

port manager of John Powell, will serve as chief operating executive.

### **American Agricultural Buys Fertilizer Plant in Ohio**

American Agricultural Chemical Co. has announced purchase of the Hamm Co., Washington Court House, Ohio, which is to become the 29th fertilizer plant of AACC. The plant is to be renovated in time to produce fertilizer for the fall season. American Agricultural Chemical has 3 plants in Ohio, at Cincinnati, Cleveland, and Cairo.

### **IM&C Building New Offices near Carlsbad Potash Mine**

International Minerals & Chemical will build a \$250,000 office building at its potash mine near Carlsbad, N. M. The building will provide 12,000 sq. feet of floor space, sufficient office facilities for 75 people. Entirely air conditioned, the west wall of the building will be solid, to protect it from the hot afternoon desert sun, and the north wall will be largely glass to take advantage of the desert's strong north light.

## **RESEARCH**

### **Proteins Seen as Key to Improving Nutrition**

There is general agreement among scientists working in the fields of public health, human nutrition, and agriculture that improvement in the quality and quantity of protein foods presents one of the most acute and difficult problems that must be solved as a means of improving living standards for a large part of the world's population—especially in the underdeveloped and tropical and subtropical areas where population densities are already high. Death rates are kept high among infants and small children, as a direct and indirect result of protein malnutrition, and additional penalties are being imposed by stunted growth, greater susceptibility to infections, premature aging, disturbances in glandular functions and structures, and relatively low levels of health in many respects.

These problems were the subject of a conference of biochemists and physicians from many parts of the world, at Princeton, N. J., June 19 to 24, under the sponsorship of the Food and Agricultural Organization of the United Nations, the World Health Organization, and the Josiah Macy, Jr. Foundation. The United Nations Children's Fund was also represented.

Among constructive results from the conference were plans for voluntary integration of research efforts, better agreements on acceptable standards for

protein requirements, and acceptance of technical precautions that should be taken in the development or introduction of new or modified foods.

Increased production and consumption of animal protein foods represent desirable and practical goals, but these objectives are not going to be reached quickly or adequately, for a long time in areas where the need is greatest, according to C. G. King, Nutrition Foundation and Columbia University, who was chairman of the conference. Meanwhile, there are many practical measures that offer promise of parallel and effective development, in the direction of improving and using more widely, protein foods directly from plant sources. By judicious use of new information about the amino acid content of foods and the specific human requirements for each of these protein fragments, prospects are favorable for new and varied developments, with greater economic, cultural, and health advantages.

Plans have been made for publishing the proceedings of the conference by the Josiah Macy, Jr. Foundation. Proceedings from an earlier conference held in Jamaica were published by Cambridge University Press.

## **BUSINESS AND FINANCE**

### **Continental Can Sets New 6-Month Record**

Continental Can's net sales and earnings for the six months ended June 30, again established new records for the period. Sales were up to \$306,047,599 from \$285,536,539 in 1954, and earnings increasing to \$10,289,395 from \$9,131,932.

Earnings were equivalent to \$2.74 per share compared with \$2.48 earned per share in the 1954 period.

For the June quarter net earnings were \$7,090,011 on sales of \$171,555,064, compared with \$6,131,615 earned on \$157,555,782 for the quarter last year.

### **Monsanto Sales Up 22%**

Sales of Monsanto Chemical Co. and its consolidated companies for the first six months of 1955 amounted to \$207,514,258, an increase of 22% over the sales of \$169,714,534 for the first six months of last year.

Net income for the first half of 1955 amounted to \$16,409,680, as compared to net income of \$11,597,710 for the first half of 1954. After provision for preference dividends, this was equivalent to \$3.05 per share on the \$5.00 par value common stock, or \$1.02 per share on the new \$2.00 par value common stock after the three-for-one split approved by the stockholders on July 1, 1955. For the first six months of 1954,

the adjusted earnings on the \$5.00 par value common stock were \$2.15 per share.

### **Hercules Sales Up \$20 Million**

Hercules Powder reported for the six months ended June 30 net income equal, after payment of preferred dividends, to \$3.38 a share of common stock.

Net income in the first six months of 1954 was equal to \$2.58 a share of common stock.

For the second quarter of 1955, net income was equal after payment of preferred dividends to \$1.84 a share on common stock. This compares with net income in the second quarter of 1954 equal to \$1.37 a share.

Net sales and operating revenues for the six months' period were \$112,562,077 compared with \$92,149,029 for the corresponding 1954 period.

## **ASSOCIATIONS**

### **Research and Economics, Theme of NAC Meeting Next Month**

Effects of research and economics on the future of the pesticide industry is the theme of the 22nd annual meeting of the National Agricultural Chemicals Association. The meeting opens Sept. 7 at Spring Lake, N. J., and continues through Sept. 9.

Speakers include: Warren Moyer, president of Chipman Chemical; H. E. Luedicke, editor of the Journal of Commerce; A. W. Mohr, president of Cal-Spray; John T. Thurston, director of Stamford Research Laboratories, American Cyanamid; G. E. Lehker, Purdue professor of entomology; S. W. Simmons, Public Health Service; and James D. Hopkins, president of Hopkins Agricultural Chemical Co.

Also on the meeting agenda is a panel discussion on the latest developments relating to the Miller Amendment, which regulates use of pesticides on food crops.

### **Programs Set by Ag & Food, Fertilizer Div. for ACS Meeting**

A full schedule of general papers and symposia are scheduled by the Division of Agricultural and Food Chemistry for the 128th meeting of the AMERICAN CHEMICAL SOCIETY. The meeting opens in Minneapolis, Minn., on Sept. 11 and continues through Sept. 16. The division of Fertilizer and Soil Chemistry will have two full days of technical sessions. Programs of the two divisions are given on the following page.

In addition to the symposia listed below, the Ag and Food division will sponsor, jointly with the Division of Carbohydrate Chemistry, a symposium

on the metabolism of carbohydrates. The divisional luncheon, on Wednesday noon, will hear an address on the role of the chemist in the evolution of the cereal food industry by C. H. Bailey. Program for the fertilizer division's luncheon, on Tuesday, will be a talk on soil conditioners by W. P. Martin.

### Division of Fertilizer and Soil Chemistry

GEORGE H. SERVISS, *Chairman*  
STACY B. RANDLE, *Secretary*

#### Symposium on Fertilizer Technology

*Monday Afternoon*

GEORGE H. SERVISS, *Presiding*

GEORGE H. SERVISS. Introductory Remarks.

K. G. CLARK, J. Y. YEE, V. L. GADDY, and F. O. LUNDSTOM. Preparation and Properties of Urea-Form: Solubility Relationships and Nitrification Characteristics.

CHARLES F. WINCHELL and JAMES M. O'DONNELL. Comparative Growth Response of a Composite Turf Mixture to a Synthetic and a Natural Organic Source of Nitrogen Under Simulated Putting Green Conditions.

ARTHUR M. SMITH. Fertilizer Progress and Problems.

PAUL CALDWELL. A New Nitric-Phosphate Process—One Requiring No Other Acid or Sulfate.

A. V. SLACK, J. C. DRISKELL, H. K. WALTERS, JR. Ammonium Phosphate-Nitrate: Small Scale Preparation in a Packed Tower.

*Tuesday Morning*

G. L. BRIDGER, *Presiding*

A. V. SLACK, J. C. DRISKELL, and H. B. SHAFFER, JR. Preparation of Liquid Mixed Fertilizers: Exploratory Studies.

L. B. HEIN, G. C. HICKS, J. L. SILVERBERG, and JOSEPH G. CUMMINGS. Some Effects of Formulation on Granulation of Mixed Fertilizers.

RIKIO KUMAGI and JOHN O. HARDESTY. Relative Effectiveness of Coating Agents on Granular Mixed Fertilizers.

J. M. STINSON, M. M. STRIPLIN, JR., N. A. BROWN, and L. F. SEATZ. Ammonium Metaphosphate Fertilizer: Pilot Plant Production and Greenhouse Tests.

*Tuesday Afternoon*

G. L. BRIDGER, TEODORO L. HORIZELLA, and KUANG H. LIN. Dicalcium Phosphate Fertilizer by Treatment of Phosphate Rock with Mineral Acids or Monocalcium Phosphate.

D. R. BOYLAN and M. A. LARSON. Fertilizer by Fusion of Phosphate Rock with Gypsum.

J. R. ARCHER and R. P. THOMAS.

Water Soluble Phosphorus in Mixed Fertilizer.

J. H. CARO and W. L. HILL. Determination of Surface Area of Dicalcium Phosphate by Isotope Exchange.

E. R. HOLDEN and A. J. ENGLE. Boron Supply of a Soil, as Affected by Additions of Borax and an Experimental Borosilicate Glass.

*Wednesday Morning*

GEORGE H. SERVISS, *presiding*

JAMES M. O'DONNELL. The Effects of EDTA in Increasing the Efficiency of Insoluble Trace Element Mixtures.

W. H. MACINTIRE, MARY A. HARDISON, and DELLA R. MCKENZIE. Spanish Moss and Limed Filter Papers as Indicators of Atmospheric Fluorides.

CLEMENT D. VELLAIRE. Potassium—the Alkali of Life.

A. A. NIKITIN and JULIA P. GOODE. Relationships between Major and Trace Elements in Plant Nutrition.

M. PEECH. Phosphate Equilibrium.

### Division of Agricultural and Food Chemistry

W. O. LUNDBERG, *Chairman*  
F. M. STRONG, *Secretary*

*Monday Morning*

(Section A)

#### Symposium on Dairy Products and By-Products

ROBERT JENNESS, *Presiding*

ROBERT JENNESS. Introductory Remarks.

### Monsanto, Lion Agree to Merge

Charles A. Thomas, Monsanto president, and T. H. Barton, Lion Oil board chairman, seal merger agreement between their companies with a handshake. Stockholders of the two companies will vote on the proposed merger Sept. 23. If approved, Lion will become the Lion Oil division of Monsanto. Merger will be effected by exchange of 1.5 shares of Monsanto for each share of Lion



MARK KEENEY. Recent Studies on the Chemistry of Milk Fat Oxidation.

STUART PATTON. Chemical Aspects of Flavor Problems with Milk and Its Products.

ARTHUR M. SWANSON. Some Physical and Chemical Problems in the Production and Use of Dried Milk.

THOMAS L. MCMEEKIN, and ROBERT F. PETERSON. Factors Affecting the Molecular Size of Caseins.

FRED HILLIG. The Borden Award Address—The Role of Chemistry in the Control of Quality in Dairy Products.

(Section B)

#### Symposium on Cereals

(Joint with the American Association of Cereal Chemists)

BETTY SULLIVAN, *Presiding*

BETTY SULLIVAN. Introductory Remarks.

L. S. CUENDET, C. M. CHRISTENSEN, and W. F. GEEDES. Some Biological and Biochemical Aspects of Wheat Deterioration.

J. W. PENCE, D. K. MECHAM, and H. S. OLCOTT. The Proteins of Wheat Flour.

JOHN HOLME and D. R. BRIGGS. The Physical Nature of Gliadin.

*Thursday Afternoon*

#### Symposium on Rumen Function

ORVILLE G. BENTLEY, *Presiding*

ORVILLE G. BENTLEY. Introductory Remarks.

R. E. HUNGATE. Kinetics of Microbial Activity in the Rumen.

RICHARD G. WARNER, WILLIAM P. FLATT, and JOHN K. LOOSLI. Dietary Factors Influencing the Development of Rumen Functions.

ORVILLE G. BENTLEY, J. W. HIBBS, and RONALD R. JOHNSON. Studies on the In Vivo and In Vitro Nutritional Requirements of Rumen Microorganisms.

WILLIS D. GALLUP. Utilization of Nonprotein Nitrogen in the Ruminant.

WILLIAM H. HALE. Rumen Metabolism of Nonprotein Nitrogen.

CLYDE K. SMITH. Bloat with Special Reference to the Activities of the Rumen Microflora.

*Thursday Morning*

W. O. LUNDBERG, *Presiding*

FRANCIS S. OKUMARA, M. H. SALTZA, F. M. STRONG, CARLOS O. MILLER, and FOLKE SKOOG. Biological Activity of Analogs of the Plant Growth Substance, 6-Furfurylaminopurine.

JOHN T. GARBUTT and F. M. STRONG. A Colorimetric Determination of  $\beta$ -Aminopropionitrile in Legumes.

E. P. MARBACH and D. M. DOTY. The Microdetermination of Hydrogen Sulfide in Gamma-Irradiated Meat by Condensation with N,N-Dimethyl-P-Phenylenediamine.

M. O. SCHULTZE, V. PERMAN, C. E. REHFELD, and J. H. SAUTTER. Development of a Bioassay for the Toxic Factor in Trichloroethylene-extracted Soybean Oil Meal.

M. WRIGHT TAYLOR, JOHN J. PISANO, and A. N. MEISS. Growth Response of the Confused Flour Beetle Larva and the German Cockroach on Six Nutritionally Different and Carefully Tested Proteins.

EDWARD F. HOOVER. Reliability of the PTC Sodium Benzoate Method of Determining Taste Classifications.

IRWIN HORNSTEIN. The Use of Granulated Zinc Columns for Determining Chlorinated Organic Insecticides.

#### Thursday Afternoon

W. O. LUNDBERG, *Presiding*

JOHN J. PISANO, A. N. MEISS, and M. WRIGHT TAYLOR. The Extraction of Plant Proteins with Sodium Lauryl Sulfate.

W. S. RULIFSON, MAX MILNER, and H. L. MITCHELL. Feedstuffs Values and Chemical Changes in Spontaneously-Heated Alfalfa Pellets.

MARIE BURGER, LLOYD W. HEIN, L. J. TEPY, P. H. DERSE, and C. H. KRIEGER. Vitamin, Mineral, and Proximate Composition of 11 Frozen Fruits.

D. C. STRONG, T. BISHOP, E. B. WILCOX, J. A. BENNETT, L. E. HARRIS, L. SHUPE, B. CRANDALL, R. HURST, and D. A. GREENWOOD. Effects of Feeding Rations Containing Sucrose to Corn-Belt Fattened Beef for Short Periods Prior to Slaughter.

D. A. M. MACKAY and RALPH L. EVANS. The Chromatographic Determination of Trace Amounts of Sucrose in Beer.

C. W. FRITSCH and F. E. DEATHERAGE. A Study of the Volatile Matters Produced by the Autoxidation of Methyl Oleate, Oleic Acid, and *Cis*-9-Octadecene.

R. C. SALANCER, HANS FISHER, and M. WRIGHT TAYLOR. Creatine Biosynthesis in the Chick as a Function of Age and Amino Acid Precursor.

N. A. KAHN, RALPH H. KURTZMAN, JR., R. V. COYNE, M. B. VISSCHER, and J. T. KING. Elaidinization: III. Preparation and Properties of Elaidic Acid and Its Glycerides, Methyl and Ethyl Ethers.

J. A. ANDERSON and I. HLYNKA. Lines of Attack on Dough Chemistry.

R. MONTGOMERY and F. SMITH. The Carbohydrates of Wheat and Other Cereal Grains.

### CALENDAR

**American Society of Agronomy.**

Davis, Calif. Aug. 15-19.

**National Joint Committee on Fertilizer Application and American Society of Agronomy.** University of California, Davis. Aug. 15.

**American Soybean Association.** Netherlands Plaza Hotel, Cincinnati, Ohio. Aug. 30-31.

**National Soybean Processors Association.** Netherlands Plaza Hotel, Cincinnati, Ohio. Aug. 29.

**American Chemical Society.** 128th National Meeting. Minneapolis, Minn., Sept. 11-16.

**American Oil Chemists' Society.** Bellevue-Stratford Hotel, Philadelphia, Pa. Oct. 10-12.

**Fertilizer Section, National Safety Council.** LaSalle Hotel, Chicago, Ill. Oct. 17-18.

**World Symposium on Applied Solar Energy.** Westward Ho Hotel, Phoenix, Ariz. Nov. 1-5.

#### Monday Afternoon

##### General

ROBERT JENNESS, *Presiding*

ROBERT JENNESS. Introductory Remarks.

ABRAHAM LEVITON. Ionophoretic Investigations of Milk Proteins I. Ionophoresis and the Quantitative Determination of Some Whey Proteins in Skim Milk and Whey.

CARRELL H. WHITMAN, WILLIAM D. RUTZ, and FOLLY C. FRYER. Effects of Homogenization Pressure on Some Physical Properties of Milk.

A. VAN KREVELD and G. VAN MINNEN. Change of Ca<sup>++</sup> and Mg<sup>++</sup> Activity of Milk during Processing and Storage.

NIKITA P. TARASSUK and ARJEN F. TAMSMA. Control of Gelation in evaporated Milk: An Approach to the Problem.

ANABEL BEATY, FRED C. WARD, ELLA EILERTSON, and WILLIAM ROWE. The Nutritional Value of White Bread Supplemented with Concentrated Milk Protein (Casein).

##### Pesticides Subdivision

*Tuesday Morning and Afternoon*

L. W. HAZELTON, *Chairman*

HOBART O. THOMAS, *Secretary*

##### General

R. W. FOGELMAN, *Presiding*

GEORGE R. BOYD. Methods of Analysis for *o*-2,4-Dichlorophenyl-*o,o*-Diethyl Phosphorothioate (V-C 13 Nematicide).

PAUL A. GIANG, and F. F. SMITH.

Colorimetric Determination of Metaldehyde Present in Plant Residues.

PAUL A. GIANG, F. F. SMITH, and S. A. HALL. Enzymatic Estimation of Dimethyl 2,2-Dichlorovinyl-phosphate (DDVP) as Spray Residues.

MORTON BEROZA. Determination of Methyleneoxyphenyl-Containing Synergist in Fly Sprays.

SPIRO J. LOULOUDIS, J. N. KAPLANIS, and C. C. ROAN. Synthesis of Radioactive Diazinon Using Phosphorus-32.

SHERMAN K. REED, NORRIS J. BRUNS-VOLD, J. FORREST ALLEN, and OSCAR H. JOHNSON. Study of the Structure of Vinyl Phosphates.

JAMES E. FEARN and JAMES B. DEWITT. Correlation Between Chemical Structure and Rodent Repellency of Some Benzoic Acid Derivates.

C. H. H. NEUFELD, C. F. KREWSON, T. F. DRAKE, T. D. FONTAINE, J. W. MITCHELL, and W. H. PRESTON, JR. Synthetic Plant-Growth Modifiers. V. 4-Chlorophenoxyacetal Derivatives of Amino Acids.

R. W. FINHOLT, and CLAYTON HATHAWAY. Effect of Water Solubility on Fungitoxicity.

S. S. RISTICH and W. L. BUTTS. A New Approach to Phosphorus Insecticides Related to Chlorothion.

WENDELL F. PHILLIPS, *Presiding*

WENDELL F. PHILLIPS. Introductory Remarks.

OREN F. WILLIAMS and JACK R. GRAHAM. A New Series of Fungicidally Active Alkylenebisdithiocarbamates.

MORTON BEROZA. 3,4-Methyleneoxyphenoxy Compounds as Candidates Synergists for Natural and Synthetic Pyrethrins.

R. W. FOGELMAN and E. G. BATTE. An Evaluation of the Safety for Use of Captan in Warm Blooded Animals.

P. D. PETERSON. Uses of Captan.

R. H. CARTER, F. W. POOS, B. A. APP, RAY E. ELY. The Persistence of Insecticide Residues on Forage Crops.

JAMES D. DEWITT. Effects of Chlorinated Hydrocarbon Insecticides upon Quail and Pheasants.

GEORGE W. PEARCE, E. L. GOODEN, DONALD R. JOHNSON. Specifications for Water Dispersible DDT Powders for Use in Malaria Control Programs.

JOSEPH D. CAMPBELL. Copper Dihydrazinium Sulfate—A New Plant Fungicide.

L. W. HAZELTON. Concluding Remarks.

#### Wednesday Morning

**Symposium on Metabolism of Pesticides in Plants, Mammals, and Insects**

D. A. GREENWOOD, *Presiding*

L. W. HAZELTON. Introductory Remarks.

JAMES M. BANN, THOMAS J. DECINO, NORMAN W. EARLE, and YUN-PEI SUN. The Fate of Aldrin and Dieldrin in the Animal Body.

CIPRIANO CUETO, ARVIS G. BARNES, and ARNOLD M. MATTSON. Determination of DDA in Urine Using Ion Exchange Resin.

S. C. NELSON, T. L. BAHLER, W. V. HARTWELL, D. A. GREENWOOD, and L. E. HARRIS. Serum Alkaline Phosphatase Level, Weight Change and Mortality Rates of Mature Rats Fed Various Levels of Endrin.

WAYLAND R. HAYES, JR. Review of the Metabolism of Chlorinated Hydrocarbon Insecticides Especially in Mammals.

JOHN E. CASIDA. Residual Properties and Plant Metabolism of a Substituted Vinyl Phosphate Systemic Insecticide.

NORMAN MITLIN. The Inhibition of Development in the House Fly by 3,4-Methylenedioxyphenyl Compounds.

R. G. OWENS. Interactions of Fungicides in Metabolism.

G. CONGDON WOOD and ISAAC D. WELT. Punch-Card Techniques and Pesticide Metabolism.

Divisional Luncheon. C. H. BALEY. The Role of the Chemist in the Evolution of the Cereal Food Industry.

Wednesday Afternoon

D. A. GREENWOOD. Introductory Remarks.

JOHN E. CASIDA. Metabolism of Organophosphate Insecticides in Relation to Antiesterase Activity, Stability, and Residual Properties.

JOHN N. KAPLANIS, S. J. LOULOUCES, and C. C. ROAN. The Distribution and Excretion of Phosphorus-32 Labelled Diazinon in Guinea Pigs.

H. MARTIN. Toxicological Chemistry and Breakdown of Toxicants by Biological Agencies.

SAAD EL DIN AFIFI and C. C. ROAN. The Distribution and Metabolism of Phosphorus-32 Labelled Diazinon in the American Cockroach.

D. A. GREENWOOD. Concluding Remarks.

**Fermentation Subdivision**

MARVIN JOHNSON, *Chairman*  
J. C. SYLVESTER, *Secretary*

Symposium on Improvements in Fermentation Equipment and Process

Wednesday Morning

ROBERT K. FINN, *Presiding*

ROBERT K. FINN. Introductory Remarks.

JOHN W. ALMOF and HAROLD L. SADOFF. The Testing of Filters for Phage Removal.

ELMER L. GADEN, JR., and ARTHUR E. HUMPHREY. Design of Fibrous Filters for Air Sterilization.

C. L. KROLL, S. FORMANEK, A. S. COVERT, and W. E. BROWN. Equipment for Small-Scale Fermentation.

A. R. ERDA and M. W. BRENNER. Improved Stainless Steel Pure Culture Equipment.

H. A. NELSON, W. D. MAXON, and T. H. ELFERDINK. Small Scale Equipment for Detailed Fermentation Studies.

WALDO C. FRIEDLAND, MERLIN H. PETERSON, and JOHN C. SYLVESTER. A Fermentor Design for Small Scale Submerged Fermentations.

EDWARD O. KAROW and DEMETRE N. PETSIAVA. Effect of Physical Variables on the Microbiological Transformation of Steroids.

Wednesday Afternoon

MICHAEL R. SFAT, *Presiding*

MICHAEL R. SFAT. Introductory Remarks.

SAUL S. DAYAN and ELMER R. GAYDEN, JR. Agitation-Aeration Characteristics of Laboratory Fermentation Equipment.

J. Y. OLDSHUE. The Role of Mixing Impellers in the Aeration of Activated Sludge.

PING SHU. Oxygen Uptake Control in a Deep Tank Fermentation.

EDGAR L. PIRET and ROBERT LUEDEKING. Transient and Steady States in Continuous Fermentation.

J. E. NOWREY and R. K. FINN. Production of Acetone and Butanol by Continuous Fermentation.

**General**

Friday Morning and Afternoon

R. J. ALLGEIER, *Presiding*

R. J. ALLGEIER. Introductory Remarks.

F. B. STRANDSKOV and J. B. BOCKELMANN. Nutritional Requirements of Brewery Microorganisms. II. Nutritional Requirements as Related to Types of Bacterial Contaminants Encountered in Brewery Fermentations.

MAYNARD A. AMERINE. Submerged Culture of Film Yeasts.

J. F. T. SPENCER, J. M. ROXBURGH, and H. R. SALLANS. Factors Influencing the Production of Polyhydric alcohols by Osmophilic Yeasts.

MERLIN H. PETERSON, WALDO C. FRIEDLAND, FRANK W. DENISON, JR., and JOHN C. SYLVESTER. The Conversion of Mannitol to Fructose by *Acetobacter suboxydans*.

JOHN A. JOHNSON, BYRON S. MILLER, FAWZY Y. REFAI, and DONALD MILLER. Effect of Fermentation Time on Certain Chemical Constituents of Preferments Used in Breadmaking.

ROBERT E. BARRET. Enzymes of Unaged Bright and Burley Tobaccos.

ROY L. WHISLER and KENNETH W. KIRBY. Characteristics of Soil Polysaccharides.

**On the Cover**

**Liquid Fertilizer Profits Closely Related to Chemical Know-How**

The striking returns from liquid fertilizer manufacture shown on the cover come from Monsanto's pilot plant and economic studies, which are discussed in detail in the feature in this issue, page 656 through 663. The table below expands the financial details for such operations as are discussed in the feature and particularly on page 663.

**Estimate of Annual Earnings for Liquid Fertilizer Plant**

	Daily Capacity		
	50 net tons	100 net tons	200 net tons
<b>Annual Production (90 Days)</b>	4,500 net tons	9,000 net tons	18,000 net tons
<b>Capital Requirements</b>			
Fixed capital	\$ 25,000	\$ 35,000	\$ 50,000
Working capital (20% Sales)	50,000	100,000	200,000
<b>Total capital</b>	<b>\$ 75,000</b>	<b>\$135,000</b>	<b>\$250,000</b>
<b>Annual Earnings</b>			
Sales @ \$55/net ton, f.o.b. plant	\$248,000	\$495,000	\$990,000
Operating cost	178,000	340,000	662,000
<b>Gross profit</b>	<b>\$ 70,000</b>	<b>\$155,000</b>	<b>\$328,000</b>
Sales, administrative expenses (10% sales)	25,000	50,000	100,000
<b>Net profit before 50% taxes</b>	<b>\$ 45,000</b>	<b>\$105,000</b>	<b>\$228,000</b>
<b>Net profit after taxes</b>	<b>\$ 22,000</b>	<b>\$ 52,000</b>	<b>\$114,000</b>
<b>Return on total fixed and working capital</b>	<b>29%</b>	<b>38%</b>	<b>46%</b>
<b>Payout Time (On fixed capital)</b>	<b>1.2 yr.</b>	<b>0.7 yr.</b>	<b>0.4 yr.</b>

S. C. PAN and J. D. CUTCHER. Paper Chromatographic Separation of Acetylated Meomycins B and C.

JARED H. FORD, MALCOLM E. BERGY, A. A. BROOKS, EDWARD R. GARRETT, JOSEPH ALBERTI, JOHN R. DYER, and H. E. CARTER. Further Characterization of Neomycin B and Neomycin C.

KENNETH MORGAREIDGE and PAUL KAHN. The Assay of Commercial Feeds Containing High Levels of Antibiotics.

WILLIAM B. HARDIE, HAROLD E. DOWNING, CHARLES R. ADAMS, WARREN M. REYNOLDS, and HERBERT T. G. LUTHER. Effect of Terramycin on Rumen Function and Growth in Calves and Feeder Cattle.

RAYMOND BORCHERS, D. MOHAMMAD-ABADI, and J. M. WEAVER. Antibiotic Supplements to Raw Soybean Oil Meal Rations.

**PEOPLE**

**MCA Head Joins Mathieson as Executive VP**



**William C. Foster**, former Deputy Secretary of Defense and President of the Manufacturing Chemists' Association, Inc., becomes an executive vice president of Olin Mathieson Chemical Corp. Mr. Foster

assumed his new duties, with headquarters in the Olin Mathieson New York Offices on Aug. 1. He had previously resigned as MCA President on July 31.

**Charles W. Shepherd** has been named plant manager of Federal Chemical Co. at Columbus, Ohio. He has been with Federal for several years. **Alvin R. Wagner** has been appointed assistant plant manager.

**Elwood I. Lentz** has been named general manager of Western Phosphates, Inc. He has been vice president and plant manager since the company's founding in 1952.

**R. Lindley Murray** has been elected board chairman of Hooker Electrochemical, succeeding **Edwin R. Bartlett** who has become chairman of the newly organized finance committee. **Bjarne Klaussen**, formerly executive vice president, was elected president to succeed Mr. Murray.

**Ivor R. Burden** has been designated vice president and general manager of Heckathorn & Co., United Chemical Co., and United Fertilizer Co. He will

also serve as sales manager of United Chemical. Sales managers of Heckathorn and United Fertilizer are **Harry R. Field** and **Peter Cherian**, with the latter also serving as purchasing agent for all three companies. **E. G. Trimpey** was designated operations manager and assistant secretary for all three companies.

**Gerard J. Carney** has joined International Minerals as marketing staff manager of the plant food division. He was formerly vice president and general sales manager of Dayton Pump & Mfg. Co.



**George S. Gordon** has joined U. S. Potash Co. as director of research. Dr. Gordon has been vice president of Titanium Zirconium Corp. since March 1951.

**John R. Lowry** has been promoted to project leader in radio chemistry at the General Foods laboratories in Hoboken.

**J. M. Hoerner** has been appointed general manager of the Armour & Co.'s chemical division, succeeding **F. B. Pat-**

**ton** who recently became general manager of Armour Auxiliaries. Mr. Hoerner joined Armour in 1953 as director of sales and purchases.

**Rex E. Lidov** has been appointed research associate in the research department of Brea Chemicals, Inc. He was formerly assistant manager of Shell Development's agricultural chemicals division. He will be responsible for some aspects of new product development from Brea's raw materials.

**Carlton Bates** has been promoted from executive vice president to president of the Solvay Process Division of Allied Chemical & Dye. He succeeds **A. B. Chadwick**, who has retired.

**Leslie R. Hamilton** has been named coordinator of fertilizer operations for California Spray-Chemical Corp. He will coordinate marketing activities in connection with the recently announced \$16 million fertilizer plant being built at Richmond, Calif.

**Milton Rex Wingard** has been named project engineer, fats and oils department, chemical plants division, Blaw-Knox Co. He has been with the company since the war.

A NATURAL QUALITY PRODUCT

**TAKO**

QUALITY & SERVICE SINCE 1935

**A HIGH GRADE COLLOIDAL KAOLINITIC KAOLIN**

**"TAKO"** Airfloated Colloidal Kaolinitic Kaolin is a practically pure inert colloid with exceptional qualities. Used in large tonnage for years most successfully and economically as a prilling and graining agent in the production of fertilizers.

**"TAKO"** Excellent adhesive-absorption qualities—colloidal properties—excellent in formulations of insecticides and pesticides—gives increased workability, dispersion—free flowing from all types of dusting equipment—absolute minimum drifting when sprayed from airplanes—does not reduce toxic action.

MICRON SIZE

Minus 1 Micron...	55%
" 2 " ...	68%
" 5 " ...	85%

No Mica—No Alkalies

Airfloated; Bagged or Bulk Guaranteed less 1% free moisture

**NON-ABRASIVE • NON-HYGROSCOPIC • NON-CAKING • FREE-FLOWING**

IT WILL PAY TO INVESTIGATE "TAKO" FOR YOUR REQUIREMENTS

**THE THOMAS ALABAMA KAOLIN CO., 2412 KEN OAK ROAD, BALTIMORE 9, MARYLAND**