further applications of this technique to the analysis of fats and oils. The writer was personally disappointed over the lack of papers on the determination of triglyceride configuration and on the correlation of the triglyceride composition of fats and oils with their physical properties and performance. It is only through better understanding of the fundamental nature of the materials with which we are dealing that we will be able to bring about the technological break-through that we are all seeking.

CHARLES W. HOERR,
Durkee Famous Foods, Chicago, Ill.

The R. J. Brown Company wishes to announce that the winner of the Polaroid camera given away at the Chicago Oil Chemists' Society meeting was Raymond Jones of Darling and Company, Chicago, Ill.

Spring Convention Plans

The Committee Chairmen for the 53rd Annual Meeting of the American Oil Chemists' Society, in New Orleans, have been designated by General Chairman Carroll L. Hoffpauir, as follows: James L. Ganucheau—Entertainment; Robert T. O'Connor—Technical Program; Henry L. E. Vix—Registration; W. Sidney Singleton—Hotel Reservations; Mrs. Robert T. O'Connor—Ladies' Entertainment; James P. Hughes—Publicity; Frank C. Magne—Golf; Ralph M. Persell—Treasurer; T. H. Hopper—Adviser.

Mr. Ganucheau is District Chemist for the Wesson Division, Hunt Foods and Industries. The other chairmen are staff members of the Southern Regional Research Laboratory.

As it has been so many times in the past, the meeting will be held in the Roosevelt Hotel, familiar to many of our members who have attended Spring meetings in New Orleans. The dates are May 7–9, 1962, when spring weather in the Crescent City should be at its best.

Technical Program Chairman O'Connor issues a cordial invitation to the membership to present papers at the technical sessions. Anyone who has a paper to present is urged to get in touch with him.

The first planning session of the committee was held November 9, 1961.

Short Course Announced for 1962

DEVELOPMENTS IN FAT CHEMISTRY has been announced as the subject for the 1962 Short Course by W. C. Ault, Program Chairman. Plans are already well advanced for the course. It will be held at Lehigh University, Bethlehem, Pa., July 9 to 11, 1962. Special emphasis will be given to the use of fats for the synthesis of a wide variety of derivatives having valuable characterisies for use in such varied fields as surface coatings, lubricants, and foods.

• *Fatty Acids*

September production of fatty acids, as classified under Categories No. 1–No. 13, totalled 51.9 million pounds, up 1.8 million pounds from August, and up 5.8 million pounds from September 1960. Production of saturated fatty acids was 20.3 million pounds, compared with 18.3 million pounds in August and 21.4 million pounds in September last year. Unsaturated fatty acid production, including the tall oil types, was 31.6 million pounds, versus 31.8 million pounds in August and 24.7 million pounds in September 1960.

Disposition of all fatty acids amounted to 52.5 million pounds, down 3.1 million pounds from August, but up 3.5 million pounds from September last year.

Finished goods inventories totalled 40.4 million pounds on September 30th, up 1.8 million pounds from the August 31st figure. Work-in-process stocks amounted to 18.6 million pounds, compared with 17.1 million pounds at the end of last month.

• *Local Section News*

North Central Section

Officers and members of the North Central Section of the A.O.C.S. met Wednesday evening, October 25 at the Builders' Club, Chicago, for their first dinner of the 1961–62 season. Decatur Campbell, Jr., of Eastman Chemical Products, Inc., president of the group, opened the meeting with a welcoming address.

J. C. Lamping, Jr., of Hoffman-LaRoche Inc., program chairman, introduced the guest speaker of the evening, Horace P. Andrews, Head of Statistics Division of Research Laboratories, Swift & Company.

Dr. Andrews gave a talk on "Evolutionary Operation (EVOP)." This is a method for improving industrial processes without interfering with the quality and output of product or process. His concise presentation, with helpful blackboard demonstrations, met with enthusiastic response.

Liaison Committee Breakfast

A breakfast meeting of the Local Sections Liaison Committee was held at 8:00 a.m. October 31, in the Coffee House of the Pick-Congress Hotel. Present were: F. D. White and E. Marshak, representing the Northeast Section; Leo Goldblatt, representing the Northern California Section; Lester O. Leenerts, representing the Southern California Section; and W. O. Lundberg, Secretary of the American Oil Chemists' Society. Decatur B. Campbell, Jr., who was to have represented the North Central Section, could not attend.

Much of the initial discussion was devoted to defining areas in which the Liaison Committee could benefit both the national organization and the local sections. It was agreed that local advertising committees could assist in obtaining advertising for the Journal if the national organization would provide leadership and planning in how this should be accomplished.

It was decided that the Liaison Committee could serve a useful function in making recommendations concerning programs to the national program committees. Mr. White suggested that, since the Liaison Committee consists of representatives of local sections who are conscious of fats and oils problems of particular interest to the local sections, the Liaison Committee could recommend to national program committees subject matters which are of particular interest to a local section and would be of national interest also.

All of the representatives of local sections expressed strong interest in having the Society's president visit the local sections. It was agreed that the programs of all local section meetings should be published in the Journal, and that local sections should cooperate in providing the necessary information. Finally, it was recommended, and unanimously agreed upon, that the Liaison Committee should be expanded to include the vice president as well as the president of each local section.

• *New Members*

Active

Richard R. DeGregorio, chemist, technical service, Durkee Famous Foods, Chicago, Ill.

James P. Duffy, manager, technical service department, HumKo Products Company, Chemical Division, Memphis, Tenn.

Marion A. Guidry, assistant professor of biochemistry and pathology, Louisiana State University, New Orleans, La.

Gerald E. Miller, section leader, Quality Control, Spencer Kellogg, Division of Textron, Inc., Buffalo, N. Y.

Akio, Nomi, chemist, Los Angeles Soap Company, Los Angeles, Calif.

George R. Riser, chemist, Eastern Regional Research Laboratories, USDA, Philadelphia, Pa.

Dan C. Schmidt, research chemist, Crosby Chemicals, Inc., Picayune, Miss.

Wilma J. Schneider, chemist, Northern Regional Research Laboratories, USDA, Peoria, Ill.

Ronald Anthony Spunar, assistant research chemist (Fats & Oils), Wilson and Company, Chicago, Ill.

Albert J. Stattman, oil technician, Armstrong Paint and Varnish Works, Chicago, Ill.

Molly J. Talley, research chemist, Frito Company, Dallas, Tex.

Ralph A. Whitaker, research chemist, Crosby Chemicals, Inc., Picayune, Miss.

Individual Associate

Henry C. vonDohlen, technical sales service representative, Food Machinery and Chemical Corporation, Princeton, N. J.

Cottonseed Processors Should Aim at New Markets, Research Committee Told

The cottonseed industry must look beyond present economic considerations in evaluating new products and processes, Garlon A. Harper, Director of Research and Education for the National Cottonseed Products Association, said during a meeting of the Association's Processing Research Subcommittee. The Committee met at USDA's Southern Utilization Research and Development Division in New Orleans, and was the occasion for a joint conference of the Committee, the Southern Division, and Texas A&M scientists engaged in cottonseed research.

Mr. Harper made the comment during a discussion of the mixed solvent extraction process under development at the Southern Division. Laboratory development of the process, and the chemical and nutritive properties of the meals produced, were described by V. L. Frampton, who said that these meals have a very low gossypol content At the same time quality of the protein is better than average, because the meals are not subjected to high temperatures during processing. The new process employs a carefully proportioned mixture of acetone, hexane, and water for extraction of oil. Hexane is commonly used alone.

A. M. Altschul, of the Seed Protein Pioneering Research Laboratory at the Southern Division, commented that because of its superior quality, cottonseed meals produced by the mixed solvent process should be regarded by the industry as a new product, especially as a possible source of protein for human consumption. He said that present concepts of using cottonseed meal primarily as a feed for cattle should not be allowed to continue to dominate the thinking of the processing industry. He expressed the opinion that great possibilities for much more extensive use of cottonseed meal, not only for the feeding of swine and poultry, but also humans, are opened up through the mixed solvent process.

Dr. Frampton also discussed the measurement of the nutritive value of cottonseed meal through determination of epsilon free-amino acid groups in the protein, explaining that this method, also developed at the Southern Division, is a much more accurate measurement of nutritive quality than either free or total gossypol. He summed up requirements for high-quality cottonseed as: (1) low gossypol content; (2) high protein content; and (3) low oil or lipid content.

E. A. Gastrock, of the Engineering and Development Laboratory, discussed pilot-plant experiments now in progress on mixed solvent extraction. Philip D. Aines, of Procter and Gamble, recommended that wherever possible, laboratory processes should be adapted to equipment already in the mills, so as to avoid heavy capital investment in the commercial application.

A. Cecil Wamble, of the Cottonseed Products Research Laboratory, College Station, Texas, reporting on work being done there for the improvement of cottonseed protein products, said that their octyl amine process shows considerable promise. Nutritionists who have worked with protein products produced by this method, which actually removes most of the gossypol without binding it to the

protein, report excellent results in feeding tests, he said. One of the big problems in connection with this process is satisfactory refining of the oil, which contains most of the gossypol originally in the seed.

Mr. Wamble emphasized that in manufacturing cottonseed products for human consumption, only select quality cottonseed should be used. The seed must be clean according to sanitary standards, and handled, processed and stored under sanitary conditions. The products must be uniform in color, taste, water absorbency, and many other properties, and they must be competitive with similar products in price as well as in performance.

A paper by W. B. Harris, of the same laboratory, was presented by Mr. Wamble, describing cottonseed oil refining studies conducted there. Of the components and processes screened, few showed encouraging results.

Walter A. Pons, of Oilseed Crops, and Paul H. Eaves, Engineering and Development, reported on progress with the new alumina bleaching process for cottonseed oil. Mr. Pons said that the alumina used in the process can be reactivated, and that its useful life is apparently limited only by mechanical losses. The process has given excellent results in bleaching off-colored cottonseed oils, and while the volume of oil is a little less than that from earth bleaches, the yield of neutral oil is higher. The fact that residual oil can be stripped from the alumina improves the economic prospects for the process. Mr. Eaves, reporting on pilot-plant studies, outlined experiments now in progress, and said he would have considerably more information a little later, when the work is completed.

Progress in the development of cocoa butter-like fats using cottonseed oil as one of the major constituents was discussed by R. O. Feuge, of Oilseed Crops. He said the object is not to make a substitute for cocoa butter, but to make a fat which can be used for similar uses, which is important because there is a chronic shortage of cocoa butter. At least one of the compositions tried has approximately the same melting point, and good mouthing quality and little bloom. It does have the disadvantages of not being quite so glossy as the better grades of cocoa butter, not so much snap, and some trouble has been encountered in demolding, but it is hoped these difficulties can be corrected.

J. J. Spadaro, Engineering and Development Laboratory, described progress in pilot plant trials for the preparation of this new type confectionery fat.

Other papers on the program included a final report by Stanley P. Clark, of the Cottonseed Products Laboratory, College Station, on evaluation of the ARS Cottonseed Cleaning-Belt Unit, and an outline by T. H. Hopper, Oilseed Crops Laboratory of the Southern Division, of studies planned on unexplained oil losses. H. L. E. Vix, Engineering and Development Laboratory, described research being initiated to improve the market position of cotton batting.

A.O.C.S. Offers Junior Memberships

For the third year, the American Oil Chemists' Society offers, without charge for one year, an Active Junior Membership to graduate students conducting research in lipids. This offer includes a year's subscription to the Society's Journal. The student or his professor can obtain application blanks for membership from any member, A. E. MacGee, Membership Chairman, 35 East Wacker Drive, Chicago 1, Illinois, or John C. Cowan, Chairman of Education Committee. A letter from the professor with the application and an indication of the area of lipid research should be sent to Dr. MacGee, with a carbon copy to Dr. Cowan, Northern Regional Research Laboratory, Peoria, Illinois. The subscription will be started at once for the new Junior Members.

C. P. Long, Emeritus Member

Ex-president Long has requested a correction of the address erroneously listed in the 1960 Directory. This should be 1283 Michigan Ave., Cincinnati 8, Ohio.

• *35 Years Ago*

The December 1926 issue of the Journal of Oil & Fat Industries carried an editorial headed "Another Milestone Reached," as follows: "This issue of the Journel appears in a garb different from any of its predecessors. The reader delves through the Journal to find a more friendly atmosphere, the pages beckoning him to read.

The change is more than superficial; a difference in the character of the reading matter is evident. Several of the original papers forsake the laboratory completely. The leading article describing a model cottonseed crushing plant has an almost universal appeal, and although more suggestive than complete in the scope of its treatment, is a discussion of the first importance. Mr. Thurman's review, What We Do With Our Vegetable Oils, draws an excellent picture of the many ramifications of this industry. William Scheck dropped in the office the other day from the Holy Land, and recounted how other nations are girding their loins with the most modern and efficient weapons of industry to compete with our own oil producers. This thought underlies the article he has written. Mr. Bosart's paper on the metric system is likewise quite universal in its appeal.

"In this transformation, the Journal is fulfilling its natural destiny. The founders of the publication produced the first number along strictly scientific lines nearly four years ago; but even at that very early date the hope was expressed that it one day would serve a wider sphere of usefulness. For two years almost insuperable obstacles prevented its appearance with greater frequence than as a quarterly. Then occurred the second important period in the publication's life history: since the beginning of the current year, an issue has been published every month.

"Although the events we have just chronicled have covered a period of only three brief years, they offer a striking and significant parallel to the great industry the publication serves. Like so many other industries, the origin of the production and the utilization of vegetable and animal oils was in the laboratory. These products were not and could not be utilized by industry until the chemist solved the basic problems involved. Indeed, in this respect the work of the chemist has just begun; for who can venture to predict the almost limitless uses to which these products will be put in years to come."

• *Names in the News*

C. A. C. de Boinville (Great Britain) has been nominated President of the International Association of Seed Crushers, to succeed the late Guy Chipperfield.

George J. Hutzler (1955) has been appointed Director at Spencer Kellogg Research Center, Division of Textron, Inc. Mr. Hutzler has been with Spencer Kellogg since 1955, and formerly was Manager of Engineering Research.

Paul D. Garvey (1953) has been promoted to Manager of Solvent Sales by the Esso Standard Region, Humble Oil & Refining Company. Mr. Garvey has been with Esso since 1946, and had previously been Assistant Manager.

Truman P. Kohman, professor and researcher in the Chemistry Department at Carnegie Institute of Technology, will be presented with the Nuclear Applications in Chemistry Award of $1,000 next spring at the 141st National Meeting of the American Chemical Society in Washington, D. C., for outstanding contributions in nuclear chemistry.

William R. Willets of the Titanium Pigment Corporation, New York, was presented with the Bingham Medal of the Society of Rheology at the 32nd annual meeting of the Society on October 31st.

• *New Books*

ORGANIC ANALYSIS, VOL. IV., edited by John Mitchell Jr., I. M. Kolthoff, E. S. Proskauer, and A. Weissberger (Interscience Publishers Inc., New York, 429 pp., 1960, $13.50). It is the aim of this series to describe techniques and discuss topics which are concerned with the analysis of organic substances. Volume IV should be exceptionally interesting to those workers involved in the analysis of fats and oils, and especially to those interested in techniques of structure determination.

The book is comprised of six chapters and a subject index and its presentation is well supplemented with references. Chapter I is an excellent review and description for the determination of organic peroxides, with 182 references. Comparisons and recommendations for the use of various methods of analyses are given.

Chapter II describes several enzyme catalyzed reactions. It contains a list of well authenticated enzymes and reactions. This chapter should be of interest for the elucidation of molecular structure as well as analysis because of the inherent specificity of enzyme catalyzed reactions. It contains 100 references.

Chapter III, Gas Chromatography, is a general description of history, principles, theory, apparatus, interpretation, techniques, and instrumentation. Only a few short pages are devoted to application and of this very little is given to lipids. However, the abundant references cited (336) fill the gaps and serve as an excellent introduction to the literature.

Chapter IV describes the history, instrumentation, and application of nuclear magnetic resonance spectroscopy to organic analysis as a relatively new member of the spectroscopy team, and is supported by 78 references.

Chapters V and VI are concerned with the analysis of crystalline substances by microscopy, X-ray diffraction, and differential thermal analysis techniques. While the examples cited did not pertain to fats, the techniques are certainly applicable. These chapters are supplemented by 30 references.

Volume IV should serve as an excellent stimulus for the application of newer analytical methods to the lipid fields.

A. E. THOMAS III, Durkee Famous Foods, Chicago, Ill.

HANDBOOK OF TEXTILE TESTING AND QUALITY CONTROL, by Elliot B. Grover and D. S. Hamby, (Textile Book Publishers Inc., New York, 614 pp., 1960, $17.50). In the preface of this book the authors state that they have confined their efforts to cotton and synthetic fibers. In view of this it would have been preferable to choose a less general and more accurate title for their book, since it does not deal with the general field of textile testing, and covers only the application of certain aspects of physical testing to cotton and synthetic fibers.

The book has 33 chapters, five appendices, and an index. Chapter 1 is introductory, and deals generally with the subject of textile testing and the various physical tests carried out in textile testing laboratories. The next five chapters deal initially with the presentation of data and then take up the application of statistical methods to such data, especially in the matter of statistical quality control charts. The four following chapters cover the use of these charts in analysis by defects, sample size, differences between averages, and correlation. These first nine chapters are well written and provide a logical and useful guide for the textile student interested in applying the methods of statistics to product improvement.

Chapters 11 to 16 cover fully and well the testing of cotton fiber and includes the measurement of cotton staple length and grade, cotton fiber length analysis, fiber strength, fiber fineness and maturity, non-lint content and nep potential, and other fiber tests and methods. Chapter 17 deals with the various fiber tests carried out on synthetic staple fiber. Here in discussing the extracting and drying of specimens, it is unfortunate that no mention is made of the possible hazard involved in removing flammable solvents such as xylene, ether, and alcohol by drying in an oven which may contain exposed electrical heating elements.

Chapters 18 and 19 cover the applications of the principles of statistical control to the operations relating to opening and picking, and to quality control in the card room. A chapter on yarn numbering follows. The important property of yarn strength is covered in Chapters 21 to 23, which are followed by chapters on yarn grade and appearance, twist testing, and additional physical tests.

The manner of presentation of the methods covered in Chapters 11 to 26 covering test methods, is good.

In Chapter 27 the important subject of the implications of yarn evenness is discussed and methods of measuring evenness, and evaluating the data obtained are covered in Chapters 28 and 29.

The subject of yarn is completed in Chapter 30 which deals with the control of the winding, warping, and slashing operations.

The final three chapters of the book are devoted to the testing of woven fabric; Chapter 32 deals with the measurement of fabric strength: breaking, tear, and bursting. Unfortunately the authors give no indication of the fact that machines based on three different principles of applying tension to the test specimen are in use. These are of course the constant rates of traverse (employed on most pendulum machines), extension and loading, the latter being the principle of the inclined plane tester. Some reference to these principles would have served to broaden the scope of the treatment.

Possibly the most disappointing part of the book is the first part of the chapter on humidity and moisture. Here the use of such phrases as "the vapor pressure of the atmosphere" and of statements such as "absolute humidity is the actual density of water vapor in the atmosphere," in which the word "density" means "amount," are not in keeping with the more careful and meaningful language used in the rest of the book.

In general it can be said that, while being considerably narrower in its coverage than the title suggests, the book will serve a useful purpose. It is obviously written for North American use, dealing almost exclusively with North American practice. But because of the importance of the cotton industry to this continent, the book will be useful in mill laboratories and to those interested in the physical testing of cotton and synthetic yarns and fabrics and to the appraisal of the resulting data by statistical methods.

C. H. BAYLEY, Textile Chemistry Section, National Research Council of Canada, Ottawa, Ontario, Canada

SYMPOSIUM ON APPLIED RADIATION AND RADIOSCOPE TEST METHODS. ASTM Special Technical Publication No. 268 (American Society for Testing Materials, 1916 Race St., Philadelphia, Pa., 112 pp., 1960, $3.75). Eleven diversified testing methods utilizing radioisotopes are presented in detail along with critical evaluations of the new methods, and comparisons with alternative test procedures.

With the exception of two papers, one on determining uniformity of mixing, and the other on determining thickness and uniformity of vacuum-evaporated metal films, the methods are presented in the format of "proposed" ASTM methods, and emphasize experimental data and statistical analysis of actual test results, rather than theoretical discussions. Brief discussions of some of the papers are included.

The advantages of the radioscope techniques in the test procedures cited should be clear, even to readers with no background in radioisotope work. Readers doing test work in the areas specifically covered will want to give serious consideration to adoption of these methods. Others will find the techniques applicable to analogous testing problems.

The tests for detergency efficiency, film permeability, and mixing uniformity will be of interest to many readers of the JAOCS.

J. W. HARLAN, Swift & Company, Chicago, Ill.

INFRARED SPECTROSCOPY; ITS USE AS AN ANALYTICAL TOOL IN THE FIELD OF PAINTS AND COATINGS. (Chicago Society for Paint Technology, 159 N. Dearborn St., Chicago 1, Ill., 160 pp., $2.75). The accompanying manual was

written primarily to acquaint the protective coatings industry with the infrared spectrophotometer and the information which can be gained from its use. Although infrared has become a useful tool in the chemical and related industries, the protective coatings industry as a whole has been somewhat reluctant to make use of it. This reluctance is no doubt due to the popular misconception that infrared equipment is extremely expensive and requires the services of highly specialized personnel.

The authors believe that an infrared laboratory manual explaining the basic concepts of theory, sample preparation and qualitative and quantitative spectra analysis will help to clear up some of these misconceptions. Such a manual can also serve as the sole source of instruction for those interested in utilizing infrared spectroscopy.

Since this is a basic manual, it will be useful to persons not employed in the paint or plastics industry who are interested in infrared analysis. The student or industrial chemist will find in this manual all that is necessary to develop reasonable proficiency in this science. The references cited and the library of spectra will be useful, not only to the beginner, but also to those already engaged in spectrometric methods of analysis of plastics, paints and coatings.

The section entitled "Theory" presents a brief discussion of terms and the theoretical aspects of analysis by means of infrared radiation. Since the paper was meant to be a laboratory manual, no attempt was made to present a rigorous theoretical dissertation.

In the next section descriptions of the sample cells available are given together with a detailed explanation of sample preparation. Since most of the materials encountered in the paint and plastics industry are complicated mixtures, some attention has been given to the separation of these materials. However, all of the common methods of sample preparation have been covered, including solution, mulling and pressed medium (KBr) techniques.

Following this is a discussion of the care and cleaning of cells and windows. Simple grinding and polishing procedures are outlined.

The next two sections deal with qualitative and quantitative analysis. The qualitative portion gives an explanation, with two examples, of how to analyze a spectra by means of group frequencies with the aid of a Colthup chart. Further group frequency data is given using the "bands" present and absent in the spectra of four alkyd resins. The advantages, limitations and precautions to be observed in analyzing the spectra of both organic and inorganic materials are pointed out. In the quantitative portion the absorption law and its relation to quantitative determinations is discussed. The conditions necessary for accurate analysis are pointed out and methods for obtaining quantitative analytical data are described in detail.

The bibliography consists of 259 references pertaining to both the theoretical and practical applications of infrared spectroscopy.

The remainder of the paper consists of the largest single library of spectra related to this field available in a technical manual today.

AN INTRODUCTION TO FLUID DYNAMICS, by F. J. Bayley, (Interscience Publishers, New York, 215 pp., 1958, $4.85). The subject of fluid dynamics was, until recently, largely restricted to hydraulic undertakings of the civil or mechanical engineer. The field has now widened to include the endeavors of the chemical engineer where the dynamics of liquid and gas movement and diffusion are dominant factors in accurate analysis of reaction rates, uniformity of chemical treatment, process control, quality of product, process washing, and other unit operations involving mass transfer.

This introductory textbook was first published in Great Britain in 1958 to supplement undergraduate work in the mechanism of fluid flow as offered in the various branches of engineering curricula. The text is divided into ten chapters, as follows: Important Fluid Properties and Parameters, Fluids at Rest, Momentum Changes in Moving Fluids, Dimensional Analysis, Viscosity Effects in a Moving Fluid, which includes discussions of laminar and turbulent flow in parallel boundaries, circular and noncircular passages and ducts, and the effect of surface roughness, Losses in Pipes, Flow in Open Channels, Flow Over Immersed Bodies, and Fluid Machinery. Each chapter, except the first, is followed by a series of examples which demonstrate the application of the theories involved, and to which answers may be found in the back of the book.

The book is almost devoid of references; the two or three which may be found refer to tables of data rather than to other sources of fluid flow theory. The subject matter is readily understandable, yet concise, and is written in a manner which should permit easy translation of the fundamental theory to more complex problems. The nongloss paper which has been used provides for extra comfort and speed of reading.

The text presents a collection of elementary information on fluid dynamics as derived from related course studies in various engineering fields. There is very little new material. The reviewer feels that the book would be a desirable adjunct and quick reference for many courses touching on fluid dynamics, as was apparently intended by the author. It would also be a valuable reference for those who have an occasional need for basic information on fluid dynamics.

E. A. GASTROCK, Southern Utilization Research and Development Division, New Orleans, La.

ADVANCES IN ENZYMOLOGY, Vol. 23, 1961, annually edited by F. F. Nord (Interscience Publishers, Inc., New York, 557 pp., 1961, $15.50). A distinguished international group of authors has produced nine reviews for the latest volume in this series. Subjects covered include: Possible Polypeptide Configurations of Proteins from the Viewpoint of Internal Rotation Potential; Denaturation and Inactivation of Enzyme Proteins; Periodic Enzymic Reactions and Their Possible Applications; Pancreatic Lipase; Collagenases and Elastases; Cytochromes of Group A and Their Prosthetic Groups; Mechanisms of Synthesis of Adenosine Triphosphate; Metabolism of 2-Carbon Compounds by Microorganisms; and Discovery and Chemistry of Mevalonic Acid.

After a twelve year drought the last three volumes of this series have furnished one or two reviews per year of specific interest to the lipid chemist. The short (12 pp.) review on mevalonis acid is somewhat anticlimactic after the lengthy (50 pp.) review on cholesterol biosynthesis in the preceding volume of this series, and the innumerable other related reviews which have appeared elsewhere in the last two years.

The article on pancreactic lipase by P. Desnuelle (29 pp.) will probably be of most interest to the lipid chemist. Evaluation of the material presented is impossible since not less than 14% of the documentary citations are to "unpublished experiments," papers "in press," or abstracts. In principle a similar review by the same author is to be found in "Biochemistry of Lipids" edited by G. Popjak (Pergamon Press, London, 1960) but in practice this is actually a one paragraph abstract. The most recent detailed presentation on the subject of lipases, including pancreatic lipase, is probably that by Morris Kates in "Lipide Metabolism" edited by K. Bloch (John Wiley and Sons, Inc., New York 1960).

The other articles appeared, so far as this reviewer was competent to judge, of high quality and were well written. Indeed, that on "Periodic Enzymic Reactions and Their Possible Applications" might best be described as fascinating. While technical accuracy is high, proofreading appears to have been overlooked.

As is the case with the host of Advances in —, Progress in —, and Annual Reviews of —, a valuable effort is made to present the reader with capsule comments on a variety of subjects within a specific area which he cannot spare the necessary time to review constantly in the face of torrential publication of scientific papers in the world's technical journals. At this price ($15.50) the book cannot be recommended for the average personal library but should certainly be a part of any university or large library interested in biological research.

LLOYD A. WITTING, L. B. Mendel Research Laboratory, Elgin State Hospital, Elgin, Ill.

CHEMICAL PROCESSING NOMOGRAMS, by Dale S. Davis, Editor, (Chemical Publishing Company, 256 pp., 1960, $12.00). From nomograms which have appeared monthly in Chemical Processing, Editor Davis has selected the best one hundred and sixty-six for use in Chemical Processing Nomograms. These nomograms are drawn from the works of 52 authors who have exercised considerable care to achieve convenient, accurate charts that would work. The nomograms have been grouped according to subject into fifteen units as follows: How to make nomograms, heat, flow of fluids, pulp mill calculations, vapor pressures, pressure-volume-temperature relationships, solubilities, densities and specific gravities, viscosities, relative humidity, costs, sizing equipment, conversions, standard deviations and quadratic equations, and miscellaneous. Each chart is accompanied by a statement of what information the nomogram is designed to furnish. A typical example is furnished to illustrate how each of the nomograms is to be used.

As an introduction the author describes nomographs, alignment charts, and line coordinate charts as consisting in their simplest form of three scales so located that they may be cut by a straight line to give values which satisfy an equation or agree with data in a set of tables. Unit 1. "How to Make Nomograms" provides typical illustrations and working directions so that a reader can prepare elementary nomograms to fill his own needs. Nomograms are especially useful in making special calculations, particularly those industrial calculations which are repetitive for control and operating purpose. They are particularly popular because they save time, are simple, accurate, and leave no doubt about where to put decimal points.

The table of contents, in addition to giving the chapter titles, also lists subtitles of the various subjects which are covered. The book is adequately indexed by subject material as well as cross-indexed by authors whose work is presented in the text. The subject material is grouped into logical and related units.

Chemists, engineers, or plant operating personnel whose work requires repetitive calculations for some purpose, should find this volume a useful reference or helpful guide to making nomographs best suited to their individual needs.

W. J. GOODRUM, Spencer Kellogg and Sons, Inc., Buffalo, N. Y.

WERKSTOFFE IN DER CHEMISCHEN TECHNIK (Structural Materials in Chemical Technology) is the title of Volume 39 of the series of Dechema Monographs which has just been published by the Verlag Chemie GmbH., Weinheim/Bergstrabe (286 pages, size DIN A 5, with 140 illustrations and 19 tables; price to members of the DECHEMA DM 19.80 and to non-members DM 24.80).

The present volume contains the text of 16 lectures which were presented at the Dechema Annual Meeting 1960. In some cases the original texts have been considerably extended. Each of the lectures is based on a different theme in the highly complex field of structural material techniques in chemical works and laboratories and particular value is attached to discussing applications in the most important problems. The subjects covered include the prevention of metallic corrosion by the most varies types of surface coatings and by inhibitors, the prevention of boiler scale, the use of noble metals in the construction of plant, the properties of cladded materials, the use of acid and heat resisting substances as well as of plastics materials in chemical technology and in the control of quality of chemical plant. A discussion on structural materials for the building of rockets is of general interest.

Summaries of the individual lectures in English and French are included in order to make this volume more readily accessible to the European technical world. A subject index completes the volume.

PYRIDINE AND ITS DERIVATIVES (Part II of four parts, Arnold Weissberger as consulting editor), edited by Erwin Klingsberg (Interscience Publishers Inc., New York, 1961, 576 pp., 1961, $37.50; $32.50 by subscription). This is the latest publication in the extremely important series on the Chemistry of Heterocyclic Compounds.

In Part I of the four part publication, reviewed in JAOCS, *37*, 30, two main topics were covered: the general physical and chemical properties of pyridine; and a survey of various sources of the pyridine ring, both natural and synthetic. Here part II deals with the preparation, properties, and reactions of certain pyridine compounds as shown by the chapter titles:

3. Quarternary Pyridinium Compounds, by Elliott N. Shaw.
4. Pyridine N-Oxides, by Elliott N. Shaw.
5. Alkylpyridines and Arylpyridines, by Leon E. Tenenbaum.
6. Halopyridines, by Holly E. Mertel.
7. Organometallic Compounds of Pyridine, by Harry L. Yale.
8. Nitropyridines and Their Reduction Products, by Renat H. Mizzoni.

The material on pyridinium compounds and pyridine N-oxides emphasizes the difference between pyridine and benzene chemistry, while the remaining subjects are more closely analogous to aromatic hydrocarbons.

Much of the new chemistry of pyridine deals with pyridine N-oxides and their derivatives. The altered resonance system in these compounds causes profound changes in the chemical behavior of the ring and its substituents. Since the oxygen atom can be removed, it is a useful temporary modification of the molecule for the sake of guiding substitution or displacement reactions.

The chapter on alkyl- and arylpyridines notes that many alkylpyridines can be obtained by thermal degradation of alkaloids, a reaction of little value in synthesis but very useful in the elucidation of structure.

As in Part I, the preparation, properties, and reactions of many compounds are tabulated. This makes it possible to cover a large amount of literature in a comparatively small space. More than 2400 literature references are cited.

Material of direct interest to oil chemists is limited, but all organic chemists should have access to this volume. With the completion of Parts III and IV, this will undoubtedly become the standard work in the literature of pyridine chemistry.

The high quality of the topography and format of Part I is continued. Structural formulas and equations are clear and easily read. Nomenclature follows Chemical Abstracts.

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Part I is reviewed in J. Am. Oil Chemists' Soc., *37*, 30 (1960).

ADVANCES IN X-RAY ANALYSIS—Volume 4, Edited by William M. Mueller, (Plenum Press, New York, 568 pp., 1961, $8.50). This is the fourth volume of a series, and reports the proceedings of the Ninth Annual Conference on Application of X-ray Analysis which was held in Denver, Colorado, August 1960. Thirty-eight of the 41 papers presented are given in this volume. Volumes 1, 2, and 3 reported similar conferences in 1957, 1958, and 1959, respectively. The book (9 by 6 in.) is well bound and has good press work and an adequate index. Also, it contains many illustrations.

In 1951 Professor Fankuchen was on the summer faculty at the University of Denver and his presence led to the one day symposium on X-rays out of which has grown the annual conference on application of X-ray analysis. The scope of the conferences is widening and it should soon include all ways of applying X-rays to yield information, and all the equipment this requires. This volume not only contains papers dealing with the determination of elements by methods based on X-ray absorption and emission, but also includes papers on optical transforms and crystal-structure analysis, use of computer techniques to plot pole figures, the Debye temperature of carbonyl iron, electrocrystallography of cobalt and cobalt nickel alloys, and the fundamentals of quantitative electron probe microanalysis, to mention just a few.

The title of the book, as does the conference, emphasizes X-ray analysis. One would think "Application of X-rays" would be more appropriate as this material ought to attract many with little or no interest in analytical chemistry.

The publishing of compiled conference papers often needs to be justified. Application of X-rays are growing

in scope and in importance and there definitely are advances to report. Collecting these diverse applications into single volumes will benefit readers who are acquainted with X-rays but are not working in the field. In a period of rapid development there is often need to publish more experimental detail than the average journal can afford. This publication seems to be worthwhile.

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DIAZO AND AZO CHEMISTRY (Aliphatic and Aromatic Compounds), by Heinrich Zollinger, translated by Harry E. Nursten, (Interscience Publishers, Inc., New York, 444 pp., 1961, $16.50). This work represents an extensive revision of, and incorporation of several new chapters into, the 1958 publication of Zollinger's "Die Chemie der Azofarbstoffe" by the Birkhäuser Verlag. (Attention is invited to the very capable review of this earlier work by Straley in *J. Am. Chem. Soc., 81,* 3807 (1959)).

In the English translation of Diazo and Azo Chemistry there has been a shift in emphasis to the properties and reactions of azo and diazo compounds in general rather than to those restricted in interest to the dyestuff industry. Aliphatic and quasi-aromatic systems, and such reactions as the Sandmeyer, Meerwein, and Pschorr synthesis (not covered in the earlier work) are all detailed in this volume. On the other hand, topics concerning dyeing technology (such as the first chapter on concepts) in the 1958 book have been largely omitted. There is strong emphasis on mechanisms and kinetics with excellent presentation and development.

Chapters 1–4 (preparation of diazo compounds, diazotization mechanisms, diazo equilibria, and isomerism in diazo derivatives) are up-to-date revisions of the corresponding chapters in the earlier work, the most noteworthy addition being the chemistry of diazoalkanes. Chapters 5 and 6 are new additions on syntheses with, and reaction mechanisms of aliphatic diazo compounds. Chapter 7 (reactions of aromatic diazo compounds) has been considerably expanded from the original; new additions include aromatic diazo compounds as electrophilic reagents and the very important catalytic and reduction-oxidation reactions. Chapters 8 (diazoamino compounds); 9 and 10 (preparation of azo compounds, and coupling reaction mechanisms, with such new topics as azoalkanes, quasi-aromatic systems, and oxidative coupling); and 11 (applications of coupling theories to azo technology) are up-to-date expansions of the earlier work. Chapter 12, a new addition, deals with homolytic fission, thermolysis, photolysis (with an interesting account of light fastness of dyestuffs), and general applications and chemistry of aliphatic and aromatic azo compounds. Chapter 13 is an enhanced treatment of light absorption, tautomerism, and acid-base equilibria of azo compounds; Chapter 14, the chemistry of metal complexes of azo dyes, remains largely unchanged.

Nursten's translation is excellent. Fifty references randomly chosen were checked and no errors were found. Binding, paper, and printing are of excellent quality.

A fault noted in the above cited review has been carried over into "Diazo and Azo Chemistry", i.e., indexing is incomplete. As examples, coupling reactions in non-aqueous media (pp. 231–233) and addition of organometallics to azo bridges (p. 307) are not indexed. There is very little cross-referencing: triazenes are listed only as diazormino compounds, and many of the compounds in the book are not indexed at all. The author index has 18 entries for pp. 10–12 (which pages comprise the table of contents). The excellence of the book in all other respects is worthy of more thorough indexing.

In "Diazo and Azo Chemistry" Prof. Zollinger has presented a stimulating, up-to-date, and thorough account of this subject which is assuming importance in ever-wider fields of research. It should be a very useful sourcebook for any chemist engaged in such research and is suitable as a supplementary graduate-level text not only for this phase of organic nitrogen chemistry but also for course work in kinetics and reaction mechanisms.

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