, no thought of conservation of a precious natural resource, few standards of quality, and a minimum of research and scientific processes. Also, there was but precious little restraint in the unwritten laws of oil production and marketing, which began and ended in the theory of the survival of the strongest. In fact, the first move toward orderliness in the petroleum industry was made with President Woodrow Wilson's declaration on October 2, 1918, of U. S. Government specification standards for gasoline, the first official standard for any petroleum product!

Thus, just as The American Oil Chemists' Society during the past 50 years has witnessed the great expansion and diversification of the activities related to the production and use of vegetable and animal oils, fats, and waxes, the Skelly years have encompassed a vital period in the petroleum industry, a period during which more progress has been made than in all the earlier years combined. This was the era during which petroleum geology and other amazing scientific developments in oil field exploration and production methods were made as well as the introduction of more efficient recovery of and utilization of refinery products, to say nothing of the astounding progress made in conservation practices which not only practically eliminate waste of oil and gas but also harness natural underground energy for more efficient and greater percentage recovery of the crude oil. From the earliest trials of rotary drilling, in the Hewitt field in 1919, Skelly Oil Company has participated in testing and proving scientific methods of exploration and production, being among the first to test the jelly-seal method in connection with acidizing limestone formations and in installing radial hydraulic pumping. Of course, as first thermal cracking, then catalytic cracking processes were introduced for the production of larger percentages of better-quality motor fuels, Skelly Oil Company engineers and chemists have participated in many of these revolutionary developments. It seems as though the industry has revolutionized its manufacturing operations every 10

(Continued on page 10)

The Economics of Processing Soybeans

PROCESSING soybeans to produce oil and meal sounds like a rather simple economic task. Classic marketing problems, such as product line, brand preference, and sales organization, are nonexistent. Presumably if cash beans are carefully bought and faithfully hedged and if product sales and concomitant hedge-lifting are well handled, then given no serious over-capacity, making money ought to be simple, almost automatic.

Unfortunately this is not the case. Facing the processor are enormous and often unappreciated problems of market judgment. Hedging covers only absolute price movements. It does not protect the basis, *i.e.,* the relationship of cash beans to future or cash products to futures. In addition, the processors' main concern is not absolute price but the relationship between cash soybean cost and product sales value. This relationship is known as conversion. (See table below.) Few problems in markets are as unpredictable or as hard to handle.

TABLE I
Rule of Thumb Conversion Relationships

Cash oil 10¢ per lb. × yield 10½ lb. per bu.[1] Value per bu.	$1.05
Cash meal $60 per ton × yield 48 lb. per bu.[2] Value per bu.	1.44
Total value of products	2.49
Less cost of cash beans	2.25
Margin before costs	0.24
Average processing cost[3]	0.15
Net profitability	$0.09

[1] Current yield which is below short-term average of 10¾ lb. and below longer term average of 11 lb.
[2] Longer-term meal average 47½ lb. per bushel.
[3] U.S.D.A. in a 1952–53 survey estimated costs at 37¢ per bushel, but this is much too high. Use 15¢ for a good modern mill.

Unpredictability stems from the large number of outside forces constantly working separately on beans, oil, and meal. As mentioned here many times, all fat and oil prices are to some degree independent. Meal has competitors in the feed field. Soybeans are constantly being affected by support programs and export demand.

The processor is under great pressure to employ plant and equipment investment profitably. Unfortunately vagaries of conversion often force him to speculate in order to show an apparent profit. (If you think about this, you will realize that this is self-deception. If you make money speculating and lose money processing, then you should quit processing and become a professional speculator.) The commonest form of processor speculation is to buy as many beans as possible at harvest time when storage is tight. This usually means an attractive basis under futures as well as a probably depressed futures price. These cheap beans are not hedged, and processors pray for a rally. This does not always work.

WE ARE NOW at a time of year when this type of speculation is no longer possible. The support program has siphoned off cheap beans. At this time of year conversion tends to lose ground or be static. No real improvement can be expected until late summer. Up until now (early March) this year has been a consistently good one from the standpoint of nearby conversion, and a huge crush has resulted. Deferred conversion however has been consistently bad. For example, in January nearby conversion showed 24¢ while July showed 6¢. So nobody put on deferred conversion. Now nearby has sagged to 8¢, and July is a minus figure. This means a prospect of not even out-of-pocket costs being covered in July. What is the solution, now and for July?

TABLE II
Changes in Conversion in Spring and Summer Months

	Changes and ranges	Median changes and direction
April–May	7 to plus 5	− 3
May–June	6 to plus 11	− 1
June–July	6 to plus 22	− 3
July–August	18 to plus 9	0
August–September	7 to plus 18	+16

Problems in shutting down are quite complicated. Obviously clerical and executive costs will continue. So will most maintenance and tax costs. Laying off labor is seldom easy. The usual line of attack is to reduce but not stop, crush as long as out-of-pocket costs are being met and some reasonable contribution to overhead is being made. As overhead contribution approaches zero, there may be shutdowns.

Slowdowns-shutdowns are a two-pronged weapon for increasing profitability. First, less production means less pressure on cash oil and meal. Second, reduced demand for cash beans should result in lower bean prices. For the last few years operation of the government support program has reduced sharply the effectiveness of the latter item. It will be obvious to the reader however that shutdowns must be done pretty much in concert. Any general fudging will mean that a few people will be heroes and that the nonheroes will reap the benefits. As a result, no one wants to make the first move, and there is usually a lot more threatening than shutting.

Sometimes crushers can avoid some of the hazards of conversion by putting spreads on in futures before the new season begins. This involves buying bean futures and selling oil and meal futures whenever reasonable differences show. This has the disadvantage, of course, of limiting profit. However not fixing profit spreads in a business as difficult to forecast as soybean processing appears to us to be unwise.

JAMES E. MCHALE, Merrill Lynch, Pierce, Fenner, and Smith Inc., Chicago, Ill.

Fatty Acids Reported

PRODUCTION of fatty acids, as defined in Categories No. 1–12, totalled 38.6 million lbs. in January 1959 in comparison with 37.9 million lbs. in the previous month and the same in January 1958, according to the Fatty Acid Producers' Council, New York.

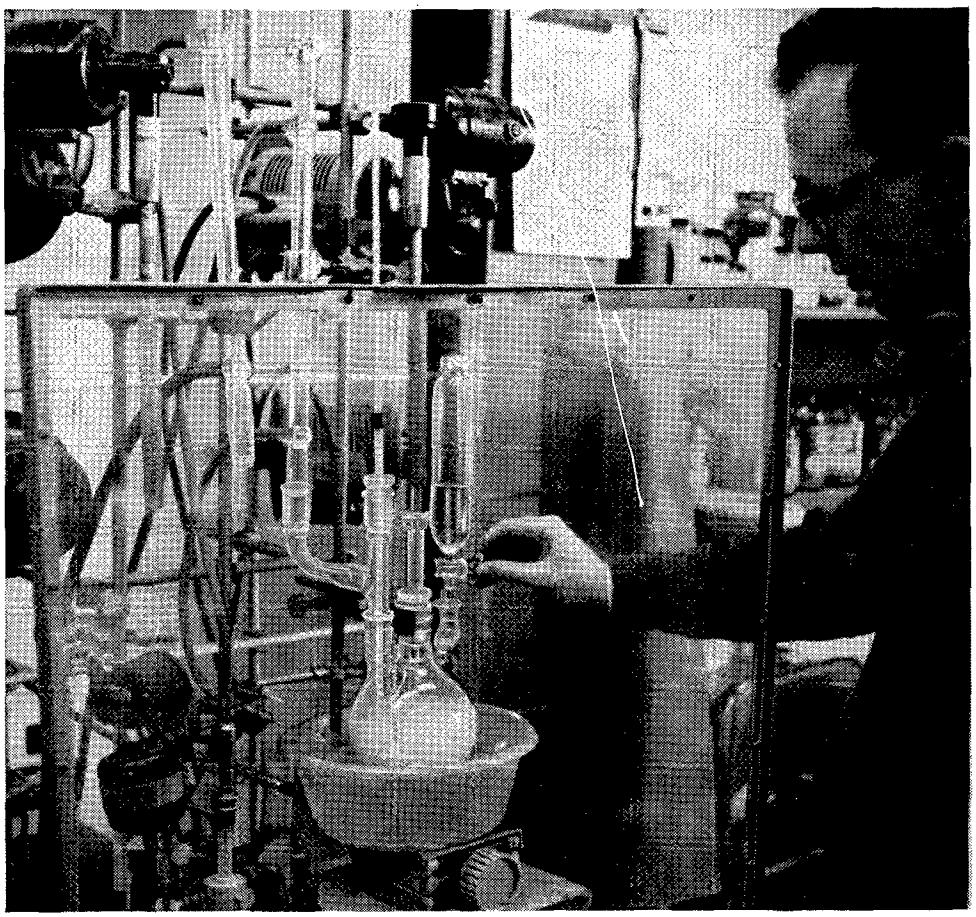
Fatty acid disposition in January was 41.2 million lbs. *versus* 40.4 million lbs. in December 1958 and 36.2 million lbs. in January 1958. This is an increase of 14% over last year for the same products. Tall oil fatty acids, oleic acid, and "other stearic acids" made the major gains.

Finished goods inventories amounted to 27.2 million lbs., down 1.1 million lbs. from the December 1958 level and down 11.2 million lbs. from a year ago. Work-in-process stocks rose slightly from last month.

Consultant to Calcutta

General Mills Inc., Minneapolis, Minn., has been selected by the Soybean Council of America to send a technical consultant to Calcutta, India, to take charge of an exhibit at a U.S. Solo Small Industries Fair, March 15 to April 15, sponsored by the Office of International Trade Fairs, U.S. Department of Commerce. The consultant, F. H. Hafner, will demonstrate how soybeans and soybean products can be incorporated into the Indian diet and will familiarize the Indian people with the ways in which they are used in America.

Conducting an experimental epoxidation reaction at SOLVAY Technical Service, Syracuse, N. Y.



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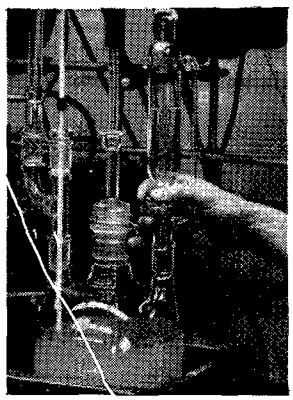

Adding reagents in an epoxidation reaction with hydrogen peroxide.

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Please send booklet(s):

- ☐ "SOLVAY Hydrogen Peroxide for Epoxidation and Hydroxylation Reactions." HP-13
- ☐ "Recent Advances in Uses for Epoxidized Fatty Acid Derivatives." HP-19
- ☐ "Reduction of Cleavage in Epoxidation Reactions." HP-20
- ☐ See attached letter on my problem.

Name_____

Company_____

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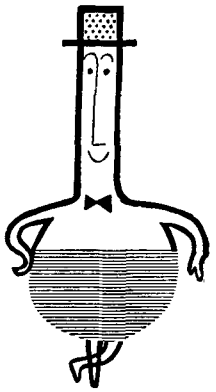


Meetings

A.O.C.S. National Meetings

1959—New Orleans, Roosevelt hotel, April 20–22
Los Angeles, Statler Hilton hotel, September 28–30

1960—Dallas, Baker hotel, April 4–6
New York, The New Yorker, October 17–19

1961—St. Louis, Sheraton-Jefferson hotel, May 1–3
Chicago, Hotel Sherman, November 6–8

1962—New Orleans, Roosevelt hotel, May 7–9
Toronto, Royal York hotel, October 2–4

1963—Atlanta
Minneapolis

A.O.C.S. Section Meetings

North Central—March 25, and May 27, 1959, at the Builders' club, Chicago, 6:30 p.m.

Northeast—first Tuesday of February, April, and June, 1959, at Whyte's Restaurant, New York, 6 p.m.

Northern California—May, September, and November at selected places

Southwest—second Thursday of every other month, beginning January 8, 1959, at Rodger Young Auditorium, Los Angeles, 6:30 p.m.

Other Organizations

April 18–21—Annual Meeting, American Society of Tool Engineers, Schroeder hotel, Milwaukee, Wis.

April 20—Fifth Annual Open Symposium (on instrumentation), American Society of Perfumers, Essex House, New York

April 21–23—14th Annual Meeting and Exhibit, American Society of Lubrication Engineers, Hotel Statler, Buffalo, N.Y.

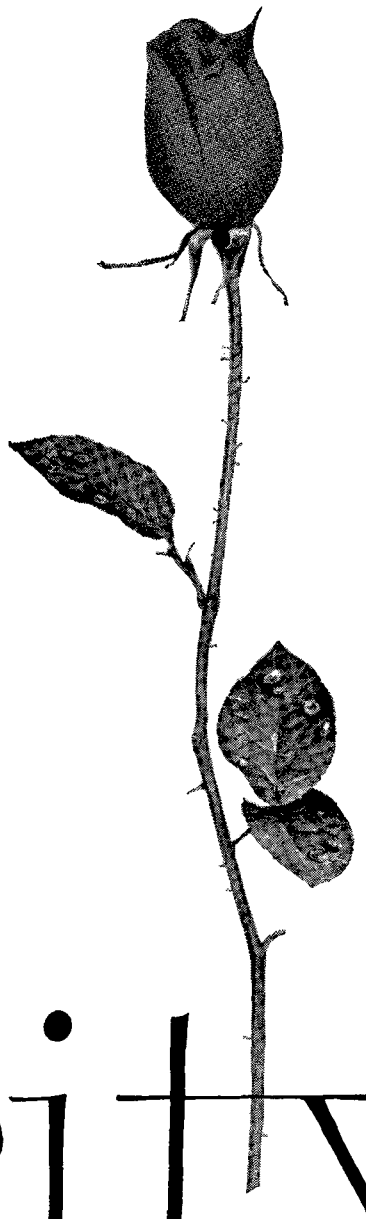
April 25–30—41st Annual Meeting, Scientific Apparatus Makers Association, Greenbrier, White Sulphur Springs, W. Va.

May 5–7—14th Purdue Industrial Waste Conference, Memorial Union building, Lafayette, Ind.

May 11–16—Fifth Symposium sur les Matières Étrangeres des les Aliments, Budapest, Hungary (in care of Secretariat Permanent, Gorkij Fasor 44, Budapest)

Chemetron Corporation, Chicago, Ill., has announced the formation of a German affiliate, Girdler-Suedchemie Katalysator G.m.b.H., Munich, Germany, to handle its line of Girdler catalysts in Europe.

The Chemical Division of General Mills, Kankakee, Ill., has announced the commercial availability of a new line of amphoteric surfactant products, trade-marked the Deriphats.



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Penola

Pilot California Company, Los Angeles, Calif., announces the appointment of Richard W. Yocom (1943) as eastern representative, with headquarters in Chicago. Mr. Yocom will direct the marketing and distribution of Pilot's line of high active alkyl aryl sulfonates, hydrotropic solvents, and sulfated nonionics from Chicago and warehouse points in St. Louis, Cincinnati, and New York. Mr. Yocom has been associated with the soap and detergent division of Swift and Company for the past 22 years.

• *A.O.C.S. Commentary*

(Continued from page 4)

years, beginning some 50 years ago with a simple distillation-condensation operation, then progressing through thermal cracking, catalytic cracking, and alkylation, on into the broad field of synthesis of oxygenated compounds, plastics, rubber, fertilizers, and so forth. Of signal importance to the oil and fat industry was a refinement in the processing of natural gas and crude oil that made available solvents in tank-car quantities which had a quality beyond all previous experience in the petroleum industry. These extra pure, low-boiling industrial naphtha fractions, which permitted the preparation of oils and meals without foreign taste or odor, made it possible for the large-volume, continuous solvent-extraction process, that began about 1930 in the United States, to achieve immediate commercial success and grow continuously until today the solvent-extraction process is firmly established throughout the soybean, cottonseed, corn-germ, peanut, flaxseed, and other industries. And in this development Skelly Oil Company rendered pioneering service.

For an industry, or for a company within such an industry, which has seen crude oil utilization in the United States alone grow from about 1,000,000 barrels to about 8,000,000 barrels daily within the span of the past half century and has seen manufacturing operations in that time proceed from comparatively simple distillation-condensation operations to highly complex chemical synthesis of such products as acetone, glycerine, and benzene, who would dare make a firm prediction as to what the next 50 years will bring? Will crude oil utilization in the United States increase to 16,000,000 barrels daily? Will liquid natural gas or methane be shipped routinely in tank-ships to London and other overseas consuming-centers? Will synthesizing techniques develop to where food products, such as sugars and proteins, are made in petrochemical plants? Possibly these and even more sensational developments will take place! In any event, we can be sure that the knowledge, energy, enthusiasm, and devotion to duty that has characterized so many of the members of the oil and fat industry will result in maintaining or even accelerating in coming years the technological progress that has been made during the last half century.

A. E. MacGee, Skelly Oil Company, Kansas City, Mo.