FOUR CORNERS

EUGENE MARSHACK, Chairman
International Relations Committee

R.F. KOHLMANN, B. WEINBERG, L. MASSON,
T. ASAHARA, S.G. BROOKER, E. VIOQUE,
E. SEVER, Corresponding Secretaries

Brazil . . . . . R.F. Kohlmann

New Soybean Processing Plant

A great soybean processing complex was inaugurated in June by SANBRA, Sociedade Algodoeira do Nordeste Brasileiro S/A., a Brazilian company.

This new complex is located in the city of Ponta Grossa, state of Paraná. Its initial goal is to industrialize 2,000 tons/day of soybeans (600,000 tons/year), with a daily production of 1,500 tons of meal, 400 tons of crude oil, and 10 tons of lecithin. When construction began, the purpose of the Company was to start its activities with a processing capacity of ca. 360,000 tons/year. However, due to a significant increase in soybean production (Paraná, which is the leading producer state, went from 350,000 tons in 1969/1970 to over 567,000 tons in 1971, reaching one million tons in the last crop) and, simultaneously, the significant soybean valorization on the international market, plus the export incentives offered by the federal government, the Company started operating the new unit with 600,000 tons/year. Its importance still can be measured, considering the fact that, of the estimated annual shipping, the complex will add 115 million dollars to the total traded by Brazil in foreign countries, in addition to 48 million dollars in sales to the internal market.

This new unit represents just the first stage of the industrial complex. In a second phase, refinery units will be installed. Therefore, this new complex was built on a site with 667,000 m2.

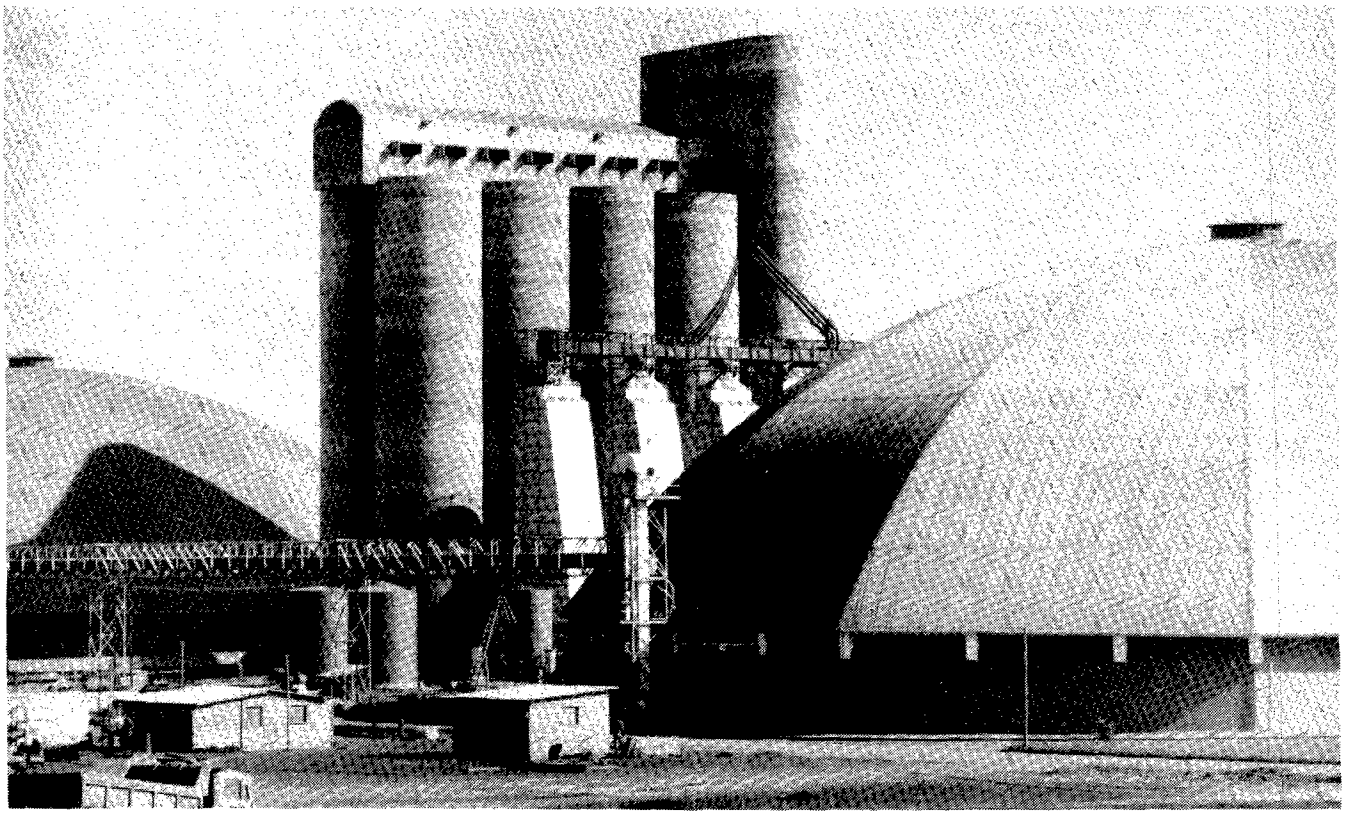
Canada . . . . . B. Weinberg

Canada's 1973 Oilseed Crop

The total 1973 Canadian oilseed acreage of ca. 5.4 million acres differed insignificantly from the previous year and remained well below the record of 7.9 million acres in 1971. The principal cause for the failure of the oilseed acreage to respond to the strong world market demand is to be found in the greater attractiveness of wheat, where the acreage rose by ca. 3.4 million acres to 24.7 million acres.

Rapeseed continues to be Canada's dominant oilseed crop with an expected production of 55.3 million bushels. At least 15 million bushels will be required by the domestic crushing industry to meet domestic demands and have some oil available for export. The crushing for oil exports is expected to grow within the next few years. The oil equivalent of this year's rapeseed crop amounts to 500,000 metric tons, i.e. close to 1.2% of the world fats and oils supply in 1973.

The flaxseed crop increased by ca. 10% to 1.45 million



New soybean processing complex in Brazil.

acres, with an expected production of 18.9 million bushels. In view of the modest crop forecasts for the U.S. and Argentina, the other major producers, the world flaxseed supply problem will not be relieved greatly by the Canadian crop.

The soybean acreage, all concentrated in southern Ontario, has increased to 475,000 and remains insufficient to meet current domestic demand. The sunflower seed acreage, largely concentrated in Manitoba, declined from 217,000 to 130,000 acres in 1973. The crop has to become agronomically more attractive to western farmers before a permanent expansion can be achieved. As to mustardseed, where Canada is the world's major exporter, private estimates anticipate a substantial increase in acreage from 180,000 last year to possibly more than 300,000 acres in 1973.

Canadian Oilseed Acreage and Production

	1971	1972	1973	1971	1972	1973
	(Thousands of acres)			(Millions of bushels)		
Flaxseed	1,768	1,321	1,450	22.3	17.6	18.9
Rapeseed	5,306	3,270	3,150	95.0	57.3	55.3
Soybeans	367	405	475	10.3	13.4	N.A.
				(Millions of pounds)		
Sunflower seed	239	217	130	167	170	N.A.
Mustardseed	206	180	N.A.	186	152	N.A.

The Change-over of the Rapeseed Crop to Low-Erucic Acid Varieties

The potential health hazard attributed to erucic acid, C_{22}-monoenoic acid, led the government of Canada to recommend the conversion of the rapeseed crop to low-erucic acid varieties in 1970. It is estimated that in 1973 close to 86% of the acreage was grown to such summer rapeseed, *Brassica napus* and *campestris* varieties. The erucic acid level in the *B. napus* varieties has dropped to well below 1%, while the *B. campestris* seed still ranges ca. 4%. The agronomic performance of the first new varieties left room for improvement, and plant breeders are continuing to introduce higher yielding and earlier maturing varieties. In the *B. napus* area, the variety Midas was introduced in 1973 which is superior to the varieties grown prior to the crop conversion program. As to *B. campestris*, the new variety Torch is superior to its predecessor Span, but further improvements in yield are expected.

The high level of glucosinolates in rapeseed meal has been the major deterrent against the expanded use of the meal in livestock and poultry feeding. Glucosinolates are precursers of goitrogenic substances. Plant breeders have succeeded in developing two as yet unlicensed *B. napus* varieties which combine low-erucic acid with low glucosinolate levels. Following commercial testing in 1973, one, or both, of these varieties will be licensed for growing in 1974. If successful, these new varieties are expected to overcome the major impediments to the growth of the market for rapeseed products. Plant breeders also have started selecting corresponding seed among the *B. campestris* varieties.

Canadian Fats and Oils Products

Output of crude vegetable oils by Canadian crushers has grown from 385 to 593 million lb in the past 5 years. Rapeseed oil production reached 295 million lb in 1972-73, leaving soybean oil with 219 million lb in second place. Sunflower seed oil output remained at 29 million lb.

The throughput of the edible oil refineries reached about 750 million lb in 1972, including lard. Rapeseed oil, at 212 million lb, was the largest individual item. Nearly all of the refined oils are consumed domestically.

Margarine production reached 212 million lb (9.7 lb/capita) compared with a butter consumption of 320 million lb (14.6 lb/capita).

Progress in Margarine Legislation

The manufacture and sale of margarine was legalized by the Supreme Court of Canada just 25 years ago. While margarine is a nonstandardized food under Federal Food and Drug Regulations, the conditions for its manufacture and sale are under the jurisdiction of Canada's 10 provinces. Initially there was a wide variation of standards concerning ingredient and packaging regulations, thus hampering the development of an efficient industry. However, in the past few years, considerable progress has been made toward establishing uniform standards across the country. Only four out of 10 provinces continue to restrict margarine coloration to below 1.6 red and above 10.5 red on the Lovibond scale. Other provinces are likely to change their regulations in the near future. The federal government abolished a 12% sales tax previously imposed on margarine. One province now permits the blending of margarine oils with butter. Progress also is being made toward a uniform code on packaging regulations.

Studies on the Possible Allergenicity of Fats and Oils Products

Some medical allergists have been advising their patients who are allergic to specific oilseed proteins to avoid any foods containing oils derived from these seeds, because there are traces of proteins left after processing. Since the problem might affect decisions concerning the nutritional labeling of foods, the Canadian Committee on Fats and Oils requested the National Research Council to investigate some commercial products. The study also covered the effect of processing on protein content. The following samples were analyzed: alkali refined coconut and herring oil; alkali refined and bleached soybean oil; alkali refined, bleached, and deodorized coconut oil, soybean oil, and peanut oil; and alkali refined, bleached, hydrogenated, and deodorized herring oil.

Testing the chromatographically separated neutral, polar, and acidic lipid fractions for total phosphorus gave negative results. The oils contained less than 1 ppm phosphorus, and no phospholipids were detectable by thin layer chromatography.

Only one fraction of the alkali refined and bleached soybean oil showed any detectable protein. Ten grams of this oil contained 74 nanomoles of amino acids, equivalent to 1 ppm protein. It was concluded that none of the oils tested contained proteins, phospholipids, or nitrogen containing compounds which could cause any allergic reactions.

Restrictions in Content of C_{22}-Monoenoic Fatty Acids in Processed Edible Fats and Oils

In June the Minister of Health and Welfare announced that the maximum content of C_{22}-monoenoic fatty acids in processed edible fats and oils would be restricted to 5% of the total fatty acids present, as of December 1. The minister had taken this decision in the interest of public

health following an appraisal of the report of the Expert Committee on Long Chain Fatty Acids established late in 1972. The 5% limit on long chain fatty acids can be met by use of the low-erucic acid varieties of rapeseed. To meet this level it will be necessary to reduce the percentage of certain other sources of long chain fatty acids, such as marine oils, in processed products.

The edible oil industry has promised full cooperation in achieving this restriction by voluntary means. Adherence to the program will be monitored by the Health Protection Branch.

The Expert Committee on Long Chain Fatty Acids had been charged to examine the relationship between long chain fatty acids (C_{20} and greater) and the biochemical, histopathological, and physiological changes in animals and to recommend safe levels of intake of these acids for humans.

Committee findings are: (a) Data from a number of laboratories have shown that short-term dietary intake of certain vegetable and marine oils causes transient diffuse myocardial lipidosis in several animal species. This change reaches a peak at ca. 1 week and falls to almost normal levels by 4 weeks, despite continued feeding of the dietary lipid. This effect is directly proportional to the quantity of long chain fatty acids (especially C_{22}) in the oil. After long-term feeding (16-20 weeks) of these oils, focal necrotic lesions, with reactive cellular infiltration leading to fibrotic changes, make their appearance in heart muscle. (b) Studies with oils containing low levels of long chain fatty acids have not produced visible lipidosis in the heart muscle; however, necrotic lesions have been found with long-term feeding of these oils by some investigators and not by others. The relationship of the late necrotic lesions to the early lipidosis is not clear. (c) Metabolic data from rats fed high-erucic acid rapeseed oil indicate an interference with the mitochondrial function, as manifested by reduced oxidation and ATP synthesis (energy production). (d) There is little evidence available regarding the effects of oils containing long chain fatty acids in humans. At the present time there is no specific evidence to indicate any toxic effects of these oils in man.

Chile . . . . . L. Masson

Feasibility study on anchovy oil underway

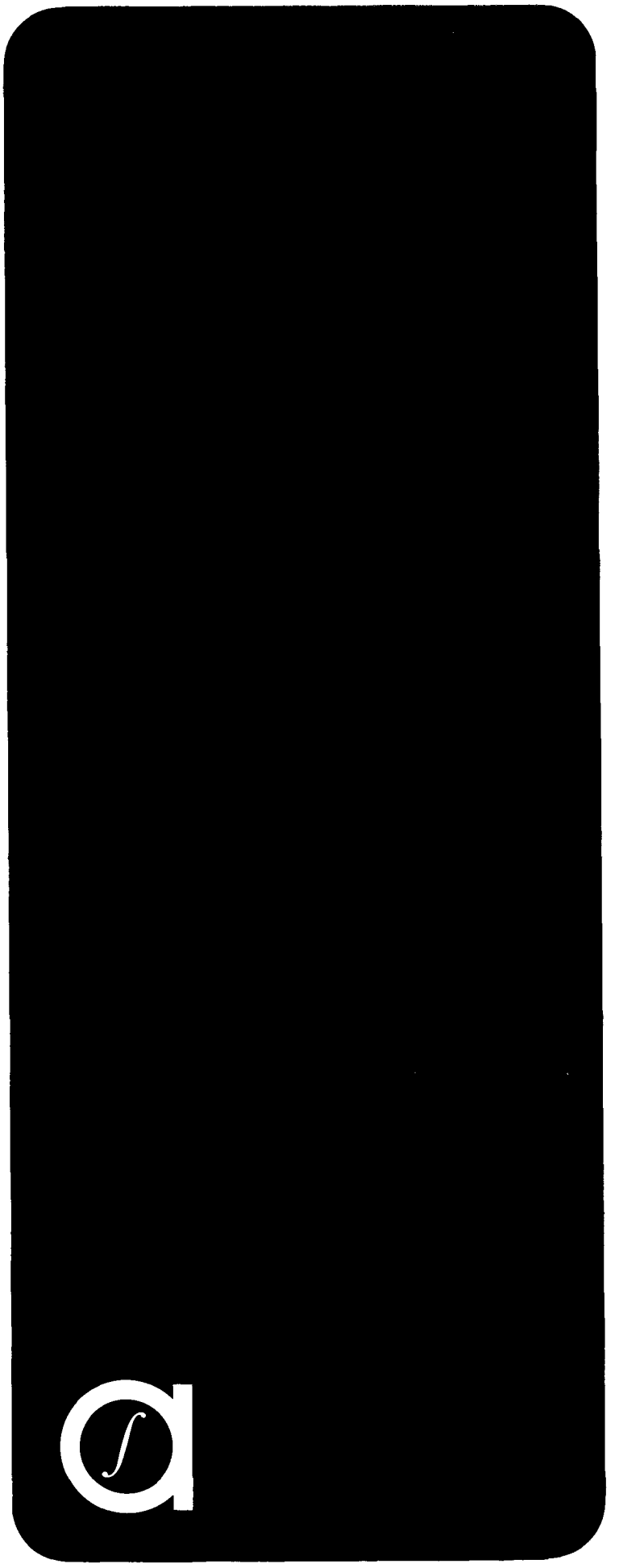
The Corporacion de Fomento de la Produccion, through an agreement with the Chemical Engineering Department, Catholic University, recently completed a technical and economical feasibility study intended to obtain edible oil from Chilean anchovy oil. This project is done under the direction of: Armin Lauterbach, Ing. Arturo Contreras, Ing. Fernando de la Barra, and Ing. Eduardo Castro.

The process that has been developed consists of a selective hydrogenation followed by a separation by crystallization in micelle phase (separation method patented by K. Zondek) of the anchovy oil that has been previously submitted to degumming, neutralization, and bleaching processes. A solid and a liquid phase are obtained from the last step. The liquid phase, previously deodorized, is mixed with vegetable oil; the solid fraction may be used directly in the manufacture of margarine, once deodorized.

The objective of this project is to obtain an economical edible oil from a Chilean raw material that could replace vegetable oils which are, to a large extent, being imported at present.

This project is part of a series of research work that the Chemical Engineering Department is carrying on in the utilization of fish oils, principally in their nutritional and biological aspects with special attention to the unsaturated fraction of high mol wt.

The Chemical Engineering Department also is developing



the following studies: transesterification of anchovy oil with sunflower or soybean oils by using the solid fraction that is obtained in the former process, searching of substitutes for butter-oil in synthetic feed for calves (The influence of iodine value and per cent *trans* is being studied.) and elaboration of brown factice from anchovy oil.

Detoxification of rapeseed flour

This work has assayed a procedure of detoxification of dehulled rapeseed flour by extraction with alcohol and water solutions, under different conditions of pH, time, number of extractions, proportions of alcohol: water and dilutions.

The experimental work was performed at laboratory scale. The best results were obtained with solutions methanol:water 85:15 at pH 3, isopropanol 85:15, 60:40 both at pH 9, obtaining a reduction of toxies compounds at a level of traces and at the same time increasing the protein content from 44% to 53-54% in the case of methanol extraction.

The efficiency of the procedure might allow the utilization of dehulled and detoxified rapeseed flour in the feed for monogastrics animals if economic studies demonstrate its feasibility.

This work is done by the Technological Institute of Chile (INTEC) and the Department of Food Science and Chemical Technology, Chemical Sciences Faculty, University of Chile, under the direction of Fernando Sanchez and Lilia Masson.

Japan . . . . . T. Asahara

Symposium on environmental problem of detergent

Ecological problems with detergent components in connection with the eutrophication by phosphates and the toxic properties of some surfactants to human being and aquatic life still are a controversial issue in Japan. Because of this situation, the Japan Oil Chemists' Society conducted the symposium on "Environmental Problem of Detergent" in Tokyo in October.

A special meeting on "Technology Assessment in Fatty Oil Industry" was held in Osaka in July. Lecturers were K. Nagae, Science and Technology Agency; S. Komori, Osaka University; T. Asahara, University of Tokyo; and S. Tomiyama, Lion Fat & Oil Co.

Lecturers from overseas

G. Maerker, Eastern Regional Research Laboratory, Philadelphia, Pa., presented his work on "Recent Research on Chemical Derivatives of Tallow" in Tokyo and in Osaka in May.

H. Kaunitz, Columbia University, New York, N.Y., gave a lecture on "Fat and Aging" in Tokyo in May.

H.J. Heinz, Henkel, Germany, lectured on "Detergent and the Environment" in Osaka and in Tokyo in June.

Continuing activity of JOCS Committees

The JOCS Biodegradation Subcommittee moved to study the total organic carbon testing method for estimating biodegradability of detergents biodegraded in the shake culture as an independent one from foam ht and cobaltothiocyanate analysis for nonionics and methylene-blue active substance analysis for anionics, both of which already were established.

The JOCS Gas Liquid Chromatography Committee and Carbonyl Value Subcommittee reported the final joint experiment results on tentative methods of flame ionization detector (FID) gas liquid chromatography for analyzing fatty acid composition and of carbonyl value of animal and vesitable fat and oil, respectively. These two standards were supplemented to Japanese Standard Testing Method for Fat and Oil.

JOCS holds fall meeting

The 12th Annual Fall Meeting of JOCS was held on the campus of Hiroshima University, Hiroshima, in October during a session of the 29th Annual Fall Meeting of the Chemical Society of Japan. Ca. 49 papers were presented here.

New Zealand . . . . . S.G. Brooker

Margarine manufacture in New Zealand

The manufacture of margarine in New Zealand has been strictly controlled since 1895, when an act was passed which prohibited the inclusion of any milk products, coloring, or any other substances except fats, oils, water, and salt.

"Margarine" was defined as any substance made in imitation of butter or capable of being used as a substitute for butter. This legislation, in practice, confined the use of margarine to cooking and manufacturing purposes, so that no table margarine had been produced in New Zealand for ca. 80 years.

However in October 1972, in response to some pressure from the medical profession, the government, with little warning, amended the Margarine Act to permit the manufacture of polyunsaturated margarine which could be flavored and colored. "Polyunsaturated" was defined as containing not more than 20% of saturated, and not less than 40% of, "cis-methylene interrupted polyunsaturated fatty acids." This change caught local margarine manufacturers rather unprepared, and it was not until June 1 of this year that limited quantities of locally produced polyunsaturated margarine were on the market. In the meantime the demand has been met partially by importation of this type of margarine from Australia.

Butter always has been cheap in New Zealand–currently $.33/lb ($N.Z. = $1.47 U.S.); and, because of this and lack of competition, consumption has been ca. 39 lb/head/annum. Despite a price tag of ca. $.55/lb for margarine, it has proved popular–sales reportedly having reached one-sixth those of butter.

The dairy industry has accepted this challenge in two ways, first by planning, with two large margarine manufacturers in Australia, to use their technical know-how to produce the new product in two different factories. Some of this is now on sale. The polyunsaturated margarine available now has the backing of a large section of the medical profession, but a good deal of its popularity probably is due to its easy spreadability at refrigerator temperatures. The dairy industry's second response to the threat of margarine has been to produce a soft butter by fractionating butterfat and converting the softer fraction back into butter. Although fractionation of beef fat has been carried out commercially for over a century, being included in Mège Mouriès' original patent in 1869, its application to butterfat has been fraught with a number of technical problems. It is too early yet to gauge public reaction to this soft butter, but the first production sold out quickly. However, it will be interesting to see how many people will be prepared to pay the $.07 premium over the price of ordinary butter.

Oil seed cultivation

The high consumption of butter mentioned above has been in line with the heavy bias toward animal fat in the New Zealand diet, but there are signs that this is changing. One is a considerable interest in the growing of oil seeds. Linseed has been grown and crushed in New Zealand for a number of years, but the new direction is in edible oils. At

present the only edible vegetable oil produced in New Zealand is coconut oil from copra imported from South Pacific islands.

Rapeseed has been produced for growing green feed for stock for many years, but its cost for oil production so far has been uneconomical. However, a good deal of research is being undertaken particularly on the low erucic varieties to increase yield/acre.

Other oil seeds of interest are sunflower (for polyunsaturated margarine) and soybeans, the latter both for oil and meal. Since under New Zealand conditions stock can be pasture fed all the year round, there has been, up until now, a limited need for stock foods. However this situation could be changing, particularly for feeding pigs and poultry; and this could create a substantial demand for soybean meal.

The variable climate in New Zealand makes the growing of any new crops somewhat hazardous, and the high price of suitable land for oilseed growing imposes an initial handicap on such an industry. Another factor is the present buoyant situation in the market for meat, wool, and other pastoral products which makes farmers loathe to change to growing field crops.

Spain . . . . . E. Vioque

D. Pedro Miro Plans elected president of international organization

D. Pedro Miro Plans was elected president of International Committee of Surface Active Agents (C.I.D.) at its May meeting. He is well known in the areas related to textiles, surface active agents, and detergents.

D. Pedro Miro Plans

The C.I.D.'s main purpose is to promote the normalization of the terminology, assay methods, and analysis of surface active agents and detergents at an international level. It is active in 17 countries, among them all of Western Europe, Russia, and Japan.

His election is, in addition to a just recognition of his merits, a new sign of the important international position held by Spanish applied chemistry directed to topics of industrial interest.

IX plenary meeting of the Instituto de la Grasa

The above meeting was held in May. The sessions were presided over by J.M. Piñar, president of the Technical Administrative Council of the Instituto de la Grasa; J.M. Martinez Moreno, director of the same Instituto, and various members of the Council.

L. Salvador presented a study on the "Mechanization of the Processes of Elaboration of Table Olives" at the first session.

The "Marqués de Acapulco" Medal was presented to D.M. Lora Tamayo, to whom the Instituto de la Grasa owes his proper foundation in 1947.

In the second session, A. Martinez presented a paper on the topic "The Spanish Olive Oil Quality, Types, Production, and Consumption." Other different problems, mainly on olive oil and table olives, were studied.

Fourth International Congress on Science and Technology of Foods

The Congress, under the direction of the International Union of Science and Technology of Foods, will be held in Madrid, September 22-27, 1974.

The Spanish National Institute of Science and Technology of Foods organizer of the Congress invites scientific and technological people of any country to attend.

There will be two sorts of sessions: those devoted to the presentation of papers and those devoted to round table meetings. The following topics will be included in the first type of session: chemistry and technology of foods, physical properties of foods, organoleptical projects of foods, microbiology of foods, food industry processes, food engineering, nutrition problems in science and technology of foods, production of manufactured foods with high nutritional value, and sanity and hygiene of foods.

For the round table discussions, the following subjects have been selected: present experience on the depuration of the waste products of the food industry, methodology for precision research need, recent progress on the uses of vegetable proteins (oil seed proteins and cereal protein, and proteins from leaves and other sources), plans and books for teaching science and technology of foods, criteria to evaluate the needs of the consumer as a base for planning the investigation and development phases in food technology, present state of the publications on science and technology of foods, and necessity of a cooperation between the Research Centers and International Organisms related to foods and the industrial development.

AOCS members participate in IUPAC Section Meeting

Norris Embree reports that AOCS member C. Paquot, Paris, France, was elected secretary of the Section on Oils and Fats of the International Union of Pure and Applied Chemistry.

The Section on Oils and Fats met with the other IUPAC sections and commissions at the organization's conference in Munich, Germany, in August.

AOCS members participating in the Section's work in Munich were: T. Asahara, Tokyo; Norris Embree, Kingsport, Tenn.; M. Naudet, Marseilles, France; H. Niewiadomski, Gdansk, Poland; Jan Pokorny, Prague, Czechoslovakia; C. Paquot, Paris, France; A. Rutkowski, Warsaw, Poland, and K.A. Williams, London, England.

The Section on Oils and Fats is drafting and testing analytical methods for fats to be used by the Codex Alimentarius, the international collection of food standards, as well as methods for other international scientific and industrial purposes. ■

Any further information can be obtained from: Secretaria del IV Congreso Internacional de Ciencia y Tecnologiá de Alimentos, Jaime Roig 11.-Valencia 10. Spain.

Turkey . . . . . E. Sever

New products in Turkey

The second half of 1973 brings a variety of new products to the Turkish market. "Rama," a soft margarine in PVC tubs, produced using sunflower and cottonseed oils, was launched in early October by Unilever-İs Ltd., Istanbul.

At almost the same time, Berrak Edible Oil Company

(Continued on page 533A)

New Books

J. F. Gerecht, Book Review Editor

Allyl Compounds and Their Polymers, Calvin E. Schildknecht (Wiley-Interscience, New York, N.Y. 1973, 736 p., $29.95).

Allyl Compounds and Their Polymers (including Polyolefins) offers a thorough description of many classes of allylic compounds that have either been homopolymerized or copolymerized. The author has done an effective job in culling the literature and has provided a complete review of the subject. Each chapter is replete with literature references.

The scope of the book can best be defined by giving the chapter titles: Introduction to Polymerizations of Vinyl and Allyl Compounds, Polymerizations of 1-Alkenes, Allylic Diolefins, Allyl Halides and Related Allylic Alcohols, Allyl Acids and Related, Allyl Aldehydes and Ketones, Monoallyl Esters, Allylic Isopropenyl Compounds, Diallyl Carbonates, Diallyl Phthalates, Other Polyfunctional Allyl Esters, Monoallyl Alkyl Ethers and Related, Polyfunctional Allyl Ethers, Allylic Acetals and Ketals, Allyl Aryl Ethers, Allyl Phenols and Related, Allyl Sulfur Compounds, Allyl Amines and Their Salts, Allyl Amides, Allyl Urethanes, Other N-Allyl Compounds, C-Allyl Nitrogen Compounds, Triallyl Cyanurate and Related, Allyl Acrylic Monomers, Diallyl Maleate and Diallyl Fumarate, Other Allyl Vinyl Monomers, Allyl Phosphorus Compounds, Allyl Silicon Compounds, Allyl Boron Compounds, and Allyl Compounds with Metals. The book also contains an adequate index.

Of special interest to chemists working with long-chain fatty acids and related substances, the chapters dealing with allyl esters of long-chain fatty acids and of dibasic acids will be most useful, even though these represent only a small percentage of the total coverage in the book. However, the discussions of the polymerization and copolymerization of allyl ethers, N-allyl-substituted amides, and related compounds should furnish any ingenious chemist with numerous ideas for extending studies into the field of long-chain compounds. Furthermore, since the most frequently encountered unsaturated oils, fatty acids, esters, and alcohols are "allylic," information given in many chapters of this book should be of considerable interest and value to lipid chemists.

The book is relatively free of typographical errors, and it is extremely well organized. Everyone interested in polymer chemistry should have a copy of this book or see that their library purchases it.

DANIEL SWERN
Chemistry Department
Temple University
Philadelphia, Pennsylvania

Analysis of Triglycerides, Carter Litchfield (Academic Press, New York, N.Y., 1972, 355 p. $19.50)

This book is an excellent review of triglyceride analysis at a time when, as the author states, the field has reached

• Four Corners . . .

(continued from page 524A)
relaunched their liquid sunflower oil "Salat" in a new design using plastic bottles.

The other new products were "Elidor" and "Pril." The former is a shampoo launched by G. and A. Baker in three different colors and formulations. Amber colored "olive oil," yellow colored pearly opaque "egg," and greenish-yellow transparent "lemon" are the three brands. "Pril" is a dishwash liquid produced by Turyağ Company, İzmir. ■

• Report from Italy . . .

(Continued from page 531A)
and the Italian Oil Chemists' Society. Since 1954, 11 Congresses and some 15 meetings, even at international level, have been organized on the various scientific and technological aspects of fatty materials, oil meals, surfactants, etc. All papers have been published in *Italian Review of Fats.*

The SIOG has been collaborating for many years with some working groups of the OCDE (Paris) and the EEC (Brussels), with COI, CID, IUPAC, ISO, ISF, etc. In fact, the Experiment Station had the responsibility to organize the first ISF Congress in 1965. ■