

Highlights of the Second Annual Short Course

THE Second Annual Short Course opened Monday morning, August 15, 1949, with a warm welcome from R. B. Browne, dean of the University of Illinois Extension Division. The 171 enrolled "students" drawn from 24 states, the District of Columbia, and six foreign countries, were indoctrinated with several interesting and humorous remarks on the history of education by Dr. Browne. He stated that the university was especially pleased to extend its facilities to the A.O.C.S. members because of the many compliments which were received on the arrangements for the 1948 Course.

The first lecturer, A. B. Paul of the university, reviewed production trends of the past 25 years for edible fats and oils. Based on current trends, he anticipates a period of increased consumption, especially of vegetable oil products. The peak year, 1943, will probably be exceeded this year.

The chemistry and the composition of fats was reviewed by B. F. Daubert, who indicated that the infrared spectrometer has been discovered to be a useful tool in the study of geometrical isomerism. It has been found that the presence of *trans* isomers such as elaidic and brassidic acid in vegetable oils causes decreased absorption at 10.3 microns. Fractionation of triglycerides by solvent crystallization and analysis of the fractions provides the best method for the study of triglyceride composition.

Monday afternoon Dr. Burlison, head of the Agronomy Department, conducted a tour of the university's experimental farms. Considerable interest was shown in the plots where high oil content varieties of corn were growing and where soybeans, perilla, guar, sesame, castor, and sunflower varieties are being cultivated for selection and cross-breeding to obtain varietal improvement. Among the many amazing experiments being carried out was one where hail damage to soybeans is studied by throwing cracked ice at the growing plants, and another in the cattle barn where samples of digesting food are removed from a cow's stomach for a study of the organisms which promote digestion.

A series of movies were shown by A. R. Baldwin at the smoker held in the Urbana-Lincoln Hotel Monday evening. The General Electric Company furnished three pictures, entitled "Jet Propulsion," "Clear Water," a study of sanitary engineering, and "Adventures in Science and Engineering: Applications of the Photo Tube." "The Inside Story of Cake



Classroom in the Open

Baking," showing what happens when a cake is baked under the microscope, was presented by Swift and Company, and the Santa Fe Railroad's movie, "Wheels A'Rolling," told the history of railroading taken at Chicago's Railroad Fair. Refreshments were served following the movies.

A FULL schedule of lectures was given on Tuesday, starting at 8 in the morning and lasting until 9 p. m. Since most of the lectures will be published at an early date, they will be mentioned only briefly. R. P. Hutchins discussed the recovery of oil from oilseeds by mechanical means and devoted most of his talk to the technology of continuous screw presses. For locations remote from the large production centers, screw presses may be operated advantageously on soybeans because of freight differentials on beans and meal. Solvent extraction is not considered advisable if production is less than 50 tons of beans per day. Oilseeds which contain large quantities of oil are usually prepressed to remove most of the oil, and the press cake is then extracted with a solvent.

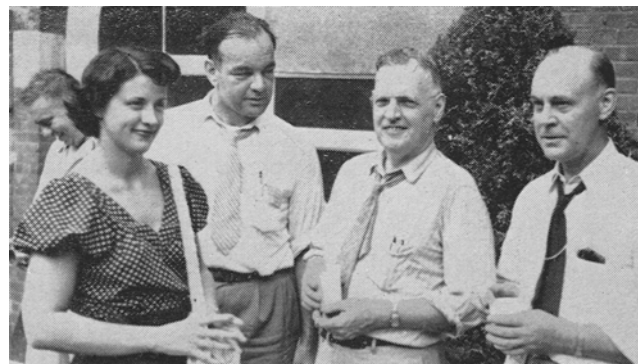
In his talk on the theory and mechanics of solvent extraction George Karnofsky discussed the factors which affect the amount of material which may be removed by this method and those which determine the rate of extraction. Consideration was given to such factors as the moisture content of the material, the degree of heat treatment which it has undergone, the type of solvent used for extraction, the form of the material, and the temperature of extraction. Types of solvent extraction equipment which are being used and the requirements considered essential for the successful operation of this equipment were reviewed.

F. C. Vibrans described several methods of recovering fats from animal tissues. The type of rendering which is practiced depends to some extent upon the ultimate use of the fat but, for producing edible products such as lard, the dry rendering method seems to be in favor. This is best accomplished under vacuum



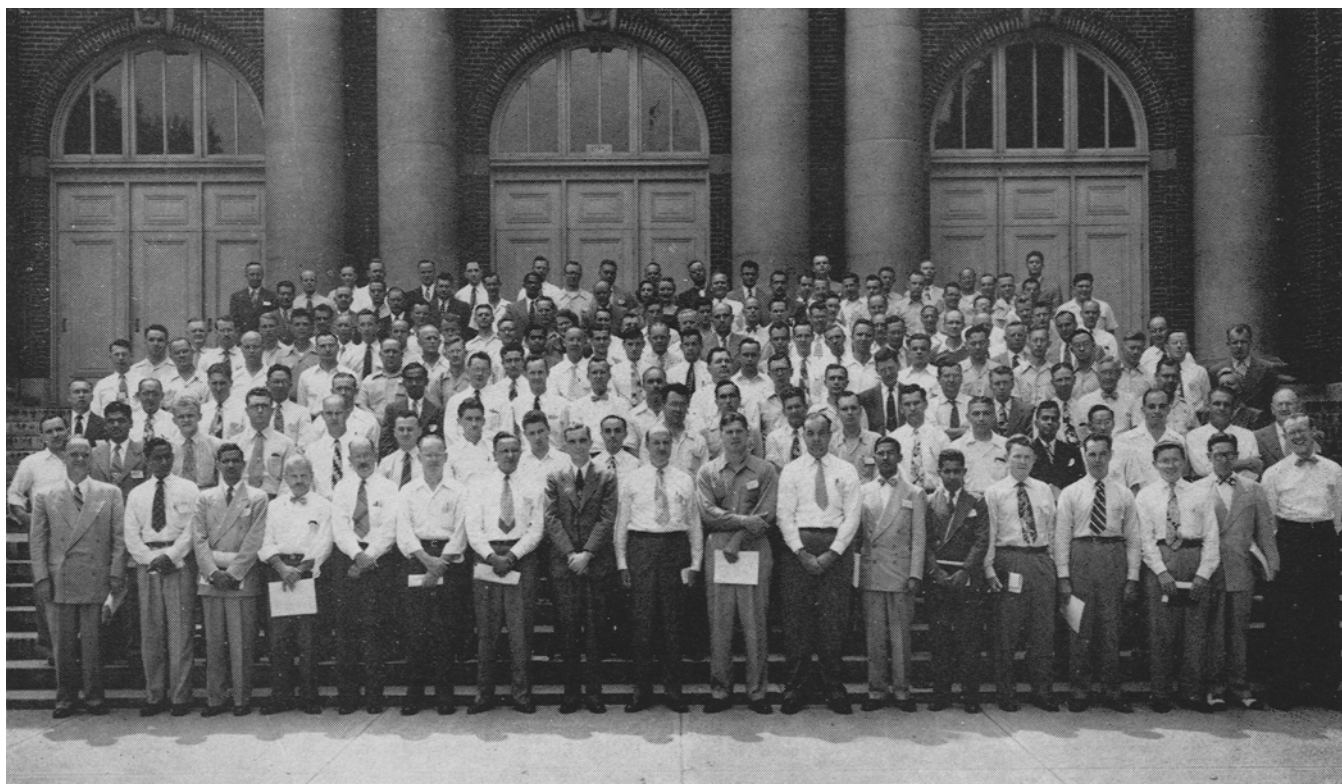
Speaking for the Corn

Discussing Crops



Exchange of Ideas

Students and Faculty at Short Course in Urbana



Left to Right

Row 1: C. W. Crowe, S. A. Hussain, S. S. Acharya, L. W. Murphy, J. D. Lindsay, H. E. Louk, J. S. Siefker, F. C. Linneweh, Walt Fluemfelt, Leo Saukko, Harry Whitmore, N. R. Bhow, H. S. Shahani, John Keane, Paul Garvey, Eduardo Alonso, Robert W. Bates, Robert G. Fulton.

Row 2: Allen B. Paul, S. R. Dadoo, J. L. Carlson, P. L. Twedt, E. M. Foster, J. R. Baxley, D. M. Whitley, H. O. Buchanan, M. H. Neustadt, H. V. Gilmore, E. M. Kurtz, Arvid Kuutti, Don Alexander, John Mogush, L. L. Shapin, N. A. Khan, I. W. Cheng, P. G. Poulet, George Clark, A. Greentree.

Row 3: Arthur Kiess, F. P. Parkin, J. P. Miller, Arnold M. Gavin, O. N. Breivik, Fred G. T. Menezes, D. A. DeLaHunt, R. F. Portmann, C. M. Widmer, H. L. Barnebey, R. E. Kistler, R. S. Wayman, R. A. Cass, F. A. Grambling, W. Doss Lumpkin, W. R. Schwandt, L. C. Brown, F. C. Vibrans, Harry A. Johnston, Mrs. Johnston.

Row 4: C. D. Evans, E. E. Krebsler, Thomas J. Potts, Jorge Frohmann, C. C. McInnes, W. B. Holvet, W. D. Cannan, Francis X. Kobe, Robert S. Stephens, Warren Wurster, Ralph Bentz, R. A. Behrmann, J. L. Trauth Jr., Richard Overbeck, Carl Georgian, Chen-Chong Shih, Arthur Waugaman, Myron Holmes, Paul Seaberg.

Row 5: J. E. Thompson, Earl Hoglund, George Neumunz, J. K. Hirtzinger, Roy Riemenschneider, C. D. Srinii Vasan, Donald Sincroft,

H. E. Seestrom, George A. Head, George H. Benck, Frank G. Shea, John Harrison, Paul Aldrich, E. H. Gautby, A. W. French Jr., William Kubie.

Row 6: R. K. Newton, Andre Blais, Emil F. Werly, Robert E. Beal, Paul D. Patrick, Edward E. White, Harriet Burns, Keith Nicholls, E. W. Eekey, A. E. Bailey, F. E. Middleton Jr., F. L. Avera, N. Larsen, T. Lawatsch.

Row 7: Esler I. D'Aquin, E. C. Howe, Bernard Gilmore, B. H. Jackson, L. F. Deibel, W. Q. Braun, C. C. Price, A. C. McArthur, G. G. Harkreader, G. H. Gribbins, J. M. Crockin, P. H. Eaves, H. G. Hoyer, T. S. Hamilton.

Row 8: V. K. Babayan, B. H. Rickert, R. F. Thompson, C. R. Lingiah, M. F. Hoyer, A. T. Gros, Sven Young, Robert J. Carbonell, Al Seehafer, Warren Williams, Keith Queal, H. D. Chirgwin Jr., R. C. Hussong, George Karnofsky, Frank Lerman.

Row 9: W. A. Lagamarsino, H. E. Welhener, R. A. Hodson, I. A. MacDonald, J. R. Loebe, T. I. Kennedy, L. D. Tyler, R. H. Gustafsson, H. Thompson.

Row 10: John S. Gates, Mitchell Sniogowski, Frank Cygan, Gordon Christensen, Allen Greenlaw, J. E. Teaford, H. H. Gross, W. H. Clendenin, M. E. Griem, W. R. Lewis, Martin Rubin, Oscar Johnson, M. C. Blume, Arthur Schwab, Phillip Bateman.

in a steam-jacketed kettle. The quality of the product could be improved if an instrument were available for continuously indicating the moisture content of the hot fat so that heating could be terminated at the proper time.

A symposium on refining methods was given by B. H. Thurman, discussing batch and continuous refining, and W. H. Goss, describing solvent refining and fractionation. Consideration of the type of oil, the method whereby it was produced, and its analytical constants governs practical methods of reagent refining and the amount and strength of reagent to use. The continuous centrifugal method is more versatile and places less reliance on the skill of the operator for successful operation. Solvent refining is not yet practiced on a large scale although it shows considerable promise of yielding edible oils equal or superior to those obtained by methods employing reagents.

Prof. T. S. Hamilton, who acted as coordinator of the course and introduced the speakers, presented a

lecture on the nutritive value of residues from oil and fat extractions on Tuesday evening, in which he extolled the value of soybean meal as a feeding supplement for farm animals. The amino acids which the body cannot synthesize, called the essential amino acids, are found in the best balance in this meal among all the vegetable proteins ordinarily available. The balanced ration requires however a blend of several animal and vegetable proteins residues, the relative amounts of which depend upon the type of animal for which the ration is intended. J. L. Krider of the university described the use of residues in the feeding of swine and said that he has found solvent processed meal to be as palatable and efficient for swine as either corn supplement or meal obtained from the continuous screw press. Of considerable interest was the fact that cottonseed meal should not exceed 10% of the diet of swine because it produces hard fat, while linseed meal, if used in excess of 5%, depresses growth.

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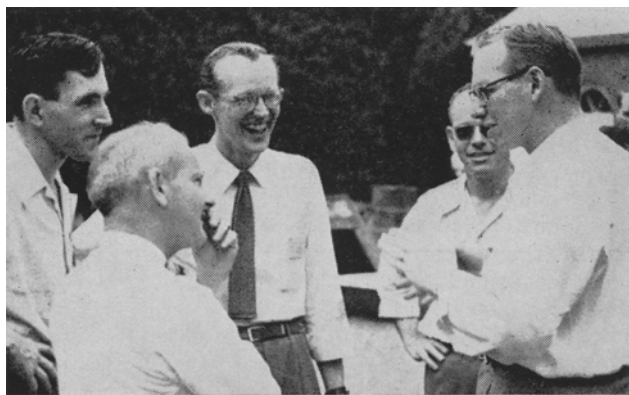
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Informal Chat in Spare Time

WEDNESDAY morning, A. E. Bailey discussed the theory and mechanics of hydrogenation, and R. W. Bates and C. E. Morris reviewed the fundamentals and mechanics of deodorization. After going into the theory of selectivity and the effects of catalyst concentration, type of catalyst, temperature and pressure of hydrogenation on the character of the hardened product, Mr. Bailey concluded by recommending that operation for selective results is best accomplished by varying only the temperature of operation while maintaining the best agitation and highest pressure practical. The same catalyst may be used for both margarine and shortening products.



Women on Campus Too

Mr. Bates described the analogies and differences between the theory of steam distillation as applied to the deodorization of oils and the practice of deodorization. Freshly deodorized oils of low free fatty acid content do not always possess a good flavor, and it is therefore impractical to consider the theoretical aspects from the viewpoint of fatty acid removal. Mr. Morris described the history of the development of deodorizers, including the several types in current use.

The color symposium on Wednesday afternoon, conducted by J. C. Cowan, began with a practical discussion of color removal by A. R. Baldwin and concluded with a theoretical discussion of color and its measurement by Duncan MacMillan. Dr. Baldwin described the compounds responsible for color in oils and the various methods by which they may be removed therefrom to render them colorless. Dr. MacMillan decried the use of the Lovibond color glasses since they indicate only hue and intensity of color, and not its purity, and, in many cases, seriously err in measuring intensity and hue.

"Graduation" ceremonies were held at the Urbana-Lincoln hotel Wednesday with Toastmaster "Dick" Baldwin presiding, and C. E. Morris talked on production planning in the oils and fats industry with consideration of the potentially declining foreign market for edible products, increased importation of crude oils, and the threat of the "polyoxyethylene bread softeners" to the shortening industry. But despite the existing uncertainties in the future demand situation, the speaker closed on a note of optimistic prophecy that the sales and technical staffs in industry will continue to make advances in creating improved products and greater consumer realization of the value of quality fats in the diet. Professor Hamilton handed out "diplomas" to the graduates at the close of the evening.

CLASSES came to a close Thursday morning after talks by H. T. Spannum on the stabilization of fats and oils, C. E. McMichael on the history and technology of plasticizing and packaging hardened oils, G. A. Crapple on shortening, and L. C. Brown on the production of margarines and salad dressings. Mr. Spannum described four types of flavor impairment as hydrolytic, ketonic, and autocatalytic rancidity, and reversion, discussing the factors which cause these chemical reactions in fats and methods of preventing them. Mr. Crapple's talk was well illustrated with cake, showing the effect of shortening properties upon the structure and quality of baked products. Mr. Brown gave many interesting technical facts regarding the manufacture of margarine in his talk.

The Robert Allerton estate, recently given to the University of Illinois, was the scene of a much-enjoyed fish fry Thursday afternoon. The estate includes 6,000 acres of land, three-quarters of which is under cultivation. The tour through the formal gardens and woodland paths preceding the fish fry was highly enjoyable until a sudden rainstorm sent everyone scurrying to the shelter of the greenhouse, where some of the "students" peeled off sodden shirts and dried them before an improvised fireplace. But despite the brief shower the picnic was a huge success, as attested by many hearty appetites.

Buses were boarded Friday morning for a trip to Peoria and a visit at the Northern Regional Research Laboratory. The "students" were organized into small groups and conducted on a three-hour tour of the laboratory facilities. With the return to Urbana the short course came to a successful and memorable conclusion. The great success of this second venture in education is a tribute to the many who planned and participated in the arrangements.

ROBERT E. BEAL.

Wanted: One Lost Bag

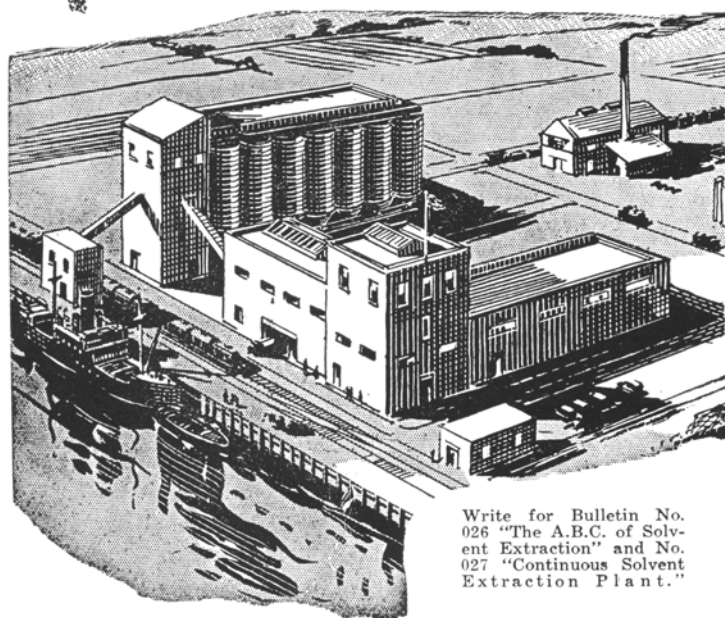
Addendum to Urbana short course: Edward P. White, R. R. 2, Covington, Va., thinks that his bag was taken by mistake from the chartered bus on the Urbana-Peoria field trip on August 19. There was no identification tag on the bag, according to Mr. White. He will appreciate its return.

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People and Products

Description of new tools for the analytical chemist is in the Waco Catalyst, Volume VIII, 1949, published by the WILKENS-ANDERSON COMPANY, 4525 W. Division street, Chicago 51, Ill. Among the 51 items listed are the Boekel Pipette Washer, Bechman pH Meters, and Coleman Photofluorometers.

CORNING GLASS WORKS, Corning, N. Y., has issued two bulletins: B-83, Properties of Selected Commercial Glasses, and B-84, Manufacture and Design of Commercial Glassware.

The summer edition, 1949, of Scientific Apparatus and Methods, including latest catalog revisions, published by E. H. SARGENT AND COMPANY, 155-165 E. Superior street, Chicago, Ill., is now available. An article entitled "Techniques for Cutting Glass Tubing" contains description and picture of the tubing cutter with carborundum wheel.

Glyco heating jackets are described in What's New for the Laboratory, No. 8, Summer, 1949, published by the SCIENTIFIC GLASS APPARATUS COMPANY INC., 49 Aekerman street, Bloomfield, N. J.

BJORKSTEN RESEARCH LABORATORIES, Chicago, Ill., have announced that John B. Eisen, formerly group leader with the chemical research laboratories of American Viscose Corporation at Marcus Hook, Pa., has joined its Madison, Wis., staff as section leader.

A new bulletin on Flotation is available without cost from the DENVER EQUIPMENT COMPANY, Dept. 115, 1400 17th street, Denver 17, Colo.

Several improved types of Titanium Dioxide are now being manufactured and standardized for distribution by the AMERICAN CYANAMID COMPANY, Calco Chemical division, Bound Brook, N. J.

Construction features of ALLIS-CHALMERS COMPANY'S type S, single stage, double suction centrifugal pump are described in a new 24-page bulletin. Copies are available from Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

W. E. Mahin, chairman of metals research at ARMOUR RESEARCH FOUNDATION of Illinois Institute of Technology, Chicago, Ill., has been named director of research.

I. I. T. will offer a graduate course in technology of the paint industry, beginning September 21, 1949 and running through January 18, 1950. The course, first of its kind in the Chicago area, will analyze the technology and properties of paint and related products, including a study of manufacturing and testing methods. It has been organized by Milton A. Glaser.

WALLACE & TIERNAN PRODUCTS INC., Belleville, N. J., announces a castor oil by-product material, Plastimer, which the company has available in considerable quantities. A residue from castor oil processing operations, it contains largely unsaturated fatty acids ranging in chain length from 14 to 24 approximately.

Societies and Meetings

Tentative programming of the events at this year's Pacific Chemical Exposition and Pacific Industrial Conferences, to be held in San Francisco's Civic Auditorium November 1-5, has been completed. Highlights of the 5-day industrial chemical gathering are: talks and panel discussions in 11 separate scientific groupings; more than 100 commercial exhibits; a group of special exhibits; and continuous industrial motion pictures.

The expansion of western chemical industry—processing of raw material imports now being sent to the East and South for that purpose—will be discussed at the Pacific Industrial Conferences, to run concurrently with the Pacific Chemical Exposition.



The American Association for the Advancement of Science, Washington, D. C., is holding its 116th meeting in the Penn Zone hotels of New York, December 26-31, 1949. All members of the American Oil Chemists' Society, especially those in the metropolitan area of New York and those who find it convenient to be in the city at that time, are cordially invited to attend the sessions, the Science Theatre, and the special events.

Alfred G. Susie, chief chemist at Marbon Corporation, Gary, Ind., for the past four and a half years, has been appointed supervisor of plastics research at ARMOUR RESEARCH FOUNDATION of Illinois Institute of Technology, Chicago.

New Equipment

Fisher Scientific Company, 717 Forbes street, Pittsburgh 19, Pa., has recently announced a new Dehumidifier and a new direct-reading instrument called the Gram-atic Balance for use in the laboratory. Elimination of high humidity is made possible through the Dehumidifier, which is capable of controlling moisture in a room of 8,000 cu. ft. volume.

The Gram-atic Balance weighs oils and pigments to $\frac{1}{20}$ of a milligram with analytical balance accuracy, but in $\frac{1}{3}$ the usual time. It has only one pan, and the weight reads directly on a scale at eye level, eliminating a usual source of error in adding up individual weights.

National Bureau of Standards

A supplement to the Handbook H28 (1944), Screw-Thread Standards for Federal Services, has just been issued by the National Bureau of Standards and is available from the U. S. Government Printing Office, Washington, D. C., at a cost of 25c.

A general account of the Bureau's broad program of research and development in applied optics and optical glass has just been published and is available at a cost of 15c. Remittances from foreign countries must be made in United States exchange and must include an additional sum of one-third the publication price to cover mailing costs.

To make sure that your Methods are up-to-date, order your 1947 and 1948 Revisions (\$1 each).

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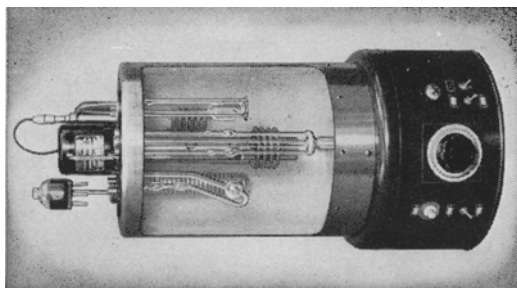
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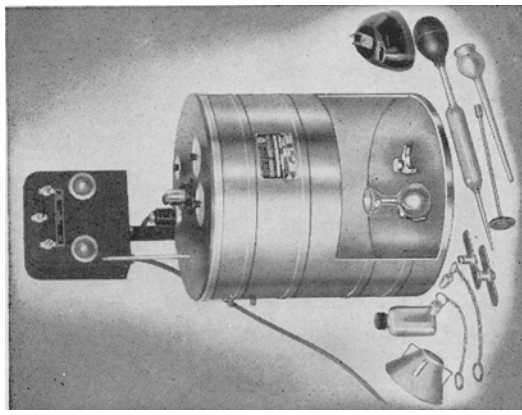
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The new Fisher Forced Draft "Isotemp" Oven put out by the Fisher Scientific Company, 717 Forbes street, Pittsburgh, Pa., for general laboratory use is said to perform drying operations in one-half to one-third the time required with a conventional gravity-type oven. It embodies design features, especially-selected construction materials, and operating advantages which produce uniform temperature throughout the 10 x 12 x 12 in. aluminum heating chamber with a minimum consumption of current.

The new oven has a motor-fan unit beneath the heating chamber and an ingenious arrangement of ducts and louvers, which conduct hot, dry air to the heating chamber where the air moves gently against and completely around the sample. Once the selected operating temperature (range 75 to 175°C.) is attained, the new oven will maintain that temperature within plus or minus 1 degree.

Extra heavy glass wool insulation, aluminum shelving and heavy cast housing afford stability, even heat distribution and efficient operation. Current consumption is 550 watts and oven draws current during only about one-fifth of the time after reaching pre-set temperature.

Safety features include a special latched door which will open should any pressure develop within heating chamber; also thermostat elements are sealed in a capsule, heating elements are embedded in a refractory material, and entire heating area is maintained at a relatively low temperature.

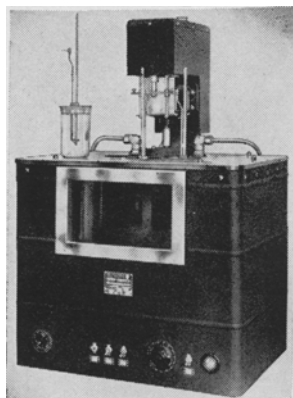
The "Isotemp" Forced Draft Oven provides 400 square inches of shelf area. Tests with it show that samples can be dried in about 90 minutes as compared with 200 minutes in a comparable gravity-type oven.

J. M. Lowe Dies

Word has just been received from an official of the Bisbee Linseed Company, Philadelphia, of the death of J. M. Lowe on August 22, 1948. Mr. Lowe had been a member of the American Oil Chemists' Society since 1945.

R. W. Planck has joined the fat and oil research group of the SOUTHERN REGIONAL RESEARCH LABORATORY, New Orleans, after transferring from the U. S. Natural Rubber Research Station, Salinas, Calif. Previously he had conducted chemical research for several industrial concerns and the Mellon Institute. He received his Ph.D. from Northwestern University.

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Titer Test Apparatus

Titer Test Apparatus

A TITER Test Apparatus has been developed by Precision Scientific Company, Chicago, with the co-operation of the control laboratory of Emery Industries inc., Cincinnati, for testing commercial fats and oils in accordance with A.O.C.S. Official Method Cc 12-41. The engineering aim was to design a mechanically foolproof instrument requiring an absolute minimum of the operator's attention.

The apparatus is applicable for determining the titer of commercial oleic acid (red oil), animal and vegetable fats and oils and marine oils titering from about -5°C . to 45°C . The A.O.C.S. Method Cc 12-41 specifies that the cooling bath be held at a temperature of $20^{\circ} \pm 1^{\circ}\text{C}$. for all samples having titers of 35°C . or higher and 15° to 20°C . below the titer point for all samples with titers below 35°C . Since animal greases and tallows usually titer between 35° and 45°C . and vegetable and marine oils titer below 35°C ., the wide utility of the Titer Test Apparatus is apparent.

Actually, however, it has been the practice to make the titer test on samples titering above 35°C . at room temperature. Experience has shown that this practice, while not strictly according to method, is accurate enough for most purposes. The Titer Test Apparatus finds its greatest application, therefore, in the vegetable and marine oil industries and, of course, in the soap and fatty acid industries where low titer products such as oleic acid are either used or produced.

English Leads

English is now the leading language of science, putting German and French in the background, according to a survey made by Fletcher S. Boig, professor of chemistry at Northeastern university, Boston, Mass.

Russian, says Boig, was of very slight importance 20 years ago as a scientific language but is now a serious contender for honors as the leading foreign language.

Among countries publishing scientific periodicals and articles the United States has a comfortable lead, with Britain, France, Russia, and Switzerland following in that order. Germany has lost ground, as have Italy and Russia.

Fifty-seven per cent of all scientific articles are now published in English. French, German, Russian, and Italian, in that order, account for the remainder.

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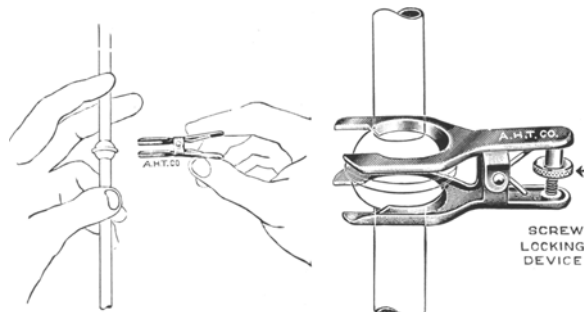


Fig. 1

Fig. 2

PINCH CLAMPS, A.H.T. Co. Specification (Patented). For use on spherical ball-and-socket glass joints. Of brass, with smooth, black, corrosion-resistant finish, and with strong, spring closed, forked jaws. With the two parts of the glass joint held in one hand, and the Clamp held between thumb and forefinger of the other hand, as shown in Fig. 1, the Clamp can be quickly slipped over the joint. When pressure is released, the two parts are held securely by the spring.

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Size 102, recently added to the series, has a flat hinge and spiral spring between the upper and lower jaws, which permit adjustment of the clamp over the joint with one hand. Two slotted posts, each fitted with hinged screw and knurled head nut, are provided at the mouth of the forked jaws to lock the clamp securely in position.

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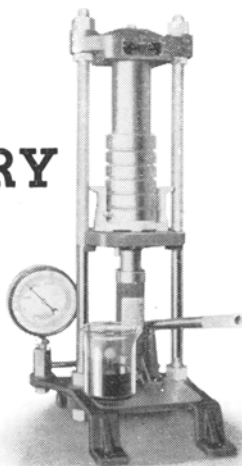
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As a result of this difficulty the National Bureau of Standards, Washington, D. C., obtained and tested 16 different laboratory-type Bunsen burners, eight of which were of the Meker type and eight, straight tube burners. The limits of operation of each of these burners, sold as suitable for natural gas, were determined. By a correlation of these data with the basic requirements for good burner design the reasons for the poor showing on natural gas and the changes required for satisfactory operation were found.

A survey of the various heating operations for which a laboratory burner is used indicated that the Meker-type burner should be capable of producing a hot, stable flame at gas rates up to 10,000 Btu per hour, and the straight tube burners should be usable at rates up to 5,000 Btu per hour. The average maximum usable rate for the Meker burners tested was only 6,363 Btu per hour while that for the straight tube burners was 2,781 Btu per hour.

A comparison of the dimensions of the 16 burners with the fundamental relations for good burner operation brought out three major reasons for their unsatisfactory performance on natural gas.

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