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P. 349/44/IV

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NEW DESICCATING DECOLORIZING AGENTS

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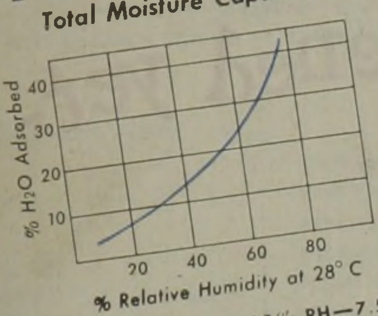
Total Moisture Capacity



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Rapid in its adsorption of water.
Will not become wet on exhaustion.
Will not shrink, expand or disintegrate on adsorption of water.

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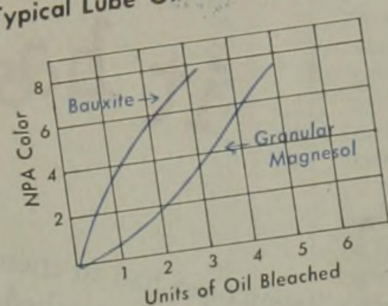

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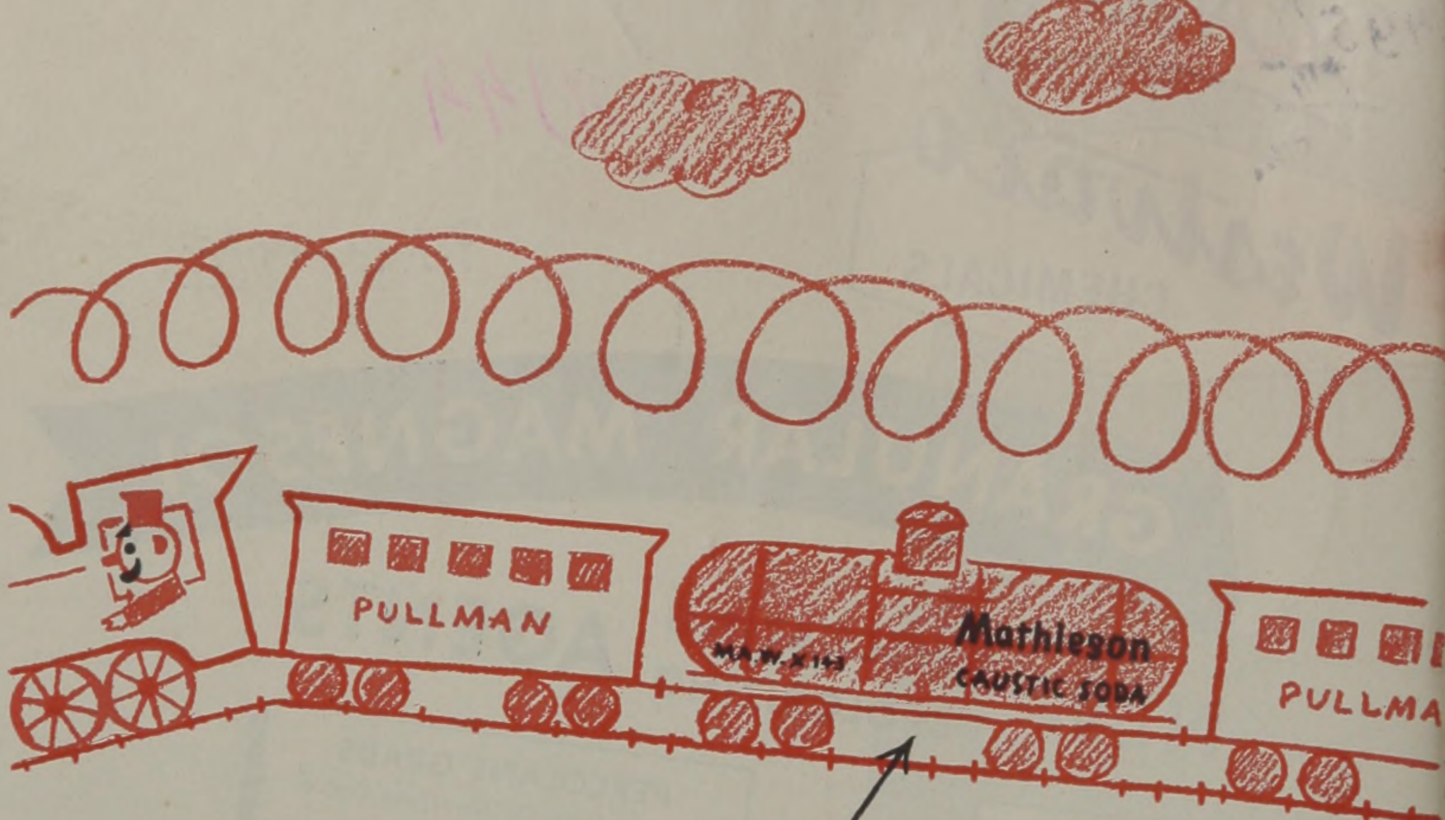

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P. 349/44/IV

Chemical Industries

THE BUSINESS MAGAZINE for MAKERS and USERS of CHEMICALS
Management • Research • Production • Marketing

VOL. 55—NO. 5

November, 1944

Contents

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THE READER WRITES

Not a Handicap

To the Editor of Chemical Industries:

I saw your recent two page article on silicones in CHEMICAL INDUSTRIES. I thought you did very well with the material available to you. On the whole the story was accurate. However, we do not agree with the statement near the end to the effect that the process we are using is a handicap to the development of our products.

W. R. COLLINGS, *Vice President*
Dow Corning Corporation
Midland, Michigan.

The article referred to by Mr. Collings is "Organo-Silicon Compounds Emerge from the Laboratory," in the August issue of CHEMICAL INDUSTRIES. The concluding paragraph of this article reads as follows:

"As a new class of commercial products there seems to be a good future ahead for the silicones in view of the low cost raw material required and the valuable properties of the products. The drawback at present is said to be the costly and difficult Grignard method of synthesis."

We are very glad to know that Mr. Collings does not believe the Grignard synthesis will be a handicap. The viewpoint expressed in our article is held by certain others who have been close to the development. Time will tell which is correct. We hope it is Mr. Collings.—EDITORS.

Professional Engineering

To the Editor of Chemical Industries:

You have been aware for some time that the legislation requiring the registration of professional engineers in Illinois has been in litigation.

The Supreme Court of the state recently handed down a decision holding the present act unconstitutional, citing as the chief basis for this decision a very uncertain definition of what was involved in the practice of professional engineering as defined in the act under litigation.

The definition of the professional engineer was taken almost verbatim from the "model law." It seems to us in Illinois that with this in mind future litigation in states having copies of the "model law" enacted are likely to be subject to litigation with the same decision as has been rendered in Illinois.

The Illinois Engineering Council is now in process of redrafting the law to meet the objections raised by the Supreme Court and, as has been stated, the major trouble is the definition of professional engineering. The Illinois Engineering Council would therefore, appreciate all possible assistance in their attempt to rewrite a definition of the qualifications and activities as embodied in the practice of professional engineering.

H. MCCORMACK, *Director*
Dept. of Chemical Engineering
Illinois Institute of Technology
Chicago, Illinois.

Optimism Unjustified

To the Editor of Chemical Industries:

Lately I have noticed an apparent optimism by some persons regarding the chemical manpower situation. I personally am the most pessimistic I have ever been on this subject. I shall give you some of my reasons.

Probably our most important war projects are those on penicillin and antimalarial drugs. Four of my men in these fields are now in 1-A under appeal. This is in spite of the fact that the special green forms were certified for them by the proper agencies in Washington and were approved by the State Selective Service Headquarters. The Local Boards are taking the attitude that the war is not only won but is practically over. They are trying to get every available man to be used in the armies of occupation so that the boys who have been fighting can come home. This would be an entirely laudable idea if the premise was correct and if we did not need every technically trained man for the finishing of the war and for the winning of the peace.

In order to get the above green forms certified and approved it was necessary for me to swear that we had no men working on postwar projects. As I understand it, this is the uniform requirement in order to get deferment for a man under 28. Of course you could not expect to attract a man over 26 for a salary much less than $4,000. If you had such a man on a postwar project it would render it impossible for you to get any deferment for any man under 26.

I sincerely hope I am wrong but my conviction is that the chemical manpower situation is worse now than it has ever been. Moreover, it probably will be very much worse before it is any better.

A glimpse at the future can be seen even from our own little institution. Instead of a normal senior class of chemists and chemical engineers of about 109, I met my senior class on Monday consisting of one girl, two 4-F men and two men in 1-A who will almost certainly be called before they can graduate in June. At the present time instead of having about 80 graduate students in chemistry and chemical engineering we have four girls and four 4-F men. If there is any basis for optimism, I haven't seen it.

COLLEGE PROFESSOR.

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WASHINGTON

T. N. SANDIFER *reporting*

German Industry Control • Rubber Negotiations • Surplus Plants Foreign Paint Markets • Postwar Exports

Foreign Markets for American Paints

The Bureau of Foreign and Domestic Commerce is building up data on the market abroad now and after the war for American paints and varnishes.

While virtually every country manufactures a certain amount of paint, in only a relative few are high grade and specialized paint products made. The United States is the largest paint producing nation, as to volume, variety and quality, but exports in recent years have represented an average of less than 2 percent of the total value of manufacturers' sales in the United States.

The purpose of the Department's effort is to build up a well-rounded and accurate file on the paint industry and total paint requirements of foreign countries and areas. The Bureau believes that foreign countries are open to augmented exports of the American product, especially as the war fades, and resumption of normal activity takes place. The survey will cover paint, varnishes, lacquers, and kindred products.

Postwar Foreign Trade

Lauchlin Currie, deputy administrator of the Foreign Economic Administration, has laid before the House Committee on Post-War Planning, a comprehensive foreign trade program. Whether this can be termed an Administration proposal is open to construction. Mr. Currie enjoys the reputation of a close association with inner-Washington planners, however, and in this light his views are worth roting.

The following are significant highlights:

The reciprocal trade program must be carried forward and expanded.

All forms of discriminatory treatment in international commerce should be eliminated. "The United States itself will obtain a large share of the benefits that will result from the elimination of these trade barriers," Mr. Currie claimed.

Wartime controls over exports and imports should be terminated as soon as practicable. Among the controls which will be abandoned as soon as military and foreign policy considerations permit are those designed to prevent strategic supplies from reaching the enemy by way of neutral countries.

Blocked or frozen currencies should be freed. Countries should be free to spend the current money proceeds of their exports in any market they may choose. "To this end we should use our national influence and assistance if necessary to terminate this blocking of balances as soon as it ceases to be needed to aid in prosecuting the war," he added.

Foreign credits will be necessary, and the United States Government should take an active share of this promotional necessity.

There must be an orderly liquidation of surplus property abroad. "Particular care must be taken to ensure that the disposal abroad of surplus property will interfere to the least possible extent with the export of newly manufactured American products."

In elaborating his points, Mr. Currie reported that of the nearly $15 billions of U. S. exports this year, $11.5 billions will consist of lend-lease materials. This, he pointed out, is four times the volume of prewar exports.

"The United States will be the greatest industrial power, and almost the only important industrial nation which has suffered no physical war damage to its industrial or agricultural equipment," he recalled.

"Present figures indicate that we are turning out about $196 billions of goods and services a year, which is about double our highest production in any year up to 1939. (The highest was 99.4 billions in 1929.)" If, he continued, the nation is to continue on a high employment level to sustain this expanded production, the sights must be raised on exports. It will be necessary to fill the gap between the $2.8 billion of pre-war exports, and the present level, now occupied by lend-lease. This will mean, Mr. Currie emphasized, a foreign trade approximating $14,000,000,000.

He foresees that the need for American goods abroad will far exceed that of any previous time. However, he warned, "it is apparent that if a high level of exports is to be maintained it will be necessary for the United States Government to make and guarantee loans on favorable conditions in terms of interest rates charged and the periods for payment."

Another Plan for Control of German Industry

The question of whether Germany is to be left with any heavy industrial and technical production capacity after the war is apparently still up in the air. The abortive plan attributed to Secretary of Treasury Morgenthau has caused a reaction, regardless of its authenticity, that raises a question as to any new proposals of equal severity having much chance of consideration at this time.

The hesitancy to proclaim a definite plan for German industry is frankly credited to a desire not to aggravate German determination to resist to the end, rather than to any solicitude for that people's well-being.

That being so, considerable interest attaches to proposals now being heard here looking to a more subtle approach to somewhat the same general end as the more drastic suggestions that have been suppressed for the moment. These latest ideas would incidentally affect any German capacity for chemical output, as well as metals involving extensive chemical processes, such as aluminum, magnesium, etc. Specifically, any German industry dependent on electric power, such as that now derived from Germany's important hydro and hydrogenation industries, would be vitally affected.

Briefly, this idea, as put forward unofficially, would make any German industrial activity which depends at all on electric power or gas, subject to the pull of a switch, with the switch handle in Allied hands.

To accomplish this control, German utilities, which in any case would have to be allowed to operate within certain limits, would be internationalized. A restricted number of German generating stations would be allowed to operate, probably confined to the Saar basin, with its cheap coal, and supplemented where necessary by power that would be imported from outside the Reich.

Most of the power for German industry would, in fact, be imported or tied in with transmission lines under direct control of the Allied occupation authorities. Thus Germany would have a modicum of industrial activity, but subject to instant curtailment. To understand the effect of this control, it is only necessary to recall protests made by the Secretary of Interior when the War Production Board cut his publicly-operated transmission lines to West Coast war industry areas by holding back materials.

This interesting proposition is unofficially reported to have been on the agenda of the discussions at Dumbarton Oaks.

International Rubber Negotiations Under Fire

REPORTED INFORMAL STUDY by a joint Netherlands-U. S.-British group, of the whole rubber situation—synthetic, crude and reclaimed—can have little advantage for the United States, Senator Guy M. Gillette, chairman of the Senate's rubber investigation, has protested to the Secretary of State.

Referring to the efforts of the Senate committee to develop the facts of synthetic versus natural rubber, and to formulate recommendations for the post-war synthetic industry, Senator Gillette wrote:

"In the light of our studies of more than 30 months, I am frank to say that I do not envision any advantage to our nation and her industries that would not be available to us without such a conference, and I can envision action which might result seriously in its impact on our own great new industry of synthetic rubber production from agricultural sources, our forest wastes and from petroleum products."

New Natural Gas Supply Proposed for TVA

A NATURAL GAS COMPANY HAS APPLIED to the Federal Power Commission for authority to build a 66-mile pipeline that would furnish natural gas to the Reynolds Metal Company at Listerhill, Ala., and the TVA at Muscle Shoals. The company, Alabama-Tennessee Natural Gas, was organized for this purpose, it was stated, and to supply certain utilities.

Surplus Plants

THE RFSULTS OF THE FIRST INQUIRY by Defense Plant Corporation into sales prospects for currently Government-owned war plants, show a preponderant interest by private industry in buying or leasing these plants when they become surplus.

The query was made of 378 operators of 568 war plants belonging to the Government, and replies were received from all but 7. Operators of 325 plants indicated they would like to either buy or lease the properties they are now handling. Most of them expressed a preference for leasing; 77 contractors, in charge of 120 plants were still undecided, and only 39 contractors, handling 55 plants, said flatly they would not be interested in either buying or leasing.

On the basis of replies received, preliminary conversations already have been held with some operators, DPC reported.

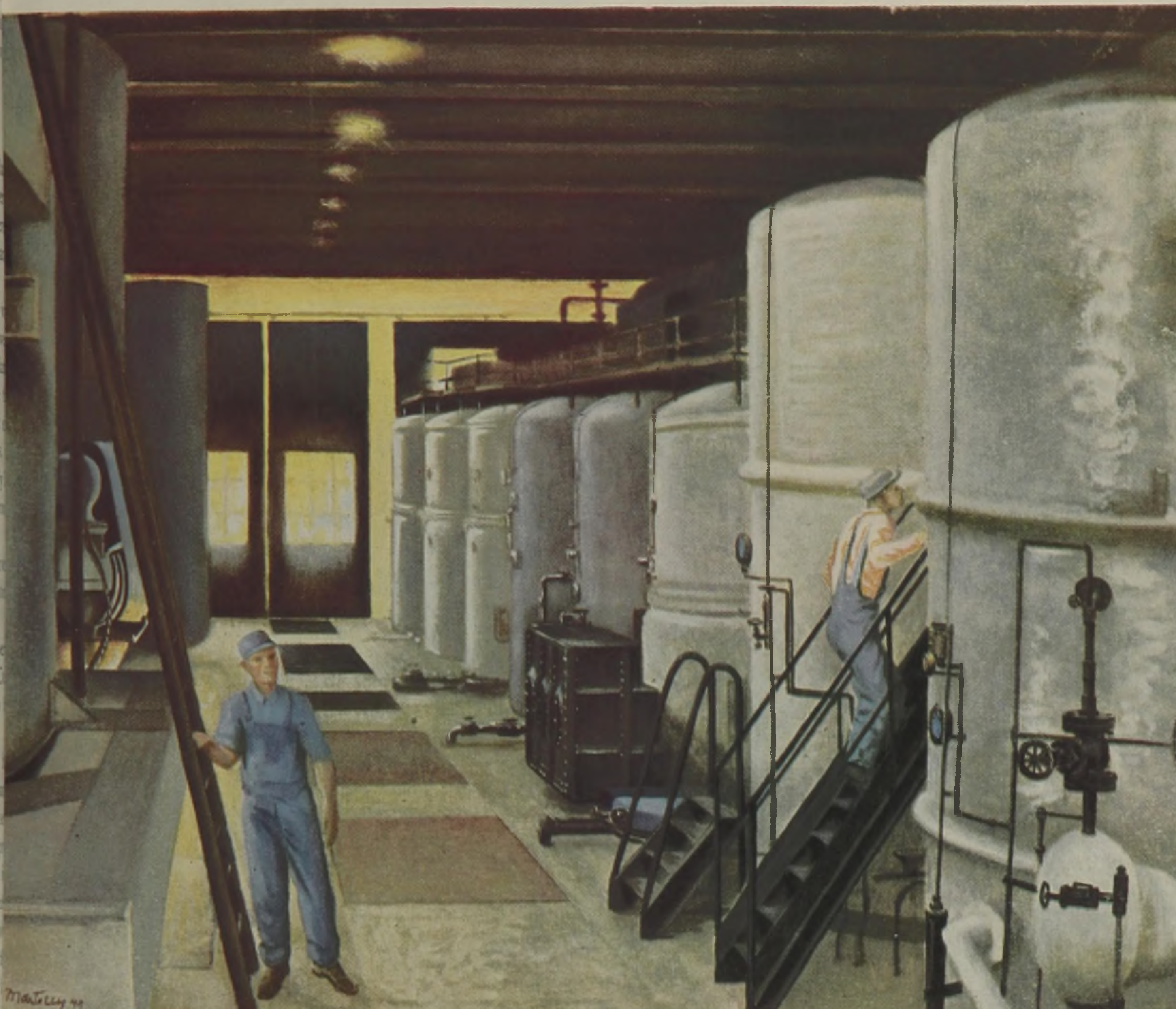
Meanwhile, the recently-enacted Surplus Property law probably will be amended by the incoming Congress in November, after its election recess, to facilitate disposal of certain of these plants.

Amendments are to be sought particularly for elimination of many restrictions on sales of such plants which were written into the law just passed. These amendments might involve removal of the provision requiring Congressional approval of sales involving certain plants and liberalization of the "freeze" provision governing strategic materials, which as now approved would hold some minerals and metals off the market for 15 months. The armed services would be given wider latitude in disposing of surplus commodities.

The bill that passed was admittedly a stop-gap, enacted under pressure from some quarters for a law in the event the war ended while Congress was in recess. More than 50 bills had been introduced at one time or another on the subject, and in some respects the version that passed had merely picked up provisions here and there of other bills that had fallen behind in the shuffling that took place before recess.

The Administration was known to have been dissatisfied with the bill that passed and to have indicated it would seek a bill more in line with its views later. The amendments to come may not fall in this category, but may still further modify the policy on the subject as it stands.

Timely Experience . . .



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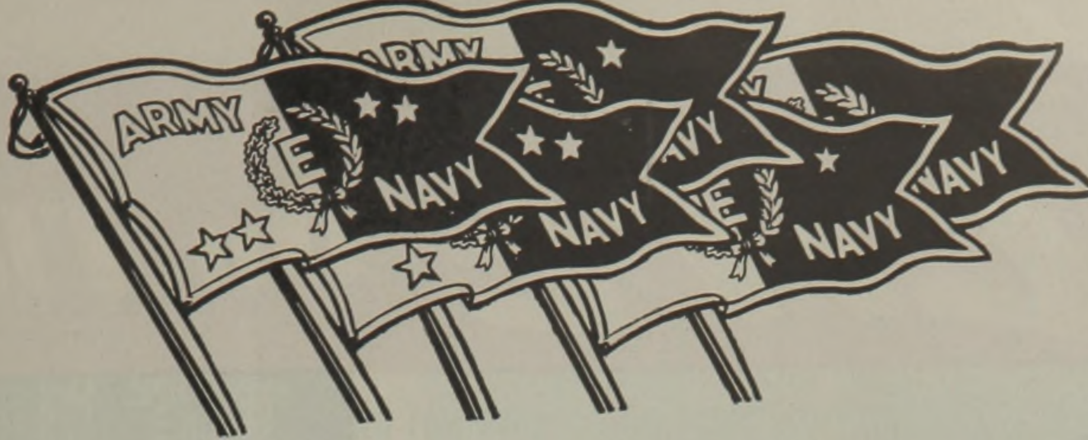

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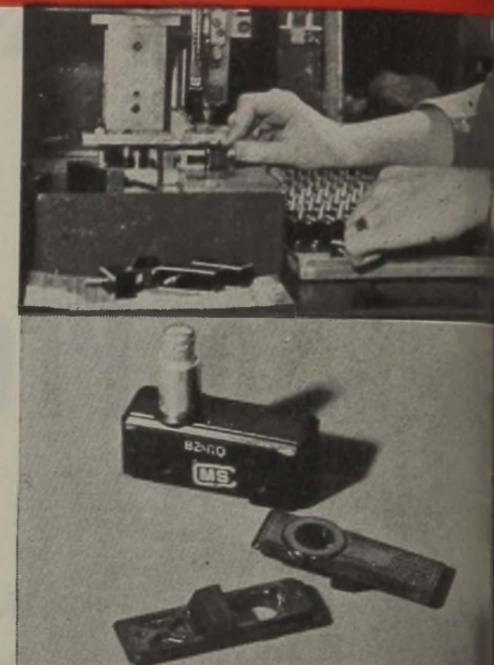
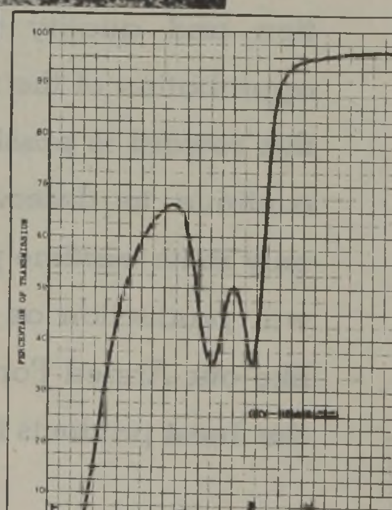
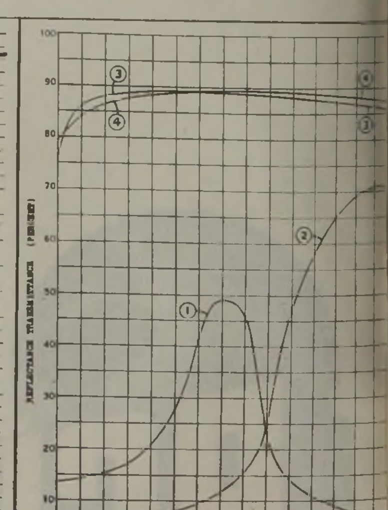


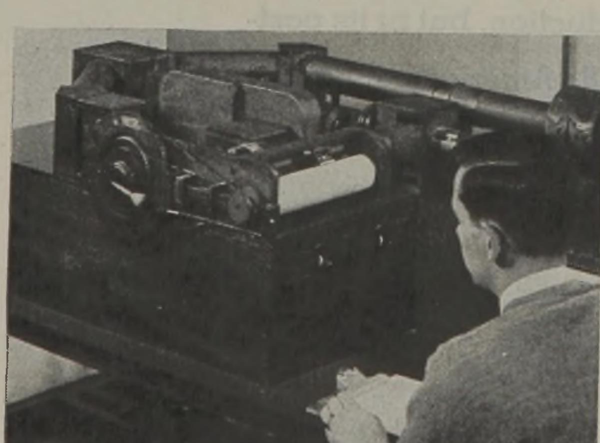
(*Above*) **PRECISION MOLDED PLASTIC HOUSINGS** ma Cyanamid's BEETLE* insure reliable operati under long continuous service for these feathe weight Micro Switches.



(*Above*) **COLOR BY TRANSMITTED WAVELENGTHS** through human blood . . . Characteristic absorption curve of normal human blood is shown on this spectrophotometer graph for use in biochemical research. Colors of spectrum are plotted along bottom in terms of wavelengths in millimicrons, percentage of transmission up the side.



(*Above*) **EXACT COLOR INTENSITY AN WAVELENGTHS** in millimicrons ar measured by the spectrophotometer Color by reflected wavelengths from a painted object as measured by th spectrophotometer. Here curve 1 is green, curve 2 is a red and curves and 4 are two whites. The instru ment tells exactly how much white 3 is than 4.



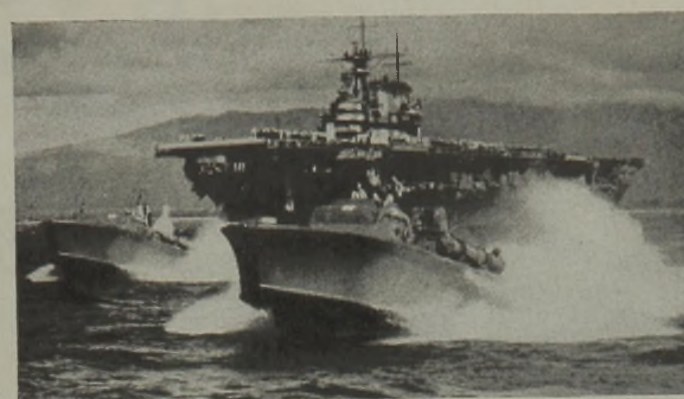
(*Above*) **THOUSANDS OF SPECTROPHOTOMETRIC** color analyses are made each year in the Stamford Research Laboratories for many important phases of Cyanamid research and production.

Chemical Newsfront

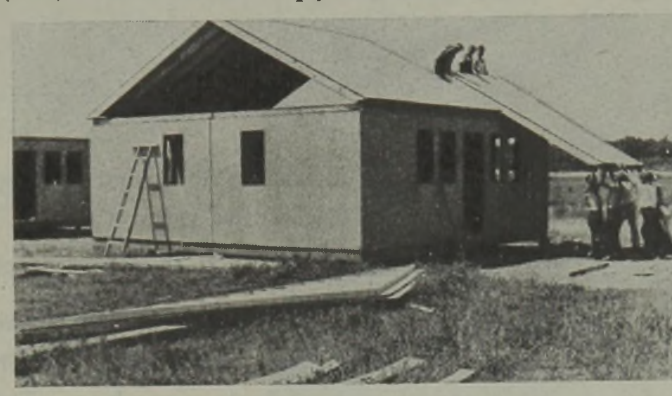
ESIN ADHESIVES OPEN A NEW WORLD FOR WOOD

lywood planes with complex curved surfaces, torpedo boats and ınding barges, huge laminated wooden beams and trusses, preıbricated houses—all made of wood bonded with synthetic resin dhesives—point the way to new possibilities in the woodworking elds. Composite wooden structures can now be assembled with afety, economy, and speed. Structurally, weight for weight, they re stronger than steel. The bond formed by the adhesive is ronger than the material it unites.

A full line of both hot-set and cold-set resin adhesives has been eveloped by Cyanamid's Plastic Division. These hot-set resins re stepping up production of plywood and assembly of wood ructures to new highs. The cold-set resins are making possible ssembly gluing where complex shapes prohibit perfect joining nd high pressures are not applicable to insure uniformly thin lue lines. These resin adhesives are bringing new strength, urability, and usefulness to an amazing variety of wood products nd wood structures. Cyanamid will be glad to consult with ou on the use of their new-day industrial adhesives—BEETLE, IELMAC*, MELURAC*, and URAC* resins.



(Above) **PT BOATS** are made of plywood bonded with resin adhesives.



(Above) **PRE-FABRICATED PORTABLE HOMES** erected of durable plywood.

(Above) **WOODEN SUB-ASSEMBLIES** for the *Mosquito* bomber are formed into wings and fuselage, spars fastened to ribs and ribs to skin, with a bond of cold-setting BEETLE Cement.

(Above) **MOSQUITO BOMBER** is wood bonded with BEETLE Cement.

*Reg. U. S. Pat. Off.

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The extreme adsorptive power of Nuchar Active Carbon results from its intricate capillary structure, and industrial chemists are putting this tremendous activated surface to work in chemical process plants everywhere. They are quick to recognize that adsorption makes a thoroughly effective, dependable and faster method of purification.

The use of Nuchar Active Carbon is standard practice in the Chemical Process Industry. Chemical Manufacturers and processors producing on a tremendous wartime scale are finding Nuchar indispensable in their distillation, crystallization, sublimation and other purification processes. In some cases Active Carbon has replaced entirely other slower and more costly methods of purification.

Possibly your process can find added production through extending the use of Nuchar. Write for complete information, stating conditions, to assist us in determining the best grade for your use. A generous laboratory sample will be gladly sent on request.

Nuchar Active Carbons
Abietic Acid
Snow Top Precipitated Calcium Carbonate

Liquid Caustic Soda
Chlorine
Lignin
Liqro Crude Tall Oil

Indusoil Distilled Tall Oil
Tall Oil Pitch
Sulphate Wood Turpentine

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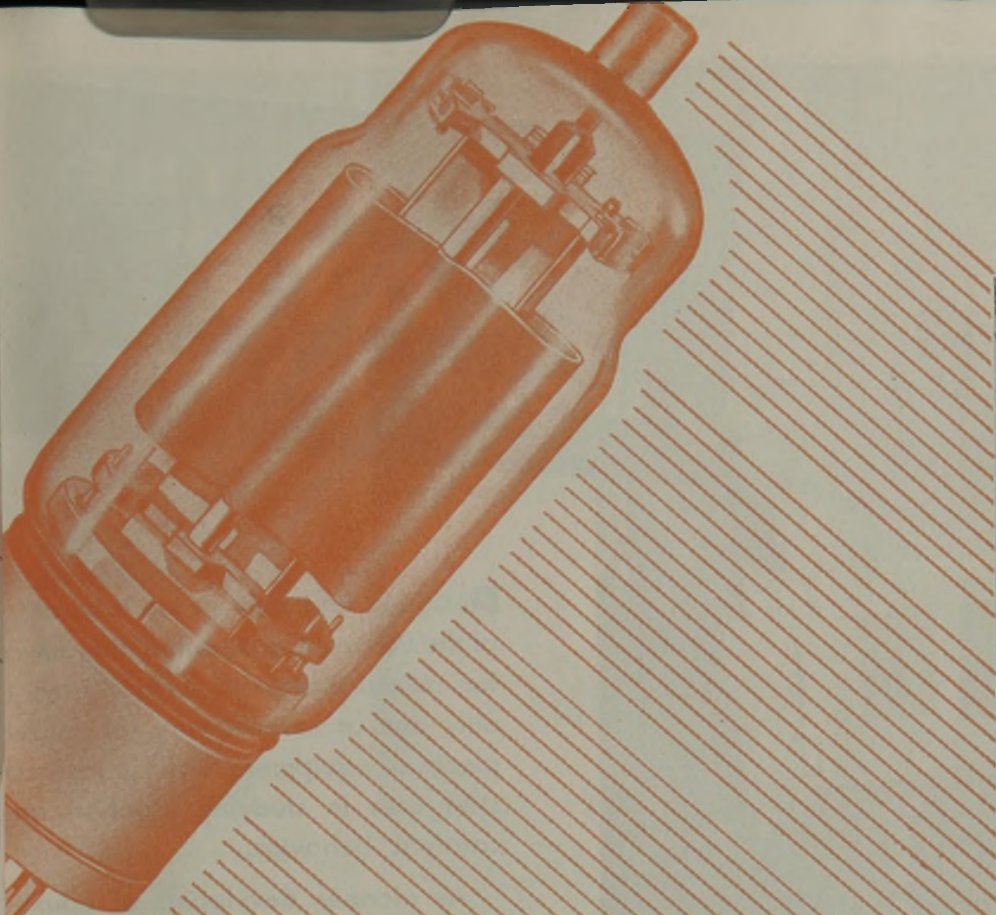
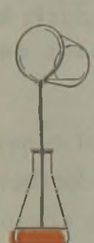


Measured purity contributes to the wonders of ELECTRONICS



Electronics—the new science of putting the electron to work!

Today . . . the electron tube helps control the quality of countless products of war . . . guides the destinies of armies and fleets all over the world.

Tomorrow—this miracle-working tube which sees, hears, tastes, feels and smells with amazing sensitivity—will revolutionize our peace-time lives.

It will invade industry in all its aspects, save energy, save time, save money, protect life and property.

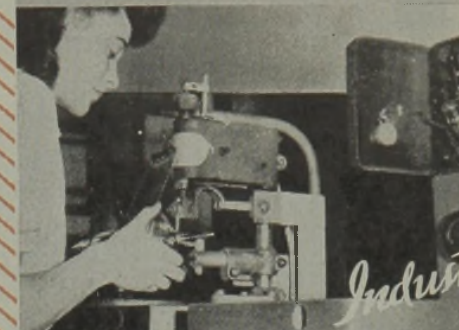
Baker is playing its part in contributing chemicals of extraordinary purity to make possible the coating of the filament used in the electron tube. Here, *purity is demanded*—so that transmission of electronic power may not be impeded.

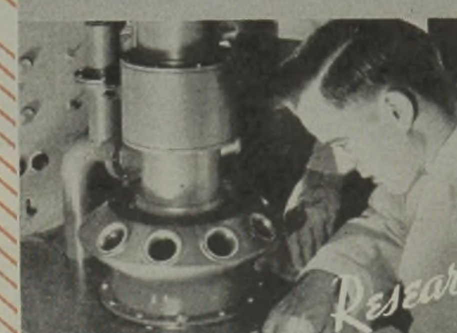
This is only one of the many instances where *purity*, as exemplified by Baker Chemicals, has increased efficiency in today's forward march of industry.

Baker's Chemicals (purity by the ton) have been supplied to many manufacturing concerns for the manufacture or processing of many products.

If you have special chemical requirements for war- or post-war production products, we invite you to discuss your needs in confidence with Baker.

J. T. Baker Chemical Co., ***Executive Offices and Plant:*** **Phillipsburg New Jersey.** ***Branch Offices:*** **New York, Philadelphia and Chicago**



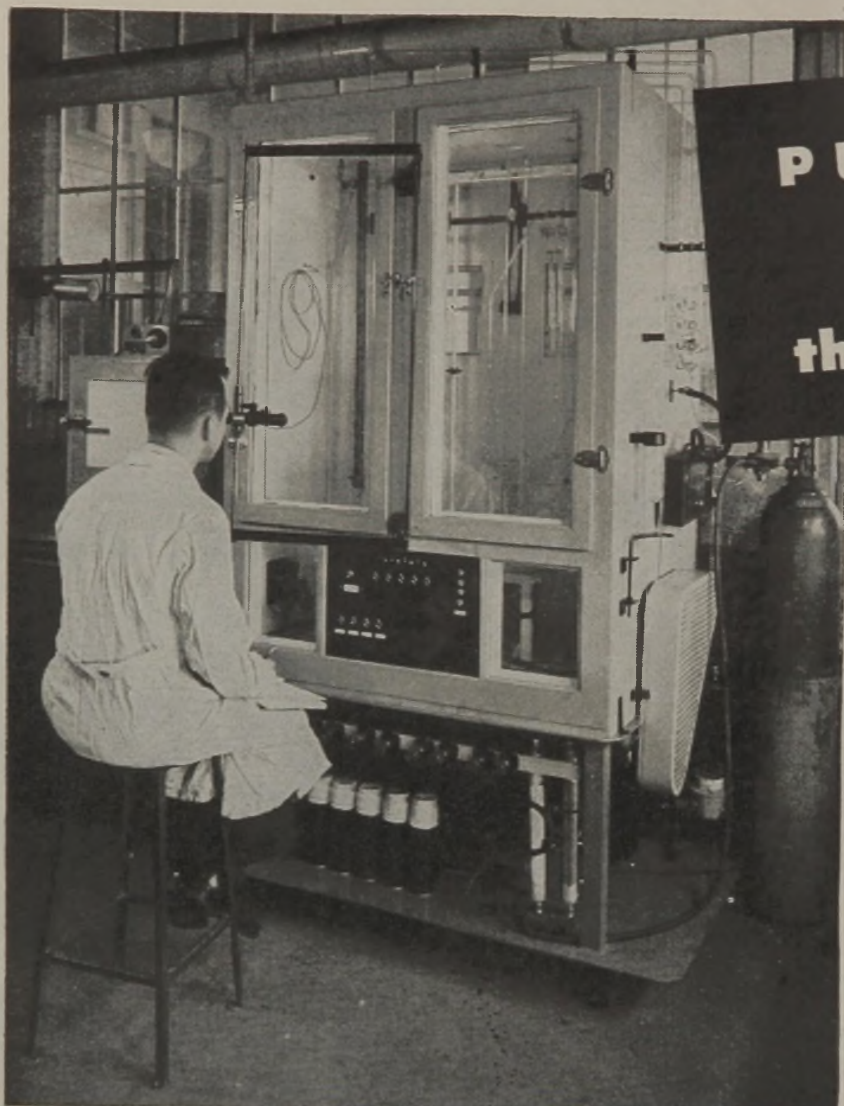


Three lower pictures courtesy Radio Corporation of Ar

Back the Attack with War Bonc

Baker's Chemicals

C. P. ANALYZED • FINE • INDUSTRIAL



PUTTING THE "CATS" through their paces

Designed and built in the laboratory of the Porocel Corporation, this device for measurement of surface area is only one of several very specialized pieces of equipment that our research staff uses in studying catalysts and catalytic behavior.

As pioneer developers of bauxite catalysts and carriers, our research activities have two main purposes –

- **To protect the quality and uniformity of our products.**
- **To help the petroleum and chemical industries to use these products by improving known processes and developing new ones.**

Before figuring the costs of a new catalyst or reagent using adsorbent materials, it will pay you to consult our Technical Staff. We have developed a great many applications of the versatile materials described here, and co-operative study with interested organizations has uncovered other valuable uses.

Many things we've learned in our laboratory and field studies are available to you. We'll also be glad to send you generous samples and technical data. Just write us about your catalytic problems. Probably we can help.

POROCEL — A long-lasting, hard and granular activated bauxite, used as a catalyst, adsorbent and catalyst carrier.

ISOCEL — The easy-to-use prepared catalyst — selected bauxite impregnated with anhydrous aluminum chloride.

CYCLOCEL — A specially prepared granular bauxite used as a cracking and cyclization catalyst.

POROCEL CORPORATION • **BAUXITE ADSORBENTS AND CATALYSTS**

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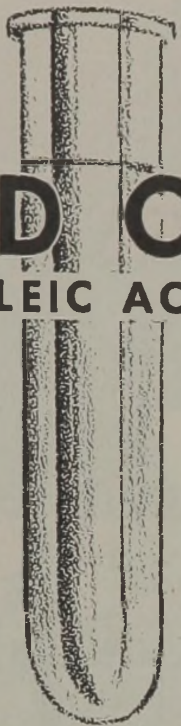
Diamond
Caustic Soda
$Na_2CO_3 + Ca(OH)_2 = 2NaOH + CaCO_3$
SODA ASH + LIME = CAUSTIC SODA + CALCIUM CARBONATE
VITAL IN WAR...
INDISPENSABLE IN PEACE!
A BASIC ALKALI PRODUCT THROUGHOUT INDUSTRY
PULP AND PAPER
In making pulp and paper, caustic soda is used for de-inking and reclamation of waste paper.
IRON AND STEEL
Caustic Soda removes undesirable impurities in the manufacture of iron and steel.
SOAP
Another huge consumer of caustic soda is the soap manufacturing industry
FOOD PROCESSING
A large tonnage use for caustic soda is in the lye peeling of root crops such as carrots, beets, potatoes.
IN THE HOME
Caustic Soda helps make many products used in the home—cellophane, paper, rubber, textiles, lye, soap, dehydrated foods.
TEXTILES
In addition to its use in making rayon, caustic soda is employed in numerous other textile processes.
CLEANING
Many commercial and industrial cleaners are made more effective by the use of caustic soda.
PETROLEUM
In petroleum refining, caustic soda is used to remove undesirable acids and other impurities.
CHEMICALS
Many chemical products and processes depend to a large extent upon caustic soda.
RAYON
The rapidly-growing rayon industry is now one of the greatest users of caustic soda.
RUBBER
Reclaiming of rubber has been materially aided by the use of caustic soda.
ALKALI
DIAMOND ALKALI COMPANY
PITTSBURGH, PA. AND EVERYWHERE



RED OIL
(OLEIC ACID)

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--and in the quality and quantity that you require

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Intensive research and long experience make HARDESTY *the* source of supply for Red Oil in many grade specifications and over a wide range of titres. Add to this HARDESTY'S production background, its oil specialists with their comprehensive knowledge of your problems, and you have a combination that's hard to beat.

Write for a sample and subject it to the most severe tests. We know you will find the results completely satisfactory, because HARDESTY Red Oil is of the same high quality as these other HARDESTY products: Stearic Acid, Glycerine, Hydrogenated Fatty Acids, Animal and Vegetable Distilled Fatty Acids, Pitch and White Oleine.

HARDESTY PRODUCTS

Stearic Acid
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Hydrogenated Fatty Acids
Animal and Vegetable Distilled Fatty Acids
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PRESCRIPTION FOR PROCESSING

Specially designed

CHEMICAL STONEWARE EQUIPMENT

While the General Ceramics line of *standard* chemical stoneware processing equipment is complete, industry's demands today are ever-widening. New processes, more complex designs in newly developed equipment, calls for unusual shapes and forms — these bring new needs which only specially-designed processing equipment can meet. Realizing this, the consulting and design department of General Ceramics Co. is prepared to function from blueprint to finished product . . . ready to produce to individual requirements all types of chemical equipment such as tank linings, mixers, reactors and towers in chemical stoneware or Cerawite porcelain.

Here is a seasoned and progressive planning board at your disposal, a closely-cooperating group consisting of experienced chemical engineers, and expert ceramicists. Here are technicians to help you with every equipment problem that cannot be solved by General Ceramic standard chemical stoneware products.

It is never too early to contact General Ceramics design consultants and lay before them your processing equipment problems. Their design and manufacturing service includes not only the ceramic ware but also all parts.

VISIT OUR EXHIBIT
Booth Nos. 160 and 166
National Chemical Exposition
Chicago Colosseum
November 15, 16, 17, 18, 19

GENERAL CERAMICS CO.

CHEMICAL STONEWARE DIVISION

KEASBEY, NEW JERSEY

Buffalo: 610 Jackson Building • Chicago: 20 N. Wacker Drive • Los Angeles: 415 So. Central Avenue • New York: 30 Broad Street
Portland: 3019 N. E. 26th Ave. • San Francisco: 598 Monadnock Bldg. • Seattle: 1411 Fourth Ave. • Spokane: 3219 Wellington Pl.
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High Frequency Insulation for the Electronics Industries

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Domestic and Institutional Sanitary Ware

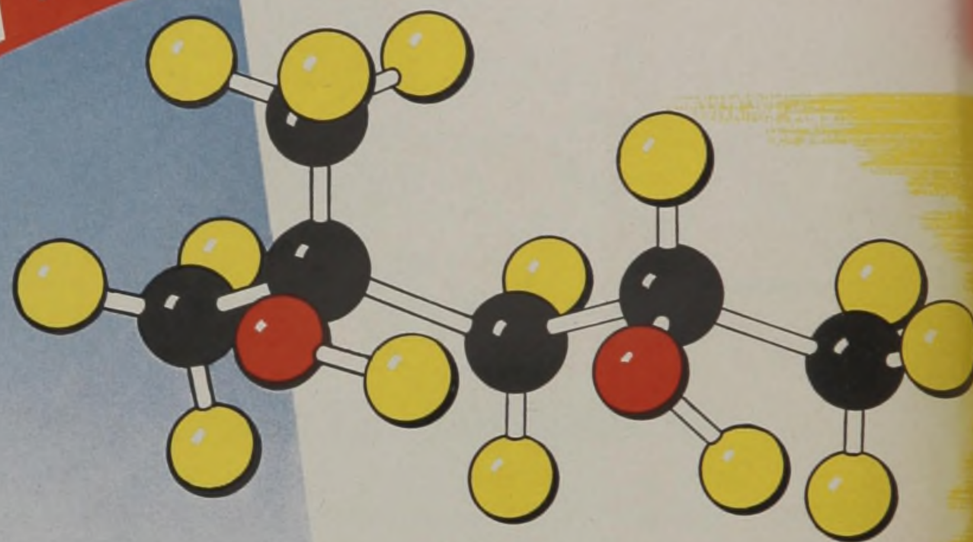
The manufacturing facilities of these affiliates of GENERAL CERAMICS CO. are available for handling ceramic problems in all branches of industry. GENERAL CERAMICS CO. is thus able to offer a service covering all industrial applications of ceramic products.

2-2-4

HIGH-BOILING SOLVENT
PENETRANT AND LUBRICANT
COUPLING OR BLENDING AGENT
MILD HUMECTANT

$(CH_3)_2COHCH_2CHOHCH_3$

2-Methyl-2,4-Pentanediol



Specifications

Specific Gravity:	0.921—0.924 at 20°/20°C 0.919—0.922 at 25°/25°C
Acidity:	0.005% Maximum as acetic acid
Color:	Water-white
Distillation Range:	Below 190°C—none Below 200°C—not less than 98%
Non-Volatile Matter:	Not more than 0.005 g per 100 cc
Water:	No turbidity when 1 volume is mixed with 19 volumes of 60° Bé gasoline at 20°C

Properties

Molecular Weight:	118.17
Water Solubility:	Miscible in all proportions
Weight per U. S. Gallon:	7.68 lbs. at 20°C
Refractive Index:	1.4282 at 20°C
Specific Heat:	0.44 at 20°C
Heat Capacity:	0.405 cal/cc/°C
Viscosity: (Saybolt Universal)	17.15 minutes at 32°F 2.85 minutes at 75°F
Flash Point:	94°C (201°F)
Melting Point:	Becomes semi-solid at -40°C with no crystal formation

PERHAPS THE MOST USEFUL property of 2-2-4 is its miscibility with an unusually large number of liquids of basically different chemical nature. This property . . . combined with its stability and mild odor . . . makes 2-2-4 an exceptionally valuable solvent. It is also useful as a coupling agent for blending otherwise immiscible liquids.

Whether or not your industry is listed among the "known uses," 2-2-4 might be the answer to your problem. May we send you samples and technical data on 2-2-4?

CSC

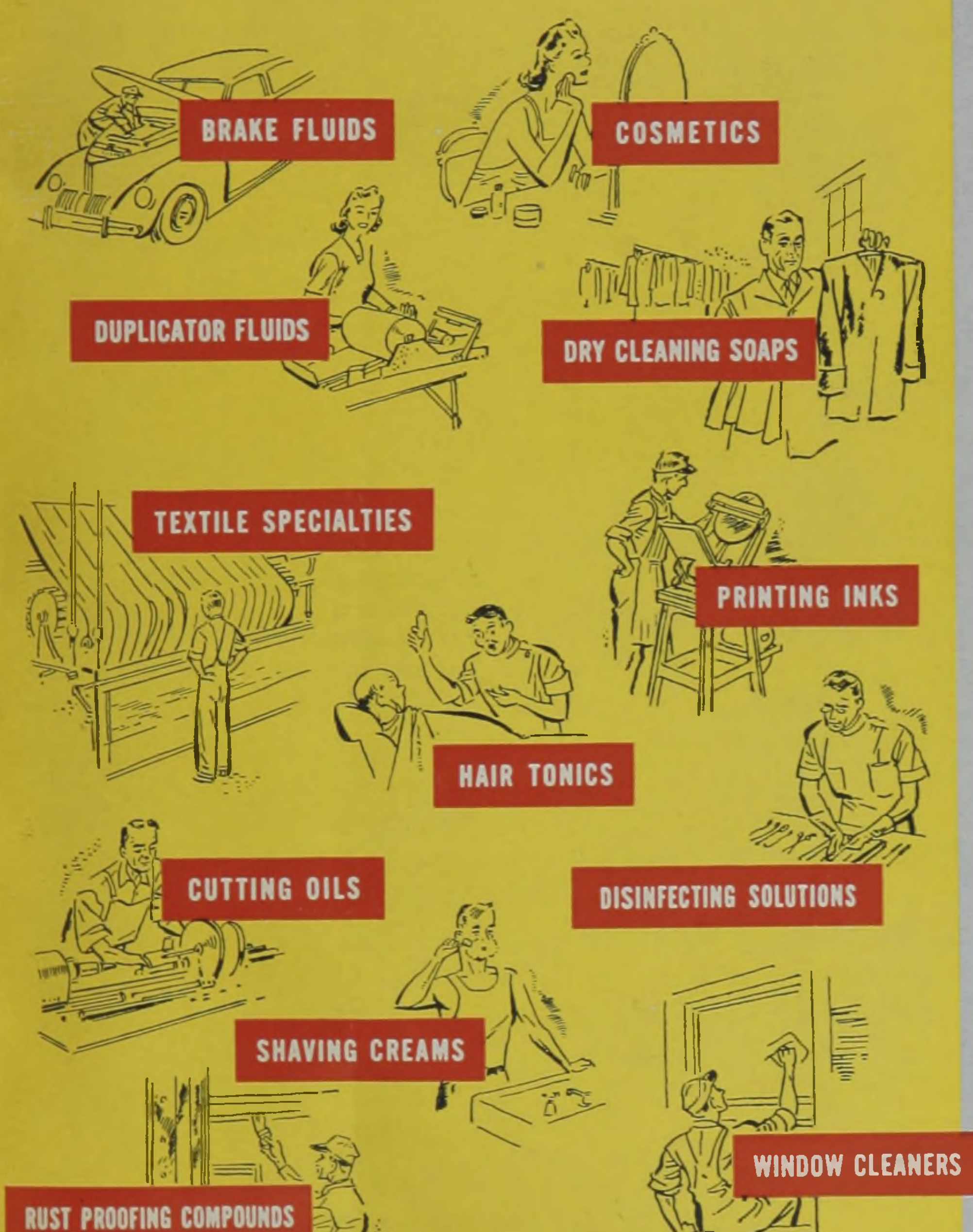
COMMERCIAL SOLVENTS
Corporation

17 East 42nd Street New York 17, N. Y.

THE SOLVENT PROPERTIES OF 2-2-4:

MAY Be The ANSWER

Known Uses for 2-2-4 include:



. . . also such products as electrolytic condensers, greases, grinding assistants, leather dressings, mercerizing assistants, metal cleaners, morticians' supplies, paper, soluble oils, surface-active agents, textile soaps, and printing pastes.

Substances Soluble in 2-2-4

Acetic Acid
Acetone
2-Amino-2-methyl-1-propanol
Ammonia (liquid)
Aniline

Benzaldehyde
Benzene
Benzyl Alcohol
Butyl Acetate
n-Butyl Ether
Butanol

Carbon Disulfide
Carbon Tetrachloride
Castor Oil
Chloroform
Cyclohexylamine

Diacetone
Dibutyl Phthalate
Dibutyl Sebacate
o-Dichlorobenzene
1,1-Dichloro-1-nitroethane
Diethylene Glycol
Diethylene Glycol Butyl Ether
1,4-Dioxane

Ethyl Acetate
Ethyl Alcohol
Ethyl Ether
Ethylene Dichloride
Ethylene Glycol
Eucalyptus Oil

Furfural

Glycerol

Isopropyl Alcohol
Isopropylamine

Mesityl Oxide
Methanol
Methyl Isobutyl Ketone
Morpholine

Naphtha (light)
Naphtha (Stoddard Solvent)
β-Naphthol
Nitrobenzene
Nitroethane
Nitromethane
1-Nitropropane
2-Nitropropane

Oleic Acid

Phenol
Phosphoric Acid (75%)

Tetrachlorethylene
Trichloroethylene
Triethanolamine
Triethylamine
Toluene
Turkey Red Oil

Substances Insoluble in 2-2-4

Beeswax

Carnauba Wax
Casein
Ceresin (Ozokerite)
Ceresin (Synthetic)

Dextrose

Ethyl Cellulose

Nitrocellulose

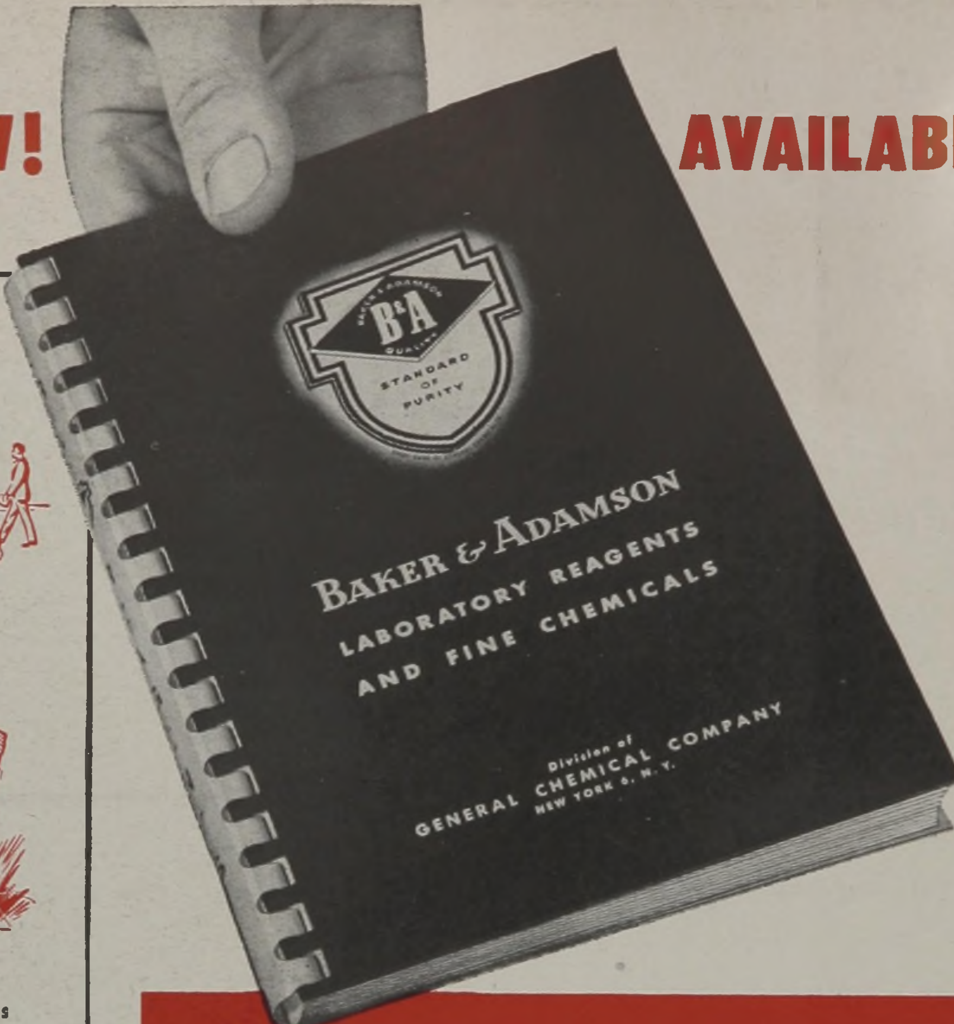
Parlon

Rezyl 19
Rezyl 412

Sorbitol
Sulfamic Acid

Zein

NEW! AVAILABLE NOW!



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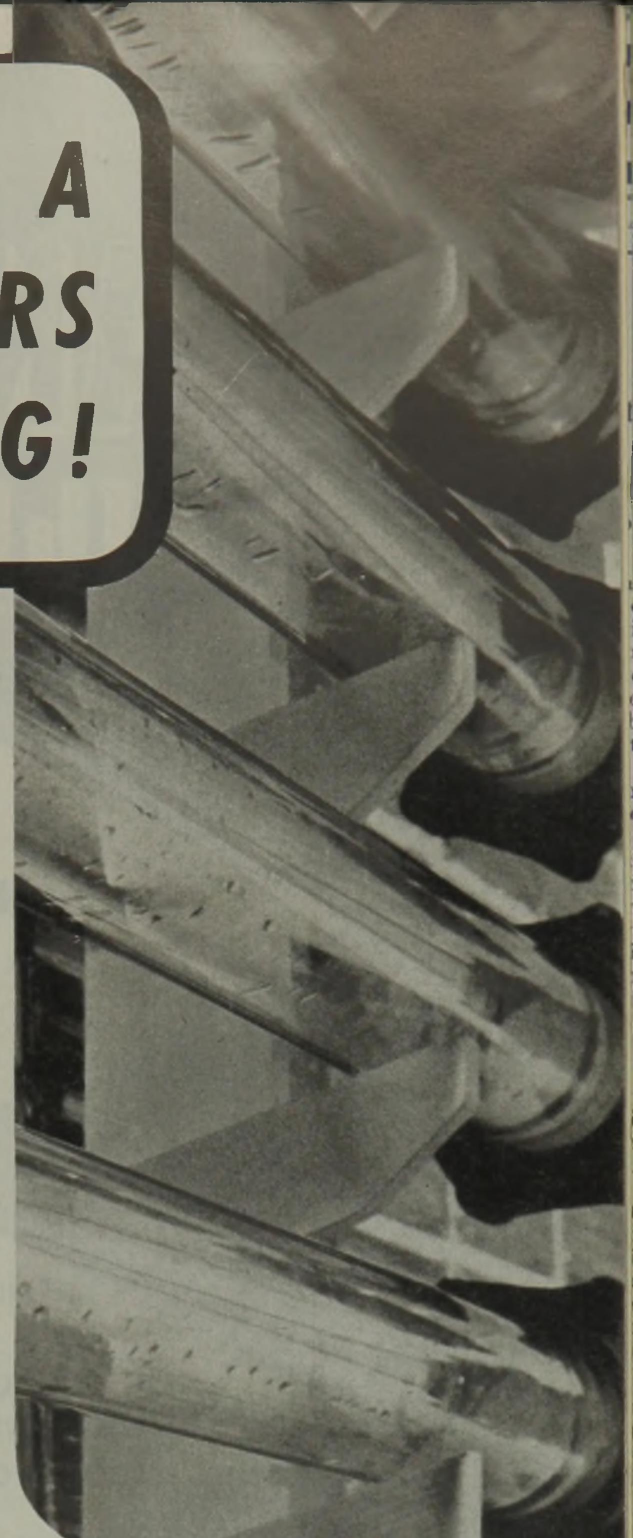
Breakage IS NOT A PROBLEM TO USERS OF PYREX PIPING!



The many users of PYREX Brand Piping will tell you that they do not worry about breakage. To them, the slight extra care required in handling is more than offset by its many advantages.

Here's what any of them will tell you—"Just follow the simple instructions in Corning's installation bulletin . . . see that supports are provided at proper intervals . . . as you would with any other piping. If it has to be exposed to exceptional hazards at some points, see that it is protected as recommended.

"Once your PYREX pipe line is properly installed you can look forward to long, trouble-free service . . . plus the advantages of resistance to corrosion from all acids except HF, uninterrupted transparency and resistance to mechanical and thermal shock . . . a combination of qualities offered by no other material. Even, positive cleaning . . . a simple flushing procedure with hot water, steam and a mild alkaline detergent . . . is easy on the line."

If you have any process that can be handled better or more economically in PYREX Piping, you can safely take the advice of these users . . . and cross out the problem of breakage. For further proof of what PYREX Piping can do for you, write Industrial Sales Dept., CI11, Corning Glass Works, Corning, N. Y.

"CORNING" and "PYREX" are registered trademarks and indicate manufacture by Corning Glass Works, Corning, New York.

CORNING
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Pyrex Industrial Glass

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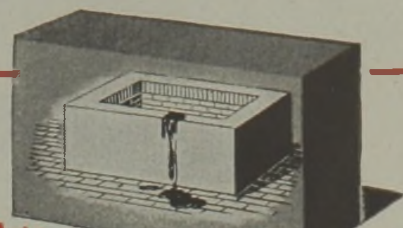
Having Floor Trouble?

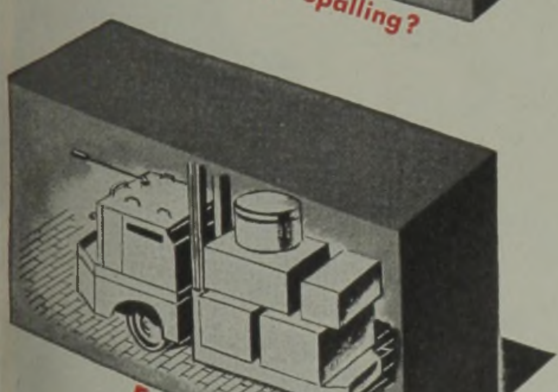
LOOK WHAT "NATIONAL" CARBON BRICK FLOORING CAN DO FOR YOU!



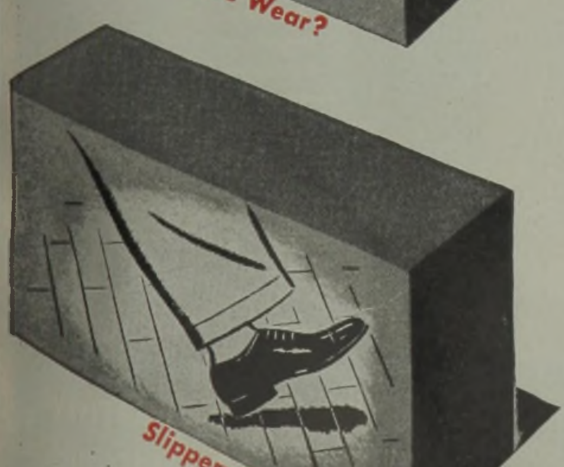
Acid, Solvent, Alkali Damage?

Static Dangers?

Sticking? Spalling?



Excessive Wear?



Slippery?

FOUNDRIES, glass works, chemical and processing plants, steel mills! These are a few of the places where industrial flooring may fail from reaction to acids, solvents, alkalies, and other severe conditions.

"National" carbon brick floors, set with "National" carbonaceous cements, are solving such difficult floor problems for more and more manufacturers. For "National" carbon brick is resistant to practically all acids (notably hydrofluoric), alkalies and other corrosive chemicals. It is not wet by molten metals or glass, preventing sticking. And its negligible coefficient of expansion eliminates spalling and cracking under extreme thermal shock.

Carbon's no-static property helps to add protection from fire and explosion. It is light in weight. It has a non-slippery surface. Its strength assures long life under heavy duty.

No other practical floor material provides all these advantages.

The Chief Engineer* of a nationally known glass manufacturing company states: *"The ["National"] carbon brick flooring in use in our plant is giving excellent service under severe conditions where no other type of flooring previously used proved satisfactory."*
*Name on request.

Keep your eye on the infantry . . . the Doughboy does it!

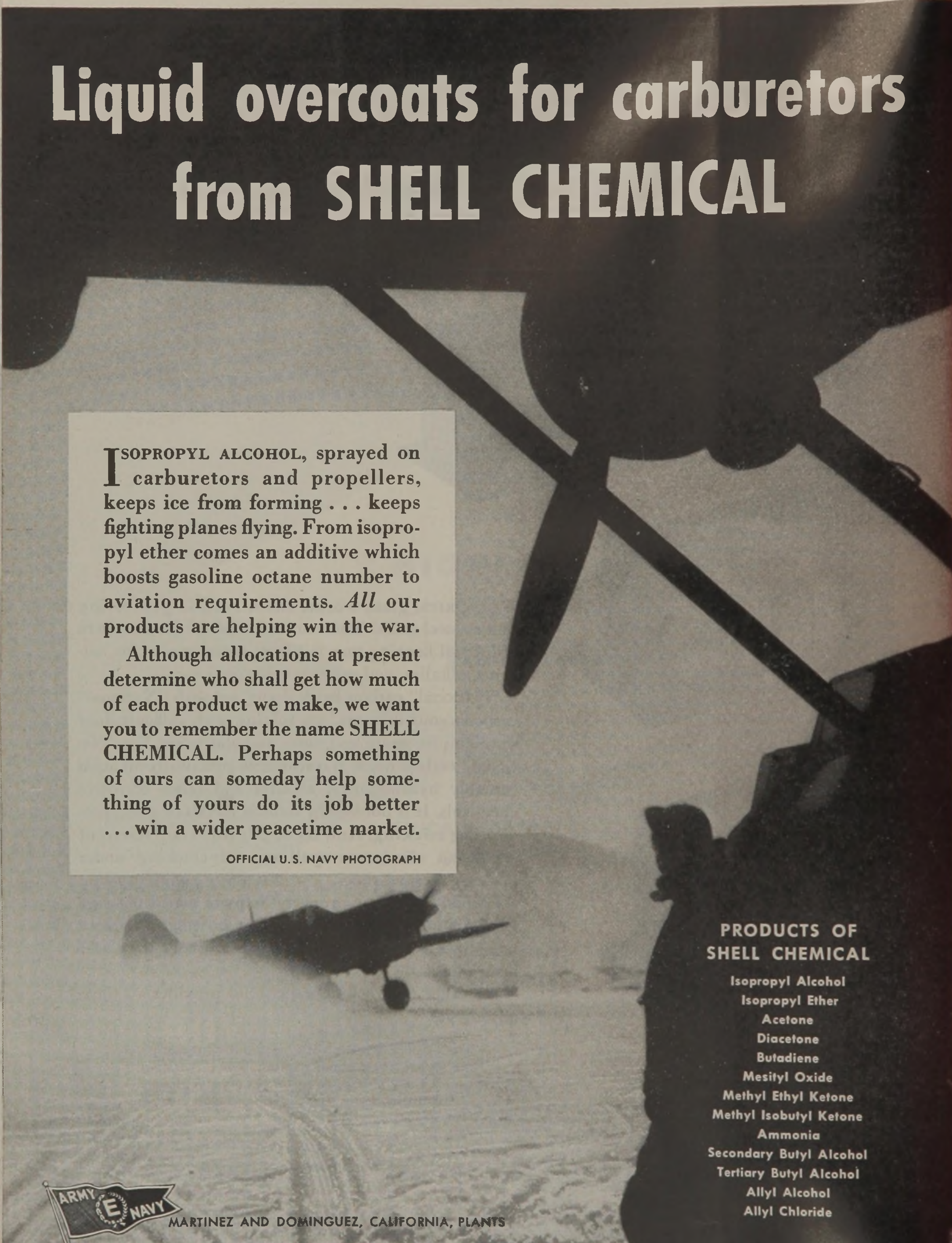
NATIONAL CARBON COMPANY, INC.
Unit of Union Carbide and Carbon Corporation

UCC

General Offices: 30 East 42nd Street, New York 17, N. Y.
Division Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco

The word "National" is a registered trade-mark of National Carbon Company, Inc.

Liquid overcoats for carburetors from SHELL CHEMICAL



ISOPROPYL ALCOHOL, sprayed on carburetors and propellers, keeps ice from forming . . . keeps fighting planes flying. From isopropyl ether comes an additive which boosts gasoline octane number to aviation requirements. *All* our products are helping win the war.

Although allocations at present determine who shall get how much of each product we make, we want you to remember the name SHELL CHEMICAL. Perhaps something of ours can someday help something of yours do its job better . . . win a wider peacetime market.

OFFICIAL U. S. NAVY PHOTOGRAPH

PRODUCTS OF SHELL CHEMICAL

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Diacetone
Butadiene
Mesityl Oxide
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Methyl Isobutyl Ketone
Ammonia
Secondary Butyl Alcohol
Tertiary Butyl Alcohol
Allyl Alcohol
Allyl Chloride

ARMY E NAVY

MARTINEZ AND DOMINGUEZ, CALIFORNIA, PLANTS

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The villain of this film threatens *your* plant, too!

FIRE, the saboteur, can destroy your plant—even though you've installed the most modern fire-fighting equipment! If your men don't know how to operate it, or if they use the "right" equipment against the wrong fire, disaster can easily result.

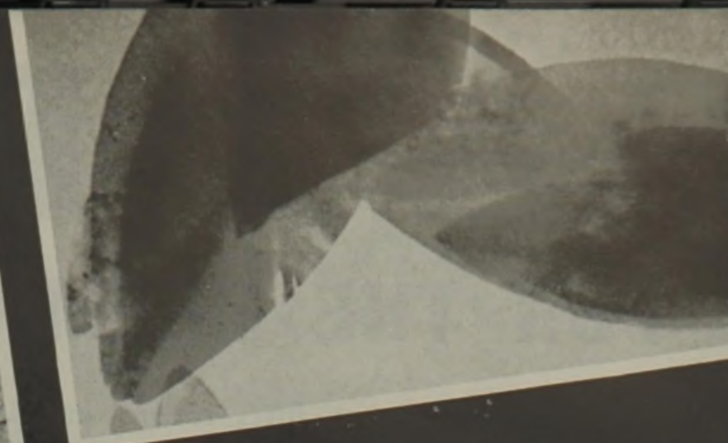
Believing that visual instruction is easiest understood, longest remembered, Walter Kidde & Company have produced a color film with sound. It shows exactly what to do when fire strikes. It pictures the different classes of fire, shows how to fight each of them. It's fast-moving, grips the attention of its audience during the twenty minutes of its run.

We'd be glad to show this film to key men at *your* organization. There is no obligation whatever for this service. Just drop a line today to the address below and we'll arrange a showing at your convenience.

Kidde

WALTER KIDDE & COMPANY, INC. 140 CEDAR STREET, NEW YORK 6, N. Y.


the RCA ELECTRON MICROSCOPE
for RESEARCH ANALYSIS PRODUCTION



Buy More War Bonds

At Work for Chemists and Metallurgists

...the RCA ELECTRON MICROSCOPE

Prominently featured in some of the most interesting papers presented this year have been slides made from micrographs taken with the RCA Electron Microscope.

Advances in the technique of preparing surface replicas for study with this instrument have opened the way to important metallurgical disclosures.

In process industries discoveries made have led to substantial improvements in product quality and process control.

Extreme resolving power and depth of focus are characteristic of the RCA Electron Microscope. These, together with its great range of magnification, are shown in the micrographs here reproduced.

Two Models Have Been Developed

Two models of the RCA Electron Microscope have been developed: one, a large "Universal" Model (Type EMU); the other, a smaller, lower-priced "Console" Model (Type EMC). Descriptions and specifications of both, with many interesting illustrations, are contained in a new RCA Bulletin now ready. Write for your copy. Address Department 200.

1919
1944

RCA

25 Years of Progr
In Radio
and Electronics

RADIO CORPORATION OF AMERICA

RCA VICTOR DIVISION • CAMDEN, N. J.

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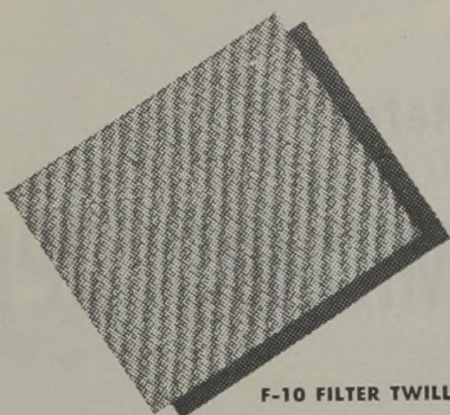
RCA VICTOR COMPANY LIMITED, MONTREAL

FABRICS

FOR THE CHEMICAL INDUSTRY

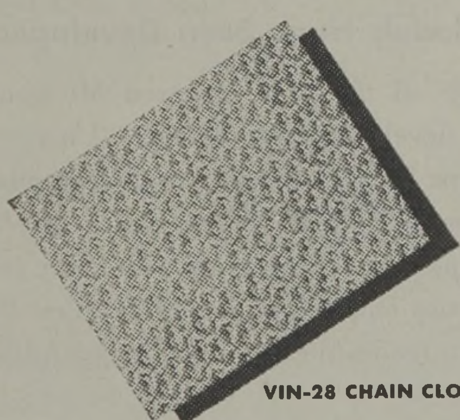
Long experience with filter fabrics enables us to meet the individual needs of processing operations carried out under widely varied conditions. Where a standard fabric does not meet a particular requirement, we frequently are able to develop a special construction. Our laboratories are always available for consultation with chemical engineers and manufacturers.



F-10 FILTER TWILL

COTTON FILTER FABRICS

The eighteen mills we represent maintain such close laboratory control that a consistent uniformity of each individual product can be relied upon.

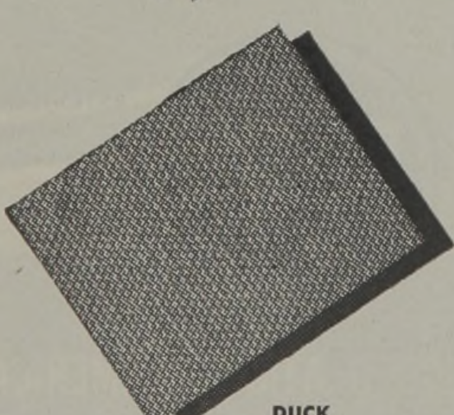


VIN-28 CHAIN CLOTH

"VINYON"* FIBER FILTER FABRICS

Filter fabrics of this synthetic fiber are highly resistant to mineral acids and alkalies, and therefore offer important advantages where ordinary filter blankets are short-lived. Due to the fact that "Vinyon" fibers have definite heat limitations, we suggest that our engineers be given an opportunity to discuss their application to your particular filtration process.

* Reg. Trade Mark C. & C. C. C.



DUCK

FABRICS FOR PLASTICS

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HOOKER CHEMICALS

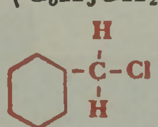
Where You Want the Benzyl, Benzal or Benzoyl Group, Choose from these Hooker Intermediates

Purity, chemical activity, ease of handling and comparative costs are some of the factors which should influence the choice of a chemical intermediate.

Where you need to incorporate a benzyl, benzal or benzoyl group into your product, Hooker gives you an opportunity of balancing these factors against chemical characteristics from a number of intermediates. Among Hooker chlortoluene compounds and derivatives, there are two chemicals that provide the benzyl group, one—the benzal group and four—the benzoyl group. From them we can help you select the one which best meets your requirements on all counts.

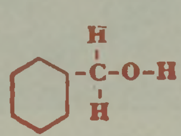
For the Benzyl Group ($C_6H_5CH_2$)–

BENZYL CHLORIDE, $C_6H_5CH_2Cl$



May be used in Friedel-Crafts reactions, may be reacted with alcohols in presence of caustic soda to produce mixed ethers; to introduce benzyl group in amino compounds; will react with sodium cyanide to form benzyl cyanide or phenyl acetonitrile; reacts with sodium sulfhydrate to form benzyl mercaptan; reacts with sodium sulfide to form benzyl sulfide. Produces esters with sodium salts of acids.

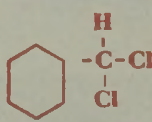
BENZYL ALCOHOL, $C_6H_5CH_2OH$



Reacts with some alcohols in presence of dehydrating agent such as sulfuric acid to produce ethers. Produces esters with acids, acid anhydrides or acid chlorides. Reacts with acetyl chloride to produce benzyl acetate.

For the Benzal Group (C_6H_5CH)=

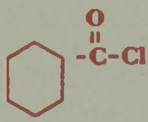
BENZAL CHLORIDE, $C_6H_5CHCl_2$



Reacts with water to form benzaldehyde. May be used in Friedel-Crafts reactions as source of chloro group in production of triphenyl methane derivatives.

For the Benzoyl Group (C_6H_5CO)–

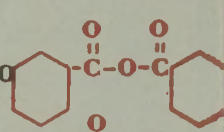
BENZOYL CHLORIDE, C_6H_5COCl



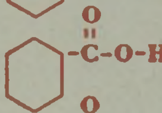
May be reacted with alcohols to produce esters. May be used in Friedel-Crafts reactions to produce ketones. Reacts with ammonia to form benzamide. Reacts with amines to give benzoyl substituted products.

Benzoyl Chloride is the most reactive chemical of the Hooker Benzoyl compounds. However, the following are also sources for the Benzoyl Group, and may be preferable in some cases:

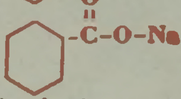
BENZOIC ANHYDRIDE, $(C_6H_5CO)_2O$



BENZOIC ACID, C_6H_5COOH



BENZOATE OF SODA, C_6H_5COONa



When requesting Bulletin 320, containing further information on these Hooker chemicals, please write on your letterhead.

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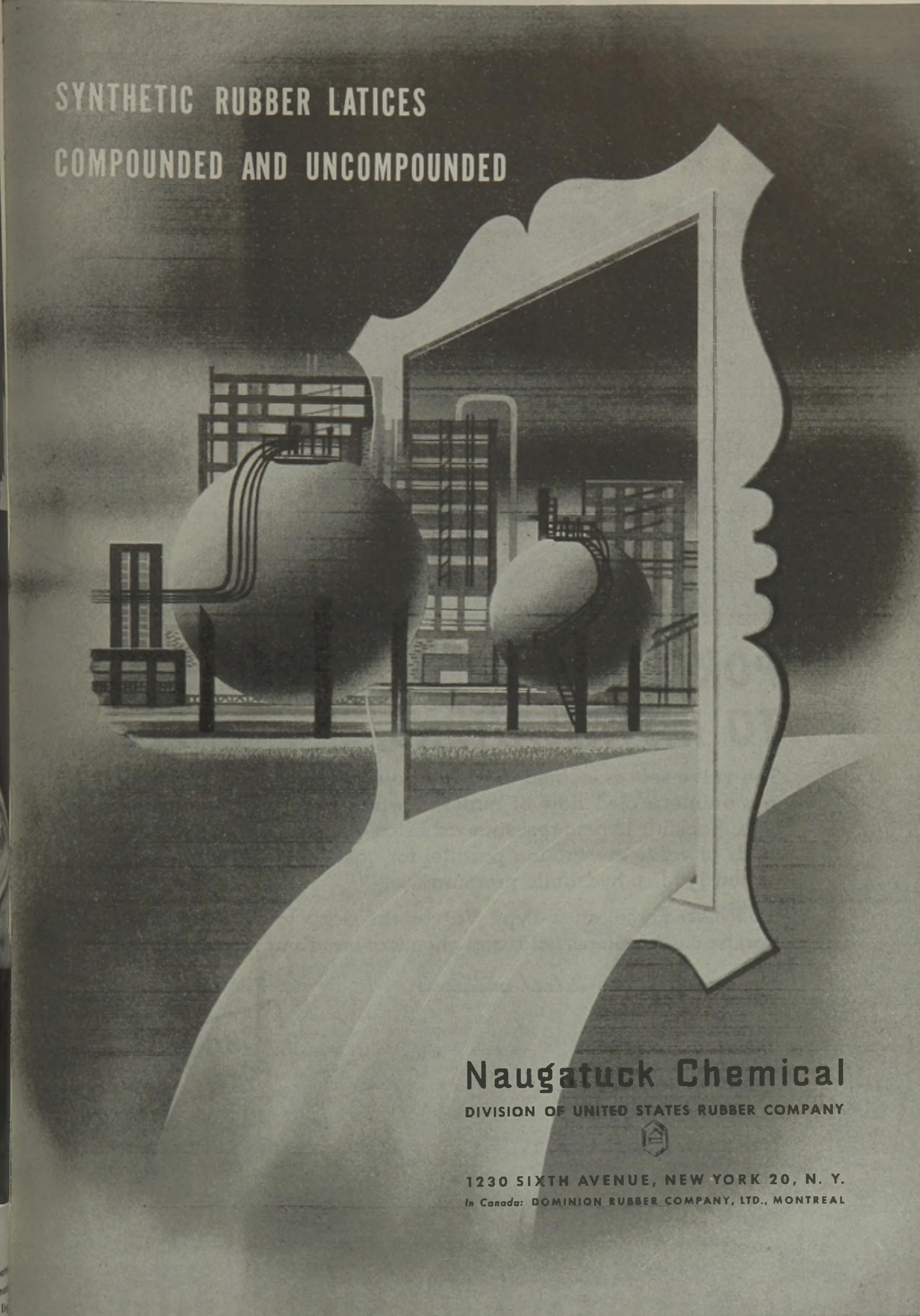
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Naugatuck Chemical
DIVISION OF UNITED STATES RUBBER COMPANY
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The valve seat is located in lowest possible position so that you get uninterrupted flow of material when stem is in open position. Packing is acid-resisting asbestos—graphite impregnated. Ends of valve are ground parallel for gasketing. All valves are tested 100 lbs. hydraulic pressure.

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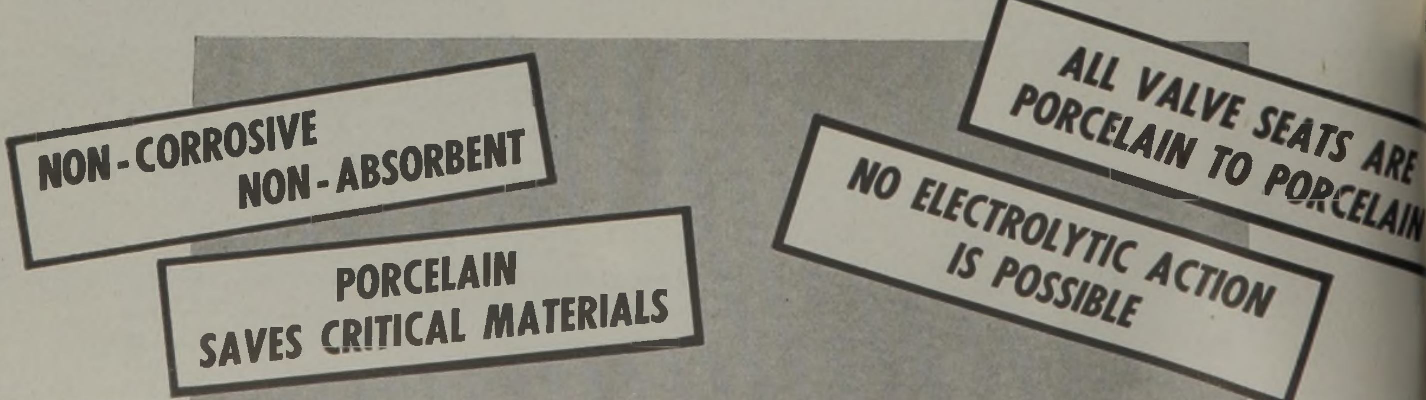

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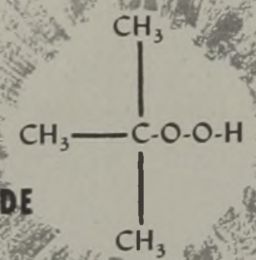
Two PEROXIDES *with Interesting Possibilities*

*

t-BUTYL HYDROPEROXIDE



GENERAL DESCRIPTION

A new, organic, alkyl peroxide which offers extremely interesting possibilities. It is standardized at a concentration of 60% (10.66% available oxygen). Use of the proper activators increases the rate of release of the oxygen.

SUGGESTED USES

1. As a catalytic agent in one or two phase polymerizations. **t-Butyl Hydroperoxide has proved to be an excellent catalyst for polymerizing Styrene, as well as certain Elastomers such as Buna S.**
2. As an accelerator in the curing of snythetic resins.
3. As an accelerator in the vulcanization of certain synthetic rubbers.
4. As an oxidation agent for laboratory purposes
5. As a drying accelerator in oils, paint, varnishes, etc.
6. As a combustion accelerator for heavy fuel oils used in Diesel engines.

PROPERTIES

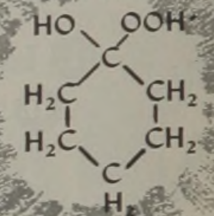
Molecular Weight		90
Specific Gravity @ 25° C. (60% concentration)		0.859
Boiling Range	"	90° to 107° C.
Freezing Point	"	−35° to −36° C.
Flash Point	"	18.3° C.
Refractive Index @ 25° C. (60% concentration)		1.3960
Available Oxygen	"	10.66%
Color	"	Water White
pH of 1 part 60% Conc. in 10 parts water		4
Stability	Completely stable up to 76.6° C.	
Solubility:	60% concentration in water	11%
	Water in 60% concentration	5%
	In short chain aliphatics	Excellent
	In aromatics	Excellent

ACTIVATORS

Benzoquinone and other similar organic reducing agents have proved to be efficient secondary catalysts in polymerization reactions (when used in quantities up to 0.1% of *t*-Butyl Hydroperoxide), greatly increasing the efficiency of polymerization. When use requires quick release of oxygen, the same proportions of Benzoquinone mentioned above have proved efficient.

*

1-HYDROXYCYCLOHEXYL HYDROPEROXIDE-1



GENERAL DESCRIPTION

A new, organic, cycloalkanyl peroxide in white crystalline solid form that is extremely stable at room temperature and possesses 12.13% active oxygen.

POSSIBLE USES

1. As a Mild oxydizing agent.
2. As a catalyst for various polymerizations.
3. As a bleaching agent.
4. As a drying accelerator in paints, oils and varnishes.
5. As the ingredient source of active oxygen in face creams and similar products.

PROPERTIES

Molecular Weight		132
Melting Point		76-78° C.
Active Oxygen		12.13%
Stability:	Excellent at room temperatures. Explodes only mildly when heated over a flame on a steel spatula.	
Solubility:	Soluble in organic solvents. Insoluble in water.	

Both of these interesting peroxides are nearly as new to us as they doubtless are to you. We have given above practically all the technical information concerning them known at present. *t*-Butyl Hydroperoxide is now in limited commercial production, and samples will be gladly sent anyone interested in investigating its possibilities. 1-Hydroxycyclohexyl Hydroperoxide-1 has been produced successfully in our laboratory on a small scale and can be made in commercial quantities if there is sufficient interest in the product. Samples will be gladly made up upon request. Address all inquiries to the Union Bay State Chemical Company, Peroxide Division, 50 Harvard Street, Cambridge 42, Massachusetts.

* U. S. Pats. 2176407,2223807 & 2298405

UBS

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UNION BAY STATE *Chemical Company*

Sharples Research... PIONEERING FOR THE FUTURE

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IN THE field of Organic Chemicals, Sharples Research has pioneered in the development of commercial processes for the manufacture of many alkylamines.

Each of the amines listed below is a water white liquid of over 95% purity. All are soluble in water and most common organic solvents. Typical of this class, these amines undergo a wide variety of reactions. As examples, they react with aldehydes, ketones, carbon bisulfide, phosgene, chlorohydrins, sulfonchlorides, hydroxyaromatics, organic acids and anhydrides, cyanic acid, thiocyanic acid and alkyl or aryl isocyanates.

Because of their versatility it is suggested that these amines be considered for the following applications: synthesis of pharmaceuticals and dyestuffs, preparation of textile assistants, emulsifying agents for floor waxes and emulsion paints. Isobutylamine may be of interest for the preparation of insecticides. Other applications may be suggested by the properties below and samples will be sent gladly upon receipt of your request on company letterhead.

These products are available in only limited quantities at present but larger scale production can be undertaken when conditions warrant and permit.

SHARPLES TRADE MARK CHEMICALS

MONO-ALKYL AMINES

Name	Formula	Molecular Weight	Boiling Range ° C.	Sp. Gr. 20/20°	Refractive Index at 20° C.
Propylamine	$CH_3CH_2CH_2NH_2$	59.1	46-51	0.718	1.389
Isopropylamine	$(CH_3)_2CHNH_2$	59.1	31-35	0.690	1.376
sec-Butylamine	$CH_3CH_2CH(NH_2)CH_3$	73.1	62-69	0.725	1.394
Isobutylamine	$(CH_3)_2CHCH_2NH_2$	73.1	66-69	0.731	1.398

ARMY (E) NAVY

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PENTASOL (AMYL ALCOHOLS)
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BURAMINE (CRUDE BUTYL UREA)
PENTAPHEN (p-tert-AMYL PHENOL)
o-AMYL PHENOL — DIAMYL PHENOL
DIAMYLPHENOXY ETHANOL
MONOAMYLAMINE — DIAMYLAMINE — TRIAMYLAMINE
MONOBUTYLAMINE — DIBUTYLAMINE — TRIBUTYLAMINE
MONOETHYLAMINE — DIETHYLAMINE — TRIETHYLAMINE
DIETHYLAMINOETHANOL
ETHYL MONOETHANOLAMINE — ETHYL DIETHANOLAMINE
MIXED ETHYL ETHANOLAMINES
DIBUTYLAMINOETHANOL
BUTYL MONOETHANOLAMINE — BUTYL DIETHANOLAMINE
MIXED BUTYL ETHANOLAMINES
MIXED AMYL CHLORIDES — DICHLOROPENTANES
AMYL NAPHTHALENES — MIXED AMYLENES

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The facilities and the know-how that have made Malmstrom America's Largest Supplier of Lanolin and Degras are available to you, together with samples, should you prefer to conduct your own tests.

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4. SMOOTHER *TEXTURE*
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From the start, The Harshaw Chemical Company participated in this enormous job by supplying catalysts for ALKYLATION, ISOMERIZATION, DEHYDROGENATION, HYDROFORMING, HYDROGENATION, POLYMERIZATION, DEHYDRATION.

The potential uses for catalysts are unlimited. All indications point to increased possibilities for wider industrial uses in manufacturing applications not yet explored.

Samples are available for test purposes.

TYPICAL CATALYSTS

Anhydrous Hydrofluoric Acid • Aluminum Chloride
Boron Trifluoride • Anhydrous Hydrochloric Acid

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Magnesia	Titanium
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CHLORINATED SOLVENTS

THESE PRODUCTS are stable, rapid, penetrating fluids, quick and efficient extraction agents. They mix readily with each other and with benzol, petroleum distillates, alcohol, acetone and many other organic solvents. Each chlorohydrocarbon in this series has a definite boiling point, the lowest in the series boiling at—23.7°C. and the highest at 161.9°C., a range not approached by any other related group of non-flammable or moderately flammable solvents.

THE NON-FLAMMABLE NATURE, selective solvent power and stability of the Du Pont Chlorinated Solvents offer excellent possibilities for many types of industrial work. All are powerful solvents which, for many applications, have already found a place in modern industry.

SELECTIVE SOLVENT ACTION—These solvents readily dissolve oils, fats, waxes, tars, natural resins, free alkaloids and are miscible with alcohol, ether and other ordinary organic solvents. Sugars, alkaloid salts, ordinary plant acids, and water are insoluble or practically insoluble in these solvents.

ASY RECOVERY—They can be removed readily and economically without decomposition from extracted residues by distillation or filtration.

APPLICATIONS AND USES

METAL DEGREASING—Trichlorethylene and, to some extent, perchlorethylene are used in specially designed and constructed equipment for vapor degreasing of metals. Among the many factors leading to the selection of trichlorethylene for hot solvent degreasing are non-flammability, low latent heat, ideal boiling point, low solvent loss under conditions of use, and high stability even in the presence of water. Du Pont solvents for metal degreasing are supplied nationally through distributors. Consult our district offices for information about nearest source of supply and availability.

RY CLEANING—Trichlorethylene, perchlorethylene and carbon tetrachloride are in common use as dry cleaning solvents.

EXTRACTION—Most of the chlorinated hydrocarbons find use in the extraction field, the selection of the solvent depending upon many factors such as solubility of the material being extracted, cost, flammability, stability, and nature of extraction process. Some important examples are methylene chloride for cocoa butter; chloroform for medicinals, carbon tetrachloride for oils and fats from substantially dry materials; trichlorethylene for soy bean oil and alkaloids. Methylene chloride is particularly suited for low-temperature extraction of materials such as essential oils and edible fats which are adversely affected by higher temperatures. Like trichlorethylene, it has sufficiently high stability in the presence of water to permit its complete removal from extracted oils by steam distillation.

MISCELLANEOUS USES

Methyl chloride is used as a refrigerant and as a low boiling solvent. Methylene chloride has excellent oil dewaxing properties. It is a highly efficient paint remover and is particularly valuable for this purpose because of its non-flammability. Chloroform is being utilized in vitamin and penicillin manufacture. Carbon tetrachloride finds wide use as a spotting solvent and also for small-scale cold cleaning of metals. Trichlorethylene is used for spotting, paint removal, wool degreasing and oil dewaxing. Perchlorethylene is used as a rubber solvent, while tetrachlorethane and pentachlorethane find use as chemical intermediates and in special solvent applications.

* * *

At present, supplies of these solvents have been allocated or restricted to military or essential civilian uses. Small quantities are available, however, for research and development purposes. Write for complete data. E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

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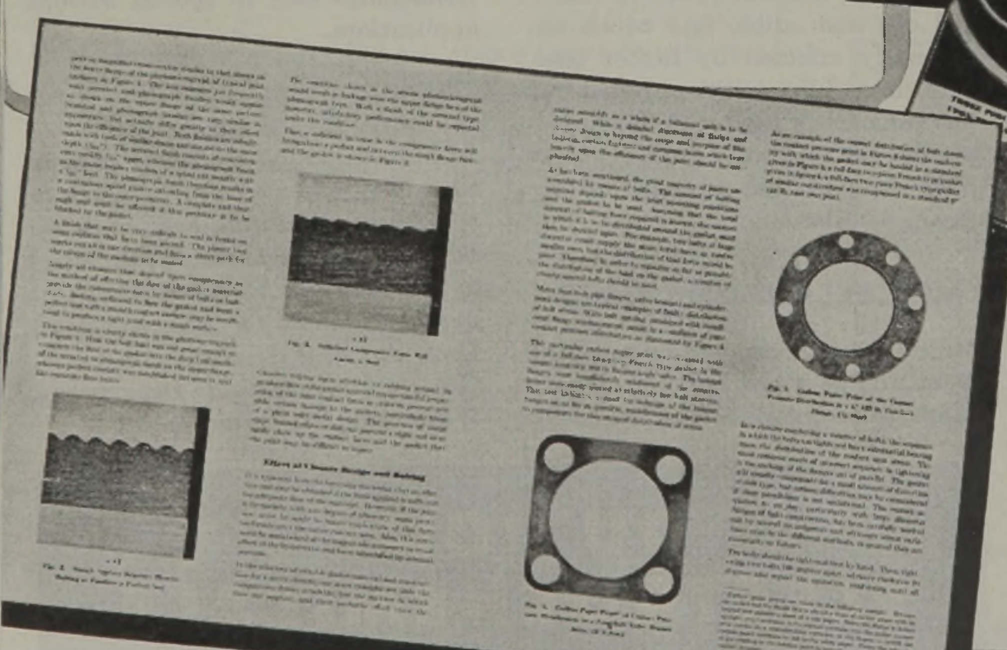

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POST-WAR developers are taking a close-up view of PQ soluble silicates and their properties.

In the catalog of 50 grades are liquids, solids and powders which range from $3Na_2O$, $2SiO_2$ to Na_2O, $3.9SiO_2$. The ariety is worth remembering for they rovide an interesting array of characteristics useful to industry. Bul. 1703 mailed free on request reviews the pertinent facts of properties, grades and uses as adhesives, binders, detergents, gels, colloids, inhibitors, coagulants.

You may already be working with a product or process which involves a sodium or potassium soluble silicate. Then make use of our silicate information service for data on your specific problem. PQ "know-how" of silicate manufacture and application technique has been accumulating for over 75 years. The many references to silicates in patents and literature in our files are a time-saver and help to investigators. This background is worth remembering too.

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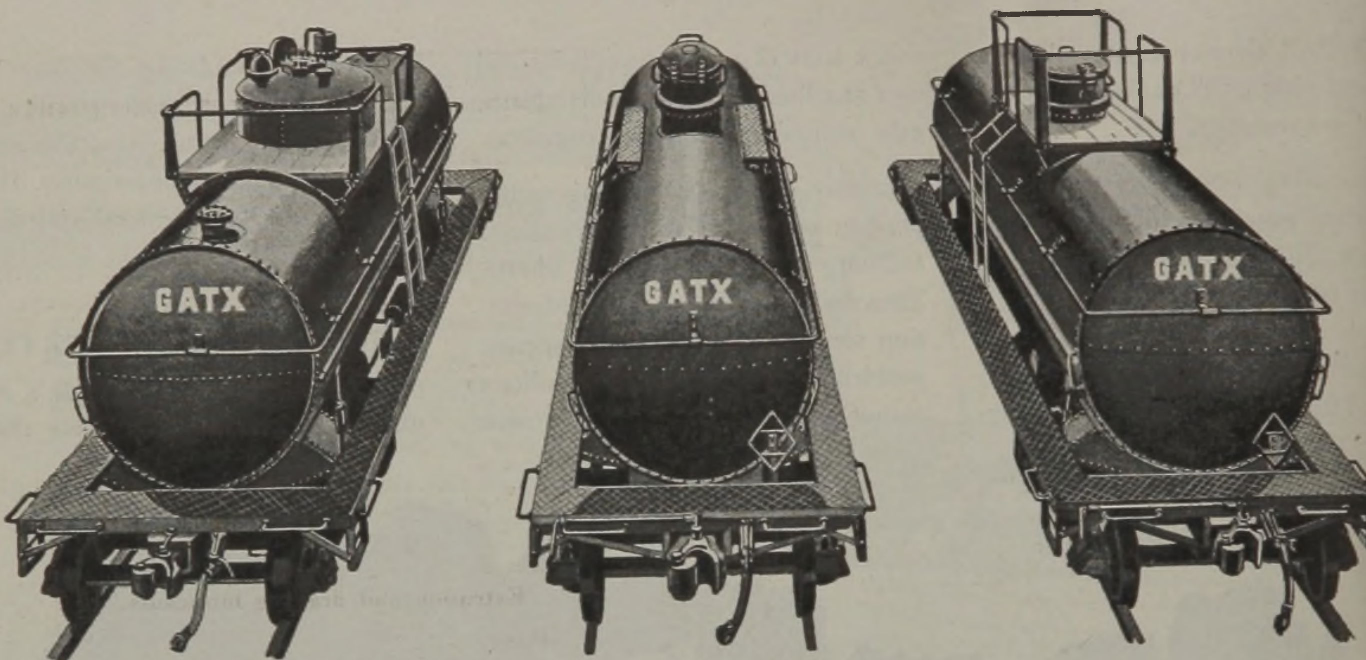

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New Lower Prices For Polyethylene Glycols and "Carbowax" Compounds

These glycols

- Are chemically stable
- Have a broad range of hygroscopicities
- Are soluble in water
- . . . and are available in consistencies ranging from liquids to waxy solids resembling petrolatum or paraffin.

● At their new lower prices, "Carbowax" Compounds—solid polyethylene glycols—and liquid Polyethylene Glycols should be even more popular as lubricants, binders, plasticizers, or thickening agents... applications where they are often superior to many natural oils, gums, and waxes ordinarily used.

Chemically, Polyethylene Glycols can be modified by reacting the hydroxyl groups to form surface-active compounds useful as detergents, and emulsifying agents, or unusual alkyd resins.

The "Carbowax" Compounds are solids supplied in five different molecular weights ranging from 1000 to several thousand. The liquid Polyethylene Glycols are available in four molecular weights from 200 to 600. Almost any desired consistency can be obtained by blending them.

Write for further information on the physical properties, uses, and new lower prices of the Polyethylene Glycols and "Carbowax" Compounds.

Some Commercial Applications of Polyethylene Glycols and "CARBOWAX" Compounds

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Color binder and vehicle, mold lubricant, modifier for cements and plaster.

Agriculture
Binders, carriers, and spreaders for plant hormones, fertilizers, larvicides, and insecticides.

Leather
Polishes; cleaners; dye penetrant; dressing agent.

Metal
Extrusion and drawing lubricants.

Paper
Coating, softening, and sizing agents; plasticizer for zein coatings.

Pharmaceuticals
Carrier and solvent for hormone, sulfa drug, peroxide, and other ointments.

Photography
Film lubricant.

Polishes
Lubricant and film-former; spreading agent.

Pigments and Paints
Carrier and dispersing agent.

Rubber
Mold lubricants; compounding wax; activator for mercapto-type accelerators.

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Lubricant: dispersant for dyes; finishing agent; sizing compounds; detergent intermediate.

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Unit of Union Carbide and Carbon Corporation
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Carbowax" is a registered trade-mark of Carbide and Carbon Chemicals Corporation.
he term "Polyethylene Glycols" refers to those Polyethylene Glycols higher than triethylene glycol.

Celanese* Chemicals

In decompression chambers for pilot training the rarefied atmosphere of high altitude is reproduced and students learn to handle their oxygen masks. With the possibility of free oxygen being present it is imperative that the lubricant in the vacuum pumps be safe. Lindol* is used because, in addition to being an excellent lubricant, it is non-oxidizing, non-flammable and non-corrosive.

CELANESE CORPORATION OF AMERICA

"...in terms of properties and characteristics desired..."

'HE HIGHER DEVELOPMENT of synthetics has hanged many conventional industrial buying hab-s. The idea of taking "next best" when no standard iemical compound offered the exact properties and iaracteristics desired is passing out of the picture.

From the founding of Celanese Corporation of .merica, Celanese research has recognized the full ossibilities of synthetics. The basic idea that syn-ietics can meet specific needs *with precision* nounts to a creed.

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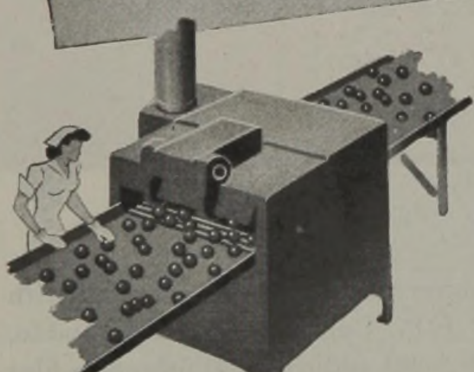

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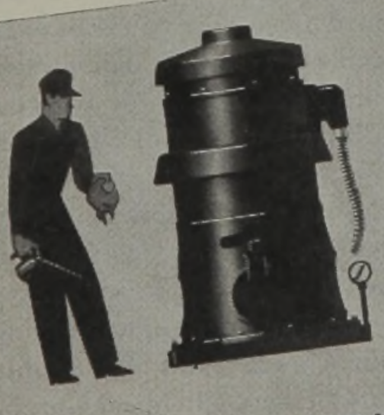

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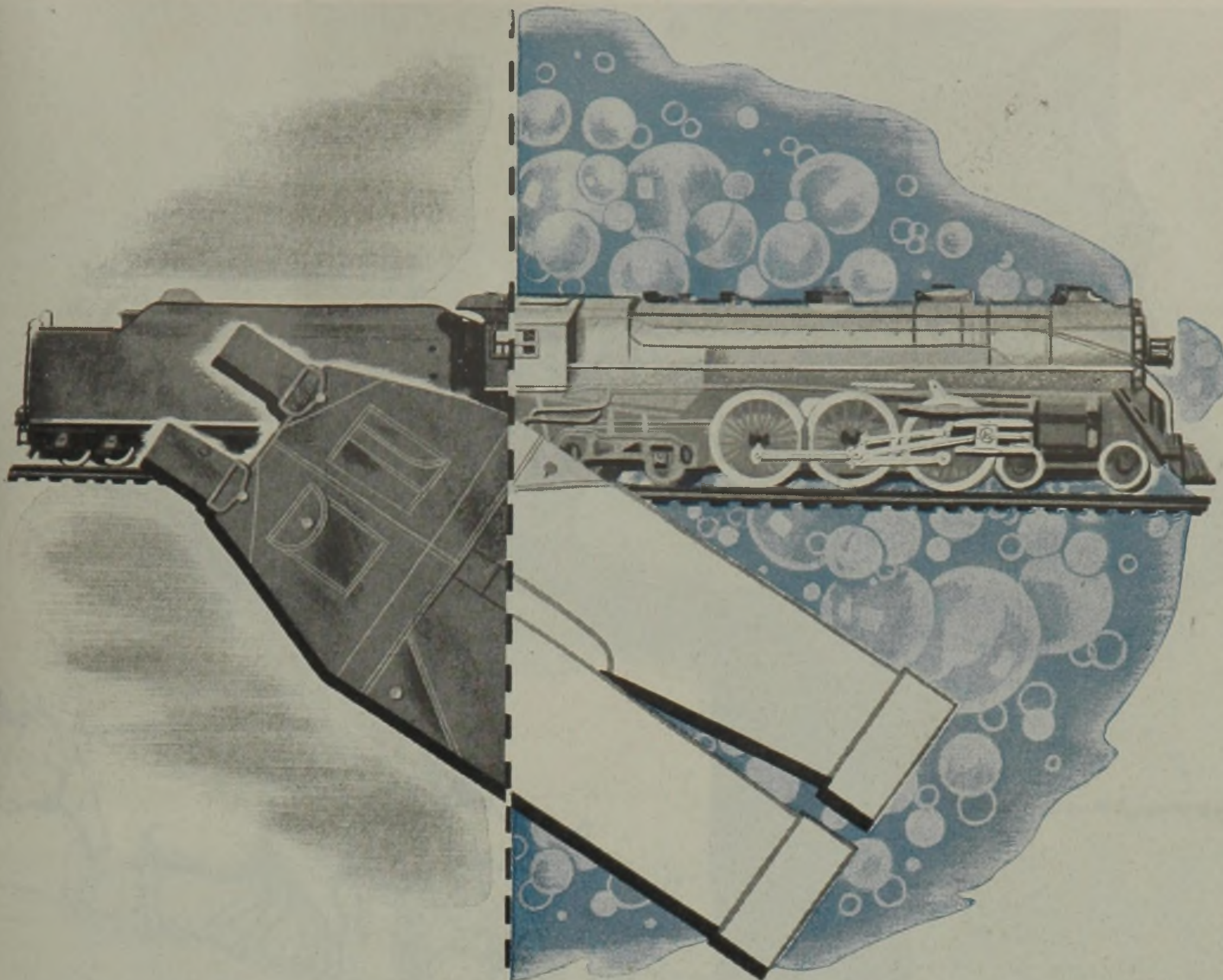

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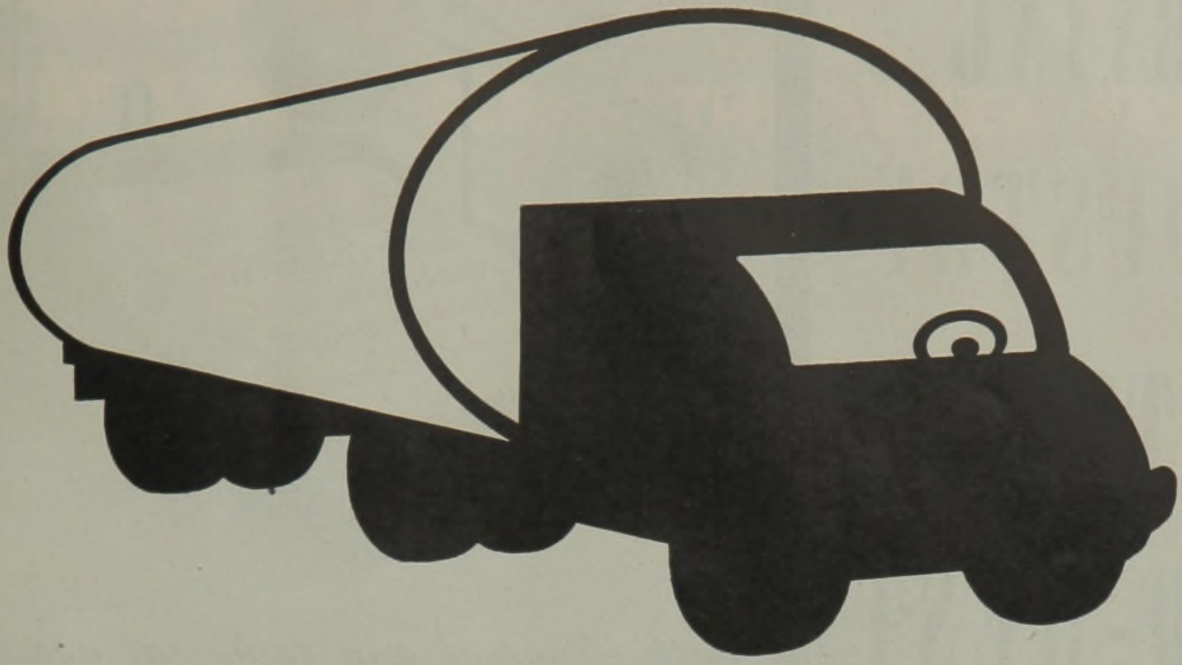

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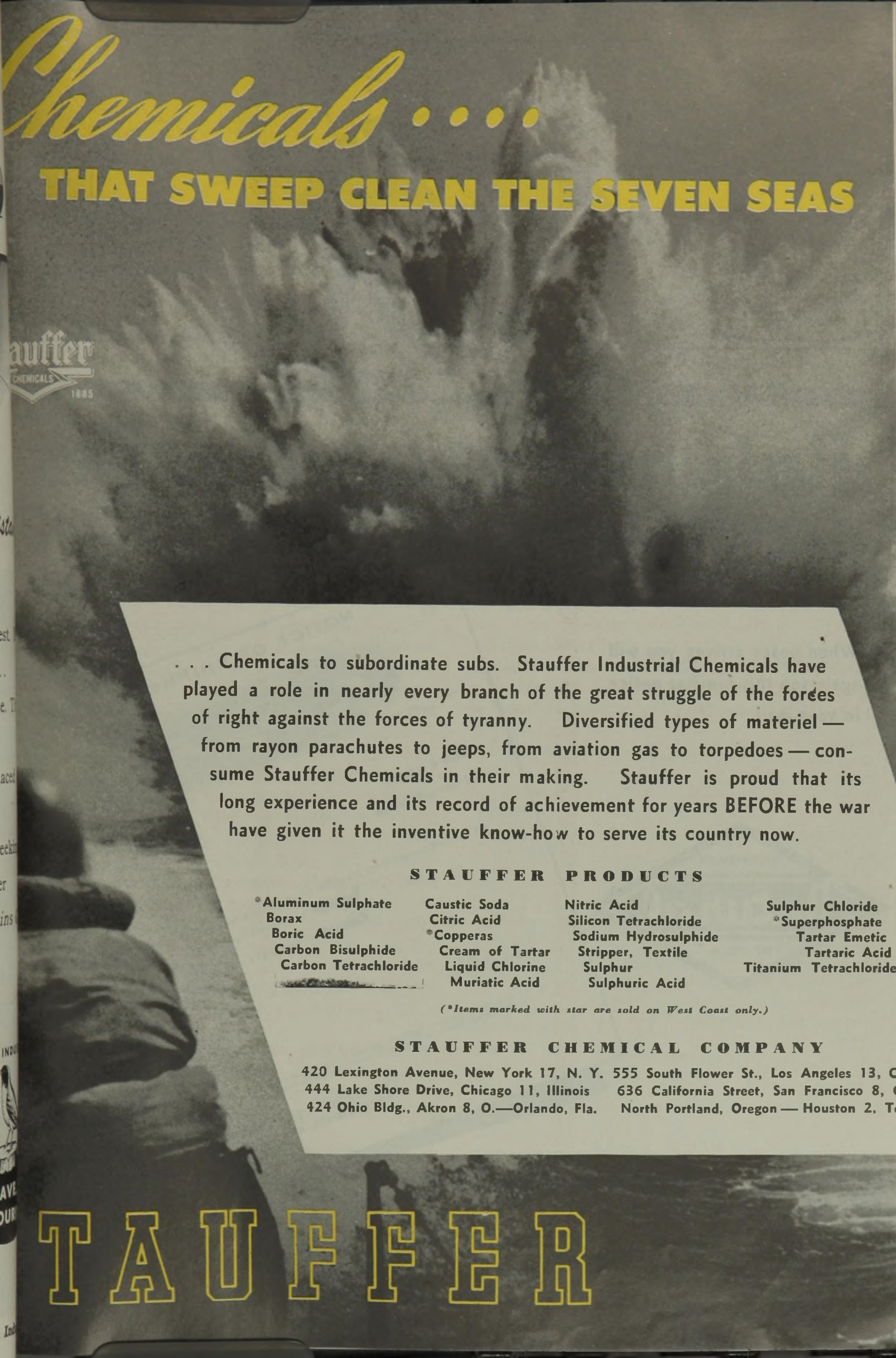
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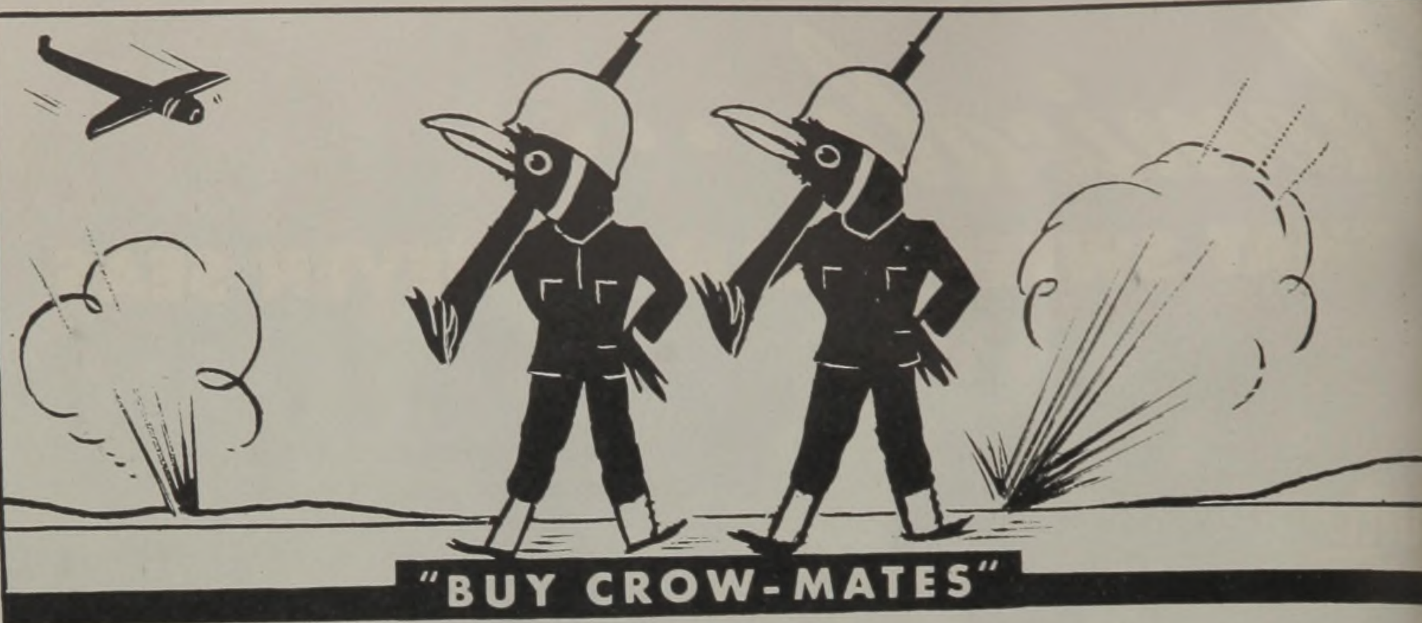

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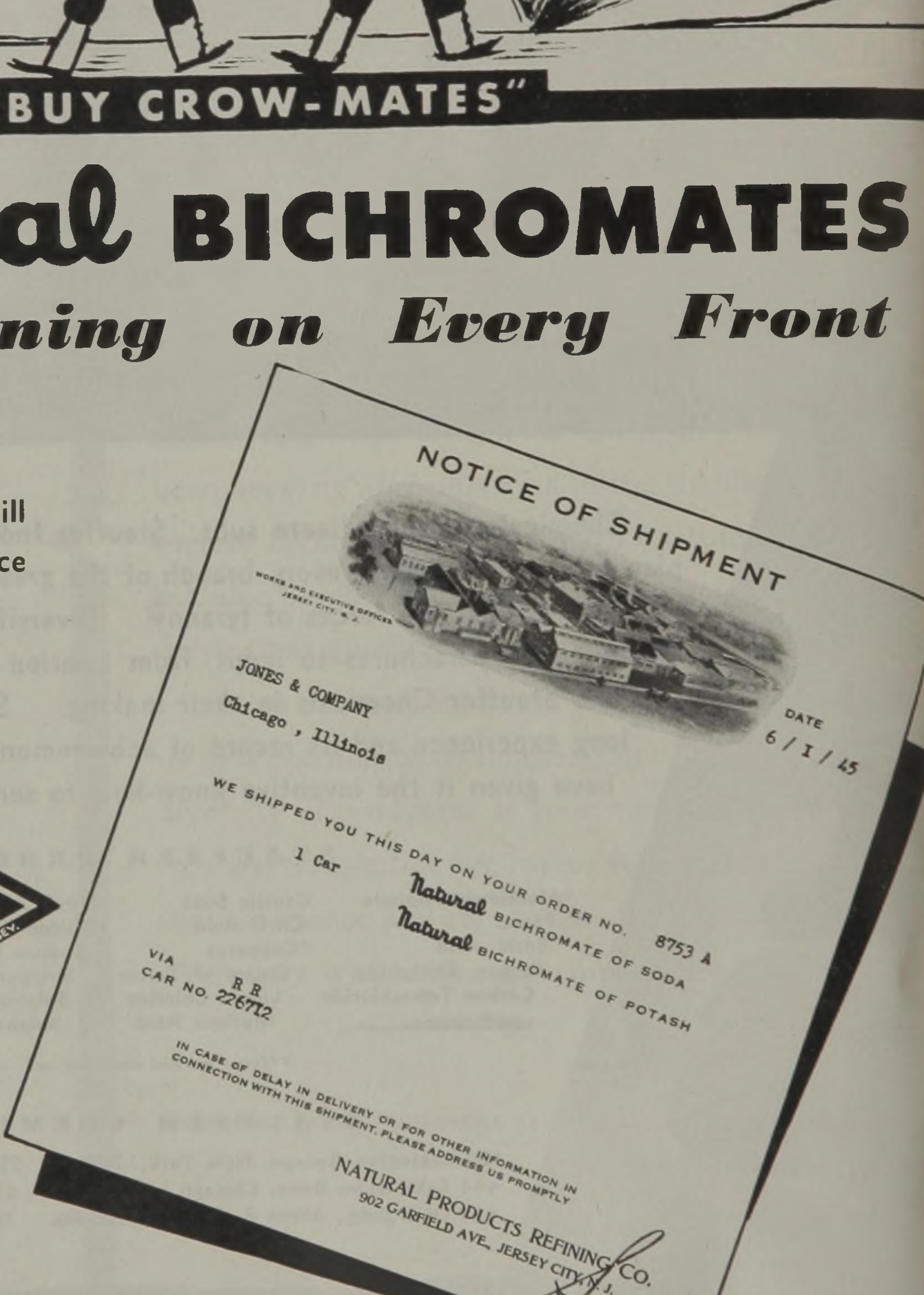
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Editorial

Watch Canada

by ROBERT L. TAYLOR, editor

CANADA'S INDUSTRIAL EXPANSION during the war has been impressive. Since 1939 the value of output of all of her manufactured goods has tripled. Capital investment in her chemical and allied industries alone has shot up from $170,000,000 in 1939 to over $410,000,000 in 1943. Even imports of industrial chemicals have climbed steadily.

All of this might be considered as pretty much a wartime bubble due for rapid deflation if it were not for two important facts:

The first is Canada's well-known wealth of natural resources—notably minerals, grain, timber and power. These assets provide the Dominion with the principal prerequisite for industrial expansion — ample raw materials.

The second is a greatly increased emphasis on organized industrial research, a development brought on by the war but which appears to be taking on aspects of permanency. This trend, we are told, is distinctly noticeable throughout the Dominion, and it is one which should do much to stimulate further rapid development of the Canadian resources. It is reported in the lead story in the "Canadian News" section of this issue.

Canada, it seems, is becoming sensitive to the fact that her research expenditures on a proportionate basis are only about one-third of Britain's and not more than one-eighth of the United States' and Russia's. As a result, the Dominion government has eased excess profits tax regulations to exempt a percentage of research allocations from taxable income, research grants to universities have shown a marked increase, the National Research Council has been expanded several fold, and the public and industrial management interest in research in general has taken a decided upturn.

THESE TWO FACTORS TOGETHER—plentiful resources and a new emphasis on research—point toward a continuation of the wartime pace of industrialization in Canada. This can mean several things to United States chemical manufacturers.

To many it probably sounds an ominous warning. It cannot help but mean a greater degree of basic chemical self-sufficiency in Canada, for that country has ample supplies of most of the major chemical raw materials. In prewar years, which figures are still the latest available, Canada was by far our best export customer for chemicals. Her purchases of $28,939,547 worth of U. S. chemicals in 1939 topped the United Kingdom, our next best customer, by $7,000,000. Our chemical imports from Canada, on the other hand, for the same year amounted to only $11,769,457, about three-quarters of which was represented by four products—calcium cyanamide, sodium cyanide, and radium and uranium salts.

THERE IS NO SOUND REASON why this one way trade in chemicals between the United States and Canada should be expected to continue forever. To those who know Canada, the rapid rise of a domestic chemical industry is neither unexpected nor unnatural. Thus far the limited Canadian market in many chemical lines has been better and more economically served by imports from the large-scale United States production. But there is no reason why it should continue so once Canadian facilities and Canadian needs reach the point where they can support a home industry, and judging by Canadian wartime performance and postwar plans, that point has been reached for a large share of the tonnage chemicals. It appears that there is little alternative but for U. S. chemical producers to reconcile themselves to a loss of some of their Canadian prewar market.

However, that is only one side of the chemical picture in Canada. The other is that while wartime industrialization has built up a sizable domestic chemical production, it has also built other industries that consume chemicals. Reference has already been made to the fact that chemical imports into Canada have continued to increase throughout the war period. While we do not yet have information as to the exact character of these imports, doubtless they are chiefly items not included in the new Canadian production—items such as fine chemicals and specialties which despite increased use in Canada can still be obtained more cheaply from the United States. We can expect a continued increase in Canadian purchases in these classifications, and it is not out of reason to expect that even after the war they may more than make up for the decline in purchases of other chemicals.

THUS THE OUTLOOK FOR OUR CHEMICAL TRADE with Canada is not all gloom by any means. Canada will continue to need U. S. chemicals, quite possibly in greater quantity than ever before. It is just that they will not all be the same chemicals. Some U. S. manufacturers will lose once-profitable Canadian markets, while others will gain sizable new ones. The war has accelerated a trend that has been inevitable and apparent in Canada for many years. For some U. S. chemical manufacturers it will mean adjustments, but those who plan with their eyes open should make out all right. There is plenty of room for both Canada and the United States in the North American chemical business.

Kilgore Postwar Model

SENATOR KILGORE OF WEST VIRGINIA is getting ready to burst forth with a new model, according to late reports from Washington. There will be a brand new name-plate, a few refinements here and there, an additional gadget or two, but underneath it looks from this distance pretty much like the same old bus.

Yes, there is to be another bill reported out of the Senator's war mobilization subcommittee soon after Congress gets back after the election. And you guessed it again—it will set up another agency, this time a National Scientific Foundation instead of an Office of Scientific and Technical Mobilization. Like the Office, however, the Foundation reportedly will control all patents and inventions developed by industry with Government financial help. This means the major share of all wartime developments.

The new bill must be watched closely by scientists and by members of industry. The original Kilgore bill (S.702) was sidetracked into committee last year. We will reserve our comments on the new one until after we have had a chance to study it, but a bad egg by any other name smells no better.

Are We Reverting to Alchemy?

A 30 PER CENT DECLINE in patent applications since 1939 has led R. J. Dearborn, president of the Texaco Development Corporation, to observe that we are burning up our backlog of scientific knowledge during the war just as we are using up our natural resources. "War stimulates the application of accumulated knowledge rather than pioneering on the frontiers of science and technology . . . To prevent a decline in the normal rate of scientific and technological progress, incentive must be provided for research and invention."

In reply, a reader of the New York *Times* pointed out that the attitude of our courts, and not lack of scientific zeal, is responsible for this apparent lethargy. The compiler of a directory or the writer of banal-verse —not remarkably radiant with the glow of creative imagination—can obtain protection with no questions asked. But the painstaking and methodical research is met with a cold fixed stare when he justifiably asserts that his compound or process is entitled to at least the same consideration.

Persistence of this attitude will inevitably usher us into a new age of alchemy. Laboratories will be tightly locked; furtive chemists will whisper in dark corners; curious formulas will be concealed in elaborate codes—and scientific progress will grind painfully to a stop.

Thomas Midgley, Jr., 1889-1944

THE WORLD THIS MONTH LOST A GREAT CHEMIST and scientific leader.

A good many people have had their names on more patents than Thomas Midgley, Jr., but few have made as many chemical discoveries of major importance to their fellow men.

Tetraethyl lead and Freon refrigerants, both Midgley developments, have revolutionized transportation and refrigeration. Bromine from the sea has not only unlocked a new unlimited source of a scarce chemical but has pointed the way to the recovery of many more materials from one of the world's great remaining mineral storehouses. Synthetic rubber was among Midgley's early subjects of investigation.

Aside from his noteworthy scientific achievements, Thomas Midgley found time to participate in professional activities. He was vice president of the Ohio State Research Foundation and the National Inventors' Council and was immediate past president of the American Chemical Society. An attack of infantile paralysis five years ago left part of his body paralyzed but it did not dampen his spirit.

Dr. Midgley's passing is mourned by the many who knew him personally and by the thousands of others who knew him as one of the outstanding figures in contemporary chemistry.

Bargain Battle

WITH JUST ABOUT TWICE the prewar number of contenders in the field, the U. S. is being prepared today for the greatest battle of materials the world has ever seen.

While "substitute" has virtually become synonymous with "headache" after the past four years, all of these wartime pinch-hitters have not turned out badly by any means. Unknowns that didn't have a ghost of a show before the war have been put on their feet, improved, and even become reasonaby well entrenched in certain uses. Entirely new materials have sprung up—seemingly out of nowhere and nothing in some cases—to fill voids left by those commandeered for war duty. Metals, plastics, wood, paper, synthetics, ceramics, and various combinations and modifications of all six, have at one time or another been pressed into service in ways that could not possibly have been anticipated a few years ago.

The struggle will be hard. Research armies and sales armies of great strength will be marshaled in the various opposing camps. As in any battle, there will be victors and losers. But the real winner will be America and the American public. The postwar years should see the greatest demonstration ever of what science and industry under capitalism can do for Mr. Wallace's common man.

by BRADLEY DEWEY
President, Dewey & Almy Chemical Co.
Formerly National Rubber Director

The Role of ORGANIZED RESEARCH in NATIONAL DEFENSE

WHAT WAS IT that permitted us to design, build and put into operation in a little more than two years a synthetic rubber industry now turning out half again as much rubber as was ever used in this country in any prewar year? Colonel Dewey, who administered much of the program, gives us his answer.

THAT this is a technological war, a war of complicated weapons and intricate apparatus, radar, synthetic rubber, high octane gas, new planes and amphibious landing crafts, needs no argument. And, that we are winning this technological war is also blessedly obvious.

Therefore, this seems the moment to inquire into the reasons behind our country's success at technological warfare; to look at the machinery of science and industry behind the machinery of the battlefront. Now, with the lessons of this war clear in our minds, is the time for us to consider what preparations we must make for defense in the future.

How was it possible for this peace-loving nation to leap from a standing start into a global war and to surpass quickly in both volume and quality the material of war which our dictator enemies had spent years in scheming, planning and producing?

It was possible, I think, because American free enterprise in time of peace had given us for the time of war the needed teamwork of scientists and technical men and business men which was able to work the miracles of large scale.

The Synthetic Rubber Program, with whose details I am familiar, seems to me to exemplify this teamwork without which we might long ago have become a captive, subjugated people.

Let us look at some of the lessons learned in this rubber program and see what it was that permitted us to design, build and put into operation in a little more than two years a synthetic rubber industry now turning out half again as much rubber as was ever used in this country in any prewar year.

The Rubber Reserve Company, Jesse Jones and his technical adviser, E. R. Weidlein, the Truman and Gillette Committees of the Senate, the great Baruch Committee, and the experts of the Office of Rubber Director, all made their essential contributions to the program.

But, when all is said and done, the actual work—the job itself—was done by the research chemists and chemical engineers, the mechanical engineers, the construction and production men of industry.

Most of these men—who really did the job—were working in teams in the laboratories and organizations of large units of American business. While I am from a small business, I emphasize that the big job was done by men with background and experience gained on their jobs with big chemical companies, big rubber companies, big oil companies and big engineering and construction companies.

Of course, some small companies played an important part. Some individuals from small companies were essential. But—make no mistake—the major miracle could not have been performed without these big organizations.

Why was this so?

In the first place—even with the knowledge brought to this country by the much-abused companies with foreign contacts—the synthetic rubber industry could not have been built without a tremendous utilization of four great technological developments of the last two decades.

These were, first, high temperature catalytic cracking for the production of monomeric materials. Second, prefabricated welding of piping and steel, field-welded in place. Third, high alloy steels for superheating hydrocarbons as well as steam. And lastly, the control of temperatures, pressures and flow of fluids within close limits by automatic control valves actuated by remote control instruments.

These tools had been developed so recently that only men who had gone through the grief of their development could possibly use or apply them effectively without long and extensive piloting. These men were in the large chemical, oil and rubber companies. Moreover, even these experts were faced with the necessity of using these new tools in plants built around reactions many of which had never been piloted. There was no time for piloting. Processes had to be expanded directly from the glassware stage to ten and twenty thousand ton plants. *Men had to extrapolate data, draw on their experience and lay their bets while Hitler spun the wheel.*

All this overnight expansion was possible only because the leading chemists, chemical engineers, mechanical engineers and executives of many of these organizations had for a long time been working together as teams. Their technical staffs understood each other's methods—yes, even their idiosyncrasies. Banded into teams, they were accustomed to teamwork.

They knew who was given to exaggeration and who was given to understatement. They knew to whom to appeal to resolve their differences—whose decision was final. They knew which suppliers were reliable and where to turn for specialized help and consulting advice. They knew the abilities of the various consultants of the country—ofttimes professors in universities who had trained them or their engineers and, in so doing, had played a vital but little recognized part.

Thanks to the American competitive system, we had men of resource and intellectual daring, trained and fitted to cope with the new and ever-changing problems of war. We had men out of laboratories and offices accustomed to facing real problems realistically. Surely, these men were far more capable in the emergency of war than they would have been had their only training been in the ivory towers of bureaucracy.

These teams of experts of whom I am speaking are, in the military sense, not skeleton divisions, but full fighting units of veterans, right down to the last buck privates. Many of them, beginning in small business, have come up the "hard way," are products of the American system under which the small business of today is often the large one of tomorrow. The rubber and petroleum companies grew big, as the automobile industry grew big. The fast pace of growing kept their leaders virile.

In Bigness, Strength

Now, it is true that big companies do not have any monopoly on ideas. But, it is also true that, given equally discerning managements, they can, with their greater resources, attract a greater number of eminent specialists and risk more money backing their faith in research than can smaller companies. Properly directed, they can carry on research almost upon an actuarial basis and plan on one success out of every four or five projects. They can afford to make more mistakes than little companies and can undertake more daring and speculative objectives. With their advantage of manpower they can contribute more heavily to a war effort.

With American boys fighting and dying on the battlefronts of the world, it is unthinkable that we should compare any sacrifice made on the home front with *their* sacrifices in the jungles, on the oceans and in the deserts.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

"We must guard the nation against the foolish notion that research has to stop during war, and, equally, we must guard against the abandonment of essential military research when peace comes. With no two points on the globe further apart than 60 hours by air, we shall have no leisure for bumbling next time."

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

But this does not mean we should overlook the fact that American business has been eager to do its best. Big business has sent its laboratories and engineers to war. It pooled its patents and information that we and our allies might fight. In many cases processes and procedures were disclosed so that promising plans for future competition had to be abandoned. Once released, secrets could not be called back.

As everyone knows, patents were made available to competitors, often royalty free for the duration and at nominal royalties thereafter. Many big companies have built up competitive capacity which in years to come will surely haunt them. They have made it possible for enterprising small businesses to become large and to compete with them. They are operating Government plants at purely nominal fees.

The contribution by big business to the synthetic rubber program is but one of many which has permitted our soldiers to go into the field better equipped than those of any other country.

The high octane program is another. The research laboratories of the great oil companies contributed to the high octane program their basic information on catalysis. Chemical engineers in the industry, including the big equipment firms, engineered and built the high octane plants so that now our bombers and our transports fly all over the world with fuel of a quality unheard of before the war.

In the fields of metallurgy, light alloys, plastics, explosives, foods and textiles—in fact, in all the great process industries—it is the well integrated, capably trained groups of researchers and engineers that are doing a job Hitler said and bet we could not do.

I cite a single instance:

Many of our ordnance and automotive practices depended upon alloy steels, but, when the alloying materials were no longer available, research metallurgists, working with testing engineers in the big companies, soon learned how to make as good steels without the unavailable constituents.

Turning now to the fabricating and assembly industries—such as the automotive industry, the can-making and packaging industries, the electrical equipment industry—they too are lending to the war effort teams of men trained in their methods of production. Under the guidance of these teams pour forth the machine guns, airplanes, anti-aircraft guns, radar parts and a thousand and one new things we lacked at Pearl Harbor and which our enemies believed it would require us years to build.

The situation with respect to research is somewhat different in these fabricating and assembly industries from that in the process industries. For them it is possible, often advisable, that research be conducted outside their own research laboratories. Much of it is now being done by the Armed Services. Where the production problems start with a drawing and a model is turned out and tested by the laboratory, the close relationship between the research laboratory and the engineering and production groups, so necessary in the metallurgical and process fields, is not so valid.

Now, how should all this experience affect our thinking and our action in the future?

In many parts of the world in the last decade, free speech has been suppressed. In our own country there has been a confused fear which has kept many of us from speaking out our beliefs. We have been all too prone to say: "Unscrupulous theorists are in power. . I will keep out of sight. I will not stick out my neck. Let George do it."

It is this philosophy which caters to the theorists. It gives them the chance to sell their doctrines unopposed, to interpret to the public our restraint as proof of guilt. The public can be trusted to reach the right answer—but only when all of the facts are fearlessly presented.

Why do I bring this up in a talk on the role of research and business in national defense? Because not many years ago, powerful influences were at work casting doubt upon the social values of research, rearing the bugaboo of technological unemployment and seeking the emasculation of our patent system. It is true that a few fearless men—notably Karl T. Compton—spoke out against this. But all too many scientists, engineers and business executives were quiet. Research weathered the storm at that time. But—we must be on our guard to see to it that no such ideas ever take root again.

In this country fast-growing big business, which, being human, unquestionably in the past was guilty of mistakes, has been cast in the role of whipping boy by some politicians in their lust for power or for insecure security or in their loss of confidence in the American pioneering spirit.

It is our duty to oppose these men and their doctrines and by speaking out against them to let the American public see the facts as they are. Mere size must not make business a whipping boy.

We Must Keep on the Alert

We have today many large companies, still generally unappreciated, which have contributed greatly to the miracle of American production which has so well and amply equipped our Armed Forces and those of our Allies. I am a small businessman. I believe in small business. I believe that if the time were to come when many of the leaders of large business were not graduates from small businesses, large business itself would suffer. But, despite my belief and my faith in small business, I know that the building of the synthetic rubber industry and many other achievements on the industrial fronts of this war are proof that without the teamwork of research and production led by big business, this country would have faced—and might have succumbed to—disaster.

That America, armed and powerful, must remain alerted for war for a long time to come seems to me to go without saying. No reasonable person able to read the newspapers can doubt that if the peace of the world is to be kept, America must be ready.

But let us keep uppermost in our minds that any future war will be technological, will draw even more heavily than the present war upon our resources of technical skills and our laboratory and factory facilities.

With no two points on the globe further apart than 60 hours by air, we shall have no leisure for bumbling next time. We must be prepared to hurl our hard-hitting teams of scientists, executives and production men into the battle with the same speed that our bombers take the air. If this is to be possible, now is the time when we must begin to overhaul our selective service laws for the future.

Since gray hair—and bald heads—are rather the rule among our topflight executives and production men, they offer no special problem. But, by the same token, in technical men increasingly the accent is upon youth.

Young men are the men trained in the newest developments and unafraid to try them out. However well-intentioned the men who drafted our present Selective Service Law and however well-intentioned those who have administered it, the blunt fact—known to us all—is that too many of our young chemists, physicists and engineers have been put in uniform and lost to war research and industry before endless redtape could be unwound. Some authorities have interpreted rulings one way, some another.

Ironically, here was a case where the initiative and the responsibility for requesting deferments should have been retained by the Government and, instead, was tossed into the lap of industry.

Activities valuable to the war should not have had to ask for the deferment of a single technical man. Rather, their technical men, regardless of their desires, should, if necessary, be barred from the privilege of fighting and retained instead for the essential tasks of technological war where only they can serve their country.

Now, while we are in the midst of a war in which new weapons are born and become obsolete overnight, it is clear and plain to us that we must keep research on weapons ever up-to-date. Yet, incredible as it may seem, as short a time as a year and a half ago, a few high ranking military officers were standing by the false, exploded doctrine that after the start of a war it is too late to introduce new weapons and processes. We who have fought and are winning the industrial battles of this war will have to guard against falling back into this sort of error again.

Yes, we must continue military research after the war. Military security forbids talking of potential secret weapons during war, even when it is common knowledge that the enemy is working along the same lines. However, the stupidest man must be impressed with the close parallelism of work done here and in Germany—as for example in jet propelled aircraft. History will show that the work of units of the Office of Scientific Research and Development already has determined many decisive battles of this war.

To stick our heads in the sand and fail to carry on unfinished developments of today's science may well give some enemy a chance to destroy over night all that we are now fighting for. This would be suicidal folly.

In directing research upon new weapons, the Office of Scientific Research and Development has had great success because it has been able to call, in the name of patriotism, upon a great body of virile, independent research men from educational institutions.

Of course this set-up should not and cannot continue after the war. These men must return to their institutions and to peacetime pursuits. But the Government must find ways to carry on the work they leave unfinished, as well as that research essential to the Armed Services which offers no hope of profit in peacetime and hence does not appeal to industry.

Now, in summary, we who know the story of the part big business and its teams of researchers, engineers and production men have played in fighting this technological war have a duty to the future. We must see that the lessons learned are not forgotten. The Government itself must in the future accept the full responsibility for seeing to it that our vitally needed young technical men, regardless of any understandable desire to fight, are not siphoned off to armed regiments but remain where they are most needed on the industrial and research fronts. We must be alert to resist—by using our rights of free speech—the false doctrines of those who would check or halt research. We must guard the nation against the soft and foolish notion that research and development have to stop when war is declared, and, equally, we must guard against the abandonment of essential military research when peace comes.

And above all, we must remember that in many cases it was the teamwork of scientists, engineers and production men in big industry which saved us on the production front in this war. We must keep these teams intact and healthy so that we may turn to them when future danger threatens.

Condensed from an address "The Role of Organized Research and Business in American National Defense" presented in acceptance of the Chemical Industry Medal, November 10, 1944.

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"I am a small businessman. Yet I know that the building of the synthetic rubber industry and many similar wartime industrial achievements are proof that without the teamwork of research and production led by big business, this country would have faced—and might have succumbed to—disaster."

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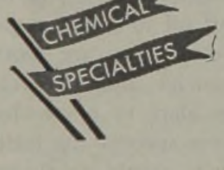
Treating paper chemically to impart wet strength

A New MARKET for New CHEMICALS: WET-STRENGTH PAPER

by K. W. BRITT, Assistant Staff Technical Director, Scott Paper Company



LONG A USER of large-tonnage heavy chemicals, the paper industry has now joined hands with the synthetic resins industry to open up a promising market for special paper products. Wet-strength paper is one of the vigorous and healthy offspring of the union. Urea-formaldehyde and melamine-formaldehyde resins, well-known among plastics for their strength, have emerged as the most useful chemicals for imparting that quality; but the field is still very fruitful for research.

THE PULP and paper industry has long been one of the best customers of the chemical industry. Certain trends have been apparent in the paper industry which presage an increasing use of chemicals, particularly specialty chemicals of which wet-strengthening materials are typical.

There was a time when paper was almost exclusively a medium for writing and printing. Today the most spectacular expansion in the use of paper products is taking place in other fields. This is especially true in wrapping and packaging materials, absorbent and cleansing papers, and in the use of paper products for structural materials. This trend has been taking place for a number of years, and conditions incident to the war have added new impetus to it. There is every indication that this trend will continue in the post-war period with more emphasis upon the quality of the new paper products.

Everyone is familiar with the weak, soggy character of ordinary paper when it is thoroughly wet with water. Such a sheet of paper appears to have lost all of the strength which it formerly possessed in the dry state. Actually, careful tests show that all papers retain a small proportion of their strength even when completely wet. This proportion varies somewhat among the various grades and types of paper, the range being from about 4% to about 12%, with the great majority falling between 6% and 10%.

It is rather interesting to note that the time-honored processes involved in paper-making and by which the various grades are differentiated have relatively little effect upon the wet strength property. Such factors as the degree of beating, rosin sizing, tub sizing, waxing and coating change the degree of wet strength very little—provided that the paper is completely saturated with water at the time ot test. The type of fiber or pulp going into the paper has an effect large enough to detect, but probably not large enough to be of practical significance. The more highly purified bleached pulps and alpha pulps give papers of lower percentage wet strength, while pulps such as groundwood which contain greater amounts of non-cellulosic material have a somewhat higher percentage wet strength.

In recent years wet-strength paper has attracted the interest of the paper industry because of its promise of new and improved paper products. Likewise, it has attracted the attention of the chemical manufacturer as a new outlet for chemicals. It has become abundantly evident that this interest is justified. Numerous paper products have appeared which have an amazing ability to withstand rough treatment when thoroughly wet. These products have been made with the use of chemical products, some of which were laboratory curiosities only a few years ago.

Synthetic Resins

The new element in the wet strength picture which is largely responsible for the present prominence of the subject is the use of synthetic resins deposited upon the fiber from aqueous solution and polymerized *in situ.* Thus, wet-strength paper becomes the result of controlled chemical reactions, the raw materials of which must be furnished in one form or another by the chemical industry.

The actual mechanism by which these small amounts of resin accomplish such startling results is of some theoretical interest. This question is by no means fully explored, and is outside the scope of this article. The reader will find a discussion of the question in a recent patent.[1]

In the use of synthetic resins, the wet strength develops only upon the polymerizing or curing of the resin. This is accomplished by subjecting the paper to heat in the presence of a catalyst, or by allowing the paper to cure during a storing period.

Catalysts used in this process are mildly acidic substances such as ammonium and aluminum salts. Many mill trials fail to give good results because of improper curing of the resin. Most paper machines are not capable of subjecting the paper to as high a degree of heat as would be desirable for complete development of wet strength. Hence, resins of extremely rapid cure are sought as well as optimum catalytic conditions. This is a principal reason why the number of successful synthetic resin compositions has been so limited.

Comparison of Materials

Let us turn now to the evaluation and comparison of wet-strengthening materials. The principal factors of importance to the papermaker in selecting a wet-strength chemical are as follows:

1. The degree of wet strength produced per unit cost of chemical.
2. Methods which must be used to apply the chemical to the paper.
3. Effect of the treatment upon other properties of the paper.
4. The curing properties of the material.
5. The premanency of the wet strength produced.
6. Conditions necessary for re-using the wet strength "broke" or waste.

Table I gives the wet and dry tensile strengths of a wide variety of papers, none of them specifically treated for wet strength, except as noted.

Table I

Kind of Paper	Dry Tensile lb./15mm.	Wet Tensile lb./15mm.	Per cent retention when wet
Towel, 35% groundwood	2.42	0.25	10.3
Towel, all chemical pulp	2.00	0.12	6.0
Kraft wrapping	14.5	0.93	6.4
White Paraffined Tissue	4.8	0.37	7.7
Alpha Waterleaf	5.05	0.21	4.15
Machine Glazed Tissue	2.03	0.18	8.9
U. S. Postal Card Bristol	17.9	1.75	9.8
Blotting Paper	9.45	1.01	10.7
Double Coated Book	7.07	0.84	11.8
Machine Finish Book, Sulphite	6.6	0.52	7.9
Machine Finish Book, 100% Rag	13.0	1.64	9.1
Bond, 100% Rag, Tub Sized	13.7	1.61	11.7
Manila Lens Paper	4.2	0.15	3.6
Towel, Wet-Strength, 0.75% UF	2.04	0.54	26.5
Towel, Wet-Strength, 1.5% UF	2.03	1.09	53.5
Towel, Wet-Strength, 3.0% UF	2.09	1.41	67.5

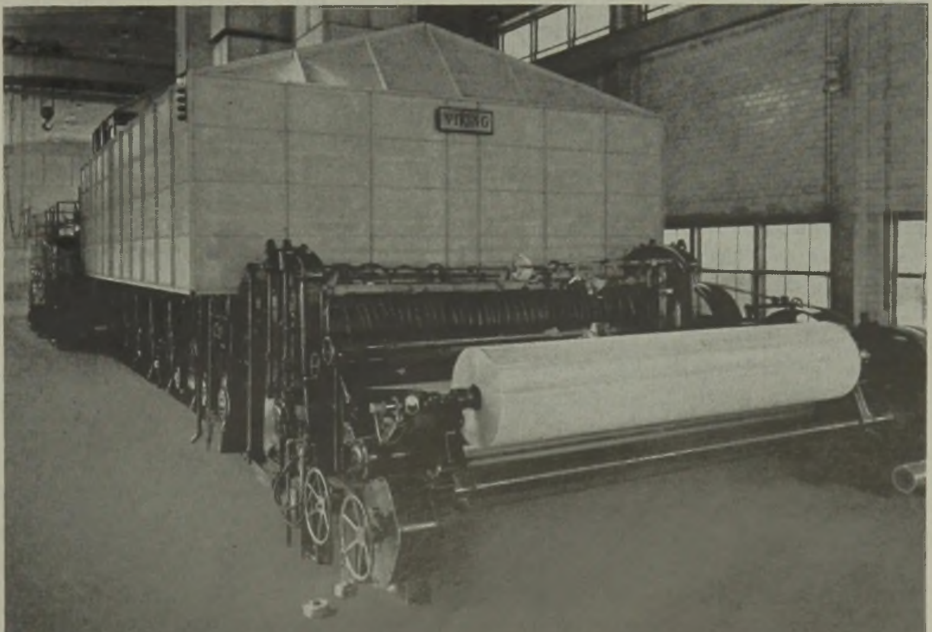
Evaluation of Wet Strength

The testing of wet-strength paper has led to some confusion. A majority of papers have a greater or less degree of resistance to the penetration of water, and consequently they are difficult to wet thoroughly. A simple rosin-sized paper will retain a considerable amount of strength for some time after being immersed in water. Waxed or asphalted papers require hours or days of immersion to become completely wet. It is possible to define wet strength as the strength possessed by a paper after exposure to water for a fixed length of time. Such a test may be of importance in determining the usefulness of a paper product, but it is technically confusing because it measures a combination of wet strength and of resistance to wetting. As an alternative, it may be defined as the strength possessed by a paper after complete saturation with water.

In the TAPPI Tentative Standard Method T456m-42[2] a compromise is struck between these two alternatives by calling the former "normal wet strength" and the latter "ultimate wet strength." It might be preferable to call the former "wet exposure strength" and the latter "true wet strength." The TAPPI method is a tensile test. The Mullen bursting test is also widely used in testing wet strength.

It is to be noted that there is a wide range of absolute values of wet strength in Table I, even though none of the papers was specifically treated for this property.

A modern paper machine



Testing treated paper for wet tensile strength

On the other hand, there is a much narrower range in percentage wet strength. For this reason it has been suggested that the real criterion of the wet strength property is the ratio between the dry strength and the wet strength, or, in other words, the percentage wet strength as given in Table I. There has been an increasing tendency to use this percentage to evaluate wet-strength processes, and to reserve the absolute value of wet strength as a "use test" for the particular paper product in question. Thus it is possible to transcend the enormous variation in paper base stocks and to arrive at a real measure of the performance of a wet-strength process.

The most common materials at present available to the papermaker for producing wet strength paper are various urea-formaldehyde and melamine-formaldehyde compositions. These materials vary considerably in unit cost and also in degree of wet strength produced. It is possible to compare the effectiveness of these materials in the laboratory by preparing a dilute solution of known concentration, say 2%, adding a suitable catalyst, and saturating a sample of absorbent paper such as paper toweling by immersing it in the solution. After the increase in weight due to wetting is determined, the paper is dried and heated at about 250 F until no further increase in wet tensile is obtained. Similar samples are made with two or three dilutions of the original solution and a graph is plotted between percentage wet strength (see above) and the per cent chemical present in the paper. From this graph it is possible to compare the cost per unit of wet strength for the various samples submitted. With dimethylolurea, one of the common wet-strength chemicals, a resin content of 1.0% using the above procedure will give a wet strength of about 50%.

Method of Application

The synthetic resins which are available for wet strength may be classified broadly into three groups with respect to the method by which they may be applied to the paper. Some compositions are suitable only for impregnation of the paper sheet; that is, as "tub sizing" materials. An example is dimethylolurea. Other compositions are suitable only for treatment of stock prior to sheet formation, an example being a special melamine-formaldehyde product soluble in hydrochloric acid. This is absorbed by the fiber without the aid of a precipitating agent such as alum. A third group, represented by urea-formaldehyde compositions of an intermediate degree of polymerization, may be used either way. When used for treatment of stock, alum is necessary to precipitate these materials upon the fiber. The papermaker will choose among these alternatives in consideration of the methods of application available to him, of the properties desired in the finished product, and of the cost of the materials. Stock treatment offers advantages in simplicity of operation, but tub sizing offers economic advantages.

Other Effects of Treatment

The application of the wet-strength process may have a pronounced effect upon other properties of the paper, and proper attention must be paid to these changes. The effect of the process upon absorbency is particularly to be watched. It is possible to produce wet-strength paper which is as absorbent as in the untreated state. On the other hand, some wet-strength processes greatly decrease in this property. It is not clear why this should be, but apparently it is due to the nature of the resin after it is cured.

Other properties of paper that may be altered by the use of a wet-strength process are softness, tearing strength and folding endurance. The effect upon these properties is usually related to the amount of resin present in the paper. It is often possible to avoid trouble by limiting the amount of resin incorporated with the paper, using a composition which gives the required strength when used in an amount insufficient to affect the other properties adversely. Modifying the paper base stock may be necessary to obtain the desired results.

It has been pointed out[3] that the resins used for wet strength have a varying resistance to hydrolysis. Hydrolysis of the resin results in loss of wet strength and, therefore, has a bearing upon the permanency of the process. The extent of hydrolysis will also be affected by the humidity and temperature to which the paper is exposed during storage and use.

Defibration

In any paper making operation, the re-use of broke or waste is an important consideration. Since the re-use of broke or waste involves disintegration of the paper in water and complete dispersal of the fibers, the property of wet strength must cause more or less difficulty. Some of the older wet-strength papers, such as vegetable parchment, are impossible to defiber. Synthetic-resin papers offer less difficulty because, as mentioned above, the resin may be dissolved or hydrolyzed under appropriate conditions. Both urea-formaldehyde and melamine-formaldehyde papers may be hydrolyzed by acid at elevated temperature. The pH range for this operation is between 2.5 and 4.0, and the temperature range is usually between 150 F and 212 F. The milder the conditions of temperature and acidity, the longer will be the time required for disintegration. The melamine-formaldehyde papers are much more difficult to defiber than those treated with urea-formaldehyde.

Permanency and ease of waste recovery are contradictory properties. The method of comparing wet-strength papers for resistance to hydrolysis is described in a previous article.[3] This method is also useful in identifying the process used in treating an unknown sample of paper.

The relative importance of waste disposal in influencing the choice of a wet-strength chemical will depend upon several factors. Some of these, such as permanence, are evident from the above discussion. Others are economic—the amount of waste involved and the price range of the product. Still others depend upon the conditions found in the particular paper mill, such as the facilities available for waste disposal.

Potential Market

Any attempt to estimate the potential

market for wet-strength chemicals at the present time is guesswork. Turning to Table II and making the assumption that the segment of the industry represented by the board, wrapping and tissue grades is a potential user of wet strength, we have a rapidly growing annual production of 12 million tons as of 1941. Such a field would seem to offer a fairly substantial market. On the other hand, it is important to remember that most of these grades are standard products which have been performing their appointed functions for a long time without the aid of wet strength. Also, wet strength represents a rather substantial added cost. Since this property cannot be seen or felt in a casual inspection of the dry product, it must be sold strictly on performance. The increase in utility due to such treatment must be real and evident. In fact, wet strength has made a bad impression in certain quarters because of too enthusiastic selling of some grades in which its value is questionable.

It is noteworthy that the first group in the table—news, book, cover, and writing papers—shows a relatively slight gain in tonnage between the years 1929 and 1941. In other words this is the more static segment of the industry, and significantly it is in these products that wet strength is of little or no importance. In contrast, the pasteboard, wrapping, tissue, and absorbent group shows spectacular gains and is the more dynamic segment of the industry. It is in these rapidly expanding grades that wet strength is of the most importance.

In the application of a new process to an old industry there are two alternatives —to use the new process to improve the quality of products already in existence, or as a basis for entirely new products which would not otherwise exist. The first alternative is the quickest way to get into business, but sooner or later a point arrives at which further extension is not justified because of the cost burden upon the finished products. The second alternative requires more time, more imagination, and probably some false starts; but, if successful, offers whole new horizons.

Future Development

It is always interesting to speculate upon the future course of development of a new process. In view of the wide range of paper products involved, it seems reasonable to expect that numerous chemical agents will find places in the wet-strength field. What appear to be advantages for one application may be disadvantages for another. A chemical which gives a perfectly reasonable cost picture for one paper product may be economically impossible for another. We are not likely to see a single material dominate the field.

In the matter of possible technical advances of a chemical nature, a few may be mentioned without attempting to predict how important a part they may play. A beater wet-strength process which does not adversely affect absorbency would be desirable. Also, a synthetic-resin wet strength hydrolyzed by neither acid nor alkali would be advantageous for filter papers. Then, too, a synthetic-resin wet strength hydrolyzed by alkali and not by acid might give us more permanent papers without increasing the difficulty of waste recovery. A urea-formaldehyde composition which would cure rapidly without the use of an acid catalyst would be of interest. Although the mechanical problems involved in applying the wet-strength solutions on the paper machine are outside the scope of this article, i might be mentioned that improved mean of treating a fast moving sheet of pape on a paper machine is a matter of grea importance.

In spite of these more or less mino deficiencies, we do possess some ver handy chemical tools for producing wet strength paper. The extent to which th use of these tools is expanded in the nea future will depend primarily upon the de sign of new or improved paper product of high volume possibilities.

In summary, we may say that wet strength paper is already established ir a number of products of which pape towels, maps, blueprint paper, wrapping for moist materials and building paper are examples. The prospects for consid erable expansion in these and simila grades are hopeful. The extent of th over-all expansion of the market fo wet strength chemicals, however, depend upon technical and marketing develop ments both in paper products and in we strength chemistry itself.

Table II

Grade of paper	Tonnage manufactured 1929	1941
Newsprint	1,409,200	1,045,26
Book and Magazine	1,497,900	2,026,29
Cover Paper	28,100	28,00
Writing	607,600	735,00
Total	3,542,800	3,834,56
Paperboard	4,451,200	8,246,57
Wrapping	1,605,800	2,860,00
Tissue	387,000	870,00
Absorbent	90,800	154,00
Total	6,535,600	12,130,57

Literature Cited

[1]Britt, K. W., U. S. Patent 2,325,30. (July 27, 1943).

[2]TAPPI Standard Methods, Technica Association of the Pulp and Paper In dustry, 122 E. 42nd St., New York 17 N. Y.

[3]Britt, K. W., *Paper Industry and Pape World*, 26, No. 1 (April, 1944).

THIS IS WET-STRENGTH PAPER

YOU ARE INVITED to compare this sheet with the ordinary paper used throughout the rest of the magazine. Simply cut strips from the margins and soak them in a saucer of water. Note that the ordinary paper wets faster than the wet-strength paper. Note too that after both strips are completely saturated, the wet-strength paper has considerably more tensile strength—although the two are of about the same weight.

Oxidation Inhibitors for Insulating Oils Offer Questionable Research Opportunity

ALTHOUGH many papers and patents can be found in the literature f the last twenty years describing comounds which are effective in retarding he oxidation reaction in oils, it is a urious fact that very little use is being nade of oxidation inhibitors in the inulating oils, a group which today contitutes a sizable volume. An interesting xplanation of this apparent anomaly is ffered by L. J. Berberich of the Insuation Department of Westinghouse Reearch Laboratories in a paper "Oxidation nd Oxidation Inhibition in Insulating Dils" delivered October 11 before the Pennsylvania Electric Association.

This non-use of inhibitors in insulating ils, Dr. Berberich points out, is in strikng contrast with the extensive use of uch materials in the various types of ubricating oils and internal combustion ngine fuels. He lists the following as he principal reasons for the condition:

1. The life of the electrical apparatus n which insulating oils are used is long, wenty or more years, and the evaluation f an inhibitor in terms of such a long fe is an extremely difficult problem.

2. Since the cost of the oil is only a elatively small fraction of the total cost f the apparatus, there is not any great ncentive to take the risk which the use f an untried inhibitor involves.

3. The universal inhibitor has not yet een found, that is, one that is effective a wide range of oil types.

4. The use of different inhibitors by the arious oil suppliers would bring about omplicated storage and field servicing roblems. There is no assurance that two ls containing different inhibitors can be ixed without deleterious effects. Thus orage tanks may be necessary for the oil om each supplier.

5. Modern electrical oil-filled apparatus more and more approaching a type of onstruction in which contact of oil with xygen is avoided, thus further reducing centive for using inhibitors.

"In the face of the situation just deribed," Dr. Berberich states, "it is difcult to make an attractive case for the se of inhibitors at the present time. What the future holds, of course, cannot e predicted, but the adoption of one oil nd one inhibitor by the whole industry ould certainly help the inhibitor cause.

"The use of inhibitors in reclaimed oils ppears to offer some possibilities. However, large scale reclaiming has not come to general use in this country because e price of new oil is so low that such perations are not very profitable. This cture can change in the future, especially we should reach the point where we will be faced with low petroleum reserves, as is the case now with many of the European countries."

Chief among the materials which have shown greatest effectiveness in retarding the oxidation reaction in oils, according to Dr. Berberich, are the aromatic amines, aromatic sulfides and disulfides, aromatic phenols, and aromatic phosphates and thiophosphates. "There are certain compounds which appear to owe their effectiveness to either deactivation of the metal or reacting with the metal surface in such a way as to eliminate its catalytic action. The phosphorus compound, tert-amylphenyl phosphite, is an example of this type. There is also a third type of compound which is believed to be a 'sludge solvent.' These appear merely to increase the solubility of the oil for the sludge, thus preventing its precipitation. Nitrobenzene and nitronaphthalene are examples of this type."

Dr. Berberich mentioned that one of the principal needs in establishing the use of inhibitors in insulating oils is for a good standard evaluation test.

COMPARISON of Natural and Synthetic Rubbers

FREQUENTLY in chemical conversations the question of comparative properties of natural and synthetic rubbers comes up. We are indebted to the Industrial Products Division of the B. F. Goodrich Co. for the following simplified and up-to-date table of property relationships between natural rubber and four of the common synthetics. Missing ratings indicate insufficient data.

Property Relationships Between Natural and Synthetic Rubbers

	Natural Rubber	Neoprene (GR-M)	Thiokol	Buna-N (GR-N)	Buna-S (GR-S)	Butyl (GR-I)
Workability	E	G	F	G	G	G
	All synthetic rubbers can be worked on rubber machinery, but in some products they are more difficult and expensive to fabricate than natural rubber due to lack of tack.					
Vulcanizing Properties	E	E	F	E	E	G
Adhesion to metals	E	E	P	E	E	G
Adhesion to fabrics	E	E	F	G	G	G
Resistance to swelling in lubricating oil	P	G	E	E	P	P
Resistance to deterioration in oil	P	E	F	E	P	G
Resistance to aromatic hydrocarbons (benzol, toluene, xylene, etc.)	P	P	G	F	P	F
Resistance to chlorinated hydrocarbons	P	P	G	G	P	P
Resistance to lacquer solvents	P	P	G	F	P	P
Gas diffusion	F	G	E	G	F	E
Resistance to diffusion of petroleum products	P	F	E	E	P	P
Adaptability for contact with food*	E	F	P	F	F	G
Dielectric strength*	E	F	F	F	E	
Electrical conductivity*	F	F**	F	F**	F	F
Resistance to water absorption*	F	G	F	G	G	F
Resistance to strong oxidizing agents	P	P	P	P	P	G
Tensile Strength*	E	G	F	E	G	F
Elongation	E	E	F	E	G	E
Resistance to cold flow*	E	G	P	E	E	F
Resistance to sunlight*	F	E	E	G	F	E
Resistance to ozone*	F	E	E	G	F	E
Resistance to aging	G	E	E	E	E	E
Approx. specific gravity basic material	.93	1.23	1.34	1.00	.94	.92
Heat resistance*	G	E	P	E	E	E
Flame resistance	P	G	P	P	P	P
Cold resistance*	E	G	F	G	E	G
Rebound elasticity (snap)	E	G	G	F	G	P
Abrasion*	E	G	P	E	E	F
Tear resistance*	E	G	P	G	F	G
Abrasion resistance—soaked in oil	P	F	P	E	P	P
Hardness Durometer A tests (100 is bone hard)	20-100	20-90	35-80	20-100	35-100	15-90
Color range	G	G	P	G	G	G
Freedom from odor*	E	F	P	F	G	G
Resistance to paint and ink dryers	P	E	E	E	E	E

E—Excellent; G—Good; F—Fair; P—Poor.

* These properties available only in specific compounds.

** Electrically conductive compounds with more "rubbery" characteristics can be made of these synthetics than is the case with natural rubber, which has to be very heavily "loaded" to attain the same degree of conductivity.

V. AGRICULTURE: Already Large Chemical Consumers, Farmers Are Increasingly Alert to Scientific Aids

By
PHILIP H. GROGGINS*

CONCENTRATION of responsibility in the War Food Administration for the wartime claiming of chemicals required for the production of foods, feeds and fibers has served to emphasize the magnitude and importance of agriculture as a market for chemicals. An important function of the War Food Administration is to claim the chemicals needed for (1) food production, (2) crop and animal protection, and (3) food processing and preservation. In terms of its broad wartime activities, agriculture is in all probability the largest single user of chemicals. It will probably surprise many to learn that even during the active prosecution of a war, agricultural requirements of chemical nitrogen and sulfuric acid for the production of nitrogenous and phosphatic fertilizers exceeds those of Ordnance for the manufacture of ammunitions.

It has been found advantageous to group agricultural chemicals into three classes: fertilizers, economic poisons, and miscellaneous chemicals. This classification has proved to be most practical, has promoted good working relations with the numerous industries involved and is also useful insofar as appraising the post-emergency outlook for chemicals is concerned.

FERTILIZER CHEMICALS

The fertilizer industry does an annual business of approximately $400,000,000. An analysis of the financial situation shows clearly that farmer expenditures for fertilizers are closely related to farm

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income—on which subject more will be said later.

Insofar as the practical, individual farmer is concerned, he has learned that an agronomically sound investment in fertilizers brings high returns, as indicated in the accompanying pictograph.

Agronomic Importance

The following excerpt from an editorial in September *Capper's Farmer* emphasizes the importance of safeguarding the fertility of our soil:

"Soil is the reservoir of nutrition. Neglected and abused it becomes worthless. Carefully preserved it serves humanity for centuries on end. That is why good husbandmen guard it carefully. Plant food is continuously removed from cultivated areas by harvests and by wind and water erosion. No soil, however rich, can remain that way under constant depletion. Nutritive elements must be replaced from other sources."

The attainment of necessary wartime food production would not be possible without an adequate supply of fertilizers, which are perhaps justly regarded as the most important chemicals needed by farmers. Their use results in a visible increase in crop yields, and it is generally accepted that about 20 percent of our total crop production is due to the application of fertilizers.

The total effect of fertilizers on the volume of crop production varies greatly for different crops, the greatest effect being on tobacco, potatoes, cotton, vegetables, and fruits. An estimate of the contribution of fertilizers in producing these crops is as follows:

Tobacco	51 percent
Potatoes	33 percent
Cotton	23 percent
Fruits and Vegetables	50 percent

But the use of fertilizers does more than increase the yield of crops, it also improves the quality. The importance of introducing nutritional elements into crops—particularly grass and forage—through the appropriate use of fertilizers, while recognized as a worthwhile and important practice, has not, however, been widely followed. The Agricultural Adjustment Administration, in its soil improvement program recently sponsored by both Secretary Wickard and War Food Administrator Marvin Jones before the House Special Committee on Postwar Economic Policy and Planning, and other governmental and state agencies are endeavoring with the aid of industry to educate farmers to the fact that feed and food crops will not contain desired beneficial chemical nutrients unless these chemicals are put into deficient soils.

Supplies and Requirements

On the assumption that Germany will be defeated this winter, thus permitting Ordnance contributions of ammonia and sulfuric acid, it appears that the available supply of all fertilizer materials for crop production during the year July 1, 1944 to June 30, 1945, will again exceed that of the previous similar period for the third consecutive year. The following data show how the consumption of nitrogen, phosphoric acid, and potash has kept pace with our wartime requirements for food production.

Consumption of Fertilizer[1] as Nitrogen, Phosphoric Acid and Potash
(Thousands of tons)

	Year or season	Nitrogen tons	P_2O_5 tons	K_2O tons
	1935	306	593	302
	1936	351	673	347
	1937	411	795	415
	1938	384	744	394
	1939	390	783	405
Average ..	1935-39	368	718	373
Start of War	1941-42	420	1044	521
	1942-43	460	1114	590
	1943-44	643	1300	604
Outlook	1944-45	682	1440	725
1943-44 increase over 1935-39 average		74.7%	81.0%	61.9%
1944-45 increase over 1943-44		6.1%	9.7%	20%
1944-45 increase over 1941-42		62.4%	37.9%	39.2%

[1] Includes Hawaii, Puerto Rico and Alaska.

The consumption of fertilizers during the present emergency, as well as during the first world war, is indicated in the chart "Fertilizers in Two War Periods." Here we find that consumption has risen from less than eight million tons in 1939 to about 11.5 million tons in 1944. Of equal importance, however, is the steady rise in plant food content which in the final analysis determines crop response. This trend in the production of higher analysis fertilizers has aided the war effort by conserving bags, transportation and labor. To the discerning farmer it means cheaper plant foods.

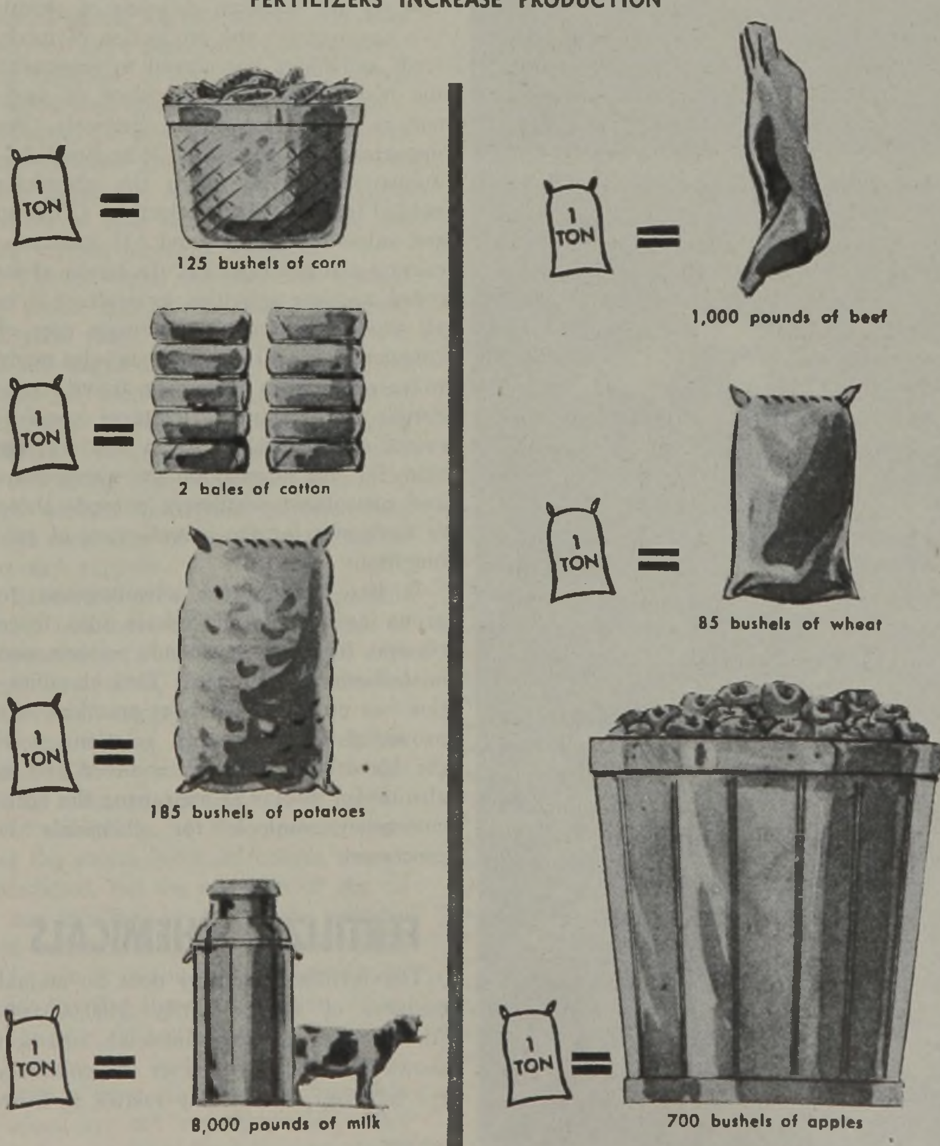
From Scavenger to Chemical Industry

In 1910, domestically produced fertilizers contained 74,400 tons chemical nitrogen and 71,000 tons of organic nitrogen. The organics included dehydrated manures, fish and leather scrap, tankage, oilseed meals, dried sewage, etc. During the 1943-44 season 643,000 tons of nitrogen were used of which only 30,000 tons were organics. It is clear then, in light of the chemical nature of phosphate and potash production, that the fertilizer industry is now based almost exclusively on chemicals, most of which have other applications in the chemical and other industries.

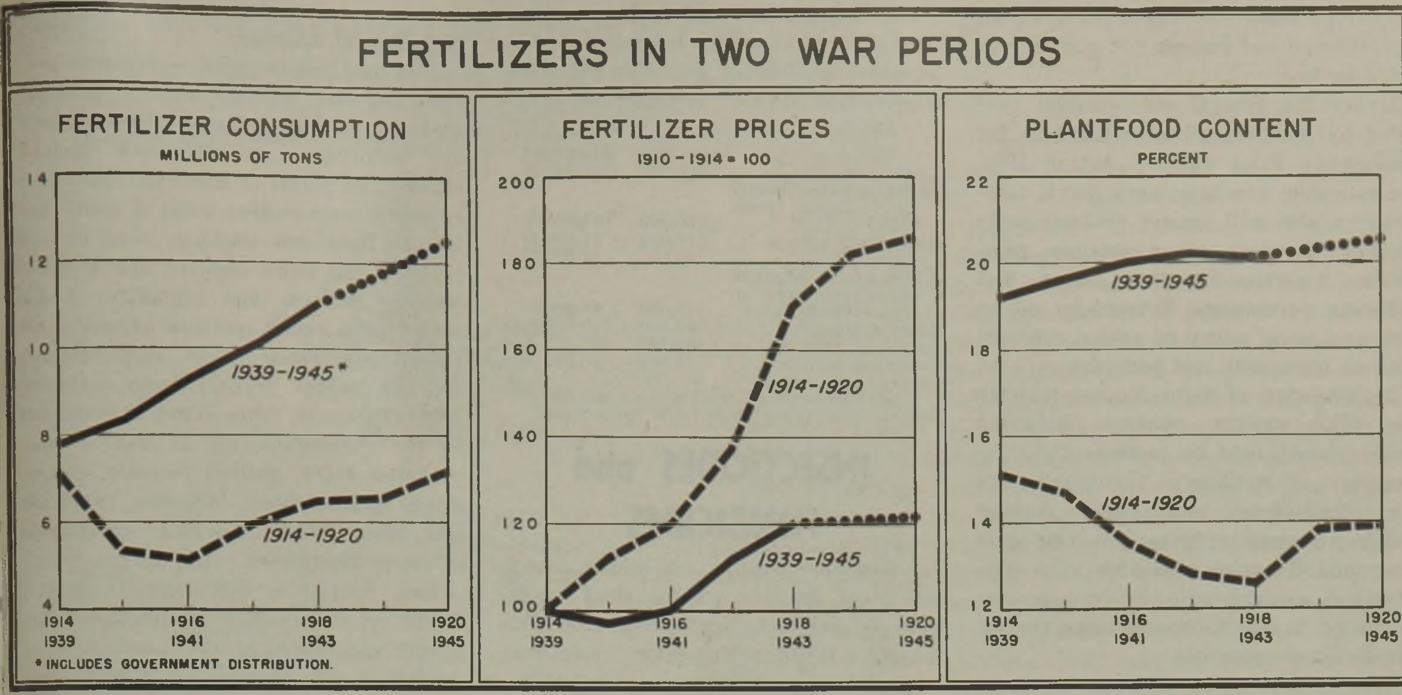
Outlook for Fertilizer Supplies

Although the immediate outlook for

FERTILIZERS INCREASE PRODUCTION



Source: National Fertilizer Association



●●●●● PROJECTED IN THE LIGHT OF PRESENT INFORMATION.

some fertilizer materials is uncertain because of the impact of military requirements, the outlook for the postwar period is excellent. By utilizing some of the ammonia and nitric acid facilities constructed by the War Department during the war, adequate facilities will be available to produce all the chemical nitrogen fertilizers that American farmers desire to buy. In light of national policies this domestic supply will in all probability be supplemented by importations of nitrate of soda from Chile, as well as divers nitrogen carriers from Canada.

The need for sulfuric acid in the wartime production of munitions and aviation gasoline has resulted in a large expansion of production facilities. Consequently, after the cessation of hostilities there should be sufficient sulfuric acid and acidulating facilities to produce at least 10 million tons of superphosphate annually. The domestic production of agricultural-grade potassium chloride has increased appreciably during the past few years and it is expected that the potash requirements of crops and soils can be met satisfactorily. This is indeed a healthy situation and is a tribute to the potash industry, which in a space of a few years has made us independent of foreign supplies.

Outlook for Fertilizer Markets

An analysis of the more important factors pertaining to postwar fertilizer markets indicates that there will be a continued demand at a relatively high level. Let us examine some of these factors:

(1) *National Prosperity.* There appears to be general agreement that we will enjoy a relatively high degree of national prosperity for at least two years after the war. The prediction is based on the expected combination of high purchasing power due to (a) employment at good wages, (b) constrained savings during the past few years, and (c) wartime civilian purchases of government bonds coupled with the enormous potential market for automobiles, radios, electrical equipment, refrigerators, farm machinery, etc. This situation augurs well for a high level of industrial activity, and consequent heavy domestic demand for agricultural products. The collapse of Germany will probably result in a diminution of roughly 20 percent in national income with accentuated decreases in some areas because of reconversion problems and an accompanying reduction in the demands for foods and fibers. There may be an appreciable food requirement for the rehabilitation of reconquered nations until they can harvest their own crops, but there are large food reserves now on hand to help meet demands for that purpose.

(2) *Relation Between Farm Income and Demand for Fertilizers.* What the farmer has historically spent for fertilizer has been closely related to his cash income. This relationship is brought out clearly in the accompanying chart. It may reasonably be predicted that the future consumption of fertilizers will continue to be governed by farmer cash income, which in turn will be influenced by the War Food Administration (or U. S. Department of Agriculture) price support for crops. On the other hand, should it become necessary to adopt measures restricting agricultural production, and a selective reduction in acreage is not unlikely, the demand for fertilizers and other production supplies may fall off, but there is an equal chance that farmers may use more chemicals to get an increased production from a limited number of acres.

Postwar price support in the form of

FERTILIZER CHEMICALS

Aluminum phosphate
Ammonium nitrate
Ammonium phosphate
Ammonium solutions
(ammonium nitrate or urea dissolved in aqueous ammonia)
Ammonium sulfate
Anhydrous ammonia
Arsenic
Borax
Boron
Calcium carbonate
Calcium cyanamide
Calcium hydroxide
Calcium oxide
Calcium-magnesium carbonate—dolomite
Calcium magnesium oxide and hydroxide
Calcium nitrate
Calcium sulfate
Concentrated superphosphate
Calcined phosphate
Copper sulfate
Creatinine
Magnesium oxide
Magnesium silicate
Magnesium sulfate
Manganese sulfate
Manure salts
Normal superphosphate
Paris green
Phosphoric acid
Potassium carbonate
Potassium chloride
Potassium magnesium sulfate
Potassium nitrate
Pyrites
Sodium chloride
Sodium fluosilicate
Sodium nitrate
Sulfuric acid for superphosphate
Sulfur
Urea

commodity loans for cotton, corn, wheat, rice, tobacco and peanuts for nuts is provided by law.

Under the general authorization provided by the Steagall amendment to the Emergency Price Control Act of 1942, the following non-basic agricultural commodities also will receive postwar price support: potatoes, sweet potatoes, peas, beans, American-Egyptian cotton, and soybeans, peanuts and flaxseed for oil, as well as a broad group of animal products such as hogs, milk and butterfat.

Maintenance of farm income through the price support measures indicated above should tend to promote the consumption of fertilizers. Continuation of the Agricultural Adjustment Agency soil improvement program involving governmental financial assistance as a conservation payment will also be a powerful factor in maintaining a large market for fertilizer materials.

Wartime Experience Important

As a result of their wartime food production activities, many farmers have learned the agronomic value and economic importance of fertilizers and other production supplies such as insecticides, fungicides, liming materials, etc. It is consequently unlikely that the advantages of this experience will be either ignored or forgotten, or that we shall witness a return to the prewar levels of consumption. Industry should in increasing measure continue its cooperation with federal and state agricultural agencies in the task of educating more farmers to realize that the use of fertilizers in accordance with sound agronomic practices pays good dividends when crop prices and fertilizer costs are in line.

The prospective market for chemical fertilizers is indicated by the following tentative supplies for the War Food Administration 1944-45 fertilizer program:

	Gross Tons	Tons plant food
Ammonium Sulfate	1,000,000	205,000 N
Sodium nitrate (including imports from Chile)	1,200,000	192,000 N
Ammonium nitrate	215,000	73,000 N
Cyanamid	80,000	16,000 N
Ammonia solutions (containing urea or ammonium nitrate)	255,000	85,000 N
Superphosphate*	8,000,000	1,440,000 P_2O_5
Potassium chloride	1,400,000	672,000 K_2O
Potassium sulfate	75,000	36,000 K_2O

* Approximately 4 million tons of 60° Bé. sulfuric acid required for this production.

INSECTICIDES and FUNGICIDES

Except for weather conditions, insects and plant diseases are the most important natural factors affecting crop production. When pests appear crops may be partially or entirely ruined if left unprotected. The farmer's investment in land, seed, fertilizer, and labor may be lost if he does not control pests, hence insecticides and fungicides should be available.

The producers of agricultural insecticides and fungicides have ably met the wartime problems pertaining to the production and distribution of insecticides and fungicides. The industry has kept pace with entomological and plant pathological researches and the farmer's demand for economic poisons resulting from appreciation of their economic importance. In order to render better service, industry has also carried out extensive exploration and development work. As a concomitant of such progressive efforts, the agricultural insecticide and fungicide industry has rapidly grown to almost a $100,000,000 business.

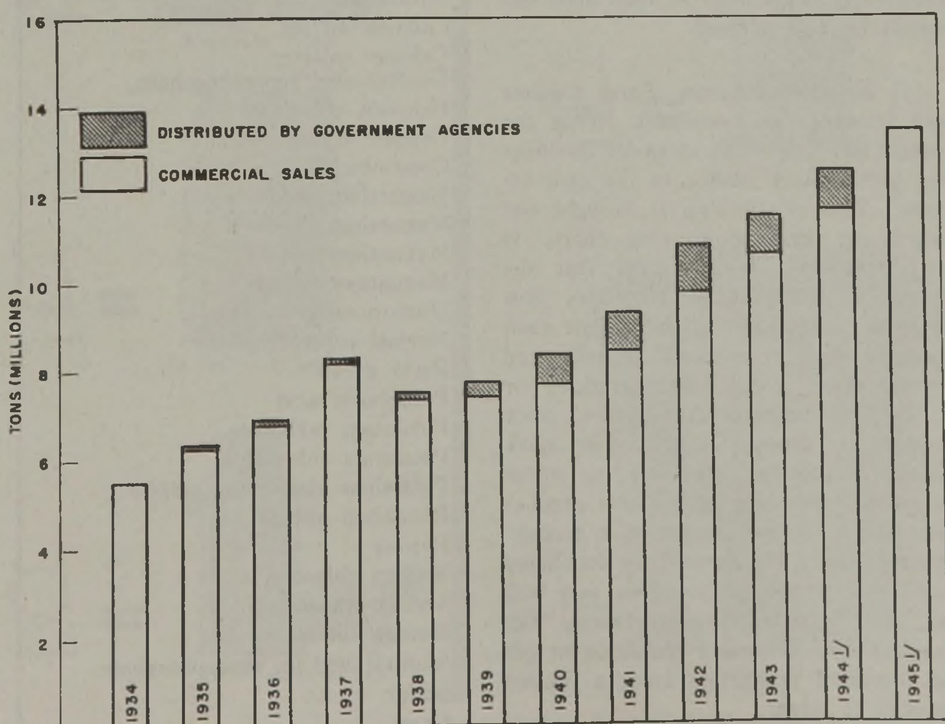
The development of the economic poisons industry in one respect parallels that of the dye industry. Not so long ago coloring materials were derived either from plants or minerals. Now, the synthetic organic dyes, most of which are fast to light and washing, have largely replaced the more fugitive and less attractive extracts and pigments. To a considerable extent synthetic organic compounds are replacing or supplementing the insecticides derived from plant or mineral sources. This trend is evidenced by the considerable use of organic thiocyanates, DDT, methyl bromide, chlorinated hydrocarbons, Spergon, Fermate and other synthetic organic compounds in the production of cattle sprays, insecticides, fungicides and grain fumigants. Based on the analogy to dyestuffs, continued expansion in the production of synthetics may be expected with the result that uniform materials of desired specificity will be offered.

Insecticides from Plant Sources

Some of the most widely used economic poisons, particularly insecticides and rodenticides, are obtained from plant materials. Supplies of these cannot be increased quickly since from two to four years or longer are required to grow plants from which the poisons are obtained. The problems of providing increased quantities of insecticides from plant materials are therefore much greater and more complex than those encountered in the manufacture of synthetic organic or inorganic materials.

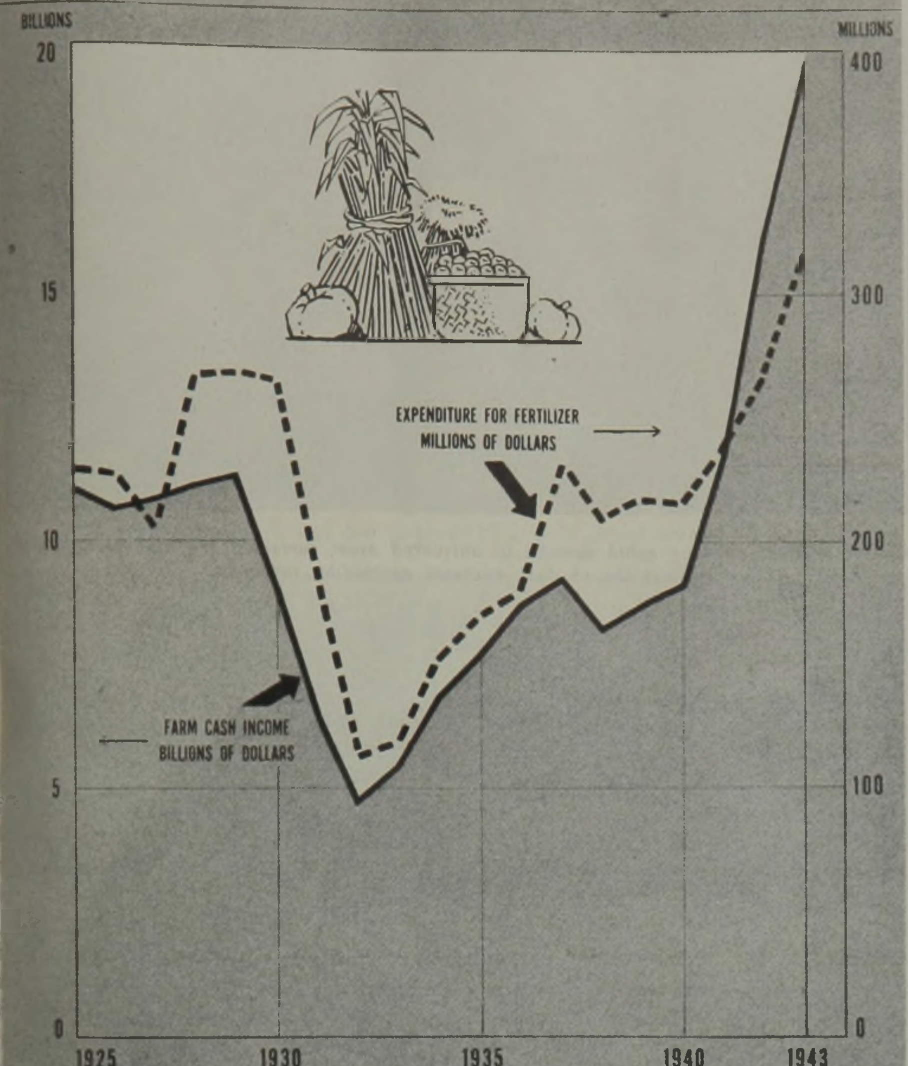
Pyrethrum is one of the oldest insecticides obtained from plants. Because of its low toxicity to warm-blooded animals, high toxicity to many resistant insects, quick knockdown and other desirable features, it has found extensive use especially in sprays for the household and food processing plants. Of particular interest at present is the military use of pyrethrum dissolved in Freon as an aerosol for the control of malaria-bearing mosquitoes. In 1942, American farmers used about 4,400,000 pounds of pyrethrum flowers. During the past season, owing to military demands, only the equivalent of 400,000 pounds of pyrethrum flowers, in the form of a by-product "gunk," was available. From 10 to 20 million pounds of pyrethrum flowers were imported annually prior to the war for use as civilian and agricultural insecticides. Estimates of wartime agricultural requirements were 10 to 15 million pounds. Notwithstanding the present and potential impacts of alternative commodities, it is reasonable to assume that the postwar demand for pyrethrum flowers for all uses will approximate 15 million pounds annually if the insecticide can be made available at prewar prices.

CONSUMPTION OF FERTILIZER IN U. S.
CALENDAR YEARS, 1934-1943
IN MILLION TONS



FARMERS EXPENDITURES FOR FERTILIZER

COMPARED WITH FARM CASH INCOME, 1925 TO 1943



SOURCE: U. S. DEPARTMENT OF AGRICULTURE

Rotenone, contained in certain plant roots, because of its low toxicity to warm-blooded animals and its efficacy in controlling many insects on fruit and vegetable crops is assured of a prominent and permanent market as an insecticide.

Immediately prior to the outbreak of war, we imported about 7 million pounds of rotenone-containing roots, half of which came from Latin America and the other half from the East Indies. Owing to the exigencies of war the supplies from the Netherlands, East Indies and Malaya were cut off, but production and price agreements with Peru have alleviated what might have been a serious shortage. During the past two years we have had available for agricultural uses about 4.5 million pounds of rotenone-bearing roots. The outlook for Latin America production is bright, and it is probable that of the Peruvian 1945 output, which may total 6 million pounds, about 5 million pounds will be available for the United States. The domestic market can readily absorb this quantity as well as any additional quantities that can be obtained from the East Indies.

To alleviate short supplies of pyrethrum and rotenone and as a partial replacement for these materials a special tobacco diversion program was initiated by the U. S. Department of Agriculture in 1942 to increase the production of *nicotine* from a normal of about 950,000 pounds to 1,400,000 pounds during 1944. The greater supply was nevertheless inadequate to satisfy domestic and allied nations requirements. A factor contributing to the heavy domestic demand was the heavy infestation of aphids and codling moth. At present it is not known whether there will be a tobacco diversion program for 1945 and the currently estimated supply will approximate only one million pounds. Although the demand is expected to exceed the supply, some relief may be obtained from foreign production when hostilities cease. The demand for nicotine, although subject to fluctuation, is expected to continue at least at prewar levels.

Arsenicals and Fluorine Compounds

The arsenicals—lead arsenate, calcium arsenate, and Paris green—have for many years been considered the backbone of the agricultural insecticide industry. Notwithstanding recent developments to the anatomical structure through the introduction of newer insecticides it is expected that these poisons will continue to function as an important part of the industrial organism. They are comparatively inexpensive; and effective procedures for the removal of spray residues are known. It is altogether probable that the recent production rate of 70-85 million pounds of lead arensate and 60-70 million pounds of calcium arsenate will be sustained if agricultural production continues at the present high level. The demand for calcium arsenate which has fluctuated considerably in past years is now relatively good because of the high price of cotton. If, however, the demand for cotton goods should decline because of the more favorable competition from synthetic fibers or other reasons, cotton acreage may be curtailed and the demand for calcium arsenate to combat the boll weevil may be reduced.

Partly because of the shortage of rotenone, increasing amounts of *cryolite* are being utilized as insecticides. Cryolite has gained considerable acceptance during the war for the control of some species of bean and tomato insects, codling moth on apples in the Pacific Northwest, gypsy moth on tree foliage and in the production of general purpose mixtures containing sulfur and synthetic contact insecticides for garden use. In 1943, only 6 to 8 million pounds of cryolite were used for insect control, but present indications point to a demand for about 12 to 15 million pounds in 1945.

Synthetic Organic Stomach and Contact Insecticides

In light of past beneficial contributions of chemistry to practically all aspects of our daily life, it is not surprising that we are now reaping the rewards of chemical research in the field of entomology. These benefits are destined to increase with the passage of time necessary to complete systematic research and to obtain the results of field tests. It is to be expected, therefore, that synthetic organic chemicals will play an increasingly important role not only in the field of agriculture but also in the civilian struggle to control household pests. It is not possible to discuss in this article the large numbers of new synthetics which are now available; suffice it to state that their number is increasing.

Probably no other chemical having agricultural use has in recent years held greater interest for scientists, agricultural workers, and insecticide manufacturers than *DDT* or 2,2-bis(para-chlorophenyl)-1,1,1-trichloroethane. Synthesized many years ago in Germany, its remarkable insecticidal properties were only recently discovered by European workers. Specialists in the U.S.D.A. Bureau of Entomology and Plant Quarantine have pointed out potential and specific military, agricultural and civilian insecticidal uses for DDT. By continued experimentation they and other entomologists throughout the nation will undoubtedly develop further its applications for specific insect control.

The great value of DDT both in louse powders and in mosquito control to the Armed Forces is resulting in a rapid expansion of production in this country. When the heavy initial requirements of the Armed Forces are satisfied, it is expected that agriculture will benefit from the increased output. This will not only relieve shortages of pyrethrum and rotenone, but will also provide new methods of combating some species of insects not previously controlled satisfactorily by any other insecticide.

The synthetic organic thiocyanates, known to the trade as Lethanes, Thanite, and other proprietary names have played an important wartime role in providing toxicants for oil-base insecticides used as household, dairy and mill sprays. The adoption of thiocyanates has alleviated the temporary shortage of pyrethrum and has provided a material which can be blended with other insecticides such as rotenone and nicotine so as to extend short supplies and also provide new effective combinations.

Field of mustard showing aphid damage in untreated area; remainder of field protected by applications of dust mixtures containing rotenone.

Field of beans showing bean beetle damage on the right; remainder of field protected by applications of rotenone insecticides.

Fungicides

Copper chemicals are used more extensively than any other material, with the exception of sulfur in the control of fungus diseases on fruit and vegetable crops. For the control of many fungus diseases copper fungicides are essential, not being replaced satisfactorily by sulfur or any other compound. Certain seeds must be treated with copper carbonate or cuprous oxide, and copper-deficient soils, if they are to be productive, require the addition of copper salts. The domestic agricultural requirements of copper compounds on a sulfate basis, are estimated to be about 115 million pounds. Agriculture has been assured of 100 million pounds for 1945.

Sulfur is used in large quantities for the control of some kinds of insects and mites and fungus diseases which attack plants and animals. The estimated agricultural requirements of fine dusting sulfur amount to nearly 200 million pounds of which about 125 million are for plant disease control and 75 million (largely as a diluent of other insecticide materials) for the control of insect pests.

Fermate and *Dithane* are new synthetic organic fungicides which are highly effective against plant diseases not controlled effectively by copper fungicides.

The demand for coppers and sulfur is likely to continue at a relatively high level because they are effective and inexpensive; and their use is ingrained in the agricultural habits of farmers. The new synthetic organic fungicides are now being widely accepted and their future appears assured.

The chemical industry supplies many millions of pounds of divers chemicals for insect, grain and soil fumigants, detergents, wetting agents, rodenticides, seed disinfectants and for numerous other agricultural uses. Space limitations prevent even a brief discussion of their uses here. Suffice it to say farmers, as a result of their wartime experience, have learned to appreciate the value of economic poisons as a form of crop insurance.

Outlook for Economic Poisons

The same factors which govern the future demand for fertilizers and which indicate a relatively high level of consumption apply with equal validity to economic poisons. These are (1) national prosperity, (2) relationship between farm income and demand for agricultural supplies, and (3) appreciation for economic poisons in insuring bigger and better crops. As a result of the cumulative impact of these factors it appears that the postwar demand for agricultural insecticides and fungicides will continue at a high level.

ANIMAL MEDICINALS

During the past few years several new drugs have been introduced into veterinary medicine, which have contributed greatly to the improvement and conservation of the livestock industry in the United States. These chemicals are used principally against internal para-

Tobacco plant bed which was not sprayed; blue mold injury severe; Georgia, 1943.

Tobacco plant bed which was sprayed with a fungicide; no blue mold injury; Georgia, 1943.

sites, which it has been estimated cause a loss to the domestic livestock industry of fully $125,000,000 a year. It is due largely to these chemicals that it has been possible to develop and improve the livestock industry in areas where parasites made it impossible to conduct stock raising profitably.

Phenothiazine—a cousin to the sulfa drugs—is the most generally useful substance available for the removal of internal parasites from livestock. It approximates the ideal anthelmintic more closely than any other drug because of its relatively low toxicity to the host animal and its efficacy as an anthelmintic in sheep, goats, cattle, swine, horses, mules, chickens, and turkeys. In less than six years since the discovery of the anthelmintic action of phenothiazine, it has become the most widely used of all drugs for the removal of internal parasites from farm animals. The demand for phenothiazine in 1945 will probably exceed 5 million pounds.

Diphenylamine is one of the active ingredients used in compounding the important medicinal known as Smear 62 which is an effective remedy against the screwworm fly, a livestock pest of major importance. The screwworm fly lays its eggs on the edges of wounds and the eggs hatch into maggots which gradually destroy tissues and enlarge the wound. Finally, vital organs are exposed or the poisons from the extensive wounds are absorbed and the animal dies. The annual loss to the livestock industry caused by this pest has been estimated at 5 million dollars.

There are a number of other drugs that are used in the treatment of animals against parasites. Among those used for internal parasites the following may be mentioned: barium antimonyl tartrate, copper sulfate, carbon disulfide, carbon tetrachloride and tetrachloroethylene. For external parasites, lime-sulfur solutions and nicotine solutions have been extensively used for cattle and sheep dipping baths, while arsenical solutions continued to be used as cattle dips. Although the quantities of such chemical medicinals required for agriculture are relatively small, they are nevertheless of utmost importance in insuring profitable livestock production.

MISCELLANEOUS

A great variety of chemical substances, in addition to those used as fertilizers, and as economic poisons, are employed in agriculture in connection with the production, processing, preservation, and distribution of foods. These include edible acidulants, flavoring agents, mineral salts, vitamins for food and feed enrichment, disinfectants for stables, grains, seeds, soils, and dairy implements; preservatives, food sanitation and refrigeration chemicals, and herbicides.

The principal *acidulants* are citric, phosphoric, tartaric, and lactic acids. It is estimated that the requirements by the food and beverage industries for 1945 will be closely as follows:

Citric acid	6,750,000 pounds
Tartaric acid	12,000,000 "
Lactic acid	4,500,000 "
Phosphoric acid	2,000,000 "

The annual use of these acidulants is indicated by the following approximate distribution of citric acid to the food industries:

	Pounds
Finished beverages	1,000,000
Beverage concentrates	1,500,000
Beverage syrups and extracts	800,000
Bakery products	100,000
Confectionery	250,000
Dairy products	200,000
Gelatin desserts and pectin	2,000,000
Jams and jellies	700,000
Miscellaneous foods	200,000
Total	6,750,000

Phosphates of special purity are used either as ingredients or in the preparation of certain foods. It is estimated that the annual requirements of divers phosphates derived from elemental phosphorus for use in foods, beverages, or in the production of foods will be 18,680 tons which are distributed as follows:

	Tons Phosphorus
Acid leavening agents	11,000
Yeast	950
Sugar	350
Cheese and condensed milk	650
Beverages	1,060
Other foods (jams, jellies, gelatin, salt)	1,670
Food sanitation	3,000
Total	18,680

Food wrappings, particularly *cellophane,* are being used in ever increasing amounts for the packaging of foods. The peculiar properties of cellophane, its light weight, and imperviousness to oil, grease, moisture, and its flexibility make it a very useful material for this purpose. It is estimated that the annual requirements of cellophane by the food and related industries are about 51,000 tons. The distribution is roughly as follows:

Estimated Requirements of Cellophane for Agricultural Products

	Tons
Foods	
Frozen Foods	
Frozen Berries, Fruits and Vegetables	860
Cereals and Dried Fruits and Vegetables	
Vegetables	
Dry Beans	100
Dry Peas	200
Cereals	500
Rice	400
Macaroni and Noodles	1,500
Dehydrated Food	
Dehydrated Soups	1,000
Dried Figs	110
Dried Dates	35
Dehydrated Fruits and Berries	300
Other Food	
Meats	
Sliced Bacon	3,000
Sliced Dried Beef	150
Fish and Seafood	1,200
Cheese	1,400
Bakery Products	
Bread and Rolls	3,600
Cake	9,670
Pies	390
Biscuits and Crackers	5,430
Retailers and House to House	880
Doughnuts	650
Confectionery	
Candy	2,500
Chewing Gum	2,500
Miscellaneous	
Peanuts	200
Shelled Nuts	400
Baby Food	50
"C" Biscuits	200
Food Lockers	300
Hoods for Milk Bottles	120
Total for Food	37,645
Tobacco Products	
Cigarettes	12,000
Cigars	1,000
Smoking Tobacco	1,200
Total	14,200
Grand Total (For Food and Tobacco Products)	51,845

CHEMICALS USED IN INSECTICIDES & FUNGICIDES

MATERIAL	FUNCTION
Ammonium polysulfide	fungicide
Arsenic trioxide	stomach poison for poison baits
Barium carbonate	rodenticide
Barium fluosilicate	stomach poison
Bentonite	diluent and sticker
Beta-naphthol	treatment for codling moth bands
Bismuth subsalicylate	fungicide for young tobacco plants
Borax	cockroach powders; larvicide
Bordeaux mixture	fungicide
Calcium arsenate	stomach poison
Calcium carbonate	dust diluent
Calcium caseinate	spreader and sticker
Calcium cyanide	fumigant
Calcium monosulfide	fungicide
Carbamates	fungicides
Carbon disulfide	fumigant
Carbon tetrachloride	fumigant
Casein	sticker
Chloropicrin	fumigant
Citronella	repellent, deterrent
Copper arsenate	stomach poison
Copper oxychloride	fungicide
Copper sulfate, monohydrate	fungicide dusts
Copper sulfate, tribasic	fungicide
Cottonseed oil	spreader and sticker
Creosote oil	repellent
Cresols and phenols	dormant tree sprays
Cryolite	stomach poison
Cyclohexylamine	contact insecticides
DD mixture	soil fumigant
DDT	contact insecticide
Detergents, synthetic	wetting agents and emulsifiers
Diatomaceous earth	diluent for contact dust
Dichlorodiethyl ether	soil fumigant
Dimethyl phthalate	repellent
Dinitrophenols	contact sprays
Diphenylamine	repellent for screw worm fly
Ethylene dichloride	fumigant
Ethylene oxide	fumigant
Eugenol	attractant
Fish oils	spreaders and stickers
Fish oil soap	spreader and emulsifier
Formaldehyde	seed and soil disinfectant
Geraniol	attractant
Gypsum	dust diluent
Hydrated lime	dust diluent and carrier
Hydrocyanic acid gas	fumigant
Iron Sulfate	spraying corrective
Isoamyl salicylate	attractant
Isopropyl formate	fumigant
Kerosene	fly spray
Lead arsenate	stomach poison
Lignin pitch	emulsifying agent
Lime-sulfur	fungicide and contact insecticide
London purple	stomach poison
Lubricating oil emulsions	dormant and summer contact sprays
Magnesium arsenate	stomach poison
Manganese arsenate	stomach poison
Manganese sulfate	spray injury corrective
Mercurials, organic	seed disinfectants
Mercuric chloride	soil insecticide and seed disinfectant
Mercurous chloride	soil insecticide
Methaldehyde	poison bait for slugs
Methyl bromide	fumigant
Nicotine	contact insecticide
Orthodichlorobenzene	soil and wood fumigant
Paradichlorobenzene	repellent, fumigant
Paris green (copper aceto-arsenite)	stomach poison
Pentachlorophenol	contact insecticide and repellent for wood borers
Petroleum sulfonic acids	emulsifying agents
Phenothiazine	stomach poison
Phosphorus	stomach poison
Pine oil	repellent, contact insecticide
Potassium antimony tartrate	stomach poison
Pyrethrum	contact insecticide
Pyrophyllite clay	diluent for contact dust
Quassia	contact insecticide
Red oil (oleic acid)	emulsifier
Red squill	rodenticide
Rosin	adhesive
Rotenone	stomach and contact insecticide
Sabadilla	louse powder and contact insecticide
Selenium	contact insecticide for red spider
Sesame oil	activator for contact insecticides
Soaps	spreaders and emulsifiers
Sodium arsenite	poison baits
Sodium cyanide	fumigant
Sodium fluoaluminate	stomach poison
Sodium fluoride	cockroach powders
Sodium fluosilicate	poison baits
Soybean oil	spreader or sticker
Strychnine	rodenticide
Sulfur	fungicide and fungicidal diluent
Talc	diluent for contact dust
Tar oil emulsions	dormant contact spray
Thellium sulfate	rodenticide
Thiocyanates	summer contact and household spray
Triethanolamine oleate	emulsifying agent
Walnut shell dust	diluent for contact dust
Wetting agents	wetting and spreading
Zinc arsenite	stomach poison
Zinc chloride	fungicide for wood treatment
Zinc oxide	fungicide; spray injury corrective
Zinc phosphate	rodenticide
Zinc sulfate	spray injury corrective

A great variety of acids, alkalis, and salts are employed in compounding preparations for use in the sanitation of dairies and of food processing plants. It is estimated that the following quantities of diverse chemicals are required annually:

	Tons
Trisodium phosphate	18,500
Tetrasodium pyrophosphate	2,250
Disodium phosphate	3,500
Phosphoric acid (75%)	700
Soda ash	24,000
Modified soda ash	3,000
Caustic soda	25,000
"N" Brand silicate	1,000
Sodium metasilicate	600
Sodium chromate	50
Sesqui-carbonate soda	2,000
Hydrochloric acid (18°)	700
Chlorine	5,100

It is not possible in a brief article of this character to discuss the numerous other categories and chemical compounds which play an important role in the processing and distribution of foods. The following titles which appear in the Outlook Report on Miscellaneous Chemicals prepared by the Chemicals and Fertilizers Branch, Office of Materials and Facilities, War Food Administration,* will give the reader an idea of the diversity of agricultural demands.

Food Supplements
  Citric Acid, Tartaric Acid, Benzaldehyde, Carbon Dioxide, Caffeine, Vitamins
Food Chemicals
  Phosphorus Compounds, Iron, Iron Salts
Bleaching, Aging, and Preserving Chemicals
  Chlorine, Sulfur, Benzoyl Peroxide, Benzoic Acid, Food Dyes
Food Wrappings
  Cellophane, Paraffin, Microcrystalline, Wax, Zein, Resins, Plastics
Food Sanitation
  Alkalies, Acid and Salts, Wetting Agents
Refrigeration Chemicals
  Dry Ice, Freon, Ammonia
Feed Supplements
  Phosphorus Compounds, Manganese Sulfate, Urea, By-Product Protein
Poultry, Soil, Seed, and General Disinfectants
  Formaldehyde, Potassium Permanganate, Other Disinfecting Agents
Weed-Killing Chemicals
  Chlorates, Arsenic, Other Chemicals
Legume Inoculants and Plant Hormones

Outlook

It is difficult and dangerous to generalize in making forecasts of future demands for chemicals in the face of such a diversity of agricultural requirements. Undoubtedly national prosperity, that is, continued employment at relatively high levels, coupled with wages approximating those now in effect, will do much to sustain the present high peak of production and consumption. Another factor is that we will have facilities now engaged in production for war purposes which management will want to keep in operation, and this desire is complemented by the desire of consumers to get materials and services which they have learned to appreciate.

Summing up, it can be said that agriculture is about the largest market for the chemical industry. It is a growing and appreciative market. The chemical industry should nurture it and aid in maintaining its purchasing power at high levels.

*Restricted distribution

COLOR—An Aid to SAFETY

. SAFETY COLOR CODE based on color-thought sociation has been evolved by Faber Birren, industrial ılor consultant, and Harold L. Miner, manager of the u Pont Company's Safety & Fire Protection Division.

OLOR has been traditionally associated with characteristic meanings, evident in such allusions as "the red ıdge of courage," or "born to the purple." A red traffic light 's "stop" as emphatically as a burly policeman. Green says)" and yellow says "wait" as plainly as the spoken words mselves.

The railroad industry has long recognized the language of or. In railroad circles all over the country, blue, for instance, s "don't move this object—men are working on or around The Interstate Commerce Commission uses different cold labels to identify explosives, acids and inflammable mates; and the Army and Navy identify different kinds of shells characteristic colors.

n a number of ways industry has already recognized that or can convey emphatic messages. Why not use it, then, hout danger and point to salvation in industrial plants?

he Du Pont Company retained Faber Birren, the wellwn industrial color consultant, to work with Harold L. ıer, manager of its Safety and Fire Protection Division, to k out a standard color code for marking industrial hazards. y devised a system using six colors—each chosen for its icular message because of the inherent associations coned with it, or because of its natural psychological effect.

High Visibility Yellow, either alone or striped with black, sed to mark strike-against, stumbling, falling or tripping ırds. As such it should be used on trucking equipment, s of pits, railings, conveyor parts, low beams, stairway oaches and the like.

lert Orange, the shoutingest color in the whole spectrum, sed on dangerous parts of machines that might cut, crush therwise injure a worker. If machine guards can be opened ıre removable, the inside should be painted Alert Orange ttract attention to the danger of unguarded parts. It should used on fuse boxes, switch boxes, guards, pulleys, gears, ers and cutting devices—either solid or in the form of ırrow or inverted triangle.

recaution Blue should caution workers not to start or move hinery on which work is being done. It might also be l on switches to remind employees to be sure that equipment ee of danger before starting. A large blue disc which can ıung prominently on the machine in question is an effective to use it.

afety Green is used to mark first-aid rooms, stretchers, wers, cabinets for gas masks and medicinal supplies. It is n painted on a white background in the form of a cross. square of Fire Protection Red indicates the location of extinguishers, alarm boxes, hose, fire doors, blankets and rants. A red square on the floor below discourages clutter of the aisle in the vicinity of such equipment.

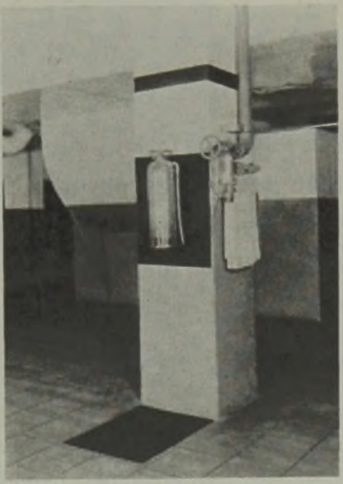
astly, Traffic White (Gray or Black) is used to mark aisles, age areas, waste receptacles, and similar channels of normal fic.

oo often color is used indiscriminately. Fire doors, for ance, have been painted red, yellow, green and white—right he same plant. Safety showers were painted red—like the equipment. If uniform use of color were adopted, many dents might be prevented, or many minutes saved in those ergencies when time is most precious.

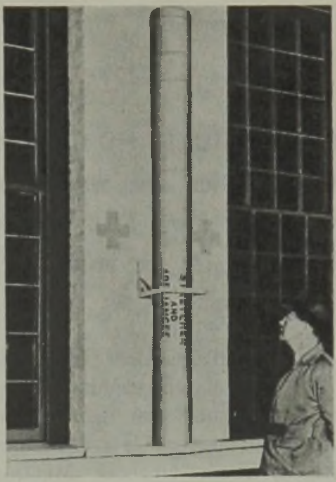
High Visibility Yellow calls attention to posts and cranes.

Precaution Blue warns workers not to start shut-down equipment.

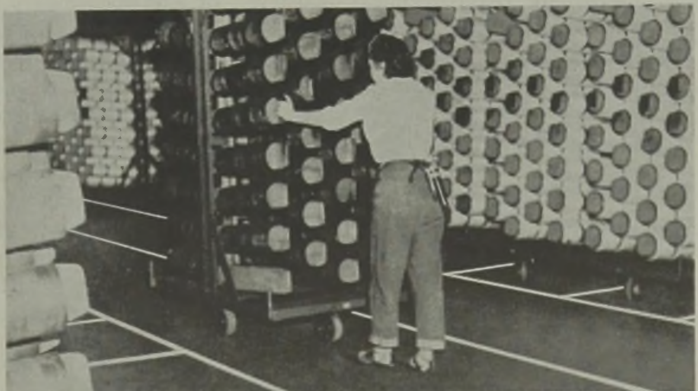
Alert Orange serves functionally when painted on the inside of machine guards. It shouts that protective equipment has been removed. Note stripe on gear wheel.



Fire Protection Red marks the location of a fire extinguisher.



A stretcher case is indicated by a cross of Safety Green.



Traffic White (Gray or Black) marks traffic lanes, aisles and storage areas; or Yellow can be correctly used where the traffic area is adjacent to a hazard.

R. L. Murray, Hooker Electrochemical Company, presiding at the caustic chlorine symposium, with Dr. Colin G. Fink, secretary of the Society.

Neal J. Johnson, National Carbon Company, Inc., addressing the caustic-chlorine symposium on graphite corrosion in brine electrolysis

Electrochemical Society Meets in Buffalo

MAGNESIUM AND CHLORINE PRODUCTION, induction heating and electrodeposition are war-important techniques about which electrochemists talked at their Fall Meeting. They honored Dr. William Blum, Acheson Medalist, for his important contributions to the science of electroplating.

M. S. Kircher, Hooker Electrochemical Co., addressing the caustic-chlorine symposium

ELECTROCHEMICALS which have had a far-reaching effect on our military production were the nucleus of technical papers presented before the Eighty-Sixth General Meeting of the Electrochemical Society in Buffalo, October 12-14. Over five hundred members and guests met at the Hotel Statler, in the heart of the electrochemical industry, to participate in symposia on caustic soda and chlorine, induction heating, dry cell developments and electrodeposition.

Acheson Medalist

Dr. William Blum, of the Bureau of Standards, was presented the Edward Goodrich Acheson Medal and $1000 Prize at a dinner in his honor. Dr. Hiram S. Lukens, University of Pennsylvania, and Thomas Slattery, Bureau of Printing and Engraving, reviewed Dr. Blum's life and accomplishments.

Dr. Blum came to the Bureau of Standards in 1909, shortly after receiving his Ph.D. from the University of Pennsylvania. For several years he was engaged in researches on analytical chemistry, including the use of sodium oxalate as a primary standard, the titration of manganese, and the gravimetric determination of aluminum. About 1913 he gradually changed his activities to electrochemistry, to which he has since given practically all of his time. He is chief of the Section of Electrochemistry in the Chemistry Division of the Bureau, which section is devoted principally to electroplating and electrotyping. During World War I and during the present war he has been engaged in various researches on military applications of electroplating.

An interesting comment on the present metals situation was that the replica medal, usually cast of bronze, was made of sterling silver this year because of the scarcity of the former material.

Postwar Aviation

A nine-fold expansion of commercial aviation by 1950 was foreseen by Dr. C. C. Furnas, research director of Curtiss Wright Aeronautical Corporation, who spoke at one of the dinner meetings. Passenger planes will fall into four size categories: 12-16 passenger planes for "feeders" from smaller communities to the established air routes; planes of present capacity (20-25 passengers) for short-hop "locals"; larger planes carrying 40-60 passengers to carry the bulk of the traffic and very large transports carrying 10 passengers or more for high-speed trans continental or transoceanic flight.

He further predicted that all first-class mail whose destination was more than 45 miles distant will be flown at no premium postage, and that the use of air freight will increase several-fold.

Jet propulsion and helicopters, he asserted, will play important roles in the future, but the immediate expansion of aviation will come through established modes of flight.

Although aviation appears to be quite far afield from electrochemistry, the two are bound closely by their mutual interest in light metals. Much of the present efficiency of our aircraft is due to the introduction of light alloys of magnesium and aluminum.

Electrochemistry of Magnesium

Ralph M. Hunter, Dow Chemical Company, reviewed the electrochemistry of magnesium and pointed out some of the problems which arise in the electrolysis.

Magnesium chloride is separated from Michigan brime in the form of the hexahydrate. This is dried by counter-current air in a spray dryer until the crystals contain 1.25 molecules of water, corresponding to 75% magnesium chloride. This is suitable for introduction into the electrolytic cell.

The commercial electrolysis of pure, or even approximately pure, magnesium chloride is impractical; its melting point is high (712 deg. C), and it is a poor conductor. In practice, most baths contain a minor quantity of magnesium chloride and consist in the main of sodium or potassium chlorides. The sodium salt is preferable because it has a higher conductivity and specific gravity, but fused carnalite ($KCl\ MgCl_2\ 6H_2O$) has been used successfully.

Both sea water and the Michigan brines, fortunately, do not contain salts of metal capable of alloying with magnesium. They are also low in sulfates, which are detrimental to the electrolytic process.

An element is present in sea water, however, which caused spectacular difficulties until its nature was discovered. Boron, it was found out, in concentrations as low as 0.01% prevents the coalescence of the deposited magnesium. This is believed to be due to the formation of a magnesium boride film. Some of the metal is sufficiently weighted with boride to sink and accumulate in the sludge. Boron is best controlled by keeping it out of the cell feed by chemical treatment.

The electrolysis at Dow is carried out in steel pots 6 x 5 x 11 feet in size and containing ten tons of molten salt. They carry a current of 30,000 to 70,000 amperes at 600 to 650 volts. Each pot produces about 1100 lbs. of metal per day. The metal is obtained in 99.9% purity.

Recent refinements include the use of silver—less susceptible to corrosion—in place of copper, the use of Saran sheeting to prevent current leakage, and ventilation at the record rate of 60,000 cubic feet of air per minute per cell.

Electrical Hazards

A. M. Hamann and R. E. Hulse, E. I. du Pont de Nemours & Co., pointed out the danger associated with electrolytic cell banks. The danger of fatal electrical shock to operators is present in most cell rooms. The trend to higher operating voltages, 500 volts and over, necessitates careful consideration of factors affecting this hazard.

The local points of danger are between conductors of opposite polarity leading to the cell bank, between cells at or near the ends of the banks, and between the cells or conductors and the ground or grounded objects. The first two are inherent and are usually eliminated in the initial installation. The third item is not always fully recognized and constitutes an important factor in both design and operation.

Requirements for a safe installation have been well studied, but close supervision of the operators is necessary. In most cell rooms, the temperature near the cells is quite high. This has the dual effect of lowering the contact resistance through perspiration-soaked clothing, and of making the continuous wearing of adequate rubber protective clothing unbearable. Rubber gloves and shoes should be checked by high potential or resistance methods at regular intervals.

Other Symposia

Applications of induction heating for case hardening, melting, annealing and silver brazing were presented. Papers on dry cell developments were concerned mainly with various aspects of manganese dioxide and carbon black. The Electrodeposition Division heard several papers on technical aspects of copper, manganese and chromium deposition; and the closing sessions of the meeting were devoted to round-table discussions of teaching methods, bright plating and the color in electrolytic caustic soda.

B. York, Champion Paper and Fibre Company, spoke on chlorine cells in pulp mills; and Dr. D. Vorce, Westvaco Chlorine Products Corp., who discussed the historic development of cells.

P. Wenzell and P. J. Stuber, Monsanto Chemical Company, Monsanto, Illinois, who spoke on chlorine and caustic soda.

Dr. W. C. Gardiner and R. B. MacMullin, Mathieson Alkali Works, who spoke on the electrochemical industry at Niagara Falls.

INDUSTRIAL RESEARCH Studied At Standard Oil FORUM

WHAT ROLE WILL THE GOVERNMENT play in postwar research? How should a research department be organized? Provocative questions like these challenged the participants in the Standard Oil Development Company's Silver Anniversary Forum on the principles and objectives of industrial research

ALL SPEAKERS at Standard Oil's Forum agreed that industrial research would continue to expand in the future as it has during the past quarter century. They differed only in the emphasis they gave to various factors promoting or hindering that expansion.

The several hundred representatives of science, industry and education who met at the Waldorf-Astoria October 5 as guests of the Standard Oil Development Company, upon the occasion of its 25th anniversary, were presented an optimistic picture of postwar research—tempered by ominous shadows of obstructive patent legislation and hamstringing Governmental control.

Thomas Midgley, Jr., the late president of the American Chemical Society, spoke for the chemists. Tracing the historical and philosophical background of research, he paused to look at the present-day picture and then pointed out certain pitfalls to avoid in future planning.

Summary of Midgley's Address

Some twenty-five or thirty thousand years ago a new species of animal appeared on this earth, remarkable in that it differed in one characteristic from all that had preceded it. Instead of adapting itself to the various environments thrust upon it by an unfriendly world, it had an instinct to adapt its environment to suit itself. Indeed, this was the most remarkable characteristic it possessed. Yet there remained many parts of its environment over which it could exert no control; for example, lightning, hurricanes, earthquakes and floods. At first imagination was given full sway. Creatures superior to itself were conceived of which had control of these things. Sacrificial offerings and prayers were invented to obtain the friendship of these superiors, but gradually, through the past two thousand years, such childish superstition has been replaced by what we call the scientific process.

What is this scientific process? To my mind the basis of the scientific process is the reproducible experiment. Revelations, dreams, supernatural authority are now out, and even logic is of secondary importance to the reproducible experiment. Mathematics is the only branch of science which claims exemption from this rule. Two thousand years ago, mathematics passed from the realm of the experimental to the utopia of pure logic. Is it too much to hope that other sciences, such as chemistry and physics, may some day be similarly transformed? One may always hope, even though fulfillment is still far away.

Patent Laws

For some reason, best known to our law makers, the discoverers of new fundamental facts are denied any special right to financial benefits that may result. On the other hand, those who can apply such discoveries to improvements of our environment are granted the exclusive privilege of exploiting these improvements for a limited period of time, providing they make public the nature and details of the improvements in documents called patents.

Whether this arrangement is right, fair or just is beside the point. Under its influence modern industry has come into existence and man has made great gains in controlling his environment.

In the early history of modern indus

At the speakers rostrum is Harry L. Derby, who presented management's view.

Dr. C. E. K. Mees, Eastman Kodak Company, taking part in a general discussion.

there is little evidence that it either ew or appreciated the fact that the ent system was responsible for its th. All it knew or cared about was t it had a steam engine to run machines ich could be operated by men, hired at wages, to make things that could be at a profit. Few of the early units our "modern industry" gave heed to fact that they could increase their fits by contributing to the inventive developmental process.

nevitably industry finally saw the t. Many of you can recall the "draft- room" of fifty years ago—how it w into the engineering department ich in turn gave birth to the research oratory.

ndustrial research has come into exist- e by this revolution. The field of in- trial research is restricted, primarily, making use of the discoveries of aca- nic research to improve our control r our environment, which then may used for profit making through the ent process. It often becomes neces- y, in the course of prosecuting indus- l research, to determine additional ts about the universe so that these ts may be applied. There is no legal cess for restricting the use of these ts, once determined. Secrecy and se- cy alone can retain control. I should to point out that, despite the profit tives, the large majority of industrial rators do make these discoveries pub- within a reasonable time. Such an at- ude of conscious service to society ould receive more praise and recogni- n than it does.

Public Fears Research

Instead of trying to *aid* industrial research to benefit society, it seems inherently human for many people to do their utmost to obstruct it. Possibly the suddenness with which industrial research has developed to its present position of eminence has generated unwarranted fears on the part of many people who scarcely understand it; fears that the power it obviously possesses over our future progress may be abused; fears that a monopoly of brains may be in the making, or just plain fears of change. Had industrial research developed simultaneously with modern industry over the past one hundred and fifty years instead of merely during the past twenty-five (to a large extent), these fears would be non-existent.

I should like to discuss a few of these at random, more for the purpose of disclosing the uncoordinated thinking that is taking place rather than to attempt a solution of any one of them.

For example there is one school of thought, that was rather vociferous some ten years ago, which believed that all industrial research should be ended for some indefinite period, until, as they expressed it, the humanities had caught up. Frankly, the thought processes involved are beyond my poor comprehension. How unemployment may be reduced by increasing it, or how stopping industry will start employment is merely a denial of logic to me.

Then there is the thought that placing all industrial research under governmental direction would result in accelerated progress. I have read the various Kilgore bills and the arguments for and against; but again I must confess that I simply cannot understand the logic involved. Somehow, it seems to me that the proponents of this and similar proposals assume that research scientists are going to work largely for the pleasure of presenting the results of their labors to society gratis, without any desire for rewards for themselves. It is quite true that scientists, as a group, are more willing to work for the sheer joy of satisfying their inquiring minds than are most other people; but it is also true that scientists have wives and children, just as other folks do, and they are as deserving of an opportunity to obtain a financial reward that is somewhat proportional to the services they render society. I have never been able to figure out where they get it under the Kilgore proposal.

There are also those who would change our patent system. Somehow these people have an aversion to the government's granting a monopoly for seventeen years to any individual for making public an invention. These people seem to think the government is giving away something to the inventor. Actually, by its very nature, a patentable invention brings into existence with it a natural monopoly, which merely requires secrecy for its preservation. If the government decides to drive a much harder bargain, is it not permissible to wonder how many inventors will volunteer to surrender their natural monopolies? Certainly those who make an invention which may be exploited and kept secret will scarcely be expected to do so. The results will be disastrous.

Then, too, there are court decisions that are difficult to understand. The Supreme Court uses the term "flash of genius," as though the method of making an invention was of more importance than the invention itself. Another court proclaims that an individual can make an invention; but if a group, working together, perform the same act and obtain the same result, it is not an invention. It is all very disconcerting. The attitude of these courts seems to be comparable to a general's deciding that if a regiment takes a position from the enemy, no advance has been made; whereas, if a single individual does so, it is a commendable act deserving of a medal.

I am proud of our patent system, proud of its past record—a record which speaks for itself; and I sincerely believe that this record alone fully justifies its retention.

Present Trends

Certain trends in industrial research are becoming obvious. Research has not yet come into its own with respect to many of the smaller units of industry. Now that the exploratory stage is pretty well over and trained personnel is available for executive positions, there is no longer any reason why the smaller units of industry should not make full use of industrial research for their own advancement and welfare. The expense handicap can be overcome by cooperative laboratories, and such laboratories are coming into existence already.

I am of the opinion that, as time goes on, more and more research of the fundamental type will be necessary. Should such research be done in the actual industrial laboratory, or would it be better, in most instances, to delegate it to the educational institutions? The majority of cases should be such that they may be safely entrusted to the research staffs of our universities and colleges for study. This attitude should be encouraged whenever possible, for three reasons: first, the university staffs are generally able to bring a much broader vision to bear on these fundamental problems; second, where fundamental problems are being prosecuted in industrial laboratories, they have a habit of being set to one side and forgotten when more urgent work develops; and third, the work thus given to the educational staffs will be of considerable value in educating future scientists to do more such work.

Probably no other field holds more and varied promises for successful industrial research than chemistry; success for the investigator who may satisfy his curiosity about the unknown with a fair share of honor and wealth; success for industry which may increase its payroll, its output and its profits; and success for the public, who will reap the benefits of better health, higher standards of living and a safer world in which to live and travel. But there are two catches to this charming picture.

First is the recent apathy the public has shown toward raising its standard of living. It is discouraging to develop new things just to have the public yawn and say, "So what?" Unless the public cooperates, unemployment is the inevitable result. I am not suggesting that the public go on a wasteful spending spree, but I do suggest that it supply itself with better houses, better lighting, better radios and refrigerators, air conditioning and sound proofing, better automobiles, tires and gasoline and the thousand and one useful articles that industrial research will be improving again when the war is over.

The second handicap to expansion of our research is the lack of properly trained personnel in the chemical fields. The war has already eliminated three years of the normal supply of college graduates, and if the upward surge of research takes place after the return of peace, we will find ourselves very short of professional chemists and chemical engineers. As competitive industry again gets under way, the educational situation may be quite disastrous. The universities are in no position to bid, financially, for the services of the younger men who are needed. Industry should take heed of this situation. By ample fellowships, both in size and number, it should encourage many young men to remain in educational work in order that its own needs can be met in the future.

The accelerating expansion of potential fundamental knowledge constitutes an ever-growing stockpile of raw materials ready for fabrication by industrial research. Obviously, this indicates the desirability of a continuation of the expansion that industrial research has experienced during the past twenty-five years. But there are other realities which will have a more quantitative effect than mere desirability. During the past 25 years industrial research has expanded ten times. Seventy thousand scientists are now engaged in it—a rather large percentage of the total number available. Another sizeable group *must* remain in educational work, or the whole system will collapse. It is difficult to visualize any sizeable expansion until our supply of scientifically trained personnel can be increased through the normal process of education.

Under-Secretary of War Robert P. Patterson, speaking at the dinner session of the Forum.

Organization

Once expansion does set in, management will again be faced by the problem of organization, location and unit size of the new laboratories to be built.

The past 25 years has established certain concepts of research organization that we may expect to endure for some time to come. The research "team" as a unit in this organization has gained popularity in the recent past. The individuals of any particular team are chosen for their qualifications in their field of specialization, as it is related to the problem to be studied. This is a different approach to organization than the conception of a departmental head, with a variety of assistants. The "team" is better adapted to the solution of problems involving two or more fields of science, while the "head", with assistants, works best on problems substantially confined to a single field. It has been observed that the problems involving multiple fields are becoming more numerous and hence the team conception is gaining in practice.

A minimum size of laboratory is indicated for retaining efficiency. On the other hand it is fair to ask the question "Is there a maximum size, above which efficiency declines?" I have an instinctive feeling that there is. The obviously controlling factor is the capacity of the research director to maintain an efficient understanding of the various problems for which he is responsible. In a way this capacity is similar to a chess master playing simultaneous chess. Up to a certain number of games he is able to maintain a high playing standard; but, with a few more games added, the result is little more than a semi-automatic moving of pieces.

Another problem that eternally plagues management is location. There is no ideal location. There are advantages in being near the production center; there are advantages in being away from it. There is *no* advantage, that I am aware of, in complete isolation. There are undeniable advantages in having the laboratory personnel well informed with respect to production problems and economics best obtained by proximity. On the other hand, the proximity of the research laboratory to production is an ever-present temptation to the production management to draw the laboratory into undertakproblems which the production unit ould be capable of solving for itself. Duplication of effort is another probn that faces most research executives. itness the tremendous activity that folved the discovery of deuterium. Pracally every department of chemistry s busily engaged in some form of aterium research within a few weeks, t little more came out of this vast eft than would have resulted from a ntralized research.

There are countless minor researches der way all the time that might very ll be centralized, with excellent rets and considerable savings. Call it operative" or by any name you please, should be encouraged. Sometimes the id solution of some critical problem is necessary that management is justified setting two or more groups at work it at the same time. Usually it is well have the different groups attack it m different viewpoints. It is a situa-, however, that requires skillful manment, or the result may be disastrous. long as esprit de corps can be mained with, perhaps, the stimulation of ndly competition, all is well; but once sonal jealousies have developed stagon rather than progress is likely to ult.

Public Relations

should like to close with the suggesthat better public relations be deped by industrial research in gen- Advertising copy has a way of anticizing research, putting an air of tery around the laboratory, calling "Home of Magic" or some other lly intriguing name. By these means public is led to believe that industrial arch is beyond their understanding what the public does not understand ears.

the public should be told just what rech is, when used by industry, and how enefits mankind. Then, too, as little ecy as possible should be placed nd new fundamental knowledge. It t be recognized that some secrecy is e proper, but let it be as little as ible. Publish as soon as is compatible safety, and notify the public of this ugh the daily press, and keep in mind t Dr. Kettering once said, "When lock the laboratory door, you lock more than you lock in."

Derby Speaks for Management

Harry L. Derby, president of Ameri- Cyanamid & Chemical Corporation, ussed the impact of research on busis and industrial policy. In the followpartial summary of his remarks, he rges on the theme of patent rections:

n the early years of this century a companies organized research departments. But it is only since World War I, which drew attention to the developments that had given Germany such industrial strength, that industrial research has become a major feature of our economic life. Before that time, there was mutual misunderstanding and lack of appreciation between men of science and men of business. Many managements strongly doubted that it was a proper function of industrial organizations to create research divisions and to support continuing broad research programs.

Dr. C. E. Williams, General Aniline & Film Corporation; Wallace P. Cohoe, consulting chemist; Lammot du Pont; and Dr. Francis C. Frary, Aluminum Company of America.

Certainly that situation is changed today. Research is now not only recognized as an integral part of business, but the United States has become the acknowledged world leader in this field.

We in management realize that research today involves much broader considerations than, let us say, simply the physical improvement of an existing product. It provides a guide for us in decisions bearing on the health and very life of our companies.

By way of illustration, twenty-five years ago the interurban electric trolley line was a familiar feature of American life. Today the interurban trolley has disappeared almost completely, supplanted by autos, buses and trucks operating on highways. There has been a fundamental change in modes of transportation, and industrial research has had a large part in that change.

Similar changes, or potential changes, abound now. The management of a company in the light metals industry, for example, must be aware not only of research in light metals but also in plastics. And the reverse holds good for management in plastics.

Competition operates not only on its previous level but on new ones. It is no longer only rivalry among similar products in the same field. Today one kind of material competes with one or more totally different kinds which can be applied to the same use. There is competition between processes, and between raw materials as sources for the same product—for example, the production of toluene from coal tar and from petroleum.

I am confident that research in industry has not reached the ultimate in its scope and importance. The future outlook, I believe, is for enlargement to continue, and for research to occupy a still larger place in the plans of industrial management.

Government Policy

While not desiring to be overly pessimistic, nor in any sense to deprecate the value of your achievements, I would pose a few questions, the answers to which may to some extent influence the scope of future programs of research and development.

Patents are important to you men and to organizations engaging in programs of research and development. Now, if the theory and basis of our patent system is to be radically changed, as some in Government seem to wish; if large corporations or small corporations may no longer safely risk their stockholders' funds in research; if no longer the individual may be sure his idea will be protected; if these discoveries are to be free to all; then the incentive for burning the midnight oil disappears—and incentive has always been the motivating factor in industrial development in America.

Jewett Speaks for Physicists

Responsibility for research was the theme, as indicated in the following partial summary, of Dr. Frank B. Jewett, retiring vice president of the American Telephone & Telegraph Company, in charge of development and research.

Industrial research organizations need not be large to be efficient, and in a host of industries we will find small laboratories doing distinguished creative work. In many fields, however, the products will be such as to involve a wide range of physical, chemical and biological problems so interwoven as to call for scientific attack from many angles; and so we will have large research organizations

Left to right: Rear Admiral J. A. Furer, coordinator of research and development, U. S. Navy; Charles L. Parsons, secretary of the American Chemical Society; Per K. Frolich, Standard Oil Development Com- pany; and Brigadier General W. C. Kabrish, Chemical Warfare Servic

with specialists and specialized facilities in many fields, all organized to function as a coordinated team.

Experience has shown that this is the most powerful, effective and economical method of handling complex problems. At all stages of the work the several elements react on one another, and that which can or cannot be done in one field determines what can or cannot be done in another. Facility for intimate daily intercourse between the research and development men expedites progress, eliminates much false work and insures a better end product.

By this I do not mean to imply that there is no place for specialized industrial research laboratories, nor that great research organizations will not find it profitable to seek their assistance. In general I think, however, that such assistance will be confined to questions which are in themselves essentially complete problems.

Governmental Research

There are very large sectors concerned with applied science where the maximum benefits of scientific knowledge cannot be made available to the nation without active participation of political government.

Most outstanding are fields like agriculture and public health, where the number of those to be benefited is very great, the units small and uncoordinated, and the difficulties of voluntary cooperation correspondingly large. In these sectors there seems to be no escape from large governmental participation as the only effective means of providing the funds and facilities which the nature and magnitude of the scientific and technical problems demand.

The great objection to delegating to political government control of much of industrial research and development is inherent in the structure of government itself. It is difficult, if not impossible, to insure against the intrusion of political factors which are inimical to the full realization of all that fundamental and applied science is capable of doing. In addition to this, government must necessarily be controlled by general and rather rigid rules, many of which we are commonly wont to describe as "red tape."

Thus, quite aside from the pernicious intrusion of political factors which have no place in a research undertaking, the setting is one in which a large number of the best of our scientific and technical men are reluctant to operate. As a result, there is a large tendency toward the expenditure of huge sums of money for what is essentially second-rate work done by those less-than-best men who are content to spend their lives as poorly compensated civil servants.

During the last few years there has been a large amount of agitation to make the fruits of scientific research and development more generally available to the public through an enlarged intrusion of government into what we have been accustomed to consider the province of the individual or of industry. When boiled down, much of this discussion is found to be based either on misconceptions; on real reasons that are masked; or on a desire to get something for nothing or something at the public's expense.

Research Direction

Wise management will see to it that those who direct its research and development organization are an integral part of its policy making group. Such participation imposes a grave responsibility on the directors of research and development. They must be more than able scientists and technologists—they must be industrial statesmen capable of viewing the problems and accomplishments of the laboratory not only as scientific achievements but as part of an economic and social structure.

Small Business Discussed

Other speakers concerned themselves with the applicability of research to small business. Research by business itself was presented by Edwin H. Land, president of Polaroid Corporation; Dr. Westbrook Steele, executive director of the Institut of Paper Chemistry, discussed researc by trade associations and cooperatives and professional research organization were discussed by Dr. Earl P. Stevenson president of Arthur D. Little, Inc.

Dr. Clyde E. Williams, director of th Battelle Memorial Institute, talked abo the work of foundations; and the role the government was revealed by A. Fieldner, chief of the Fuels and Expl sives Division of the Bureau of Mines.

The dinner speaker was Under-Secre tary of War Robert P. Patterson, wh stressed the need for continued hig quality military research.

The consensus of all speakers was th industrial research is bound to expa after victory. They agreed that wh most of it was private domain, the go ernment was best able to sponsor r search in the fields of agriculture, pub health and the like.

Frank A. Howard, president of t sponsoring organization, summed up t problems which confronted the partic pants in the forum:

"All businesses have become consciou of the increasing importance of resear to continued progress. Research has b come an accepted part of peacetime a tivity. In war, research facilities and e perience have been one of the chief facto in the enormous contribution of Amer can industry to the prosecution of the wa

"Many new problems now face th concerned with industrial research. Pr lems of conversion from war to peace a mounting in importance, and the time nearing when these questions will ha to be met. The effect of industrial r search on the entire business structu has been a matter for comment and co cern. Responsible leaders in governme in industry, and in education have rais the question of the future course of i dustrial research. Whether industrial r search has given an undue advantage large business over small business h been debated; the part government shou play in research and in making availab the results of research, whether by go ernment or not, is being widely reviewed

HEADLINERS in the NEWS

DR. WILLIAM BLUM, of the National Bureau of Standards, received the Edward Goodrich Acheson Medal given by the Electrochemical Society.

DR. MERVIN J. KELLY, director of research for the Bell Telephone Laboratories, has been elected executive vice president and member of the board of directors.

JOSEPH W. CROSBY has been elected president and member of the board of the Thiokol Corporation. Mr. Crosby had been general manager of the company since last year.

DR. EVERETT C. HUGHES has been appointed chief of the research division of the manufacturing department of The Standard Oil Co. (Ohio), succeeding Dr. R. E. Burk.

ROBERT B. CRAGIN, formerly sales engineer of the M. W. Kellogg Company, has joined the Houdry Process Corporation as vice president in charge of sales engineering.

HARRY KREHBIEL has been elected president and chief executive officer of the Catalin Corporation. He has been vice president and director since 1941.

LYLE M. GEIGER has been appointed by the Neville Company as director of research. He has been acting director of research for the last year and a half.

ARTHUR V. DANNER, formerly a patent attorney with Socony-Vacuum Oil Co., has joined Houdry Process Corp. as vice president and member of the board of directors.

Acheson Medal Award Marks Electrochemical Meeting

Although the Electrochemical Society meeting in Buffalo was marked by the usual wartime simplicity, members and guests derived pleasure as well as instruction from various luncheon and dinner meetings. Dr. C. C. Furnas, shown at the right with Mrs. Furnas, told the group about the future of commercial aviation at one of the dinners. The following evening, October 13, the Edward Goodrich Acheson Medal was presented to Dr. William Blum of the National Bureau of Standards. More pictures accompany the story of the meeting on page 748.

At the Medal Banquet were John D. Sullivan, chairman of the Acheson Award Committee; Mrs. William Blum; Dr. Colin G. Fink, secretary of the Society; Thomas F. Slattery, Bureau of Printing and Engraving; Dr. Blum; and Sidney D. Kirkpatrick, president of the Society.

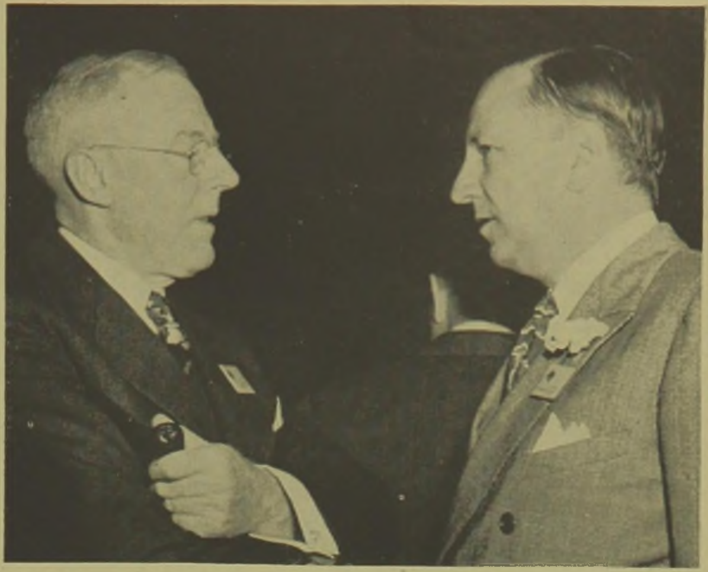
Also at the speakers' table were Howard Acheson; Dr. Hiram S. Lukens, University of Pennsylvania; R. M. Burns, past president of the Society; R. L. Baldwin, finance committee; Mrs. Kirkpatrick; Paul S. Braillier, chairman of the Niagara section; and Francis C. Frary.

Charles Blum, Catherine Moore, and Mr. and Mrs. Louis Blum, members of the medalist's family, were honored guests at the banquet.

Among other guests at the banquet were Dr. Harry A. Alsentzer, University of Pennsylvania; Mrs. R. L. Baldwin and Mrs. William Harvey.

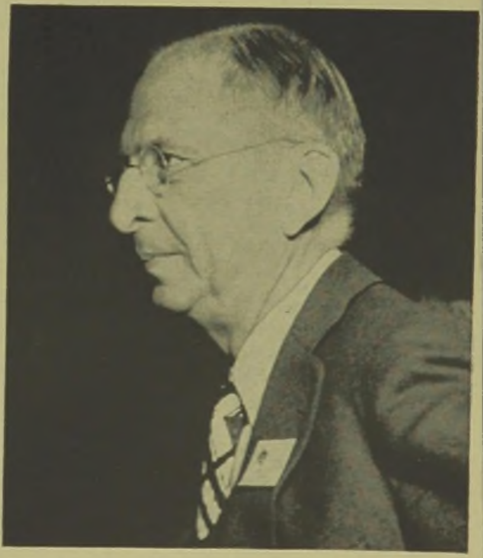
Leaders in Many Fields At Standard Oil Forum

Standard Oil Development Company's Silver Anniversary Forum brought together leading men in industry, government, the armed service and educational institutions to consider the functions and prospects of industrial research. Many of them participated in the general discussions which followed the addresses of the day. On page 750 is a fuller account of the meeting which took place at the Waldorf-Astoria October 5.



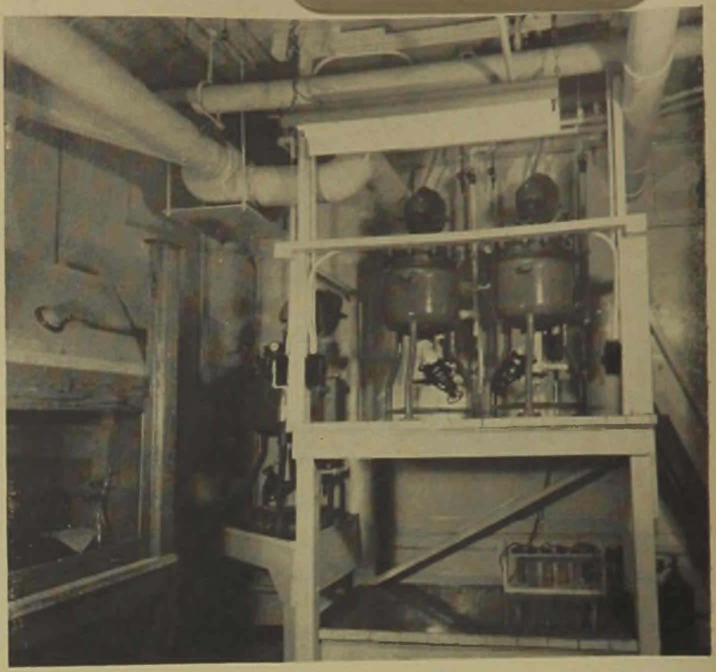
Dr. E. K. Bolton, E. I. du Pont de Nemours & Company, and R. T. Haslam, vice president of the Standard Oil Company (New Jersey).

Left to right: Brig. Gen. W. A. Borden, New Developments Division, War Dept.; Dr. L. P. Briggs, National Bureau of Standards; R. W. Gallagher; H. C. Weiss, Humble Oil & Refining Company; Carroll L. Wilson, CRSD; and R. P. Russell, president-elect of the host company.



D. L. Marsh, Boston University; C. M. Alter, Boston University; and R. W. Gallagher, chairman of the board of directors, Standard Oil Company (New Jersey). At right: Lammot du Pont, chairman of the board of directors, E. I. du Pont de Nemours & Company, Inc.

Purification Equipment for Electronic Chemicals



hese steam jacketed glass-lined autoclaves are part of the new hemical laboratory at the Dobbs Ferry plant of North American hilips Company, Inc. In these containers chemical purifications and eactions are conducted for manufacture of luminescent materials for athode ray tubes. Phosphors for this purpose require a high degree f purity. The purest chemicals on the market must be specially hanled to eliminate certain impurities that impair color and efficiency f cathode ray screens. Hydrogen sulfide from the tank (bottom) asses through six stages of purification before going to the autoclaves.

Glass Tanks Prove Worth In Industrial Processes

These tanks, made by the Pittsburgh Plate Glass Company of specially treated glass four times as strong as normal glass and able to resist shock of extremely sharp temperature variations, were introduced recently in a plant of the Westinghouse Electric and Manufacturing Company. They were originally designed as a wartime substitute for metal, wood and ceramic industrial tanks. For the process shown here, in which precision parts are being cleaned in an acid bath while electrically charged, it was found that the new tanks were superior in that they did not corrode, wear or leak.

Portable Smoke Generator Developed for Army

A portable mechanical smoke generator for use on jungle trails, mountain passes and beachheads is the newest smoke-screening device developed by the Chemical Warfare Service. With favorable wind conditions this midget fog machine can blot out an area five miles long and about 200 yards wide.

So light that it can be carried by two men, the generator consumes 50 gallons of fog oil and five gallons of water per hour as well as five gallons of gasoline to operate the all-aluminum one-cylinder engine which drives the blower and pump. It is completely automatic, and the smoke is neither harmful nor discomfiting to troops.

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BETWEEN THE LINES

The Nitrogen Picture

Department of Agriculture, without specifying either Government or private operation, favors converting some 40 per cent of Government nitrogen-producing capacity to manufacture of fertilizer and ammonia derivatives for postwar agriculture. An advance estimate gives 875,048 to 900,000 tons of nitrogen needed for fertilizer after the war—almost double prewar consumption. Government-owned plants would be needed to furnish 19 to 24 per cent of this, with increased imports the only alternative, according to the Department.

THERE are nine publicly owned synthetic ammonia plants, built by the Federal Government to produce nitrogen for manufacture of explosives. The question of what to do with them when their war purpose ends is currently the subject of much discussion.

During Congressional preliminaries incident to passage of the present bill for disposal of surplus Government-owned war properties, spokesmen for certain farm interests urged retention by the Government of at least a part of these facilities for fertilizer production, or their operation under semi-public control for this purpose.

The Secretary of Agriculture has since received, and has under study, the recommendations of a postwar planning group within the Department of Agriculture, calling for production of solid nitrogen fertilizer at some of the synthetic ammonia plants involved.

This planning group, the Inter-Bureau Committee on Post-War Programs in the Department of Agriculture, did not specify whether Government or private industry should operate the plants after the war. However, its report favors the ultimate conversion of nearly 40 percent of the total rated nitrogen-producing capacity of existing Government plants for manufacture of granular nitrogen fertilizer, ammonia, and ammonia derivatives for use of postwar agriculture and industry. Other Government nitrogen-producing plants, the report recommended, should be maintained in stand-by condition as part of the military establishment. They could be put in operation to supplement the supply of fixed nitrogen for civilian use, if needed.

Commenting on the report, Secretary Wickard said that "These recommendations represent sound public policy. Their adoption would help assure farmers of enough nitrogen fertilizer to meet their demands at reasonable prices after the war, enable the people to realize benefits in peacetime from public money invested in chemical war plants, and in case of emergencies provide nitrogen for explosives without jeopardizing the nation's food supplies."

Chemically fixed nitrogen has varied uses—in fertilizers, commercial and military explosives, plastics, refrigeration, dyes, nylon, petroleum refining, fire retardants, weed-killers, animal feeds, and in metallurgy. Nitrogen compounds are the basic ingredient of all military explosives from small arms to naval guns, bombs, and torpedoes. In normal times, however, almost three-fourths of United States domestic consumption is by agriculture in the form of fertilizers.

Farm Needs Bow to Military

Pearl Harbor precipitated a conflict between these two basic needs, military and farm, with the military winning out to the extent that for the two ensuing seasons, agriculture was on a short issue. The supply was brought up to above prewar level in 1943-1944. In the interim, the report recalled, "a more serious and prolonged shortage was averted by Government construction of synthetic ammonia plants and a Government subsidy of Chilean nitrate imports." Imports at the time were restricted and uncertain, due to shipping shortages and other war factors.

Meanwhile, as of August this year, according to the Department's advisors, there was a serious question as to the ability to supply fertilizer nitrogen in the amounts it was estimated would be necessary for 1945. That month found the Department of Agriculture writing to fertilizer manufacturers to suggest that mixed fertilizers carry a heavy potash content as contrasted with earlier years. increased potash supplies, the letter stat would be available to them.

From mid-summer on, steadily mou ing military demands resulted in deter rating prospects of supplies of nitrog and phosphate fertilizers for the 19 crops. By mid-October the nitrogen su ply was regarded as 588,000 tons for c tain. Included in this figure is the nitrog in 850,000 tons of Chilean nitrate at percent nitrogen, for which shipping p orities have been assured. While m than the average immediate prewar c sumption, the amount available for 1 is approximately 43,000 tons under t used for fertilizer in the 1943-44 year.

In sight, according to the Departm of Agriculture, is 7,000,000 tons of sup phosphate, 18 percent equivalent, c pared with 7,600,000 tons last year. B stering the promise of increased pot however, the Department states tha expects 725,000 tons of K_2O, compa with 604,000 tons last year and the mediate prewar average consumption 373,000 tons. The increase this yea expected to be in the form of muri rather than sulphate of potash.

The Agriculture Department's exp have gone into considerable detail a the normal use of nitrogen in this co try. Their research shows that the of fertilizer nitrogen varies widely different sections of the country, acc ing to soil differences, climate, cropp practices, and other factors. In 1941, t reported, approximately 55 percent of tilizer nitrogen was used in seven Sou eastern states, about 15 percent in N England and Middle Atlantic states, percent in Pacific coast states, and the maining 20 percent about equally divi between the Midwestern area, the Sou west, Hawaii, and Puerto Rico. One-h of the nitrogen used was in mixed tilizers and one-half for direct applicat

Prewar industrial consumption, it found, was approximately 35 percent the consumption used in manufacture commercial explosives, 20 percent nitric acid other than in explosives, percent for refrigeration, and the mainder for miscellaneous purposes. Th research also disclosed that farmers this country were particularly depend on imports for ntrogen. Of total nitro imports amounting to 201,700 tons example, 194,905 tons represented fer zer material, as a typical division. the years 1936-1940, industrial consu tion of 138,300 tons comprised only 5 cent of imported nitrogen, the remair 95 percent being of domestic origin; fertilizer, however, in the same period total of 389,800 tons was used, of wh half represented imports.

In recent years, it is shown, about percent of our import requirements h been furnished by Chile, nearly 25 p cent by Canada, and the remainder fr

(*Turn to page 812*)

EE THE INSIDE STORY

AS TOLD BY

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NEW PRODUCTS & PROCESSES

Trimethylolpropane

A new polyhydric alcohol, trimethylolpropane, is now commercially available from the Heyden Chemical Corporation. The product is a crystalline waxy solid with the following properties:

Formula	$C_8H_{11}(OH)_3$
Molecular Weight	134.17
Hydroxyl Content (% OH)	33.5%
Combining Weight	50.8
Color (Gardner)	11
Solubility, grams per 100 grams solvent at 25°C.	
Water	all proportions
Ethyl Alcohol	all proportions
Glycerol	all proportions
Benzene	0.02
Acetone	71

Trimethylolpropane has already found uses in making low viscosity drying and non-drying alkyd resins. These alkyds have shown application in the manufacture of textile printing pastes and impregnants. TMP is also used in the manufacture of synthetic drying oils, rosin esters, coating compositions and plasticizers. In general, resins and oils made from trimethylolpropane show wider solvency and compatibility than corresponding compounds made with other polyhydric alcohols.

Esters made with rosin and trimethylolpropane are soluble in mineral spirits and have good compatibility with drying oils and nitrocellulose so that they may be used for the preparation of spirit lacquers, oil lacquers, and nitrocellulose lacquers. TMP resins are said to have considerably higher stability to light than the usual ester resins from rosin and other polyhydric alcohols.

Wool Shrinkage Control

A new shrinkage control method for wool is now commercially available through the use of a new synthetic resin manufactured by American Cyanamid Company and trade marked under the name "Lanaset," according to an announcement by the Calco Chemical Division of the American Cyanamid Company.

Lanaset, a melamine resin, has already been tested with success by a number of leading mills and finishers. It stabilizes wool and wool blends without affecting the absorbency normally characteristic of wool. The usual chemical methods for controlling shrinkage actually alter the wool and destroy some of its valuable properties. Lanaset, on the contrary, is an additive and takes away none of these desirable qualities.

Another advantage, according to Calco's reports, is the simplicity of its application. The fabric is passed through an aqueous bath containing the resin, and squeezed uniformly through a mangle, dried and heat cured, and given a light wash to remove surface resins. The application is permanent for the life of the fabric, resisting laundering and dry cleaning. The pair of socks shown in the cut was washed with soap and soda at 140 degrees F for two hours. The one at the left was processed with Lanaset.

This stabilizing finish for wool fabrics is expected to be of particular value in the processing of dress materials, blends of wool and spun rayon for sportswear, tropical worsteds for men's suits, sweaters, children's wear, blankets and socks.

Mills that process wool and blends of wool and rayon can make immediate full-scale runs with Lanaset for trial on their lines.

Dichlorostyrene in Synthetic Rubber

A new chemical compound, dichlorostyrene, from which heat resistant plastic or synthetic rubber can be made, has been announced by the Mathieson Alkali Works.

The new compound was developed in the Mathieson research laboratories.

According to the company, the Mathieson plastic prepared from dichlorostyrene has excellent heat resistance and electrical insulating properties. Other plastics with either one of these properties are available, but the Mathieson plastic, it is claimed, is unique in its combination of properties, being more resistant to heat than any plastic which combines excellent electrical characteristics with good strength, machinability and moldability.

The new plastic is expected to be im-portant in electronics and, in general wherever electrical insulation at high tem-peratures is required.

The Mathieson rubber, which is mad from dichlorostyrene and butadiene, wa announced not long ago. It is now under-going government-sponsored road tests where it has appeared promising fo heavy-duty trucks and buses.

Dichlorostyrene monomers are highl active, and polymerize readily. Polydi-chlorostyrene, the Mathieson plastic whic is formed by this polymerization, resem-bles polystyrene in chemical resistanc solubility, and general appearance. It di-fers from polystyrene chiefly in resistan to heat, having a heat distortion point 240°-265° F, as compared with 165' 190° F for polystyrene. The Mathies plastic is also more resistant to water. is stable, showing no tendency to lo hydrochloric acid. It may be molded conventional methods.

Dichlorostyrene is readily copolyme-ized with other unsaturated compounds, form rubber-like products. The outstan-ing characteristic of the new rub formed by the copolymerization of chlorostyrene with butadiene is heat sistance. When compounded in a form of GR-S type, this rubber shows mu better oil resistance, tensile strength, elo gation, tear and modulus at 300% th GR-S. It also compares favorably w natural rubber in hot tensile strength, sistance to heat aging, and to water sorption, and excels in oil resistance.

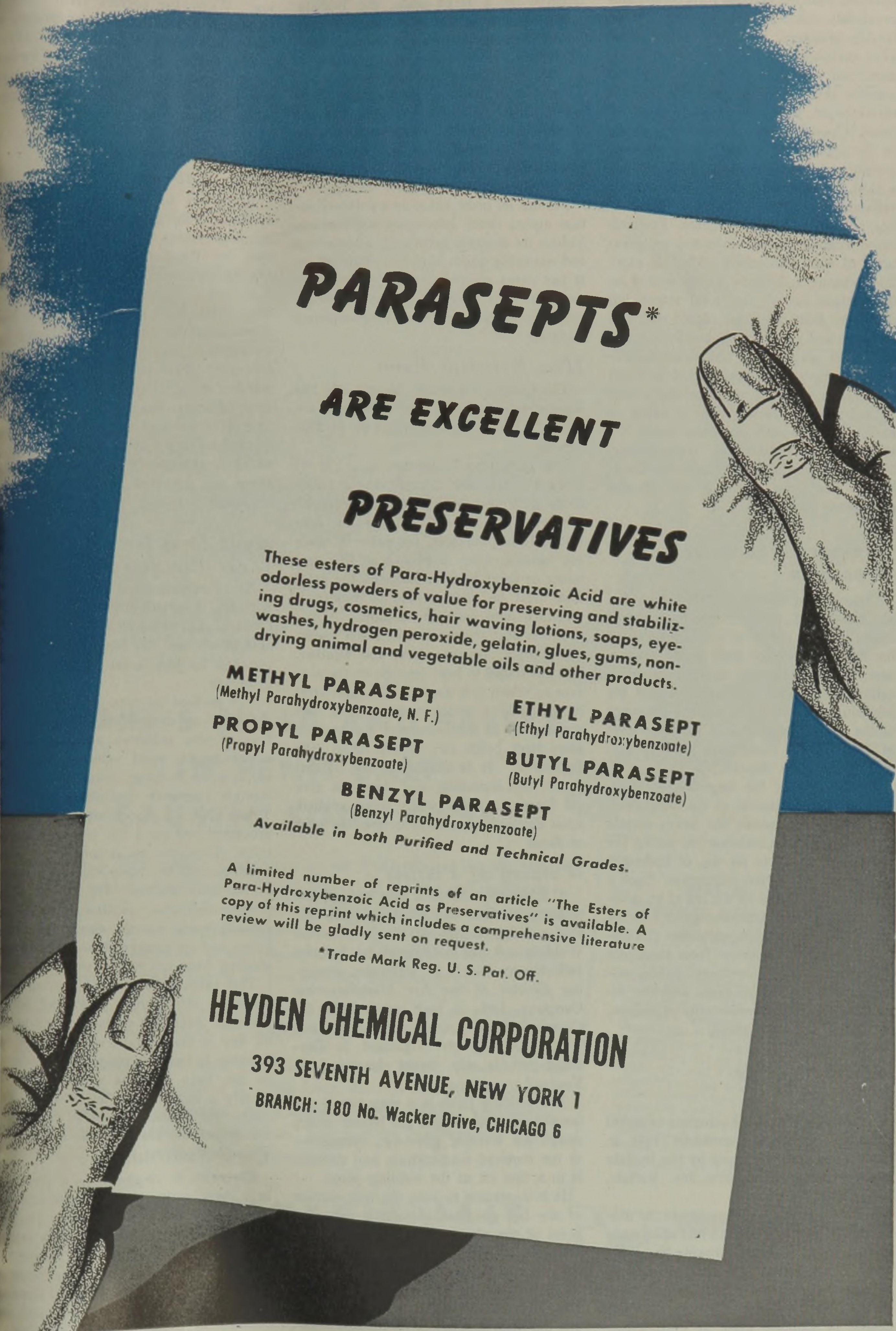
Synthetic Tanning Agent

The first complete synthetic replacem for vegetable tannins produces leat fully equal in quality to that produ with war-scarce natural tans. Known Orotan and developed by the Rohm Haas Company of Philadelphia, the n synthetic is a reddish brown visc liquid, resembling the conventional liq tanning extracts, and is completely solu in cold as well as hot water. Orotan p sesses all the necessary requirements a complete vegetable tannin replacem When used according to the regular sch ule in the normal process for produc sole leather, Orotan either alone blended with vegetable tannin materi behaves in the normal manner of natural tannins.

Allyl Starch

A new type resinous coating mate that looks like varnish, withstands h temperatures and the action of m chemicals and solvents, and can be m from sugars and starches of farm cr has been developed by the Research ministration of the Department of A culture.

The product, known as "allyl starc is prepared by treating starch with eit allyl chloride or allyl bromide and is qu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different from the carbohydrate compounds previously made by this method. When freshly prepared, allyl starch and other allyl carbohydrates are soluble in most paint and varnish solvents, which makes possible their ready application to wood, metal, paper, glass, textile and other surfaces. Upon "curing," in contact with air or by application of heat, they undergo complex chemical changes that produce a hard, smooth surface which is extremely resistant to organic solvents, acids, alkalies, and other corrosive agents. Properly cured coatings have withstood temperatures of 400° Fahrenheit. Alcohol, gasoline, acetone and other liquids spilled on the surface coated with allyl starch left no mark. Boat flag poles coated with this material and subjected to continuous day and night service and the abnormal climatic changes from hot to cold and wet to dry, are standing up surprisingly well in experimental tests. The coating is easily applied, and possesses such desirable characteristics as transparency, high gloss, hardness, and adequate flexibility. The development is now in the pilot plant stage.

Improved Manganese Deposition

Consolidated Mining and Smelting Co. of Canada, Ltd., has been granted a patent recently which covers an improved method for the deposition of high purity manganese from a manganese sulfate-ammonium sulfate electrolyte. It is claimed that the procedure improves the current efficiency of the process, and insures the deposition of high purity manganese as a tough, uniform, smooth deposit.

Fundamentally, the improvement consists of the purification of the electrolyte, particularly to remove the heavy metals therefrom, and the maintenance during the electrolysis of 30 to 60 mg. of hydrogen sulfide per liter in the electrolyte. Such a condition is realized by the use of an addition agent selected from the group consisting of hydrogen sulfide, xanthates, thiosulfates, the product obtained from treatment of caustic soda with hydrogen sufide, sulfamic acid, carbon bisulfide, and the dithionate and tetrathionate salts of sodium, potassium, and manganese.

Acetyl Peroxide Made Stable

A process for making solutions of acetyl peroxide, which are perfectly safe to handle, has been developed by the Buffalo Electro-Chemical Company, Inc., Buffalo, New York.

With the great developments in the production of synthetic plastics and elastomers in recent years, acetyl peroxide has again come to the foreground, as it was found to be one of the outstanding polymerization catalysts. Since 100% acetyl peroxide cannot be shipped, used, or even manufactured on a large scale, the Buffalo Electro-Chemical Company carried out extensive research work to overcome these difficulties. The product now available is a 30% solution of acetyl peroxide in dimethyl phthalate. This solution is a water-white, non-explosive liquid, immune to shock and impact. It represents a form of acetyl peroxide that is suitable for commercial purposes and that can be handled with ease and perfect safety.

Besides its great value as a polymerization agent, other interesting applications include its use as a germicide, a bleaching and oxidizing agent, and in vulcanization. It has great possibilities in organic syntheses as it is very reactive and offers a source of active oxygen in a non-aqueous medium.

Heat-Resistant Paint

The Quigley Company, New York, has announced a new paint for metal surfaces which will resist temperatures up to 2500 degrees F.

The paint may be applied by brush or, when it is desirable to apply it to hot surfaces without shutting down, it may be sprayed. For normal interior or continuously hot surfaces, the paint is ready for service after application. For exterior or damp interior surfaces, the paint film must be heat treated to render it moisture- and weather-resistant.

When heat treated it will resist water, oil, gasoline, benzene, heat and weather. The resistance to heat depends on the surface to which it is applied. On light steel it will adhere under rapid heating and cooling up to 1400 degrees F., and on alloy steel, brick, etc., it will stand 2500 degrees F. It is absolutely non-inflammable, non-irritating, and does not give off fumes or odors when being applied, upon drying, or when subjected to heat or flame.

Welding of Plastics

A demonstration of a new method for welding plastics was recently given before a joint meeting of the Institute of Welding and the Institute of the Plastics Industry by Dr. J. H. Paterson, managing director of the Arc Manufacturing Company, Ltd., it was reported in the Chemical Trade Journal of Great Britain.

The method was originated in Germany but is now being developed in England.

The welding torch is a very simple arrangement comprising a gas burner which raises the welding gas—e.g., nitrogen—to the required temperature, and delivers it in a fine jet at the welding point.

It is important to keep the temperature of the hot gas just above the softening point of the plastic, but below the charring or decomposition temperature, requiring control within fairly narrow limits. An excess of heat produces gas bubbles and decomposition of the material, and too little heat causes insufficient bonding. When the correct temperature is employed, the weld is approximately 80 per cent as strong as the original material.

The method has been applied successfully to polyvinyl chloride and polythene, but it is believed that the range of materials will be greatly increased.

Resins Improve Glass Fabrics

Properties of the first commercially available Fiberglas fabrics coated with synthetic resins indicate a wide application for these materials, according to Owens-Corning Fiberglas Corporation.

Coatings of Neoprene, Koroseal and vinyl resins have given materials of high dimensional stability and tear strength and substantially increased flexing resistance. Uncoated glass fabrics are not recommended for applications involving continuous or severe flexing, but experience to date with some of the coated fabrics indicate that they may be used satisfactorily under flexing conditions that would destroy an uncoated fabric by internal abrasion.

Aqua Dyes for Clear Plastics

An effective method for dyeing plastics with true colors of any shade without the common difficulties of expense, disagreeable odors, and fire hazard has been announced by the Great American Color Company.

The method permits any plastic product, such as methyl methacrylate, cellulose nitrate, cellulose acetate, cellulose acetobutyrate, ethyl cellulose and vinyl chloride, or molding resins such as Clear Acetate Lumarith (cellulose acetate) or Tenite No. 2 (acetobutyrate), to be processed and come out with any desired color. Exposure to as long as 2 weeks sunshine fail to cause any discoloration in the dyed plastics. The colors are as smooth and clear as though they were actually made into the plastic itself; and joints and curvatures show no change of shading from the rest of the piece.

The process consists of heating plain water to the boiling point and adding the dye. About 10 parts of water to one of dye is the proper ratio. When the solution is hot, the plastic can be dipped in the vat; and the desired shade is merely a matter of a few seconds. The longer the plastic remains in the solution the deeper the shade of the color.

Cork Substitute

Glycerine is employed as a plasticizer in a new cork substitute developed by government research workers. The new material, called "Noreseal", was created by S. I. Aronovsky, W. F. Talburt and E. C. Lathrop, all of the Department of Agriculture's Northern Regional Research Laboratory. By cutting pitch into fine particles or using fine fibres carrying air

Highballing along!

THERE'S SPEED AND SAFETY IN PENN SALT CAUSTIC SODA CARS

Special 8000 gallon tank cars speed Penn Salt Caustic Soda safely to its destination. These insulated units have protective lining, are equipped with special draining plates, caustic resisting valves and interior connections. They are your guarantee of fluid Caustic Soda in any weather, contamination-free because the steam heating coils do not contact the caustic.

Furthermore they empty rapidly and safely. No loss of time, no loss of effort, no loss of Caustic Soda.

Available as 50% and 72-73% solution in liquid form in tank cars. In 750 lb. drums in solid form. In 125 and 400 lb. drums in flake form. Consult our technical staff, without obligation, for aid in handling problems. For further information about Penn Salt Caustic Soda, write us.

SOME OF THE PRODUCTS MANUFACTURED BY PENN SALT:

ACIDS, Sulphuric, Muriatic, Mixed Acids, Hydrofluoric, Hydrofluosilicic, Nitric • AMMONIA • ALUM, Sulfate of Alumina • HYDRATE OF ALUMINA • BLEACHING POWDER • AMMONIA, Anhydrous and Aqua • CARBON BISULPHIDE • CARBON TETRACHLORIDE • CAUSTIC SODA • CORROSION - RESISTING CEMENTS • LIQUID CHLORINE • FERRIC CHLORIDE • FLUORIDES AND FLUOSILICATES • HYDROGEN PEROXIDE • *KRYOLITH Flux and Opacifier • *KRYOCIDE Insecticide • ORTHOSIL AND *PENNSALT METAL CLEANERS • SAL AMMONIAC • SODIUM ALUMINATE.

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PENNSYLVANIA SALT
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Chemicals

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New York • Chicago • St. Louis • Pittsburgh • Cincinnati • Minneapolis • Wyandotte • Tacoma and incorporating these with additional air into a liquid composition that sets and hardens into an elastic body, a material has been produced that closely resembles cork in its physical structure and applicability. A representative formula employs glue, glycerol, glucose, peanut hulls, saponin, formaldehyde and water.

The new product has been thoroughly investigated and its properties have been studied in both the laboratory and in pilot plants. Commercial bottling tests are reported to show that the new cork replacement is satisfactory, from the angles of both efficiency and price, for sealing carbonated beverages, beer and liquid foods.

Improved Starch Process

An improved practical method for the separation of starch and gluten from wheat flour has been developed by the National Research Council of Canada. The new process, which is entirely mechanical in nature, is adaptable to continuous operation and can be scaled up to any size of plant design.

The fundamental steps employed are the kneading of wheat flour and water into a smooth dough which is then slurried with water until it breaks up into small pieces. The slurry is then passed over a shaker screen which separates the crude gluten and the starch milk.

The crude gluten is then put through an extruding machine, mixed with a small volume of water, re-screened, and dried. The starch is recovered by tabling.

Laboratory yields of 97 per cent of the theoretically recoverable starch and 96 per cent of the gluten have been recorded.

Reclamation of Sulfite Liquor

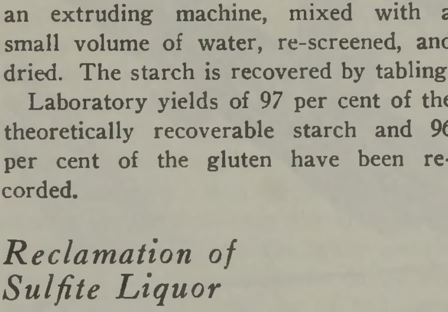
A recently issued Canadian patent outlines a method for the reclamation and regeneration of "waste" sulfite liquor from the magnesia-base sulfite process, which, if widely utilized, will have profound effects upon the chemical industry.

The magnesia process, which is essentially the same as the conventional lime-sulfite method with magnesia substituted for the lime of the older procedure, lends itself to controlled spray-drying of the residual liquor with the consequent formation of reactive magnesia and sulfur dioxide. By means of their recombination magnesium bisulfite is formed for recycling. Efficiency of the reclamation is claimed to exceed 95 per cent recovery.

Because of wartime difficulties in obtaining requisite equipment, no commercial installations have been made as yet, although several papermakers have indicated postwar intentions. In that the new development places the sulfite process on a more comparable economic footing with the kraft paper industry, it is anticipated that it will contribute to the growth of the former, possibly at the expense of the latter.

Apart from such possibilities, industrial adoption of the process will affect the consumption of lime, sulfur, and magnesia appreciably.

New Rubber at Goodrich



One of the first tires made of rubber from kok-saghyz, or Russian dandelion, whose seeds were flown to America from the Soviet.

Two New Dyeing Processes

While vat dyes have long been recognized for their extreme fastness to light and laundering, their application has been limited for the most part to cotton. This has been due to certain technical difficulties arising when more delicate fabrics are to be dyed. Two new processes, developed by Du Pont and made available to the textile industry without cost, as part of the company's technical service, will avoid or overcome these difficulties, it is believed, and make possible the use of vat colors in a much wider variety of fabric than ever before. These may include not only woolens, but also many blends of natural and synthetic fibers. Thus the textile industry may be able to supply the growing demand for color fastness in high-style textiles.

One of the new methods has been named the Pad-Steam Process. A final name has not yet been selected for the other, which operates on a multiple lap principle.

The customary vat dyeing methods usually involve reduction of the dyestuff with sodium hydrosulfite and caustic at temperatures of from 120 to 140 degrees F., and 15 minutes to an hour or more is ordinarily required for the reduction and dyeing. The exact time depends upon the nature of the specific process and the vat color selected.

In the operation of the Pad-Steam Process the fabric first passes through a conventional padder, in which the pigment is applied. The padded cloth is then dried in a flue dryer, after which it is carried over a cooling cylinder and down through a "chemical pad" consisting of a solution of sodium hydrosulfite and caustic. The fabric now goes into the steam chamber, from which oxygen is carefully excluded, and is exposed there for a few seconds to a minute to a saturated steam atmosphere of 212 degrees or slightly higher. Following the steaming the cloth is subjected to conventional oxidation, soaping, rinsing and drying.

The other machine was devised by William M. Wentz, technical assistant in the Dyestuffs Division, during research on the problem of continuous dyeing of delicate fabrics, such as ladies' woolen dress goods, spun rayons and combinations of animal and vegetable fibers. In ordinary continuous dyeing processes these fabrics could not be handled without undue distortion or crushing. The Multi-Lap equipment is an effort to answer the mechanical aspect of the problem.

The fabric is first padded and is then carried into an enclosed development bath or chamber. Here it travels on an endless slatted reel or conveyor, so arranged that the fabric is dipped into the bath on each trip around. Rolls are set at various depths in the bath to insure complete immersion on each lap, and at the end of the treatment the cloth turns a right angle over a diagonally placed bar to emerge from the center of the reel.

Throughout the process there is a minimum of tension on the fabric. The period during which the cloth remains in contact with the bath can be varied by increasing or decreasing the number of laps, without changing the speed of the machine. Another advantage of the Multi-Lap process is the unusually low ratio of treating liquor to textile materials, which makes possible relatively long periods of liquid-fabric contact in a compact, closed unit.

New Plasticizer for GR-S Rubber

A new low cost neutral plasticizer for GR-S synthetic rubber has been announced by the Thiokol Corporation of Trenton, New Jersey, and designated TR-11.

Very low cost mechanical goods stocks having tensiles of 1800 to 2000 lbs. per square inch, are obtainable through the use of the new TR-11 as a plasticizer and high loadings of carbon black as a reinforcing pigment and filler. TR-11 greatly improves the elongation of GR-S stocks, and because it is a neutral cure these stocks do not lose elongation rapidly.

The physical properties of a highly loaded GR-S stock containing TR-11 are illustrated by the data below:

GR-S	100
Zinc Oxide	5
EPC Black	100
TR-11	45
Stearic Acid	2.0
Sulfur	3.0
MBT	1.5
DPG	.2

Cure	50 minutes © 298° F
Dura	70
Tensile	2000 lbs./sq. in
Elongation	600%
Modulus at 300%	970 lbs./sq. in
Sample aged 24 hours at 212° F.	
Dura	78
Tensile	1930 lbs./hq. in.
Elongation	450%
Modulus at 300%	1500 lbs./sq. in.

International Epsom Salt

Southern drug and industrial markets can now get fast rail and truck shipments of Epsom Salt from a conveniently located Southern factory. At its chemical plant in Augusta, Georgia, International is producing U.S.P., Technical and Stock Food grades of Epsom Salt for the drug trade, textile mills, leather tanneries and manufacturers of feeds and remedies for poultry and cattle. In other ways, too—with a variety of industrial chemicals obtained from the basic minerals it produces—International is serving the growing industrial empire of the South. It is a market the International organization knows well. For more than thirty-five years, thousands of farmers throughout the South have used International Fertilizers to increase the yield and quality of their crops.

International Minerals & Chemical Corporation
General Offices: 20 North Wacker Drive, Chicago 6

MINERALS
CHEMICALS
for industry and agriculture

Potash and Phosphate
for Fertilizers and Industrial Chemicals

Fertilizers
and Fertilizer Materials

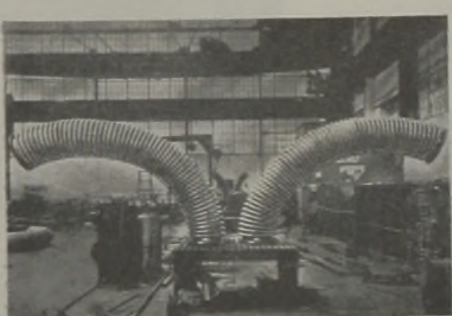
Chemicals
Epsom Salts—Defluorinated Phosphate—Glutamic Acid—Mono Sodium Glutamate—Potassium Chlorate—Silica Gel—Sodium Silico-Fluoride—Sulphuric Acid—and others.

International
MINERALS and CHEMICALS
CHEMICALS • PHOSPHATE • POTASH • FERTILIZER

NEW EQUIPMENT

Long Bent Flexible Tubing QC 473

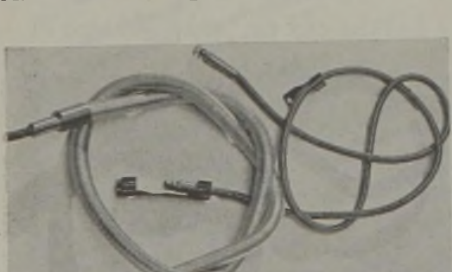
Large diameter flexible corrugated stainless steel tubing is being manufactured for the first time in long bent lengths by Zallea Brothers & Johnson. Pictured are two 16 in. diameter by 9 ft. Diesel exhaust connectors bent to 110°. Extensively used on Diesel engine exhaust and high temperature vapor lines, these connectors have inherent advantages of value to the chemical, power and petroleum industries by application of this development to existing problems in these fields.



The connectors absorb expansion, contraction and extreme deflection in all planes. Supplied in sizes 6" diameter and larger in carbon steel, any type of stainless steel and other corrosive-resistant alloys, they require no packing and, having no seams, are permanently gas-tight. The connectors handle corrosive liquids and gases under pressures up to 30 p.s.i. and at temperatures from sub-zero to 1800° F. Connectors for absorbing linear expansion only can be furnished for pressures up to 300 p.s.i.

Flexible Heat Unit QC 474

A new flexible, "serpentine" electric heat unit has been perfected by the H. & A. Manufacturing Co., Inc.



Because it can be coiled in close or in widely spaced turns around pipes and cylinders, spiraled around molds, or fitted to odd contours, H. & A. engineers believe the new element will find innumerable applications.

Of metal-ceramic construction, it can be made in varying lengths and diameters and in capacities upwardly to 15-20 watts per lineal inch. Exact temperatures up to 1000° F. can be maintained without deterioration of the steel-ceramic structure.

Heat may be applied through direct contact of the unit or may be transferred through clips or fixtures of various designs. The unit may be left exposed or may be sealed or coated over with insulating cement.

Applications already have been designed for molds where critical temperatures must be maintained, and on melting pots of unusual shapes. Other applications include the heating of pipes and valves carrying viscous fluids. Experimental work is being done on various applications in the plastic field.

Uniform Admixture With New Feeder QC 475

A mixer has been designed by J. F. Barton, Federal Portland Cement Co., which insures uniform addition and blending of small quantities of materials. It was originally designed to add Vinsol resin to portland cement; Federal specifications call for the admixture of 0.25-0.45% resin.

A supply hopper is connected with a feeding device and a horizontal revolving plate. Agitation inside the reservoir insures positive flow of materials into the feeding mechanism, which controls and delivers the materials in measured quantity to the revolving plate. A micrometer adjusting plow is provided for the purpose of further adjustment for ultimate quantity and for diverting the material from the plate into the grinding system.

The design of the feeder is such that it permits operation at a varying capacity from zero to 300 grams per minute. This range accommodates cement production rates up to 360 bbls. per hour.

It is believed by the inventor that the principle involved in the machine is equally adaptable to many other dry, light-weight materials, and particularly adapted to resins and organic acids which exhibit a sticky consistency.

Magnetic Separator QC 476

The Dings Magnetic Separator Company have announced the Super-High Intensity Type IR induced roll magnetic separator.

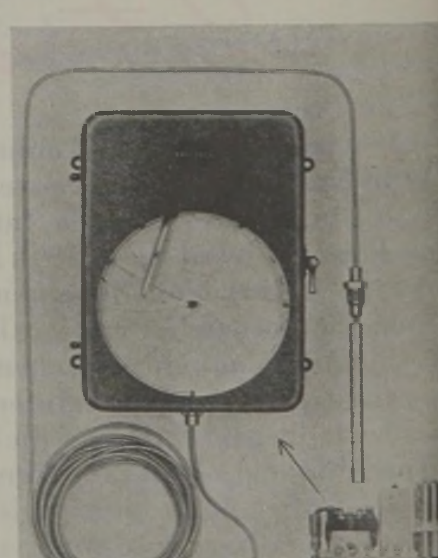
This machine has been successfully applied to the purification or concentration of many products and materials, typical of which are chemicals, drugs, sands, salt and various minerals.

The particular construction of the induced roll magnetic separator develops the most powerful magnetic fields known to the separation industry. Operating on the deflection rather than the extraction principle, it segregates feebly magnetic particles which were heretofore considered impossible to eliminate.

Design incorporates a powerful primary magnet with tapered pole pieces and a bridge bar of suitable proportion to balance the circuit. Interposed between poles and bridge bar are laminated rotors which become highly induced when direct current is applied, and over which the material is made to flow. Briefly, separation is accomplished by adjustment of dividers directly below each roll which cause the deflected magnetic portions to discharge into separate chutes. The induced rotors are the only moving parts and are equipped with special over size, anti-friction bearings and dust seals, assuring long life and trouble-free service.

Electronic Control Instruments QC 477

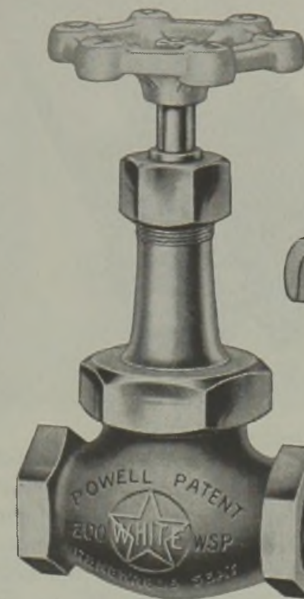
A new electronic-type controller, known as Bristol's Free-Vane electronic controller, has been announced by The Bristol Company. The new line of controllers operates on the shielding effect of a vane passing between two coils in an electronic circuit. Recording and indicating models are offered for automatic control of temperature, pressure, liquid level, and humidity.



The new controller for temperature is offered in ranges from —125° F. to +1000° F. for use in conjunction with motor and solenoid valves, relays, main line switches, and other fuel control apparatus for controlling the temperature in electric, oil, gas fired, and steam-heated ovens, dryers, dehydrators, oil baths, smoke houses, tanks, and other similar industrial apparatus.

The pressure controller is available in

Inside information on POWELL VALVES



From the outside, this small size 200-pound "White Star" bronze Globe Valve looks very much like the same type of valve in other makes. But inside, where it really counts, Powell design and engineering show the results of nearly a century of "know how" in Valve making.

Among its many features are the regrindable and renewable semi-cone plug type seat and disc, especially designed for severe service conditions. The disc is made of "Powellium," a special nickel-bronze alloy developed by Powell Engineering. The seat ring is furnished in a specially heat treated Stainless Steel. Both are highly resistant to corrosion and erosion.

Of interest, particularly to maintenance men, is the fact that this valve can be *repacked under pressure* when wide open. This feature is provided by the machined face on the base of the bonnet which, engaging with the cut-off collar machined on the top of the disc lock nut, positively seals off the pressure from entering the bonnet. An exceptionally wide and deep stuffing box affords generous packing space. The protruding gland, held in place by a large stuffing box nut, also affords an additional guide for the stem.

The ground joint union body-bonnet connection, held fast by a heavy hexagonal ring nut, permits the bonnet to be easily and quickly removed from and re-attached to the body any number of times without impairing the tightness of the connection.

Ample space between the end of the pipe thread and the diaphragm prevents the pipe striking the diaphragm and distorting the seat when screwing the pipe into the body.

The malleable iron *non-heating* handwheel is designed to fit the hand and afford ease in operating the valve.

The complete POWELL Line includes Globe, Angle, Gate, Check, Relief, Y, Non-Return and other types of valves in bronze, iron, steel, pure metals and special alloys to meet the demands of all branches of industry for dependable flow control equipment.

This valve, especially adapted for throttling service in steam, oil, water or gas lines, is widely used in chemical plants throughout the United States.

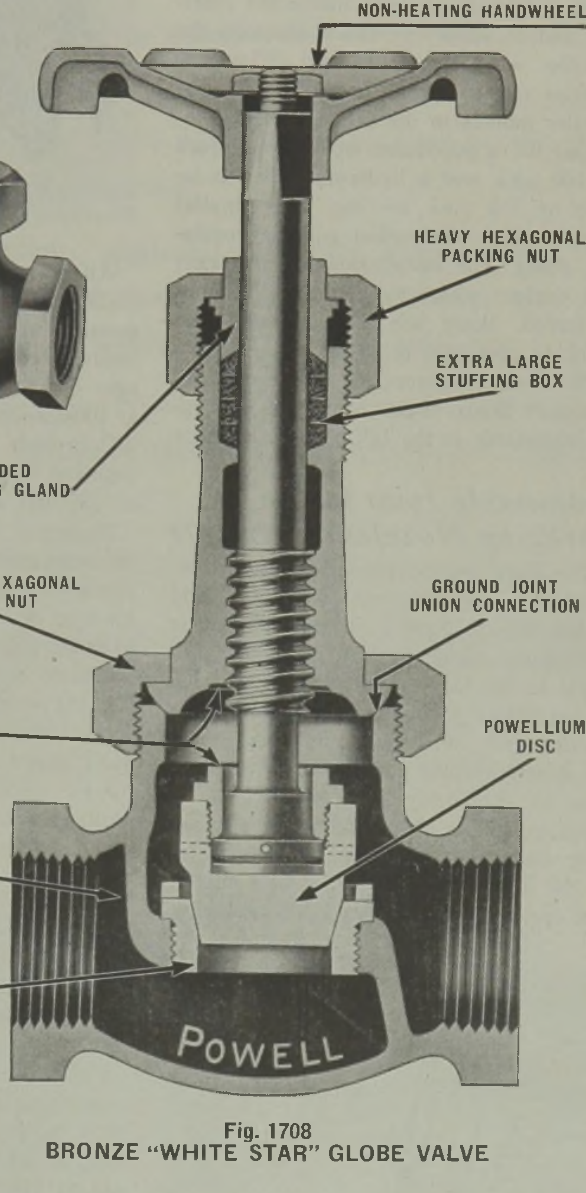


Fig. 1708
BRONZE "WHITE STAR" GLOBE VALVE

The Wm. Powell Co.

Dependable Valves Since 1846

Cincinnati 22, Ohio

POWELL VALVES

ranges from full vacuum to 6000 pounds per square inch and in addition is available for automatically controlling liquid level. The humidity controller operates from a wet and dry bulb type of element with separate control for each bulb. The Free-Vane electronic controller is also offered as a time-program controller for automatically controlling temperature, pressure, liquid level or humidity according to a definite time schedule.

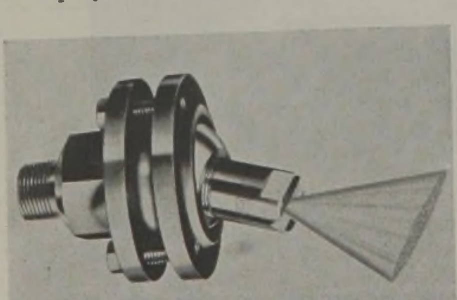
Oil Clarifiers QC 478

The Briggs line of oil clarifiers has been further expanded by the introduction of the new DR Series for lubricating oil.

The standard DR Series clarifiers have been designed to meet industry's need for oil filters for by-pass installation. Each unit is equipped with a precision-built relief valve set to maintain the most efficient operating pressure inside the clarifier and to allow circulation through the clarifier when the oil is cold. Flow capacities range from 1 to 20 GPM. The smaller models in the DR Series are designed for a maximum working pressure of 100 p.s.i. and a hydrostatic test pressure of 150 p.s.i. for use with smaller size internal combustion engines requiring shunt type installations. For larger size engines where by-pass installation is preferred, there are DR models with working pressures of 40 p.s.i. and hydrostatic test pressures of 60 p.s.i. All standard D-size refill cartridges are interchangeable in the DR Series clarifiers.

Adjustable Joint for Spraying Nozzles QC 479

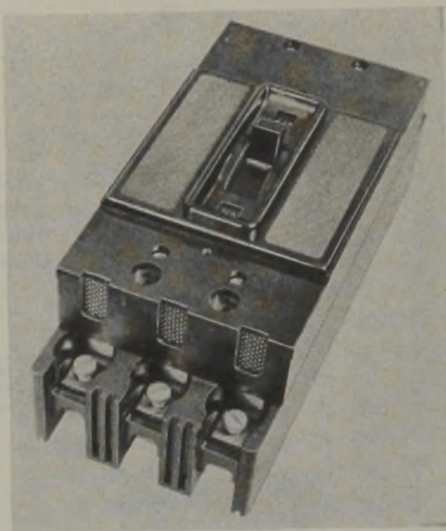
The Spraying Systems Company's new adjustable joint, because of new ball and socket design, provides a full 50° nozzle adjustment range in any plane at right angle to the face of the joint. The thick socket plates permit an unusually strong friction grip, more than sufficient to hold the nozzle in fixed position no matter how extreme the spraying operation. Three machine screws are quickly turned to adjust the joint as required. Illustrated is the adjustable joint with a "Veejet" flat spray nozzle mounted in the socket.



This adjustable joint is made in brass or steel as standard, but may be had in a variety of special steel alloys as required. Various sizes of joints with standard pipe thread can be furnished. Typical applications are found in equipment for washing, rinsing, and paint flow-coating.

Circuit Breaker QC 480

A new 100-ampere "De-ion" circuit breaker which requires less space and permits lighter structures for distribution panelboards, built-in applications and bus duct plug-ins is announced by Westinghouse Electric and Manufacturing Company.



All ratings are available in one compact breaker with uniform pole spacings and terminal arrangement, providing complete interchangeability between ratings. The new F Frame permits for the first time a 100-ampere, 600-volt AC or 250-volt DC breaker in the same space formerly required by the 50-ampere, 600-volt AC or 250-volt DC rating.

Equipped with thermal and instantaneous magnetic trip elements, the "De-ion" fuseless circuit breaker permits maximum loading of circuits and fast resumption of interrupted service. Contact pressure increases with wear, thereby prolonging the life of contacts and breaker. Silver alloy contacts give increased contact life with lower wattage loss. The special alloys used also prevent "freezing." Both two and three-pole units are available.

New Blackmer Low-Capacity Pump QC 481

A new direct-connected, small capacity rotary pump designed and built by the Blackmer Pump Company plant has the following specifications: Capacity, ½ GPM; discharge pressure, 100 psi; direct connected by a flexible coupling to an 1800 RPM motor. Overall dimensions: Length 11¾", width 5⅜", height 5", weight 15¾ lbs.

Built-in relief valves are optional and the units are available for belt drive, as a pump only, or the rotating elements may be supplied where the pump is installed as an integral part of a machine.

Due to the special "bucket design," these pumps are self-adjusting for wear, maintaining normal capacity throughout the life of the buckets, which are easily replaced when worn out.

Condensate Return System QC 482

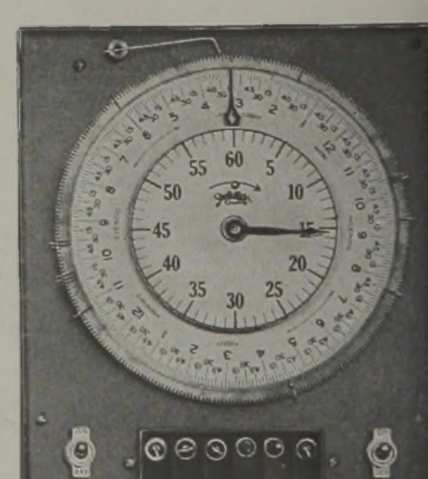
A new unit manufactured by the Cochrane Corporation completely solves the return of condensate from process equipment operating at pressures up to 200# directly back to the boiler without flash loss and with all of the sensible heat contained in the original steam. Fuel savings of from 10 to 15% are obtained, boiler pressure more easily maintained and boiler capacity increased.

More important than these benefits are the higher production rates made possible by the patented jet pumping principle involved. All condensate, non-condensible gases and entrained air are easily handled by the jet at high temperature with a constant differential maintained across the equipment creating positive drainage. The entrained air is automatically discharged from the closed circuit before return to the boiler.

Because of the high back pressure maintained against the equipment, with constant flow of gases and liquids, there is no appreciable pressure drop in the steam chambers as is the case when discharging to atmosphere or a low pressure. Hence, heat transfer rates are higher and more uniform, resulting in hotter heating surfaces, greater production at the same steam pressures and with less fuel costs.

Program Timer QC 483

A new Zenith Timer is an automatic switch which can be set to close an electrical circuit at any desired 5-minute interval as often as desired. As many as 288 operations a day are possible.

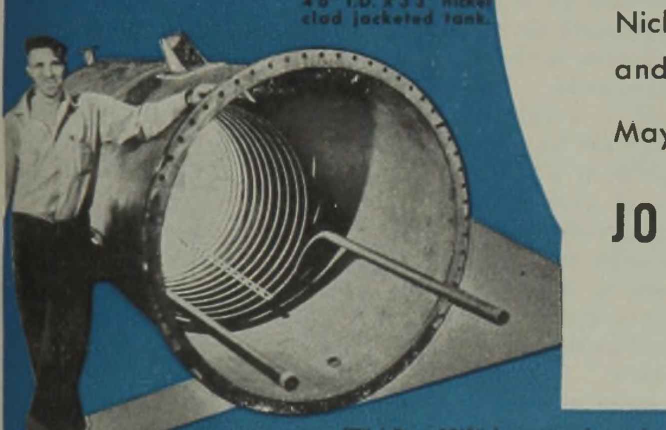


The program mechanism is set automatically by turning the minute hand as on an ordinary clock. The schedule is easily changed any time without the use of tools. Small spring brass clips are inserted in slots of program disc for the program desired. These pins select the operating times. Operation is performed by a

The Problem: RELIABLE FABRICATION OF NICKEL AND NICKEL ALLOYS

The Solution: NOOTER!

4'6" I.D. x 3'3" nickel clad jacketed tank.



57" I.D. x 10'0" long Monel metal tank with Monel metal coils.

Solid and clad nickel and nickel alloys are among the most difficult materials to fabricate. It takes long experience and special methods.

Nooter has learned, by experience, how to surmount economically the many problems presented by this difficult type of construction.

Punching, rolling, shearing, forming, and welding require special treatment, involving problems of heat treatment, sound welds, and iron-free surfaces.

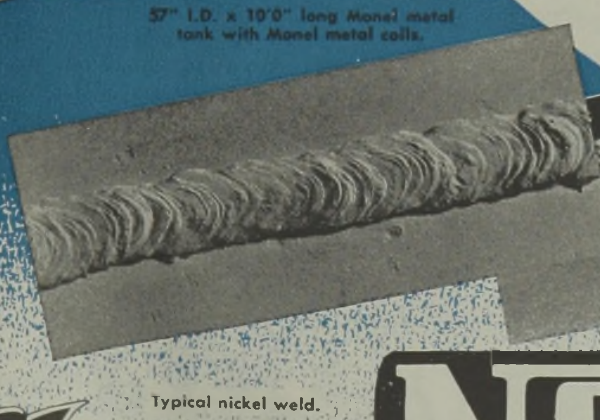
Nooter fabricates: Nickel, Monel, Inconel and Cupro Nickel; also Stainless Steel, Bronze, Aluminum, Copper and Steel.

May our Engineers help you?

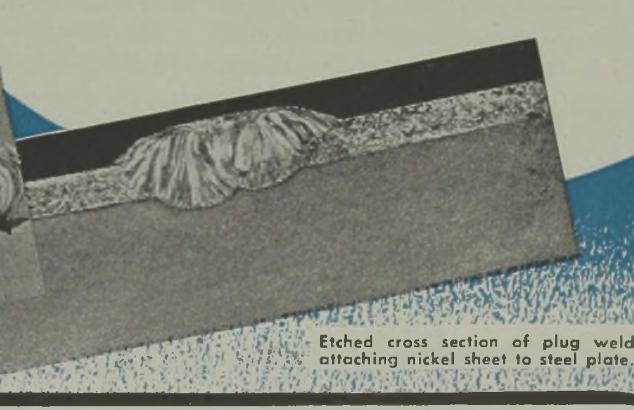
JOHN NOOTER BOILER WORKS CO.

Alloy and Bi-Metal Fabricators

1408 SOUTH SECOND ST. • ST. LOUIS 4, MISSOURI



Typical nickel weld.



Etched cross section of plug weld attaching nickel sheet to steel plate.

ARMY NAVY

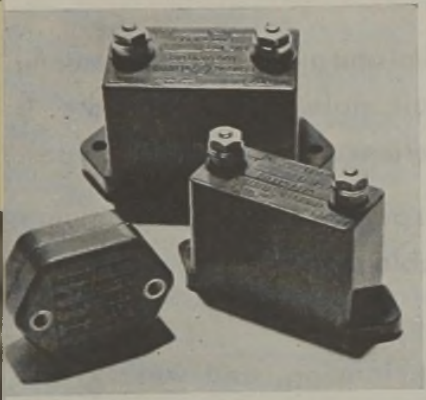
NOOTER
ST. LOUIS

of cam-operated contacts. Silver con-
s operate with snap action.

he rating is 10 amps., at 110 volts, the steel case is 8" x 12" x 4".

·ctrofilm Capacitors QC 484

.ectrofilm capacitors, available in case -65, and -70 types (mechanically in-:hangeable with mica capacitors types :60, 65 and 70) have been announced the General Electric Company. Lectro-h is a new synthetic dielectric material eloped especially for capacitors and de from materials available in the ited States. It is characterized by its form quality and stability under high bient temperature conditions.



Lectrofilm capacitors are ideally suited : radio-frequency blocking and by-pass plications in communications and other :ctronic equipment. The internal foil d lectrofilm assemblies are arranged r minimum inductance and low foil sses. They are carefully treated to as-re a rigid assembly and permanence of aracteristics under vibration, shock, and ide temperature changes.

'ortable Electroplater QC 485

A new improved electrolytic brush, used conjunction with Warner electroplat-g compounds, has now become available r peacetime production. With the co-peration of DuPont, it was developed by e Warner Electric Company to solve ecific electroplating problems encoun-red in the manufacture of special war equipment.

The new brush and process are now being employed in an increasing number of industrial applications. This method

has proved practical and demonstrated its usefulness in decorative work, maintenance, and in the salvaging of tank-plated rejects. Immovable objects may be electroplated without being dismantled. A company's name or trade mark may be electroplated on the article being manufactured. The conductivity of electric switch contacts, blades and jacks may be improved or renewed without disassembly. Dies and shafts may also be plated and renewed when worn.

Warner electroplating compounds are available in gold, silver, nickel, copper, cadmium and chromium.

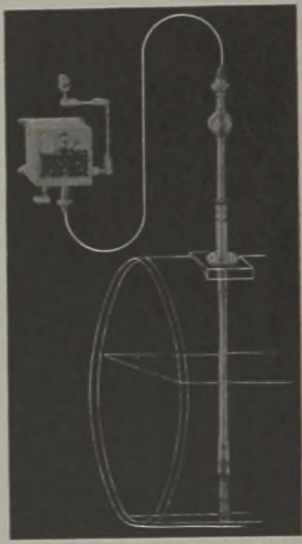
Liquid Level and Interface Control QC 486

Devices recently developed and manufactured by the Wheelco Instrument Co. for the chemical process industries sense and control liquid and interface levels.

These devices are applicable to a wide range of materials, both in dry and liquid forms. Liquids may range from acids and strong alkalis to oils and alcohols. Level sensing of the interface between a wide range of liquids of differing density and differing physical constants is one of the interesting problems in the chemical industry which may be solved by the use of this apparatus.

The apparatus eliminates the usual float and diaphragm apparatus normally used drawbacks of the electrical conductivity type of level sensing equipment.

The apparatus functions by the use of an electronic oscillator which generates a high frequency alternating current at very low values of voltage and current, such current being routed to a level sensitive electrical condenser protected by a special protecting tube, so that the condenser may be directly immersed in the liquid to be sensed. The change in liquid level causes a change of the electrical capacitance of the immersion condenser; the capacitance change, in turn, controls the frequency of the oscillator to, in turn, produce a current change to an associated relay apparatus for the control of valves, pumps, etc.



Wide conditions of temperature and pressure are met with adequate design of the immersion equipment. A typical apparatus assembly, of the interface level sensing type, is applied to the sensing of the interface between gasoline and deposited water in underground reservoirs. A variation of the apparatus senses the level of liquids in manometer columns and gauge glass units.

Fire Protection for Chemical Plants QC 487

A new line of single-stage, double-suction fire and booster pumps have been announced by Allis-Chalmers Mfg. Co. The pumps are approved for heads ranging from 60 lbs. per square inch to 108 lbs. per square inch at capacities ranging from 500 gpm to 1500 gpm.

The pump units, approved by Underwriters Laboratories, include pump with brass plugs, umbrella cock, increasers and capacity plate mounted on base plate, and direct-connected to a driver by means of a flexible coupling. According to plant requirements, the units also can be completed with a splash partition plate.

To make the unit suitable for its purpose, fire fittings are available for 500, 750, and 1000 gallon ratings. These include hose valves, discharge base elbow, hose manifold, relief valves, discharge cone, suction and discharge gauges.

CHEMICAL INDUSTRIES TECHNICAL DATA SERVICE

:HEMICAL INDUSTRIES, 522 Fifth Ave., New York 18, N. Y. (11-4)

Please send me more detailed information on the following new equipment.

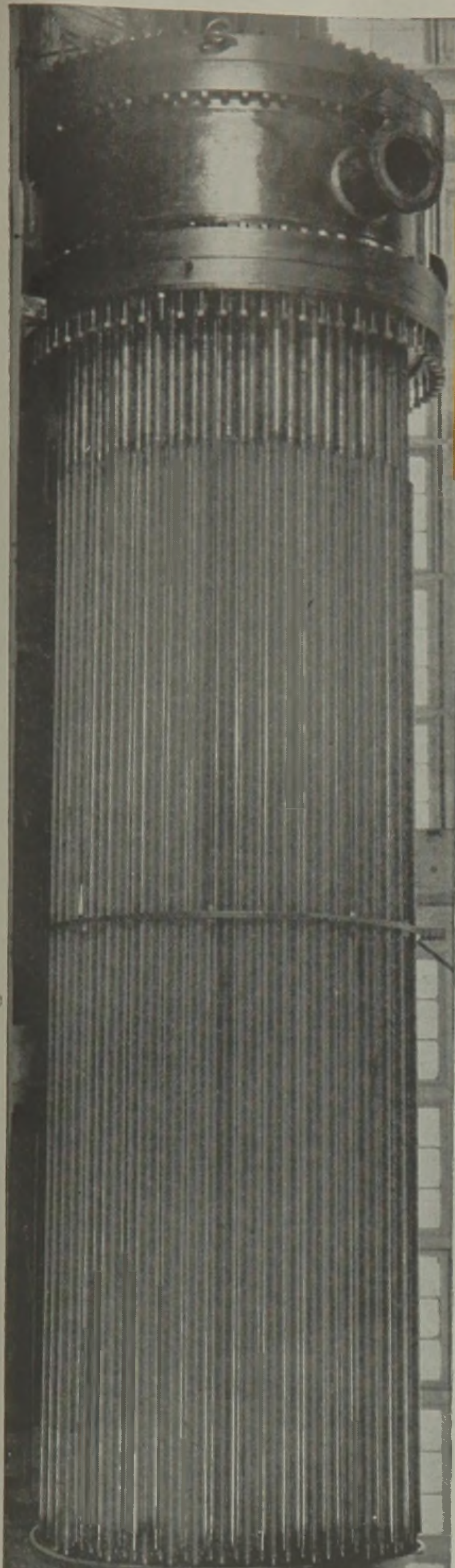
QC 473	QC 476	QC 479	QC 482	QC 485
QC 474	QC 477	QC 480	QC 483	QC 486
QC 475	QC 478	QC 481	QC 484	QC 487

Name .... (Position) ....

Company ....

Street ....

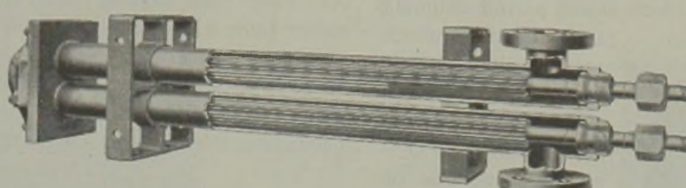
City & State ....



Investigate

G-FIN

COOLERS...CONDENSERS
HEATERS...EXCHANGERS



G-FIN . . . the pioneer finned-tube heat transfer surface with longitudinal fins . . . has PROVED its effective principle and also its superior construction in many tens of thousands of installed units, some of which have been in service for well over 10 years.

The illustrations in this advertisement show two of the many different types of heat transfer apparatus in which this patented surface has proved highly successful. The illustration at the left is one of more than 100 large G-Fin bundles used in Stratco Contactors in alkylation plants. The small illustration above shows the design of the Twin G-Fin Section, of which more than 40,000 are in use on a wider variety of services than any other design of heat transfer apparatus.

G-Fin elements are also applicable to vacuum or pressure condensers, baffled exchangers, preheaters, storage tank oil heaters and other types of exchangers. Before buying your next heat transfer apparatus, be sure to investigate the possibilities of a G-Fin unit.

WRITE FOR BULLETIN 1625

THE GRISCOM-RUSSELL CO.
285 MADISON AVENUE, NEW YOR 17, N. Y.

GRISCOM-RUSSELL

Pioneers in Heat Transfer Apparatus

PACKAGING & SHIPPING

by T. PAT CALLAHAN

Synthetic Rubber Packaged In Multiwall Paper Bags

When Japan seized control of Far-Eastern rubber resources, American industry was forced to develop and produce synthetic rubber. How well it succeeded is familiar to all of us. But the rubber had to be packaged, and that story is an important and interesting adjunct.

SYNTHETIC RUBBER needed a package which would furnish adequate protection and would not adhere to or mix with it, which would permit shipping and stacking which would be within proper price range, and above all, would be available in considerable volume on short notice.

T. Pat Callahan

After weighing these considerations, packaging experts called in on the problem by the Rubber Reserve Corporation decided that multiwall paper bags could be made to suit the purpose best. Synthetic rubber (GRS and GRM) is now one of the more than 300 commodities packed in heavy-duty multiwall paper bags. The entire output of this product, both for export and domestic use, is shipped in this type of container.

Because of its adaptability it was possible to design and manufacture a multiwall paper bag for the specific needs of synthetic rubber. It was necessary to manufacture a special-size bag which would fit the bale of rubber tightly.

The inner ply of the container is a talc-coated paper which will not adhere to the rubber, and a crepe-surfaced outer ply is used to prevent the bags from slipping when stacked.

Inasmuch as this was a completely new product, it was necessary for the packaging engineers to design an efficient method of packing the rubber into the bag.

As illustrated in the upper photograph, synthetic rubber is processed into blocks which weigh approximately 75 lbs. By means of automatic equipment, these blocks are inserted into the multiwall paper bag as shown below. The filled container is then conveyed to a sewing machine where the top of the bag is sewn closed, or to a packaging crew who apply a diamond fold to the top of the container and tape the top of the package.

The multiwall bag proves to be a good, immediate solution to the problem for a number of reasons: It lends itself to rough handling without rupturing the container walls; it is inexpensive—using much less pulp than cartons; the empty container folds flat, effecting a saving in storage space; and it is easy to open, since there is no adherence of the rubber to the paper. Its continued use is foreseen for packaging the postwar commodity.

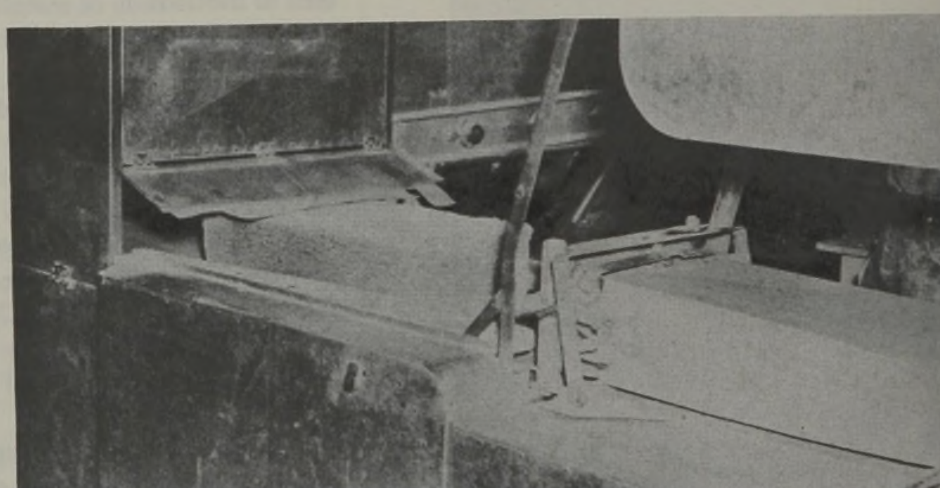
New Container for Hypochlorite

The Hood Chemical Company has announced a new and convenient container for calcium hypochlorite. Hereafter the 25 lb. resealable pail of steel, lined with a special chlorine resistant lacquer, will be a standard package for its calcium hypochlorite. This pail is of extremely sturdy construction and has been adopted as a standard container for shipping certain chlorinated chemicals overseas to the armed forces.

Postwar Packaging Will Be Improved

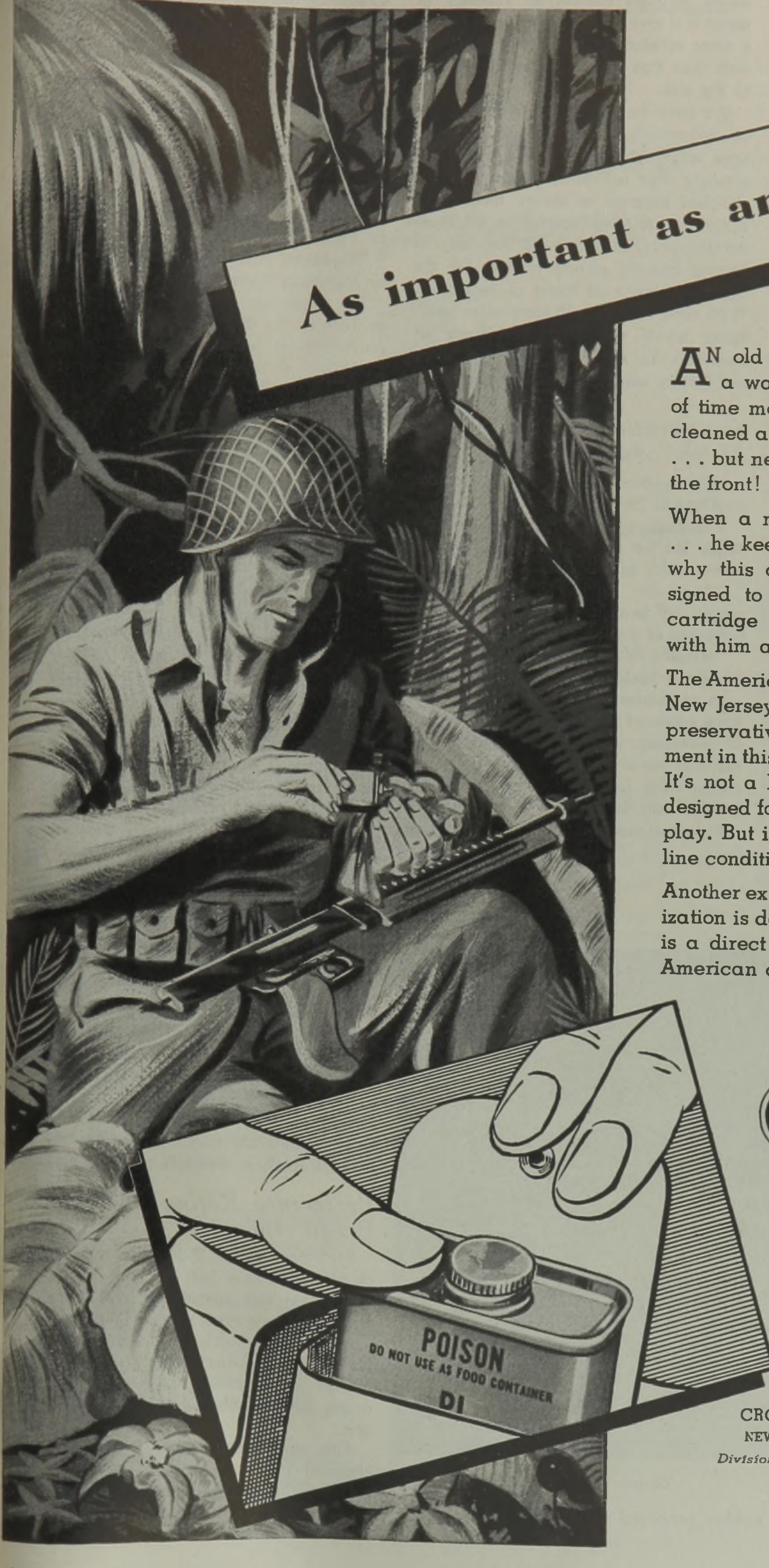
Statements are being made in articles and advertising concerning the packaging industry that we are again back in limited production for some civilian needs which do not interfere with war production. While all engaged in packaging must naturally devote all the time necessary to the use and development of packages needed for war, it is also essential that careful attention be given to the packaging of chemicals when hostilities are at an end.

Many packages now used by the chemical industry were unheard of before their necessity was forced upon the industry for unusual protection of materials due to war conditions. Shipping of these materials under the most adverse conditions of weather and extreme hazard in handling to all parts of the world has de-



Courtesy St. Regis Paper Company

Above: Synthetic rubber block emerging from dusting machine. Below: Block entering baler where it is automatically packed into bag.



As important as ammunition!

AN old line sergeant now in Italy told a war correspondent he spent a lot of time making sure rifles were properly cleaned and cared for in a training camp . . . but never had to worry about that at the front!

When a man's life depends on his rifle . . . he keeps it cleaned and oiled. That's why this container for rifle oil was designed to fit a pocket of the standard cartridge belt. A fighting man wants it with him all the time.

The American Oil & Supply Co. of Newark, New Jersey, packages its lubricating and preservative oil for the Ordnance Department in this container . . . made by Crown. It's not a highly decorative can . . . it's designed for concealment rather than display. But it is sturdily built to stand front line conditions—and that is where it goes!

Another example of how the Crown organization is doing a war production job that is a direct contribution to the success of American arms!

CROWN CAN

CROWN CAN COMPANY
NEW YORK • PHILADELPHIA
Division of Crown Cork & Seal Company
BALTIMORE, MD

›ed experience from which the chem- industry will benefit greatly. Were ›t for these conditions, developments as wet-strength paper or moisture r proof paper might have been de- l for a long time. Paper containing l foil, asphalt and other forms of r protection has made possible the shipment of all forms of material; where conditions arise in the chemi- field wherein moisture must be con- ed either from within or without, e developments will play a very im- ant part in our packaging.

he development of the V-box with ially treated fiberboard is a develop- t which will greatly enhance the safe aging of chemicals when this form of erial is available. It will go a long towards reducing packaging costs by nature of its construction and the pro- ion which it offers.

rior to the war, the fiber drum indus- had been working on various linings coatings. The number of synthetic ings and linings available after the will be great, and it is definitely felt for protection of chemicals in fiber ms, there will be a coating or a lining ch will safely protect practically any n of powdered chemical which may d to be shipped in those containers.

Ietal containers, including cans, pails drums, will show radical changes in struction many of which will make m more economical than before. eatment of the metal, substitution of thetic coatings, and various developments through electrolytic coatings of metal will give in a great many instances a more satisfactory protection for chemicals than that which was available prior to the war.

We have mentioned just a few of the developments and potential uses of packages which should be considered. We strongly urge individual members of the chemical industry to survey their packaging and to keep abreast of all these developments. There most definitely is coming into the picture changes for the better in almost all forms of packaging. With these changes will come safer packaging which will provide delivery of chemicals to the customer in a more satisfactory condition than ever before.

Conservation Order M-380 Amended

Conservation Order M-380 was amended on October 23.

This order restricts the use of moisture vapor barrier material which is defined in the order as follows:

"'Moisture vapor barrier material' means any laminated or coated material composed of the following:

"Metallic foil, with or without a paper or textile backing, the foil being coated with or laminated to a heat sealing medium approved for Method I-A or Method II packaging, which laminated or coated material has a maximum moisture vapor transmission rate of 0.25 or less grams per 100 sq. inches in 24 hours when tested at a vapor pressure differential of 42 mm. of mercury at 100° F. The term 'moisture vapor barrier' material includes but is not limited to the following commercial barriers:

"Reynoldsflex A50 and A51 produced by Reynolds Metals Company.

"Shellflex 770 and 903 produced by Shellmar Products Company.

"Valley 2A and 4 produced by Valley Industries Company.

"Plastic No. A-6004 produced by Plastic Film Corporation.

"Rapinwax A.K. and A.K.A. produced by Rapinwax Paper Company."

The purpose of this order is definitely to restrict the use of this material to converters. It is definite that no civilian packaging of any kind, regardless of its necessity, is allowed.

Drum Order L-337 Amended

For greater working efficiency, the fiber shipping drum order, L-337, has been amended to alter a number of details.

The principal new provision of the amended L-337 calls for a one-time certification to the drum manufacturer that purchasers are familiar with terms of the order. Certifications are required by many WPB orders, and serve to prevent misunderstanding and unnecessary correspondence, WPB said.

Minor changes in L-337 schedules have been made in keeping with trade needs. The amended order also permits inner containers for fiber drums for goods that require this added protection.

Price Regulation of Secondhand Containers

We refer all persons purchasing secondhand shipping containers to Maximum Price Regulation 529 which became effective on October 5, 1944.

Because of the extensive use of what is referred to as re-usable, repairable, and re-conditioned paperboard shipping containers, except fiber drums, all persons who sell or purchase secondhand paperboard shipping containers should acquaint themselves with this revised Maximum Price Regulation which appears in the Federal Register dated October 3, 1944.

Preference Rating P-146 Amended

Preference rating P-146 was amended on October 23.

Prior to this amendment, P-146 had one schedule covering all containers manufactured from fiberboard and corrugated fiber. This amendment now gives certain ratings for containers other than fiber drums and for fiber drums for certain uses.

This amendment definitely affects the chemical industry, and all shippers of chemicals in any form who use fiber shipping containers should acquaint themselves with the amended order.

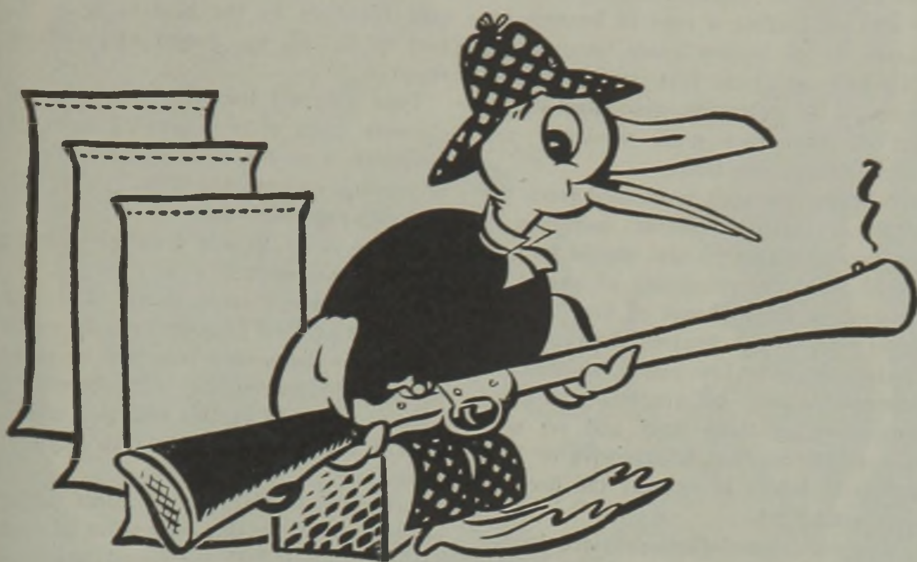
ackages of Synthetic Rubber

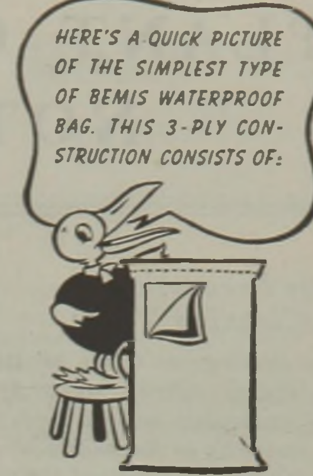
Courtesy St. Regis Paper Company

hese are 75-lb. blocks of synthetic rubber packaged in multiwall paper bags nd loaded in a boxcar.

ON CONSTANT GUARD

Against the enemies ...of your products





1. An inside layer of flexible creped kraft paper impregnated with...
2. a layer of waterproof adhesive that also seals the interstices in the...
3. outside layer of tough, closely woven fabric and cements both layers together.

The outer fabric may be either cotton or burlap. The kind of bonding adhesive depends upon the commodity to be packed. One or more linings of paper and adhesive may be incorporated depending upon the protection needed. Bag seams may be cemented or sewn.

THEY'RE TAILOR-MADE TO YOUR JOB

Will absorbed moisture—or evaporation—damage your packaged products? Is there possibility of your products absorbing foreign odors while in storage or in transit? Or of losing their natural, desirable aroma? Is sifting a problem? Or vermin? Or contamination?

If the answer is "yes" to any of these questions, and if your products are in powdered, granular, crystal or lump form, then Bemis Waterproof Bags are just what the doctor ordered. They give full protection against all these enemies of your products.

How will you know what particular type of bag your products require?

That's one of the tasks of the Bemis Shipping Research Laboratory. With specially designed equipment, chemists and research specialists determine what bag materials and constructions should go into each job.

Almost as important as top protection for your products are the major money savings you enjoy. Bemis Waterproof Bags cost less than other containers giving comparable protection. Further, they save storage space on both empty and filled bags—they speed up filling, closing and handling time—they save on shipping costs—and frequently reduce damage claims.

Send the coupon today for the interesting booklet—"A Guide to More Efficient Shipping." Then, if you wish, one of our representatives will call on you to discuss your packaging requirements. No obligation, of course.

WATERPROOF DEPARTMENT

BEMIS BRO. BAG CO.

ST. LOUIS • BROOKLYN

BEMIS BRO. BAG CO., 408-J Pine St., St. Louis 2, Mo.; 5122 Second Ave., Brooklyn, N. Y.

Please send your special booklet, "A Guide to More Efficient Shipping," and details about use of Bemis Waterproof Bags for________ (PRODUCT)

*Firm Name*________

*Street Address*________

*City*________ *State*________

*Mark for the attention of*________

PLANT OPERATIONS NOTEBOOK

Safety Precautions for Cleaning Tanks

The cleaning or repair of tanks in which organic solvents are used should not be undertaken without rigid precautions, inasmuch as the vapors of all organic solvents are toxic and the majority are flammable as well. Oxygen deficiency in the tank is another hazard which must be considered.

If a tank has contained a flammable solvent, the safest method for removing the vapors, preparatory to cleaning or repair, appears to be thorough flushing by steam, followed by mechanical ventilation of a type approved for flammable vapors. Steam jets to loosen sludge have been successful, after which the tank is washed, drained and dried out with warm air. If the use of steam is impractical, the sludge may be washed out with high-pressure hose, but care must be exercised to avoid building up static electricity. Steam also has some disadvantages, such as the building up of combustible mixtures at the vents. Non-sparking shoes and tools, vapor-proof lamps, and protective clothing should be utilized, and the Code for Flammable Liquids and Gases of the National Fire Protection Association should be observed.

Before cleaning a tank that has contained a non-inflammable solvent, the concentration of vapor in the tank should be reduced as much as possible, preferably by mechanical ventilation.

The cleaning of any tank that has contained an organic solvent should be done from outside the tank if possible. In degreasing processes utilizing non-flammable solvents, where the process is wholly or substantially enclosed, metal chips, mud, and other solid residues are usually removed by scraping, and a clean-out door is generally provided through which the sludge may be removed by a long-handled scraper. The liquid residue and sludge are immediately confined, to lessen volatilization of the solvent in the atmosphere. An approved canister type gas mask is advisable.

If cleaning from the outside is not possible, before entry into the tank an air test by a competent chemist is advisable. Workmen who must enter should be further protected, preferably by air-line respirators approved by the U. S. Bureau of Mines for the purpose, though in some cases canister type gas masks approved for organic vapors may be used. Protective clothing should be afforded and there should be stationed outside the tank a watcher holding a rope or harness attached to the person inside, in order to haul him out at the first sign of trouble. Removal of protective apparatus should not be permitted until workmen are safely outside the tank.

Whether the tank is cleaned from the inside or outside, however, workmen in the surrounding area also should be protected from the possibility of vapor inhalation or the outbreak of fire. All organic vapors are heavier than air and tend to settle in low places, so that the atmosphere may be practically free of vapors at breathing level and yet contain a mixture that is explosive or hazardous to health at or near the floor or in a nearby pit.

Any recommendations provided by the chemical or equipment manufacturers should be carefully observed, and all workmen should be thoroughly drilled in safe practice.

Fuel Saving

Money saving has always been the aim of most operators, and I dare say it always will be.

Money can be saved in most plants; and if you burn a considerable amount of fuel in a year, the writer suggests that you turn your attention in that direction.

For those who are eager to save fuel and thereby save money, the writer has developed some handy rules which anyone can apply to assist in determining the exact amount of money one can save per year by reducing the chimney gas temperature.

Every reader doubtless knows that reduction of chimney gas temperature is important. It is attained in numerous ways, the most common of which are by (*1*) baffling the boiler in such a way that there will be no short circuiting of the hot gases through cracked or broken baffles; (2) by maintaining a constant gas velocity through all of the boiler passes; (*3*) by cross-baffling; (*4*) by increasing radiation-absorbing surfaces; (*5*) by modernizing the furnace; (*6*) by keeping the tubes free from ashes and soot; (*7*) by keeping the tubes free from scale; (*8*) by installing an economizer; (*9*) by installing an air preheater; and (*10*) by installing a superheater.

Any process that makes good use of the heat in the exit gases causes a temperature drop and saves money, but I shall not go into that phase of the subject here. What I want to give here is the method which will enable you to estimate money savings. It is necessary to know only these four things: your present boiler efficiency; the heat value of your fuel in B.T.U. per pound; the temperature of the chimney gases now, before making any improvements; and the promised temperature of the chimney gases after the improvements are made.

First, multiply the present boiler per cent efficiency by the heat value of the fuel in B.T.U. per pound and call the result A.

Then subtract the temperature of the chimney gases *after* improving from the temperature of the chimney gases *before* improving, multiply the difference by 457, and call the result B.

Divide A by B, add 1 to the quotient and call the result C.

Divide your present annual fuel cost in dollars by C. The quotient is the result you want—the money that will be saved per year by making the improvement.

In order to be certain that you understand the rules fully, let us take a typical example:

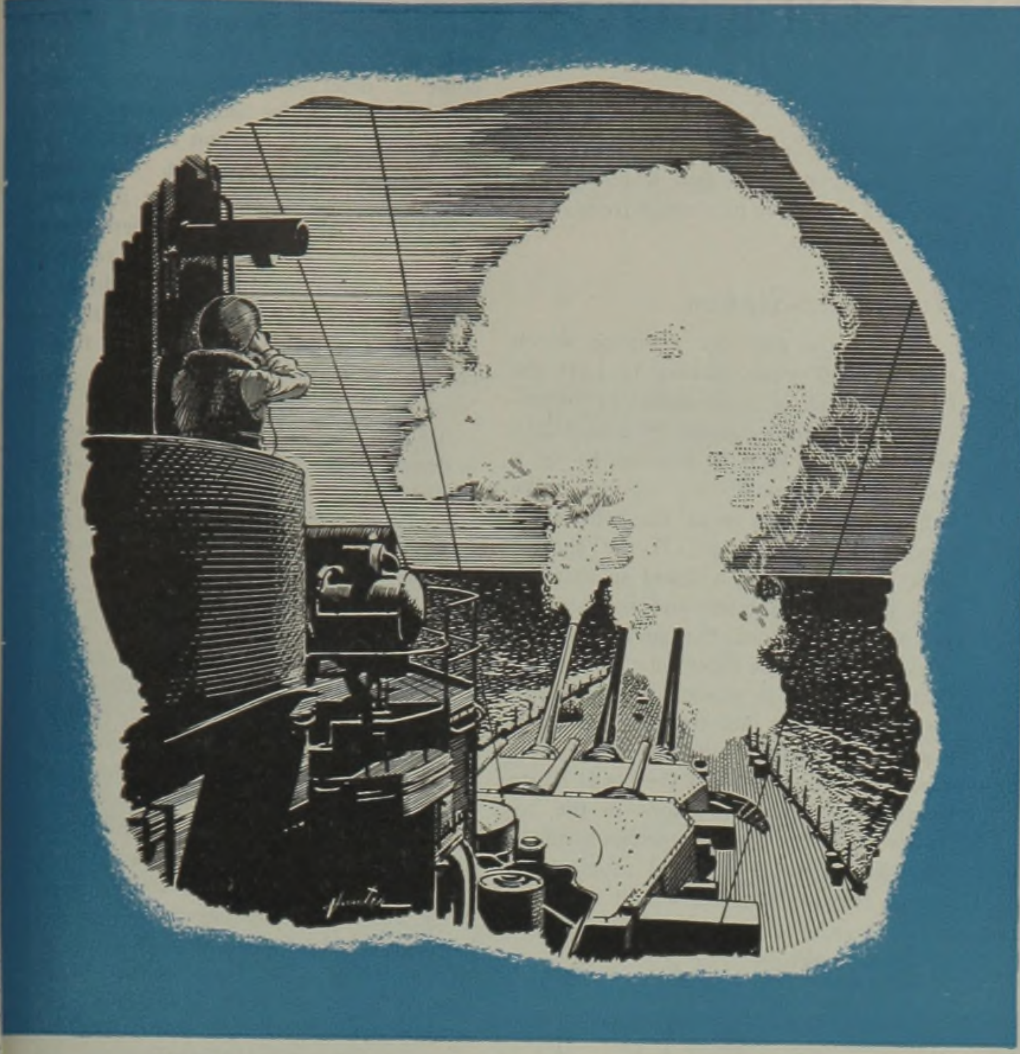
Let us say that your present boiler efficiency is 70%; that heat value of your fuel is 12,000 B.T.U. per pound; the temperature before making the improvements is 600 deg. F. and after making the improvements it is promised that the temperature will be 500 deg. F.; and your present annual fuel cost is $100,000. Substituting in the above rules you will find that your saving will amount to $5150.00 per year.

The above rules are based on the assumption that upon making the improvements the proper amount of air will be used in the process of combustion—neither too little nor too much. 18 pounds of air to each pound of fuel is usually regarded as good.

Wear Resistant Floors

All floors in industrial plants, especially loading platforms, receiving and shipping room floors, corridors and runways are subject to heavy traffic, shock and abrasion; consequently, floor troubles are frequent. Maintenance men have been demanding tough, durable floors which are not slippery, show no noticeable wear for long periods and involve practically no upkeep costs. That such floors can now be constructed with Ferem, the "Blue Temper" component, is claimed by its manufacturers, the A. C. Horn Company.

A complete material containing all the desirable characteristics of hardeners, admixtures and processed components, Ferem contains no sand, stone or silica and requires only the addition of cement and water. Ferem "Blue Temper" Floors are unusually resistant to wear, water and chemical disintegration.



When Accuracy is a Must

On the horizon's rim, the enemy maneuvers desperately to elude the conflict. The first salvos must find their marks to assure decisive action.

The range finder brings twin images into sharp coincidence . . . the range is worked into a formula with speed and course, barometric pressure, air temperature and humidity, wind deflection, powder temperature. Within seconds the turrets swing and the huge guns roar . . . the spotter checks the pattern of a perfect salvo, amazing in its accuracy, which initiates another great naval victory.

Accuracy in the manufacture of many products is today accepted almost casually. But intense and constant effort is required to maintain these high standards. Columbia, recognizing the problems of its customers, helps to make their task easier by furnishing chemicals which meet exacting specifications.

COLUMBIA CHEMICALS

PITTSBURGH PLATE GLASS COMPANY
COLUMBIA CHEMICAL DIVISION
GRANT BUILDING · PITTSBURGH 19, PA.

CHICAGO · BOSTON · ST. LOUIS · PITTSBURGH · NEW YORK · CINCINNATI
CLEVELAND · PHILADELPHIA · MINNEAPOLIS · CHARLOTTE

COLUMBIA SPOTLIGHT

RIVER TRANSPORTATION of Chlorine has received strong impetus as the result of a new barge designed and perfected by Columbia. Cradling four huge tanks in its 135 foot length, the barge transported 380 tons of Liquid Chlorine on its maiden voyage in September from Natrium to Charleston, W. Va. Formerly, all river shipments had been limited to one-ton containers—a slow and tedious handling method in comparison with the new barge. This is the latest of numerous improvements in the transportation of Chlorine and other chemicals introduced by Columbia.

CHLORINE MARKETS—If you are interested in developments in the manufacture of Chlorine and the probable part this chemical will have in the postwar period, an enlightening analysis is presented in the article published in the August issue of *Chemical & Metallurgical Engineering*, page 115. Included are data on plant expansion and manufacturing methods, new and potential uses of Chlorine.

COLUMBIA RESEARCH—Though they have not been glamourized, the activities of Columbia's Research Laboratories have contributed much to the nation's war effort. Synthetic, natural and reclaimed rubber, textiles, plastics for aircraft, water purification and chemicals for other military uses—these are but a few of the important fields in which this research has played a vital role. And it will have an equally important part in serving the world's needs when peace has been restored.

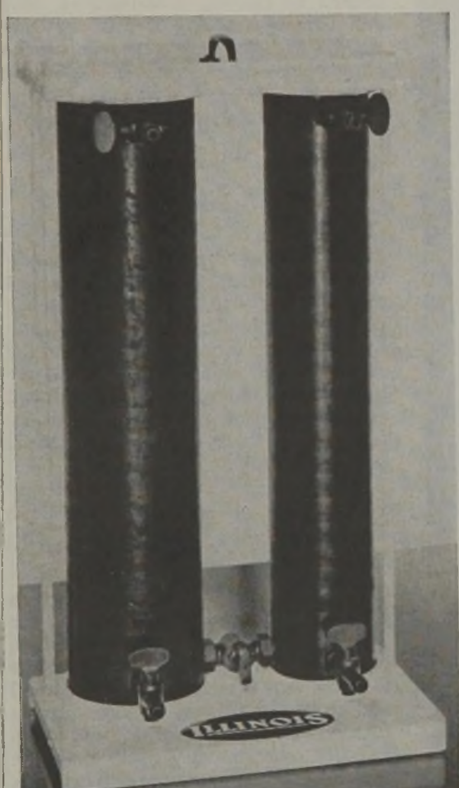
NO INHIBITORS are required in Columbia's thermosetting plastic, Allymer, to prevent polymerization while in storage. Allymer may be stored under ordinary conditions for several months without appreciable change. This stability eliminates the distillation or washing processes necessary for removal of inhibitors used in older monomers, and facilitates mass shipment and storage. Data and reports of extensive research on Allymer may be obtained on request.

COLUMBIA CHEMICALS include Soda Ash, Caustic Soda, Sodium Bicarbonate, Liquid Chlorine, Silene EF (Hydrated Calcium Silicate), Calcium Chloride, Soda Briquettes, Modified Sodas, Caustic Ash, Phosflake, Calcene T (Precipitated Calcium Carbonate) and Calcium Hypochlorite.

LABORATORY NOTEBOOK

Water for Laboratory Use

Water comparable to that supplied by distillation, may now be produced by a recently developed laboratory sized deionizing unit. The apparatus has a permissible flow rate of 12 gallons per hour and the cost of the treated water is less than 1 cent or 2 cents per 100 gallons, depending on the raw water supply. The pictured equipment requires a floor space of approximately 16″ x 10″ and is 30″ high.



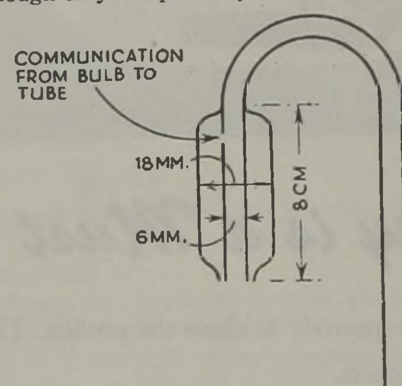
The treated water, which is equal in quality to that designated by the U. S. P. as "distilled water," is produced by a method which is functioning successfully in industry. This arrangement removes all the salts from aqueous solutions by passage of natural water through a double system which consists of a hydrogen exchanger and an acid absorbent resin.

When the raw water containing ionizable substances passes through the cation removal unit, all of the positive cations (calcium, magnesium, sodium, iron, copper) are removed from solution and hydrogen is substituted for them. The resultant dilute anionic acids pass under pressure to a second reactor container where all the anions are adsorbed. This then leaves the water free of soluble solids as all sulfates, chlorides and nitrates have been removed by the anion exchange adsorbent.

By using the exchanger method of removing soluble salts from a water supply it is possible to produce quantities of water under pressure that would be difficult and expensive to produce from steam stills.

Automatic Siphon

Here is the plan for a siphon which may be used when sucking to start the flow of liquid, is inconvenient or impossible. The device consists of a bent-tube whose shorter limb is surrounded by a bulb with a constricted opening; the bulb communicates with the tube by a small hole at the top. If the shorter limb is plunged into a liquid so that the bulb is fully immersed and the bend is not too high above the surface, liquid rises at once up the inner tube and slowly into the bulb. It pushes the air there through the hole into the tube, where it rises and, acting as an air lift, carries the liquid over the top of the bend. Once started, the siphon functions in the ordinary manner. The dimensions given in the sketch have been found satisfactory, though they are probably not an optimum.



A glass-blower of average skill should be able to construct the siphon; it is only important to keep the opening at the mouth of the bulb small, so that it takes 3 seconds to 5 seconds to expel the air.

Removing Nickel from Plant Solutions

Dimethylglyoxime may be employed in removing nickel from large plant batches of liquor intended for use in the production of cadmium pigments. It has been found that this expensive chemical can be recovered by suitable treatment of the nickel dimethylglyoxime precipitate. In order to determine the volume of solution necessary to precipitate the nickel a control test should be made. Since the usual gravimetric procedure is very time consuming, the following volumetric method is suggested.

An accurately measured 5 ml. of the dimethylglyoxime solution is placed in a 250 ml. beaker. This is followed by 5 ml. of glacial acetic acid, 50 ml. of water and 10 ml. of concentrated NH_4OH. The resulting solution is heated to 95° C. and titrated with the liquor to be tested. This liquor is added dropwise from a burette and with vigorous stirring. The end point is determined by means of test paper, prepared by impregnating filter paper with a 10% solution of nickel sulfate and subsequently drying. One drop of the solution in the beaker is transferred to a piece of this test paper with a stirring rod. The end point is reached when the solution no longer produces a red coloration of the paper. Care should be taken not to mistake any red flecks coming from the beaker for the end point of the reaction.

A slight excess of the dimethylglyoxime is desirable. In working with 1000 gallon batches of plant liquor it has been our experience that in no instance will the excess be greater than one gallon of a 3% solution.

Rapid Scale for Small Quantities

The Toledo "9190" series combines the sensitivity of the type ordinarily associated with a laboratory balance with the speed and ease of operating an automatic scale.

The "9190" may be used either as a general purpose scale, or for specialized weighing problems. Rapid action, durability and a wide choice of charts and equipment make the Model 9190 adaptable to the weighing of small parts, critical quantities of materials, counting, and weighing of test samples. As an example of one of its specialized applications, for use in the textile industry, optional equipment includes a hook adapting it for the weighing of roving.

This scale is available for weighing either in grams or grains, and has a capacity of 1500 grains. Graduations are as fine as 2 grains, or 0.2 gram, and the indicator comes to rest quickly—an unusual feature in a highly sensitive scale. The mechanism is simple, with a minimum number of operating parts. Its sturdy carrying case (optional) adds to the compactness and easy portability of the scale, which without the case has overall dimensions of 15¾″ by 14½″.

One of the FOUR Major Properties of

PETRONATE

(OIL-SOLUBLE PETROLEUM SULFONATE)

#1 EMULSIFICATION and DISPERSION of LIQUIDS with PETRONATE

EXAMPLES

PRODUCT	PRIMARY FUNCTION OF PETRONATE	SECONDARY FUNCTION
Soluble Cutting Oils	Emulsifying Agent for Mineral Oil	Rust Inhibitor
Emulsifiable Solvent Cleaners	Emulsifying Agent for Solvent	Detergent
Dormant Spray Emulsions	Emulsifying Agent for Spray Oil	Surface Tension Depressant
Cattle and Sheep Dips*	Emulsifying and Dispersing Agent	Penetrant
Emulsion Polishes	Emulsifying and Dispersing Agent for Waxes and Oils	Wetting Agent for Surface to be Polished
Disinfectant Emulsions*	Emulsifying Agent for Active Ingredients	Potency Stabilizer
Stencil Paper*	Emulsifying and Dispersing Agent for Waxes and Oils	Wax Plasticizer
Specialty Papers*	Emulsifying and Dispersing Agent for Sizings	Wetting Agent for Paper Fibres

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For the graduate student, the chapters on aromatic chemistry are really an advanced, completely up-to-date treatise on the subject. As a matter of fact, this information can be used with extreme benefit as a reference work for research workers in this increasingly important field. Of general interest are the chapters on petroleum, rubber, plastics, etc.

It is a pleasure to recommend this book to the student and research worker alike.

INDUSTRY'S BOOKSHELF

Tool for Engineers

CHEMICAL ENGINEERING THERMODYNAMICS by *Barnett F. Dodge*, McGraw-Hill Book Company, Inc., New York, 1944. 663 pp. $6.00. Reviewed by *David E. Pierce*, General Aniline & Film Corporation.

PROFESSOR DODGE'S new book is an important contribution to the literature of chemical engineering. It will be of interest and value not only to the graduate students for whom it is primarily intended but also to practicing engineers who wish to bring themselves up to date on this "method of attack on problems, a versatile tool of broad applicability."

The first half of the book gives the theoretical side, the last half, the practical side of the subject. The first two chapters present the two fundamental laws of thermodynamics, together with the definitions of terms used, all with a minimum of advanced mathematics and with well-chosen illustrations. The quantitative treatment of the subject begins in the third chapter, where the author develops the equations for changes in enthalpy, entropy, availability, "work function", free energy, fugacity and activity, and shows very briefly the application of these equations to ideal gases. The fourth chapter, in which general equations of equilibrium are developed, is, as the author frankly admits, "a chapter bristling with mathematical formulas, unleavened by any interesting applications." However, it does bring together in convenient form the equations needed for the specific applications of the later chapters. Chapters V and VI present a review of *pvt* data, the equations of state for expressing them, and the integrated equations which permit numerical calculations.

The practical application of the equations developed in the first six chapters of the book to some of the more important unit operations of chemical engineering forms the interesting subject matter of the remaining seven chapters. With the help of a great many completely worked-out illustrations, the author shows how to make use of the equations involving enthalpy, entropy, activity, etc. in such diverse fields as heat transfer, fluid flow, refrigeration and distillation. From a study of these chapters, the engineer may find that he has been using chemical engineering thermodynamics for a long time without calling it by that name. In any case, he will appreciate having the latest methods of calculation brought into usable form and correlated with the fundamental laws in such a satisfactory manner.

Chemistry of Natural Compounds

ORGANIC CHEMISTRY, by *L. Fieser and M. Fieser*. Heath and Co., Boston, Mass., 1944; 1091 pp., $8.00. Reviewed by *Y. SubbaRow*, Lederle Laboratories.

ANY WORK OF ART or science is the reflection of the personality of the author and his background. The popularity with the undergraduates of Dr. Fieser's Chemistry 2 course at Harvard, which he has been teaching for the last decade, is a tribute to his versatility as a teacher. His well-known contributions to aromatic chemistry, carcinogenic hydrocarbons, and steroids rank him as one of the authorities on these subjects. In addition, one must mention his constant, intense interest in the chemistry of natural compounds. All this is reflected in his book.

Most usually text books in organic chemistry are descriptive in character, a method of presentation not conducive to easy reading. The authors of "Organic Chemistry" carefully avoided this method of presentation by presenting important group reactions and relegating important factual data to tables. Organic chemistry is a live, dynamic subject, and the author's lucid style of writing keeps the interest of the reader especially as there are frequent references of biological and technical importance interspersed to illustrate more vividly the subject being presented.

Of value to the undergraduate student is the inclusion of the historical background to introduce each new phase of the subject. The student is gradually led from the elementary to the more advanced mechanisms and type reactions with their general applications. In this way the subject matter for all general courses in organic chemistry is covered.

For the biochemist, the book is of great significance because it gradually leads to the chemistry of natural compounds after a preliminary fundamental study of the compounds related thereto. The chemistry of proteins, carbohydrates and fats are well presented in a concise way; their metabolism is briefly discussed. The chapters on the chemistry of hormones—mainly steroids—vitamins, and the recent advances of chemotherapy are sufficient in scope to be of value to a medical student. The opportunity provided by this book to refresh and correlate the fundamental chemistry involved in biochemical lectures is of immense help to the biochemical student.

Success in Chemurgy

SOYBEAN CHEMISTRY AND TECHNOLOGY, by *Klare S. Markley and Warren H. Goss.* Chemical Publishing Co., N. Y., 1944: 261 pp., $3.50. Reviewed by *R. A. Boyer*, The Drackett Company.

TO ANYONE embarking on a scientific study of the soybean, this book will be indispensable. For the first time there is now gathered together in one volume a comprehensive review of the scientific facts concerning this fascinating subject. The authors, having had access to all phases of soybean industry during its remarkable growth throughout the last decade, present in this volume an accurate picture not only of the chemical but also the commercial developments of the modern soybean industry.

The book is written in two parts, part one being devoted to the chemistry of the soybean and its major components, and part two describing the commercial processing and technology.

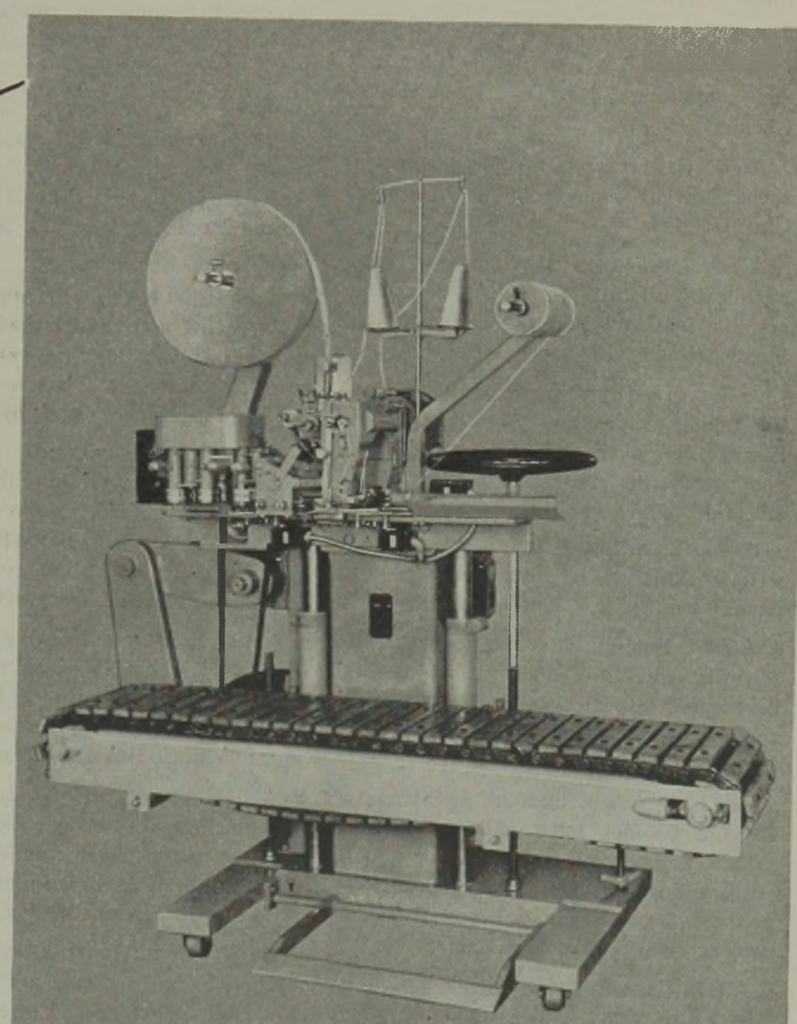
A very complete review of the chemistry of such subjects as the composition of various varieties of soybeans, the proteins, vitamins, and soybean oil and its derivatives is given in part one. The chapter on soybean oil is especially informative and the bibliography is extensive. Chemists wishing to study any phase of the soybean will do well to consult this book first.

In part two all the major methods used in processing soybeans are described. A good over-all picture of the soybean processing industry as it exists today can be obtained from this section. Techniques are described for bean handling from storage through the various oil extraction systems including a description of oil refining methods.

Notably missing (probably because much of the information is still highly confidential) is any mention of the rapidly expanding developments in the fractionation of soybean oils and in the isolation and production of purified proteins. Both of these developments are today the subject of much research work and probably will lead to many other refined products.

During the next few years as more knowledge and information is made available it is to be hoped that the authors will have the opportunity of preparing volume two on soybean chemistry and technology.

16!



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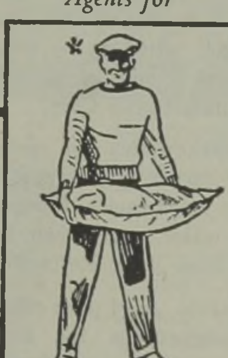

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Chemicals

A684. Active Carbon and its function in decolorizing, deodorizing and purifying oils, fats and related products is explained in an eight-chapter booklet from Industrial Chemical Sales Div., West Virginia Pulp and Paper Co.

A685. Carbon and Graphite products and their application in industry, are studied in catalog section M-8000. National Carbon Co., Inc.

A686. Chemicals and Acids are listed in a catalog, No. 150, dated July, 1944 and containing 72 pages. J. T. Baker Chemical Co.

A687. Chemicals List and supplement sheet show products from the Ecclestone Chemical Co.

A688. Chlorinating Agents. A new technical bulletin, No. 328A, describing six chlorinating agents has been prepared by the Hooker Electrochemical Co.

A689. Coatings. A new 16-page catalog telling the uses of Amercoat plastic coatings in a wide range of industries comes from the American Pipe and Construction Co.

A690. Duralon Resin is presented in a mimeographed laboratory report, (10 pages) from U. S. Stoneware Co.

A691. Foods and Beverages. The scientific quality control of foods and beverages by chemical and biological analyses is revealed in an 18-page booklet from Schwarz Laboratories, Inc.

A692. Furnace Black. An attractive 20-page booklet tells, with the aid of graphs and charts, how Continex SRF, semi-reinforcing furnace black, may be used to best advantage in GR-S and natural rubber. Witco Chemical Co.

A693. Grease for Plug Cocks. This brief leaflet deals with a silicone product used in the lubrication of valves and plug cocks (which must operate at elevated temperatures or be subjected to corrosive chemicals). Dow Corning Corp.

A694. Hydraulic Gauges, including direct stem and flush mounted gauges, for use on hydraulic presses and pumps to indicate pressures, are discussed in a 4-page leaflet, No. 230-A. Watson-Stillman Co.

A695. Hydraulic Presses for extruding and molding ceramics, equipped with motor-driven, radial-type oil pumps, and push button control or hand lever for automatic, single-cycle operation are the subject of a 4-page illustrated bulletin, No. 650-A, from Watson-Stillman Co.

A696. Insecticide. Thanite, an insecticide with a variety of uses, from sprays for plants, storehouses and buildings to dog baths, is depicted in a 12-page pamphlet from Naval Stores Department, Hercules Powder Co.

A697. Lubrication is the title and subject of a 40-page technical booklet (volume XXX, No. 4) from The Texas Co.

A698. Magnesia Refractory. A bright folder presents Hearth Patch, with simple directions for use in emergency repair of holes in basic open hearth furnaces. Basic Refractories, Inc.

A699. New Starch. A small 16-page multi-colored booklet about the domestic starch, Amioca, has been published by the American Maize-Products Co., National Starch Products, Inc., and Stein, Hall & Co., Inc.

A700. Perfume and Flavoring Agents. A price list and catalog including essential oils, aromatic chemicals, oleoresins certified colors, etc., has been published by Magnus, Mebee & Reynard, Inc.

A701. Photographic Chemicals. Fixation of X-Ray Film with Ammonium Thiosulphate NH5, Hypo Concentrate (at high-speed) is explained in an attractive six page leaflet put out by the Ingraham Research Laboratories.

A702. Plastics. Bakelite Cast Resins, Plastics is the title of an attractive, informative, 16-page technical booklet which includes data on application, machining and finishing. Bakelite Corp.

A703. Propylene Glycol. A short pamphlet about propylene glycol, mentions its uses in the pharmaceutical, food flavoring, cosmetic, tobacco and other industries. B. L. Lemke & Co.

A704. Protective Coatings, White Hot and Pyro-Chrome are announced in a 1-page bulletin by Preferred Utilities Manufacturing Corp.

A705. Protective Coatings, working on the principle of heat reflectance, are discussed in a new pamphlet called "New Approaches to Surface Protection" which mentions such articles as refractories, metals, ceramics and glass. Preferred Utilities Manufacturing Corp.

A706. Refractories for open hearth and electric furnace, with machines for emplacement on furnace linings by air stream and water, are shown in a four page leaflet from Basic Refractories, Inc.

A707. Resins. A 44 page catalog, listing resin suggestions for government specifications and suggested formulations, entitled Resins and the War (revised) recently has been published by U. S. Industrial Chemicals, Inc.

A708. Rubber Extender. Dutrex plasticizer and extender for GR-S synthetic rubber is presented with tables and graphs in a 26-page, carefully planned booklet. Shell Oil Co., Inc.

A709. Scales. A recent catalog, (R-44), records completely the scales manufactured by the Philadelphia Division of the Yale & Towne Manufacturing Co.

A710. Soda Briquettes and Hennig Purifier. A folder which presents information about Soda Briquettes (sodium carbonate pellets) and Hennig Purifier for open hearth and Bessemer practice, which will be valuable to blast furnace, foundry and open hearth operators. Pittsburgh Plate Glass Co.

A711. Soldering Products such as metal coatings, all-metal soldering compounds, soldering flux and fluids (some especially for stainless steel, tin, aluminum and silver, etc.) are listed in a bright colored four-page brochure put out by the Lloyd S. Johnson Co.

A712. Specialty Chemicals. A well-illustrated booklet discusses Montville unit organization for supplying chemicals difficult to obtain on the open market, those considered too confidential for general purchasing methods, and for the custom manufacture of chemicals. Montville Chemical Works.

A713. Spot Remover described in a small brochure by Afta Solvents Corp.

A714. Synthetic Resins. The characteristics of resins of more than eight types are concisely displayed in a 25-page booklet from American Cyanamid and Chemical Corp.

Equipment—Methods

F192. Air-operated Controllers. Information about instruments for the control of temperature, pressure, vacuum, humidity, etc., is given in an 8-page bulletin, No. A115, from the Bristol Co.

F193. Air Scrubber. Bulletin No. 205 presents in 4 pages, information on the Ross Air Scrubber which is designed to clean air and for use in humidifying, dehumidifying, cooling and fume elimination. J. O. Ross Engineering Corp.

F194. Cathode-Ray Oscillograph, type 248, from the DuMont Laboratories is described in a 6-page folder, with a price list enclosed. Allen B. DuMont Laboratories, Inc.

F195. Cooling Unit. The Spasaver, a ceiling-type refrigerator may be seen in an 8-page, profusely illustrated booklet from Drayer-Hanson, Inc.

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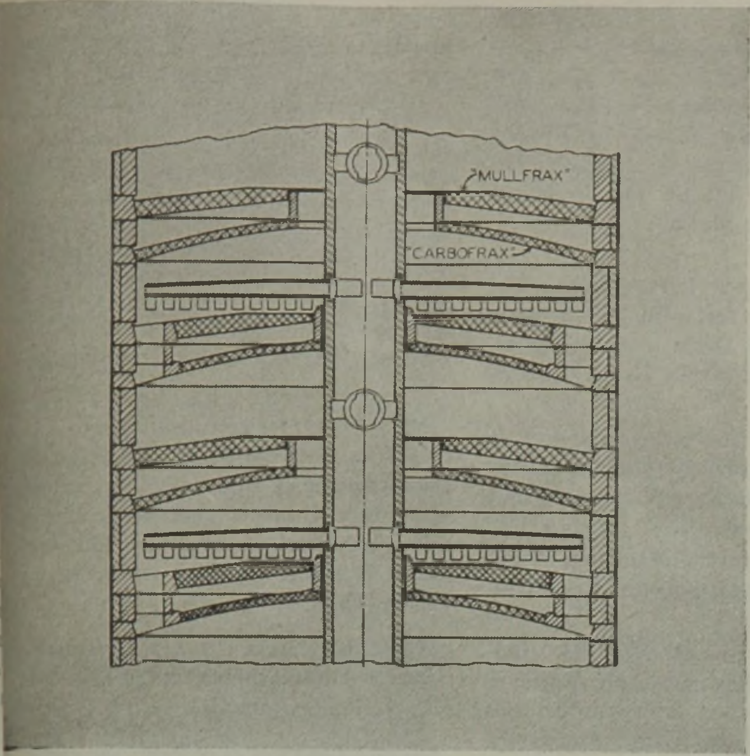

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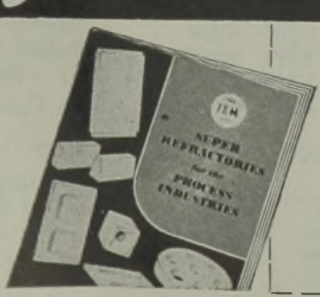

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F197. Jack Catalog No. 44, which covers Simplex lever, screw and hydraulic jacks has been issued by Templeton, Kenly & Co.

F198. Jar Mills of both the roller and standard type, are presented in Bulletin No. 255 from U. S. Stoneware Co.

F199. Heat Exchange Equipment which is corrosion resistant, and includes temperature control units, evaporators and condensers is described in a yellow and black 24-page catalog from the National Carbon Co., Inc.

F200. Moisture Meter. A 4-page leaflet (Bulletin No. 1263), announcing a dielectric type moisture tester, which is particularly designed for use with powders and granular materials comes from C. J. Tagliabue Mfg. Co.

F201. Organic Chemicals. A price list of organic chemicals has been prepared by Columbia Organic Chemicals Co., Inc.

F202. New Boiler Ratio Meter. Publication No. 4071 traces methods of checking combustion efficiency in boiler plants and presents a description of the ideal boiler meter including installation details. Cochrane Corp.

F203. Open Steel Floorings of both riveted and welded types are displayed with photographs, drawings, tabular specifications and installation data in a 22 page catalog. Wm. F. Klemp Co.

F204. Packaging Machines which "form, fill and seal your package" are displayed in a three-page folder with pictures and data on materials, capacity, production, and operators. Stokes & Smith Co.

F205. Pipes and Rings. A small folder with information about pipe equipment and rings has been issued by the Dresser Manufacturing Co.

F206. Pneumatic Tires. A comprehensive 50-page manual on the design and construction of pneumatic tires has been published for United States Army training schools and is now available to interested civilians. B. F. Goodrich Co.

F207. The Process of Extruding is the title of a recent 12 page catalog presenting data for industrial engineers and designers about the process of extruding, and products that can be made thereby, from natural, synthetic and reclaimed rubber and from plastics. B. F. Goodrich Co.

F208. Propeller Type Meter. The Propeloflo meter for main line metering is presented in a folder, suitable for inclusion in a notebook by Builders-Providence, Inc.

F209. Pumps. A recent catalog of 20 pages lists with photographs and charts, Rex pumps manufactured by the Chain Belt Co. of Milwaukee.

F210. Pyrometers, Radiation Type, are shown in a new bulletin, No. P1202, from The Bristol Co.

F211. Pyrex Glass No. 774. Bulletin 884 presents 8 valuable pages of facts with charts and outlines to describe the properties of this glass. Among the properties delineated are: thermal shock resistance, corrosion resistance, strength, transparency, dimensional stability, heat resistance and dielectric strength. Also included is a table showing possible applications. Corning Glass Works.

F212. Qualitative Filter Papers are carefully described in a 25-page booklet from the Eaton-Dikeman Co.

F213. Resins. The bonding of Vinylite elastomeric resins to themselves and to such materials as metal, ceramic surfaces, leather, wood and so forth is discussed in a pleasing 16-page booklet from the Plastics Division of Carbide and Carbon Chemicals Corp.

F214. Rivet. Rivnuts which may be used as blind fasteners, and double as nut-plates or rivets or both, recently have been made available and are represented with pictures in a four page catalog section, No. 12050, from the B. F. Goodrich Co.

F215. Safety Valves. Information bulletin 501-A is an interpretation of the new safety valve standards developed under W. P. B. and National Bureau of Standards with facts about valves of iron, steel and bronze. J. E. Lonergan Co.

F216. Shears. The improved features of hydraulic and hand shears for cutting commercial grade wire rope, flat bars and other metal objects are announced in the third edition of Bulletin No. A-6 from the Watson-Stillman Co.

F217. Silicone Resins for electrical and heat-resistant insulation are shown, with samples, in a booklet from the Dow Corning Corp.

F218. "Spectrophotometry and the Colorist," bulletin No. 756, discusses the interpretation of spectrophotometric data and suggests methods of application to mill production and research problems. Calco Chemical Division, American Cyanamid Co.

F219. Spot Welders are presented in a recent 58-page catalog #CE-44W from Eisler Engineering Co.

F220. Thermal Control. A catalog introducing standard temperature and pressure control apparatus, including in its 44 pages photographs and installation drawings, and showing over 20 devices which can be used from sub-zero temperatures to 2,000 degrees Fahrenheit, has just been issued by Fenwal Inc.

F221. Thermostat. Bulletin J303-2 presents a device called the Rheotrol, which provides control of electric power, heat input, or flow of liquids or gases. Wheelco Instruments Co.

F222. "Three-Dimensional Seeing. The Science of Color and Light For Better Vision In Industry," a 20-page, color-illustrated brochure, presents suggestions to promote safety and comfort for workers in machine shops, textile mills, garment and furniture factories, and so forth. Finishes Division, E. I. du Pont de Nemours & Co.

F223. Timing Devices. Bulletins J403-2 and J402-2 describe simplified electrical timing devicees which, when employed with any automatic control instrument, maintain desired input of electrical power, heat, or flow of liquid or gases to any process equipment.

F224. Used Machinery. The Contribution of Used Machinery to American War Production titles a small booklet from Consolidated Products Co., Inc.

F225. Valve Positioning Device used in conjunction with any control instrument having a high and low contact, with a neutral position is described in Bulletin J602-2 of the Wheelco Instruments Co.

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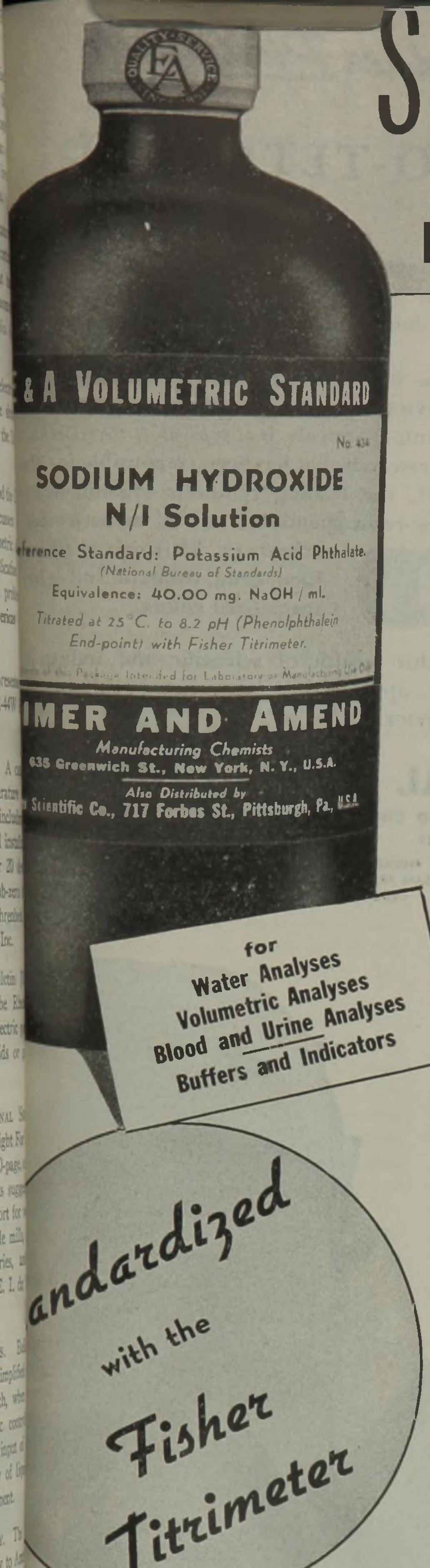

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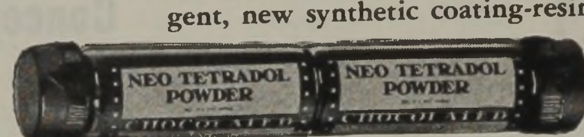

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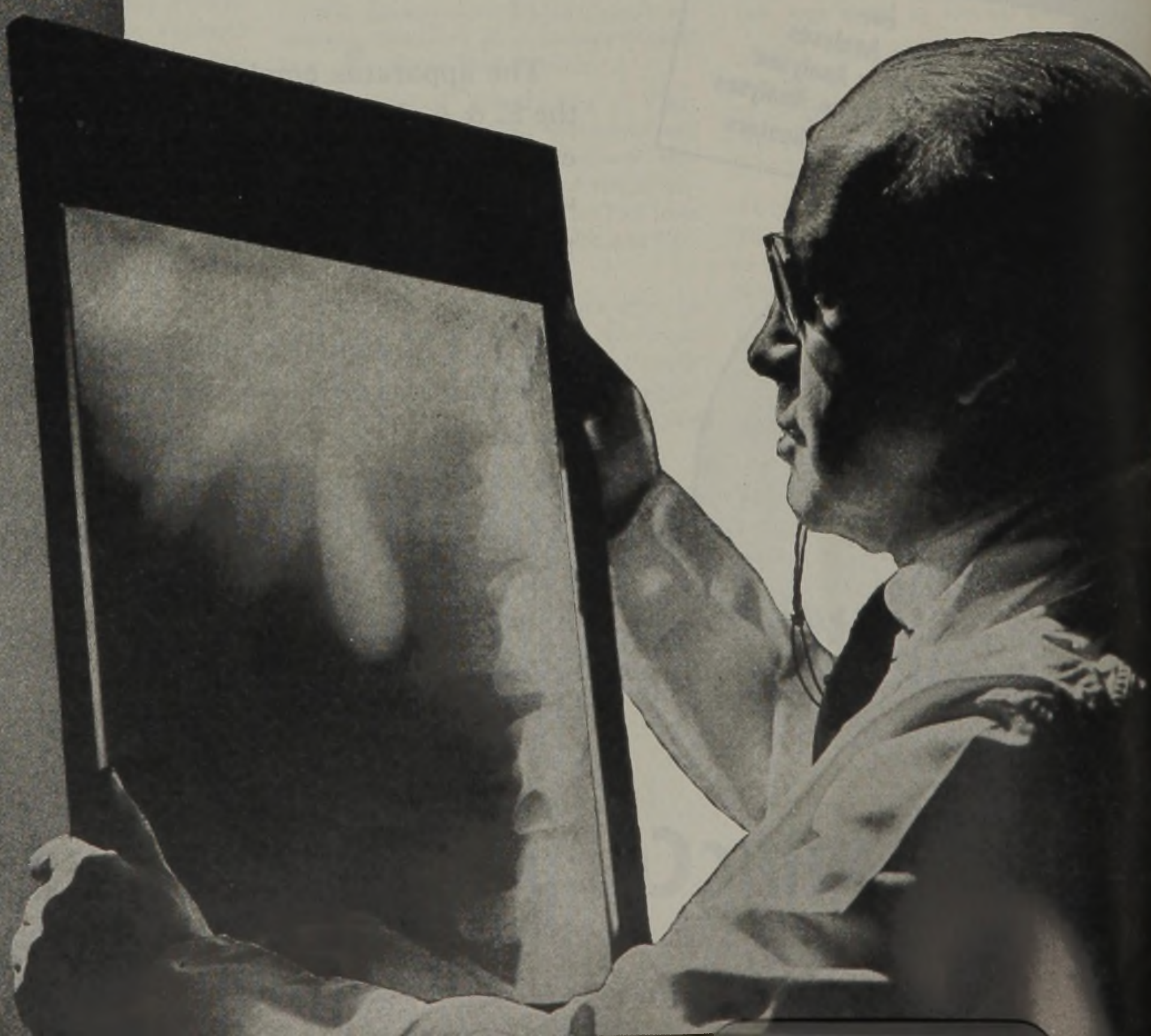


NEWS OF THE MONTH

A. I. Ch. E. Meets in St. Louis

Accrediting of chemical engineering curricula discontinued for the duration. New meeting policy announced, effective 1945.

MEETING in St. Louis for the first time since 1937, the American Institute of Chemical Engineers this month placed penicillin, butadiene, and catalytic cracking at the top of the program of its 37th annual session, held at the Hotel Jefferson. As has been done for the past several years, the meeting was confined to two days, with a continuous program of technical papers which in addition to the above included the subjects of magnesium chloride production, mass spectrometry, alumina from clay, magnesium production, styrene production, recovery of carbon and potash from molasses stillage, and studies on special phases of agitation, liquid-liquid extraction, and solubility relationships.

The usual announcement of officers for the coming year was made at the general business session. Lawrence W. Bass of Air Reduction Co. and U. S. Industrial Chemicals, Inc. was named president, and Albert B. Newman, dean of engineering of the College of the City of New York, vice president. S. L. Tyler and C. R. DeLong were re-elected secretary and treasurer respectively.

New directors elected for terms of three years were Francis J. Curtis, Monsanto Chemical Co.; C. C. Furnas, Curtiss-Wright Airplane Division; Allan P. Colburn, University of Delaware; and Guy N. Harcourt, Buffalo Foundry & Machine Co. W. W. Duecker, Texas Gulf Sulphur Co., was elected to finish out one year of an unexpired term.

In its annual report to the membership the Council announced that number of members of the Institute had increased 21.4 per cent over the past year to a new high total of 4,783 as of November 1, 1944. This includes a 12 per cent increase in active members and a 31.3 per cent increase in juniors for the year. In commenting on the report, Secretary Tyler said that new applications for membership are continuing to come in at a higher rate than ever before.

Accrediting Frozen

In recognition of the effects of the war on civilian education, the Institute's committee on accrediting of chemical engineering curricula announced that the 1943 list of accredited colleges and universities will in effect be frozen for the duration. The committee will make no additions or changes in the list until there is a "resumption of reasonably normal educational activities and a re-examination." In the meantime, however, the Institute council has agreed to cooperate with the Engineering Council for Professional Development in certification of curricula in technical institutes.

The St. Louis meeting was the last to be held under the old system of two national meetings a year. Beginning in 1945 a new meeting policy will go into effect calling for three meetings a year—two regional and one national. The purpose of the change is to permit a wider selection of meeting places. With attendance at national meetings increasing at a rapid rate, the number of cities which could accommodate such meetings became so small and their locations so distant from some parts of the country that many of the members found it difficult to attend. The schedule for 1945 calls for a regional meeting at Houston, Texas, May 1, 2 and 3, another regional at San Francisco in September, and the annual meeting at Chicago in December.

With the inauguration of the new meeting policy, a committee was appointed whose duty it is to plan meetings well in advance and to be responsible for arrangement of the programs for all meetings, both regional and national. This committee consists of C. G. Kirkbride, A. & M. College of Texas, chairman; M. C. Molstad, University of Pennsylvania, vice-chairman; F. W. Adams, Pittsburgh Plate Glass Co.; W. I. Burt, B. F. Goodrich Co.; R. L. Copson, Tennessee Valley Authority; C. P. Davis, American Cyanamid Co.; S. Cottrell, Monsanto Chemical Co.; Gustav Egloff, Universal Oil Products Co.; A. N. Hixson, Columbia University; Donald B. Keyes, Office of Production Research and Development; John H. Perry, E. I. du Pont de Nemours & Co.; D. E. Pierce, General Aniline Works; and W. R. Veazey, Dow Chemical Co.

One of the features of the meeting was the open discussion on "Problems Ahead in Chemical Engineering Education" held Sunday afternoon by the Committee on Chemical Engineering Education. The regular banquet session was held Monday evening with James G. Vail, vice president of the Philadelphia Quartz Co., as the featured speaker. Dr. Vail has recently returned from China and India where, as a representative of the American Society of Friends, he performed a special mission pertaining to the distribution of relief funds.

Lawrence W. Bass (left) was elected new president of the American Institute of Chemical Engineers. Gaston DuBois (center) was honorary chairman of the St. Louis meeting and Carl E. Pfeifer (right) chairman.

First Brazilian Chemical Engineering School to Be Established

Sao Paulo will soon have the first school of chemical engineering in the republic of Brazil. The new institution, when completed, will combine with the existing School of Business Administration and School of Technical Drawing in this city to form the Technical University of Sao Paulo.

Announcement that construction would soon begin on a two million dollar building to house the school was made recently by Father Roberto Saboia de Madeiros, S. J., following a six months' visit to the United States as a guest of the Department of State in Washington. Father Saboia, organizer of the project, was instrumental in obtaining financial support and equipment for the institution from industrialists in this country and in the United States. Plans for the school were prepared by United States architects during his stay in that country.

The school will be non-sectarian, and at least three instructors from the United States will be numbered among its faculty.

Brand Honored by Chile

Charles J. Brand, executive secretary and treasurer of the National Fertilizer Association, has been honored by the government of Chile with appointment as Comendador of the Order Al Merito. The decoration was presented to Mr. Brand by Marcial Mora, Chilean Ambassador to the United States, at a luncheon October 19 in Washington. The Chilean honor recognizes Mr. Brand's valuable services in the development of Andean alfalfa and the promotion of other phases of Chilean agriculture, as well as in connection with agricultural use of Chilean nitrate.

High Gas Costs in Carbon Black Output

The OPA has taken cognizance of the higher costs of natural gas burned in making carbon black, entailed in the recent effort to increase production for the rubber program.

The great increase in the amount of synthetic rubber being processed has increased the demand for easy-processing channel carbon black. Increased demand is substantially in excess of the present production capacity. War Production Board has launched a plan to increase production, by re-opening closed-down portions of old plants, moving old plants to new locations where gas is available, building new plants and by furnishing additional gas supplies.

Since the principal material cost in this grade of carbon black is natural gas, and most of the additional output will require gas at much higher costs than under the original program, OPA had to act to preclude manufacturers turning out augmented carbon black supplies only by incurring a loss.

The agency has provided a special pricing formula for sales of this incremental output, intended to make it possible for producers to recover approximately the total production cost, which will vary with the producing facility.

CALENDAR OF EVENTS

AMERICAN BOTTLERS OF CARBONATED BEVERAGES, Morrison Hotel, Chicago, Ill., November 28-30.
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, Annual Convention, Hotel Jefferson, St. Louis, Mo., Nov. 19-21.
AMERICAN PETROLEUM INSTITUTE, Twenty-fifth Annual Meeting, Stevens Hotel, Chicago, Nov. 13-16.
AMERICAN SECTION SOCIETY OF CHEMICAL INDUSTRY, CHEMICAL INDUSTRY MEDAL AWARD, Hotel Roosevelt, New York City, Nov. 10.
AMERICAN SOCIETY OF MECHANICAL ENGINEERS, Annual Meeting, New York City, Nov. 27-Dec. 1.
ASSOCIATED COOPERATE INDUSTRIES OF AMERICA, INC., Semi-annual Business Conference, Jefferson Hotel, St. Louis, Mo., Nov. 28-29.
CANADIAN INSTITUTE OF MINING AND METALLURGY, Annual Western Meeting, Hotel Vancouver, Vancouver, Nov. 15-17.
INDEPENDENT PETROLEUM ASSN. OF AMERICA, 15th Anniversary Meeting, Dallas, Texas, Nov. 23-25.
INDUSTRIAL HYGIENE FOUNDATION, Ninth Annual Meeting, Mellon Institute, Pittsburgh, Pa., Nov. 15-16.
NATIONAL ACADEMY OF SCIENCES, Autumn Meeting, Washington, D. C., Nov. 15-16.
NATIONAL ASSOCIATION PRINTING INK MAKERS, Directors Meeting, Philadelphia, Pa., Nov. 28.
NATIONAL CHEMICAL EXPOSITION, Chicago Coliseum, Chicago, Ill., Nov. 15-9.
NATIONAL EXPOSITION OF POWER AND MECHANICAL ENGINEERING, Madison Square Garden, N. Y., Nov. 27-Dec. 2.
PACKAGING INSTITUTE, INC., Annual Meeting, Hotel New Yorker, N. Y., Nov. 1-2.
PACKAGING MACHINERY MANUFACTURERS INSTITUTE, INC., Annual Meeting, Hotel New Yorker, N. Y., Nov. 1.
SOCIETY OF AUTOMOTIVE ENGINEERS, INC., Fuels and Lubricants Meeting, Hotel Mayo, Tulsa, Oklahoma, Nov. 9-10.
SOCIETY OF PLASTICS INDUSTRY, Annual Fall Convention, Waldorf-Astoria Hotel, N. Y., Nov. 13-14.

Ickes Announces New Laboratory

A synthetic liquid fuels research and development laboratory—the most modern of its type in the world—will be built by the Bureau of Mines at Bruceton, Pa., and will be ready for occupancy by next fall, Interior Secretary Ickes has announced.

The laboratory will be headed by Dr. H. H. Storch, now stationed at the Central Experiment Station at Pittsburgh. He was recently named chief of the research and development division of the Office of Synthetic Liquid Fuels.

Immediate Postwar Rubber Competition Held Unlikely

Serious competition between imported natural rubber and the domestic synthetic product will not develop for a year or two after the reconquest of the rubber-producing areas of the Far East, the United States Tariff Commission has predicted in a report covering the entire rubber situation.

The Tariff Commission's report, one of a series on war changes in United States industry made in response to a request from the Senate Finance Committee and the House Ways and Means Committee, summarizes information on natural, synthetic and reclaimed rubber in the pre-war, war and postwar periods. One section analyzes international controls and their effects upon prices and supplies. The development of the synthetic rubber industry in the United States is gone into in detail, as well as the future prospects of this war-born activity.

Practically all of the nation's $700,000,000 of synthetic rubber plants will need to be kept in operation to meet postwar requirements during this period prior to resumption of large-scale importation of natural rubber, the report emphasized, and for these two reasons there is no immediate necessity for a far-reaching policy with regard to rubber. This, however, should not preclude a systematic study of the problems involved with a view to eventual formulation of a working rubber policy, the report said.

A.C.S. Universal Oil Trust Created

Creation of a trust under which the Guaranty Trust Company of New York is trustee of securities of the Universal Oil Products Company of Chicago for the benefit of the American Chemical Society was announced recently by the Society.

The trust, known as The Petroleum Research Fund, was set up to administer the gift made by a group of oil companies owning securities in Universal, one of the leading research and development enterprises of the country.

The management and operation of the Universal Oil Products Company will be under the direction of a board of directors to be appointed by the Guaranty Trust Company of New York as trustee.

"The net profit from the Universal Oil Products Company will flow to the American Chemical Society to be used for purposes of research in the petroleum and natural gas field," it was announced.

"The Society will have no obligation insofar as the management of Universal Oil Products Company is concerned. The Society, on the other hand, will have absolute discretion in the matter of selecting the research projects. The Society can withdraw at any time it feels that it should not act further and it can then disclaim any interest in the trust."

Directory of Latin American Scientific Publications Issued

A comprehensive directory of leading Latin American scientific publications has been published here by the Division of Intellectual Cooperation of the Pan American Union "with a view to assisting scientists and scientific instiutions to become acquainted with the work of their Latin American colleagues." The 65-page publication was compiled and annotated by Miss Katherine Lenore Morgan, research assistant at the Pan American Union, and has been made available for general distribution to the public at a nominal charge.

The directory lists scientific journals published in the other American republics by country, and alphabetically by subject. Fields which it covers include the agricultural sciences; astronomy; biology; botany; chemistry; chemical, electrical, mining, sanitary and general engineering; entomology; forestry and wild life conservation; physical geography; geology and mineralogy; herpetology; hydrography; ichthyology; limnology; malacology; mammalogy; mathematics; meteorology; natural sciences, scientific bibliography and source material on the history of science; ornithology; paleontology; physics; seismology and general zoology.

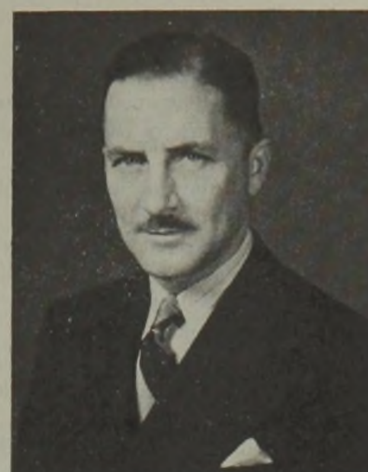
An added feature of the work is a table of Latin American exchange rates to aid subscribers to any of the journals in converting subscription rates to their equivalent in United States money. Each publication indexed in the directory is followed by a brief description of its contents or other information of value to those interested in obtaining the publications.

Three-Dimensional Views of Crystals Made Possible

Three-dimensional pictures of views through an electron microscope, revealing the shape of ultra-microscopic crystals of which magnesium and other metals are composed, were demonstrated publicly for the first time at the 29th annual meeting of the Optical Society of America, October 20. It was shown that the point of a common pin can be made to appear as vast and rough as a mountain range when photographed through an electron microscope and, enlarged to 100,000 diameters on a three dimensional polaroid vectograph. In these three dimensional pictures it is now possible to study and measure the shape and space characteristics of minute structures that are extremely difficult to see in ordinary photographs.

The demonstration of techniques in applied electron microscopy was made at the society meeting by Robert D. Heidenreich, of the Dow Chemical Co., Midland, Mich., where the electron microscope has been used in the investigation of corrosion phenomena in magnesium alloys.

M. R. Stanley Returns to Victor Chemical



M. R. Stanley, Victor Chemical Works, Chicago, resigned his position as Deputy Chief of the Acids and Salts Section of the Chemicals Bureau of the War Production Board to return to Chicago and resume his duties in the executive offices of Victor with whom he has been affiliated for over 21 years.

Chemistry Alumni Association Formed

New York University graduates in chemistry and chemical engineering have organized a chemistry alumni association to promote the welfare of both the alumni and the University. Dr. Maxmilian Toch, head of Standard Varnish Co. and of Toch Bros., is Honorary President. Bruce Silver (New Jersey Zinc Co.) is president; Kenneth L. Saunders (American Cyanamid), vice-president.

Activities of the U. S. Conciliation Service in The Chemical Industry

Type of Situation	Number 1944 September	1944 August	1943 September
Total	77	74*	65
Labor Disputes			
Strikes and Lockouts	14	8	
Threatened Strikes	7	2	
Controversies	34	36	
Other Situations			
Arbitrations	4	5	
Technical Services	1		
Special Services	3	7	
Disputes certified to National War Labor Board	14	16	

* 7 situations included in this total were disposed of as Special Services.

Metal Finishing Research Fellowship Established

The Du-Lite Chemical Corp. of Middletown, Conn., has established a fellowship in the chemical engineering department of the College of Applied Science, Syracuse University, for the purpose of conducting research on metal finishing. The recipient of the fellowship is Michael A. Streicher of Orange, N. J., who is studying towards his master's degree in chemical engineering. He will do the research work under the direction of Dr. N. F. Murphy.

Pursuing a policy of post-war expansion in "chemifinishing" of metals, the Du-Lite Corporation plans to develop new finishes for metals and to study the requirements for the application of finishes.

Joint War Production Committee Plans U. S.-Canadian Resources Integration

Further integration and coordination of American and Canadian use and processing of raw materials into chemicals and explosives is expected as the result of a recent meeting in Montreal of a subcommittee of the Joint War Production Committee of the United States and Canada.

The meeting explored means of combatting or avoiding shortages of chemicals required for the explosives program. It was stressed at the meetings that although victory is in sight production of explosives must be greater than ever. To achieve the greater production the best and fullest use must be made of the entire resources at the command of the United Nations.

New Chemurgy Projects in West

Western Chemurgy, Ltd., has been incorporated and will operate a $50,000 wheat starch-glucose unit in Moosejaw, the first such project to be located in Canada's west. The new industry will function on a relatively small scale until additional equipment can be obtained, with a processing capacity of about 600 bushels of wheat per day to yield ten tons of glucose.

Prairie Vegetable Oils, Ltd., has also located at Moosejaw and is erecting an oil extraction unit. The Wheat Board has appointed Prairie Vegetable Oils, Ltd., as official purchasing agent for all rape-seed grown in Western Canada.

Surplus Property Handbook Issued

W. L. Clayton, Surplus War Property Administrator, has announced the issuance of the first installment of a Handbook of Standards for Describing Surplus Property. The purpose of the handbook is to establish the minimum of information that should be supplied in listing surplus property while at the same time furnishing enough description in commercial terms to form an adequate basis for resale.

Daley Heads du Pont Pigments Department

John F. Daley was recently appointed general manager of the Pigments Department of E. I. du Pont de Nemours & Company. Mr. Daley succeeds the late Carl H. Rupprecht.

Synthetic Liquid Fuels Office Established

With the approval of Secretary of the Interior Harold L. Ickes, an Office of Synthetic Liquid Fuels has been established in the Fuels and Explosives Branch of the Bureau of Mines, Dr. R. R. Sayers, Bureau Director, has announced. This office will guide the five-year program of research and development designed to provide oil and gasoline from sources other than natural petroleum.

Authorized recently by Congress, the synthetic fuels program includes the construction and operation of laboratories and demonstration plants to acquire the "know how" for private commercial production of synthetic liquid fuels from coal, lignite, oil shales, and agricultural and forestry products.

The work of the Office of Synthetic Liquid Fuels will be divided among four divisions—a Research and Development Division, a Synthesis Gas Production Division, a Hydrogenation Demonstration Plant Division, and a Gas Synthesis Demonstration Plant Division. In addition, a new oil shale section has been set up within the Bureau's Petroleum and Natural Gas Division.

Director Sayers said that Dr. W. C. Schroeder has been appointed acting chief of the new Office of Synthetic Liquid Fuels, which will operate under the Fuels and Explosives Branch, headed by Dr. A. C. Fieldner, Branch chief. Dr. Schroeder is a graduate of the University of Michigan and has been with the Bureau of Mines since 1935. He has served as assistant chief of the Fuels and Explosives Branch for the past two years.

Medical Research Fostered

Inauguration of a medical research program on tropical diseases common to South American countries, which has enlisted the support of medical colleges, hospitals, and leading physicians in Chile, Peru, and Colombia and Mexico has been disclosed by John W. Hart, vice president of Winthrop Products, Inc., a subsidiary of Sterling Drug, Inc., New York.

Dr. Felix Marti Ibanez, medical director of the company, is supervising the work. He reports that important findings to date include the use of the antimalarial metoquina (known as Atabrine in the United States) in the treatment of typhus, the use of reprodral for Malta fever, and a combination treatment of Vitamin B^1 and Reprodral in aiding nerve involvement forms of leprosy. Detailed studies are being prepared for publication.

Cooperating in the research are San Marcos University, Lima, Peru, oldest college in the Western Hemisphere, the School of Medicine, Santiago de Chile, and outstanding hospitals in Antiochia and Medellin, Colombia.

Dr. de la Garza Brito, medical director of Laboratories Winthrop, Mexican subsidiary of Winthrop Products, Inc., is supervising the studies being carried on in Mexico, which has the support of the School of Tropical Medicine, Mexico City. Special emphasis is now being given in Mexico to the treatment of malaria.

Styron Price Reduced

Increased wartime demands and subsequent increased production enables The Dow Chemical Company to announce another drop in the base price of Styron (Dow polystyrene) from 27 to 25 cents per pound; the second price reduction within the year.

Dow introduced the first high-purity polystyrene to the trade under the trade name Styron in 1937 and is the largest private producer of styrene, a major component in the synthetic rubber program, in this country.

More familiar uses of Styron are in the lighting, packaging, refrigeration and electrical fields, the latter expanded to include radio, television and radar. There are at least 12 types of battery cases made from Styron at present.

Chemical Industry Mobilizes for Sixth War Loan Drive

W. C. Keeley, vice-president of the Air Reduction Co., Inc., and chairman of the Chemical Industry Division of the War Finance Committee for New York held a luncheon meeting, Thursday, October 26th, which was attended by the twelve committeemen who have agreed to serve with Mr. Keeley in achieving their industry quota of $60,000,000 for the Sixth War Loan. Also at the meeting were Robert Harsell and E. J. Ade, executives of the War Finance Committee for New York, who are coordinating with the Chemical Division in this drive.

Howard R. Salsbury, sales manager of the Air Reduction Company, who has been delegated by Mr. Keeley to direct the plans and activities of the committee, outlined their specific duties in this intensive bond selling campaign, whereby practically every excutive and department head of more than 225 firms in the Chemical field is to be contacted personally, and by this means reach all individual employees.

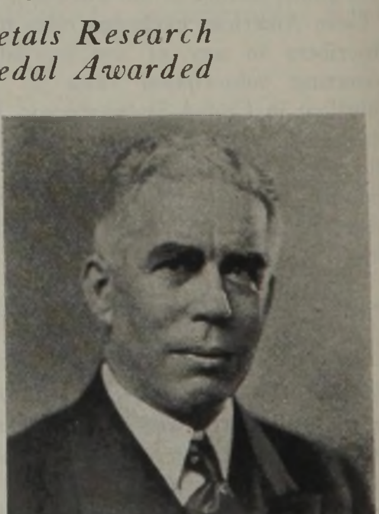
WPB Reports on Industrial Finishes

Large military cutbacks on orders for industrial finishes immediately following Germany's defeat may make paints, varnishes and lacquers available to take care of increased production of such goods as automobiles, refrigerators and washing machines, the War Production Board reports.

The Consumer Durable Goods Division of WPB reported this outlook at the two-day meeting of the Paint, Varnish and Lacquer Industry Advisory Committee in September.

WPB officials said that they did not wish to make producers of durable consumer goods too optimistic, and warned that they could not legitimately hope for any synthetic finishes based on phthalic alkyd enamels before Germany is defeated. Even the collapse of Germany will not guarantee an abundance of these enamels, officials added, and emphasized that this depends almost wholly upon the size of military orders.

Metals Research Medal Awarded



Robert Crooks Stanley, chairman and president of the International Nickel Company of Canada, received the American Society of Metals medal for the advancement of research at the annual dinner of the society, October 19, in Cleveland.

Army Helps Sale of Chemicals

An Army contractor is being assisted by Philadelphia Quartermaster Depot to dispose of 203,656 pounds of aluminum acetate, 20 per cent solution, sulfate free, which has been released for commercial use by reason of a Government contract termination. This chemical is stored in New York city, and the adjacent north Jersey area and in Boston.

Chemical Exposition Held Success

Eyes of the industrial chemical world were focused November 15 to 19 on the National Chemical Exposition and the National Industrial Chemical Conference held at the Coliseum in Chicago.

The third biennial presentation sponsored by the Chicago Section of the American Chemical Society was given added importance because of vital contributions of the industry to the Allied war effort and its significant postwar civilian potentialities.

Highlighting the five-day conclave and show were the industrial conference with daily programs addressed by noted authorities from many section of the country. Prominent among the speakers was Charles F. Kettering of the General Motors Corporation, who made the main address at the November dinner meeting of the Chicago Section on Friday evening, November 17.

The show committee, of which M. H. Arveson was chairman, announced that the additional space which was made available to exhibitors by leasing of the North Hall expanded the show to more than twice the size of the last national chemical exposition held by the Chicago Section in 1942.

Booths were manned by experts conversant with the technical aspects of products exhibited. Visitors secured scientific information and viewed new discoveries and developments in the science of chemistry and its application and progress in many fields of activity.

Rohm & Haas Announce Lethane Price Reduction

A reduction in the price of Lethane insecticide concentrates, toxic agents in a high proportion of the total gallonage, of the nation's household, industrial and livestock sprays, has been announced by Rohm & Haas Company. Concentrates affected by this latest price reduction are Lethane 384, Lethane 384 Special, and Lethane 60.

Since its introduction in 1941 Lethane 60 has found extensive use in agricultural dusts and sprays as an extender for war-scarce rotenone and pyrethrum, as well as a supplementary killing agent in household, industrial, and livestock sprays.

Advisory Committee on Scientific Personnel Named

An advisory committee to the National Roster of Scientific and Specialized Personnel of the War Manpower Commission has been named by Paul V. McNutt, chairman of WMC, to advise on the utilization of technically trained men and women in the war effort.

Mr. McNutt said this committee would be asked to contribute, also, to plans for a post-war program.

"It is of the utmost importance," he said, "that we make the most effective utilization possible of our scientific and professional groups in the reconversion period. We will need them then as we need them now."

Members of the committee include William L. Batt, vice-chairman of the War Production Board who is on leave as president of SKF Industries; Dr. Vannevar Bush, director of the Office of Scientific Research and Development and president of Carnegie Institution of Washington, Dr. Edward C. Elliott, president of Purdue University; Dr. Frank B. Jewett, Short Hills, N. J., president of the National Academy of Sciences and vice-president of the American Telephone and Telegraph Company; Dr. Waldo G. Leland, Newton, Mass., director of the American Council of Learned Societies; Paul Webbink, Washington, D. C., of the Social Science Research Council; and Dr. Leonard Carmichael, president of Tufts College and until recently director of the National Roster.

Mica-Graphite WPB Division Disbands

The Mica-Graphite Division of the War Production Board will be abolished and its functions consolidated with the Miscellaneous Minerals Division in the Office of the Vice-Chairman of Metals and Minerals, effective December 2, 1944, WPB has announced. As a result, the Miscellaneous Minerals Division will include the Mica, Fluorspar and Magnesite, and Non-Metals Sections. The Non-Metals Section will have units controlling graphite, beryllium, tantalite and electrodes.

James S. McGregor, of New York City, will continue as director of the Miscellaneous Minerals Division, and Fred G. Rockwell, of Pikeville, Ky., will continue as a deputy director. Frank F. Watts, of Turbotville, Pa., deputy director of the old Mica-Graphite Division, will become a deputy director of the Miscellaneous Minerals Division, and Harry D. Sharpe, of Merchantville, N. J., assistant to the director of the Mica-Graphite Division, will become assistant to the director of Miscellaneous Minerals.

M. H. Billings, of Minneapolis, Minn., director of the Mica-Graphite Division, has resigned to return to private industry. He will be associated with the Union Carbide and Carbon Co., a division of the National Carbon Co., at Niagara Falls, N. Y.

Carbon Black Export Association Probed

The Federal Trade Commission has ordered an investigation under the Export trade act, to determine whether Carbon Black Export, Inc., New York, and its officers, directors and stockholder-members have entered into agreements and engaged in restraint-of-trade practices in violation of law.

Standard Oil Research Changes Presidents

R. P. Russell

F. A. Howard

R. P. Russell, left, is the new president of the Standard Oil Development Company. He has been with the company since 1927 when he left an assistant professorship of chemical engineering at Massachusetts Institute of Technology to direct the newly organized Esso Laboratories at Baton Rouge. Frank A. Howard, right, former president of the company and original administrative head of the organization, has announced his retirement.

INDUSTRY ADVISORY COMMITTEES

Chlorine Allocations Requirements Determined

"Chlorine allocations should be continued for at least one month after "Victory in Europe" Day, the Chlorine Akali Industry Advisory Committee recommended at a recent meeting, the War Production Board has reported.

To keep production and distribution in balance, WPB has prepared new instructions concerning the quarterly shipments of chlorine by industry. These instructions, approved by the committee follow:

"During the fourth quarter of 1944, the following conditions will prevail with respect to the delivery of chlorine:

"1. In any one month of the fourth quarter of 1944, no consumer shall receive at any one consuming point more than one-third of the amount of chlorine allocated to him in that quarter for use at that consuming point without special authorization from WPB.

"2. If one-third of the amount of chlorine allocated to any one consuming point cannot be fully shipped in standard containers (tank cars), the delivery of that amount can be exceeded by enough chlorine to permit shipment of a full container (tank car) without special authorization.

"3. The total amount of chlorine shipped during the quarter to any one consuming point shall not exceed the total amount allocated to that point without special authorization.

"4. Consumers of chlorine for sewage treatment and purification shall be exempted from this ruling."

Chlorine allocations for the fourth quarter amounted to 338,554 tons, WPB officials told the committee.

Increased Output Sulfuric Acid Required

The new ordnance program calling for increased production of smokeless powder and TNT (trinitrotoluene) will require a corresponding increase in sulfuric acid output, a Chemicals Bureau representative advised members of the Inorganic Acids Industry Advisory Committee at a recent meeting, the War Production Board has reported.

From an output of 8,393,100 tons in 1943, the capacity of the sulfuric acid industry is expected to reach a peak of 9,426,600 tons on June 30, 1945, Chemicals Bureau officials said.

Demands for new and spent acid during 1944 are expected to reach 10,556,200 tons, with an estimated supply of 9,650,700 tons for this period. The requirement for the first six months of 1945 is estimated at 5,663,600 tons of acid, against an estimated supply of 5,251,000 tons, the committee was told. The figures are exclusive of ordnance production and requirements. Some spent acid from ordnance plants may be available to make up for part of the estimated shortage, WPB said.

The committee also recommended that the Inorganic Acids Industry Advisory Committee meet with the Superphosphate Producers Industry Advisory Committee to discuss the problem of making more acid available for the production of fertilizers.

Future Fungicide Requirements Discussed

The effect of an Allied victory in Europe on supplies of rotenone, pyrethrum, arsenic and copper fungicides and considerations that might make it necessary to continue allocation controls after "Victory in Europe" Day were discussed at recent meetings of the War Production Board's rotenone, pyrethrum, arsenic and copper fungicides industry advisory committees, WPB has reported.

Chemicals Bureau officials informed the rotenone committee that Germany's defeat would not mean any increase in present restricted rotenone supplies. Increases can come only with the recapture of the large producing areas in the Far East, the committee was told.

A War Food Administration representative reported that WFA requirements of rotenone for cattle grub will increase in 1945, while rotenone allotments for victory gardens probably will be correspondingly cut. Firm requirements of agriculture for rotenone can be predicted only on food goals that are not yet announced.

Furthermore, demands for pyrethrum will be greater following "V-E" Day without any increase in the available supply, the pyrethrum committee was informed, the present indication being that allocation may have to be continued after "V-E' Day. Pyrethrum is imported from British East Africa, the Belgian Congo and Brazil. The increasing demand would result from the shift of troops from Europe to the Pacific, which would increase the military requirements for aersol bombs to combat insect-borne diseases, officials said.

Production of calcium arsenate is expected to be lower in 1945, due to large carry-over stocks, WPB officials explained to the Arsenical Insecticides Manufacturers Industry Advisory Committee. This committee recommended that allocation of arsenic be continued in order to assure stabilized production. There will be a sufficient supply of calcium arsenate to meet agricultural needs for 1945, WPB officials said.

Farmers and cotton growers should be informed that supplies of calcium arsenate ought to be purchased now for possible emergency use due to unexpected insect infestations, the committee urged.

WPB informed the Copper Fungicide Manufacturers Industry Advisory Committee that Italy and France will need large quantities of copper sulphate for use on potato and grape crops. Sufficient capacity is available to supply copper sulphate to the liberated areas, the committee was told.

Copper Fungicide Manufacturers IAC

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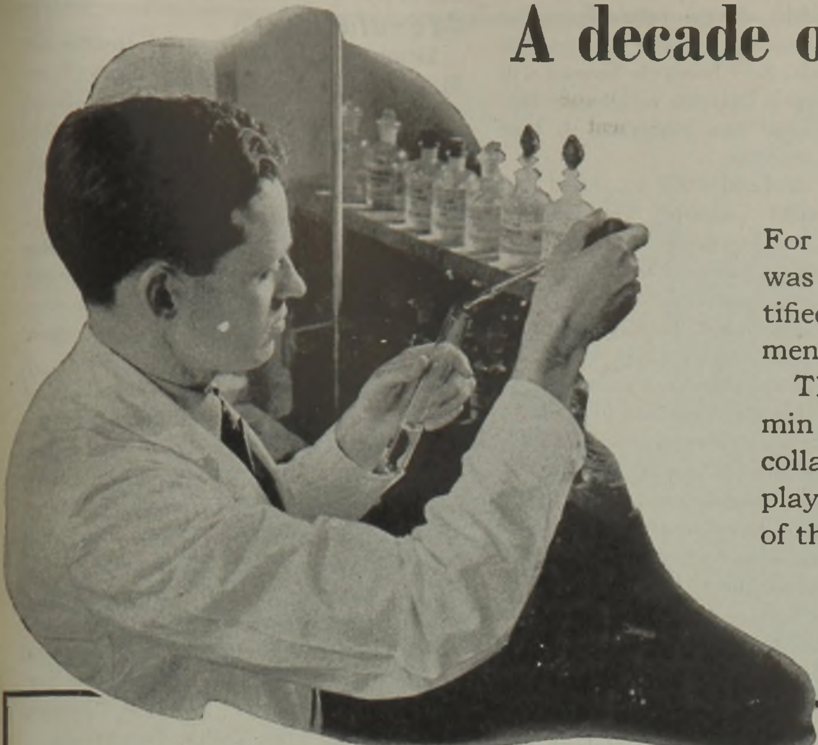
A decade of Vitamin Leadership



For a decade—since 1934, when Ascorbic Acid was synthesized—the name Merck has been identified with leadership in the synthesis, development, and large-scale production of pure vitamins.

The following list of contributions in the vitamin field made by Merck chemists and their collaborators emphasizes the outstanding rôle played by Merck & Co., Inc. in the development of these vitally important substances.

1934

Ascorbic Acid Merck (U.S.P.) was made available by Merck & Co., Inc.

1936

Vitamin B_1 was synthesized in the Merck Research Laboratories.

1937

Thiamine Hydrochloride Merck (U.S.P.) was made available in commercial quantities.

1938

Nicotinic Acid Merck (U.S.P.) (Niacin) and Nicotinamide Merck (U.S.P.) (Niacinamide) were made commercially available.

1938

Riboflavin Merck (U.S.P.) was the second pure crystalline vitamin to reach commercial production during that year.

1938

Alpha-Tocopherol (Vitamin E) was identified and synthesized by Merck chemists and their collaborators in other laboratories.

1939

Vitamin B_6 was synthesized in the Merck Research Laboratories.

1940

Vitamin B_6 Hydrochloride Merck (Pyridoxine Hydrochloride) became available in commercial quantities.

1940

Alpha-Tocopherol Merck (Vitamin E) was made commercially available.

1940

Vitamin K_1 Merck (2-Methyl-3-Phytyl-1,4-Naphthoquinone) was made commercially available.

1940

Menadione Merck (U.S.P.) (2-Methyl-1,4-Naphthoquinone), a pure chemical having marked Vitamin K activity, became available in commercial quantities.

1940

Pantothenic Acid, member of the Vitamin B-Complex, was identified and synthesized by Merck chemists and their collaborators in other laboratories.

1940

Calcium Pantothenate Dextrorotatory, a biologically active form of Pantothenic Acid, was made commercially available by Merck & Co., Inc.

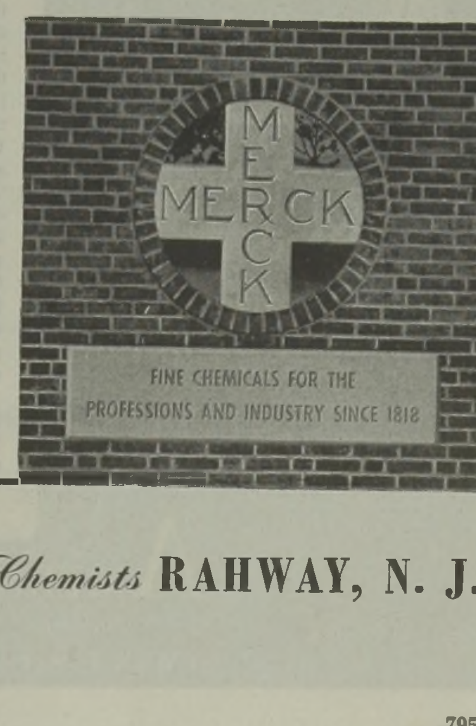
1943

Biotin, member of the Vitamin B-Complex, was synthesized in the Merck Research Laboratories.

1944

Biotin Merck was made available for investigative use.

Merck & Co., Inc. now manufactures all the vitamins commercially available in pure form, with the exception of vitamins A and D.



You are invited to write for literature

ARMY E NAVY
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MERCK & CO., Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

Industrial Advisory Committee was organized with the following members: Martin H. Crego, Phelps Dodge Refining Co. N. Y.; Leon David, Brooklyne Chemical Works, Baltimore, Maryland; A. J. Flebut, California Spray Chemical Co., Richmond, Calif.; James J. Haprov, Los Angeles Chemical Co., Los Angeles, Calif.; Daniel Murphy, Rohm and Hass, Philadelphia, Penn.; George Patterson, Irvington Smelting and Refining Co., Irvington, N. J.; F. B. Porter, Tennessee Corporation, Atlanta, Georgia; M. L. Somerville, The Sherwin-Williams Co., Bound Brook, N. J. The Government Presiding Officer is Melvin Goldberg, Chemicals Bureau.

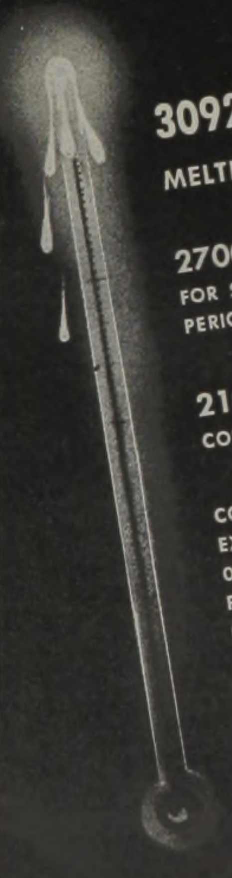
At their organization meeting on Sept. 21, the Copper Fungicide Manufacturers Industry Advisory Committee discussed: (1) the availability of raw materials; (2) supply and requirements of copper fungicides for export and domestic agriculture for the agricultural year 1944-45; (3) possibilities for meeting increased demands for copper fungicides in the fourth quarter of 1944 and the first half of 1945; (4) containers; and (5) manpower problems.

Commenting on the requirements figures, Mr. Goldberg pointed out that the total is about 38 million pounds in excess of the industry's normal productive rate. However, actual consumption for domestic agriculture may fall 10 to 15 million pounds below the estimate and the Canadian requirement may not have to be met by United States exports after the first quarter of 1945. If the requirement for domestic agriculture should exceed 100 million pounds, the Chemicals Bureau will urge the Copper Division to allocate sufficient additional raw materials to take care of the increase.

Dr. G. F. McLeod (WFA) stated that the requirement estimates for domestic agriculture are based on the best data available and are believed to be firm; no changes of any magnitude in the rate of demand are anticipated. In response to his inquiry, industry stated that stocks of copper sulfate are abnormally low.

Stressing that the commitment made by the United States Government to supply 18,300,000 pounds of copper sulfate for UNRRA requirements must be met, Mr. Goldberg asked manufacturers to estimate the extent to which production could be increased during the last quarter of 1944 and the first half of 1945. In reply, three producers on the East Coast submitted estimates totaling a potential increase of 7 million pounds for the fourth quarter (on the assumption that adequate raw materials will be made available). Two producers indicated that they could fulfill one-third of the requirement for the fourth quarter and possibly for the two subsequent quarters if assistance were provided on manpower; the third gave unconditional assurance that his company could fulfill one-half of the requirement in each of the three quarters.

AMERSIL*!



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Arsenical Insecticides Manufacturers

Members of the Arsenical Insecticides Manufacturers Industry Advisory Committee are the following: Hallam Boyd, Commercial Chemical Company, Memphis, Tennessee; J. B. Cary, Niagara Sprayer and Company, Inc., Middleport, N. Y.; J. A. Cavanagh, The Dow Chemical Co., Midland, Mich.; H. C. Davies, California Spray Chemical Corporation, Richmond, Calif.; J. M. Fountain, Cotton Poisons, Inc., Bryan, Texas; D. I. Trainer, General Chemical Company, New York; J. J. Haprov, Los Angeles Chemical Co., Los Angeles, Calif.; C. B. Melander, Pittsburgh Plate Glass Company, Milwaukee, Wisconsin; H. M. Rosencrans, E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware; M. L. Somerville, The Sherwin-Williams Co., Bound Brook, New Jersey; William Steinschneider, Ansbacher Siegle Corporation, New York; B. P. Webster, Chipman Chemical Company, Inc., Bound Brook, New Jersey; A. B. Young, Jr., Woolfolk Chemical Works, Ltd., Fort Valley, Georgia.

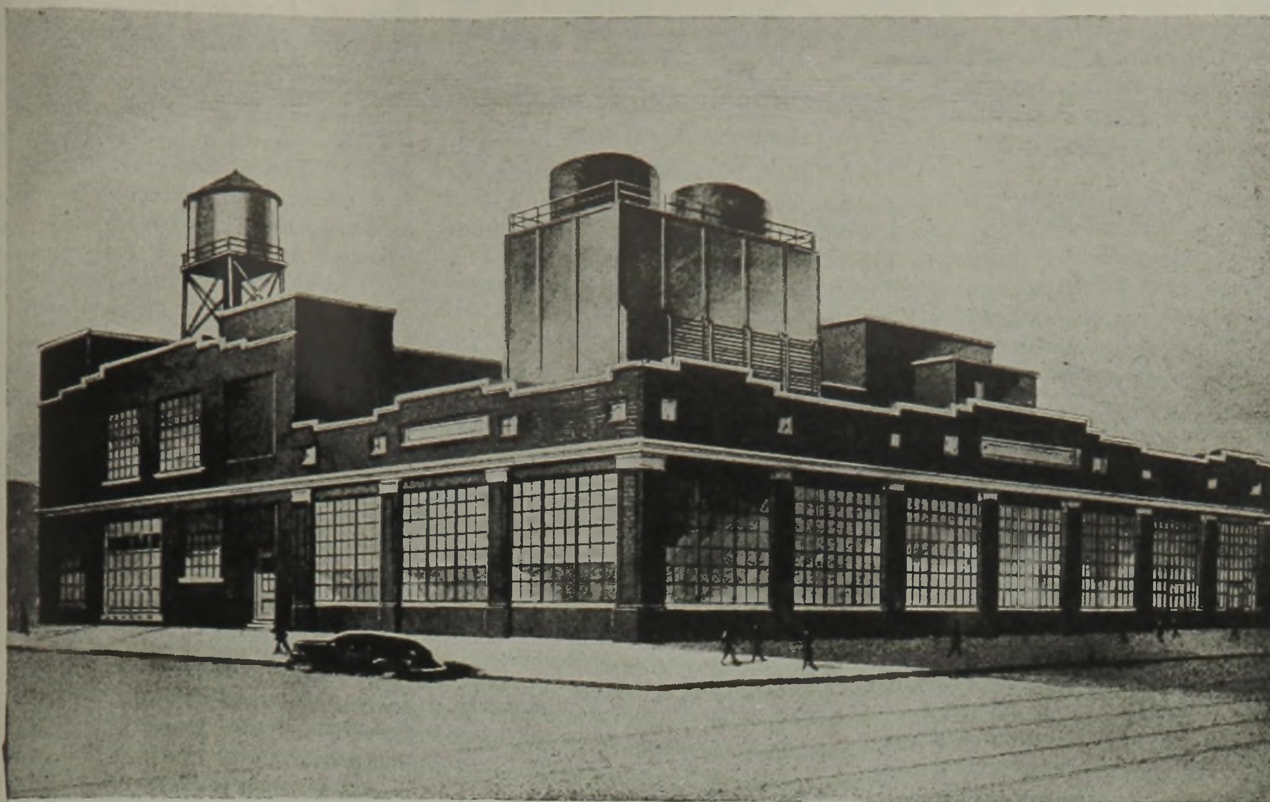
The Arsenical Insecticides Manufacturers Industry Advisory Committee met on September 21, 1944, to discuss (1) inventory position as of September 1, 1944; (2) the program of the War Food Administration and the Foreign Economic Administration for 1944-45; (3) the availability of arsenic for the coming season; and (4) the containers situation. Mr. John A. Rodda of the Chemicals Bureau, WPB, served as Government presiding officer.

Indications are that the production of arsenic during 1945 will be 25% below 1944 output even if subsidized production is continued, Mr. Rodda told the committee.

Household Insecticide Advisory Committee

The Household and Industrial Insecticide and Disinfectant Manufacturers Industry Advisory Committee has met to discuss the containers situation, the shortage of hand sprayers, the future outlook for supplies of raw materials, and other matters of interest to the industry.

The members of the Household & Industrial Insecticide & Disinfectant Mfgs. IAC Committee are: J. L. Brenn, Huntington Laboratories, Inc., Huntington, Indiana; P. Calvert Cissel, American Disinfectant Co., Washington, D. C.; H. W. Hamilton, Koppers Company, Kearny, New Jersey; Lester W. Jones, McCormick & Company, Inc., Baltimore, Md.; Paul Mayfield, Hercules Powder Company, Inc., Wilmington, Delaware; John Powell, John Powell & Co., Inc.; Dr. O. H. Sobell, The J. R. Watkins Co., Winona, Minnesota; W. J. Zick, Stanco, Incorporated, New York, N. Y. Government Presiding Officer: John A. Rodda, Chemicals Bureau.



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Potash, Nitrogen to Go Off Allocation

The War Production Board may remove allocation controls from potash and nitrogen before January 1, 1945. Chemicals Bureau officials told the Superphosphate Producers Industry Advisory Committee at its recent meeting, WPB has reported.

WPB explained that this contemplated action is in line with the WPB policy of lifting allocation controls from materials as soon as the supply-and-demand pattern makes such action practical.

The committee recommended that allocation controls be maintained on potash and nitrogen to assure a balanced supply to industry. However, if WPB controls are removed, the chemicals should be completely freed from governmental restrictions, they added.

As a result of increased ordnance requirements, the quantity of nitrogen available to agriculture for the current fertilizer year will be less than was available last year, the committee was told.

For the first six months of 1945, approximately 1,200,000 tons of sulfuric acid (exclusive of ordnance supplies) are expected to be available for the production of superphosphate, WPB said. This should result in the production of approximately 3,550,000 tons of superphosphate for this period, which is equivalent to production of superphosphate from both industry and ordnance spent acid for the first six months of 1944, WPB reported.

Hydrofluoric Acid Facilities Expanded

The War Production Board has authorized construction of new facilities to alleviate a serious shortage of anhydrous hydrofluoric acid, the Hydrofluoric Acid Producers Industry Advisory Committee was informed at a recent meeting, WPB has reported.

Anhydrous hydrofluoric acid is used in the manufacture of aviation gasoline and the production of Freon-12 for refrigeration and aerosol bombs, as well as for military applications.

Because of plant breakdowns and other production complications, the output of anhydrous hydrofluoric acid has not met production goals, WPB said.

WPB has authorized the General Chemical Company, of New York City, to construct a $700,000 plant at Baton Rouge, La., with a capacity to produce 6,000 tons of the acid annually. The Nyotex Chemical Company, of Houston, Texas, has received authorization to expand its plant at Houston to increase its annual capacity by 3,900 tons. The Houston project will cost $485,000.

Brazil Expands Chemical Industry

Brazil's chemical, pharmaceutical, and perfumery industry has been expanded 38 per cent since the start of the war in 1939 to a production value level in 1943 of $105,000,000, and is exceeded only by the foodstuffs, textile, and ready-made goods industries, according to a survey appearing in a recent Foreign Commerce Weekly prepared by the U. S. Embassy at Rio de Janeiro.

Aldine Barrington Leslie, economic analyst who prepared the embassy's report, said also that Brazil's foreign trade in chemicals has also shown a marked increase since 1939, particularly in the case of exports which were more than doubled in value, due largely to heavy purchases by the United Nations of Brazil's medicinal and pharmaceutical products, and oils, gums, waxes and resins.

Benson Joins Carl F. Miller Staff

W. Ronald Benson, who joined the staff of Carl F. Miller & Co., November 1st, comes from the position of technical supervisor for National Paper Products Division of Crown Zellerbach Corp. of Carthage, N. Y.

COMPANIES

Hercules Gets Geared For Export Trade

The centralization of Hercules Powder Company's foreign chemical sales in the Export Department as the first step in the restoration of the company's overseas trade have been announced by P. W. Meyeringh, vice president, in charge of sales.

To facilitate the company's activities in rebuilding its foreign trade, William Ca-

Tartaric Acid

The acid of grapes is not under governmental allocation.

We can make prompt shipments to provide for your immediate needs.

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U.S.I. CHEMICAL NEWS

November ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 19

Non-Critical Resin Proves Practical for Variety of Jobs

S&W Aroplaz 1306 Performs Like a Modified Alkyd Resin

Introduced in the early part of this year as an alternate for critically scarce phthalic alkyd resins, S&W Aroplaz 1306 is now reported to be in successful use in a wide range of interior industrial coatings. The new resin is also proving practical in numerous architectural and exterior applications. Manufactured by a new process developed by U.S.I., "1306" contains no critical materials and is available without priority.

Color and Gloss

Initially very pale, the staining properties of "1306" are so slight that white enamels can be made approaching the whiteness obtained with alkyds, and color retention is excellent. In gloss and gloss-retention it is superior, in both clear and pigmented films, to many alkyds. It is also high in water- and alkali-resistance, and in flexibility.

SPECIFICATIONS — AROPLAZ 1306

	65% SOLIDS in MS	75% SOLIDS in MS
Acid Value (Plastic)	10-15	10-15
Color (G-H 1933)	7-9	7-9
Viscosity (G-H)	T-V	Y-Z1
Weight/Gallon at 25 C	7.7	7.9 lbs.

Metal-on-Plastic Plating Uses Alcoholic Solutions

According to claims set forth in a newly-granted patent, a metallic coating heavy enough to serve as a cathode for subsequent electroplating may be applied to plastic articles, such as buttons, costume jewelry, and so forth.

The plastic object to be plated is prepared by rolling it in sand to abrade the surface, immersing it in a ferrous sulphate bath and then one of copper sulphate. Next, the plastic article is treated in a bath of ethanol, water, sulphuric acid, quinol and stannous sulphate. Following this, comes a treatment in a bath of sodium hydroxide, silver nitrate and ammonia.

In order to cause a thin layer of silver to deposit from the silver nitrate upon the plastic articles, a reducing agent is added to the last bath. This reducing agent is composed of ethanol, sugar, nitric acid and water.

The metallic silver thus deposited is heavy enough to carry the subsequent electroplating current.

U.S.I. Announces New Pacific Coast Office

In order better to serve western industry, U.S.I. has opened a new Pacific Coast office in Los Angeles. This new office is to be the headquarters for the company's entire Pacific Coast operations, and will handle all sales and technical matters in the states of California, Oregon, Washington, Idaho, Nevada, Utah and Arizona.

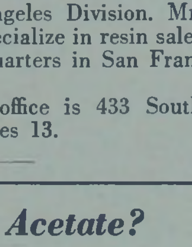
The new office is to be in the charge of Mr. Robert E. Alexander, Pacific Coast Manager, while Mr. G. C. Dohm will serve as Manager of the Los Angeles Division. Mr. Henry M. Lindau will specialize in resin sales and will have his headquarters in San Francisco.

Address of the new office is 433 South Spring Street, Los Angeles 13.

Need Ethyl Acetate?

The most widely used fast-evaporating nitrocellulose solvent, ethyl acetate offers the advantages of low cost, strong solvent power and mild, pleasant, non-residual odor. With the availability situation undergoing continual change, it is quite possible that you can make wider use of this versatile solvent. U.S.I. will be glad to discuss the possibilities of filling your requirements.

Tipsy Oysters Shed Shells in Record Time



Fish and Wildlife Service experiments point the way to more rapid shucking of oysters. In laboratory tests the oysters were soaked in carbonated water for five minutes.

The carbon dioxide intoxicated the bivalves to the point where the large muscle holding the shells closed relaxed and the oysters were easily opened. In one test, a novice opened 150 drunken oysters in twenty minutes, a speed difficult for the most experienced oyster shucker to attain with sober oysters. Neither flavor nor quality of the oysters was affected.

Doubles Output of Ethyl Acetoacetate, Wider Use Foreseen

U.S.I. Pictures Continuing Postwar Demand for Its Increased Productio

The postwar use of synthetic anti-malaria now seems certain to continue at much high levels than was originally thought. For Atebr and other quinine substitutes are demo strating definite therapeutic advantages ov the natural product. Equally significant, th are bringing tremendous reductions in t cost of treating and preventing malaria. Wi the end of the war, these factors will make possible to attack—on a scale never befo dreamed possible — a scourge which still tak more than a million lives a year.

The use of the sodium derivative of acet acetate in the preparation of Atebrin an other anti-malarials thus will continue alo to account for large quantities of this r active intermediate. The synthesis of thiami hydrochloride (Vitamin B_1) and antipyrin are other uses now consuming steadily i creasing tonnages.

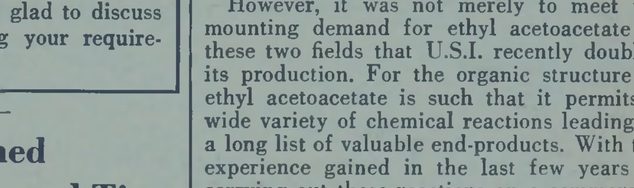
Other Uses Seen

However, it was not merely to meet th mounting demand for ethyl acetoacetate i these two fields that U.S.I. recently double its production. For the organic structure c ethyl acetoacetate is such that it permits wide variety of chemical reactions leading t a long list of valuable end-products. With th experience gained in the last few years i carrying out these reactions on a commercia scale, many new end-products loom as im minent realities. The two unusual propertie which make ethyl acetoacetate important i chemical synthesis are:

1. The reactivity of the hydrogen on th carbon adjacent to the $COOC_2H_5$ grou Hydrogen substitutions at this point lea to the introduction of groups such a halogen, metal, acyl and alkyl radial Ammonia, aniline, urea and many othe types of compounds containing the NH group, add with the elimination of wate
2. The addition products (especially th amides) mentioned above have a tendenc to close into ring structures of the mos varied types, giving for example subst tuted pyrroles, pyrazoles, pyrazolones

(Continued on next page)

The chemical structure of ethyl acetoacetate shifts between the enol and keto forms. Both forms are shown in this diagram, in which hydrogen atoms are represented by circles, oxygen by ellipses, and carbon by squares. The square is used as the symbol for carbon, instead of the conventional tetrahedron, in the interests of simplicity.



DVERTISEMENT — This entire page is a paid advertisement.

ovember ★ U.S.I. CHEMICAL NEWS ★ 1944

oybean Protein Extraction Stepped-up with Ethanol

The best soybean protein is that extracted om flaked soybeans, which contain less oil nd a more soluble protein than does soybean xpeller meal. To date, flakes available comercially have been those extracted by petrolum ether.

A study made by the U. S. Department of griculture laboratories demonstrates that akes extracted by ethanol contain 10 per ent more protein than the petroleum exacted flakes, and in addition the final separaon of the protein from the solution of flakes n water is greatly speeded. Protein precipiated from ethanol-produced flakes settled in 0 minutes, while it required two hours for rotein from petroleum-produced flakes to ettle. Filtration rate of wet protein is increased 50 per cent.

The pilot plant, operated by the laboratory or more than a year, should be a source of aluable information to plants engaged in the arge-scale production of soybean protein.

ew Glycine Process Hinges on Ethanol

Glycine, and the primary amino carboxylic acid which is used as an intermediate n the synthesis of surface-active agents and corrosion inhibitors, are prepared more readly by a new method, according to the claims et forth in a recent patent.

The glycine is produced by heating a olution of sodium hydroxide, sodium cyanide, n alkyl metal salt of aminomethanesulfonic cid, and water together, adding hydrochloric cid to the solution, and evaporating the soluion to dryness. From this residue the glycine ydrochloride is extracted with ethanol.

Primary amino carboxylic acid is obtained by reacting a metallic salt and an alkyl metal salt of aminomethanesulfonic acid together with water in an aqueous solution which is then acidified. After multiple refluxings, excess mineral acid and water are removed by evaporation. The dry residue is dissolved in ethanol to remove the amino carboxylic acid salts from the inorganic salts. An addition of aniline to the alcohol extract liberates the aminocarboxylic acid from its salt, and as it is virtually insoluble in ethanol, it may be separated directly by filtration.

Ethyl Acetoacetate

(Continued from preceding page)

pyrimidines, pyridines, quinolines, isoxazoles, furane and coumarin derivatives.

Amino Acids

One example of a field in which ethyl acetoacetate appears destined to open up new possibilities is in the synthesis of the amino acids which have been shown to be essential to human life, and which are increasingly mentioned in projected nutritional programs. Starting with ethyl sodium acetoacetate, it is indicated that these amino acids can be prepared according to the following reaction:

Amino Acids Made with Ethyl Sodium Acetoacetate

$$CH_3C(ONa){:}CHCOOC_2H_5 \xrightarrow{RCl}$$

$$CH_3COCHRCOOC_2H_5 \xrightarrow{C_5H_9ONO\ +\ H_2SO_4}$$

$$RC{:}(NOH)COOH \xrightarrow{H_2} RC(NH_2)HCOOH$$

Cottonseed Suggested as New Source of Lecithin

Soybean phospholipid, commercial source of lecithin which is an antioxidant and emulsifying agent widely used in foods and pharmaceuticals, finds a close counterpart in cottonseed phospholipid, according to recent investigations. Possibilities of using the cottonseed product as an added source of lecithin suggest themselves.

The cottonseed phospholipid was prepared experimentally by stirring commercial cottonseed, containing phospholipid, with changes of acetone to percipitate the phospholipids. The resulting powdered phospholipids were dissolved in ethyl ether and then poured into an excess of acetone. The resulting purified phospholipid was a stable, powdery solid, brilliant yellow in color, and the yield was 54 per cent. Fifteen to 20 per cent of this phospholipid could be dissolved by extracting with multiple changes of hot ethanol. This resulting lecithin fraction was high enough in phosphorous and nitrogen to render it commercially usable.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

A new wetting agent and detergent has been developed for use in the textile field. Added uses as an industrial cleaner and in priming compounds and pickling baths are claimed. According to the manufacturer, the product is highly concentrated, containing less than 5 per cent water, and is soluble in alcohol. (No. 869)

USI

To strip paint from metal surfaces, a new compound is designed to be brushed on, then washed off with a hose, carrying the paint with it. It is said to remove zinc chromate as well as other paint coatings and to permit the washing of brushes and other equipment in water. (No. 870)

USI

A new synthetic rubber cement, which is claimed to bond neoprene to neoprene or neoprene to fabric, and fabric to fabric, is announced. Company also announces a general-purpose cement claimed to adhere as well as rubber cement to a variety of surfaces. (No. 871)

USI

Fungus resistance for phenolics is claimed to be imparted by a newly-developed coating compound. It is intended to inhibit fungus development on phenolic electrical parts used in tropical climates. The new product may be applied by spray, dip or brush and has high dielectric strength. (No. 872)

USI

An improved phosphorescent pigment, which is claimed to emit a brighter afterglow of longer duration, has just been announced for use in luminous paints, tapes, decalcomanias, etc. (No. 873)

USI

To measure water hardness, a new instrument has been developed. Said to be much more rapid than gravimetric procedures, this new apparatus is designed to give accurate measurement of minerals, calcium, and magnesium in water samples in ten minutes. The new instrument is described as small, sturdy and inexpensive. (No. 874)

USI

Plastic insulating tape, claimed by its manufacturer to be resistant to caustic or corrosive fumes, oils, acids, alkali and moisture, has been placed on the market. Designed to protect wires, piping and equipment, it is stated to be remarkably flexible, of high mechanical strength and to have heat sealing and flame resistant properties. (No. 875)

USI

A new, heavy-duty paint, which is stated to protect brick, concrete, metal and wood surfaces against severe attacks by moisture, salt water, acid fumes and alkalis, is offered. This black, processed coal-tar paint may be applied by either brush or spray and is said to be well adapted for use on ships, docks, etc. (No. 876)

USI

Ceramic insulation may be deposited on copper wire and other electrical conductors by a newly developed process, according to a recent announcement. Films are stated to retain their electrical characteristics, at about twice the temperature limits of enamel and other organic insulations, and to be flexible enough for winding coils. (No. 877)

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Diethyl Phthalate

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Ethyl Chloroformate
Ethyl Formate

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Acetoacet-para-chloranilide
Ethyl Acetoacetate
Ethyl Benzoylacetate
Ethyl Sodium Oxalacetate

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*Curbay Special Liquid
*Vacatone 40

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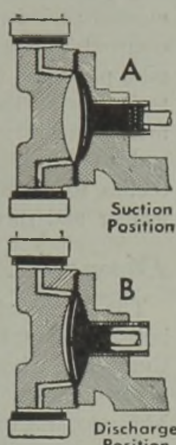
K-11

WILSON PULSAFEEDERS

(PROPORTIONING PUMPS)



When war-time production levied upon industry for *quality* in fantastic *quantity*, manufacturers and processors turned without hesitation to WILSON *Pulsafeeders* for measured flow of chemicals and nearly every other kind of liquids. Old friends added new units. New users bought confidently in quantity. Such is the value of reputation in emergency.

Accuracy of Wilson Pulsafeeders is guaranteed, in most instances, at better than ⅛ of 1% through automatic or manual controls.

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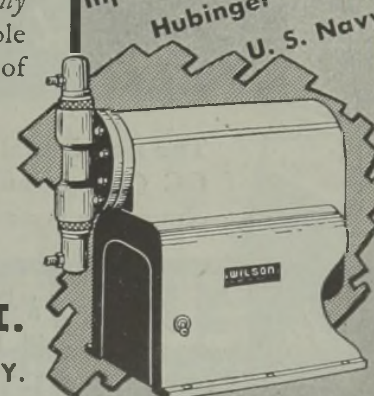

WILSON CHEMICAL FEEDERS, Inc.

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ESTABLISHED 1923 . . . WITH EXPERIENCE IN ALLIED LINES SINCE 1914 hall, Elmer Newsome, and Warren Mendenhall, of the export division of the Naval Stores Department, have been transferred to the Export Department to assist Dr. Theodore Switz, the director.

American Viscose Establishes Dyestuff Research Laboratory

To assist textile converters and finishers who are licensees under the American Viscose Corporation's "Crown" Tested Plan, the company has established a Dyestuff Research Laboratory in its New York offices. Under the "Crown" Tested Plan, fabrics made by licensees that contain the American Viscose Corporation's rayon are subjected to numerous tests for consumer serviceability.

One of the principal reasons for establishing the dyestuff laboratory is to simplify and speed up the procedure of testing dyed and finished fabrics to determine whether or not they will meet the standards of the "Crown" Tested Plan. Another objective is to develop dye formulae that meet "Crown" Tested Plan specifications, which can be made available to converter and finisher licensees operating in cooperation with the plan.

Union Carbide Forms Plastics Group

The Union Carbide & Carbon Corporation has formed a new "Plastics Group" to correlate the company's activities in plastics.

The company has announced that the Plastics Group would bring together many activities that are related either to the manufacture, compounding, or sale of synthetic resins and plastics products. According to the company, this step is taken to co-ordinate the technical knowledge, sales engineering, research production and engineering methods for all plastics and resinous products.

The number of products groups into which the activities of the various units of the corporation are divided is increased from four to five by the formation of the Plastics Group. These groups include alloys and metals, chemicals, electrodes, carbons and batteries, industrial gases and carbide and plastics.

Bakelite Corporation will carry on the integrated sales activities of the new Plastics Group.

American Resinous Reports Finance, Research Activities

American Resinous Chemicals Corp. reports sale of industrial chemicals, particularly synthetic rubber compounds and resin and lacquer formulations for coating, finishing, impregnating and laminating, amounting to $1,100,000 for the six months period ending June 30, 1944. The company announces the opening of a new pilot plant and additional research laboratories for further investigation of monomer polymerization to produce new resins, and to coordinate developments in synthetics for paint, plastics, paper, textiles, leather and specialty rubbers.

Diamond Alkali Expands

The Diamond Alkali Company, Pittsburgh, Pennsylvania, has purchased the Emeryville Chemical Company, 405 Montgomery Street, San Francisco, California. The manufacture of silicate of soda, sodium metasilicate, and silicate compounds will be continued at the plant which is located at 1269 66th Street, Emeryville, California.

Stanley Pedder and Charles Eckland will continue in their present capacities as president and vice president of the company, and no changes in personnel are contemplated except that Howard R. Bauer will be transferred from the Diamond Alkali organization to San Francisco to serve as general manager of the Emeryville Chemical Company.

General Aniline Declares Dividend

General Aniline & Film Corporation has declared a dividend of $2 a share on common A stock and 20c a share on common B stock, payable December 1 to holders of record October 26.

The company is offering stockholders the option of taking half the value of their dividend in 50 per cent paid stock of I. G. Chemie, Swiss company, in which General Aniline owns a minority interest.

The company said General Aniline & Film Corporation management has been

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Potassium Thiocyanate, N. F. Tech.

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completely Americanized and that 98 per cent of its voting stock now is held by the Alien Property Custodian.

Standard Oil Management Changes

Several major changes in the top management of the Standard Oil Company of Indiana were announced November 1 by Edward G. Seubert, president. They will become effective on Jan. 1, at which time Mr. Seubert will retire from the presidency after serving the company for more than fifty-two years, fifteen of which were as its chief executive officer. He will remain a director and become chairman of the executive committee of the board of directors.

Robert E. Wilson, now president of the Pan American Petroleum and Transport Company, a subsidiary, will become chairman and chief executive officer of the Indiana Company. Mr. Wilson also will take over Mr. Seubert's responsibilities as chairman of the board of the Pan American Petroleum and Transport. A. W. Peake, a vice president, will be made president of the Standard of Indiana.

F. O. Prior, now president of the Stanolind Oil and Gas Company, an oil-producing subsidiary, will succeed Mr. Peake as vice president of the Indiana Company. In addition, Mr. Prior will become a director of the Indiana Company and chairman of the Stanolind Oil and Gas Company, Stanolind Pipe Line Company and the Stanolind Oil Purchasing Company, of which Mr. Peake is now chairman.

Essential Chemicals Emerges From Old Company

The old Vera Chemical Co., established in Milwaukee in 1898, which passed through the hands of a number of owners, has re-emerged as a separate company once again but under a new name.

In 1928 the company was purchased by the Papermakers' Chemical Corp. In 1931 it became the Papermakers' division of the Hercules Powder Co. This soap and soap powder branch of Hercules now has been purchased by a group of former employes and will be operated as the Essential Chemicals Co., with headquarters in a new plant now under construction at 3286 N. 33rd st.

Essential Chemicals will do a national business in specialized soaps and allied chemical products, according to James H. Wheeler, president of the new firm. Edward J. Redmond, named secretary-treasurer, will continue in charge of research and manufacturing. Wheeler was associated with Hercules here and in other cities from 1928 until 1942.

Hercules will continue here in the chemical field with offices at 5228 N. Hopkins st., Wheeler said.

Company Notes

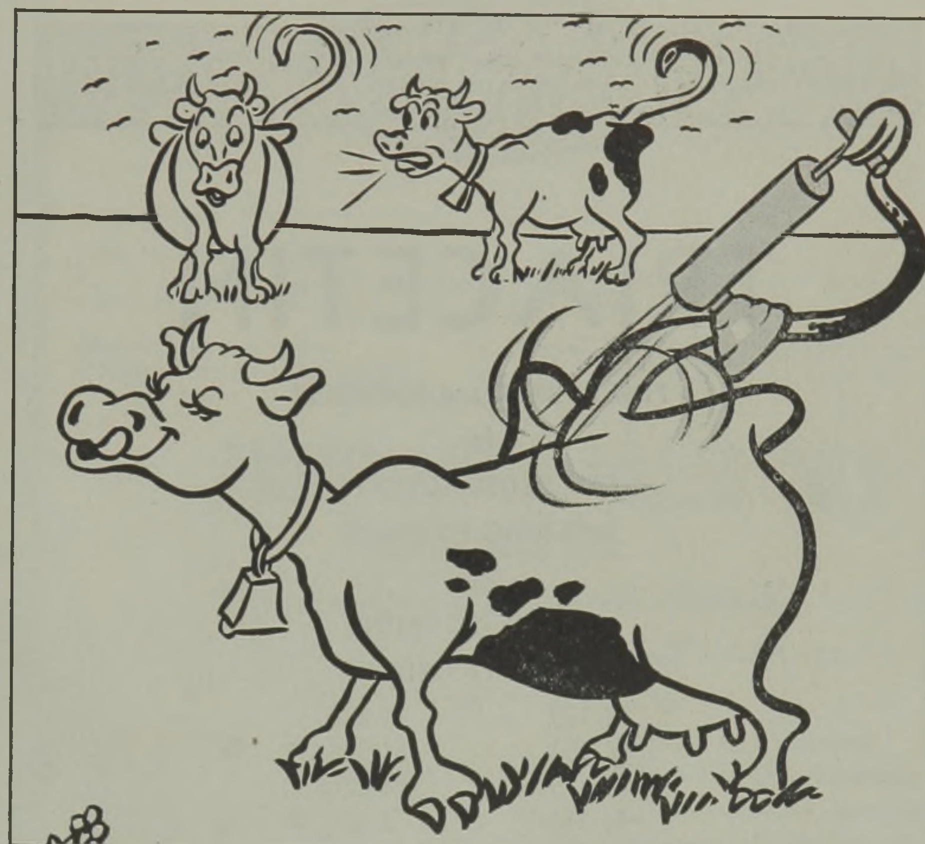
THE DUGAS ENGINEERING CORP., a subsidiary of the Ansul Chemical Co., became, on October 1, the Dugas Division of the parent company. The division, which is engaged in the manufacture of fire extinguishing equipment, has been owned and operated by Ansul for the past four years.

THE MARIETTA DYESTUFFS CO., recently acquired by the American Home Products Corp., is planning the production of DDT. A manufacturing goal of 200,000 pounds monthly is being considered.

HEYDEN CHEMICAL CORP. has been authorized an increase in its contract by the Defense Plant Corp., according to an announcement by Jesse Jones, Secretary of Commerce. The increase will provide additional facilities at a plant in Princeton, N. J., at a cost of approximately $80,000, resulting in an over-all commitment of approximately $2,650,000. Heyden Chemical Corp. will operate these facilities with the title remaining in Defense Plant Corp.

MID-STATES GUMMED PAPER CO. of Chicago has been acquired by the Minnesota Mining and Manufacturing Co. George H. Halpin, vice-president of Minnesota Mining and Manufacturing Co., will correlate the activities of the two concerns, both of which are in the business of coating products.

THE HILTON-DAVIS CHEMICAL CO. is planning reorganization and transfer of its "assets, business and good will" to Sterling Drug, Inc. The transaction involves an exchange of stock, on the basis



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of 3¼ shares of Hilton-Davis for one share of Sterling, or approximately 45,000 shares of Sterling. Besides the manufacture of chemicals and dyes, The Hilton-Davis Chemical Co. is producing intermediates required in the synthesis of atabrine and atabrine powder.

The Barrett Division, Allied Chemical & Dye Corp., has announced plans for building a tar distillation plant at Ironton, Ohio. The project will be devoted primarily to the distillation of coal-tar for recovery of various chemicals.

ASSOCIATIONS

Dewey Receives Chemical Industry Medal

The Chemical Industry Medal of the American Section of the Society of Chemical Industry was presented to Colonel Bradley Dewey, president of Dewey & Almy Chemical Company and former Rubber Director, at a meeting held in the Hendrik Hudson Room of the Hotel Roosevelt, November 10, 1944. This was a joint meeting with the New York Section of the American Chemical Society, and the American Institute of Chemical Engineers with Dr. Norman A. Shepard presiding. The election of Colonel Dewey to receive the medal which is awarded for valuable application of chemical research to industry, was in recognition of his work in colloid chemistry, especially as pertaining to rubber latex, and his accomplishments in administering the synthetic rubber program during the critical war period.

New Association Formed

The formation of the Oxychloride Cement Association as a non-profit organization rendering service in helping to standardize performance tests and application specifications for the benefit of users has been announced. The members of the association are The Dow Chemical Company, F. E. Schundler and Company and Westvaco Chlorine Products Corporation. Its address is 1010 Vermont Avenue, N. W., Washington 5, D. C.

Junior Chemical Engineers Hear Egloff

The Junior Chemical Engineers of New York heard Dr. Gustaf Egloff, president of the American Institute of Chemists and director of research for Universal Oil Products Co., at their dinner meeting Saturday, October 28. Dr. Egloff discussed "Modern Products from Petroleum."

A.S.T.M. Receives Ordnance Distinguished Service Award

At a special meeting of the American Society for Testing Materials in Philadelphia on October 12, Major General G. M. Barnes, Chief, Technical Division, Army Ordnance Department, presented to the Society the Ordnance Distinguished Service Award, this having been authorized some weeks earlier. President P. H. Bates, National Bureau of Standards, received the award for the members; preceding the special meeting there was an informal dinner with local ordnance officials and representatives from Washington present with officers of the Society and local members.

New ASA Standard Protects Workers

The new American Standard Allowable Concentration of Formaldehyde, Z37.16-1944, has been endorsed and sponsored by the Conference of State and Provincial Health Authorities of North America and adopted by the American Standards Association. The ASA committee on toxic dusts and gases reviewed the literature on this subject, and performed a number of experimental investigations prior to establishing the standard. The document covers briefly the scope and purpose of the standard, the properties of formaldehyde (HCHO), the permissible concentration, sampling procedure and analytical methods, and a bibliography.

The maximum allowable concentration is established at 10 parts of formaldehyde per million parts of air by volume, corresponding to 0.012 milligrams per liter at 25 degrees centigrade and 760 millimeters pressure.

The determination of atmospheric concentrations of formaldehyde involves precision techniques and should be conducted

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by an experienced and well qualified laboratory worker. Determination of the exposure of the industrial worker in the plant depends upon accurate sampling of the atmosphere breathed by him during a representative operating period. The method used in the laboratory for the determination of formaldehyde may be colorimetric or the more recently developed electrometric type of procedure, both of which are mentioned in the standard.

It has been demonstrated in many plants that the combination of a sound medical program and engineering measures can effectively control formaldehyde dermatitis or respiratory irritations. Cleanliness and avoidance of contact with materials containing formaldehyde are important measures in preventing dermatitis. Local exhaust ventilation and enclosures are effective engineering means of keeping atmospheric concentrations below levels which will cause serious respiratory irritation.

Consulting Chemists Choose Officers

At the annual meeting of the Association of Consulting Chemists and Chemical Engineers, Inc., held October 24 in New York, these officers were elected: A. P. Sachs, president; H. M. Shields, vice president; C. F. Davis, secretary.

Heesch Joins Hooker Electro-Chemical

The Hooker Electrochemical Company, Niagara Falls, New York, announces the appointment of Herbert Heesch to its sales staff in the northern New Jersey area. Prior to his appointment, Mr. Heesch was a salesman with the Heyden Chemical Corporation.

PERSONNEL

Reichhold Personnel Changes Made

John J. Bradley, Jr., director in charge of research for Reichhold Chemicals, Inc., Detroit, announces that the men named below were promoted to the positions indicated September 1.

Arthur C. Lansing, manager of research and assistant to Mr. Bradley; P. Stanley Hewett, director of research, chemicals division; C. John Meeske, director of research, coating resins division; Clinton A. Braidwood, assistant director of research, coating resins division.

Personnel Notes

J. French Robinson, president of the East Ohio Gas Co., has been elected president of the American Gas Association. During the war Mr. Robinson has been a member of the Petroleum Industry War Council, and chairman of the Natural Gas & Natural Gasoline Committee of Petroleum Administration for War.

Paul B. Slawter, Jr., navigator of a B-17 bomber, stationed in England, has been promoted from second lieutenant to first lieutenant, according to a recent announcement. Before entering the AAF in November, 1942, Lt. Slawter was an editor on the staff of Chemical Industries.

Dr. Arthur C. Cope, associate professor of chemistry at Columbia University, has been chosen professor in charge of the organic chemistry division of the department of chemistry at Massachusetts Institute of Technology. Dr. Cope is currently on leave for the performance of special war work.

John W. Sands, who has been with the Conservation Division of the War

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Production Board at Washington since January, 1942, has resumed his duties with the Development and Research Division of the International Nickel Co. at New York.

Dr. Richard M. Hitchens has been promoted to the position of associate research director of Monsanto Chemical Company's Organic Chemicals Division. Dr. Hitchens who was formerly assistant director, has been with Monsanto since 1931, having started as a research chemist, and later having become a research group leader.

Arthur M. Ospenson has been appointed to the greater New York sales staff of Magnus Mabee & Reynard, Inc.

Capt. Mack E. Kittay has been appointed manager of the Southern Division of National Starch Products, Inc. Prior to his enlistment in the Army, he was with National Adhesives Corp. for 13 years.

Francis D. Bowman has been named director of public relations for The Carborundum Co. For many years Mr. Bowman has held the title of advertising manager of the company.

Charles P. Wilson, Jr., formerly of the Chemical Section of the War Production Board, has joined the staff of Givaudan-Virginia, Inc., of New York City and will handle the sales of anhydrous aluminum chloride.

Dr. Arnold J. Veraguth has been appointed to the research staff of Battelle Institute, Columbus, Ohio, and assigned to its division of organic chemistry. He was previously associated with the Hercules Powder Company, Wilmington, Delaware.

Glenn L. Haskell, president of U. S. Industrial Chemicals, Inc., will become chairman of the chemical division of the campaign committee of the Visiting Nurse Service of New York in the drive which opened October 26.

Andrew E. Buchanan, Jr., was appointed assistant manager of the Rayon Technical Division of E. I. du Pont de Nemours & Company, it has been announced. He succeeds Dr. G. W. Filson, who was appointed assistant manager of the Rayon Division some time ago.

M. H. Corbin was elected a director of the Standard Varnish Works recently and was appointed vice president in charge of sales of both the New York and Chicago divisions.

Felix N. Williams, general manager of Monsanto Chemical Company's Plastics Division at Springfield, Massachusetts, was elected a vice president of the company at a meeting of its Board of Directors on Oct. 25, it was announced by Charles Belknap, president.

Elmer Stewart, solicitor of patents in organic chemistry in the Office of the Alien Property Custodian for the past two years, has resumed his private practice of patent and trademark law at 930 Earle Building, Washington 4, D. C.

Luke H. Sperry was appointed to the position of director of engineering for Hercules Powder Company and Ernest S. Wilson as chief engineer of the company was announced by the company.

E. M. Flaherty as manager of the finishes division of the Fabrics & Finishes Department was announced by E. I. du Pont de Nemours & Company.

Clifford McIntire was appointed assistant to the general manager of the Grasselli Chemicals Department and T. H. McCormack as director of sales of the same department it was announced by the du Pont Company.

Joseph A. Howell, formerly vice-president, has been elected executive vice-president of the Virginia-Carolina Chemical Corp. His name as well as those of H. Hiter Harris and George M. Wells, has been added to the board of directors.

H. B. Higgins, president of the Pittsburgh Plate Glass Co., has been elected

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president also of the Pittsburgh-Corning Corporation, replacing the late H. S. Wherrett. R. L. CLAUSE, vice-chairman of Pittsburgh Plate, was named vice-president of Pittsburgh Corning, which is owned equally by the Corning Glass Co., and Pittsburgh Plate. R. B. TUCKER, vice-president of Pittsburgh Plate, was elected to the subsidiary's board.

SPEAKERS

JOHN W. CHURCH, of Falk & Company, addressed the membership on the subject of "Emulsion Paint" at the Louisville Paint and Varnish Production Club Sept. 21.

DAVID S. HOPPING *and* WILLIAM F. CULLOM, Celanese Celluloid Corporation, addressed the Detroit Chapter of the American Society of Tool Engineers on October 19. Mr. Hopping discussed end uses in his talk, supplemented by a display of finished articles from plastics. Mr. Cullom discussed the general qualities of plastics and techniques employed by molders and fabricators.

DR. E. CLIFFORD WILLIAMS, vice-president and director of research of the General Aniline & Film Corporation, addressed a meeting of the New York Section of the American Chemical Society at the Hotel Pennsylvania, October 6 on the subject, "Development of Petroleum Technology into a Major Chemical Industry."

Kopecky Joins Heyden

Ferdinand F. E. Kopecky has joined the Heyden Chemical Corporation as patent attorney. Mr. Kopecky started his professional career as a research chemist with the Bakelite Corporation and has been connected with Ellis Laboratories and Monsanto Chemical Company in chemical capacities.

CLIFFORD MCINTIRE and T. H. MCCORMACK have assumed the positions of general manager and director of sales, respectively, of the Grasselli chemicals department of E. I. du Pont de Nemours & Co. Mr. McIntyre, former director of sales, has been with the company 34 years. Mr. McCormack has been general assistant director of Grasselli sales.

OBITUARIES

Thomas Midgley, Jr.

THOMAS MIDGLEY JR., who invented ethyl gasoline and did some of the first synthetic rubber research, died at his home near Columbus, Ohio, on November 2, 1944 at the age of 55. He had been an invalid since suffering an attack of infantile paralysis four years ago. Following an autopsy, the Coroner returned a partial verdict of "death by strangulation." He said a full verdict would be returned after further investigation. Mr. Midgley was believed to have accidentally become tangled in a harness he had devised to aid in arising from his bed.

Long regarded as one of the nation's outstanding chemists, his work led to the invention of ethyl gasoline. In the course of that research work he had discovered new uses of chlorine and bromine compounds. However, a shortage of bromine developed and Mr. Midgley then invented a method of extracting bromine from sea water.

Thomas Midgley, Jr.

Among his more than 100 patents also was one for freon, a safe refrigerant for both commercial and domestic refrigerators and air conditioning systems. His tetraethyl lead played an important role in the development of high-octane gasoline required for modern military planes.

Mr. Midgley was vice president of the Ethyl Gasoline Corporation and Kinetic Chemicals, Inc. He was vice president of Ohio State University Research Foundation, vice chairman of the National Inventors Council and also had been president of the American Chemical Society.

The recipient of many high honors, Mr. Midgley was awarded the Nichols Medal

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of the American Chemical Society in 1923, the Perkins Medal in 1937, the Longstreth Medal of Franklin Institute in 1925, the Priestly Medal of the American Chemical Society in 1941 and the Willard Gibbs Medal in 1942. He leaves a widow, Mrs. Carrie M. Reynolds Midgley; a daughter, Jane, of Washington, D. C., and a son, Thomas Midgley, 3rd of Hartford, Conn.

George A. Martin, paint and chemical pioneer, well-known mid-west industrialist, and board chairman of The Sherwin-Williams Company, world's largest paint manufacturer, died in Cleveland, Ohio, on Oct. 31. He would have been 80 years old on November 7th.

Nathan S. Beekley, manager of the Graphic Arts Division of Merck & Co., Inc., died suddenly on September 26 at his home in Westfield, N. J.

Dr. Fin Sparre, a director of E. I. du Pont de Nemours & Co., died of a heart attack October 8, at his home in Wilmington, Del. For 25 years he had been director of the development department, retiring from that position on August 31. He was 65 years old.

NEWS OF SUPPLIERS

Robert S. Peare, manager of publicity and broadcasting for the GENERAL ELECTRIC COMPANY since 1940, and chairman of the company's general advertising committee, has been elected a vice president by the board of directors, it was announced in New York by Gerard Swope, president. Other announcements of appointments included H. V. Erben, manager of the central station of the General Electric Company since 1941, elected a commercial vice president by the board of directors, and Owen D. Young and Gerard Swope for the twenty-first time elected chairman of the board and president respectively of the company.

MORSE BOULGER DESTRUCTOR COMPANY of New York announces the purchase of all assets, patents, rights and other property of Robinson Air-Activated Conveyor Systems owned hitherto by E. Gwynn Robinson, the inventor. Engineering and sales of the system will be under the management of E. S. Bishop who has been identified with the bulk material handling business for many years.

THE INLAND STEEL CONTAINER COMPANY, formerly Wilson & Bennett Manufacturing Company, announces the appointment of John T. Rossett as vice president and general manager of operations. Mr. Rossett was formerly vice-president and eastern manager of operations. His offices will be located in the Chicago plant of the company at 6532 S. Menard Ave., Chicago 3, Illinois.

Appointment of M. D. Bensley as general manager of the three plants of H. D. PORTER COMPANY, INC., of Pittsburgh, Pa., at Mt. Vernon, Ill., has been announced by T. M. Evans, president.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912 AND MARCH 3, 1933

Of *Chemical Industries*, published monthly except twice in November, at Philadelphia 4, Pa., for September 14, 1944.

State of New York, County of New York, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Robert L. Taylor, who, having been duly sworn according to law, deposes and says that he is the Editor and Manager of *Chemical Industries* and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Tradepress Publishing Corporation, 522 Fifth Avenue, New York, N. Y.; Editor, Robert L. Taylor, 522 Fifth Avenue, New York, N. Y.; Managing Editor, none; Business Manager, L. Charles Todaro, 522 Fifth Avenue, New York, N. Y.

(2) That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent. or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Tradepress Publishing Corporation, 522 Fifth Avenue, New York, New York. The stockholders of the Tradepress Publishing Corporation are: John R. Thompson, 2511 Coyle Avenue, Chicago; J. L. Frazier, 2043 Orrington Avenue, Evanston, Illinois; Col. J. M. Maclean, 7 Austin Terrace, Toronto, Ontario; Horace T. Hunter, 120 Inglewood Drive, Toronto, Ontario; The MacLean Publishing Company, Ltd., 481 University Avenue, Toronto, Ontario.

3. That the known bondholders, mortgagees, and other security holders owning or holding one per cent, or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

ROBERT L. TAYLOR,
Editor and Manager.

Sworn to and subscribed before me this 5th day of October 1944. Mildred R. Endres, Notary Public, Queens Co. No. 4127. Reg. No. 87-E-5; cert. filed in N. Y. Co. No. 381, Reg. No. 233-E-5.

Your Guide...
TO THE NEVILLE LINE
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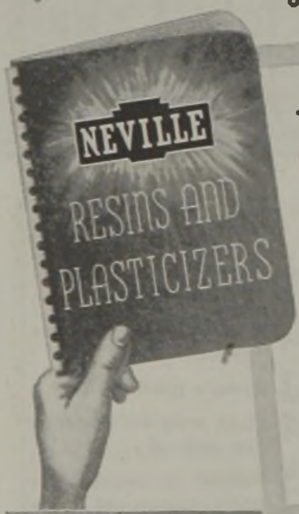

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A-15

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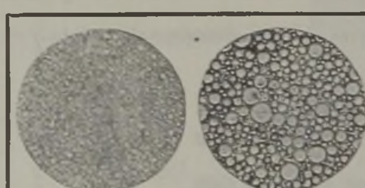

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WAR REGULATIONS SUMMARY

ACRYLONITRILE—Placed under control of General Chemicals Order M-300, previous order revoked.

ADIPIC ACID—Placed under General Chemical Order M-300, Order M-304 revoked.

BORAX and BORIC ACID—General Inventory Order M-161, as amended, has removed the last restrictions on the purchase and use of borax and boric acid.

CHLORINATED PARAFFIN—Placed under General Chemicals Order M-300, previous order revoked.

COPPER SULFATE—Ceiling price of monohydrated copper sulfate produced in the East was increased 25 cents per hundred weight, effective Oct. 18, 1944. Although applicable only to sales in 200-lb. drums in lots of 36,000 lbs. or more at the wholesale level, the resulting increase in cost to retailers may be passed on to consumers.

DICHLOROETHYLETHER — WPB Order M-226 has been revoked, discontinuing allocation control of this product.

ESTER GUM—The ceiling price of ester gum made wholly from gum rosin has been increased one-fourth cent a lb. to compensate for the increase of 24 cents per 100 lbs. in the price of gum rosin granted by OPA Oct. 11, 1944. The action, effective Nov. 11, 1944, also increases slightly the price of ester gum made from both gum and wood rosin, and provides a simplified formula for pricing solutions or mixtures of ester gum with other materials. Amendment No. 6 to MPR 406.

FORMALDEHYDE—Because of increased military requirements, the small-order exemption of formaldehyde and paraformaldehyde has been lowered. For formaldehyde, it has been reduced from 10,000 lbs. of 37% solution a month to 1,500 lbs. a month. For paraformaldehyde, it has been reduced from 3,000 lbs. to 500 lbs. a month.

GRAPHITE CRUCIBLES—All restrictions on manufacture of graphite crucibles have been removed by revocation of WPB Supplementary Order M-61-a.

MOLDING POWDERS—Allocation controls removed from cellulose acetate butyrate, urea, and melamine molding powders for civilian use.

PENICILLIN — Placed under General Chemicals Order M-300, previous order revoked.

PHTHALIC ALKYD RESINS — Placed under General Chemical Order M-300, Order M-139 revoked. Effective Nov. 1, 1944.

PLASTICIZERS — Phthalate plasticizers and phosphate plasticizers have been placed under control of M-300, the general chemicals order, by WPB. Orders M-18-b, M-203 and M-183, which formerly governed these chemicals, has been revoked.

POLYETHYLENE — Allocation control transferred from Order M-348, which has been revoked, to General Chemical Order M-300. Small-order exemption for experimental use raised from 5 to 25 lbs.

PRIMARY CHROMIUM CHEMICALS—These items placed under WPB General Chemical Order M-300.

SOLVENTS—Controls covering both Class A solvents and Class B solvents as defined in Order M-150 (Aromatic Solvents) will be continued indefinitely, according to WPB. Class A solvents as defined in the Order are generally known as xylene range aromatic solvents and Class B solvents as toluene range aromatic solvents.

THIAMINE HYDROCHLORIDE—Allocation control lifted effective October 21, 1944.

WHITE PIGMENTS—WPB Order M-353 amended to cancel all ratings on non-military orders for titanium dioxide and zinc sulfide white pigments. Only those orders accompanied by a military certification are valid rated orders.

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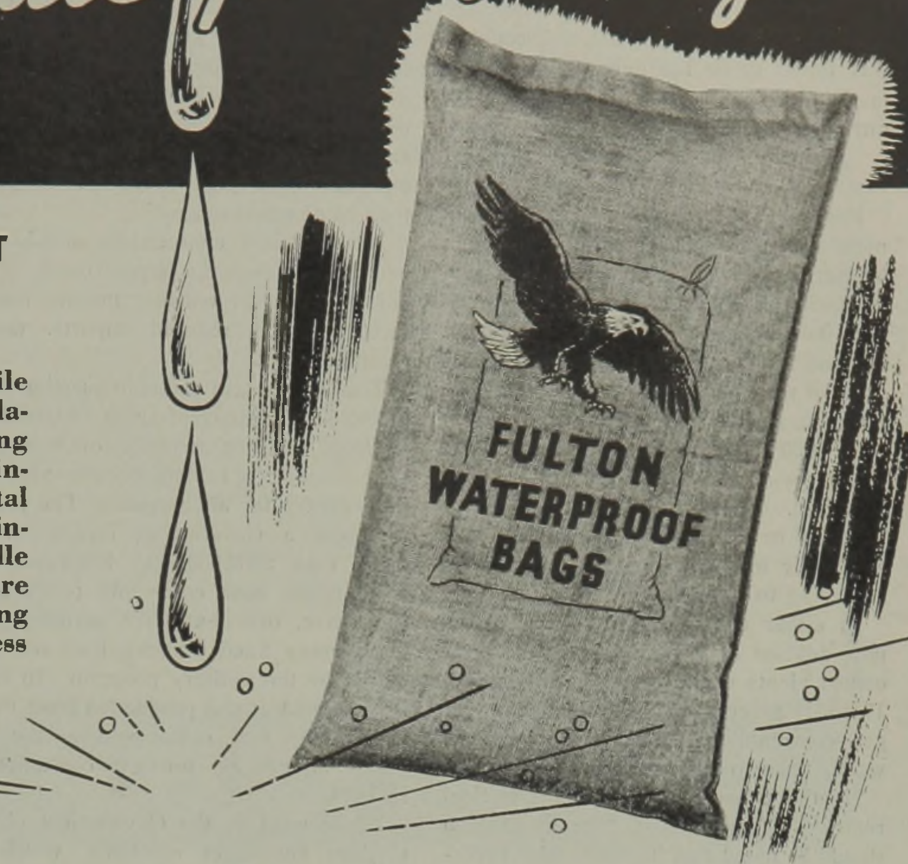

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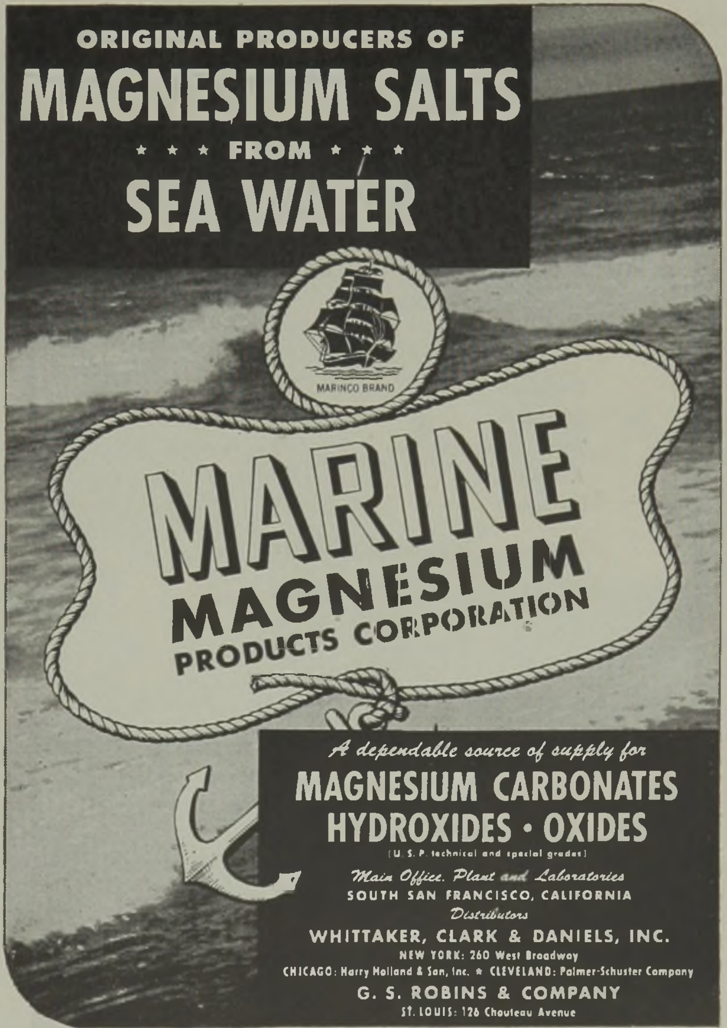

Between the Lines

(*Continued from Page 760*)

European sources in large part. Although the United States in the same years averaged 46,600 tons of nitrogen, this country was found to be the only major nation in the world as completely dependent on nitrogen imports.

Postwar Consumption Forecast

Postwar, it is forecast by the Department's research, consumption of nitrogen by agriculture and industry will depend primarily on the national production level, with its contingent factors of employment, demand for farm products, and finally the price of nitrogen. There is, as an advance estimate, an indicated annual consumption of 750,000 to 900,000 tons of nitrogen for fertilizer—almost double the prewar consumption. If consumption should go to 1,000,000 or 1,200,000 tons, it should lead to greatly increased domestic production, according to forecast.

In either case, Secretary Wickard is now advised by his group, Government-owned plants would be needed to furnish 19 to 24 percent of the estimated nitrogen consumption. Alternatively, imports would have to be increased.

"In this connection," the report to Secretary Wickard stated, "the assumption should be noted that imports under favorable conditions would be as large as average imports in 1936-40 and that postwar imports of Chilean nitrate of soda would, under most conditions, be about as large as in the years preceding the war.

"While it is assumed further that no restrictions will be placed on imports, the estimates reflect the view that American farmers should not be under necessity of using imported fertilizers at prices that are higher than should be necessary to purchase equivalent quantities of plant food of domestic origin."

If these high expectations should not be realized, on the other hand, it is pointed out that existing private manufacturers, plus reduced imports, would meet the need.

The Government plants in question have a combined capacity of about 750,000 tons of fixed nitrogen annually, or in excess of consumption in any prewar year by this country for all purposes. The plants represent a Government investment of more than $200,000,000. Moreover, as these plants have come into production, they have, over extensive periods, produced more fixed nitrogen than was required by the military program. In fact, it is claimed, it was production from these war plants that made possible the increase in fertilizer nitrogen consumption in 1944.

While most of the Government plants produce anhydrous ammonia, which is shipped to other plants making military explosives, some of them produce ammonium nitrate, classed as one of the lowest cost nitrogen fertilizers that could be produced at the war plants. However, it has been found, in all the plants concerned, an additional investment would be necessary to permit fertilizer manufacture by modern methods, and a substantial investment at that, by usual standards. Compared to the initial cost of the plants themselves, it is argued, this additional cost would not bulk large, and would save on production costs, as well as improve the physical properties of the resulting product.

The recommended capacity for conversion, if the proposals are adopted, would approximate 300,000 tons net. Further, it is recommended, conversion of some of the plants for production of granular ammonium nitrate should be started as soon as possible. All other Government synthetic ammonia plants, not converted under this plan, it was urged, should be held as part of the military reserve equipment.

"The reserve plants would be just as much a part of our military force as planes, tanks, ships and guns," it was argued.

In any event, it is believed, prompt conversion is not possible for the entire capacity mentioned in the recommendations. Plans for conversion of the recommended capacity should be ready for action.

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GRINDING DEPARTMENT: Six (6) underwater grinding machines, fourteen (14) assemblers' motors and chucks, air pump, water pressure tester and miscellaneous shafting, belts, pulleys, etc.

OFFICE EQUIPMENT: Two safes, desks, typewriters, adding machines and other office equipment. Drafting board, time recorder, etc.

AUTOMOBILE EQUIPMENT: 1936 Buick Sedan.

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PART STOCK (Partially Fabricated Parts): Approx. 280,000 miscellaneous syringe parts.

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Inspection — November 24 — 9:00 A.M. — 5:00 P.M.
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CHEMICAL SPECIALTIES NEWS

Goodrich Develops Synthetic Adhesives

Development by its research staff of a new line of synthetic rubber adhesives, is announced by the B. F. Goodrich Co., Akron, Ohio.

One is for general "utility" use and is a type of adhesive which will adhere to almost any clean surface. It serves these purposes as well as natural rubber cements in the same field, the company says.

Synthetic cements are available for heat vulcanization, air curing or cold adhesions. The compounded synthetic cements are suitable for fabric, leather and synthetic adhesions, to themselves or to each other. These adhesives have a non-toxic solvent, and will give an excellent bond with a large variety of materials. They give the same bond when used with cured or uncured neoprene, that rubber cements give with natural rubber.

Sterling Names Sahyun Vice President

Election of Dr. Melville Sahyun as divisional vice president of the Frederick Stearns and Co. division of Sterling Drug, Inc., was announced by James Hill, Jr., president. Dr. Sahyun has served Stearns as director of biochemical research and more recently as director of research.

Repellent Due for Postwar Boom

Dimethyl phthalate, a new insect repellent—successor to citronella—which the Army has found vastly more effective than peacetime "fly dopes," will be a postwar boon, the Du Pont Co. announced over the week-end.

Derived from phthalic anhydride, the compound that helped make the synthetic resin for "Dulux" enamels, the clear, nearly odorless liquid now being supplied the Army at a rate of many thousands of gallons monthly, is for some unknown reason highly unpleasant to mosquitoes, flies, fleas, gnats, sandflies and chiggers. It is partially effective against ticks.

NWDA Officers Elected

James W. Roberts, The Henry B. Gilpin Co., Norfolk, Va., is the new president of the National Wholesale Druggists' Association, succeeding Lace I. Fitschen, Alexander Drug Co., Oklahoma City, Okla.

J. W. Roberts

Mr. Roberts was elected at the concluding session of the NWDA's three-day wartime conference in New York. Chosen with him were the following: First vice president, O. L. Rafuse, McKesson & Robbins, Inc., Buffalo, N. Y.; second vice president, A. J. Sichelstiel, W. J. Gilmore Drug Co., Pittsburgh, Pa.; third vice president, A. S. Lester, McKesson & Robbins, Inc., Los Angeles; fourth vice president, R. R. Ellis, Ellis-Bagwell Drug Co., Memphis, Tenn.; fifth vice president, R. T. Thompson, McKesson & Robbins, Inc., Southern Drug Division, Houston, Texas.

New members of the Board of Control (three-year terms) include: J. D. Crump, McKesson & Robbins, Inc., Macon Ga.; C. C. Caruso, Schieffelin & Co., N. Y.; Edward S. Albers, Albers Drug Company, Knoxville, Tenn.; H. S. Price, The Orr, Brown & Price Co., Columbus, Ohio.

A total of 71 firms was elected to associate membership in the association, and 6 to active membership—a gain in membership of approximately 12 per cent, according to Dr. E. L. Newcomb, executive vice president.

Million Dollar Paint Plant to Be Built

The Oronite Chemical Co., subsidiary of the Standard Oil Co. of California, has announced plans for the construction of a $1,000,000 manufacturing plant to be erected in Richmond, Calif.

Oronite's new plant will manufacture phthalic anhydride, basic stock for alkyd resin paints and finishes. These paints which now go almost exclusively to wa uses, are expected to play an importan part in the postwar building constructio field.

They are much more durable than pre war paints and are resistant to the de terioration caused by sun, heat and mois ture. They work even better on meta than on wood. The Navy has found then highly resistant to salt spray and extreme changes of temperature. They are being used on both the San Francisco-Oakland and the Golden Gate bridges.

Shell Oil Markets Rust Preventives

Development of a new line of rust preventive oils and fingerprint removers by Shell Oil Co., Inc., announced at a meeting of Shell industrial engineers from the United States and Canada to discuss new products with Shell's research department.

The rust preventives will be marketed a the Ensis line, including four differen types of products which will be mad available in 14 grades, ranging from thi oily films to heavy, abrasion-resisting coatings.

Smith Heads Johnson Laboratories

Dr. David F. Smith has been ap pointed director of the laboratories o Johnson & Johnson, New Brunswick N. J., replacing G. S. Mathey, vic president of Johnson & Johnson whose recent illness has necessitate his relinquishing direction of the com pany's extensive activities in chemica and clinical research.

Summers Production Head Named

William N. Watmough, Jr., has been appointed production manager of the Summers Fertilizer Company and its associate company, Northern Chemicals Industries, Searsport, Maine. Mr. Watmough, was with G. Ober & Sons, Baltimore, for seventeen years and for the past several years has been assistant works manager at the Curtis Bay plant of the Davison Chemical Corporation.

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Bag Renovation Announced

The mildewproofing on burlap sandbags may be removed through processing in a weak acetic acid, the United States Testing Co. has announced. Three types of mildewproofing are used, copper napthanate, cuprammonium fluoride and cuprammonium carbonate. No cases of dermatitis have been reported from handling or sewing these bags, and Army specifications are that the mildewproofing should not be toxic to the skin.

The copper-napthanate finish might prove toxic to food stuffs over a long period, chemical men said, and is objectionable for this purpose because of its odor. The cuprammonium finishes are odorless and non-toxic, however, it was asserted. The cuprammonium fluoride mildewproofing can be detected because of the asphalt added for coloring.

Pre-Wax Floor Cleaner Introduced

For labor-saving maintenance of floors, the finishes division of the Du Pont Company announces the development of pre-wax floor cleaners as a companion to Du Pont self-polishing wax.

The new dirt-chaser is a concentrated, heavy-bodied product (about the consistency of heavy cream), which is reduced with water for use on all types of floors before waxing or re-waxing. It is said to provide a good base for subsequent waxing, setting up a "bite" on the surface to give the wax better adhesion.

Glyco Names New Director of Research

G. J. Leuck

Gerald J. Leuck has been appointed director of research of Glyco Products Co., Inc. Dr. Leuck received his Ph.D. at Northwestern University and was formerly with the Miner Laboratories of Chicago, where he did considerable work on carbohydrates and their derivatives, proteins, polymers, adhesives, etc.

Anti-Fog Compound Marketed

A new anti-fog liquid for glass, known as Merix, has been brought out by the Merix Photo Co., Chicago. The compound is claimed to prevent fog or steam on any type of glass surface, and is said by its manufacturers to be a boon to industries where large amounts of glass surfaces are in constant use. It is said to be non-inflammable, non-toxic and non-acid and loses none of its strength when exposed to light.

The compound is claimed to form an invisible film of protection which keeps surfaces free of mist or steam for an indefinite period. It is said to be ideal for windshields, goggles, eye shields, optical airplane instruments, camera lenses and other glass surfaces where temperature variations cause glass surfaces to become foggy.

Phosphorescent Pigment Developed

A new phosphorescent pigment, which emits a brighter phosphorescent afterglow for a longer period of time than similar long-afterglow pigments is announced by The New Jersey Zinc Sales Co. This pigment (designated CaS-SrS-2470) is specifically intended for use in such wartime applications as phosphorescent paints, marking tapes and decalcomanias,

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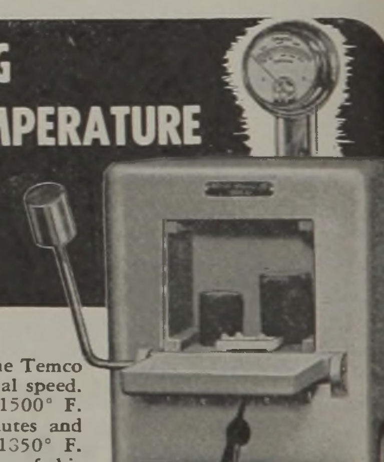

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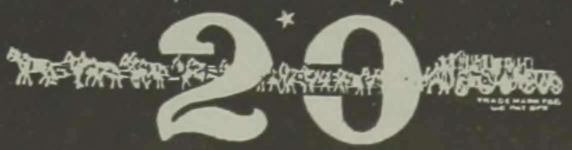

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CANADIAN NEWS

by W. A. JORDAN

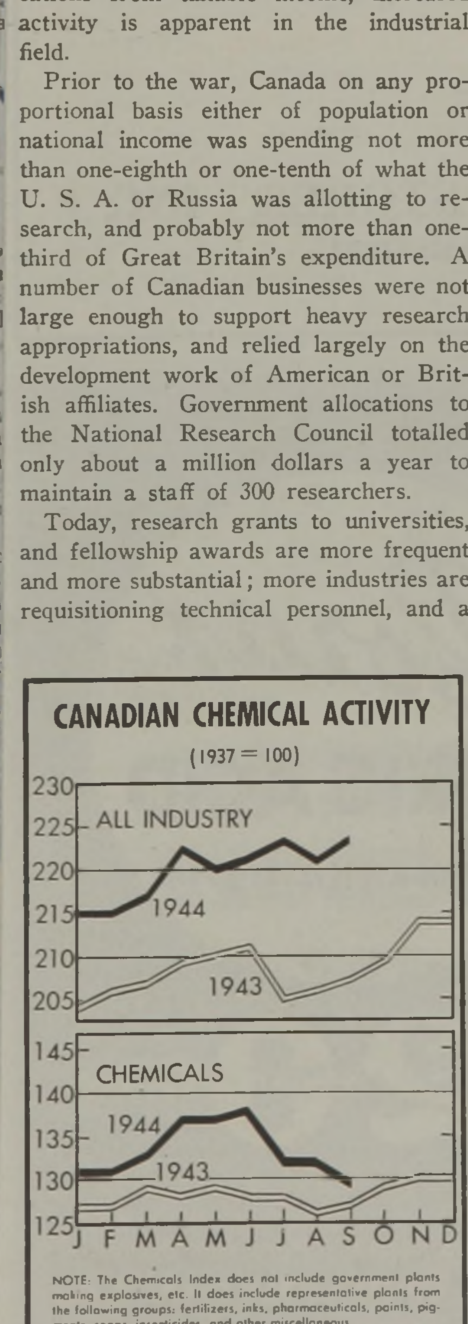
Postwar to See Increase in Research

ONE outgrowth of Canada's industrial expansion during the war years has been an increased consciousness of the value of research on the part of both Government and industry, and present indications are that Canadian research work will be much more extensive in the future than was the case in the past. Already, with Government easing of excess profits tax regulations to exempt a percentage of research allocations from taxable income, increased activity is apparent in the industrial field.

Prior to the war, Canada on any proportional basis either of population or national income was spending not more than one-eighth or one-tenth of what the U. S. A. or Russia was allotting to research, and probably not more than one-third of Great Britain's expenditure. A number of Canadian businesses were not large enough to support heavy research appropriations, and relied largely on the development work of American or British affiliates. Government allocations to the National Research Council totalled only about a million dollars a year to maintain a staff of 300 researchers.

Today, research grants to universities, and fellowship awards are more frequent and more substantial; more industries are requisitioning technical personnel, and a number of organizations, particularly banking houses, are urging the setting aside of increased research appropriations by private industry, for it is realized that only by continual advancement can industry maintain its system of enterprise.

The National Research Council has been expanded four-fold in staff, and receives six times the financial support of prewar days. There is every reason to believe that research work on the part of both Government and industry will be augmented, and coordinated, probably by means of the Council, so that corresponding scientific progress may be achieved in postwar years.



Salt Production Project

The Department of Mines and Resources is completing construction of a pilot plant at Malagash, Nova Scotia, to appraise the value of the process developed by the Department for the production of salt for the Maritime fisheries industry.

The Malagash deposits range from relatively pure halite to material containing substantial percentages of shale and anhydrite, which can be purified by means of froth flotation. However, in that this method of purification necessitates fine grinding of the feed, the salt recovered from the flotation cells is too fine grained to be acceptable to the fisheries industry, and must be melted, cast into blocks, and crushed to marketable size.

The pilot plant has been established to demonstrate the efficiency of the process and to evaluate the procedure under plant conditions so that the advisability of proceeding with a full scale unit may be determined.

Fertilizer Needs 1944-45

Official estimates place Canada's fertilizer needs for the 1944-45 crop year at an all-time high of approximately 20,000 tons of nitrogen, 46,000 tons of K_2O, and 74,000 tons of P_2O_5. Although nitrogen consumption is expected to remain roughly the same as was the case last year, potash and phosphoric requirements are up 10,000 and 15,000 tons, respectively, over 1943-44 and stand at almost double 1939 tonnages.

Although Canada is devoid of potash or phosphate resources, the capacity of war-expanded nitrogen fixation facilities, rated at 210,000 tons per annum, is far in excess of any possible domestic postwar fertilizer demand. During the past year Canada exported 162,000 tons of ammonium nitrate as fertilizer, of which 137,000 tons were routed to the U. S. A., together with 100,000 tons of calcium cyanamide. The future of some $30 million of nitrogen plants presents the Government with one of its knottiest postwar problems.

As far as potash and phosphate is concerned, Canada is primarily dependent on the U. S. A., with last season's imports of potash amounting to 60,000 tons. Phosphate rock imports totalled 310,000 tons, but even this was sufficient to supply only one half domestic needs for superphosphate, with the other half, 135,000 tons, shipped in from the U. S. A.

Sulfite Pulp May Offer Postwar Ammonia Market

According to the British Columbia Forestry Industry Commission, Consolidated Mining and Smelting Co., Ltd., is actively investigating the possible development of the ammonia sufite process, in cooperation with western pulp and paper producers, as a potential postwar market for anhydrous ammonia. To date no Canadian producer has utilized this method of manufacturing sufiite pulp, and very little Canadian research work has been published on the subject, due mainly, of course, to the Dominion's small prewar production of synthetic ammonia, and the basically low cost of lime, which is replaced by ammonia in the so-called ammonia process.

Prior to the war, Canadian paper companies were interested in the work of the Toten Mills, Norway, believed to be the only organization in the world employing ammonia in sulfite pulp production, but their interest did not extend to commercial consideration. Norwegian claims at that time were that ammonia tonnage consumption was much less than conventional lime requirements had been (supposedly sufficient only to neutralize the sulfuric content of the sulfurous acid liquor) and that whiter pulp could be more readily produced by the ammonia installation. Sufficient details of the economics of the process were not released, however, to establish the merits of the contention.

New Chemurgy Projects in West

Western Chemurgy, Ltd., has been incorporated and will operate a $50,000 wheat starch-glucose unit in Moosejaw, the first such project to be located in Canada's west. The new industry will function on a relatively small scale until additional equipment can be obtained, with a processing capacity of about 600 bushels of wheat per day to yield ten tons of glucose.

Prairie Vegetable Oils, Ltd., has also located at Moosejaw and is erecting an oil extraction unit. The Wheat Board has appointed Prairie Vegetable Oils, Ltd., as official purchasing agent for all rape-seed grown in Western Canada.

Chemical Supplies Easing

A marked easing in the supply position of several important chemicals and raw materials has been evident during the past month with the rescinding of allocation orders which have been in effect for the past few years.

All restrictions have been removed on the sale and use of glycerine, permitting its use as an antifreeze for the first time since 1940, although ethylene glycol remains under modified allocation for essential needs. Vegetable and animal waxes, and castor oil have also been freed for civilian use.

The use of shellac, which has been restricted to essential maintenance requirements, is now permitted without confining regulation, and the lifting of tung oil restrictions has followed similar action in the U. S. A. East Indian natural varnish resins have been removed from the restricted list, mainly as a result of the development of numerous substitutes to ease the demand, and both domestic and imported beeswax are now freely available.

Regulations curtailing the use of small metal containers for paint, lighter fluid, etc., have also been eased somewhat, but the supply situation in this respect is still far from satisfactory.

McGill to Launch Special Studies on Fermentation

The House of Seagram has donated $3,500 to McGill University in support of fermentation research as an initial contribution in the company's program for expanding its research activities in Canada. Investigations are to be primarily concerned with improving and extending the use of wheat and its products in the fermentation industries.

Initial research is to be directed mainly to penicillin and other anti-bacterial agents by the growth of micro-organisms on wheat products. Dr. David Siminovitch, who has returned to McGill after completing a two year post-doctorate course at the University of Minnesota, is to conduct the special studies.

New Oil Processing Plant

Victory Mills, Ltd., $2 million vegetable oil processing plant now under construction on the Toronto waterfront, is scheduled to come into production during the month, and when completed will have a capacity of 225 tons of soybeans per day.

The new plant is unique in Canada in that it combines the continuous screw press and continuous solvent extractor methods of processing oil-bearing materials. It is possible to operate these units separately or in series, depending upon the type of raw material processed and the finished products desired.

Initially, production emphasis will be placed on soya oil and soya flour, alpha protein (vegetable casein) and lecithin. In the future, attention will be given to expelling oils from flaxseed, rapeseed, sunflower seed, peanuts, copra, etc.

Chemical Exports, Imports Up

Canadian export trade in chemicals for the first nine months of this year has again shown a marked improvement rising from 1943's $61 million to $73 million for this year. The major gain has been recorded in foreign sales of fertilizer, up from $12 million to $18 million. Acid exports have declined $0.5 million at $1.7 million, and soda compounds are down a similar amount at $2.6 million.

Imports, on the other hand, mainly from the U. S. A., have increased 15 per cent for the first eight months of the year to total $55 million. The largest increases have been registered in fertilizer and paint and varnish categories.

L. E. Wicklum has been appointed president and managing director of Frederick Stearns & Co. of Canada, Limited, Windsor, and its subsidiary, Nyal Company, Limited.

R. W. Greeff & Co. Inc. New York, U.S.A.

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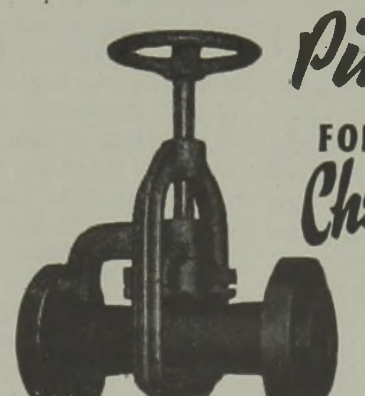

Easy to operate. No wear on valve mechanism. No metal parts contact pulp or liquid. No packing glands. Freezing temperatures will not destroy sleeves.

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●Useful for solutions which are highly corrosive, or for solutions which crystalize at normal temperatures and must be handled at temperatures up to 300°F, or for mixtures of solutions or solids which are both corrosive and abrasive.

●Patented sleeve of valve made of rubber or synthetics to meet special requirements. The 1", 2" and 3" sizes are built for continuous pressure up to 100 lbs.; the 4", 6", 8", 10" and 12" sizes up to 150 lbs.

●Recommended for transfer lines, for controlling flow in plant and in delivering product to storage or cars. Also useful in handling fine, dry materials. *Valve shuts tight even on solid particles.* When writing, state your problem.

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MARKETS IN REVIEW

Ordnance-munitions chemical needs raised.
Contracts for 1945 being renewed.
Costs force some ceilings upward.
Vitamins, penicillin down further.
H_2SO_4, an unexpected supply problem.
Pigments, a chronic shortage.
Formaldehyde tightening again.
Heavy and fine chemicals, coal tar products and paint materials.

A TIGHTENING of supply positions in our more basic and heavy tonnage chemicals, such as sulphuric acid, chlorine, ammonia, chrome derivatives, solvents, and other items essential to war production, has resulted from the necessity of stepping up the Ordnance and munitions programs during the last quarter. Both programs lagged somewhat earlier this year, and industry has been asked to provide 55 per cent of the 1944 military requirements or better during the July-December period.

These urgent heavy chemical requirements in turn appear to have adversely affected supplies available for even the most essential civilian activities, not excepting fertilizers for contemplated record food crops in 1945. Serious shortages already have developed in sulphuric acid required in superphosphate acidulating operations, and the unfavorable nitrogen supply outlook has not improved. Potash, on the other hand, appears ample for agricultural and chemical needs next year.

Chemical prices meanwhile have come in for more attention with the booking of 1945 deliveries of alkalies and other large-tonnage products. As far as sodium hydroxide, soda ash and chlorine are concerned, these contracts are being written at no change from quotations currently in effect. Price uncertainties thus have been removed in these materials, although there is reason to believe that alkali-making costs remain very firm, and that for some producers the costs increased over the year.

Contract prices for caustic soda are continued at $2.30 per 100 lbs. for the 76 per cent solid material; $2.70 for the flake or ground; powdered, $2.70, in carload quantities. Liquid caustic, 50%, sellers' tank cars, is $1.95, and in buyer's tank cars, $1.925; with 73 per cent liquid caustic at $2.; and $1.975, respectively. Carload quantities of soda ash are offered to contract buyers as follows: 58 per cent light ash, bulk, 90¢ per 100 lbs.; paper bags, $1.05; burlap bags, $1.13; extra light ash, bulk, 90¢; burlap bags, $1.13. Dense ash, bulk, 95¢; burlap bags, $1.15.

Liquid chlorine continues on the firm basis of $1.75 for shipments in single unit tank cars; $2. per 100 lbs. in multiple unit containers; three cars or more, $2.; two cars, $2.50; one car, $3.

Higher prices have been effected for some other chemicals and related materials through the adjustment of ceilings. The maximum for copper sulphate monohydrate, which as a fungicide finds wide application in the potato-growing sections, was moved up 25¢ per 100 lbs. The retailer will have to pass on the increase to the consumer in the form of advances of 5¢ to 6¢ per 100 for the finished materials. Copper sulphate crystals remain unchanged at $5. to $5.50 per 100, while the monohydrate is established at $9.20 to $9.95. The ceiling adjustment in the latter was formed by higher manufacturing costs.

Acting on a directive isued by the Stabilization Director, OPA "unfroze" the gum rosin price list by establishing a price of $5.85 for grade "K" as a compromise of the ceiling of $5.61 and the $6.05 price under the temporary "freeze" which prevailed June 28 to August 27. Later, the entire list of 13 gum rosin grades was upped 24¢ per 100 lbs. on the order of the Stabilization Director, who said the action was necessary "to maintain and encourage production." Manpower has been a problem in the South's naval stores industry and workers have been lost to war industries offering higher wages.

Without benefit of ceiling action, advances have also taken place recently in quicksilver, cinnamic alcohol, menthol, wattle bark (a tanning material) and oleo resin capsicum; while makers of synthetic resins containing more than 50 per cent gum rosin have been permitted to apply for price increases if output cannot be maintained at present ceilings. A series of price advances which has brought quicksilver up from its recent lows to a level of $113. at this writing is in response to a reduction of available spot stocks and mine curtailment on the West Coast. Mercury mines in liberated Italian areas remain inactive.

Sulphuric acid capacity, already expanded to well above 9 million short tons annually through the construction of contact and chamber acid facilities, including oleum, may have to be increased to meet the tentative Government requirements over 1945. Spent acid needed for superphosphate fertilizers and new sulphuric for industrial processes during 1944 will total 10,556,200 tons, with the supply for this period amounting to no more than 9,650,700 tons. The largest requirement, 2,852,900 tons, is for superphosphate; 2,188,600 tons will enter chemical processing, and 1,477,000 tons is needed this year for petroleum refining. Other sulphuric consumers in order of importance are paint and pigments, ammonium sulphate fertilizer, steel pickling, rayon and cellulose film, and non-ferrous metallurgical manufacture. Explosives other than Ordnance will need 742,600 tons.

Erection of new productive capacity, of course, is not the full solution to sulphuric acid problem now facing the War Production Board and the agencies planning for another record crop production during 1945. Acid-making facilities are expected to attain a capacity total of 9,426,600 tons on June 30, 1945, compared with the 8,393,100 tons made in 1943; but the string of tank cars required for hauling the basic chemical, spent acid principally, will have to be lengthened considerably. A hundred cars are needed immediately, and an additional 400 to 500 will be required when Ordnance plants still under construction are completed, and munitions and explosives outputs reach the peak set for them some time next year. Alkylation processes in the petroleum industry for the production of high-test motor fuels will take sulphuric on an expanding scale up to V-E Day. This industry's own building program may eventually absorb greater quantities of H_2SO4 in the postwar period, and the same might be said for steel. Its use in the manufacture of superphosphate and ammonium sulphate, on the other hand, could be expected to drop below the wartime rate.

Paint and synthetic coatings industry, which has had its raw materials use restricted for the most part to military production, appears to be obtaining a greater share of various products essential to its activities. Tung oil, pine tar, gum and wood rosin have been removed from the critical No. 1 Group list by WPB, and shellac is being made available in larger quantities for bleaching and cutting operations. Natural gums are scarce, but some Copals have been brought in, and negotiations are being conducted with Government agencies for importing more during 1945.

The Chemical Warfare Service has been requisitioning much of the lead-free zinc,

(*Continued on page 822*)

Chemicals for Industry

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(*Continued from page 820*)

forcing the paint manufacturers to resort to the use of the leaded zinc oxide pigments and thereby creating a secondary shortage in the latter types. CWS has been taking lead-free zinc at a rate of about 40,000 tons a year for smoke screen production out of the industry's production of 150,000 tons. The Army is now able to reduce that requirement, and there is valid reason to believe that WPB will be able to adopt a more liberal allocations policy with respect to lead-free pigments. Substitution of zinc sulfide for titanium dioxide by the paint manufacturers also has led to a severe shortage in the sulfide grades.

Titanium supplies on the whole continue insufficient for the needs of the paint industry and other consumers, and industry proposals have been made for the elimination of "leaks" which have been taking place under the titanium conservation order (M-353) in order to assure sufficient titanium shipments to manufacturers working on military business. Ratings would remain, according to the plan, but would be effective only if accompanied by a military certification.

Coating materials of various description and application are finding military uses which were unknown during the early stages of the war—making for shortages in raw materials which were not supply problems a year or two ago. WPB has found it necessary to tighten the controls for copper and zinc naphthenates which are now used for mildewproofing of canvas, duck, rope and webbing. Only the lower copper content naphthenates are available to manufacturers of essential civilian goods, those with adequate copper content being set aside for military needs. There is also little likelihood that preference ratings will be modified at this time for marine paints. Proposals have been made by the Marine Paint IAC that automatic preference ratings be continued after Germany's defeat so that manufacturers can maintain sufficient stocks at convoy ports. In this group are primers, exterior paints, "topside" paints for camouflage, and interior finishes.

Resinous products for purposes other than coating compounds are not in the favorable supply position expected at this time as the result of expanded outputs. The higher rate of Ordnance production, for one thing, has apparently tightened formaldehyde again and this development is cited in connection with increased control of urea-formaldehyde resins. Both urea and melamines will only be in adequate supply for military essentials such as aircraft, life rafts, plywood and wet-strength paper. Small-order exemptions in both resins were reduced drastically.

Cresylic acid, however, is evidently not now considered a shortage problem in the resins manufacturing industry, and a recent Tariff Commission report revealed that its stocks increased from 1,982,000 lbs. in January to 5,859,000 in July, one of the sharpest supply increases in the synthetic organics list. Cresylic acid imports from Great Britain have been a factor. In the case of synthetic acetic, stocks have gone down rather sharply, although production during the first seven months of this year ran slightly ahead of the same time in 1943. Peak output for synthetic acetic was reached in March this year at 27,720,000 lbs., from which point it receded to below 22,000,000 lbs. per month.

Plastic materials were among 42 products which WPB recently removed from the critical Group 1 list. They are acrylic resins, allyl resins, ethyl cellulose and polystyrene. Group 1 comprises materials in which the supply is insufficient to satisfy military and essential industrial demands. Chemicals which have been taken out of the same grouping include allyl alcohol, calcium carbonate, cobalt derivatives, dipentine, furfural, isopropyl acetate, methyl isobutyl ketone, styrene, thiourea and urea (not urea-formaledhyde compound). These reports will now be discontinued as the Conservation Division of WPB is being abolished.

Phenolic molding powder will remain under control, but allocations controls

(*Continued on page 828*)

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S&W AROPLAZ 1306 1309 1305

In addition to S&W Aroplaz 1306, the alkyd replacement now finding wide use in interior architectural and industrial coatings, U.S.I. now announces two variations of popular 1306. They are Aroplaz 1309 and Aroplaz 1305.

The two new resins differ from 1306 mainly in oil content. S&W Aroplaz 1309 contains slightly less oil and dries correspondingly faster; 1305 is still shorter, thus drying even faster and harder.

The three resins may be blended in any proportion to produce intermediate stages of drying time, hardness, and flexibility.

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SPECIFICATIONS

AROPLAZ	1306 65% SOLIDS in MS	1306 75% SOLIDS in MS	1309 75% SOLIDS in MS	1305 85% SOLIDS in MS
Acid Value (Plastic)	10-15	10-15	10-15	10-20
Color (GH 1933)	7-9	7-9	8-10	8-10
Viscosity (GH)	T-V	Y-Z_1	W-Y	Z_1-Z_3
Weight/Gal. @ 25C	7.6 lbs.	7.8 lbs.	8.0 lbs.	8.2 lbs.
Reportable Oil Content (Prox.) on plastic resin	65%	65%	60%	44%

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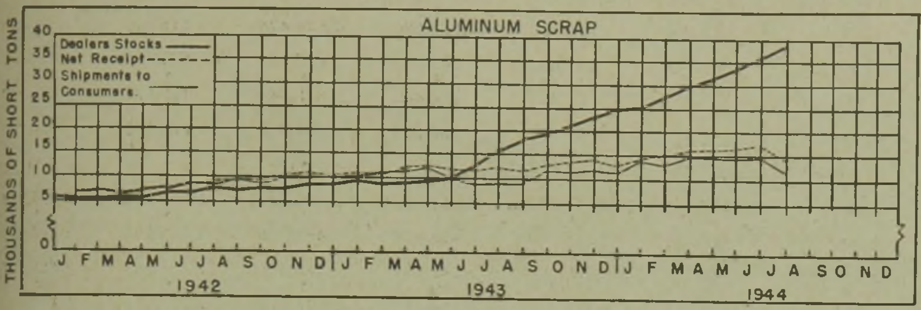
CHEMICAL ECONOMICS & STATISTICS

Aluminum Scrap Activity Declines

Following the general trend of a dull nonferrous scrap metal market during July, dealers' receipts of aluminum scrap declined sharply from 17,100 to 14,391 tons, the lowest figure since January. This decline in receipts, however, did not check the steady rise in dealers' stocks which has been in evidence for a long time, as the drop in receipts was more



than offset by a still greater drop in shipments to consumers. Sales fell from 14,697 tons in June to 11,556 tons in July, the smallest monthly total since December 1943. Dealers' stocks rose to 38,523 tons compared with 35,688 tons in June.

Ferrous Scrap Suffers Slump

Stocks of iron and steel scrap at plants of consumers, suppliers, and producers at the end of July 1944 approximated 5,909,000 gross tons, a decrease of 1 percent from the 5,991,000 tons reported on June 30, 1944, according to a statement released by the Bureau of Mines, United States Department of the Interior. Consumers stocks on July 31 were 4,770,000 tons, compared with 4,800,000 tons at the end of June, while the combined stocks of suppliers and producers were 1,139,000 tons as against 1,191,000 tons on the same dates. A decrease of 41,000 tons in stocks of scrap held by dealers and auto wreckers was the major factor in the decline in total inventories.

The amount of purchased scrap consumed during July was the smallest since February, 1943, but despite the decreased use stocks of this material held by consumers declined. This was undoubtedly caused by the reduction in scrap salvaged and produced, since inventories at suppliers' yards and producers' plants were also lessened. Combined scrap salvage and production during July were the lowest since the inclusion of such data in these studies in January, 1943.

The total consumption of ferrous materials (scrap and pig iron) amounted to 8,943,000 gross tons in July, representing an increase of less than 1 percent over the 8,889,000 tons used in June. This increase was entirely due to the longer month, since the average daily melt of scrap and pig iron declined 3 percent. This reduction in the average daily melt was occasioned by decreases of 5, 3, and 1 percent, respectively, in the average daily use of purchased scrap, home scrap, and pig iron.

Coke in 1943

The heavy demand for metallurgical coke by war industries and a shortage of solid fuels for domestic heating created widespread interest in coke production and distribution data in 1943. Although production of byproduct and beehive coke in the calendar year 1943 reached a new all-time high, total deliveries of coke exceeded the output and resulted in a reduction in stocks to the lowest point since 1926. The total consumption of coke in the United States in 1943, excluding imports, amounted to 71,636,836 tons, an increase of 2 percent over 1942 and 25 percent over the pre-war total in 1940. Shipments from beehive ovens in 1943 accounted for 11 percent of all coke deliveries, the same as in 1942, and in 1940, 5 percent. The expansion in blast-furnace capacities during the war period greatly increased requirements for metallurgical fuel and deliveries to blast furnaces in 1943 accounted for 80 percent of the total byproduct coke output and 87 percent of the beehive production compared with 74 percent and 80 percent, respectively, in 1940. The increased deliveries to iron furnaces in 1943 resulted in a gain of 36 percent over 1940 in furnace coke consumption. To meet the increased needs for blast-furnace coke, merchant byproduct-coke plants, which supplied but 3 percent of the furnace requirements in 1940, increased shipments so that in 1943 about 8 percent of the total coke for furnaces was obtained from merchant plants. Most of the additional coke required in blast furnaces was diverted from domestic trade, and shipments for domestic heating in 1943 totaled 4,714,960 tons, the lowest figure since 1927, and represented a decrease of 41 percent from 1940. Despite this sharp decrease, the domestic coke trade was the second largest coke-consuming channel and accounted for 7 percent of all large coke consumed. A significant increase of 17 percent over 1942 is noted in the quantity of coke used in the manufacture of water gas, mainly because of the increased demand for this fuel for domestic and industrial heating in New York and for ammonia synthesis in West Virginia. The consumption of foundry coke decreased for the second successive year because of limitations on castings; the quantity used in 1943 was 3 percent and 11 percent less than that in 1942 and 1941, respectively. The consumption of coke for miscellaneous industrial uses,

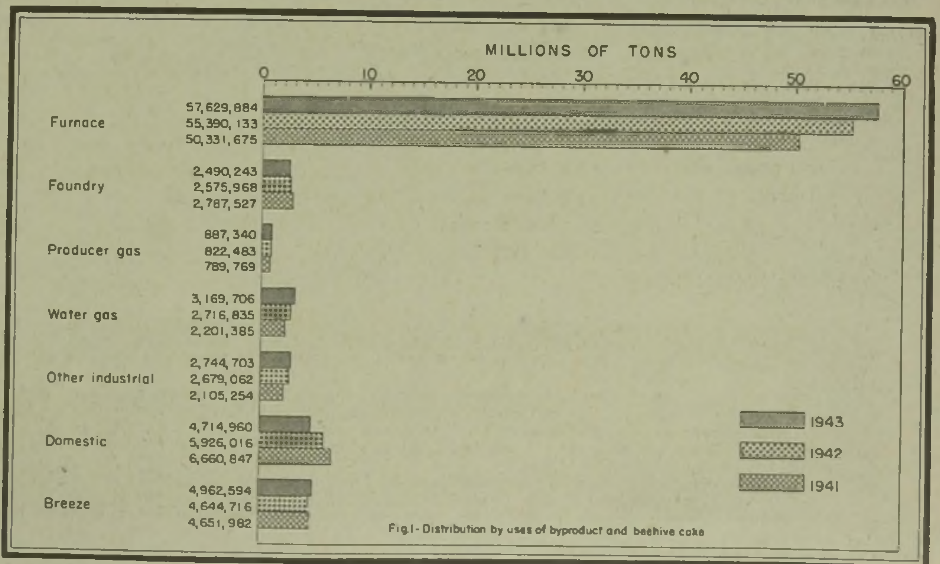


Fig. 1 - Distribution by uses of byproduct and beehive coke

Synthetic organic chemicals: U. S. production, consumption, and stocks, January-July 1944

(in pounds)

Item	January	February	March	April	May	June	July
Acetanilide (technical and U.S.P.):							
Production	439,148	599,572	699,295	643,396	367,342	[4]	177,754
Consumption	270,368	262,304	368,643	289,051	209,126	90,461	85,020
Stocks	757,278	796,064	737,310	917,388	802,667	834,008	741,269
Acetic acid (synthetic):[1]							
Production	25,234,708	23,835,226	27,719,588	24,471,598	25,185,075	22,994,169	21,870,652
Consumption	19,555,315	17,210,363	17,990,378	17,156,759	18,003,498	17,636,695	16,052,392
Stocks	9,436,835	8,004,120	9,192,322	9,263,196	9,438,528	7,954,401	6,430,917
Acetic acid (natural and from calcium acetate):[2]							
Production	3,512,324	3,338,767	3,289,140	3,448,145	3,478,309	3,308,389	3,101,849
Consumption	16,580	18,230	......	[4]	[4]	[4]	12,396
Stocks	1,529,208	1,509,517	1,279,686	1,060,371	1,292,042	1,201,607	1,189,695
Acetic anhydride:[3]							
Production	39,966,091	38,720,059	41,686,408	41,962,745	41,648,309	40,048,345	Published quarterly
Consumption	29,550,413	29,373,446	32,184,310	31,204,166	32,519,325	30,235,442	
Stocks	9,645,759	9,922,038	10,244,794	11,534,455	12,025,587	10,867,460	
Acetylsalicylic acid (Aspirin):							
Production	753,887	764,005	829,951	676,095	819,287	744,251	691,290
Consumption	[4]	[4]	[4]	[4]	......	[4]	[4]
Stocks	749,336	814,695	881,272	596,025	960,934	1,012,263	971,657
n-Butyl acetate:							
Production	5,699,444	6,231,619	7,913,081	6,235,207	5,757,102	6,124,667	5,337,323
Consumption	149,275	[4]	[4]	[4]	164,011	196,128	[4]
Stocks	2,298,399	2,808,377	2,596,717	3,145,099	3,911,193	3,056,241	3,055,406
Creosote oil, tar distillers (gallons):[5]							
Production	11,305,961	11,233,805	11,633,703	10,869,901	10,408,347	10,156,706	8,313,012
Consumption	810,998	1,013,396	1,013,209	828,796	882,897	1,039,091	835,284
Stocks	19,155,075	23,969,329	25,724,682	26,522,738	26,632,177	24,846,244	22,735,041
Creosote oil, byproduct (gallons):[6]							
Production	2,965,392	3,236,392	2,983,970	3,562,500	3,590,622	3,568,836	3,448,501
Consumption	160,186	36,021	93,488	65,254	74,816	28,549	47,519
Stocks	1,380,822	1,711,595	1,516,362	1,955,584	1,674,474	1,515,015	1,308,375
Cresols, meta-para:[7]							
Production	562,320	648,718	537,482	640,698	690,558	531,608	435,372
Consumption	[4]	[4]	147,562	[4]	[4]	[4]	[4]
Stocks	151,606	301,729	167,351	294,448	458,644	153,923	150,949
Cresols, ortho-meta-para:[7]							
Production	584,661	758,389	971,533	655,213	861,868	866,565	808,773
Consumption	......	......	[4]	......	......	[4]	[4]
Stocks	304,561	325,759	211,190	[4]	[4]	[4]	[4]
Cresylic acid, crude:							
Production	1,965,334	2,237,695	2,014,785	2,141,226	2,010,930	1,951,678	2,274,014
Consumption	[4]	[4]	[4]	[4]	[4]	[4]	[4]
Stocks	1,306,714	1,600,825	1,265,794	1,438,474	1,491,916	1,079,905	1,457,560
Cresylic acid, refined:[7]							
Production	2,723,855	3,747,714	3,737,173	3,342,989	3,782,406	3,257,439	3,552,622
Consumption	[4]	[4]	[4]	[4]	[4]	[4]	[4]
Stocks	1,982,414	2,107,819	2,365,739	2,154,511	2,016,307	2,229,757	5,858,702
Diethyl ether (all grades):							
Production	4,967,093	4,217,884	5,547,268	5,484,234	5,479,999	4,619,999	4,988,529
Consumption	[4]	[4]	[4]	[4]	495,282	353,610	757,005
Stocks	2,463,017	2,394,500	3,463,471	2,741,646	1,317,271	1,895,131	2,039,003
Ethyl acetate (85 per cent):							
Production	9,914,309	9,016,264	10,176,203	7,675,579	8,213,741	8,772,412	7,771,456
Consumption	1,513,656	1,304,683	1,585,029	1,201,397	1,344,163	1,135,158	1,409,871
Stocks	5,105,921	4,728,572	6,029,911	5,323,248	5,397,266	6,570,952	6,135,466
Lactic acid (edible):							
Production	427,944	288,344	304,732	381,579	368,974	[4]	264,254
Consumption	[4]	[4]	[4]	[4]	[4]	[4]	[4]
Stocks	345,584	369,851	334,257	307,900	371,275	267,098	298,108
Lactic acid (technical):							
Production	246,138	315,674	256,698	322,810	238,526	374,340	315,535
Consumption	10,009	15,655	18,788	21,863	21,584	15,359	14,579
Stocks	172,358	219,212	155,841	240,820	142,386	173,900	286,435
Methyl chloride (all grades):							
Production	1,291,121	1,317,988	1,990,710	2,136,340	1,936,596	2,001,151	2,053,749
Consumption	[4]	[4]	[4]	[4]	[4]	[4]	[4]
Stocks	1,078,377	934,583	700,022	718,323	871,972	709,295	613,422
Naphthalene, byproduct (less than 79° C.):[8]							
Production	9,368,375	9,121,505	8,682,110	8,288,927	9,094,765	8,230,393	8,239,513
Consumption							
Stocks	2,447,785	2,990,248	2,892,682	3,227,748	2,802,080	2,343,626	2,466.724
Naphthalene, tar distillers (less than 79° C.):[9]							
Production	15,072,813	15,744,644	17,616,262	17,013,390	15,368,562	15,725,696	15,741.231
Consumption	[4]	[4]	[4]	[4]	[4]	[4]	[4]
Stocks	9,827,554	8,270,015	8,474,152	9,371,842	9,728,602	8,790,914	7,166.598
Naphthalene, refined (79° C. and over):							
Production	7,268,318	7,768,540	8,180,156	7,578,823	7,076,885	7,294,741	6,350.584
Consumption	4,061,657	4,163,541	4,543,373	4,423,257	4,575,096	4,738,623	4.767,323
Stocks	3,042,885	2,783,416	2,910,302	2,604,018	1,785,706	1,356,642	1,454.378
Oxalic acid (technical):							
Production	1,490,234	1,447,985	1,517,309	1,367,874	1,550,038	1,584,652	1,354.572
Consumption	[4]	[4]	[4]	[4]	[4]	[4]	[4]
Stocks	681,722	764,709	443,151	452,486	351,875	437,740	414.764
Phenobarbital and sodium salts:							
Production	22,484	25,361	20,797	21,283	24,683	20,171	12.258
Consumption	[4]	[4]	[4]	[4]	[4]	[4]	[4]
Stocks	66,415	72,870	46,380	52,325	51,342	56,424	49.813
Phthalic anhydride:							
Production	9,205,342	9,675,900	10,345,136	10,607,574	10,713,572	9,664,363	10,643.510
Consumption	2,570,729	2,621,906	2,546,644	2,537,067	2,441,743	3,138.638	2,934,479
Stocks	1,564,253	1,735,855	1,982,944	1,780,311	2,403,789	2,909,286	2,954.420
Riboflavin (for human use):							
Production	9,783	8,856	12,351	8,982	9,039	7,629	5.836
Consumption	[4]	[4]	[4]	[4]	[4]	[4]	[4]
Stocks	24,151	26,170	31,504	35,759	39,228	40,051	41.937
Sulfa drugs (total):[10]							
Production	653,798	663,816	630,775	520,867	336.835	234,014	246.450
Consumption	198,104	237,139	124,205	91,671	38,781	[4]	21.879
Stocks	1,392,334	1,346,134	1,469,082	1,606,434	1,650,100	1,624,284	1.497,830

[1] Statistics of production of recovered acetic acid are confidential and therefore are not included in these data.

[2] Statistics reported here for acetic acid produced by direct process from wood and from calcium acetate are collected and compiled by the Bureau of the Census.

[3] Includes acetic anhydride produced from acetic acid by the vapor-phase process.

[4] CONFIDENTIAL because publication would reveal operations of individual companies.

[5] Includes statistics reported by distillers of purchased tar only.

[6] Statistics reported here for creosote oil represent oil produced by byproduct coke-oven operators and are collected and compiled by the Coal Economics Division of the Bureau of Mines.

[7] Includes statistics reported to the Bureau of Mines by byproduct coke-oven operators and compiled by the Coal Economics Division, Bureau of Mines, in addition to those reported to the United States Tariff Commission by tar distillers.

[8] Statistics reported here for crude naphthalene represent naphthalene produced for sale by byproduct coke-oven operators and are collected and compiled by the Coal Economics Division of the Bureau of Mines. The grades, melting at less than 74° C., 74° to 76° C., and 76° to less than 79° C., represent production for sale.

[9] These statistics are for three grades of crude naphthalene: The grade solidifying at less than 74° C., produced for sale only; the grade solidifying between 74° C. and 76° C.; and the grade solidifying at more than 76° C., but less than 79° C. As there is some conversion between grades, the data include some duplication.

[10] Statistics of production, consumption, and stocks of acetylsulfathiazole are included with those of sulfa drugs.

Source: Statistics collected and compiled by the U. S. Tariff Commission and issued jointly by the U. S. Tariff Commission and the War Production Board.

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such as nonferrous smelting, the manufacture of rock wool, sugar refining, and a variety of other uses classified as "other industrial" increased slightly over 1942 but was 56 percent higher than in 1940.

Sugar Consumption Increases

Preliminary information shows that consumption of sugar in the United States during the first eight months of 1944 has been more than 450,000 tons higher than for the same period of 1943 and also higher than was anticipated earlier this year.

In addition, the equivalent of approximately 700,000 tons of sugar has been used in the form of high-test molasses for the manufacture of industrial alcohol. The enlarged wartime alcohol program covers largely the industrial need of the synthetic rubber program. Including the sugar-bearing materials so diverted to industrial alcohol, consumption of sugar in the United States currently is higher than in peacetime.

U. S. production of beet sugar for January through August totaled 47,000 tons. During the same period, 749,000 tons were distributed, thus reducing stocks of beet sugar from a total of 838,000 tons on January 1 to 136,000 tons on September 1. This is the lowest inventory recorded for this date by the Office of Distribution's Sugar Branch since 1935.

Production of cane sugar in the mainland area during the first eight months of 1944 was 84,000 tons, and arrivals in the United States from off-shore areas totaled 3,746,000 tons—making a total of 3,830,000 tons for the period. Distribution, on the other hand, totaled 4,181,000 tons. This excess of distribution over production and arrivals, after minor adjustments, reduced stocks of cane sugar from the 928,000 tons on hand January 1 to 545,000 tons on hand September 1.

With the Axis dominating important sugar-producing areas, notably Java and the Commonwealth of the Philippines, the Caribbean area has become increasingly important as the sugar granary of the United States and our Western allies. This, together with shipping difficulties, and reduced production in some domestic areas, made rationing necessary and later resulted in international allocation.

In addition, industrial users have received 80 percent of their 1941 use of sugar during the first eight months of 1944, whereas in the first seven months of 1943, they received only 70 percent. The quota was raised because the improved shipping situation had resulted in increased arrivals from off-shore areas.

Sugar Statistics—January-August 1, 1944
(thousands of short tons, raw value)

	Beet Sugar	Cane Sugar[2]	Total[2]
Stocks January 1, 1944	838	928	1,766
Production and arrivals, Jan.-Aug.	47	3,830	3,877
Distribution	749	4,181	4,930
Stocks, September 1, 1944	136	545	681

Breakdown of Distribution, January-August 1944 and 1943
(thousands of short tons, raw value)

	1944[1]	1943	Increase
Total	4,930	4,447	483
For export and military, as sugar	534	513	21
Civilian (and non-civilian manufactured articles for melting, lend-lease and similar needs)	4,396	3,934	462

[1] August data preliminary.
[2] Failure of data to balance due to preliminary reports and other minor adjustments.

Sulfuric Acid Capacity Expanded

The sulfuric acid industry of the nation will achieve peak capacity of 9,426,600 tons per year around June 30, 1945, when plants now being constructed have been completed, the War Production Board has announced.

This increase from 1943 capacity of 8,303,100 tons will not, however, make it possible for the industry to keep up with demands, the WPB said. Demands for 1944 are expected to reach 10,556,200 tons, compared with an estimated supply of 9,650,700 tons for this period. For the first six months of 1945 demand is expected to be 5,663,600 tons compared with an estimated supply of 5,251,000 tons. The figures are exclusive of ordnance requirements. Some of the deficit is expected to be made up by re-use of spent acid from ordnance plants.

The WPB said the 9.4 million-ton peak capacity will be reached following completion of new plants this year and next at Standard Wholesale & Phosphate Co., Baltimore; Davison Chemical Co., Baltimore; General Chemical Co., Front Royal, Va.; Consolidated Chemical Co., Houston; Stauffer Chemical Co., Dominguez, Calif.; Garfield Chemical Co., Garfield, Utah; and Consolidated Chemical Co., Baton Rouge.

Production of Wood Pulp, by Process, 1940-1943[1, 2]

Process	Production in tons of 2,000 pounds			
	1940	1941	1942	1943
All processes	8,959,559	[3]10,375,422	[3] [4]10,783,430	[4]9,626,705
Mechanical, total[2]	1,842,875	2,152,487	[4]2,276,126	[4]2,130,302
Groundwood[2]	1,578,530	1,787,712	1,756,333	1,563,960
Defibrated, exploded, asplund fiber and similar grades[2]	264,345	364,775	[4]519,793	[4]566,342
Sulphite fiber, total	2,607,789	2,918,780	2,930,272	2,436,502
Unbleached	995,700	1,215,649	1,213,066	883,306
Bleached	1,612,089	1,703,131	1,717,206	1,553,196
Sulphate fiber, total	3,747,992	[3]4,526,611	[3]4,738,266	4,235,724
Unbleached	3,163,378	[3]3,703,502	3,926,814	3,486,535
Semi-bleached	131,332	163,915	158,862	147,040
Bleached[5]	453,282	659,194	652,590	602,149
Soda fiber, bleached and unbleached[5]	532,387	479,935	462,065	418,868
Semi-chemical, off quality, screenings and miscellaneous[2]	228,516	297,609	376,701	405,309

[1] Source: 1943 and the last nine months of 1942, Pulp Allocation Office, Forest Products Bureau, War Production Board; the first three months of 1942, and the years 1941 and 1940, Bureau of the Census.

[2] Data on the production and consumption of wood pulp have been revised to show separately information on "Defibrated, exploded, asplund fiber and similar grades" of pulp. This classification covers pulp manufactured by such recently developed pulping processes as wet refining, steam explosion and dry pressing in hammer mills. The pulps produced by these processes are used in the manufacture of high strength building papers and wall board. Data for these types of pulp were previously included in "Groundwood" and "Semi-chemical, off quality, screenings and miscellaneous" pulps, and information for the years prior to 1940 has not yet been revised on the new basis. However, these processes are recent developments in the field of pulp manufacture, and it is believed that the production of these types of pulp represented a much smaller proportion of all pulp produced in the earlier years than has been the case since 1940.

[3] Revised to exclude data for one Canadian mill formerly reported by the parent company in the United States as a United States mill.

[4] Revised in accordance with corrected reports of three mills for 1942 and 1943.

[5] The data for "Soda fiber" and "Bleached sulphate fiber" pulp have been revised in accordance with the corrected reports of one company.

Use of Lead Scrap Up in July

Consumption of lead-base scrap in July was up again to the May level, after a 16 percent rise from the June low point, according to the Bureau of Mines, United States Department of the Interior. During the first three months of 1944 there was not much variation in consumption from a mean of about 36,000 short tons per month, but during the next four months the rate of activity exhibited comparatively large variations and the mean monthly consumption dropped to about 32,000 tons.

The increase in lead scrap consumption, from 28,913 tons in June to 33,470 tons in July, is accounted for by an increase in the melting of battery lead plates from 16,861 tons in June to 19,356 tons in July, a sharp rise of 857 tons or 115 percent in the remelting of common babbitt scrap, and by moderately increased consumption of most other lead scrap items. The only item whose use decreased more than a nominal amount was type- and lead-babbitt dross of which 1,337 tons were treated in July compared with 1,809 tons in June. Receipts of lead scrap by smelters and remelters did not vary much from the June figures either in total or in the individual items. Consumers' stocks dropped 3 percent or 1,920 tons to 71,141 tons at the end of July which is 11 tons below the monthly average for the first 7 months of 1944. Inventories of most of the different kinds of scrap declined moderately, but stocks of battery lead plates fell to 27,413 tons from 28,637 tons at the end of June.

The estimated recoverable lead content of lead-base scrap consumed in July totaled 23,926 short tons compared with 20,594 tons in June and emerged in pig metals and fabricated products approximately as follows:

	June (Per cent)	July (Per cent)
In antimonial lead	51	52
In soft lead	24	24
In solder	10	10
In bearing metals	7	8
In type metals	8	6
	100	100

Production of secondary white metal pigs and bars increased 970 tons in July to 21,894 tons; shipments to consumers decreased to 21,696 tons compared with 22,368 tons in June and stocks held by smelters at the end of July totaled 18,027 tons compared with 17,826 tons at the end of June.

Phosphate Rock Production Up

Total mine production of phosphate rock in the first half of 1944, according to reports of producers to the Bureau of Mines, United States Department of the Interior, was over a quarter of a million tons greater than in the similar period of 1943, reaching 2,851,561 long tons. Phosphate rock sold or used in the first half of 1944, 2,682,601 tons, was over 300,000 tons greater than the corresponding period of 1943, and the value, $10,183,358, was more than a million and a half dollars greater. The average value of phosphate rock sold or used increased from $3.67 in the first half of 1943 to $3.80 in the similar period of 1944, increases being shown in nearly all classes of rock. Total stocks in producers' hands decreased, owing largely to the marked decline in Florida stocks.

Wartime restrictions prevent the publication of data on phosphate rock imports or exports for the first six months of either 1943 or 1944. These restrictions likewise prohibit the showing of apparent domestic consumption during the first half of either of these years.

Phosphate-rock industry in the U. S. January-June 1943-44

	1943			1944		
		Value at mines			Value at mines	
	Long tons	Total	Average	Long tons	Total	Average
Production (mined)	2,581,795	[1]	[1]	2,851,561	[1]	[1]
Sold or used by producers:						
Florida:						
Land pebble	1,590,418	$5,204,696	$3.27	1,876,080	$6,434,749	$3.43
Soft rock	24,814	115,219	4.64	34,705	157,368	4.53
Hard rock	15,328	85,387	5.57	12,830	82,718	6.45
Total, Florida	1,630,560	5,405,302	3.31	1,923,615	6,674,835	3.47
Tennessee[2 3]	636,321	2,854,912	4.49	620,584	2,872,425	4.63
Idaho	60,204	282,151	4.69	58,163	302,969	5.21
Montana	32,530	125,607	3.86	80,239	333,129	4.15
Virginia	[3]	[3]	[3]	[3]	[3]	[3]
Total, United States	2,359,615	8,667,972	3.67	2,682,601	10,183,358	3.80
Stocks in producers' hands, June 30:						
Florida	1,400,000	[1]	[1]	881,000	[1]	[1]
Tennessee[2 3]	545,000	[1]	[1]	[4]405,000	[1]	[1]
Other	2,000	[1]	[1]	5,000	[1]	[1]
Total stocks	1,947,000	[1]	[1]	[4]1,291,000	[1]	[1]

[1] Figures not available.
[2] Virginia included with Tennessee.
[3] Includes brown-rock matrix of sinter grade and sintered brown rock.
[4] Does not include plant stocks of washer-grade matrix.

In the first half of 1944, phosphate rock was mined in Florida, Tennessee, Idaho, and Montana, and apatite in Virginia. Florida, as usual, was the leading shipper, its marketed production being over three times that of Tennessee, its nearest competitor. Shipments of Florida land pebble and soft rock increased, but those of hard rock declined. The average values of land pebble and hard rock increased, the latter considerably. The average reported value of soft rock declined slightly. Total values of shipments of land pebble and soft rock were greater in the first six months of 1944 than in the similar period of 1943, but that of hard rock was less. The quantity of Tennessee rock sold or used in the first half of 1944 was considerably less than in the corresponding period of 1943, but a slight increase was shown in the total value. Idaho showed a decrease in the quantity of phosphate rock sold or used in the first six months of 1944 over the January to June period of 1943, with an increase in both average and total values. Montana shipments in the first six months of 1944 were more than double those of the corresponding period of 1943, with increases in total and average values.

Lime Sales Increase

Entry of the United States from the construction into the production phase of the war program last year raised total sales of "open-market" lime, as reported to the Bureau of Mines, to 6,596,615 tons, a new record high exceeding the 1942 record level by 8 per cent. Sales of hydrated lime amounted to 1,313,388 tons while quicklime sales aggregated 5,283,227 tons.

Total lime sales for chemical and industrial uses last year amounted to 4,307,799 tons, 14 per cent over the 1942 level, and distributed as follows (in tons): carbide and cyanide, 355,092; glassworks, 208,166; insecticides and disinfectants, 75,125; metallurgical, steel flux, 1,174,654; ore concentration, 680,343; other, 45,471; paper mills, 543,335; tanneries, 69,222; water purification, 395,830, and other, 760,561. With the exception of the paper and tanning industries, all sales were higher than 1942 levels.

Due in part to increased use of dead-burned dolomite as a patching material in open-hearth and electric furnaces, sales of refractory lime (dead-burned dolomite) in 1943 amounted to 1,276,725 tons, as compared with 1,229,357 tons for the preceding year.

Factory and Warehouse Stocks of Various Oils:
(In 1000 pounds)

	Aug. 31, 1944	July 31, 1944	Aug. 31, 1943
Cottonseed, crude	29,589	30,186	32,588
Cottonseed, refined	183,448	241,270	139,909
Peanut, crude	9,814	10,080	11,280
Peanut, refined	32,852	35,920	29,376
Coconut, crude	100,013	113,050	153,142
Coconut, refined	3,293	3,366	3,682
Corn, crude	11,429	10,330	3,682
Corn, refined	8,927	11,218	15,953
Soybean, crude	106,858	134,000	120,657
Soybean, refined	126,923	131,117	90,596
Palm, crude	54,074	58,111	74,937
Palm, refined	37	43	326
Babassu, crude	5,491	2,411	9,603
Babassu, refined	197	105	447
Rapeseed	15,639	17,092	23,694
Linseed	322,952	320,267	177,211
China wood or tung	24,597	25,042	28,184
Castor	53,376	56,528	43,845
Sesame	3,730	1,904	1,451
Oiticica	4,585	4,723	6,510

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(*Continued from page 822*)

have been lifted for cellulose acetate butyrate and cellulose acetate for the manufacture of civilian plastics. This action, taken early in October, also eased civilian restrictions for urea and melamine resins although a fortnight later the board found it necessary to tighten the urea-melamine control as noted previously.

Heavy Chemicals. Where manpower availability permits, outputs are being pushed to meet fourth quarter war requirements. Contract shipments of alkalies, ammonia, chlorine, acids and many metal derivatives are increasing, leaving little or nothing available for sale on the spot markets. Some of the chrome chemicals reflect this development by strengthening prices in resale quarters. Sodium bichromate, for example, is reported available as high as 10¢ lb. for small lots compared with recent quotations of around 8½¢ for immediate delivery. It is also understood that solid caustic soda is named by some dealers up to $2.40 per 100 lbs. Increased demands are reported for calcium chloride for dehydration and moisture and ice control, and for activated carbon, which is utilized more extensively in water treatment, penicillin extraction and purification, and other industrial uses. Potassium compounds in general are somewhat difficult to obtain in desired quantities, including potassium hydroxide, potassium permanganate and potassium carbonate.

Fine Chemicals. Offerings of imported tartaric acid have been made in the market at from 75½¢ to 75¢ lb., according to quantity, or at levels which are said to be only a few cents above the domestic manufacturers' prices. Brazilian menthol quotations have fluctuated considerably under the influence of crop and weather news in the producing country, and at this writing is slightly firmer at $15 to $16 per lb. Penicillin is appearing in larger quantities as the result of expanded production and prices quoted to hospitals, are over the wide range of $2.40 to $6 per 100,000 units. The inside quotation compares with the previous low of $3.20. There has been some improvement in the supply of salicylates. The large manufacturers of synthetic camphor continue to lag in the matter of deliveries despite heavy production. Chemical manufacturers have effected further price reductions for the synthetic vitamins. Riboflavin (B_2) was reduced $30 per kilo to $200 in quantities of 100 grams or more. Thiamin hydrochloride (B_1) was given a further reduction of $20 per kilo to $160.

Coal Tar Products. Benzidine aromatic naphtha, dinitrophenol and xylene are among surplus offerings listed recently by the Defense Supplies Corp. for sale, but the quantities are still too small to interest the trade. The largest benzol allocation in October was made for phenol processes—2,050,000 gallons; aniline was accorded 1,282,600, chlorobenzene 638,824, and solvents 444,429 gallons. The bulk of benzol production continued to go to ethylbenzene-styrene processes and for aviation gasoline blends. Supplies of naphthalene have been denied for moth repellent, excepting "hardship" cases. Pyridine also is being allocated carefully because of continued large requirements for sulfapyridine, medicinals, water repellents, dyes and rubber chemicals. Its use in vitamin manufacture is restricted to 65 per cent of requests.

Paint Materials. Chrome pigments continue in short supply for civilian use and have become the special concern of the WPB Chemicals Bureau. Chromium oxide green and zinc chromate are now available only to essential military uses where the specific uses of these pigments is shown and where resort to substitutes is not possible. Alkyd resins for synthetic coatings were given only 66 per cent of the phthalic anhydride requested. A reserve of phthalic is maintained for interim allocations of alkyds for military uses only. A currently larger supply of glycerin available for coatings cannot be utilized by the industry because of the phthalic bottleneck. A strong tone in linseed oil reflects a tight supply situation in flaxseed. Large crushers announced a change in the method of selling linseed oil in drums by reverting to a non-returnable drum basis. Refined fish oils recently have developed easier price trends.

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ROTAMETERS

24. *The Case of the Incompetent Clerk*

The Munroe bank held a draft drawn on Chemist Smith to pay for certain raw materials, Smith filled out a check payable to the bank for the required amount, left it unsigned on his desk, forgot about the matter until the next morning, and the check could not be found.

"Must have got in the waste basket," Smith assured himself, made out a new check for the bank and forgot all about the missing one.

A week later Chemist Smith discharged his bookkeeper for general incompetence, and when he received his next monthly statement from the bank he noticed that the check in question had been charged twice.

"What does this mean?" Smith demanded, the bank investigated, and ascertained that the bookkeeper had stolen the missing check, forged Chemist Smith's signature, added an "s" after the word "bank" and had cashed the check in a distant city under the name of "Munroe Banks." Then, when the check came in, it had been paid and charged to Smith's account.

"You know the law is that you can't charge a forged check to me, so you'll have to credit this back to my account," Smith pointed out.

"That may be true, as a general proposition, but it doesn't hold when there's been any carelessness on your part," the bank countered.

"Where have I been careless?"

"In not reporting that there was a missing check, especially after you had to fire the bookkeeper."

This point came before the Pennsylvania Supreme Court in the case of Pure Oil Pipe Line vs. Columbia N. Bank, reported in 119 Atlantic Reporter, 607, where the Court ruled in Chemist Smith's favor.

"The single question is whether Smith, on ascertaining that an unsigned check was missing, owed the bank the duty of reporting to it that fact. In our opinion no such duty existed. There is no contention that the bookkeeper had authority to sign Smith's name to checks.

Stained Paper Bags

"Ship No. 7 paper bags with bill of lading attached to a draft for the price," Chemist Smith wrote, the car was wrecked in transit, the bags specified in the order were stained by ditch water, and the manufacturer demanded payment of the draft.

"I got no bags," Smith protested. "You took the bill of lading in your own name, and the shipment was yours till I got the B'Lading."

"No—it was yours as soon as I loaded it," the manufacturer contended, the parties went to court, and the Supreme Court of South Carolina in Greenwood Grocery Co. vs. Canadian Company reported in 5 A.C. 261, ruled in Chemist Smith's favor.

"Taking the bill of lading making the goods deliverable to the order of the seller, who is himself the consignor, is very strong evidence that the seller in delivering the goods to the carrier intended to reserve the title until payment of the purchase money, and when a draft for the price is drawn on the purchaser with such bill of lading attached the title does not ordinarily pass to him until the draft is paid," said the Court, and the same rule has been laid down by the Courts of Georgia, Alabama, California, Illinois, Iowa, Kentucky, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New York, Montana, Ohio, Pennsylvania, North Carolina, Tennessee and Virginia.

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Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00
Oct., '42, $0.924 Oct., '43, $0.899 Oct., '44, $0.881

	Current Market		1944 Low	1944 High	1943 Low	1943 High
Acetaldehyde, 99%, drs. wks. lb.	.11	.14	.11	.14	.11	.14
Acetic Anhydride, drs, ...lb.	.11½	.13	.11½	.13	.11½	.13
Acetone, tks, delv ....lb.	...	.07	...	.07	...	.07
ACIDS						
Acetic, 28%, bbls ....100 lbs.	3.38	3.63	3.38	3.63	3.38	3.63
glacial, bbls. ....100 lbs.	9.15	9.40	9.15	9.40	9.15	9.40
tks, wks. ....100 lbs.	6.93	7.25	6.93	7.25	...	6.93
Acetylsalicylic, Standard USP ....lb.	.40	.54	.40	.54	.40	.54
Benzoic, tech, bbls. ....lb.	.43	.47	.39	.47	.39	.47
USP, bbls, 4,000 lbs. up lb.	...	.54	...	.54	...	.54
Boric, tech, bbls, c-l, ...ton *a*	...	109.00	...	109.00	...	109.00
Chlorosulfonic, drs, wks. ..lb.	.03	.04½	.03	.04½	.03	.04½
Citric, crys, gran, bbls, lb. *b*	.20	.24	.20	.24	.20	.24
Cresylic 50%, 210-215° HB, drs, wks, frt equal gal.	.81	.83	.81	.83	.81	.83
Formic, Dom. cbys ......lb.	.10½	.11½	.10½	.11½	.10½	.11½
Hydrofluoric, 30% rubber, dms. ....lb.	.08	.09	.08	.09	.08	.09
Lactic, 22%, lgt, bbls wks lb.	.039	.0415	.039	.0415	.039	.0415
44%, light, bbls wks ...lb.	.073	.0755	.073	.0755	.073	.0755
Maleic, Anhydride, drs....lb.	.25	.26	.25	.26	.25	.26
Muriatic, 18° cbys ...100 lb.	1.50	1.75	1.50	1.75	1.50	2.45
20° cbys, c-l, wks ..100 lb.	...	1.75	...	1.75	...	1.75
22° cbys, c-l, wks ..100 lb.	...	2.25	...	2.25	...	2.25
Nitric, 36°, cbys, wks 100 lbs. *c*	5.00	5.25	5.00	5.25	5.00	5.25
38°, c-l, cbys, wks 100 lbs. *c*	...	5.50	...	5.50	...	5.50
40°, c-l, cbys, wks 100 lbs. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks 100 lbs. *c*	...	6.50	...	6.50	...	6.50
Oxalic, bbls, wks ....lb.	.11¼	.12½	.11¼	.12½	.11¼	.12½
Phosphoric, 100 lb. cbys, USP ....lb.	.10½	.13	.10½	.13	.10½	.13
Salicylic, tech, bbls ....lb.	.26	.42	.26	.42	.26	.44
Sulfuric, 60°, tks, wks ..ton	...	13.00	...	13.00	...	13.00
66°, tks, wks ....ton	...	16.50	...	16.50	...	16.50
Fuming (Oleum) 20% tks. wks ....ton	...	19.50	...	19.50	...	19.50
Tartaric, USP, bbls ......lb.	...	.70½	...	.70½	...	.70½
Alcohol, Amyl (from Pentane) tks, delv ....lb.	...	.131	...	.131	...	.141
Butyl, normal, syn, tks..lb.	...	.10¾	...	.10¾	.10¾	.14½
Denatured, CD 14, c-l drs, ...gal. *d*	...	.54½	...	.54½	...	.54½
Denatured, SD, No.1, tks. *d*	...	.50	...	.50	...	.50
Ethyl, 190 proof tks...gal.	...	17.60	...	17.60	...	11.90
Isobutyl, ref'd, drs ....lb.	...	.086	...	.086	...	.086
Isopropyl ref'd, 91%, dms ....gal.	.39	.66½	.39	.66½	.39	.66½
Propyl, nor, drs, wks gal.	.67	.76	.67	.76	.67	.70
Alum, ammonia, lump, bbls, wks ....100 lb.	...	4.25	...	4.25	...	4.25
Aluminum, 98-99% ..100 lb.	15.00	16.00	15.00	16.00	15.00	16.00
Chloride anhyd dms wks lb.	.09	.12	.08	.12	.08	.12
Hydrate, light ....lb.	.14½	.15	.14½	.15	.14½	.15
Sulfate, com'l. bgs, wks, c-l ....100 lb.	1.15	1.25	1.15	1.25	1.15	1.25
Sulfate, iron-free, bgs. wks ....100 lb.	1.85	2.10	1.85	2.50	1.75	2.50
Ammonia anhyd, cyl ......lb.	...	.16	...	.16	...	.16
Ammonium Carbonate, lumps, dms ....lb.	.08½	.09¼	.08½	.09¼	.08¼	.09¼
Chloride, whi, bbls, wks, 100 lb.	4.45	5.15	4.45	5.15	4.45	5.15
Nitrate, tech. bags, wks..lb.	.0435	.0850	.0435	.0850	.0435	.0850
Oxalate pure, grn. bbls..lb.	.27	.33	.27	.33	.27	.33
Perchlorate, kgs ....lb.	.55	.65	.55	.65	.55	.65
Phosphate, dibasic tech, bbls ....lb.	.07¼	.08½	.07¼	.08½	.07¼	.08½
Stearate, anhyd, dms ...lb.	...	.34	...	.34	...	.34
Sulfate, dms, bulk.....ton	28.20	29.20	28.20	29.20	28.20	30.00
Amyl Acetate (from pentane) c-l, drs, delv ....lb.	...	.15½	...	.18½	...	.18½
Aniline Oil, drs ....lb.	.11½	.12½	.11½	.12½	.11½	.12½
Anthraquinone, sub, bbls..lb.	...	.70	...	.70	...	.70
Antimony Oxide, bgs .....lb.	.15	.15½	.15	.15½	.15	.15½
Arsenic, whi, kgs—powd..lb.	.04	.04¾	.04	.04¾	.04	.04¾

USP $25 higher; Prices are f.o.b. N. Y., Chicago, St. Louis, deliveries ½c higher than NYC prices; y Price given is per gal; c Yellow grades 25c per 100 lbs less in each case; *d* Prices given are Eastern schedule, *a* Powdered boric acid $5 a ton higher; *b* Powdered citric acid is ½c higher.

Current Prices

	Current Market		1944 Low	1944 High	1943 Low	1943 High
Barium Carbonate precip, wks ....ton	60.00	75.00	55.00	75.00	55.00	65.00
Chloride, tech, cyst, bgs, zone 1 ....ton	73.00	78.00	73.00	90.00	77.00	90.00
Barytes, floated, bbls. ....ton	...	36.00	...	36.00	...	36.00
Bauxite, bulk mines......ton	7.00	10.00	7.00	10.00	7.00	10.00
Benzaldehyde,tech,cbys,dms lb.	.45	.55	.45	.55	.45	.55
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd gal.	...	.15	...	.15	...	.15
Benzyl Chloride, cbys ....lb.	.22	.24	.22	.28	.22	.25
Beta-Naphthol, tech, bbls, wks ....ton	.23	.24	.23	.24	.23	.24
Bismuth metal, ton lots...lb.	...	1.25	...	1.25	...	1.25
Blanc Fixe, 66⅔% Pulp, bbls, wks ....ton *h*	40.00	46.50	40.00	46.50	40.00	46.50
Bleaching Powder, wks, 100 lb.	2.50	3.60	2.50	3.60	2.50	3.60
Borax, tech, c-l, bgs ....ton *i*	...	45.00	...	45.00	...	45.00
Bordeaux Mixture, drs ...lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases ....lb.	.25	.30	.25	.30	.25	.30
Butyl, acetate, norm drs, lb.	.1895	.1945	.1755	.1945	.1575	.1840
Cadmium Metal ....lb.	.90	.95	.90	.95	.90	.95
Calcium, Acetate, bgs. 100 lb.	3.00	4.00	3.00	4.00	3.00	4.00
Carbide, drs ....ton	50.00	95.00	50.00	95.00	50.00	95.00
Carbonate, c-l bgs,.....ton	21.00	25.00	21.00	25.00	18.00	22.00
Chloride, flake, bgs c-l ton	18.50	35.00	18.50	35.00	18.50	35.00
Solid, 73-75% drs, c-l, ton	18.00	31.50	18.00	31.50	18.00	31.50
Gluconate, U.S.P., drs. lb.	.57	.58	.57	.58	.57	.58
Phosphate, tri, bbls, cl ..lb.	...	.0635	.0635	.0785	.0635	.0785
Camphor, U.S.P., gran, powd, bbls ....lb.	.69	.71	.68½	.71	.68½	.70½
Carbon Bisulfide, 55-gal drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Dioxide, cyl ....lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, Zone 1, 52½ gal. drms ......lb.	.73	.80	.73	.80	.73	.80
Casein, Acid Precip, bgs, 100 or more ....lb.	...	.24	...	.24	...	.24
Chlorine, cyls, lcl, wks, contract ....lb.	...	.07¼	...	.07¼	...	.07¼
cyls, c-l, contract ...lb. *j*	...	.05¼	...	.05¼	...	.05¼
Liq, tk, wks, contract 100 lb.	...	1.75	...	1.75	...	1.75
Chloroform, tech, drs .....lb.	.20	.23	.20	.23	.20	.23
Coal tar, bbls, crude ....bbl.	8.25	8.75	8.25	8.75	8.25	8.75
Cobalt Acetate, bbl ....lb.	...	.83¾	...	.83¾	...	.83¾
Oxide, black kgs ......lb.	...	1.84	...	1.84	...	1.84
Copper, metal ....100 lb.	12.00	12.50	12.00	12.50	12.00	12.50
Carbonate, 52-54%, bbls.lb.	.19½	.20½	.19½	.20½	.19½	.20½
Sulfate, bgs, wks crypt. ....100 lb.	5.00	5.50	5.00	5.50	5.00	5.50
Copperas, bulk, c-l, wks ..ton	...	14.00	...	14.00	...	14.00
Cresol, USP, drs ....lb.	.10¾	.11¾	.10¾	.11¾	.10¾	.11¾
Cyanamid, bgs ....ton	1.52½	1.62½	1.52½	1.62½	1.52½	1.62½
Dibutylamine, c-l, drs, wks lb.	...	.61	...	.61	...	.61
Dibutylphthalate, drs .....lb.	.2020	.2359	.1780	.2500	.2060	.2300
Diethylaniline, lb drs .....lb.	...	.40	...	.40	...	.40
Diethyleneglycol,drs,lcl.wks lb.	.14½	.15½	.14	.15½	.14	.15½
Dimethylaniline, dms.cl.,lcl lb.	.23	.24	.23	.24	.23	.24
Dimethyl phthalate, drs ..lb.	.1875	.1925	.1875	.1925	.1875	.2050
Dinitrobenzene, bbls ......lb.	...	.18	...	.18	...	.18
Dinitrochlorobenzene, dms lb.	...	.14	...	.14	...	.14
Dinitrophenol, bbls ....lb.	...	.22	...	.22	...	.22
Dinitrotoluene, dms ......lb.	...	.18	...	.18	...	.18
Diphenyl, bbls lcl. wks ....lb.	.16	.20	.16	.20	.15	.20
Diphenylamine bbls ......lb.	...	.25	...	.25	...	.25
Diphenylguanidine, drs ...lb.	...	.35	...	.35	.35	.37
Ethyl Acetate, tks, frt all'd lb.	.1070	.1175	.1070	.1175	.107	.110
Chloride, drs ....lb.	.18	.20	.18	.20	.18	.20
Ethylene Dichloride, lcl. wks, E. Rockies, dms .....lb.	...	.0891	...	.0891	...	.0842
Glycol, dms, cl. ....lb.	...	.10	...	.10	...	.10
Fluorspar, No. 1, grd. 95-98% bulk, cl-mines ....ton	...	37.00	...	37.00	...	37.00
Formaldehyde, c-l, bbls, kgs, wks ....lb.	...	.0520	.0550	.06	.0550	.0575
Furfural tech, dms, c-l,wks lb.	...	.13	...	.13	...	.12½
Fusel Oil, refd, dms, dlvd lb.	.18½	.19½	.18½	.19½	.18½	.19½
Glauber's Salt, Cryst,c.l.,bgs, wks ....100 lb.	1.05	1.25	1.05	1.25	1.05	1.25
Glycerin dynamite, dms, c-l, ...lb.	...	.14½	...	.14½	...	.18¾
Crude Saponification, 80% to refiners tks ......lb.	...	.11¼	...	.11¼	...	.12¾

GUMS

	Current Market		1944 Low	1944 High	1943 Low	1943 High
Gum Arabic, amber sorts bgs ....lb.	.11½	.13	.11½	.14	.13½	.17½
Benzoin Sumatra, CS ....lb.	.52	1.00	.52	1.00	.52	1.00
Copal, Congo ....lb.	...	.55¾	...	.55¾	...	.55¾
Copal, East India, chips ..lb.	...	.12	...	.12	...	.12
Macassar dust ....lb.	...	.05½	...	.07⅜	.07⅜	.11¾
Copal Manila,	.13½	.15½	.13½	.15½	.13½	.15½
Copal Pontianak, bold c-l lb.	...	.23⅜	...	.23⅜	...	.23⅜
Ester ....lb.	.09½	.12	.09½	.12	.09½	.12
Karaya, bbls, bxs, dms, ...lb.	.18	.40	.18	.40	.14	.40

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.
y Price given is per gal.

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265 Lake Street, Mundelein, Ill.

	Current Market		1944 Low	1944 High	1943 Low	1943 High
Kauri, N Y						
Superior Pale XXX....lb.	...	.65¾	...	.65¾	...	.65¼
No. 3 ....lb.	...	.22	...	.22	...	.22
Sandarac, cs ....lb.	...	.99½	...	.99½	1.40	nom.
Tragacanth, No. 1, cases lb.	4.50	5.00	4.00	5.25	4.00	5.25
No. 3 ....lb.	2.75	3.00	1.10	3.50	1.10	1.20
Yacca, bgs ....lb.	.06	.07¼	.06	.07¼	.06	.07¼
Hydrogen Peroxide, cbys ..lb.	.15½	.18½	.15½	.18½	.15½	.18½
Iodine, Resublimed, jars..lb.	2.00	2.10	2.00	2.10	2.00	2.10
Lead Acetate, cryst, bbls...lb.	...	.12½	...	.12½	...	.12½
Arsenate, St. bg, lcl ....lb.	.11½	.12	.11½	.12	.11½	.12
Nitrate, bbls ....lb.	...	.12½	...	.12½	...	.12½
Red, dry, 95% Pb_3O_4, lcl lb.	.09	.10¼	.09	.11	.09	.11
97% Pb_3O_4 bbls delv..lb.	.09¼	.11	.09¼	.11	.09¼	.11
98% Pb_3O_4, bbls delv..lb.	.09½	.10½	.09½	.11¼	.09½	.11¼
White, bbls ....lb.	.08¼	.08¾	.08¼	.08¾	.08¼	.08¾
Basic sulfate, bbls, lcl lb.	.07½	.08	.07¼	.08	.07¼	.08
Lime, Chem., wks, bulk..ton	6.25	13.00	6.25	13.00	6.25	13.00
Hydrated, f.o.b. wks ..ton	8.50	16.00	8.50	16.00	8.50	16.00
Litharge, coml, delv, bbls lb.	.08	.09¾	.08	.09¾	.08	.09¾
Lithopone, ordi., bgs......lb.	.04¼	.04¾	.04¼	.04¾	.04¼	.04¾
Magnesium Carb, tech, wks lb.	.06¼	.09¾	.06¼	.09¾	.06¼	.09¾
Chloride flake, bbls, wks c-l ....ton	...	32.00	...	32.00	...	32.00
Manganese, Chloride, Anhyd. bbls ....lb.	.15	.18	.15	.18	.14	nom.
Dioxide, Caucasian bgs, lcl ....ton	...	74.75	...	74.75	...	74.75
Methanol, pure, nat, drs gal *l*	.63	.76	.63	.76	.63	.76
Synth, drs cl........gal. *m*	.31	.38	.31	.40½	.34½	.40½
Methyl Acetate, tech tks..lb.	.06	.07	.06	.07	.06	.07
C.P. 97-99%, tks, delv lb.	.09½	.10½	.09½	.10½	.09½	.10½
Chloride, cyl ....lb.	.32	.40	.32	.40	.31	.40
Ethyl Ketone,tks,frt all'd lb.	...	.08	...	.08	...	.08
Naphtha, Solvent, tks ...gal.	...	.27	...	.27	...	.27
Naphthalene, crude, 74°, wks tks ....lb.	...	.0275	...	.0275	...	.0275
Nickel Salt, bbls, NY.....lb.	.13	.13½	.13	.13½	.13	.13½
Nitre Cake, blk ....ton	...	16.00	...	16.00	...	16.00
Nitrobenzene, drs, wks ...lb.	.08	.09	.08	.09	.08	.09
Orthonisidine, bbls ....lb.	...	.70	...	.70	...	.70
Orthochlorophenol, drs ...lb.	...	.32	...	.32	...	.32
Orthodichlorobenzene, drms lb.	.07	.08	.07	.08	.07	.08
Orthonitrochlorobenzene, wks ....lb.	.15	.18	.15	.18	.15	.18
Orthonitrotoluene, wks,dms lb.	...	.09	...	.09	...	.09
Para aldehyde, 98%, wks lcl. ....lb.	...	.12	...	.12	...	.12
Chlorophenol, drs ......lb.	..	.32	...	.32	...	.32
Dichlorobenzene, wks ..lb.	.11	.15	.11	.15	.11	.15
Formaldehyde, drs, wks.lb.	.21	.22	.23	.24	.23	.24
Nitroaniline, wks, kgs..lb.	.43	.45	.43	.45	.43	.45
Nitrochlorobenzene, wks lb.	...	.15	...	.15	...	.15
Toluenesulfonamide, bbls lb.	...	.70	...	.70	...	.70
Toluidine, bls, wks ....lb.	...	.48	...	.48	...	.48
Penicillin, hospitals, institutions, ampules per 100,000 units	2.40	2.60	2.40	4.50	...	...
For gov. purchases, ampules per 100,000 units	...	1.50	...	1.90	...	...
Pentaerythritol, tech. cl. lb.	.29	.33	.29	.33	.29	.35½

PETROLEUM SOLVENTS AND DILUENTS

	Current Market		1944 Low	1944 High	1943 Low	1943 High
Lacquer diluents, tks, East Coast ....gal.	...	11½	...	.11½	...	.11
Naphtha, V.M.P., East tks, wks ....gal.	...	.11	...	.11	...	.11
Rubber Solvents, standard, East, tks, wks ..gal.	...	.11	...	.11	...	.11
Stoddard Solvents, East, tks, wks ....gal.	...	.10	...	.10	...	.09½
Phenol, U.S.P., drs ......lb.	.10½	.11¼	.10½	.11¼	.10½	.13½
Phthalic Anhydride, cl and lcl, wks ....lb.	.13	.14	.13	.14	.13	.15½
Potash, Caustic, wks, sol lb.	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾
flake, 88-92% ....lb.	.07	.07½	.07	.07½	.07	.07½
liquid, tks ....lb.	...	.02¾	...	.02¾	...	.0275
dms, wks ....lb.	.03	.03½	.03	.03½	.03	.03½
Potassium Bichromate csks ....lb.	.09⅝	.10	.09⅝	.10	.09⅝	.10
Carbonate, hydrated 83-85% calc ....lb.	.05½	.05¾	.05½	.05¾	.05½	.05¾
Chlorate crys, bgs, wks lb.	.11	.13	.11	.13	.11	.13
Chloride, crys, tech, bgs, kgs ....lb.	.08	nom.	.08	nom.	.08	nom.
Cyanide, drs, wks ......lb.	...	.55	...	.55	...	.55
Iodide, bots., or cans...lb.	1.44	1.48	1.44	1.48	1.44	1.48
Muriate, dom, 60-62-63% K_2O bulk unit-ton...ton	...	.53½	...	.53½	.53½	.56
Permanganate, USP, wks dms ....lb.	.20½	.21	.20½	.21	.20½	.21
Sulfate, 90%, basis, bgs ton	...	36.25	...	36.25	...	36.25
Propane, group 3, tks....gal.	...	.03¾	...	.03¾	...	.03½
Pyridine, ref., drms ......lb.	.45½	.46	.45½	.46	.45½	.46
R Salt, 250 lb bbls, wks lb.	...	.65	...	.65	...	.65
Resorcinol, tech.,drms, wks lb	.68	.75	.68	.75	.68	.75
Rochelle Salt, cryst ......lb.	.43½	.47	.43½	.47	.43½	.47
Salt Cake, dom. blk wks .ton	...	15.00	...	15.00	...	15.00

l Producers of natural methanol divided into two groups and prices vary for these two divisions; *m* Country is divided in 4 zones, prices varying by zone.
* Spot price is ½c higher.

	Current Market		1944 Low	1944 High	1943 Low	1943 High
Saltpetre, grn, bbls ...100 lb.	8.20	8.60	8.20	8.60	8.20	8.60
Shellac, Bone dry, bbls ..lb. r	.42½	.46	.42½	.46	.42½	.46
Silver Nitrate, 100 oz, bots ....oz.	...	.32⅜	...	.32⅜	...	.32⅜
Soda Ash, 58% dense, bgs, c-l, wks ....100 lb.	...	1.15	...	1.15	...	1.15
58% light, bgs cl....100 lb.	...	1.13	1.05	1.13	...	1.13
Caustic, 76% flake drms, cl ....100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drms,cl 100 lb.	...	2.30	...	2.30	...	2.30
Liquid, 47-49%, sellers, tks ....100 lb.	...	1.95	...	1.95	...	1.95
Sodium Acetate, anhyd. dms ....lb.	.08½	.10	.05	.10	.05	.06
Benzoate, USP dms ....lb.	.46	.52	.46	.52	.46	.52
Bicarb, tech., bgs., cl., works ....100 lb.	1.55	1.90	1.55	2.05	...	...
Bichromate,cks,wks l.c.l. lb.	.07½	.07¾	.07½	.07¾	...	.07¾
Bislnte powd, bbls, wks ....100 lb.	3.00	3.60	3.00	3.60	3.00	3.60
35° bbls. wks ......100 lb.	1.40	1.65	1.40	1.65	1.40	1.65
Chlorate, bgs, wks c.l. lb.	...	.06¼	...	.06¼	...	.06¼
Cyanide, 96-98%, wks ..lb.	.14½	.15	.14½	.15	.14½	.15
Fluoride, 95%, bbls, wks lb.	.07¼	.08¼	.07¼	.08¼	.09¼	.08¼
Hyposulnite, cryst, bgs, cl, wks ....100 lb.	...	2.25	...	2.25	...	2.25
Metasilicate, gran, bbl, wks c-l ....lb.	...	2.50	...	2.50	...	2.50
Nitrate, imp, bgs.......ton	...	33.00	...	33.00	...	33.00
Nitrite, 96-98% dom, cl. lb.	...	.06¾	...	.06¾	...	.06¾
Phosphate, di wks ..100 lb.	6.00	7.25	6.00	7.25	6.00	7.25
Tri-bgs, cryst, wks 100 lb.	2.70	3.40	2.70	3.40	2.70	3.45
Prussiate, yel, bbls, wks lb.	.10	.10¼	.10	.10¼	.10	.11
Pyrophosphate,bgswks c-l lb.	.0528	.0610	.0528	.0610	.0528	.0610
Silicate, 52°,drs. wks 100 lb.	1.40	1.80	1.40	1.80	1.40	1.80
40°, drs, wks, c-l 100 lb.	...	.80	...	.80	...	.80
Silicofluoride, bbls NY ..lb.	.06½	.10	.06½	.12	.05	.12
Sulfate tech. Anhyd, bgs 100 lb.	1.70	1.90	1.70	1.90	1.70	1.90
Sulfide, cryst c-l, bbls, wks ....100 lb.	...	2.40	...	2.40	...	2.40
Solid, bbls, wks .....lb.	3.15	3.90	3.15	3.90	3.15	3.90
Starch, Corn, Pearl, bgs ....100 lb	...	4.08	...	4.08	...	3.47
Potato, bgs, cl ....lb.	...	.0637	...	.0637	...	.0637
Rice, bgs ....lb.	no stocks		no stocks		.09½	.10¼
Sweet Potato, bgs ..100 lb.	no stocks		...	.07½	...	.07½
Sulfur, crude, mines ....ton	...	16.00	...	16.00	...	16.00
Flour, USP, precp, bbls, kgs ....lb.	.18	.30	.18	.30	.18	.30
Roll, bbls............100 lb.	2.40	2.90	2.40	2.90	2.40	2.90
Sulfur Dioxide, liquid, cyl lb.	.07	.09	.07	.09	.07	.08
tks, wks ....lb.	...	.04	.04	.06	.04	.06
Talc, crude, c-l, NY .....ton	...	13.00	...	13.00	...	13.00
Ref'd, c-l, NY ......ton	13.00	21.00	13.00	21.00	13.00	21.00
Tin, crystals, bbls, wks ..lb.	no stocks		no stocks		no stocks	
Metal ....lb.	...	.52	...	.52	...	.52
Toluol, drs, wks ....gal.	...	.33	...	.33	...	.33
tks, frt all'd ....gal.	...	.28	...	.28	...	.28
Tributyl Phosphate, dms lcl, frt all'd ....lb.	...	.47	...	.47	...	.47
Trichlorethylene, dms, wks lb.	.08	.09	.08	.09	.08	.09
Tricresyl phosphate ....lb.	.24	.54½	.24	.54½	.24	.54½
Triethylene glycol, dms lcl lb.	.18½	.19½	.18½	.26	...	.26
Triphenyl Phos, bbls .....lb.	.31	.32	.31	.32	.31	.32
Urea, pure, cases ....lb.	...	.12	...	.12	...	.12
Wax, Bayberry, bgs ......lb.	no stocks		.25	nom.	.25	.26
Bees, bleached, cakes....lb.	...	.60	...	.60	...	.60
Candelilla, bgs crude...ton	.34½	.44½	.34½	.48	.38	.48
Carnauba, No. 1, yellow, bgs, ton ....lb.	.83¼	.93¼	.83¼	.93¼	.83¼	.93¼
Xylol, Indus. frt all'd, tks, wks ....gal.	...	.27	...	.27	...	.27
Zinc Chloride tech fused, wks ....lb.	.05	.0535	.05	.0535	.05	.0535
Oxide, Amer, bgs, wks..lb.	.07¼	.07½	.07	.07½	.07	.07½
Sulfate, crys, bgs, ..100 lb.	3.40	4.15	3.40	4.35	3.60	4.35

Oils and Fats

	Current Market		1944 Low	1944 High	1943 Low	1943 High
Babassu, tks, futures ....lb.	...	.111	...	.111	...	.111
Castor, No. 3, bbls ......lb.	.13¾	.14¼	.13¾	.14¼	.13¾	.14¼
China Wood, drs, spot NY lb.	...	.39	...	.39	...	.39
Coconut, edible, drs NY ..lb.	...	.0985	...	.0985	...	.0985
Cod Newfoundland, dms..gal.	.85	.88	.85	.90	...	.90
Corn, crude, tks, wks ....lb.	...	.12¾	...	.12¾	...	.12¾
Linseed, Raw, dms, c-l ...lb.	.1550	.1560	.1550	.1560	...	.1530
Menhaden, tks ....gal.	...	.1180	...	.1225	...	.1225
Light pressed, drs .....lb.	...	.1260	.1208	.1307	.1305	.1307
Oiticica, liquid, tks ......lb.	...	no stocks	.21	.25	...	.25
Oleo, No. 1 bbls, NY ....lb.	.13¾	nom.	.13¾	nom.	.13¾	nom.
Palm, Niger, dms ....lb.	...	.0865	...	.0865	...	.0865
Peanut, crude, tks, f.o.b. wks ....lb.	...	.13	...	.13	...	.18
Perilla, crude dms, NY...lb.	no stocks		...	.245	...	.245
Rapeseed, denat, bulk ....lb.	...	.1150	...	.1150	...	.1150
Red, dms ....lb.	.12¾	.13¾	.12¾	.14¾	.13¼	.14¼
Soy Bean, crude, tks, wks lb.	...	.1175	...	.1175	...	.1175
Tallow, acidless, bbls ....lb.	...	.14¼	...	.14¼	...	.14¼
Turkey Red, single, drs ..lb.	.10	.14½	.10	.14½	.10	.14½

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y., refined 6c higher in each case.

Quick Shortcut to Chemical Information

USES and APPLICATIONS of CHEMICALS and RELATED MATERIALS

A Guide to Their Current Industrial Uses, Potential Applications, and Sales Possibilities

Compiled and Edited by
THOMAS C. GREGORY
Specialist in Chemical Market and Literature Research

Volume II just published

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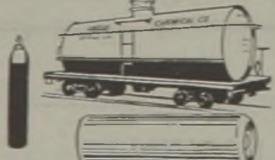

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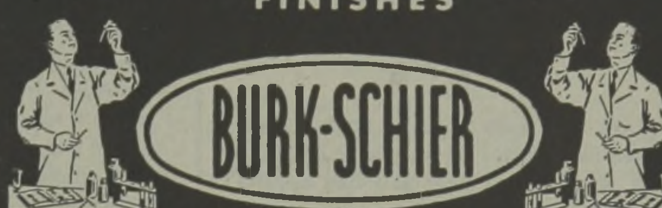

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"WE"-EDITORIALLY SPEAKING

PREDICTIONS of the postwar world are always fascinating, even if they are more fiction than fact. The Sunday supplements would have us believe, for instance, that the light metals will replace steel in a few years. The facts are that our aluminum and magnesium production totals 1.8 million tons annually, while iron and steel pour out of the furnaces at the rate of 100 million tons. That relatively insignificant 1.8 per cent will certainly not revolutionize our civilization. Plastics, light metals, plywood—all of these are marvelous, certainly, and have unique adaptabilities to many needs; but steel is, and will continue to be, the stuff of which our material society is made.

TO TRAVELERS in the Sahara Desert or farmers in Kansas dust storms are all part of a gritty routine. We used to think that the sandy clouds rolled from arid plains where the winds could shape them into devastating funnels or blankets. Now, however, we learn that dust clouds also occur on the floor of our Atlantic Ocean, nearly a quarter of a mile below the surface. The silt which lies at the bottom of the sea is much more volatile than top soil found in the "dust-bowl" area of the West. These flurries, which sometimes vanish in less than half a minute, are caused, according to theory, by swarms of fish which rest on the sandy floor, and upon disturbance take flight suddenly.

HAVE YOU EVER tried to read a rain-soaked newspaper? If so, you've probably tried to turn the page and had several columns tear off in your hand. Our troops, wading to a beachhead through three or four feet of ocean water, would have the same difficulty with their maps if they were printed on ordinary paper. They don't have this trouble, though, for military maps are printed on wet-strength paper—a triumph of chemistry which is described on page 734.

FRONT-LINE TROOPS can now enjoy fresh food from a combination shipping container, refrigerator and small depot. Twin slabs of steel, technically known as eutectic plates, form a hollow wall which contains in addition to the refrigeration coils a special chemical freezing mixture. This makes it possible for the unit to maintain low temperatures for several hours in the sun after mechanical refrigeration is no longer convenient.

Fifteen Years Ago
From Our Files of November, 1929

Lacquer Institute is formed by seventeen lacquer manufacturers whose combined output is claimed to be approximately 75 percent of domestic production.

Standard Oil Co. of New Jersey secures complete patent rights to the process for the hydrogenation of coal, oil and allied materials, for all points outside of Germany, under the terms of an agreement concluded with the I. G. Farbenindustrie.

The controlling interest in Pure Carbonic Co. of America is acquired by Air Reduction Co. and U. S. Industrial Alcohol Co.

American Cyanamid Co. acquires the assets and business of the American Powder Co. with plants in Maynard, Mass. The latter company is one of the oldest manufacturers of explosives in the country.

Aluminum chloride's prevailing low prices in this country is said to be interesting French and German chemical companies. Their reaction is that its use might be considerably enlarged by its adoption for the rapidly developing oil refining industry and various synthetic uses for which it is known to be useful or will be adapted to, depending upon its price.

Bradley Stoughton, head of department of metallurgy, Lehigh University, is awarded Grasselli Medal for 1929 at a joint meeting of the Society of Chemical Industry, American Chemical Society, Societe de Chimie Industrielle and American Electrochemical Society, held at the Chemists' Club, New York, November 8.

Archer-Daniels-Midland Co. acquires large interest in Werner G. Smith Co., chinawood oil, Cleveland.

The helium plant at Amarillo, Tex., built and operated by the Bureau of Mines, establishes a record in cost of production and purity, with an output of 847,840 cubic feet of the gas in September at a cost of $14.01 per 1,000 feet of contained helium, the Department of Commerce announced. The product has an average purity of 97.7 percent, it was stated.

Davison Chemical Co. acquires two more corporations which are manufacturers of fertilizer mixtures. They are Washington, Alexander & Cook, Charlestown, W. Va., and Oxford Packing Co., Oxford, Pa.

IN CASE ANYONE is worried that the government does not know what is "going on" these days in industry, we proffer this record. The Johns-Manville Corporation filed reports with government agencies at the rate of one every 2 minutes during 1943. The total number of reports and questionnaires was 71,588—or roughly 30 dispatches in every business hour of the year.

SYNTHETIC GASOLINE from methane, made by a modified Fischer-Tropsch process, will be able to compete with the natural product if the methane can be obtained for 5 cents per 1000 cubic feet, we have been told recently.

THE OLD STORY of fantastically reduced costs made possible by intelligent engineering and high-volume production—so strikingly true of aluminum, magnesium and synthetic rubber—has been repeated in the case of penicillin. Only two years ago 100,000 Oxford units cost $32; by early 1945 the price for the same quantity is expected to be as low as $3.

THE RAF IS NOW using a thirty-pound incendiary parachute bomb filled with methane in gasoline under pressure. The bomb emits a jet of flame about 15 feet long and 2 feet wide.

On impact a detonator is fired. Ignition of thermite heats the interior of the bomb which raises the internal pressure. The gasoline is then forced through a valve to reach a nozzle. As it passes out the nozzle, the gasoline is ignited by the flame that issues from vent holes in the striker housing.

HAVE YOU NOTICED, as we, how a fluorescent lamp flickers annoyingly in its "death throes"? A new device which fits into the lamp receptacle turns off the current automatically when the lamp has outlived its usefulness.

A RECENT ITEM about "fish farms" struck us as an amusing reversal of orthodox thinking. Our forefathers learned from the Indians that a dead fish planted with the corn would greatly improve the crop, and thereafter the use of fish meal for fertilizer became a standard practice. Now we learn that ponds are fertilized to improve the crop of fish. This inspires a nightmarish horror: We raise corn to make cornmeal to fertilize fish ponds to produce more fish to make more fish meal to fertilize corn fields to produce more corn to make more cornmeal . . . stop!

PART 2: PATENTS AND TRADEMARKS

Abstracts of U. S. Chemical Patents

A Complete Checklist Covering Chemical Products and Processes

Printed copies of patents are available from the Patent Office at 10 cents each. Address the Commissioner of Patents, Washington, D. C., for copies and for general information concerning patents or trade-marks.

From Official Gazette—Vol. 566, Nos. 1-4 (Sept. 5-26)—p. 526

*Ceramics

Color marking element comprising: a friable ceramic body including fired clay and a non-plastic hydrous silicate, and having pores filled with a coloring impregnant. No. 2,355,638. Monie Ferst and Charles Wysong to M. A. Ferst, Ltd.
Making high silica glass. No. 2,355,746. Martin Nordberg and Harold Rumenapp to Corning Glass Works.
Coating articles with molten glass. No. 2,356,016. Gordon Strubler.
Ceramic composition consisting of magnesite, Florida clay, talc, bentonite, asbestos, silica, dextrine, and Portland cement with a solution of calcium chloride and water. No. 2,356,214. Romildo Casciani, one-third to Max Bernstein and one-third to Jack Meltzer, and one-third to Julius Funk.
Lead borosilicate glaze for decorating glassware, having a fusing temperature not higher than 640°C. and exhibiting superior alkali resistance. No. 2,356,316. Carl Harbert and Robert Morrison to The Harshaw Chemical Co.
Lead borosilicate glaze comprising a pigment dispersed in a glaze matrix of lead borosilicate type and containing as smelted in addition for imparting high alkali resistance barium stannate. No. 2,356,317. Carl Harbert and Robert Morrison to The Harshaw Chemical Co.
Increasing retention capacity of sealing surface of artificial porcelain teeth. No. 2,356,513. Paul Gonon.

*Coatings

Paper coating color comprising a coating pigment and containing as predominant adhesive component a low soluble white starch gum. No. 2,355,065. Herbert Gardner to Stein, Hall Manufacturing Co.
Apparatus for coating or saturating material. No. 2,355,278. Willis Davis to Ascote, Inc.
Producing coatings and shaped articles of cellulosic materials which are stable to heat and organic solvents. No. 2,355,326. Siegfried Petersen and Karl Taube.
Producing protective coatings which comprises dissolving chromic acid in water, then adding water solution to ethylene glycol monoethyl ether. No. 2,355,889. James O'Loughlin to Paint Engineers, Inc.
Coating metallic foundations with a hot melt coating of resinous material. No. 2,355,919. Samuel Lipsius.
Coating composition comprising (A) a film forming vehicle of oils having drying properties and resins modified with such oil, and (B) a pigment, at least 50% of said pigment being pyrophyllite calcined. No. 2,356,297. Ladislaus Balassa to E. I. du Pont de Nemours & Co.
Silica coating to lower reflection of optically active surfaces. No. 2,356,553. Gustav Weissenberg.
Producing lustrous coatings on materials of fibrous structure which comprises applying a solution of a salt of free acid from interpolymerizate from maleic anhydride and vinyl butyl ether and glazing the impregnated materials. No. 2,356,879. Walter Pense and Werner Asch, Philipp May, and Hermann Stark.
Aircraft part and covering therefor having coating of cellulosic dope impregnating said fabric. No. 2,356,927. Darwin Grossman to Roxalin Flexible Finishes, Inc.
Water-soluble corrosion inhibiting coating composition for metal surfaces in contact with hydrocarbons containing water comprising dextrin, sodium nitrite and water-soluble polyhydric alcohol. No. 2,357,275. Aaron Wachter to Shell Development Co.

*Dyes, Stains

Fluorescein and halogenated fluoresceins dye acids. No. 2,355,359. William Bainbridge and Frederick Hope to H. Kohnstamm & Co. Inc.
Dioxazine dyestuffs of group obtainable by ring-closing a quinone diamine. No. 2,355,496. Frithjof Zwilgmeyer to E. I. du Pont de Nemours & Co.
Dioxazine coloring matters and process for preparing same. No. 2,355,497. Frithjof Zwilgmeyer to E. I. du Pont de Nemours & Co.
Pencil for invisible laundry marking, comprising a colorless fluorescent dyestuff, dispersed through pencil body. No. 22,530. Francis Sell to The National Marking Machine Co.
Anthraquinone dyestuffs. No. 2,356,061. Francis Irving and Henry Piggott to Imperial Chemical Industries, Ltd.
Red ink for recorders for preparing charts that may be blueprinted. No. 2,356,065. Thomas Keating to Westinghouse Electric & Manufacturing Co.
Cyanine dyes. No. 2,356,445. Leslie Brooker and Robert Sprague to Eastman Kodak Co.
Intermediates for dyestuffs. No. 2,356,569. Polydoor DeSmet and Willem Mees.
Mordant dyestuffs and a process for their manufacture. No. 2,356,740. Karl Glenz and Franz Neitzel to Durand & Huguenin, A. G.
Coloring composition for coloring fibers and fabrics comprising a colored aqueous dispersion of oil-in-water type of a solution in an organic solvent of an alkyd resin, and a urea formaldehyde resin, and water insoluble cellulose ether. No. 2,356,794. Alfred Peiker to American Cyanamid Co.
Organic dyestuffs of the thionaphthenone series and process of making the same. No. 2,356,823. John Cole and Benjamin Skiles to E. I. du Pont de Nemours & Co.
Organic dyestuffs of the thionaphthenone series and process of making the same. No. 2,356,824. John Cole and Benjamin Skiles to E. I. du Pont de Nemours & Co.

*Equipment

Apparatus for continuously determining the ratio of readily condensable to relatively non-condensable gas in a gaseous mixture. No. 2,355,052. Earl Brown to Tennessee Valley Authority.
Apparatus for deaerating viscose compositions. No. 2,355,057. Norman Copeland to E. I. du Pont de Nemours & Co.
Lamp comprising an envelope containing bismuth iodide, and means for producing a space discharge in said lamp. No. 2,355,117. Charles Smith to Raytheon Manufacturing Co.
Apparatus for hydraulic removal of solid coke from a reaction chamber. No. 2,355,323. Leo Ohlinger and Henry Heiss to Standard Oil Co.
Furnace for electrothermal production of magnesium by reduction of oxidic magnesium compounds with aid of a reducing agent furnishing only non-gaseous oxidation products. No. 2,355,343. Alfred von Zeerleder and Werner Syz to Societe Anonyme pour l'Industrie de L'Aluminum.
Method and apparatus for removing sulphur and phosphorus from molten metals. No. 2,355,362. Donald Campbell.
Apparatus for filtering and dehydrating fluids. No. 2,355,373. Lewis Hankison.
Apparatus for melting and vaporizing a solid dropped upon it from above. No. 2,355,414. Lester Borchardt and William Brastad to General Mills, Inc.
Apparatus for producing air colloids. No. 2,355,550. Lee Nusbaum.
Fluid sampling device. No. 2,355,620. John Bower and John Tarbox to Foundation for Clinical and Surgical Research.
Open mesh resilient screen of a synthetic linear polyamide condensation product. No. 2,355,635. William Dubilier.
Liquid-holding settling tank. No. 2,355,640. Anthony Fischer and William Weber to The Dorr Co.
Method and apparatus for mass spectrometry. No. 2,355,658. Reed Lawlor to Consolidated Engineering Corp.
Cooling carbon dioxide-containing air in a cold accumulator. No. 2,355,660. Jean LeRouge.
Apparatus for carrying out endothermic reactions involving contacting gaseous reactants with a porous catalytic material at elevated temperatures and adapted to operate on alternating conversion and heat regenerative cycles. No. 2,355,753. George Roberts, Jr. to The M. W. Kellogg Co.
Liquid clarification apparatus. No. 2,355,760. Henning Trebler to Sealtest, Inc.
Electrically heated molten bath furnace. No. 2,355,761. Richard Upton, one-half to Commerce Pattern Foundry & Machine Co.
Heating of fluids. No. 2,355,800. Walter Hensel to Universal Oil Products Co.
Apparatus for conditioning fluid in liquid form. No. 2,355,815. Chester McGill.
Filter medium comprising filaments of a vinyl resin resulting from conjoint polymerization of a vinyl halide with a vinyl ester of an aliphatic acid. No. 2,355,822. Edward Rugeley to Carbide and Carbon Chemicals Corp.
Porosity measuring apparatus. No. 2,355,858. Stuart Hahn and Robert Judson to The B. F. Goodrich Co.
Process of clarifying liquid by sedimentation and decantation process in superposed clarifying compartments. No. 2,355,875. Franklin Lasseter to The Dorr Co.
Maintaining different temperatures in different portions of an exothermic catalytic reaction zone involving a train of water-jacketed catalytic converters connected in series for flow of reactants therethrough. No. 2,355,938. Norman Wroby to Allied Chemical & Dye Corp.
Making a curved printing plate having a plastic facing and a metal backing. No. 2,355,949. Clarence Boutwell.
Hemoglobinometer. No. 2,355,960. Don Hastings Duffie.
Control unit for controlling predetermined condition of a liquid in a receptacle. No. 2,355,975. Fritz Henrici to The Prosperity Co. Inc.
Covering for arc welding electrode comprising carbohydrate and brucite. No. 2,355,988. David Mathias to Metal & Thermit Corp.
Heat exchange device for cooling a stream of fluid. No. 22,533. Martin Olstad and Allan Williams to Niagara Blower Co.
Producing ultra-violet radiations having a high intensity in wave band from 2000 to 2540 Angstrom units. No. 22,534. Willis Prouty to Westinghouse Electric & Manufacturing Co.
Resistance heater for electric furnaces. No. 2,356,237. Roman Geller to the Government of the United States as represented by the Secretary of the Department of Commerce.
Photoelectric apparatus for measuring color and turbidity. No. 2,356,238. Thomas Gillett, Philip Meads, and Alfred Holven.
Rigid light-transmitting sheet and a sheet of cellulose acetate cemented together by film of a polymerized incomplete polyvinyl acetal resin and glycerol triricinoleate. No. 2,356,250. Edwin Land to Polaroid Corp.
Container for anhydrous hydrogen chloride comprising a gastight metal shell. No. 2,356,334. Aylmer Maude and David Rosenberg to Hooker Electrochemical Co.
Apparatus for condensing spent steam. No. 2,356,404. Laszlo Heller.
Apparatus for softening boiler feed water. No. 2,356,405. Karl Hermes.
Fluid pressure gauge for giving both high pressure and vacuum measurements. No. 2,356,442. George Birch to B. & R. Patents Limited.
Measuring fluorescence of a body under ultra-violet light. No. 2,356,454. William Ferguson.

* Continued from last month (*Vol. 565, Nos. 2-5*).

Apparatus for absorption of a gas by a liquid. No. 2,356,530. Rudolf Pflock.
Electronic microscope. No. 2,356,551. Bodo von Borries, Heinz Muller, and Ernst Ruska.
Dry rectifier cells. No. 2,356,588. Heinrich Herrmann.
Apparatus for producing ultra-violet radiation. No. 2,356,592. John Kolbert and Frederick Haegele to The Hanovia Chemical & Manufacturing Co.
Process and apparatus for comminuting liquid substances. No. 2,356,599. Otto Landgraf.
Electronic microscope. No. 2,356,633. Manfred von Ardenne.
Apparatus for carrying out selective catalytic polymerization of olefins. No. 2,356,700. Walter Rupp and Clarke Harding to Standard Oil Development Co.
Molding thermoplastic materials which comprises coating mold surfaces with a mixture of water soluble salts of alkane sulfonic acids and chloralkane sulfonic acids. No. 2,356,814. Harry Bimmerman and Arthur Fox to E. I. du Pont de Nemours & Co.
Apparatus for continuously sampling gas from the gas flow path. No. 2,356,845. Robert Hines to Bailey Meter Co.
Dehydration of non-aqueous fluids containing dissolved water which comprises passing said fluids in contact with a solid desiccant consisting of granular adsorbent carrier. No. 2,356,890. Walter Schulze to Phillips Petroleum Co.
Heat interchange apparatus. No. 2,356,919. George Dono and Ronald Goddard to Morris Motors Ltd.
Apparatus for measuring viscosity and density of liquids. No. 2,357,003. John Hurndall to Petroleum Instrument Corp.
Apparatus for measuring and indicating quantity of liquid in a container. No. 2,357,023. Oliver Reid and Errol Erasmus.
Extractive distillation process with a high boiling selective solvent for separating a vaporizable mixture of three components A, B and C which cannot be separated from one another by fractional distillation alone. No. 2,357,028. Russell Shiras and Ava Johnson to Shell Development Co.
Making an electrical resistance element heating unit which comprises mixing an ammonium phosphate salt in water and adding fused magnesium oxide. No. 2,357,072. Bjorn Beck, Hubert Beck and Cecil Gunthorp.
Apparatus for distillation control. No. 2,357,113. Glen Houghland and Charles King to The M. W. Kellogg Co.
High temperature reaction and furnace therefor. No. 2,357,135. Frank Roper-Lowe and Robert Sandison to Magnesium Elektron Ltd.
Method and apparatus for cooling and drying acetylene produced from calcium carbide. No. 2,357,186. Ernst Gfeller.
Multiflue heat exchanger. No. 2,357,251. Robert Behr to The Babcock & Wilcox Co.

*Chemical Specialties

Turpentine composition which comprises adding phosphatide to the terpenic material. No. 2,355,061. Joseph Eichberg to American Lecithin Co.
Desalting crude hydrocarbon oil. No. 2,355,076. Harley Johnson.
Desalting crude petroleum oil which comprises treating with a brine solution. No. 2,355,077. Harley Johnson.
Desalting of oil. No. 2,355,078. Harley Johnson.
Lubricating composition comprising an organic compound containing phosphorus, sulfur and halogen. No. 2,355,106. Carl Prutton to The Lubri-Zol Development Corp.
Lubricating composition comprising a mineral lubricating oil and hexachloroethane and sulfur. No. 2,355,173. Le Grand Morell, deceased, by Edith Morell, administratrix, and Amos Knutson to The Dow Chemical Co.
Production of riboflavin from fermentation residues. No. 2,355,220. John Keresztesy and Edward Rickes to Merck & Co. Inc.
Mineral oil composition comprising a mineral oil having admixed therewith an oil-miscible substantially stable condensation product of an hydroxyaromatic carboxylic acid. No. 2,355,240. Orland Reiff to Socony-Vacuum Oil Co. Inc.
Asphaltic composition capable of setting and hardening on standing without application of heat or pressure which comprises a reduced oil tar, finely divided asbestos fiber and powdered petroleum asphalt. No. 2,355,242. Joseph Roediger to Standard Oil Development Co.
Mineral oil composition comprising a viscous mineral oil having in admixture to stabilize said mineral oil against deleterous effects of oxidation, of a chelate metal salt of a salicylidene imine. No. 2,355,257. Darwin Badertscher to Socony-Vacuum Oil Co. Inc.
Oil composition comprising an oil selected from a Diesel fuel oil and a mineral lubricating oil, and in admixture trichloromethanesulfonylchloride. No. 2,355,261. Francis Seger and Edwin Nygaard to Socony-Vacuum Oil Co. Inc.
Wetting, detergent, and sudsing agents consisting of water-soluble salts of sulphated hydroxy alkyl, fatty acid amines. No. 2,355,503. Heinrich Bertsch to The Hydronapthene Corp.
Method of treating wood, yellow pine lumber having sharply contrasting streaks of light and dark color. No. 2,355,553. Kermeth Owens and George Owens.
Flushing oil comprising mineral lubricating oil fraction, water, and an alkali metal petroleum sulfonate. No. 2,355,591. Marcellus Flaxman to Union Oil Co. of California.
Removing oxidic foreign matter from surface of metal which comprises subjecting metal article to non-oxidizing acid bath containing alphatrioxymethylene as corrosion inhibitor. No. 2,355,599. Joseph Walker to E. I. du Pont de Nemours & Co.
Black insulating tape comprising a strip of sized bias fabric, coatings of vegetable drying oil, driers, asphaltum and chlorinated rubber. No. 2,355,632. Joseph Coffey, Joseph Pickney and Robert Griffeth to Mica Insulator Co.
Treating a mineral oil containing a few % of water, said oil containing naturally-occurring emulsifying agents tending to stabilize oil-continuous emulsions and said oil containing water-dispersible impurities. No. 2,355,678. Claudius Roberts to Petrolite Corp. Ltd.
Foam generator powder consisting of equal portions of sodium bicarbonate and ferric sulfate, and a foam-stabilizing ingredient. No. 2,355,935. Clifford White to American-La France Foamite Corp.
Sealing composition made up of ground wood; fuller's earth; bentonite and asbestos floats; and a glucose and water mixture. No. 2,355,977. Hugh Hughes.

* Continued from last month (*Vol. 565, Nos. 2-5*).

Low temperature lubricants consisting of a monopropyl benzene and an extreme pressure agent to impart extreme pressure properties to lubricant. No. 2,355,993. John Morgan to Cities Service Oil Co.
Water-soluble cutting compound and method of manufacture. No. 2,355,994. John Morgan and Russell Lowe to Cities Service Oil Co.
Metal cutting base composition comprising chlorinated, phosphorized and sulfonated mineral oil, water-insoluble oil product including a chlorinated, phosphorized and sulfonated mineral oil, diglycol laurate, oleic acid, and a water soluble organic amine. No. 2,355,995. John Morgan and Russell Lowe to Cities Service Oil Co.
Liquid lubricating oil composition comprising a petroleum lubricating oil and the calcium salt of an alkyl ester of alkylated salicylic acid. No. 2,356,043. Willard Finley to Sinclair Refining Co.
Insulating material comprising a fibrous sheet impregnated with a composition of cellulose acetate and an alcohol-soluble resin having a methoxy content of about 3% to about 6%. No. 22,532. Raymond Lutz to Western Electric Co. Inc.
Lubricant composition comprising mineral hydrocarbon and dissolved therein a synthetic thickener comprising an interpolymer of isobutylene with a diolefin. No. 2,356,127. Robert Thomas and William Sparks to Jasco, Inc.
Soap sheet or leaf consisting of methyl cellulose dissolved in water, combined with liquid soap, and dried in thin film. No. 2,356,168. Clarence Mabley.
Preventing and/or removing accumulation of solid matter in oil wells, pipelines, and flow lines using transparent emulsion. No. 2,356,254. Sears Lehmann, Jr., and Charles Blair, Jr. to Petrolite Corp. Ltd.
Securing adhesion between sheets, the surfaces of which are of substantially identical compositions and are composed of an organic solvent soluble material which comprises applying to one surface an amide. No. 2,356,290. Adolph Wendler to E. I. du Pont de Nemours & Co.
Drilling fluid comprising a mixture of a thermo-setting resin with water. No. 2,356,302. Thomas Chapman to Standard Oil Development Co.
Low temperature lubricant comprising a hydrocarbon liquid having a pour point of −90°F. and a fatty acid soap of a metal of group II of periodic table. No. 2,356,313. Robert Gerlicher and John Bannon to Standard Oil Development Co.
Polyvalent metal soap of acids derived from oxidation of "sweater oil." No. 2,356,340. Eger Murphree to Standard Oil Development Co.
Stabilized oil-in-water type emulsified vitaminizing fluid for fortification of foodstuffs. No. 2,356,350. Fredus Peters and Eldor Rupp to The Quaker Oats Co.
Preparing waterproof adhesive tape. No. 2,356,354. Ernest Rodman to E. I. du Pont de Nemours & Co.
High temperature lubricant for use at temperatures above about 400° F. No. 2,356,367. Donald Wright to Jasco, Inc.
Making composition for use in detergent which comprises providing alkali metal hydroxide in form of particles, adding thereto an oil of higher fatty-acid-glyceride type. No. 2,356,443. Harry Bissinger to Drew Associates, Inc.
Making fine particle size carbon black. No. 2,356,471. John Rehner, Jr. to The B. F. Goodrich Co.
Printing paste comprising water, reaction product of a diazonium halide with a metallic halide and a non-coupling member from aryl carboxylic acids, the soluble metallic salts thereof, and their anhydrides. No. 2,356,618. Swanie Rossander, Chiles Sparks and Carl Maynard, Jr. to E. I. du Pont de Nemours & Co.
Continuous cleavage of fats, oils, and similar substances. No. 2,356,628. Georg Stalmann.
Lubricant comprising a petroleum lubricating oil having dissolved therein copper in form of an oil-soluble non-ionogenic organic compound of copper and to impart substantial oil-stabilizing properties to copper, sulfur in form of oil-soluble organic sulfur compounds. No. 2,356,661. Frederick Downing and Howard Fitch to E. I. du Pont de Nemours & Co.
Hydrocarbon oil of lubricating viscosity and a metal salt of a phenol and a metal salt of an acid ester of sulfuric acid. No. 2,356,685. George Neely and Frank Kavanagh to Standard Oil Co. of California.
Composition for preparing an oil base drilling fluid, which consists of a powdered mixture of weight material, calcium oxide, and asphalt. No. 2,356,776. George Miller to Demont Miller.
Dewaxing mineral oils including mixing waxy oil with a dewaxing solvent comprising a hydrogenated selected fraction of commercial pyridine. No. 2,356,777. James Montgomery, Luke Goodson, and Robert Henry to Phillips Petroleum Co.
Viscous liquid abrasive polish, for use in polishing lacquered and enameled surfaces, comprising an oil-in-water emulsion having finely divided feldspar abrasive particles suspended therein. No. 2,356,792. Byron Oakes and Dean Murray to Minnesota Mining & Manufacturing Co.
Slushing compound having superior anti-shipping properties comprising a petroleum fraction selected from petroleum oil, petrolatum and wax, and hydrogenated fish oil fatty acid pitch. No. 2,356,863. Frederick MacLaren and Elmer Adams to Standard Oil Co.
Mastic composition and flooring. No. 2,356,870. Stuart Miller to Allied Chemical & Dye Corp.
Soap-free detergents in bar form. No. 2,356,903. Richard Wood to The Procter & Gamble Co.
Making an abrasive article comprising mixing liquid styrene with synthetic elastomer comprising copolymer of butadiene and styrene. No. 2,356,965. Hugh Allison to The Allison Co.
Binding agent for linoleum comprising an oxidized mixture of a polymerized rosin and an oil of drying properties. No. 2,357,016. Abraham Miller to Hercules Powder Co.
Adhesive composition comprising a film-forming material capable of being solubilized in aqueous media and a glycol ester of a rosin acid. No. 2,357,073. Wyly Billing to Hercules Powder Co.
Lubricant comprising a lubricating oil and sulphurized ester of phenol and an unsaturated organic acid. No. 2,357,211. Bert Lincoln and Waldo Steiner to Continental Oil Co.
Printing paste comprising water, a reaction product of a diazonium halide with an aryl sulfonic acid, and a non-coupling member from aryl carboxylic acids, the soluble metallic salts thereof and their anhydrides. No. 2,357,226. Swanie Rossander, Chiles Sparks and Carl Maynard, Jr., to E. I. du Pont de Nemours & Co.

*Explosives

Blasting explosive, inorganic nitrate in granular form containing petroleum-hydrocarbon insoluble pine wood resin. No. 2,355,269. Robert Cairns to Hercules Powder Co.

Explosive composition comprising liquid nitrogen tetroxide and a nitroparaffin having less than five carbon atoms and less than three nitro groups. No. 2,355,817. Donald Morrow to Hercules Powder Co.

Detonating explosive comprising grains held on a 30-mesh screen and composed of an inorganic oxidizing salt and at least one oxidizable material and surrounding said grains a sensitized alkali nitrate composition. No. 2,356,149. Clyde Davis to E. I. du Pont de Nemours & Co.

Priming mixture for ammunition containing an inert material granulated to pass a 200 mesh screen. No. 2,356,210. Willi Brun to Remington Arms Co. Inc.

Ignition mixture containing normal lead triazoacetate, lead stphnate, lead sulfocyanate, lead nitrate, and glass. No. 2,356,211. Philip Burdett and Gordon Calhoun to Remington Arms Co. Inc.

Improved blasting assembly including an explosive cartridge surrounded by a preformed, annular, tubular, sheath comprising a carbonaceous material selected from balsa, bagasse and cork and a flame-quenching salt. No. 2,357,068. Jacob Barab to Hercules Powder Co.

*Food Chemicals

Preparing directly from gluten a solution of zein-containing proteins in a solvent or mixture of solvents. No. 2,355,056. Roy Coleman to Time Incorporated.

Making a corn extract for addition to food products which comprises extracting whole corn with water and then purifying extract with an organic solvent. No. 2,355,098. Sidney Musher to Musher Foundation Incorporated.

Chocolate manufacture. No. 2,356,181. Joseph Rubens to Joe Lowe Corp.

Olive processing. No. 2,356,287. Edward Van Dellen and Richard Ball.

Vacuum packing foodstuffs consisting largely of water by displacing air with water-soluble gas. No. 2,356,498. Adolf Bargeboer.

Preparing a synthetic spice. No. 2,356,501. Robert Brown and Chastain Harrel to Pillsbury Flour Mills Co.

Preparation of vitamin B_1, the step, which consists in subjecting 2-methyl-2,3-dichloro-tetrahydrofurane to action of 2-methyl-4-amino-5-(thioformamido-methyl)-pyrimidine. No. 2,356,594. Rezso Konig and Zoltan Foldi.

Baked goods comprising a flour mixture having disseminated therein a metal salt of pectin, said goods having a substantially greater volume. No. 2,356,635. Ernst Waldschmidt and Anton Bayer.

Stable food product including a fat capable of becoming rancid, and a small significant proportion of a complex-bound iron-alkali metal salt of a molecularly dehydrated phosphoric acid. No. 2,357,069. Rufus Barackman to Victor Chemical Works.

*Industrial Chemicals—Inorganic

Non-lumping, non-balling mix suitable for admixture with calcined gypsum without segregation therein comprising niter cake and calcined gypsum. No. 2,355,058. Dean Crandell to National Gypsum Co.

Aqueous electrolyte for electrolytic deposition of metals, consisting of a metal having an atomic structure presenting an incomplete outer electron shell, upon ionization, and a hydrocarbon alkyl diamine. No. 2,355,070. Charles Harford to Arthur D. Little, Inc.

Producing anhydrous $MgCl_2$ substantially free from MgO. No. 2,355,367. Hugh Cooper, one-half to Frank Wilson.

Removing nitrogen oxides from sulphuric acid by incorporating in acid a sulphamate. No. 2,355,702. Winslow Brooks to E. I. du Pont de Nemours & Co.

Production of anhydrous magnesium chloride. No. 2,356,118. Lloyd Montgomery Pidgeon and Norman Phillips to The Honorary Advisory Council for Scientific and Industrial Research.

Preparing material for storing or concentrating anhydrous hydrogen chloride without being materially affected by such use over prolonged period. No. 2,356,259. Aylmer Maude and David Rosenberg to Hooker Electrochemical Co.

Recovering concentrated hydrogen chloride from its anhydrous mixtures with air to leave in residual mixture a mean hydrogen chloride content of 4.7 per cent. No. 2,356,345. Sidney Osborne and Aylmer Maude to Hooker Electrochemical Co.

Producing pure phosphatide from a raw phosphatide containing about 40% of pure phosphatide, water and impurities. No. 2,356,382. Aage Christiansen.

Manufacture of magnesium carbonate. No. 2,356,395. Gunter Gloss and Robert Clarke to Marine Magnesium Products Corp.

Quaternary ammonium compounds. No. 2,356,587. Winfrid Hentrich, Wilhelm Kaiser and Werner Reuss, deceased, by Carl-Heinz Winkler, administrator.

Hydrating in one treatment both calcium oxide and magnesium oxide constituents of dolomitic lime. No. 2,356,760. William Garvin to Standard Lime & Stone Co.

Producing insoluble sodium metaphosphate. No. 2,356,799. George Taylor and Allen Erdman to Monsanto Chemical Co.

Preparation of hypochlorites. No. 2,356,820. George Cady to Pittsburgh Plate Glass Co.

Zinc salts of mercaptothiazolines. No. 2,356,932. Paul Jones and Roger Mathes to The B. F. Goodrich Co.

Flux consisting of an alkali fluoborate and an alkali borate more basic than the pentaborate. No. 2,357,014. Menahem Merlub-Sobel and Jerome Bialosky to William Ulmer.

Production of magnesium chloride from calcium chloride and dolomite. No. 2,357,130. Robert Pike to Harbison-Walker Refractories Co.

Manufacture of contact sulphuric acid by a contact process from burner gas containing impurities. No. 2,357,195. Carl Herrmann to E. I. du Pont de Nemours & Co.

*Industrial Chemicals—Organic

Preparation of a phosphatide composition comprising mixing a dry vegetable phosphatide-glyceride oil composition with an acid selected from concentrated phosphoric acid and glycerol phosphoric acid. No. 2,355,081. Percy Julian and Edwin Meyer to The Glidden Co.

Making an antioxidant which comprises extracting an oat product with water, adding a low molecular weight aliphatic alcohol and then removing the insoluble material. No. 2,355,097. Sidney Musher to Musher Foundation Incorporated.

* Continued from last month (*Vol.* 565, *Nos.* 2-5).

Separation of aldehydeketone mixtures which are difficultly separable by distillation whereby the ketone is recovered in form originally present in mixture. No. 2,355,140. Joseph Bludworth to Celanese Corp. of America.

N-acyl-n-alkanol aromatic amines. No. 2,355,141. Albert Boese, Jr. to Carbide and Carbon Chemicals Corp.

Purification of hydrocarbon gases containing hydrogen sulfide. No. 2,355,147. Sydney Chazanow to Phillips Petroleum Co.

Recovery of heavier hydrocarbons from a hydrocarbon mixture. No. 2,355,167. Percival Keith to The M. W. Kellogg Co.

Hydrogenation of aryl carboxylic acids. No. 2,355,219. Vladimir Ipatieff and Vladimir Haensel to Universal Oil Products Co.

Forming a homogeneous deposit free from occluded air bubbles from a watermiscible solution of polyvinyl alcohol of such viscosity that if sprayed by means of compressed air it will form a frothy deposit. No. 2,355,225. Wallace MacWilliam to Resistoflex Corp.

Water soluble high molecular weight condensation polymer of an alkyl glycoside. No. 2,355,245. Richard Schreiber and James Werntz to E. I. du Pont de Nemours & Co.

Nonfoaming oil-containing composition comprising a petroleum hydrocarbon liquid having foaming tendencies, and a defoaming agent consisting of a hydrocarbon amine reaction product of a sulfonated fatty compound. No. 2,355,255. John Zimmer and William Seitz to Standard Oil Development Co.

Preventing decomposition of a monohalobutene in which halogen atom is linked to an unsaturated carbon atom which comprises adding a compound from glycerol and methyl glycerol ether. No. 2,355,319. Rupert Morris and Edward Shokal to Shell Development Co.

Separating a mercaptan from corresponding alcohol, which comprises esterifying alcohol with boric acid and separating mercaptan from ester by distillation. No. 2,355,335. Waldo Semon to The B. F. Goodrich Co.

Preparation of ether amines. No. 2,355,337. LeRoy Spence to Rohm & Haas Co.

Hydrogenating aliphatic nitriles to amines, and increasing the yield of amines having at least two alkyl radicals. No. 2,355,356. Hobart Young, Jr. to Armour & Co.

Destructive hydrogenation of a carbonaceous material in presence of a catalyst. No. 2,355,388. Wilhelm Michael, Otto Goehre, and Wilhelm von Fuener, and Wilhelm Schneider.

Separation of a low-boiling open chain diolefin from a mixture of hydrocarbons having boiling points substantially same as that of said diolefin. No. 2,355,392. George Oberfell to Phillips Petroleum Co.

Removing acid from a liquid comprising bringing said liquid into contact with an anion exchanger comprising water insoluble reduced resinous condensation product of an aldehyde and a nitroparaffin. No. 2,355,402. Sidney Sussman to The Permutit Co.

Manufacture of brominated ketones. No. 2,355,410. Franz Bergel to Roche Products Limited.

Triazine derivatives. No. 2,355,423. Gaetano D'Alelio and James Underwood to General Electric Co.

Producing esters of higher fatty acids and alkylol amine hydrohalides. No. 2,355,442. David Jayne, Jr. and Harold Day to American Cyanamid Co.

Two-stage alkylation process. No. 2,355,460. Charles Morrell to Standard Oil Development Co.

Composition comprising a lower fatty acid cellulose ester and a hexitol tributylidene. No. 2,355,533. William Holst to Atlas Powder Co.

Making an alicyclic-alkyl halide which comprises dehydrating an arylaliphatic alcohol. No. 2,355,586. Ralph Perkins to The Dow Chemical Co.

Surface-active agent di-n-hexyl alkali metal sulfophthalates. No. 2,355,592. Milton Kosmin to Monsanto Chemical Co.

Producing 2-amino-5-hydroxydiphenyl. No. 2,355,593. Gennady Kosolapoff to Monsanto Chemical Co.

Reacting formaldehyde with calcium sulfamate under substantially anhydrous conditions in a liquid reaction medium. No. 2,355,600. Joseph Walker to E. I. du Pont de Nemours & Co.

Sterilization of organic substances containing bacteria in spore form. No. 2,356,505. Henry Christensen.

Making hydrophilic linear polyamides. No. 2,356,516. Max Hagedorn.

Purifying vinyl chloride to remove impurities which tend to promote formation of low molecular weight polymers which comprises aqueous solution of an alkali metal hydroxide. No. 2,356,562. Herbert Berg and Herbert Mader.

Glucosidic compounds and method of making them. No. 2,356,565. August Chwala.

Preparing pentone acids and their salts. No. 2,356,581. Felix Grandel.

Polymerisation product of polyvinyl chloride and an ester of thio-diglycol with a mono-basic aliphatic carboxylic acid. No. 2,356,586. Winfrid Hentrich and Rudolf Endres.

Production of unsaturated ketols of cyclopentanepolyhydrophenanthrene series by electrolytic reduction of unsaturated polyketones of said series. No. 2,356,596. Andreas Kramli and Laszlo Vargha.

Catalytic conversion of hydrocarbons by applying catalyst in form of a moving bed. No. 2,356,611. Kurt Peters.

Production of reactive polyfunctional amidine compounds. No. 2,356,622. Paul Schlack.

In dissolving raw calcium aluminate to form a stable solution, which comprises extracting raw aluminate with an aqueous solution of an ionizable alkaline compound chosen from hydroxides and carbonates of the alkali metals. No. 2,356,626. Jean Charles Seailles.

Treatment of catalyst in hydrocarbon catalytic reaction. No. 2,356,680. Joseph Marancik and Edwin Gohr to Standard Oil Development Co.

Compound having formula R-O-X where R is an arylenethiazyl sulfide group; O is oxygen directly linked to thiol sulfur of sulfide group; and X represents an R group. No. 2,356,682. William Messer to United States Rubber Co.

Producing 4, 5-cyclohexo metadioxane. No. 2,356,683. Louis Mikeska and Erving Arundale to Standard Oil Development Co.

Stabilizing and improving odor of an aliphatic alcohol prepared from corresponding olefin with sulfuric acid which comprises contacting alcohol with cuprous chloride. No. 2,356,689. Rudolph Ozol and Christopher Masterson to Standard Alcohol Co.

Converting hydrocarbons. No. 2,356,697. George Rial to Standard Oil Development Co.

Producing hydrocarbons free of olefins and having a high aromatic content. No. 2,356,701. Robert Ruthruff to The M. W. Kellogg Co.

Production of synthetic linear condensation polyamides. No. 2,356,702. Paul Schlack.

Doctor sweetening process wherein mercaptan-bearing oil is treated with alkaline sodium plumbite solution and sulfur to convert mercaptans to

organic disulphides. No. 2,356,704. Albert Shmidl and Mehemet Wiggen to Standard Oil Development Co.
Sulfuric acid conversion product of an alkyl-substituted-2-mercapto dihydro pyrimidine, and its metal salts. No. 2,356,710. Charles Stiteler to United States Rubber Co.
Treating hydrocarbon distillates with production of gasoline. No. 2,-356,711. Antoni Szayna to Albert Chester Travis.
Carrying out catalytic reactions with suspended solid catalyst particles in vapor phase. No. 2,356,717. Robert Williams to Standard Oil Development Co.
Colloidal aqueous solution of a partially polymerized positively charged guanamine-form-aldehyde condensation product. No. 2,356,718. Henry Wohnsiedler and Walter Thomas to American Cyanamid Co.
Colloidal aqueous solution of a partially polymerized positively charged a me ine-form-aldehyde condensation product. No. 2,356,719. Henry Wohnsiedler and Walter Thomas to American Cyanamid Co.
Combination thermal and catalytic cracking of hydrocarbon oils. No. 2, 356,744. Joseph Barron to The Texas Co.
Ester of a polyhydric alcohol selected from pentaerythritol, polypentaerythritols and mixtures thereof. No. 2,356,745. Robert Barth and Harry Burrell to Heyden Chemical Corp.
Cleaning composition comprising neutral coal tar oil, monoethanolamine, oleic acid, ethylene glycol, orthotoluidine, ethyl silicate, and phosphoric acid. No. 2,356,747. Max Bowman and Howard Packer.
Compounded oil comprising a hydrocarbon oil and a metal alkyl carboxylate substitute on an alpha, beta or gamma alkyl carbon atom by a substituent containing pentavalent phosphorus. No. 2,356,754. Bruce Farrington and James Clayton and Dorr Etzler to Standard Oil Co. of California.
Producing film-forming diamine-carbon disulphide condensation products. No. 2,356,764. Rudolf Kern.
Producing polymeric materials. No. 2,356,767. Edward Kropa to American Cyanamid Co.
Forming an aqua-organosol composed of a colloidal inorganic oxide, water and organic solvents. No. 2,356,773. Morris Marshall to Monsanto Chemical Co.
Forming an aquasol composed of a colloidal inorganic oxide and water. No. 2,356,774. Morris Marshall to Monsanto Chemical Co.
Purifying crude dichlorethane. No. 2,356,785. John Hammond to U. S. Industrial Chemicals, Inc.

*Leather

Tanning agent having formula Y $(SO_2\text{-}NH\text{-}Ar)n$, wherein Y is a naphthalene radical, Ar is an aromatic group containing a non-basic water-solubilizing group and n is three to four. No. 2,355,114. Erik Schirm to The Hydronapthene Corp.

*Medicinals

Therapeutic composition consisting of glycerol esterified with oleic acid and ozonized at the double bond. No. 2,356,062. Charles Johnson to Latimer Laboratory, Inc.
B-substituted-Δa,B-a-butyrolactones. No. 2,356,153. Robert Elderfield and Martin Rubin to Eli Lilly & Co.
Stimulants for combating symptoms of fatigue, production of substance from 2-phenyl-3-amino-butane and 2-phenyl-3-methylamino butane. No. 2,356,582. Felix Haffner and Fritz Sommer.
Obtaining gonad-stimulating hormones from pituitary gland. No. 2,356,803. Harry van Dyke and Roy Greep and Bacon Chow to E. R. Squibb & Sons.
Preservation of dried blood grouping serum. No. 2,357,253. Arthur Coca to Lederle Laboratories, Inc.

*Metals, Alloys

Addition alloy for cast iron comprising silicon, calcium, iron and nickel. No. 2,355,059. John Eash to The International Nickel Co.
Brazing solder consisting of silver, cadmium, copper, zinc, sodium, and phosphorus. No. 2,355,067. Melvin Goldsmith to Goldsmith Bros. Smelting & Refining Co.
Separating molten magnesium from a molten salt bath. No. 2,355,130. Leland Yerkes.
Metallurgical apparatus comprising two electric furnaces arranged in tandem. No. 2,355,095. William Moore.
Forming a bright metallic deposit on surface of an object which comprises separately atomizing a metallic salt solution and a reducing solution and mixing these atomized solutions together. No. 2,355,-186. Max Tischer.
Deep air hardening steel capable of being air hardened in sections. No. 2,355,224. George Luerssen and Carl Post to The Carpenter Steel Co.
Electroplating apparatus. No. 2,355,236. Rodney Olsen.
Ferrous alloy adapted for hard facing purposes, containing carbon, chromium, mol bdenum, nickel, cobalt and iron. No. 2,355,271. Arthur Cape to Coast Metals, Inc.
Concentration of sylvinite ores employing a collector selected from aliphatic amines. No. 2,355,365. Allen Cole to Minerals Separation North American Corp.
Repairing breaks in vitreous lining of steel equipment lined with vitreous material. No. 2,355,474. Spencer Shepard and John Magielnicki to American Cyanamid Co.
Electrodeposition of bright zinc. No. 2,355,505. John Bray and Robert Howard to Purdue Research Foundation.
Smelting tin-containing material in an electric slag resistance furnace, which comprises maintaining electrical resistance of slag in furnace within predetermined limits by making controlled additions of sodium carbonate. No. 2,355,515. Louis Deitz, Jr. to Nassau Smelting & Refining Co. Inc.
Making a nickel-copper alloy casting, which comprises melting down lead-contaminated scrap and adding zirconium to lead-containing molten bath. No. 2,355,581. Edmund Merriman Wise to The International Nickel Co. Inc.
Recovering tin from scrap which comprises thinly coating a caustic alkali upon tin scrap and fusing such caustic alkali coating. No. 2,355,777. Thomas Benson and Bertram Hoffman.
Preparing a bed of a manganese removal material. No. 2,355,808. Joseph Lawlor.
Restoring sublimable metal oxide to catalyst by passing through said catalyst, gas, at a high temperature, containing vapors of said metal oxide. No. 2,355,831. Vanderveer Voorhees to Standard Oil Co.
Purifying and refining metals and other substances in fusion. No. 2,355,885. Joseph Merle.
Process of metal plating. No. 2,355,933. Max Weiss to Cohan-Epner Co. Inc.
Improvement in sintering of a metal powder compact to bond together the particles thereof. No. 2,355,954. George Cremer to Hardy Metallurgical Co.
Bonding a gelatine-glycerine composition to a structural metal. No. 2,356,005. Glenn Roquemore to Wingfoot Corp.
Agglomerating iron-bearing materials. No. 2,356,024. Axel Andersen and Knud Horn to F. L. Smidth & Co.
Extracting alumina from iron-containing alumina ores. No. 2,356,157. Gant Gaitner.
Treating impure nickel sulphate solutions containing iron in ferrous state to separate iron therefrom. No. 2,356,183. Hugh Shepard and Carl Knierim to American Smelting & Refining Co.
Recovering copper from printing plates made up of a base metal with a coating of copper and nickel thereon. No. 2,356,329. Axel Lundbye to The Crowell-Collier Publishing Co.
Steel having characteristics due to rimming, containing vanadium and having non-aging characteristics. No. 2,356,450. Samuel Epstein to Bethlehem Steel Co.
Producing metallic manganese from impure manganese dioxide ores. No. 2,356,515. Pietro Guareschi.
Treating ores for production of iron and steel. No. 2,356,524. Julius Lohse.
Removing lead from tin or tin alloy containing lead as an impurity. No. 2,356,529. Rene Perrin.
Removal of insoluble metal compounds from aqueous rubber dispersions, which comprises mixing with a water soluble cyanide. No. 2,356,549. Godfried Johan van der Bie.
Forming a protective coat on a metal selected from iron, aluminum, copper and lead, in which said metal serves as cathode in oxidizing solution consisting of chromic acid and potassium permanganate, the anode being magnesium electrode. No. 2,356,575. Jean Frasch.
Preparing soldering coppers. No. 2,356,583. Leon Hampton to Bell Telephone Laboratories, Inc.
Addition product of a mercaptan having formula ASH where A is a heterocyclic nitrogen-containing group, with an aminoalkyl sulfide. No. 2,356,604. Roger Mathes and Paul Jones to The B. F. Goodrich Co.
Producing clean annealed alloy steel powder from contaminated alloy powder which comprises heating powder in annealing range in a fused salt bath. No. 2,356,807. John Wulff.
Electric arc welding of low alloy high tensile strength steel containing in excess of about 0.30% carbon, and alloying ingredients of chromium, nickel, and molybdenum. No. 2,356,822. John Chyle to A. O. Smith Corp.
Electrodeposition of metal of group consisting of copper, tin and lead, which comprises electrolyzing an electrolytic bath consisting of an aqueous solution of an aromatic sulphonic acid and dissolved metal of said group with an insoluble anode made of an alloy consisting of lead and antimony. No. 2,356,897. James Stack, deceased, by Alvilda Stack, executrix, to Nassau Smelting & Refining Co. Inc.
Forming an adherent layer of carbon on a metal surface. No. 2,356,-956. Elmer Thurber and Leland Wooten to Bell Telephone Laboratories, Inc.
Alkali metal chloride base flux, for joining light metal members containing at least one strontium halide and characterized by a higher wetting power. No. 2,357,125. Mike Miller to Aluminum Co. of America.
Alloying and fusing metal strip having a metal plating on surface portions thereof to provide a bright, uniform and adherent coating of improved characteristics. No. 2,357,126. John Nachtman.
Copper base alloys hardenable by heat treatment containing nickel, silicon, cerium, and copper. No. 2,357,190. Frank Evans to Langley Alloys Ltd.
Sintering operation in which a blast of oxidizing gas is passed through a non-agglomerated pervious solid metal-bearing charge, the improvement which comprises forming a series of fine intercommunicating pores in charge by incorporating prior to heating a finely divided water-swollen argilloid substance. No. 2,357,198. William Hooey to The New Jersey Zinc Co.
Bath for treatment of stainless steel articles to provide a mirror finish which contains nitric acid, hydrofluoric acid, a chloride of a metal selected from cobalt, nickel, iron, chromium and titanium. No. 2,357,219. Norman Mott, one-half to Joseph Moran.
Welding rod for ferrous electric welding having an inner coating of a fluxing substance and an outer covering of paper, same characterized by inner layer consisting of a hard glassy coating of borax pentahydrate. No. 2,357,250. Walter Baker to West Virginia Pulp & Paper Co.
Treating an alkali soluble, precipitable protein selected from casein and vegetable globulins. No. 2,356,795. Arthur Poarch to The Glidden Co.
Apparatus for melting and processing crude oleoresin. No. 2,356,798. Jesse Reed to Claude R. Wickard, as Secretary of Agriculture of the United States of America.
In froth flotation process of separating phosphate ore values from acidic siliceous gangue the step which comprises subjecting ore to froth flotation in presence of a reagent chosen from monacyl reaction products of a polyalkylene polyamine. No. 2,356,821. Ludwig Christmann, David Jayne, Jr. and Stephen Erickson to American Cyanamid Co.
Separation of butadiene in form of monomeric sulfone from a C_4 hydrocarbon mixture containing butadiene, butane and butene. No. 2,356,-840. Frederick Frey and Robert Snow to Phillips Petroleum Co.
Preparation of an aqueous dispersion of a thermoplastic hydrocarbon involving melting of such hydrocarbon with nonvolatile, thermoplastic pyrogenous residue. No. 2,356,882. Rotheus Porter, Jr. to Bennett Inc.
Mercurated aliphatic amines containing at least ten carbon atoms in one of alkyl groups. No. 2,356,884. Anderson Ralston and Miles McCorkle to Armour & Co.
1,3-diarylisobenzofurans which carry in one of pairs of positions 4,7- and 5,6- radicals of group consisting of alkyl and aryl radicals. No. 2,356,907. Roger Adams to E. I. du Pont de Nemours & Co.
Polymerization of vinyl halides. No. 2,356,925. Charles Fryling to The B. F. Goodrich Co.

* Continued from last month (*Vol. 565, Nos. 2-5*).

Preparing sulphanilylalkylisoureas. No. 2,356,949. Richard Roblin, Jr. and George Anderson to American Cyanamid Co.

Clear, colorless polyisobutylene having a molecular weight within range of 27,000 to 250,000 and containing dissolved stabilizing amount of sulfur. No. 2,356,955. Robert Thomas and William Sparks to Jasco, Inc.

Diene interpolymers and method of preparing same. No. 2,356,974. Albert Clifford to Wingfoot Corp.

Sweetening sour aromatic hydrocarbons of 6 to 10 carbon atoms per molecule containing mercaptans. No. 2,356,980. Gysbert de Ridder to Shell Development Co.

Effecting resolution of a mixture of butadiene and at least one four carbon atom acetylene into a fraction rich in butadiene and free from four carbon atom acetylene and a fraction rich in four carbon atom acetylene content of said mixture. No. 2,356,986. Frederick Frey to Phillips Petroleum Co.

Pyridine-amine-salts of para-amino-benzoic acid and method of making same. No. 2,356,996. Samuel Gordon and Frank Kipnis to Endo Products, Inc.

Manufacture of anhydrous hydrogen halide. No. 2,357,095. Theodore Evans and Harry Finch to Shell Development Co.

Preparation of pyrogen-free urogastrone. No. 2,357,103. John Gray to Merck & Co. Inc.

Desulphurizing a hydrocarbon distillate containing organic sulphur compounds. No. 2,357,121. Lawrence Lovell to Shell Development Co.

Production of thiourea by heating sodium sulfide, calcium cyanamide and calcium chloride in aqueous solution. No. 2,357,149. Jacob van de Kamp to Merck & Co. Inc.

Preparing a mono-glycoside of 1,4-dihydroxy-2-methylnaphthalene. No. 2,357,172. Gustaf Carlson and Bernard Baker to Lederle Laboratories, Inc.

Anthraquinone compounds. No. 2,357,176. Joseph Dickey to Eastman Kodak Co.

Producing an acyl sulphanilylaminoguanidine which comprises reacting a salt of a carboxylic acid acylsulphanilyl cyanamide with a salt of hydrazine. No. 2,357,181. Herman Faith and Philip Winnek to American Cyanamid Co.

Manufacture of hydrophilic synthetic linear polyamides which comprises heating hexamethylenediamine sebacate together with glycocolethylester hydrochloride until condensation occurs. No. 2,357,187. Max Hagedorn.

Plasticizer for cellulose acetate, cellulose aceto-propionate, and like, the resinous reaction product of sebacic acid, succinic anhydride, ethylene glycol, and glycerol. No. 2,357,221. Carl Opp to Interchemical Corp.

Manufacture of sulfonic acid esters, which comprises treating a member of group consisting of saturated and unsaturated 21-diazo-pregnane-20-ones with a dry organic sulfonic acid. No. 2,357,224. Tadeus Reichstein to Roche-Organon, Inc.

Producing sulphanilyl aryl substituted guanidines. No. 2,357,249. George Anderson to American Cyanamid Co.

Recovery of phenols from an oil phase containing phenols, mercaptans, and naphthenic acids. No. 2,357,252. Henry Berger, Edwin Nygaard and Henry Angel to Socony-Vacuum Oil Co. Inc.

Manufacture of improved catalyst for hydrocarbon conversion reactions which comprises impregnating hydrocarbon conversion catalyst which has been calcined with a glycerin-water solution of boric acid. No. 2,357,254. Joseph Danforth to Universal Oil Products Co.

Reactor wherein particle-form solid material is treated with gasiform reagent, an assembly for separating entrained solid from effluent gas. No. 2,357,255. George Dunham to Socony-Vacuum Oil Co. Inc.

Producing aryl derivatives of sulphonyl biguanides which comprises reacting an sulphonyl dicyandiamide with an arylamine. No. 2,357,268. Richard Roblin, Jr. and George Anderson to American Cyanamid Co.

Conversion of alphatic paraffinic hydrocarbons having at least six carbon atoms per molecule to aromatic hydrocarbons by dehydrogenation and cyclization thereof. No. 2,357,271. Hugh Taylor, Harold Fehrer and John Turkevich to Process Management Co. Inc.

Treating natural drying oil containing natural anti-oxidants which comprises lightly extracting oil with furfural. No. 2,355,605. Robert Ruthruff and Donald Wilcock to The Sherwin-Williams Co.

Non-spreading lubricant consisting of a stable aralkyl ether having chain of at least five carbon atoms, and having a benzene nucleus connected to ether oxygen atom, said ether having a positive contact angle with a steel surface in excess of 10 degrees. No. 2,355,616. George Barker to Elgin National Watch Co.

Producing graphitic marking elements. No. 2,355,639. Monie Ferst and Charles Wysong to M. A. Ferst, Ltd.

Piperidine derivatives and process for manufacture of same. No. 2,355,659. John Lee and Werner Freudenberg to Hoffmann-La Roche, Inc.

Extraction of sterols. No. 2,355,661. Robert Light, Herbert Kothe and Charles Frey to Standard Brands, Inc.

Production of ketones which comprises reacting an acyclic branched chain olefin with an organic acid anhydride in presence of an acylation catalyst. No. 2,355,703. Alva Byrns to Union Oil Co. of California.

Notration of hexamethylenetetramine to cyclo-trimethylenetrinitramine. No. 2,355,770. Joseph Wyler to Trojan Powder Co.

Polyglycol ethers of higher secondary monohydric alcohols. No. 2,355,823. Fritz Schlegel to The Procter & Gamble Co.

Making 1,2-substituted glyoxalidines. No. 2,355,837. Alexander Wilson to Carbide and Carbon Chemicals Corp.

Making chlorobutyl benzene compounds. No. 2,355,850. Robert Dreisbach to The Dow Chemical Co.

Separation of a liquid mixture of an anhydrous hydrogen halide and a hydrocarbon having a boiling point close thereto, which comprises treating with liquid glacial acetic acid. No. 2,355,857. Karl Hachmuth to Phillips Petroleum Co.

Higher aliphatic-acylated hydrazide. No. 2,355,911. Charles Graenacher and Richard Sallmann to Society of Chemical Industry in Basle.

Polymerizing olefins. No. 2,355,925. James Reid to Phillips Petroleum Co.

Acylation of methyl lactate. No. 2,355,970. Virgil Hansley to E. I. du Pont de Nemours & Co.

Acylation of methyl lactate. No. 2,355,971. Virgil Hansley to E. I. du Pont de Nemours & Co.

Removing one mol of hydrogen sulfide from one mol of 2-hydroxy-1-dithionaphthoic acid. No. 2,355,972. Albert Hardman to Wingfoot Corp.

Producing substantial yields of alkyl substituted cyclohexanes from alkyl cyclopentanes. No. 2,356,001. Herman Pines and Vladimir Ipatieff to Universal Oil Products Co.

Manufacturing a hard composition by preparing hard and refractory carbide crystal structures containing atoms of carbon in addition to atoms of tungsten and titanium. No. 2,356,009. Paul Schwarzkopf to American Cutting Alloys, Inc.

Conversion of hydrocarbon oils. No. 2,356,019. John Ward to Universal Oil Products Co.

Lacquer emulsion of oil-in-water type having a dispersed phase comprising an ethyl cellulose lacquer, and a disperse phase comprising water and reaction product of hydrogenated rosin having a hydrogen saturation of 60%. No. 2,356,025. Charles Bergamini to Hercules Powder Co.

1-Amino-4(p-alkylsulphonylbenzoylamino)-anthraquinone. No. 2,356,060. Francis Irving and Henry Piggott to Imperial Chemical Industries Ltd.

Reaction products of aliphatic alcohols and terpenephosphorus sulphide. No. 2,356,073. Robert May to Sinclair Refining Co.

Zinc salt of reaction products of aliphatic alcohols and terpene-phosphorus sulphide. No. 2,356,074. Robert May to Sinclair Refining Co.

Acrylonitriles and substituted acrylonitriles as fumigants. No. 2,356,075. Vartkes Migrdichian to American Cyanamid Co.

Copolymers of sulphur modified polyhaloprenes. No. 2,356,091. Milton Roedel to E. I. du Pont de Nemours & Co.

Purification of hydrocarbon liquids containing six or more carbon atoms which comprises contacting with a reagent comprising comminuted mixture of anhydrous aluminum chloride and dehydrated granular adsorbent carrier. No. 2,356,095. Walter Schulze to Phillips Petroleum Co.

Mixed olefinic polymerization process and product. No. 2,356,128. Robert Thomas and William Sparks to Jasco, Inc.

Preparing a solid plastic hydrocarbon interpolymer which is reactive with sulfur to give an elastic product. No. 2,356,129. William Sparks and Robert Thomas to Jasco, Inc.

Preparing a solid plastic hydrocarbon interpolymer which is reactive with sulfur to give an elastic product. No. 2,356,130. Robert Thomas and William Sparks to Jasco, Inc.

Cyclic ketals of 3-keto-17-oxy-cythrenes and method of preparing 3-keto-17-oxy-cythrenes. No. 2,356,154. Erhard Fernholz, deceased, by Mary Fernholz, administratrix, to E. R. Squibb & Sons.

Article having hydrophobic properties; and an adsorbed coating of a complex compound of Werner type in which a trivalent nuclear chromium atom is coordinated with a carbocyclic carboxylic acido group. No. 2,356,161. Ralph Iler to E. I. du Pont de Nemours & Co.

Addition product prepared by mixing sulfur with an aminoalkyl sulfide. 2,356,171. Roger Mathes to The B. F. Goodrich Co.

Addition product of a zinc salt of a heterocyclic nitrogen-containing mercaptan with an aminoalkyl sulfide. No. 2,356,172. Roger Mathes to The B. F. Goodrich Co.

Novel isomerization process. No. 2,356,190. Alexis Voorhies, Jr. to Standard Oil Development Co.

Producing cyclohexane free from benzene from a hydrocarbon mixture consisting of cyclohexane and benzene. No. 2,356,240. Marston Hamlin to Allied Chemical & Dye Corp.

Producing methyl methacrylate which comprises pyrolyzing acetic anhydride and methyl alpha-hydroxyisobutyrate in presence of a phosphoric acid catalyst. No. 2,356,247. Philip Kirk and Paul McClellan to American Cyanamid Co.

Manufacturing light-polarizing material comprising forming a mixture of a solution of soluble birefringent crystalline material and a solution of a plasticized transparent plastic which when hard has an index of refraction for light vibrating in a predetermined direction. No. 2,356,251. Edwin Land to Polaroid Corp.

Shatterproof lamination for polarizing light and method of manufacture. No. 2,356,252. Edwin Land to Polaroid Corp.

4-mercaptobenzenesulphonamide. No. 2,356,265. Elmore Northey to American Cyanamid Co.

Stabilization of polyvinyl alcohol. No. 2,356,282. Gelu Stoeff Stamatoff to E. I. du Pont de Nemours & Co.

Purifying an organic liquid selected from alcohols and ketones boiling between 78° F. and 138° F. with which is associated as impurities quantities of water and low boiling compounds. No. 2,356,348. John Patterson to Standard Oil Development Co.

Production of alkylated hydrocarbons from a mixture of normally gaseous olefin hydrocarbons having different molecular weights. No. 2,356,374. Arthur Blount to Union Oil Co. of California.

Developing hydrocarbon gas under high pressure. No. 2,356,407. Arthur Hutchinson to The Fluor Corp. Ltd.

Hard wax substitutes containing alkylolamides of fatty acid radicals occurring in hydrogenated castor oil and consisting of alkylolamides of hydroxy stearic acid, together with glycerine. No. 2,356,408. Maurice Kelley to National Oil Products Co.

Producing colorless, color-stable phthalic anhydride from crude phthalic containing tarry impurities and naphthoquinone. No. 2,356,449. Karl Engel and Henry Stasse to Allied Chemical & Dye Corp.

Preparation of beta lactones. No. 2,356,459. Frederick Kung to The B. F. Goodrich Co.

Catalytic isomerization of paraffinic and cycloparaffinic hydrocarbons. No. 2,356,487. John Upham to Phillips Petroleum Co.

Catalytically polymerizing compound selected from cyclopentadiene and alkyl substituted cyclopentadienes having cyclopentadiene nucleus containing characteristic conjugated double bonds, the steps of preventing total formation of benzene-insoluble polymers. No. 2,356,494. Samuel Trepp to The United Gas Improvement Co.

Preparing alkali metal and alkaline earth metal salts of dicyandiamide. No. 2,357,261. Donald Kaiser to American Cyanamid Co.

Treating steel preparatory to cold working which comprises immersing in a slurry consisting of a colloidal suspension of lime and mono-sodium phosphate in water. No. 2,357,269. David Russell and Stanley Kyle.

**Paint, Pigments*

Manufacturing titanium pigment. No. 2,355,187. Seldon Todd and Fredric Verduin to The Sherwin-Williams Co.

Mixing varnish consisting of a solution of an unmodified heat-harden-

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* Continued from last month (*Vol.* 565, *Nos.* 2-5).

able phenol-formaldehyde resin and a resin selected from methyl and ethyl abietates in a mutual solvent comprising a phenol. No. 2,356,-789. Matthew Holzmer and Theodore Neuhaus to The Glidden Co.
Production of an improved pigment which comprises mixing an acidic solution of a compound of a fourth group metal with an alkali metal silicate solution in presence of an aqueous suspension of a pigment. No. 2,357,089. William Daiger and George Seidel to E. I. du Pont de Nemours & Co.
Transparent iron oxide pigments. No. 2,357,096. Peter Fireman to Columbian Carbon Co.
Improving discoloration, chalking and gloss and gloss retention characteristics of a previously calcined titanium oxide pigment. No. 2,357,101. John Geddes to E. I. du Pont de Nemours & Co.

*Paper, Pulp

Apparatus for treatment and removal of chemicals from cooked or digested fiber pulp. No. 2,355,091. Manuel McDonald to The Brown Paper Mill Co. Inc.
Manufacture of coated paper with a water resistant but wettable surface. No. 2,355,953. William Craig to R. T. Vanderbilt Co. Inc.
Apparatus for continuous purification of suspensions or sludges particularly of fibrous pulp as used in paper industry, which contain contaminations of higher specific gravity. No. 2,356,497. Helmuth Banning.

*Petroleum Refining

In catalytic isomerization of hydrocarbons, the improvement which comprises injecting an inhibitor of hydrocarbon cracking at a plurality of succeeding points in reaction zone, to inhibit hydrocarbon cracking during the course of the reaction. No. 2,355,198. Harold Atwell to The Texas Co.
Separating waxy material from a mixture of oil and waxy material which comprises mixing feed mixture with a mixed solvent, consisting of a mixture of chloronitro paraffin and a solvent for oil. No. 2,355,203. Edward Cole to The Texas Co.
Method of purifying hydrocarbon liquids. No. 2,355,291. Thomas Hamilton to Dorothy DiFrasso.
Petroleum sulphonamide which comprises an intra-molecular dehydration product of a petroleum sulphonic acid salt of a polyalkylene polyamine. No. 2,355,310. Leo Liberthson to L. Sonneborn Sons, Inc.
Preparation of unsaturated hydrocarbons from primary aliphatic amines. No. 2,355,314. Miles McCorkle to Armour & Co.
Alkylating paraffins with olefins wherein paraffins and olefins are charged to the alklation reaction. No. 2,355,339. LeRoy Story to The Texas Co.
Catalytically desulphurizing hydrocarbon oil. No. 2,355,366. Miller Conn to Phillips Petroleum Co.
Subjecting hydrocarbon oil to action of aluminum chloride under isobutane-producing conditions. No. 2,355,446. Vasili Komarewsky and Lev Mekler to Universal Oil Products Co.
In isomerization of normal paraffins with a metal halide catalyst of Friedel-Crafts type which causes corrosion and erosion of metallic equipment, the improvement which comprises preventing said corrosion by wetting surfaces of said equipment with a high-boiling non-aromatic essentially paraffinic oil. No. 2,355,563. Walter Schulze to Phillips Petroleum Co.
Extraction of hydrocarbons from natural gas. No. 2,355,588. David Brandt to Cities Service Oil Co.
Fractionation of hydrocarbon mixtures containing C_3 and C_4 hydrocarbons of gasoline boiling range. No. 2,355,589. David Brandt to Cities Service Oil Co.
Breaking petroleum emulsions of water-in-oil type. No. 2,355,778. Henry Berger and Paul Goodloe to Socony-Vacuum Oil Co. Inc.
Polymerization of normally gaseous olefin hydrocarbons to convert into liquid hydrocarbons for motor fuel. No. 2,355,868. James Jean.
Converting a relatively heavy hydrocarbon fraction containing no gasoline into yields of saturated gasoline of relatively high antiknock value. No. 2,355,961. Gustav Egloff and Vasili Komarewsky to Universal Oil Products Co.
Increasing productivity of oil-bearing strata by removal of wax, associated occlusions, and brine, the step of subjecting strata to transparent emulsion. No. 2,356,205. Charles Blair, Jr. and Sears Lehmann, Jr., to Petrolite Corp. Ltd.
Catalytic cracking of hydrocarbon oils. No. 2,356,303. Gerald Connolly to Standard Oil Development Co.
Continuous removal of waxy constituents from a wax-containing feed oil. No. 2,356,346. John Packie, John Long and Paul Cornell to Standard Oil Development Co.
Treating gasoline containing olefins and aromatics to improve antiknock value and decrease olefin content. No. 2,356,357. Carleton Schlesman and John McCracken to Socony-Vacuum Oil Co. Inc.
Motor fuel of hydrocarbon type containing a compound containing an unsatured organic radicle. No. 2,356,476. Sol Shappirio.
Catalytic cracking of hydrocarbon oils using a catalyst which has been produced by mixing a silicic acid sol with aqueous solution of water-soluble salt of a polyvalent metal. No. 2,356,576. Gerhard Free and Wilhelm Fuener and Otto Goehre.
Safety fuel boiling ompletely between about 300° F. and about 400° F. No. 2,356,647. Cecil Brown to Standard Oil Development Co.
Refining a Mid-Continent lubricating oil stock having a viscosity index of at least 75 and a sulfur content below 0.3% by weight. No. 2,356,843. Robert Henry to Phillips Petroleum Co.
Conversion of a naphthenic petroleum oil, to obtain high yield of light-bodied lubricating components of superior physical characteristics. No. 2,356,952. William Alvah Smith.
Contacting catalyst material in form of pellets having a metal core covered with a thin film of a catalyst of oxides and silicates of aluminum, chromium, and zirconium, alternately with hydrocarbons to be cracked in cracking step and with oxidizing medium in regenerating step. No. 2,356,954. John Teter to Sinclair Refining Co.
Converting a hydrocarbon oil to substantial yields of high anti-knock motor fuel which comprises subjecting said oil to contact with a calcined mixture of zirconium oxide and boric oxide. No. 2,356,978. Joseph Danforth to Universal Oil Products Co.
Passing hydrocarbon oil higher boiling than gasoline through a cracking zone to effect cracking of said hydrocarbon oil and formation of gasoline constituents of high anti-kuock value. No. 2,357,136. Louis Rubin to The M. W. Kellogg Co.
Fuel for internal combustion engines consisting of liquid ammonia and containing dissolved acetylene. No. 2,357,184. Jean Leon Frejacques.

*Photographic Chemicals

Photographic silver halide emulsion spectrally sensitized with a sensitizing cyanine dye, said emulsion containing, as a supersensitizer, an aromatic aldehyde selected from o-hydroxy benzaldehydes and nonionic alkoxy aromatic aldehydes. No. 2,355,630. Burt Carroll and John Spence to Eastman Kodak Co.
Dyestuffs for photography. No. 2,355,654. John Kendall and Douglas Fry to Ilford Limited.
Pyrimidine couplers for photography. No. 2,355,691. Charles Allen and James Van Allan to Eastman Kodak Co.
Making motion picture fade-outs by aftertreaatment. No. 2,356,439. Paul Aex and Charles Guell to Eastman Kodak Co.
Phenolic and naphtholic photographic couplers containing sulphonamide groups. No. 2,356,475. Karl Schinzel to Eastman Kodak Co.
Hardening a photographic gelatin layer of an exposed photographic element by treating said gelatin layer with a solution containing a dialkyl diketone. No. 2,356,477. Cyril Staud and Catherine Popper to Eastman Kodak Co.
Color-forming photographic silver halide emulsion comprising a non-diffusing color coupler incorporated therein and, as an inhibitor of color fog, a dihydroxy maleic acid ester of an aliphatic alcohol. No. 2,356,486. Arnold Weissberger and Paul Vittum to Eastman Kodak Co.
Photographic material comprising two superposed colloid layers, one comprising a light-sensitive silver halide emulsion layer and one layer containing a water or alkali soluble dye which has a polymeric structure. No. 2,356,759. Bela Gaspar to Chromogen, Inc.

*Resins, Plastics

Plastic compound and method of making same by coagulation of lignin and gluten. No. 2,355,180. Marc de Becker Remy.
Producing a resin acid lactone. No. 2,355,782. Richard Cox to Hercules Powder Co.
Plastic floor. No. 2,356,138. John Widmayer.
Polyphenylol alkane resins for absorption of acidic constituents from fluids and for ion exchange. No. 2,356,151. John Eastes to The Resinous Products & Chemical Co.
Making a one-piece mold for reproducing parts originally made of metal in a plastic material. No. 2,356,380. Robert Chollar to The National Cash Register Co.
Treatment of resin oils and resin product resulting therefrom. No. 2,-356,384. Edwin Cline to Allied Chemical & Dye Corp.
Water-soluble resin obtained by heating reaction product of formaldehyde and a phenyl urea, the phenyl group of which contains a sulfonic acid group, with a phenol. No. 2,356,466. James McNally and Fred Duennebier to Eastman Kodak Co.
Polyvinyl acetal resin in which part of acetal groups are alkoxyacetaldehyde acetal groups selected from methoxyacetaldehyde and ethoxyacetaldehyde acetal groups. No. 2,356,479. Donald Swan to Eastman Kodak Co.
Polyvinyl acetal resins. No. 2,356,480. Donald Swan to Eastman Kodak Co.
Materials impermeable to ultra-violet radiations comprising a plastic base material having incorporated therein a benzalacetophenone compound. No. 2,356,849. William Horback to Celanese Corp. of America.
Resinous product of conjoint polymerization of a mixture of vinyl chloride and a compound of group consisting of allyl chloride and methallyl chloride. No. 2,356,871. Eugene Moffett and Roy Smith to Pittsburgh Plate Glass Co.
Preparing finely divided powders from tough thermoplastic resin. No. 2,356,896. Roy Smith to Pittsburgh Plate Glass Co.
Separation and recovery of tall oil resin acids and fatty acids. No. 2,-356,988. Frederick Gayer and Charles Fawkes to Continental Research Corp.
Preparing a lignin-phenol-formaldehyde resin dispersion. No. 2,357,090. Gaetano D'Alelio to General Electric Co.
Dispersion of pine-wood pitch-phenol-formaldehyde resinous reaction products. No. 2,357,091. Gaetano D'Alelio to General Electric Co.

*Rubber

Determining rubber reinforcing properties of carbon black comprising mixing carbon black with a solution of a crystalline substance in solvent, evaporating solvent and observing crystal formation as a measure of rubber reinforcing properties of carbon black. No. 2,355,-146. Samuel Carney to Phillips Petroleum Co.
Vulcanization of rubber. No. 2,356,163. Paul Jones and Roger Mathes to The B. F. Goodrich Co.
Vulcanizing a rubber in presence of an aminoalkyl sulfide. No. 2,356,170. Roger Mathes and Paul Jones to The B. F. Goodrich Co.
Increasing plasticity of rubber which comprises milling unvulcanized rubber in presence of condensation product of formaldehyde with a substance selected from piperidine and morpholine, and hydrogen sulfide. No. 2,356,388. Russell Dean to American Cyanamid Co.
Manufacture of articles resistant to discoloration by light from rubber mixtures containing a light stainable anti-oxidant compound selected from aldol naphthylamine and phenyl naphthylamine. No. 2,356,564. Andre Chomette and Robert Thiollet.
Anti-flex-cracking agent vulcanized product of a rubber composition containing a 3-methyl-4-alkyl phenol. No. 2,356,929. Edwin Hart to United States Rubber Co.
Vulcanizing a rubber in presence of a mixed zinc salt of a 2-mercaptothiazoline and a monocarboxylic acid. No. 2,356,933. Paul Jones and Roger Mathes to The B. F. Goodrich Co.
Rubber hydrochloride containing an N,N'-dialiphatic piperazine. No. 2,356,973. Albert Clifford to Wingfoot Corp.

* Continued from last month (*Vol. 565, Nos. 2-5*).

*Textiles

Coated fabric for making a taut, smooth covering on a rigid structure such as an airplane wing, which includes coating a fabric with a cellulosic composition in a volatile solvent. No. 2,355,157. Benjamin Hanson to The Sherwin-Williams Co.

Improving textile materials which comprises treating materials with reaction product of formaldehyde and a malonamide having at least one N-aminoalkyl substituent. No. 2,355,265. Louis Bock and Alva Houk to Rohm & Haas Co.

Impregnating a fleece of cotton fiber with a bath comprising latex, an aqueous casein solution, aqueous suspension containing soya bean flour, sulfonated oil as a wetting agent and sufficient sulfur to act as vulcanizing agent. No. 2,355,521. Geba Ganz.

Making a composite felt including steps of chemically treating nonfur fibers to impart center-seeking characteristics thereto. No. 2,355,598. George Rickus, Stanley Hoffman and Samuel Carpenter, Jr. and Warren Harris to Hat Corp. of America.

Producing wool-like artificial silk yarns of regenerated cellulose. No. 2,356,518. Georges Heberlein to Heberlein Patent Corp.

Manufacture of carpets, linings, or like having non-slip properties when set with oil, which contain cut cereal straw embodied in vulcanized rubber. No. 2,356,527. Jean Mercier.

Washing bath for linen and other textile materials comprising an aqueous solution of a polyglycol ether selected from isohexyl, isooctyl and dodecyl phenyl polyglycol ethers and a water soluble salt of a phosphoric acid. No. 2,356,550. Anton Volz.

Preparing fur for felting comprising, subjecting fur to solution, comprising sulphuric acid, chloric acid, nitric acid and hydrogen peroxide. No. 2,356,681. Warren Mercier to American Hatters and Furriers Co. Inc.

Textile finishing composition comprising a dispersion of an alkylated methylol melamine having alkyl groups and a compound having an alkyl and a nitrogen atom having attached thereto a carbonyl radical and a substituent selected from H and alkylol radicals. No. 2,357,-273. Jack Thurston to American Cyanamid Co.

*Water, Sewage, and Sanitation

Water treating apparatus. No. 2,355,069. Walter Green to Infilco Incorporated.

Water treating apparatus. No. 2,355,561. Merrill Robinson to Worthington Pump & Machinery Corp.

Agricultural Chemicals

Stabilization of fatty materials which comprises steam dedorizing nonvolatile fatty material in presence of an oil of hydrogenated refined soy bean oil or hydrogenated refined sesame oil. No. 2,357,543. Guy Phelps and Howard Black to Industrial Patents Corp.

Controlling larvae which breed in animal droppings comprising adding to feed of animal zinc stearate. No. 2,357,717. Wesley Bruce, dedicated to free use of the People of the United States.

Preserving, coating, and bleaching dried apple particles. No. 2,358,086. Edward Mollner, Joseph Weber, and James Brennan.

Preparing coagulated peanut globulin fibers. No. 2,358,219. John Dickson and William Sever to Imperial Chemical Industries Ltd.

Coloring whole fruit without affecting oil cells or causing decay thereof, which consists in subjecting whole fruit to a solution of 1-xylylazoxylylazo-2 naphthol and sodium alkyl sulphate. No. 2,358,266. David Ulrey to Gregg Maxcy.

Producing mixture of purified pyrethrum extract and sesamin compounds. No. 2,358,392. Lyle Goodhue and Herbert Haller to Claude R. Wickard, as Secretary of Agriculture of the United States of America.

Manufacturing peanut protein filaments. No. 2,358,427. David Traill to Imperial Chemical Industries Ltd.

Obtaining solution of pectase in serum of a natural pulpy plant juice containing pectase adsorbed in pulp. No. 2,358,429. John Willaman and Claude Hills to Claude R. Wickard, as Secretary of Agriculture of the United States of America.

Preparing a highly polymerized pectinic acid of predetermined methoxy content. No. 2,358,430. John Willaman, Hugh Mottern and Claude Hills, and George Baker to Claude R. Wickard, as Secretary of Agriculture of the United States of America.

Testing an atmosphere for ethylene, wherein ethylene is used to hasten ripening of fruit. No. 2,358,882. Percy Rohrbaugh to California Fruit Growers Exchange.

Insecticide. Herbert Haller and William Barthel to Claude R. Wickard, Secretary of Agriculture of the United States of America.

Insecticidal composition comprising 2,2-bis (parachlorophenyl)-1,1,1-trichloroethane and lead arsenate. No. 2,358,942. Edouard Siegler, dedicated to the free use of the People of the United States.

Combined insecticide and germicide containing a relatively non-volatile insecticide and olive oil for modifying size of aerosol particles of insecticide and to give them added insect-penetrating properties, said insecticide and olive oil being dissolved in a compressed liquid-dispersing agent. No. 2,358,986. Edward McGovran and Lyle Goodhue to Claude R. Wickard, Secretary of Agriculture of the United States of America.

Preparing directly from gluten a solution of zein-containing proteins in a solvent or mixture of solvents. No. 2,359,202. Roy Coleman to Time, Inc.

Preparing zein solutions directly from gluten. No. 2,359,203. Roy Coleman to Time, Inc.

Preparing zein solutions directly from gluten. No. 2,359,204. Roy Coleman to Time, Inc.

Dichloromalononitrile as an insecticide. No. 2,359,266. Ingenuin Hechenbleikner to American Cyanamid Co.

* Continued from last month, (*Vol.* 565, *Nos.* 2-5).

Cellulose

Isolating a water-insoluble cellulose glycollic acid from an etherification reaction mixture containing a fibrous water-soluble alkali metal salt of said acid. No. 2,357,469. Albert Houghton and Kenneth Luckhurst to Imperial Chemical Industries, Ltd.

Forming a solution of a cellulosic material which comprises contacting a cellulosic material selected from cellulose and alkali stable cellulose ethers with an aqueous solution of sodium zincate. No. 2,357,731. Sidney Edelstein.

Manufacture of sheets of cellulose fibers esterified with a lower fatty acid while maintaining original structure of fibers, which sheets are characterized by di-electric properties and possess mechanical properties of paper and cardboard. No. 2,357,962. Hans Leemann, Alfred Rheiner and Werner Hagenbuch to Sandoz Ltd.

Preparing oxidized cellulose esters. No. 2,358,064. Charles Fordyce to Eastman Kodak Co.

Cleaning a filter employed for filtration of cellulose ester solutions. No. 2,358,069. William Hincke to Eastman Kodak Co.

Pretreating cellulose to prepare it for esterification. No. 2,358,080. Carl Malm to Eastman Kodak Co.

Manufacture of regenerated cellulose ribbons. No. 2,358,376. Thomas Banigan and Roy Hartman to E. I. du Pont de Nemours & Co.

Treatment of filaments, yarns, which comprises heating such formed articles having basis of organic derivative of cellulose containing free hydroxyl groups, in a liquid acidylation medium containing mixed anhydride of an organic poly-carboxylic acid and a lower aliphatic monocarboxylic acid. No. 2,358,387. Henry Dreyfus and Robert Moncrieff and Harold Bates to Celanese Corp. of America.

Hydrogel-forming composition including a water-soluble salt of cellulose glycolic acid and agar-agar. No. 2,358,549. Peter Wenck to The Dow Chemical Co.

Solid thermoplastic substance consisting mainly of cellulose acetate and in form of numerous separate particles having a lubricant. No. 2,358,-963. Drury Davies to Cellomold Ltd.

Ceramics

Making a composite glass and ceramic article. No. 2,357,399. Waylande Gregory.

Bending a pair of glass sheets simultaneously prior to bonding them together with an interposed layer of plastic material to form a composite safety glass structure. No. 2,357,537. Hoorace Orser and William Bamford to Libbey-Owens-Ford Glass Co.

Process and apparatus for manufacture of laminated safety glass. No. 2,357,538. Ormond Paddock to Libbey-Owens-Ford Glass Co.

Insulator, forming a metallized surface on ceramic bodies. No. 2,357,550. Davidge Rowland and Carl Croskey to Locke Insulator Corp.

Minus green glass having low transmission for green light and high transmission for remainder of visible spectrum which consists of SiO_2, K_2O, PbO, MnO_2, and Cr_2O_3. No. 2,357,994. Henry Blau to Corning Glass Works.

Providing matte finish upon glass surface which comprises coating surface with liquid film comprising suspension of fine solid organic plastic particles resistant to etching acid in volatile non-solvent liquid medium. No. 2,359,071. Frederick Adams to Pittsburgh Plate Glass Co.

Etching glass to obtain a matte surface, which comprises coating surface with solution of organic plastic containing dispersed particles of inorganic pigment insoluble in solvent for plastic. No. 2,359,072. Frederick Adams to Pittsburgh Plate Glass Co.

Chemical Specialties

Mineral oil composition comprising a mineral oil having admixed therewith an oil-miscible, stable ester of an inorganic acid of an acidic metalloid element. No. 2,357,287. Orland Reiff and John Giammaria to Socony-Vacuum Oil Co. Inc.

Flexible abrasive article of coated abrasive type adapted to be used wet in abrading or polishing of glass, marble and like. No. 2,357,335. Joseph Kugler and Byron Oakes to Minnesota Mining & Manufacturing Co.

Lubricant comprising reaction product of an ester wax reacted with phosphorus sulfide. No. 2,357,346. John Musselman and Herman Lankelma to The Standard Oil Co.

Abrasive article of coated abrasive type comprising abrasive grains bonded with a polymerized mono-hydric alcohol ester of alkyl substituted acrylic acid. No. 2,357,348. George Netherly and Bert Cross and Gilbert Anderson to Minnesota Mining & Manufacturing Co.

Flexible abrasive article used wet for abrading or polishing glass, marble and like. No. 2,357,350. Byron Oakes to Minnesota Mining & Manufacturing Co.

Mineral oil composition comprising a mineral oil having admixed a phosphite ester of wax-substituted phenol carboxylic acid. No. 2,357,359. Orland Reiff and John Giammaria to Socony-Vacuum Oil Co. Inc.

Molded composition of friction material comprising asbestos, fibres bonded with a heat hardenable phenol-aldehyde synthetic resin and a reaction product of shellac acids and a metallic compound. No. 2,357,409. Joseph Kuzmick to Raybestos-Manhattan, Inc.

Aqueous mud containing positively charged suspended mineral particles to which the positive charge has been imparted by an acid protein selected from acid gelatin and acid casein. No. 2,357,497. Donald Bond to The Pure Oil Co.

Defatting animal tissue containing fatty portions and non-fatty portions. No. 2,357,566. Charles Walter and Lowell Newton to Industrial Patents Corp.

Free-flowing puncture sealing composition comprising a cold swelling starch, water, a polyhydric alcohol, fibrous material, and granulated rubber. No. 2,357,650. Lloyd Hall to Blanche Connolly.

Separating oil mixture into components of different chemical constitution which comprises extracting feed mixture with a solvent consisting of compound selected from aldehydomorpholines and keto-morpholines. No. 2,357,667. Wayne Kuhn to The Texas Co.

Producing a distillate formation located below a formation which has a low content of oil and which is at pressure and temperature conditions below dew point of distillate fluid. No. 2,357,703. Charles Teichmann to Texaco Development Corp.

Flameproofing emulsion comprising a water-dispersible emulsifying agent, a binder material including a rubbery chlorine substitute hydrocarbon material, and an aqueous solution of a water-soluble inorganic fire-retarding component. No. 2,357,725. Harry Bennett.

Chewing gum base consisting of conventional chewing gum base ingredients, white mineral oil, and high melting terpene resin unaltered by

treatment. No. 2,357,811. Frank Corkery and Samuel Burroughs to Penns lvania Industrial Chemical Corp.
Producing carbon black wherein carbon particles are formed in a gas flame and flame impinged upon a collector. No. 2,357,857. Theodore Te Grotenhuis.
Butter and a high melting point fatty material, extended in bulk by incorporation of a finely dispersed gas, all of said high melting point fatty material being in form of minute crystals and aiding in stabilizing said composition. No. 2,357,896. Charles Howe to Industrial Developments, Inc.
Preventing formation of "yellow stain" on tinned material having a porous oxide film which comprises scrubbing tinned surface and applying a hot caustic alkali solution containing an oxidizing agent. No. 2,357,970. Frank Rath.
Making a stable rotenone insecticide forming a clear potash soap and adding aqueous solution of potassium pyrophosphate to form a jelly, then mixing rotenone with resultant. No. 2,358,073. Frank Kellner and Richard Williams.
Asphalt waterproofing material and method of making same. No. 2,358,140. Lloyd Bramble to Trumbull Asphalt Co.
Parting compound comprising fly ash as principal ingredient. No. 2,358,157. George Gardner to Aluminum Co. of America.
Producing a silica hydrogel. No. 2,358,201. Abraham Behrman to Infilco, Inc.
Producing an inorganic gel. No. 2,358,202. Abraham Behrman to Infilco, Inc.
Filter for dry clean'ng liquids. No. 2,358,238. Harald Lindblad to Mercury Cleaning Systems.
Lubricating composition comprising a hydrocarbon oil having dispersed therein a heavy metal salt of a complex dithiophosphoric acid ester in which is combined with dithiophosphoric acid radical a monocarboxylic acid containing an oil-solubilizing radical. No. 2,358,305. Elmer Cook and William Thomas, Jr., to American Cyanamid Co.
Condensation product of a substance selected from riboflavin and alkali metal salts of riboflavin with a substance selected from phthalic acid anhydride and succinic acid anhydride. No. 2,358,356. Gustav Stein and William Moran to Merck & Co. Inc.
Active carbon production involving formation of a char by destructive distillation of a carbonaceous material. No. 2,358,359. Kenneth Stuart to The Colorado Fuel & Iron Corp.
Modified drying oil. No. 2,358,475. Burt Pratt and Henry Rothrock to E. I. du Pont de Nemours & Co.
Extreme pressure lubricant comprising a mineral oil having dissolved therein an organic material containing metal-corroding constituents selected from halogen and sulfur, and an oil-soluble N-alkyl substituted carboxylic acid amide. No. 2,358,581. Eugene Lieber and Aloysius Cashman to Standard Oil Development Co.
Making bottom of basic furnaces which comprises dry mixed batch of ground magnesite and ground chrome ore adding surface layer of dead burned crushed dolomite or magnesite. No. 2,358,652. Isaac Nicholas.
Cementing composition for optical assemblies, a synthetic resin consisting of homogeneous mixture of esters of abietic acid and having refractive index within range of 1.5 and 1.6. No. 2,358,696. Adin Falkoff to Universal Camera Corp.
Composite stucco comprising calcined gypsum, Portland cement, lime, and land plaster. No. 2,358,701. Harry Gardner to Certain-teed Products Corp.
Forming dentures by incorporating in mold-forming material one ingredient for forming a moisture-impervious film. No. 2,358,730. Joseph Nelson and Henry Nauss to Kerr Dental Mfg. Co.
Adhesi e sheet materials. No. 2,358,761. Raymond Reed to The Kendall Co.
Preparing organic sulphonate detergents. No. 22,548. Robert Brandt to Colgate-Palmolive-Peet Co.
Waterproofing composition for concrete and like hydraulic mixes comprising suspension of a finely divided water insoluble metallic stearate, selected from calcium stearate and aluminum stearate and sulfonated butyl oleate to depress surface tension of aqueous medium to positive capillarity with respect to said stearate. No. 2,358,776. Herbert Goldstein and Leo Li erthson to L. Sonneborn Sons, Inc.
Preparing a beta-mercaptoethylamine. No. 2,358,786. Marston Bogert and Edward Mills, Jr., to E. R. Squibb & Sons.
Pressure sealing adhesive tape comprising five layers of material secured together. No. 2,358,831. Gustave Schieman to International Plastic Corp.
Manufacturing felted mineral wool products. No. 2,358,900. Joseph Zettel to Johns-Manville Corp.
Extracting vanilla flavoring with menstruum of low alcoholic content. No. 2,358,947. Louis Towt to C. V. Goffinet and Ruth Goffinet.
Low glycerine content bar soap, for toilet and general household use, characterized by property of dispersing insoluble alkaline earth salts of fatty acids which form when soap is used in hard water. No. 2,358,976. Harold Houlton to The Procter & Gamble Co.
Non-corrosive lubricating oil comprising mineral lubricating oil containing dissolved oil-soluble arsine disulfide having formula $RAsS_2$. No. 2,359,063. Paul Van Ess to Shell Development Co.
Preparing stabilized oil-in-water emulsion, which comprises making oil-in-water emulsion from oleaginous material and water, using emulsifying agent tending to form oil-in-water emulsions, adding water soluble soap of an aliphatic amino alcohol, normally tending to form water-in-oil emulsions, to stabilize said oil-in-water emulsion. No. 2,359,066. Herbert Wampner to Commercial Solvents Corp.
Checking part for surface defects which comprises immersing part in a hot fluorescent oil so that defects are filled therewith, removing excess oil. No. 2,359,114. Gustav Jebens, Ralph Snell, Robert Heath, George Fisher, Jr., Donald Scott, and Garrett Mouw, Jr., to General Motors Corp.
Lubricant designed for high pressures consisting of lubricating base of mineral oils and greases, and substance selected from selenium dioxide and selenocyanates. No. 2,359,270. Richard Shutt and George Waitkins to Battelle Memorial Institute.

Coatings

Simultaneously decolorizing, stabilizing and hardening glyceride oils. No. 2,357,352. William Paterson to Lever Brothers Co.
Anti-static composition for coating films, sheets and pellicles of non-hygroscopic, electrically non-conducting, film-forming substances, comprising starch, a hygroscopic electrolyte, wetting agent, and water. No. 2,357,380. Gilbert Brant to E. I. du Pont de Nemours & Co.
Clear coating composition for finishing bowling pins and the like, comprising a cellulose derivative and an anti-dirt collecting agent. No. 2,357,458. John Clough to E. I. du Pont de Nemours & Co.
Producing coating of ferric acetate on a ferrous metal, which comprises subjecting ferrous metal as anode to electrolytic treatment in an electrolyte consisting of lead acetate, di oct l sodium sulfo succinate, and ammonium hydroxide. No. 2,357,554. Joseph Sears to Schlage Lock Co.
Liquid coating composition adapted to dry rapidly and to form impervious adherent protective film comprising evaporable diluent, drier and mixture of polyhydric alcoholic esters of natural vegetable oil fatty acid characterized by presence of isomers of 10,12 octadecadienoic and acid residues. No. 2,358,623. George Burr to Regents of the University of Minnesota.

Dyes, Stains

Azo compounds and material colored therewith. No. 2,357,317. Joseph Dickey to Eastman Kodak Co.
Silver halide emulsions containing as a color former fast to diffusion the condensation product of a compound capable of reacting with oxidation products of a primary aromatic amino developer to produce a dyestuff image. No. 2,357,393. Alfred Frohlich and Wilhelm Schneider to General Aniline & Film Corp.
Silver halide emulsion for color forming development containing as dyestuff former a condensation product from an aromatic hydroxy acid and an aromatic primary amine. No. 2,357,395. Alfred Frohlich and Wilhelm Schneider to General Aniline & Film Corp.
Producing in exposed silver-halide emulsion a blue image by developing said emulsion in a primary aromatic amino developer and causing oxidation products of such developer to react during development with a compound. No. 2,357,394. Alfred Frohlich and Wilhelm Schneider to General Aniline & Film Corp.
Water soluble color fixing, softening and emulsifying agent, a quaternary compound. No. 2,357,598. Ernst Mauersberger to Alframine Corp.
Preparing mordant dyestuffs for discharge printing, yielding black shades when printed with chromium mordant on cotton or on artificial silk from regenerated cellulose. No. 2,357,949. Karl Glenz and Franz Neitzel to Durand & Huguenin A. G.
Monoazo red acid dyes. No. 2,357,958. Arthur Knight to Imperial Chemical Industries Ltd.
Azo dyes. No. 2,357,977. Swanie Rossander to E. I. du Pont de Nemours & Co.
Distillation of aniline in which aniline is vaporized in presence of water to produce a mixture of aniline and steam. No. 2,358,182. Henry Orem to American Cyanamid Co.
Monoazo dyestuffs and their manufacture. No. 2,358,519. Adolf Krebser and Werner Bossard and Werner Kuster to J. R. Geigy A. G.

Equipment

Making waterproof strands of fibroin filaments. No. 2,357,503. Anthony Cidonio to Schor Manufacturing Co.
Preventing carbonaceous deposits in generators for heating stove and lighting naphtha, comprising adding to naphtha a compound. No. 2,357,547. Wayne Proell to Standard Oil Co.
Closure for containers comprising a plug removably secured to container and having two passages connecting interior of container with atmosphere. No. 2,357,620. Rosswell Thomas to Phillips Petroleum Co.
Automatic density tester. No. 2,357,639. Joseph Elias.
Apparatus for dehydrating liquid products. No. 2,357,648. Joseph Hall to Drying & Concentrating Co.
Method of and apparatus for dehydrating liquid products. No. 2,357,649. Joseph Hall to Drying & Concentrating Co.
Electrostatic separation process and apparatus. No. 2,357,658. Herbert Johnson and Ray Packer to Ritter Products Corp.
Flexible thermometer support. No. 2,357,692. Thomas Saffady.
Catalyst chamber maintained at other than atmospheric pressure. No. 2,357,694. August Schutte to The Lummus Co.
Apparatus for distillation of hydrocarbons. No. 2,357,710. Walter Ullrich to The Lummus Co.
Apparatus for separating suspended matter from air or gas. No. 2,357,734. Eugene Haber to Matthews & Yates Ltd.
In vessel, a metallic wall resistant to hydrofluoric acid, a transparent panel contiguous with said wall comprising a crystalline oxide of a metal selected from aluminum and magnesium. No. 2,357,753. Maryan Matuszak to Phillips Petroleum Co.
Apparatus for distillation of high boiling liquids. No. 2,357,829. Martin Ittner to Colgate-Palmolive-Peet Co.
Vessel adapted for contact of a finely divided solid material with an upwardly moving gas in which said solid material is suspended in a mobile state. No. 2,357,901. Warren Lewis and Edwin Gilliland to Standard Oil Development Co.
Porous tube filter. No. 2,357,943. Chester Feagley and Glenn Robinson to E. I. du Pont de Nemours & Co.
Method of apparatus for manufacturing and controlling grain size of barium sulphate. No. 2,358,050. Gerald Boulet to Eastman Kodak Co.
High vacuum pumping system. No. 2,358,067. Kenneth Hickman to Distillation Products, Inc.
Forming refractory clinker that uses dolomitic starting material. No. 2,358,107. Gilbert Seil, to E. J. Lavino & Co.
Determining ionizable material content of heated boiler water or other liquid variable in temperature. No. 2,358,163. Raymond Heym.
Gas analyzer. No. 2,358,285. Clarence Johnson to Bailey Meter Co.
Forming abrasion and oil-resistant gaskets and like, comprising a soft vulcanizable mix containing a solid vulcanizable rubberlike material selected from natural rubber, polychloroprene, and a copol mer of butadiene and acrylonitrile, carbon black and graphite flakes premixed with an oily plasticizer. No. 2,358,290. Herman Kraft to The General Tire & Rubber Co.
Apparatus for determining physical properties of fluids. No. 2,358,374. Ernest Ashcraft.
Producing high pressure steam and low pressure steam. No. 2,358,380. Edward Butzler.
Producing artificial filaments, threads and films from vegetable globulins. No. 2,358,383. Albert Chibnall and Kenneth Bailey to said Chibnall and William Astbury.
Vacuum pump. No. 2,358,412. Gustave Muller and Donald Forsman; said Muller to said Forsman.
Sterilizer and sedimentizer. No. 2,358,414. Harold Peavey to Leon Barrett.
Machine and a process for making sugared milk powder. No. 2,358,418. Joseph Rosecky to Gehl Guernsey Farms, Inc.
Porous electrode for use in electrolytic processes, said porous material having a large number of minute interconnecting channels leading away from the surface. No. 2,358,419. Erwin Schumacher and George Heise to National Carbon Co. Inc.

Reclamation filter for catalyst employed in hydrocarbon cracking operations, and comprising inner and outer filter shells providing between them an annular catalyst collecting chamber. No. 2,358,509. Joel Hirsch and Frank Herle to The Vickers Petroleum Co. Inc.
Apparatus for dosing gas. No. 2,358,587. Georg Ornstein.
Apparatus for clarifying liquids. No. 2,358,736. John Schaaf.
Heat exchanger of liquid and gas contact type. No. 2,358,874. George Mulloy to Mead, Mulloy Corp.
Scale balance for indicating amount of moisture in a substance placed within a container. No. 2,358,877. Robert Parks to The Ohio State University Research Foundation.
Pipette. No. 2,358,936. Waddy Mathis to Clay Adams Co. Inc.
Refrigerant evaporator for use in vapor condenser of type including a tank having a vacuum inlet and outlet. No. 2,358,940. Karl Schoeller.
Corrosion preventing device in combination with a water boiler, said device consisting of two concentrically arranged electrodes, the outer electrode of copper, while the inner electrode is of zinc. No. 2,358,-981. Emert Lattner.
Oxygen meter, the combination of a light source, a color filter and light sensitive cell for selecting of types operable by said light source and responsive to wave lengths which are equally absorbed by oxy-hemoglobin and reduced hemoglobin. No. 2,358,992. Glenn Millikan.
Evaporator. No. 2,359,078. Arnold Baumann.
Apparatus for extracting choles-terol from blood. No. 2,359,128. Samuel Leiboff to Abraham M. Rosenfeld, as Paragon C. & C. Co.
Temperature measuring instrument. No. 2,359,141. Coleman Moore to The Brown Instrument Co.
Gas-purifying precipitator for electrically removing gas-borne dust-particles from a stream of flowing gas. No. 2,359,149. Edward Pegg to Westinghouse Electric & Mfg. Co.
Gas-carburizing furnace. No. 2,359,157. Willard Roth to Westinghouse Electric & Mfg. Co.
Circulation system of pulp digesters. No. 2,359,172. Ivan Troedsson.
Heat exchanger. No. 2,359,268. George Jacocks and Robert Giauque to Heat Transfer Products, Inc.

Explosives

Manufacture of explosives—tetryl. No. 2,357,830. Delbert Jones to Western Cartridge Co.
Propellent powder charge including an admixture of double base smokeless powder surface modified and characterized by producing breech pressures when fired at sub-zero temperatures which are not greater than those produced when fired at ordinary temperatures. No. 2,357,989. Elton Allison to Hercules Powder Co.
Free-flowing detonating explosive in granular form and capable of functioning effectively after immersion in water. No. 2,358,384. Clyde Davis to E. I. du Pont de Nemours & Co.
Free-flowing detonable explosive in granular form free from liquid explosive ingredients comprising inorganic oxidizing agent, solid explosive nitrate of an aliphatic polysaccharide, and a plant product capable of forming a cohesive paste with unheated water. No. 2,358,385. Clyde Davis and Walter Holmes to E. I. du Pont de Nemours & Co.

Foods

Food preparation comprising soup stock, and an edible gelatin shell enclosing and hermetically sealing soup stock from air. No. 2,358,-598. Robert Scherer to Gelatin Products Corp.
Cream filler comprising anhydrous emulsion including finely divided sweetening material including dried starch conversion syrup solids, and a soft edible fat. No. 2,359,228. Robert Lloyd and Paul Prentiss to American Maize-Products Co.

Fine Chemicals

Production of N-alkylol amides, which comprises admixing an anhydrous formamide containing at least one amido-hydrogen atom with ethylene oxide. No. 2,357,283. Franklin Peters to E. I. du Pont de Nemours & Co.
Preparation of a dialyl peroxide selected from dimethyl, diethyl and dipropyl peroxides. No. 2,357,298. Richard Wiley to E. I. du Pont de Nemours & Co.
Keto derivatives of 17-ethynyl-17-hydroxy-perhydro-cyclopentenophenanthrenes and process of preparing them. No. 2,357,364. Homer Stavely to E. R. Squibb & Sons.
Concentrating aqueous formic acid comprising dehydration and extraction of formic acid by distillation in presence of triamylamine as a concentrating agent. No. 2,357,412. Jean Levesque.
Preparation of glycerol B-(methoxy methyl) ether. No. 2,357,479. Donald Loder and William Gresham and Donald Killian to E. I. du Pont de Nemours & Co.
Producing compounds containing an N-substituted amide group.. No. 2,357,484. Elmore Martin to E. I. du Pont de Nemours & Co.
Alcoholysis of an ester of a substituted acetic acid having structural formula, $ROCH_2OCH_2COOH$, in which R is an alkyl group with a polyhydric alcohol ether. No. 2,357,594. Donald Loder and Wilber Teeters to E. I. du Pont de Nemours & Co.
Separation and concentration of cis- and trans-forms of conjugated diolefins. No. 2,357,910. Richard Robey and Herbert Wiese to Jasco, Inc.
Preparation of N-dialkyl-amino-acyl anilides. No. 2,357,912. George Seymour and Victor Salvin to Celanese Corp. of America.
Ester, member of class consisting of monomers, sub-resinous esterification polymers, and cogeneric sub-resinous heat-rearranged derivatives thereof. No. 2,357,933. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.
Ester, member of class consisting of monomers, sub-resinous esterification polymers, and cogeneric sub-resinous heat-rearranged derivatives thereof. No. 2,357,934. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.
Preparation of purified tocopherol succinate. No. 2,358,046. James Baxter and Robert Lehman to Distillation Products, Inc.
Preparation of phenyl malonic ester from ethyl phenyl acetate and diethyl oxalate in presence of sodium ethylate. No. 2,358,063. Alvin Flisik, Marc Inman, and William Bitler to Kay-Fries Chemicals, Inc.
Moist ester of class consisting of monochloro- and monobromomaleates and -fumarates containing not more than 1% water. No. 2,358,130. Charles Milone to Wingfoot Corp.
Making a triaryl phosphate wherein a phenolic compound is reacted with phosphorus oxychloride. No. 2,358,133. Wesley Stoesser and Alexander Widiger, Jr. to The Dow Chemical Co.
Production of compounds containing an aromatic ring fused with a pyridine ring in presence of elementary iodine. No. 2,358,162. John Hewitt and Trustham West to Stafford Allen & Sons Ltd.
Tetraacetyl ribonic acid nitrile. No. 2,358,191. Max Tishler and John Wellman to Merck & Co. Inc.
Obtaining absolute alcohol from aqueous mixtures thereof by a single azeotropic distillation. No. 2,358,193. Theodore Wentworth.
Treatment of pyroligneous acid. No. 2,358,229. Robert Isham and Otto Spring to Danciger Oil & Refineries, Inc.
Catalytically hydrogenating an ester of abietic acid to corresponding alcohol. No. 2,358,235. Wilbur Lazier to E. I. du Pont de Nemours & Co.
Producing clear, stable, water-white, heat and moisture convertible, non-thixothropic glycol modified melamine-formaldehyde resinous condensation products. No. 2,358,276. Theodore Hodgins and Philip Hewett and Almon Hovey to Reichhold Chemicals, Inc.
Chromanes and processes for producing same. No. 2,358,286. Otto Hromatka to Merck & Co. Inc.
Amino chromanes. No. 2,358,287. Otto Hromatka to Merck & Co. Inc.
Di-(dihydronordicyclopentadienyl) ether, when pure boils at 185°-188° C./3 mm. No. 2,358,314. Herman Bruson to The Resinous Products & Chemical Co.
Dried egg substance having an intraalbumen content of an incompletely esterified reaction product of an unesterified polyhydric alcohol and an aliphatic monocarboxylic acid, and a proteolytic enzyme. No. 2,358,-324. Charles Frey and Glennard Miller to Standard Brands Inc.
Pantothenic preparations and methods of obtaining same. No. 2,358,335. Elmer Lawson, Hervey Parke, and Leon Sweet to Parke, Davis & Co.
Preparing a salt of pantothenic acid which comprises reacting in non-aqueous phase beta-alamine and a salt of alpha, 2-dihydroxy-beta, beta-dimethylbutyric acid. No. 2,358,336. Elmer Lawson and Hervey Parke to Parke, Davis & Co.
dl-alpha, 2-dihydroxy-beta, beta-dimethylbutyramide, having melting point of 126-127° C. No. 2,358,337. Elmer Lawson and Hervey Parke and Leon Sweet to Parke, Davis & Co.
Copolymer of an ester of an alpha methylene monocarboxylic acid with a (2-vinylethinyl) carbinol. No. 2,358,444. Donald Coffman and Clarence Denoon, Jr., to E. I. du Pont de Nemours & Co.
Manufacture of new esters of dihydro-estrine series consisting of estradiol, estriol, dihydroequilenine and dihydroequiline having free phenolic hydroxyl groups. No. 2,358,525. Karl Miescher and Caesar Scholz to Ciba Pharmaceutical Products, Inc.
Producing a log of the gamma ray activity of formations penetrated by a bore hole which comprises moving along bore hole an ionization chamber capable of generating current in response to gamma ray bombardment. No. 2,358,574. Lynn Howell to Standard Oil Development Co.
Manufacture of keto-alcohol acetates which comprises heating lactones. No. 2,358,618. Franz Bergel to Roche Products Ltd.
Purifying contaminated aqueous alkali metal hydroxide solution containing a solutizer for mercaptans which solution was used to extract weak acids from a sour hydrocarbon distillate. No. 2,358,619. Lawson Border to Shell Development Co.
Dielectric material comprising as tetrachlor orthonitro diphenyl derived by chlorination of mono orthonitro diphenyl and pentachlor diphenyl. No. 2,358,627. Frank Clark to General Electric Co.
Dielectric compositions comprising halogenated aryl hydrocarbons blended with nitrochlor diphenyl which is derived by nitration of chlorinated diphenyl. No. 2,358,628. Frank Clark to General Electric Co.
Purification of pentaerythritol. No. 2,358,697. William Filbert to E. I. du Pont de Nemours & Co.
Producing calcium cuproxy chloride. No. 2,358,706. Ivan Haag and Robert Pfanstiel to E. I. du Pont de Nemours & Co.
Thiazoles. No. 2,358,716. Paul Jones and Arthur Sloan to The B. F. Goodrich Co.
Plant response composition chosen from indole acetic acid, indole propionic acid, indole butyric acid, indole valeric acid, naphthalene acetic acid, etc., dissolved in a solvent. No. 2,358,727. Vartkes Migreichian to American Cyanamid Co.
Reacting metallo malonic esters, metallo beta-keto esters and metallo alpha-cyano esters, with alkyl, alkenyl and aralkyl halides and di-sulfates. No. 2,358,768. Vernon Wallingford and August Homeyer to Mallinckrodt Chemicals Works.
In treatment of sulphonatable petroleum hydrocarbon stock, improvement comprising sulphonating such stock with fuming sulfuric acid in presence of a chlorinated aliphatic normally liquid hydrocarbon. No. 2,358,-773. Manuel Blumer to L. Sonneborn Sons, Inc.
Hydantoinimide derivatives of proteins and alpha amino acids and process. No. 2,358,807. Oskar Huppert to The Glidden Co.
Purifying technical camphene which comprises heating with surface active solid silicate catalyst. No. 2,358,855. Gastao Etzel to E. I. du Pont de Nemours & Co.
Fractionating and refining organ extracts. No. 2,358,869. Siegfried Maurer and Harold Wiles.
Fractionating and refining organ extracts in which livers are macerated with water and filtered to remove connective tissue. No. 2,358,870. Siegfried Maurer and Harold Wiles.
Preparing disodium salt of disulfodisalicylal ethylene diamine (Schiff's Bases). No. 2,358,893. John Vincent to E. I. du Pont de Nemours & Co.
Extraction of lactones and phenols from pyroligneous acid. No. 2,358,-979. Robert Isham and Otto Spring to Danciger Oil & Refineries, Inc.
Interpolymerization products of vinyl chloride and a tetrahydrophthalic acid ester. No. 2,359,038. Heinrich Hopff and Wilhelm Rapp to General Aniline & Film Corp.
Production of monocyclicaryloxy ketones. No. 2,359,039. Charles Hurd to Commercial Solvents Corp.
Detecting enzyme activity in an enzyme containing liquid. No. 2,359,052. Harry Scharer.
Beta-(beta-naphthyl)-beta-hydroxy-gamma-butyrolactone. No. 2,359,096. Robert Elderfield to Eli Lilly & Co.
Molded article comprising laminated sheets of fibrous material impregnated with a phenolic condensate and coating of urea-free melamine-aldehyde reaction product. No. 2,359,097. Howard Elsey to Westinghouse Electric & Mfg. Co.
Obtaining purified flavanone glucosides. No. 2,359,126. Carl Lautenschlager and Fritz Lindner, Adolf Mager and Erich Bartholomaus, to Winthrop Chemical Co. Inc.
Preparation of unsymmetrical formals. No. 2,359,134. Donald Loder to

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Beta-substituted-delta alpha, beta-gamma-butyrolactones and beta-substituted-beta-hydroxy-gamma-butyrolactones and methods of preparing them. No. 2,359,208. Robert Elderfield and Martin Rubin to Eli Lilly & Co.

Industrial Chemicals, Inorganic

Heating heat sensitive liquids in bulk to evaporation other than basically by convection or conduction which consists in placing liquid in a container a wall of which is composed of a poor heat-conducting material which is translucent to infra-red rays. No. 2,357,286. James Arthur Reavell.
Producing vanadium oxide of high quality from an insoluble alkali metal hexavanadate. No. 2,357,466. Frederick Frick to Anaconda Copper Mining Co.
Cyclic method of handling comminuted water-insoluble catalysts through a continuous vapor-contacting operation, comprising: coating surfaces of metallic units having a high relation of superficial area to occupied volume with films of said catalyst. No. 2,357,570. Gale Adams to Socony-Vacuum Oil Co. Inc.
Well crystallized alkali metal acid salts of oxidation products of abietic acid. No. 2,357,613. Leo Sternbach to Hoffmann-La Roche, Inc.
Manufacture of silicated caustic alkali products. No. 2,357,723. Brazier Beecher and Howard Roderick to Wyandotte Chemicals Corp.
Fluid catalyst process. No. 2,358,039. Charles Thomas and Joseph Danforth to Universal Products Co.
Preparing magnesium sulphide which comprises passing hydrogen sulphide into contact with anhydrous magnesium chloride. No. 2,358,661. Theodore Sarge to The Dow Chemical Co.
Extracting magnesium carbonate from dolomite. No. 2,358,818. Lewis Miller to Keasbey & Mattison Co.
Electrolytic recording. No. 2,358,839. Edgar Wagner to Faximile, Inc.
In use of acid aqueous solutions containing chlorite, improvement which comprises repressing generation of chlorine dioxide in solution by presence of H_2O_2. No. 2,358,866. James MacMahon to The Mathieson Alkali Works, Inc.
Treating supernatant liquor formed in a sludge digestion tank to which sludge produced by a treatment process has been passed for anaerobic bacterial decomposition. No. 2,359,004. Harry Schlenz and Clifford Cox to Pacific Flush Tank Co.
Extracting bromine from aqueous bromide solution. No. 2,359,221. Ivan Kenaga to The Dow Chemical Co.
Treating red phosphorus with solution of sodium aluminate in water. No. 2,359,243. John Pernert to Oldbury Electro-Chemical Co.

Industrial Chemicals, Organic

Production of valuable hydrocarbons by vapor phase pyrolysis of petroleum oil in presence of catalyst, said catalyst being dispersed in finely divided form by electric discharge between electrodes. No. 2,357,315. Newcomb Chaney to The United Gas Improvement Co.
Regenerating a bed of spent catalyst material in a catalytic hydrocarbon conversion process operating at superatmospheric pressure and 850° to 1050° F. No. 2,357,332. Louis Kelly and Lee Van Horn to The M. W. Kellogg Co.
Solvent extraction process for separating mixture of different organic compounds comprising contacting said mixture with a 2-sulfolene. No. 2,357,344. Rupert Morris and Theodore Evans to Shell Development Co.
Recovering vanadium from material comprising a phosphato-vanadic acid. No. 2,357,488. James Nelson to Anaconda Copper Mining Co.
Converting tar or residue containing boron fluoride and hydrogen fluoride into more useful products, which comprises subjecting tar to action of hydrogen whereby to form low boiling hydrocarbons. No. 2,357,495. Herman Bloch to Universal Oil Products Co.
Treating a hydrocarbon product in natural state reducing its hydrogen sulphide content and prevent corrosion of well tubing which includes pouring between casing and tubing of well, a mixture of sulphonated higher fatty acid and aqua ammonia. No. 2,357,559. Thomas Smith to Odessa Chemical and Equipment Co.
Alkylation of iso-paraffin with olefines. No. 2,357,607. Cecilio Ocon and Ernest Ocon; said Cecilio Ocon to said Ernest Ocon.
Distilling a hydrocarbon mixture in a distillation column to obtain a predetermined separation of light distillate components from heavy residual components. No. 2,357,664. Wheaton Kraft to The Lummus Co.
Dehydrogenating hydrocarbons which comprises contacting said hydrocarbons with a chromium oxide catalyst. No. 2,357,691. Robert Ruthruff to Process Management Co. Inc.
Production of dextrose and levulose. No. 2,357,838. James Cyril Mahoney.
Producing 1,3 butadiene including step of passing ethanol over a catalyst comprising magnesium oxide and silica. No. 2,357,855. Waclaw Szukiewicz, twenty-four per cent to himself, fifty-five per cent to Tomasz Kuzniarz, twenty per cent to Dal, Inc.
Selectively separating a fraction which is rich in unsaturated glycerides from a mixture with a more completely saturated glyceride, with an organic solvent, a monohydroxy unsubstituted alcohol of from 1-3 carbon atoms. No. 2,357,881. Bernard Dombrow to National Oil Products Co.
Hydrogenation of carbon oxides. No. 2,357,894. Charles Hemminger to Standard Catalytic Co.
Polymerization of olefins to form product having a viscosity as high as that of a lubricating oil which comprises contacting olefins with a liquid catalyst comprising boron fluoride and water. No. 2,357,926. Lewis Bannon to Standard Oil Development Co.
Method of manufacturing esters. No. 2,357,935. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.
Method for manufacturing esters. No. 2,357,936. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.
Manufacturing esters. No. 2,357,937. Melvin DeGroote and Bernhard Keiser to Petrolite Corp. Ltd.
Producing alkylated aromatic hydrocarbons which comprises reacting an aromatic hydrocarbon with an olefin in presence of an alkylating catalyst consisting of hydrogen chloride. No. 2,357,978. Louis Schmerling and Arthur Durinski to Universal Oil Products Co.
Preventing a sand core including an aqueous binder solution from sticking to a metal mold that comprises coating interior of mold with a water-insoluble normally-liquid fatty acid. No. 2,358,002. William Dearing and Leonard Meyer to Libbey-Owens-Ford Glass Co.
Preparing a stable fatty acid compound from tall oil. No. 2,358,004. Russel Dressler, Robert Vivian, and Torsten Hasselstrom.
Producing saturated hydrocarbons of more-highly branched structure than that of a hydrocarbon starting material which comprises reacting said hydrocarbon in presence of a catalyst formed by interacting a phosphoric acid and a metal halide of Friedel-Crafts type. No. 2,358,011. Vladimir Ipatieff and Louis Schmerling to Universal Products Co.
Production of amines from aliphatic nitriles having at least 6 carbon atoms. No. 2,358,030. William Pool and Ralph Potts to Armour & Co.
Treatment of a hydrocarbon fraction containing aromatic and non-aromatic hydrocarbons to separate aromatic hydrocarbons. No. 2,358,129. George Lake to Union Oil Co. of California.
Regeneration of sodium hydroxide-sodium sulphide cooking liquors by dehydrating spent liquor to form black ash, carbonizing black ash, burning carbonized residue and fusing resultant organic residue. No. 2,358,187. Walter Savell to The Mathieson Alkali Works, Inc.
Making a resistor that comprises mixing finely divided resistance material with a polymeric ester of methacrylic acid, a plasticizer and a volatile solvent. No. 2,358,211. Carl Christensen and Howard Christensen to Bell Telephone Laboratories, Inc.
Producing high molecular alcohols which comprises reducing hydroabietic acid with hydrogen. No. 2,358,234. Wilbur Lazier to E. I. du Pont de Nemours & Co.
Imparting water repellent properties to fibrous products with an alkyl diamide of aromatic disulphonic acid. No. 2,358,273. David Aelony to Monsanto Chemical Co.
Production of fumaric acid. No. 2,358,775. Harry Finch and Theodore Evans to Shell Development Co.
Retarding oxidation of an organic material which comprises incorporating in said material the aldehyde oxidation product of tertiary butyl ether of o-tertiary butyl p-cresol. No. 2,358,833. Warren Smith and Carroll Wilson to Standard Oil Development Co.
Injection molding granular materials. No. 2,359,013. Warren Tucker to The Hydraulic Development Corp. Inc.
Recovery of a C_5 diolefine material from a mixture containing other hydrocarbons. No. 2,359,020. Frederick Breuer to The United Gas Improvement Co.
Sweetening chlorinated aliphatic hydrocarbons by reducing odoriferous sulphur compound by reacting with a reducing agent and removing odoriferous reduction product from chlorinated hydrocarbon by scrubbing with alkaline agent. No. 2,359,218. Wilson Hunt and George Hebbard to The Dow Chemical Co.
Halogenating a substituted acid anilide. No. 2,359,227. John Livak and Cleo Carlson to The Dow Chemical Co.
Where a phenol is reacted with a ketone in presence of a strong mineral acid, promoting reaction by carrying it out in presence of a sulphur compound. No. 2,359,242. Ralph Perkins and Fred Bryner to The Dow Chemical Co.

Medicinals

Preparing a vitamin B complex concentrate. No. 2,357,756. Sidney Musher to Musher Foundation Inc.
Isolation of anti-hemorrhagic vitamin principles present as quinones in mixtures which are soluble in low-boiling petroleum ether. No. 2,357,944. Louis Fieser to Research Corp.
Synthesis of hexoestrol. No. 2,357,985. Everett Wallis and Seymour Bernstein to Research Corp.
Sulfanilamidothiadiazoles. No. 2,358,031. Richard Roblin, Jr. and Philip Winnek to American Cyanamid Co.
Manufacture of phenobarbital by condensing phenyl ethyl malonic ester with urea. No. 2,358,072. Marc Inman and William Bitler to Kay-Fries Chemicals, Inc.
Fermenting carbohydrates to produce 2,3 butylene glycol comprising inoculating material containing fermentable carbohydrates with a culture of a 2,3 butylene glycol producing Aerobacter aerogenes. No. 2,358,212. Leo Christensen to National Agrol Co. Inc.
Parental solution comprising a 9-polyhydroxyalkyl-iso-alloxazin, and aqueous solution of an acetamidine acid-addition salt. No. 2,358,331. Alfred Jurist to E. R. Squibb & Sons.
Sulphonamide derivatives and process for obtaining same. No. 2,358,365. Benjamin Tullar to Parke, Davis & Co.
Heterocyclic substituted aryl sulphonamido compounds and methods of obtaining same. No. 2,358,366. Benjamin Tullar to Parke, Davis & Co.
Protecting material subject to attack by microorganisms which comprises applying liquid containing N-substituted 3-aminomethyl-2(3)-benzothiazolethione. No. 2,358,402. John Kurlychek to United States Rubber Co.
Sulphonamide compounds. No. 2,358,465. James McNally and Joseph Dickey to Eastman Kodak Co.
Manufacture of ethinyl testosterone. No. 2,358,808. Hans Inhoffen to Schering Corp.
Preparing dihydrodiethylstilbestrol and related compounds. No. 2,359,019. William Braker and Edward Pribyl to E. R. Squibb & Sons.
Germicidal composition comprising as active toxic ingredient a mixture of water-soluble phenolate with an alkali metal pyrophosphate. No. 2,359,240. Alexander Partansky to The Dow Chemical Co.
Water-miscible liquid germicidal concentrate including orthophenylphenol dispersed therein as principal toxic ingredient and material selected from pine oil and alpha-terpineol. No. 2,359,241. Alexander Partansky to The Dow Chemical Co.
Synthesis of vitamin B_6, 2-methyl-3-methoxy-4-cyanopyridine-5-carboxamide. No. 2,359,260. Lester Szabo to S. M. A. Corp.
Water-soluble derivatives of hormonelike acting products and process of manufacturing same, which comprises esterifying compound selected from hexane, $delta_3$-hexene and $delta_{2,4}$-hexadiene compounds. No. 2,359,276. Heinrich Medick to Winthrop Chemical Co. Inc.

Metals, Alloys

Beneficiating phosphate ore by froth flotation of silica therefrom in presence of a cationic collector. No. 2,357,419. Harry Mead and Ernest Maust to American Cyanamid Co.
Determination of tin in cast iron and steel. No. 2,357,429. Edward Saxer and Robert Minto.
Aluminum base alloy having low thermal coefficient of expansion and great wear resistance, containing silicon, magnesium, manganese, iron, copper, and aluminum. No. 2,357,449. Walter Bonsack to The National Smelting Co.
Aluminum alloy. No. 2,357,450. Walter Bonsack to The National Smelting Co.
Aluminum base alloy having low coefficient of thermal expansion, great wear resistance and high thermal conductivity. No. 2,357,451. Walter Bonsack to The National Smelting Co.
Aluminum alloys. No. 2,357,452. Walter Bonsack to The National Smelting Co.

From Official Gazette—Vol. 566, Nos. 1-4 (Sept. 5-26) p. 536

Consolidating finely divided solid metallic magnesium which comprises treating with a metal having a lower melting point and a lower boiling point than magnesium. No. 2,357,614. Harold Stowell to St. Joseph Lead Co.

Making a copper alloy containing manganese and silicon. No. 2,357,653. Herbert Heinicke to Western Electric Co., Inc.

Manufacture of strontium peroxide. No. 2,357,655. August Hummel and William Driesen to Hummel Chemical Co. Inc.

Protective sheet material for smooth polished metallic surfaces, comprising a thin flexible sheet backing having thin exposed coating of rubber and of a butadieneacrylic acid nitrile mixed polymerizate. No. 2,357,662. Milton Kemp to The Kendall Co.

Leaching metalliferous ores containing copper and a ferruginous gangue carrying siliceous material. No. 2,357,715. Harold Cutler Westby.

Deep drawing silicon-killed steel containing carbon, manganese, silicon, boron, remainder iron, and being free from deoxidizing elements, and deoxidation products thereof. No. 2,357,876. Walter Crafts and Cecil Chadwick to Electro Metallurgical Co.

Handling molten magnesium and magnesium-base alloys, which comprises holding such molten materials in a container made of steel containing 10% to 30% manganese. No. 2,357,885. Russell Franks and William Binder to Electro Metallurgical Co.

Finely divided composition comprising magnesium oxide, particles of composition comprising plate-like discs made up largely of crystals radiating from a common center. No. 2,357,987. Charles Winding to Tide Water Associated Oil Co.

Producing alkali-metal chromates from chromite ore containing vanadium. No. 2,357,988. Alfred Van Wirt and Andrew Aylies to Imperial Paper and Color Corp.

Treating copper ores. No. 2,357,990. Arturo Amenabar.

Cleaning magnesium and magnesium alloys which comprises treating with an aqueous solution of chromic acid and chromium trifluoride. No. 2,357,991. Kreigh Ayers to Wingfoot Corp.

Electrodepositing indium metal on a cathode surface. No. 2,358,029. Albert Phillips and Henry Linford to American Smelting & Refining Co.

Concentrating manganese minerals which comprises agitating a manganese ore, with a hydrophilic colloid. No. 2,358,055. Frank Cahn to The Emulsol Corp.

Comminuting molten metal by beating and flinging particles of said molten metal into a gaseous atmosphere. No. 2,358,068. Siegfried Hiller.

Metal composition formed of particles of metal selected from nickel and cobalt coated with metal selected from palladium, platinum and rhodium and metal selected from copper, silver and gold. No. 2,358,326. Franz Hensel and Earl Larsen to P. R. Mallory & Co. Inc.

Production of shaped articles such as tubes, rods, and profiles from magnesium and magnesium alloy scrap. No. 2,358,667. Max Stern.

Producing silicon steel sheet or strip characterized by enlarged grain size. No. 2,358,788. Victor Carpenter and John Jackson and Jack Lucas to The American Rolling Mill Co.

Producing a steel structural member having in tension and compression a proportional limit above 45,000 lbs. per sq. inch and a yield strength above 160,000 lbs. per sq. inch. No. 2,358,799. Russell Franks to Electro Metallurgical Co.

Matte smelting of manganese. No. 2,358,812. Ray Knickerbocker.

Electrodepositing nickel using electrolytic sheet nickel anode in electrolyte equal to 0.75-N nickel and including a chloride. No. 2,358,995. Walter Pinner to Houdaille-Hershey Corp.

Treating metal strip. No. 2,359,088. George Croft to Blaw-Knox Co.

Producing electrical contact surface for copper oxide rectifiers which comprises applying to oxidized surface a coating of colloidal graphite and covering outer surface of coating with a metal layer. No. 2,359,107. Carl Hein to Westinghouse Electric & Mfg. Co.

Casting low carbon low alloy ferrous metal shapes, which consists in mold core, having an insert of stainless steel having heat conductivity of one-third of low carbon steel. No. 2,359,234. Erwin Mebs.

Laminated wrapping material which includes outer layers of thin aluminum foil, inner adhesive layer of asphalt-reclaimed rubber and thin paper layer between these first two. No. 2,359,250. Orville Schmied to Reynolds Research Corp.

Paints, Pigments

Iron blue pigment characterized by incorporation of a non-basic nickel phosphate compound to render pigment resistant to alkalies. No. 2,357,296. Alfred Van Wirt and George Jones to Imperial Paper & Color Corp.

Filling and binding composition comprising a pyroxylin containing lacquer, calcined gypsum and lacquer solvent. No. 2,357,573. Ernest Beck, one-half to August Baumgart.

Pigment having its particles coated with a gel formed of a hydrosol comprising reaction products of an alkali metal silicate and aluminates and borates of alkali metals. No. 2,357,721. Benjamin Wilson Allan.

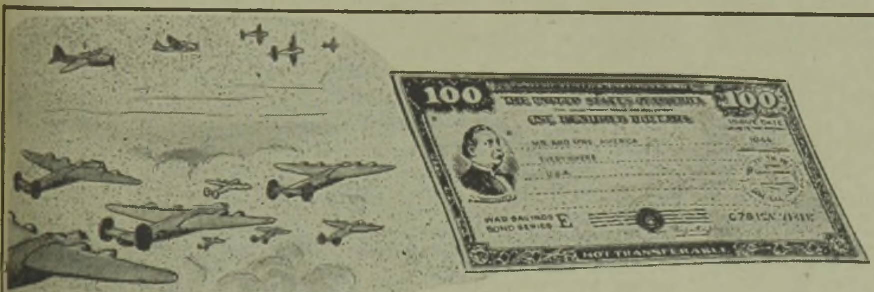
Colored water-in-oil emulsion ink containing varnish, water, pigment, colloidal agent and emulsifying agent. No. 2,357,927. James Raymond Berg.

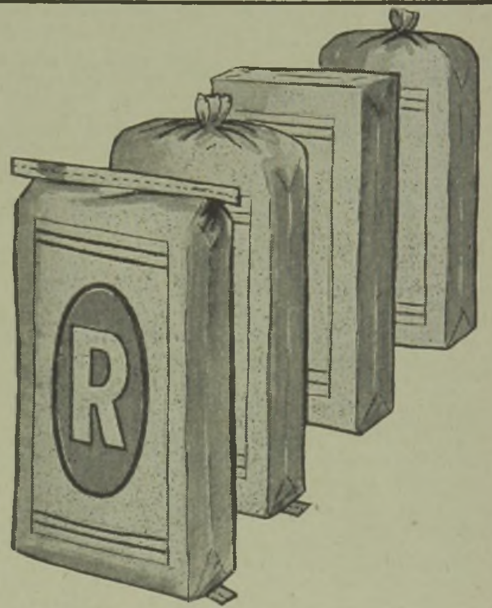
Transfer ink comprising wax having hardness and solvent power for dyestuffs similar to carnauba wax beeswax, heavy animal oil having a viscosity similar to lanoline, and colorant. No. 2,357,948. Albert Gessler and Werner Goepfert to Interchemical Corp.

Obtaining a rutile TiO_2 pigment by converting anatase. No. 2,358,167. John Keats and James Booge to E. I. du Pont de Nemours & Co.

Rotogravure ink product of an aldehyde and a protein in absence of a fixed alkali salt, and a coloring substance. No. 2,358,511. Matthew Hopkins to Howard Flint Ink Co.

Decalcomania comprising sheet of water absorbent paper, water soluble adhesive thereon, printing on said adhesive consisting of ink having cinyl compound base, and finish coating upon said printing consisting of cellulose acetate. No. 2,359,185. Marcellus Wysong to Gladys Wysong.





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MIDDLETOWN, OHIO.

From Official Gazette—Vol. 566, Nos. 1-4 (Sept. 5-26) p. 537

Paper and Pulp

Photographic paper consisting of paper having a coating of barium sulfate dispersed in polyvinyl alcohol, and an overcoating of a photographic emulsion consisting of silver halide and a carrier therefor. No. 2,358,056. Halford Clark to Eastman Kodak Co.

Mounting tissue for photographs comprising a cellulosic base sheet carrying a hot-melt composition at both surfaces comprising ethyl cellulose, a plasticizer, and a compatible non-volatile solvent. No. 2,358,135. Allen Abrams and George Forcey to Marathon Paper Mills Co.

Classifying of pulp solids containing sands and finer or lighter solids. No. 22,546. Arthur Fahrenwald to The Dorr Co. Inc.

Petroleum Refinery

Effecting catalytic conversion of naphtha in presence of added hydrogen and a dehydrogenating and cyclicizing catalyst. No. 2,357,365. Lee Van Horn and Louis Kelly to The M. W. Kellogg Co.

Isomerizing straight-chain paraffin hydrocarbons in a saturated naphtha fraction. No. 2,357,521. Webster Kay to Standard Oil Co.

Endothermic conversion of hydrocarbons employing a plurality of beds of contact material. No. 2,357,531. Percy Mather and Lev Mekler to Universal Oil Products Co.

Apparatus for coking petroleum residues. No. 2,357,621. Malcolm Tuttle to Max B. Miller & Co. Inc.

Treating of a low-boiling normally liquid fraction of a cracked mineral oil which is unsuitable for aviation gasoline material because of presence of unsaturated hydrocarbons. No. 2,357,741. Donald Howes and Eric Fawcett to Anglo-Iranian Oil Co. Ltd.

Purification procedure in refining of alkali metal oil-soluble sulphonates produced from straight-run petroleum distillates. No. 2,357,866. Francis Archibald and Dick van Dijk to Standard Oil Development Co.

Preparation of petroleum mahogany sulphonic acids from extrats derived comprising condensing dimethyl muconate with dimethyl maleate. No. 2,358,048. William Bitler and Leonard Nicholl to Kay-Fries Chemicals, Inc.

Producing lubricating oil from oil containing paraffinic and relatively non-paraffinic oil fractions. No. 2,358,128. George Lake to Union Oil Co. of California.

Producing gasoline motor fuel of high anti-knock value from a crude petroleum. No. 2,358,149. Horace Cooke to Gulf Oil Corp.

Producing gasoline motor fuel of high anti-knock value from a crude petroleum. No. 2,358,150. Horace Cooke to Gulf Oil Corp.

Manufacturing hydrocarbon oil suitable as fuel in internal combustion engines, and especially aviation engines, and having a high anti-knock value. No. 2,358,184. Povl Ostergaard to Gulf Oil Corp.

Converting paraffins into more highly branched isomers. No. 2,358,311. Herman Bloch to Universal Oil Products Co.

Method of conducting hydrocarbon conversion reactions. No. 2,358,497. Gustav Egloff to Universal Oil Products Co.

Producing gas oil for cracking operations from heavy petroleum residual crudes. No. 2,358,573. Charles Hemminger to Standard Oil Development Co.

Removing wax deposits from oil-well tubing which comprises: feeding into tubing emulsion of oil-soluble sulfonated organic body and a water-soluble gelatinous substance. No. 2,358,665. Abraham Shapiro to Socony-Vacuum Oil Co. Inc.

Preparation of petroleum mahogany sulphonic acids from extracts derived from solvent refining of petroleum hydrocarbon material. No. 2,358,774. Manuel Blumer to L. Sonneborn Sons, Inc.

Obtaining lower boiling hydrocarbons for motor fuel from a higher-boiling hydrocarbon oil of type of gas oil which contains less than .05% by weight of sulfur. No. 2,358,879. Aaron Redcay to Standard Catalytic Co.

Two-stage hydrocarbon conversion process wherein charging oil boiling above range of gasoline is catalytically converted in initial stage with resulting production of olefin-containing gasoline which is catalytically converted in secondary state to reduce its olefin content and improve its antiknock value. No. 2,358,888. Charles Thomas to Universal Oil Products Co.

Conversion of light hydrocarbons. No. 2,358,912. Howard Dimmig to Gasoline Products Co. Inc.

Mixing distillate fluid in producing well with a high density liquid, permitting resulting mixture to flow to surface. No. 2,358,920. Allen Garrison to Texaco Development Corp.

Separation of wax from wax-bearing oil wherein wax-bearing oil is mixed with a dewaxing solvent mixture comprising a wax anti-solvent and an oil solvent. No. 2,358,921. William Gee to Texaco Development Corp.

Liquid lubricant comprising a petroleum lubricating oil, a water-insoluble polyvalent metal soap and an alkali metal petroleum mahogany sulphonate. No. 2,358,939. Roy Nelson and Windsor Moore and Norman Faust to The Texas Co.

Alkylating saturated aliphatic hydrocarbon having tertiary carbon atom by reaction with alkylating agent in emulsion of hydrocarbon and sulfuric acid alkylation catalyst. No. 2,359,119. Horace Karr and Carl MacHenry to Shell Development Co.

Photographic Chemical

Method of color correction for multilayer negative film. No. 2,357,388. Herman Duerr, Herbert Morreall, Jr., and Harold Harsh.

Photographic layer comprising a light-sensitive silver halide and a binding agent comprising mixture of gelatin and a cellulose glycollic acid. No. 2,357,590. Fritz Jaffe to Chromogen, Inc.

Photographic process for etching figures on glass. No. 2,357,913. John Sigford and Waldo Kliever to Minneapolis-Honeywell Regulator Co.

Making colored photographic records comprised of superposed records of blue, green and red color aspects the cyan coloring matter not having sufficiently strong absorption at far red end of spectrum and causing a preponderance of red in finished record. No. 2,357,924. John Andreas to Technicolor Motion Picture Corp.

Recovery of aromatic amino photographic agents contained in aqueous solutions derived from photographic processes. No. 2,358,053. Karl Brunings to Eastman Kodak Co.

Photographic printing material for making prints of same contrast and same density range from negatives of widely differing contrasts. No. 2,358,060. Edward Davey to Eastman Kodak Co.

Photographic printing material for production of images of different contrast from black-and-white images, under same conditions of development. No. 2,358,169. William Kridel to Eastman Kodak Co.

Photosensitive material for photomechanical reproduction including a color sensitive silver halide emulsion layer sensitive to wave lengths longer than 5,500 A. No. 2,358,590. Frank Powers.

Water-soluble polyvinyl acetal in which part of acetal groups are 4-formylphenyltrimethyl lammonium salt acetal groups, used as dispersing agent for photographic silver halide. No. 2,358,836. Donald Swan to Eastman Kodak Co.

Photographic copying process. No. 2,359,040. George Jorgensen, five per cent to Harriette Moore.

Hardening of photographic gelatin with bath of basic chromium sulfate salt. No. 2,359,217. Charles Hollander to Rohm & Haas Co.

Processes of color photography using azole color formers. No. 2,359,274. Cyril Wilson to E. I. du Pont de Nemours & Co.

Resins, Plastics

Acid-curing, thermosetting resin carrying as a curing agent, a substituted alkyl halide. No. 2,357,635. Gaetano D'Alelio to General Electric Co.

As plasticizer and tackifier for rubber waxes, and the like, a hydrocarbon oil obtained by polymerizing mixture containing normal butanes and isobutene. No. 2,357,676. Gerry Mack to Advance Solvents & Chemical Corp.

Preparing a water-soluble resinous composition stable in cold aqueous solutions which comprises condensing three components, (a) a phenol from phenol and metacresol, (b) formaldehyde, and (c) a water-soluble inorganic sulfite. No. 2,357,798. Wendell Niederhauser and Matthew Miller to The Resinous Products & Chemical Co.

Thermoplastic composition including a synthetic thermoplastic polymer and, as a lubricant therefor, a lower alkyl ester of a saturated hydroxy fatty acid. No. 2,357,833. Earle Kropscott and Melvin Hunter to The Dow Chemical Co.

Plastic composition comprising a prolamine and a plasticizing amount of a "polymeric fat acid." No. 2,357,839. Ralph Manley and Cyril Evans to Claude R. Wickard, as Secretary of Agriculture of the United States of America.

Emulsion of a resinous body in an aqueous medium containing solubilized casein as an emulsifier, predominant ingredient of said resinous body being a hydrogenated ester gum. No. 2,357,917. Ashworth Stull and William Abramowitz to National Oil Products Co.

Brewer's pitch comprising partially polymerized rosin from which has been removed the light oils and resin decomposition products. No. 2,358,207. Joseph Borglin to Hercules Powder Co.

Treatment of polyvinyl butyral resins. No. 2,358,355. Gelu Stamatoff to E. I. du Pont de Nemours & Co.

Handling dry comminuted potentially adhesive material containing water-soluble synthetic resin in finely divided dust-forming condition, by applying a small percentage of a fluid oily liquid. No. 2,358,683. Lawrence Bradshaw and Carl MacLagan to The Bordon Co.

Forming plasticized resin comprising copolymerizing styrene and maleic anhydride in solution in compound selected from nitroalkanes and hydroxy derivatives of said nitroalkanes. No. 2,359,103. Howard Gerhart and George Eilerman to Pittsburgh Plate Glass Co.

Plastic composition comprising an incompletely-reacted urea-formaldehyde reaction product combined with a latent catalyst comprising a salt of chloroacetic acid. No. 2,359,166. Leonard Smidth.

Production of vinyl aromatic resins. No. 2,359,196. Edgar Britton and Walter LeFevre to The Dow Chemical Co.

Depolymerizing polystyrene which comprises heating polystyrene to a depolymerizing temperature by passing superheated steam into contact therewith and condensing styrene which is evolved together with steam. No. 2,359,212. Joseph Frank and James Amos and Albert Straubel to The Dow Chemical Co.

Rubber

Halogenated rubber composition comprising chlorinated rubber and glycerol borate as a modifier for said rubber. No. 2,357,383. John Coe to Carbide and Carbon Chemicals Corp.

Sealing strip comprising a layer of dense rubber united to a layer of cellular rubber. No. 2,357,513. Ulrich Harmon to Dryden Rubber Co.

Treating a synthetic rubber latex prepared by polymerization of a polymerizable butadiene-1,3 in aqueous emulsion containing an emulsifying agent. No. 2,357,861. Edward Willson to The B. F. Goodrich Co.

Manufacture of tear-resistant rubber from raw rubber. No. 2,358,195. Bernard Wilkinson, Geoffrey Ingram and Harry Waumsley; said Wilkinson to Wilkinson Rubber Linatex Ltd.; said Ingram and said Waumsley to J. G. Ingram & Son Ltd.

Synthetic rubber compositions. No. 2,358,694. Theodore Evans to Shell Development Co.

Vulcanization of rubber. No. 2,358,715. Paul Jones and Arthur Sloan to The B. F. Goodrich Co.

Rubber vulcanized in presence of a metallic salt of a 2-mercapto thiazoline, and of monocarboxylic acids and their salts with metals capable of forming activating oxides. No. 2,358,717. Paul Jones to The B. F. Goodrich Co.

Vulcanizing press. No. 2,358,762. Leslie Soderquist to The McNeil Machine & Engineering Co.

Vulcanizing press. No. 2,358,763. Leslie Soderquist to The McNeil Machine & Engineering Co.

Vulcanizing press. No. 2,358,764. Leslie Soderquist to The McNeil Machine & Engineering Co.

Reclaiming scrap containing vulcanized copolymers of butadiene-1,3 and compounds copolymerizable therewith. No. 2,359,122. Walter Kirby and Leo Steinle to United States Rubber Co.

Textiles

Finishing textiles to give a starch finish which comprises applying an aqueous emulsion, having a disperse phase consisting of a phthalic anhydride-polyhydric alcohol resin modified by incorporation of benzoic acid or alkyl-substituted benzoic acids and a continuous phase comprising an alkaline casein solution. No. 2,357,526. Donald Light and Alden Nute to American Cyanamid Co.

Insulation medium, a textile fabric having synthetic fibers and flakes of material having a surface of low emissivity incorporated in interior of fibers to render fabric heat reflective. No. 2,357,851. Emanuel Scheyer.

Additional patents on textiles, water sewage and sanitation from the above volumes will be given next month.

Abstracts of Foreign Patents

Collected from Original Sources and Edited

Those interested in obtaining further information concerning the patents reported below should communicate with the Patent Department, CHEMICAL INDUSTRIES. Photostated copies of Canadian patents are available from the Commissioner of Patents, Ottawa, Canada.

CANADIAN PATENTS

Granted and published July 11, 1944 (Continued)

Reinforced plastic material having a reinforcing medium comprising a fabric woven from textile threads and electrical resistance wire capable of being used as electrical heating medium. No. 421,334. William Yarworth Jones.

Adherent, weather-proof, waterproof drying oil base coating capable of drying rapidly throughout in layers as thick as $^1/_{16}$ inch. No. 421,336. Orville V. McGrew.

Surface treatment of anodically oxidized aluminum to remove undesired film by distilled or neutral salt water application and subsequent recovery of the film in solid form by employment of mineral or organic acid treatment. No. 421,355. The British Aluminum Co. Ltd. (Alfred Norman Douglas Pullen).

Means of stabilizing asphalt in the manufacture of asphalt roofing. No. 421,358. Canadian Gypsum Co. Ltd. (Ralph W. B. Reade).

Constant voltage rectifier. No. 421,372. Canadian Westinghouse Co. Ltd. (John A. Hutcheson, Reuben Lee).

Activating solution for treating metal surfaces to improve subsequent formation of protective, corrosion resistant phosphate coatings on the metal surface, comprising an aqueous solution of a dialkali metal phosphate and metal salts from tin, lead, arsenic group. No. 421,374. Canadian Westinghouse Co. Ltd. (John C. Lum, George W. Jernstedt).

Translucent plastic photoflash bulb capable of resisting severe internal explosive pressure. No. 421,377. Canadian Westinghouse Co. Ltd. (Raymond L. Kreidler).

Vaporizer for vaporizing and superheating a liquefied gas. No. 421,385. Dominion Oxygen Co. Ltd. (George H. Zenner).

Process of removing ferrous metal surface from a ferrous body and uniting cladding metal thereto. No. 421,386. Dominion Oxygen Co. Ltd. (Edmund A. Doyle).

An aryl-amino alkenyl monohydric phenol of the benzene series, e.g., 2 allyl-4-anilino phenol. No. 421,388. Dominion Rubber Co. Ltd. (Philip Timothy Paul).

Process for the manufacture of a-cyano-y-acetyl-glutaric acid. No. 421,402. Hoffman-La Roche Ltd. (Max Hoffer).

Purification of rock salt comprising crushing, washing, and melting the partially purified salt with an oxidizing agent to remove remaining impurities. No. 421,412. His Majesty the King, as represented by the Minister of Mines and Resources of Canada (Lionel Heber Cole, William Thomas Turrall, Correll Hunter Freeman).

Plastic collapsible tube container for packaging volatile ingredients lined with flexible, collapsible, wax coating. No. 421,427. Ortho Products Inc. (Frank V. Sander, Norman M. Lulejian).

Method of preventing flame from emerging from the exhaust of internal combustion engines by air-fin system on the exhaust passage. No. 421,458. Joseph George Blanchard, Cecil Gordon Vokes.

Cellulosic fibre cords for pneumatic tires. No. 421,460. Henry Dreyfus (Thomas Jackson, Thomas Barnard Frearson).

Hormone-like acting product formed by the reaction of an alkoxy-phenylacetone-alkali metal compound in inert organic solvent with one of the group of alkoxy-phenyl-methyl halides, and subjecting the product to ring closure by means of condensing agent and converting the alkoxy groups into hydroxyl groups. No. 421,462. Walter Salzer.

Granted and published July 18, 1944

Continuously operating plastic clay feeding apparatus. No. 421,463. Walter H. Emerson.

Safety grip for suspension from a hoisting cable to lift steel plates edgewise. No. 421,467. William H. Bass.

Improved air pressure operated, fusible head controlled, fire extinguishing and control system. No. 421,479. Ernest A. Lowe.

Process for the manufacture of a compound fabric by treatment with soluble silicate, acidulation to yield colloidal silicic acid therein, and combination with another layer of fabric impregnated with thermoplastic resins or chlorinated rubbers. No. 421,480. Hans Meyer.

Time computing slide rule design. No. 421,483. Matthias A. Roggenkamp.

Compressed gas release mechanism adapted to release compressed gases from a cylinder equipped with a rotatable control valve. No. 421,496. Automatic Sprinkler Co. of America (Harry N. Rider).

Apparatus for dispensing measured amounts of mercury or similar substances. No. 421,504. Canadian General Electric Co. Ltd. (Anthony J. Marshaus).

Composition of matter comprising the reaction products of aldehydes and organic compound from class consisting of acetoacetanilide and halogenated acetoacetanilides. No. 421,507. Canadian General Electric Co. Ltd. (Gaetano F. D'Alelio).

As a composition of matter, the reaction product of an aldehyde and di-(acetoacetyl) ethylene diamine. No. 421,508. Canadian General Electric Co. Ltd. (Gaetano F. D'Alelio).

Reaction product of aldehydes and triazine derivatives, e.g., urea, formaldehyde, and diamino s-triazinyl para-sulfamyl-phenyl-carbamyl-methyl sulphide and chlorinated acetamide. No. 421,509. Canadian General Electric Co. Ltd. (Gaetano F. D'Alelio).

Optical glass having a high combined refractive and dispersive index, containing not more than 10 per cent silica, and prepared by the fusion of oxides of lanthanum, thorium, boron, tantalum, tungsten, barium, calcium, strontium or magnesium, in stated combinations. No. 421,510. Canadian Kodak Co. Ltd. (Leon W. Eberlin, Paul E. F. De Paolis).

Increasing the viscosity of photographic gelatin by addition thereto of small amount of polyvinyl phthalate. No. 421,511. Canadian Kodak Co. Ltd. (Walter J. Weyerts, Charles Walter Wiederhold).

Explosion proof electrical circuit interrupter. No. 421,512. Canadian Westinghouse Co. Ltd. (Merritt A. Hyde Jr.).

Process of preparing casts of calcined gypsum, which comprises mixing with water and up to 25 per cent raw starch to form slurry, casting, and heating to gelatinize starch under moist conditions. No. 421,517. Certain-Teed Products Corp. (Gilbert A. Hoggatt).

Improving the freeze resistance of concrete or mortar by addition of 0.007 to 0.05 per cent tall oil. No. 421,520. Dewey and Almy Chemical Co. (Jacob Greenwood Mark).

Apparatus for storing a mixture of liquefied gases at low temperature which employs, in addition to heat insulation, means for maintaining a thin layer of liquid gases, separate from the main body, and adjacent to the inner insulating walls. No. 421,521. Dominion Oxygen Co. Ltd. (Henry C. Kornemann, Edward F. Yendall).

Acetylene generator design. No. 421,522. Dominion Oxygen Co. Ltd. (Clarence H. Baker, Malven L. Olson).

Employment of mercapto pyrimidine compound as anti oxidant in soap, and process of treating soap with reaction product of methyl ethyl ketone and ammonium thiocyanate. No. 421,523. Dominion Rubber Co. Ltd. (William Pieter ter Horst).

Magnesium base alloy containing 0.5 to 3.0 per cent cerium; 1 to 3 per cent aluminum; 2 to 8 per cent zinc; 0.2 to 0.6 per cent manganese; 0.05 to 0.1 per cent iron; and less than 0.01 per cent silicon. No. 421,538. Magnesium Elektron Ltd. (Charles James Prior Ball, Francis Arthur Fox).

Telescopic liquid—damped shock absorber design utilizing compressed gas as a resilient medium for supporting the normal load. No. 421,590. John Henry Onions (Peter Warborn Thornhill).

Composition of matter containing the resinous esterification product of phthalic anhydride with di-hydroxyethyl toluene sulphonamide, plasticized with N-hydroxyethyl N-phenyl q-toluene sulphonamide. No. 421,591. Henry Dreyfus (William Henry Moss).

Apparatus for the thermal evaporation under vacuum of metals, for deposition of a bright film of such metals on a support, which includes maintenance of liquid bath of palladium—platinum with constant percentage of metal to be deposited therein. No. 421,593. Paul Alexander.

Process comprising treatment of vitamin B_1 with alkali to form salt thereof, and treating reaction product with mild oxidizing agent. No. 421,594. Otto Zima.

Granted and published July 25, 1944

Production of transparent or translucent sheet material by wetting an open work fabric with volatile liquid, and then doping fabric in dope compatible with the volatile liquid, and containing cellulose acetostearate, and drying. No. 421,595. William Ivan Taylor, James Arthur Wainwright, Stephen Miller Fulton.

Ceramic article and method of manufacture thereof, formed from admixture of fire clay, ground fused silica, and aluminum oxide. No. 421,596. Luitpold Feldmeier, Berta Feldmeier.

Paper making process which comprises suspending paper-making fibres in water, sizing same by addition of size and excess of aluminum salt, and then adding starch gelatinized by means of alkali silicate having an $M_2O:SiO_2$ ratio of at least 1:1. No. 421,598. George B. Fowler, Donald K. Pattiloch.

Coherent foam-plug method of sealing gas main. No. 421,609. Dennis J. Manning.

Process of segregating water-soluble antioxygens containing water-soluble carbohydrates and organic nitrogen and phosphorous compounds from unbleached and unleached cereal flours. No. 421,613. Sidney Musher.

Cable clamp design. No. 421,614. Herma J. Rolland.

Temperature control for cylindrical rotating heat exchange member of drying machine. No. 421,626. Armstrong Machine Works (Adam E. Armstrong).

Apparatus for continuously pasteurizing liquids in travelling containers. No. 421,628. Barry-Wehmiller Machinery Co. (James Lilburn Herold, William John Nekola, Frederick Widmann Wehmiller).

As a new product of manufacture, dry whey solids composed of proteins, mineral salts and lactose, in substantially the same proportions as in the whey prior to drying, with the lactose preponderantly in the form of beta anhydride crystals. No. 421,633. Buffalo Foundry & Machine Co. (Charles O. Lavett).

Composite sheet of mica flakes and shellac binder with thin surface coating of methacrylate resin bonded thereto. No. 421,634. Canadian General Electric Co. Ltd. (Fred G. Pellett).

Thermally responsive overload relay. No. 421,635. Canadian General Electric Co. Ltd. (Allen G. Stimson).

Overload cutout device for electric circuits. No. 421,639. Canadian Controllers Ltd. (Joseph Frederick Frese).

Impregnation of organic solvent-soluble cellulose acetate containing esterifiable hydroxyl groups with ten per cent benzine solution of hexamethylene di-isocyanate, and baking, to raise softening point of the acetate and decrease organic solvent solubility. No. 421,640. Canadian Industries Ltd. (Donald Drake Coffman, John Smith Reese IV).

Liquefied gas dispensing apparatus. No. 421,644. Dominion Oxygen Co. Ltd. (Odd A. Hansen).

Preparation of ethyl benzene by reaction of ethylene with benzene in presence of metal halide of Friedl-Crafts type and of catalytic quantity of an isopropylated benzene compound. No. 421,646. The Dow Chemical Co. (James L. Amos).

Plastic composition comprising cellulose alkyl ether treated with between 5 and 100 per cent of its weight of a triaryl phosphate. No. 421,647. The Dow Chemical Co. (Shailer L. Bass, Toivo A. Kauppi, Clarence L. Moyle).

Device for determining the inclination of a well bore. No. 421,648. Eastman Oil Well Service Co. Ltd. (Ross E. Wiley).

Method of bonding a glass fabric to a surface of metal, glass, or ceramic body, by pressing said fabric into plastic, surface, vitreous enamel. No. 421,650. Fiberglas Canada Ltd. (Howard W. Collins).

Method of heat-treating nickel-bronze alloy, predominantly copper, and containing 4 to 15% tin, 4 to 20% nickel, 0 to 20% zinc or other element, by soaking at 700-875 C, slow cooling to 550-650 C, quenching and reheating to effect precipitation hardening. No. 421,661. The International Nickel Co. of Canada Ltd. (Leonard Bessemer Pfeil).

Woven glass backed, pressure sensitive adhesive insulating tape, wherein the adhesive element sets up into a firm, permanently nontacky condition under controlled temperature conditions. No. 421,664. The Kendall Company (Warner Eustis, G. Robert Orrill).

Electric cable in which conductor elements are enclosed in a flexible, fluid-tight protective sheath, into which polymerizable material stabilized for a determined period against polymerization has been forced, so that polymerization is effected when cable is in position for use. No. 421,669. Northern Electric Co. Ltd. (Thomas Robertson Scott, John Krauss Webb).

Granted and Published August 1, 1944

Apparatus for tension-free shrinking of textile yarns by feeding same into specially designed bath containing shrinking agent at rate higher than rate of withdrawal. No. 421,719. Frank Brentnall Hill, William Harry Kimpton.

Process for dry distillation of shale, etc. by passage of containers of same through a tunnel furnace with heating of the material accomplished by recirculation of distillation gases. No. 421,729. Edvin Andreas Johansson.

Small calibre armour-piercing projectile comprising metal core, enclosing casing, with nose forming a concave mechanical punch. No. 421,740. John Hogg Robertson.

Power chain saw. No. 421,742. Robert William Shade.

Magnetic chuck attachment plate design. No. 421,746. Frank Sheppard.

Liquid storage tank floating roof design. No. 421,755. John Henry Wiggins.

Process for the production of ligno-cellulose fibre stock by mechanical defibration of wood under super-atmospheric steam pressure at pH of 1 to 4, wherein such stock has substantially the same ligno-cellulose content as base material with pentosanes reduced. No. 421,758. Aktiebolaget Defibrator (John Arne Arthur Asplund, Johan Wilhelm Holst).

Method of preparing a stable medicinal ointment by admixing medicinal silver compound with ephedrine compound in an inert ointment base. No. 421,775. A. C. Barnes Co. (Rudolf J. Priepke).

Luminescent material comprising MgO and WO in proportions indicated by the formula Mg_2WO_5. No. 421,787. Canadian General Electric Co. Ltd. (Ted E. Foulke).

Gelatin coating composition containing photosensitive element, comprised of 3 to 10 per cent gelatin and 1 to 20 per cent of methyl cellulose having a 16 to 28 per cent methoxyl content. No. 421,790. Canadian Kodak Co. Ltd. (Donald R. Swan).

Method of protecting silver from tarnish which comprises exposing the silver in a confined space to the vapour of a volatile amine, *e.g.*, morpholine. No. 421,804. Carbide and Carbon Chemicals Ltd. (Geo. F. Briggmann).

Process for the manufacture of 4-aryl-1:3:4-oxdiazolones (-5) containing a high molecular aliphatic or alicylic substituent in position 2, comprising acylating an aromatic hydrazine of benzene and naphthalene series with one of group of aliphatic and alicyclic carboxylic acids of more than 6 C-atoms, and reacting thus obtained hydrazide with phosgene or halogen carbonic aid esters. No. 421,819. J. R. Geigy A. G. (Curt Engel, Kurt Pfaehler).

Production of colourless moth proofing products, in essence condensation product of the cyanuric series. No. 421,820. J. R. Geigy A. G. (Henry Martin, Hans Heinrich Zaeslin).

Nickel anode having increased activity, more uniform corrosion, greater sludge adherence, lesser tendency to produce loose nickel, and capable of maintaining a nickel electrolyte at predetermined equilibrium pH. No. 421,826. International Nickel Co. of Canada Ltd. (C. G. Bieber, H. E. Tschop).

Process for the manufacture of lysergic acid amides by condensation of lysergic acid azide with organic base containing at least one labile hydrogen atom linked to the nitrogen. No. 421,865. Sandoz Ltd. (Arthur Stoll, Albert Hofmann).

An optical objective, comprising two spherical reflecting surfaces, supplying substantially the whole of the optical power of the objective, and three afocal correcting surfaces for effecting correction of three of spherical aberration, coma, astigmatism, and distortion. No. 421,871. Taylor, Taylor & Hobson Ltd. (Arthur Warmisham).

Telephoto objective corrected for spherical and chromatic aberrations, coma, astigmatism and field curvature. No. 421,872. Taylor, Taylor and Hobson Ltd. (Arthur Cox).

Paper stock disintegrator design. No. 421,891. John Inglis and Clyde Paper Co. Ltd.

Preventing density differences in a moulded body by applying a layer of lubricant between the granular material in a matrix and the matrix walls. No. 421,903. Jan Cornelis Derksen.

Granted and Published August 8, 1944

Recovery of metals of gold, silver, copper, cobalt, nickel group from siliceous slags containing same by admixture of iron sulphide thereto. No. 421,906. Bo Michael Sture Kalling, Per Gustaf Lennart Branstrom.

Hair dye formulation containing dye, precipitated sulfur, silver nitrate, ammonium hydroxide, tannic acid, glycerine and water. No. 421,907. Rose Belanger.

Driving mechanism for textile spinning and twisting mechanism. No. 421,913. Vadilal Lallubahai Mehta.

Water soluble, non-toxic, cevitamate compound of therapeutic value. No. 421,917. Simon L. Ruskin.

Fuel injection machine design. No. 421,918. Arthur Freeman Sanders.

Electric battery torch lamp design. No. 421,920. Samuel Daniel Sullam.

Water resistant textile obtained by impregnating fabric with a dispersion of a lower monobasic monocarboxylic acid ester of an N-monomethylolamide of a monobasic monocarboxylic acid of at least eight carbon atoms and baking the same. No. 421,942. Canadian Industries Ltd. (Robert William Maxwell).

Method of making translucent photographic paper which comprises coating ordinary opaque paper with sensitive silver halide emulsion, drying, and subsequently treating the paper with an organic solvent and tricresyl phosphate to render it permanently translucent. No. 421,945. Canadian Kodak Co. Ltd. (Alan Kingston Soper).

In the treatment of chrome tanned leather for the production of glue and gelatin, the method which comprises treating the leather with an aqueous lime suspension containing a soluble calcium salt to depress the solubility of the lime. No. 421,972. Gypsum, Lime and Alabastine, Canada, Ltd. (Zoltan Erdeley).

Manufacture of improved absorbent paper of high temporary wet strength, increased dry strength, and freedom from age hardening, by incorporation therein of gelatinized locust bean gum. No. 421,980. The Institute of Paper Chemistry (Allan K. Smith).

Production of protective layers on light metals by anodic treatment with an aqueous electrolyte containing at least 30 per cent by weight fluoride in addition to water-soluble salts of tianium, tungsten, molybdenum, vanadium, beryllium or zirconium, capable of forming complex compounds with the fluoride deposited on the metal. No. 421,989. Magnesium Elektron Ltd. (Josef Martin Michel, Fritz Henneberger).

Bagging machine design. No. 421,994. Nock Bros. and Ayre Co. (Allan D. Hogg, John A. Ayre).

Refractory insulating cement capable of withstanding soaking temperature of 1900 Fahr. composed of exfoliated vermiculite, bentonite, mineral wool, and asbestos fibre. No. 422,000. F. E. Schundler & Co. Inc. (Paul S. Denning).

Method of applying thermoplastic insulation to an electric cable in which the insulating material is treated in vacuo in the plastic condition to render it free from voids and gaseous matter. No. 422,009. Telegraph Construction & Maintenance Co. Ltd. (John Norman Dean; James Webster).

Safety device for automatically cutting off the supply of pressure fluid upon reduction of pressure to a certain valve, including a main valve, in a hydraulic system. No. 422,047. Tage Georg Nyborg & The Mining Engineering Co. Ltd.

Production of coloured cellulose acetate from solution of the acetate by water precipitation of a vat dye, displacement of the water in the dye with acetone, and mixing the acetone-wet dye with the acetate solution. No. 422,050. Henry Dreyfus (Geoffrey Lord, Geo. Reeves).

Production of coloured cellulose acetate by mixing a solution of cellulose acetate in a water-miscible organic liquid with aqueous suspension of a free leuco compound of a vat dye, and avoiding premature precipitation. No. 422,051. Henry Dreyfus (Robert Pierce Roberts).

Granted and Published August 15, 1944

Ointment and manufacturing process therefor composed of honey 160 grains; lard 144 grains; spirits of turpentine 96 grains; beeswax 64 grains; carbolic acid 16 grains. No. 422,064. George Clarence Grece.

Apparatus for measuring the errors of voltage transformers. No. 422,071. Bernard Frank Stenning.

An intaglio printing ink comprising a colour, hydrocarbon solvent of the benzene series with a boiling point not higher than xylene and chlorinated rubber, with chlorinated rubber content from 1 to 30 per cent, and containing not more than 6 per cent drying oil fatty acid. No. 422,078. American Cyanamid Co. (Roy Allen Shive, Roy Herman Kienle).

Glow-type thermal switch comprising sealed envelope containing helium mixed with 0.15 per cent argon at 45 mm. pressure, electrical contacts, and radioactive material. No. 422,089. Canadian General Electric Co. Ltd. (Basil Noel Clack).

Method of preparing diamino s-triazinyl carboxymethyl sulphide. No. 422,091. Canadian General Electric Co. Ltd. (G. F. D'Alelio, James W. Underwood).

Method of preparing 4,6-diamino pyrimidyl-2 ortho-hydroxyphenyl-carbamyl-methyl sulphide. No. 422,092. Canadian General Electric Co. Ltd. (G. F. D'Alelio).

Apparatus for handling and working flowing molten glass comprising a part normally in contact with such glass and consisting of an alloy of 80 to 99.5 per cent platinum and 0.5 to 20 per cent nickel. No. 422,-106. Canadian Westinghouse Co. Ltd. (Henry K. Richardson).

Flexible insulating material comprised of mica flakes, fabric of glass fibres, and age hardening resistant polyisobutylene binder. No. 422,112. Canadian Westinghouse Co. Ltd. (Lawrence R. Hill).

Apparatus for the simultaneous detonation of a plurality of blasting caps. No. 422,116. Canadian Westinghouse Co. Ltd. (Ralph N. Stoddard).

Flat, frangible, shear-type oxidizing fluid pressure relieving disc composed largely of silver, with small percentage of copper, which acts to inhibit creepage of the disc in use. No. 422,127. Dominion Oxygen Co. Ltd. (Edward L. McCandless).

Lithographic ink composition consisting of pigment, resin binder, and paraffin hydrocarbons substantially non-volatile at ordinary room temperatures. No. 422,135. Interchemical Corporation (Albert E. Gessler, Everett F. Carman, Louis F. Englehart).

Conductive ink comprised of 7.5 grams kaolin, 12.5 grams graphite, 25 c. c. of glycerine, and 15 c. c. alcohol. No. 422,136. International Business Machines Corp. (Samuel Brand, Otto Weitmann, Kenneth J. Mackenzie).

Electron multiplier design. No. 422,139. Marconi's Wireless Telegraph Co. Ltd. (Ernest Walter Brudenell Gill).

Method of preparing soluble organic mercury compounds by reacting a mercuri-acetylide compound with urea, acetamide, or an organic sulfonamide. No. 422,149. Research Corporation (Morris H. Daskais).

Process for the production of cellulose derivatives having an affinity for acid dyestuffs which comprises forming a mixed ester by esterifying cellulose with a medium comprising a halogen-containing aliphatic acid and the anhydride of a lower fatty acid and then reacting the ester with pyridine. No. 422,167. Henry Dreyfus (Henry Charles Olfin, Sydney Alfred Gibson, John Edward Jones).

Process for the production of multi-ply boards which comprises forming an adhesive by heating an aldehyde with phenol or homologue up to the point of formation of two layers, saponifying pure condensation product so formed until it becomes water soluble, applying to constituent boards, pressing, and heating simultaneously. No. 422,168. Heinrich Prufer.

Granted and Published August 22, 1944

Purification of sugar by production of acid-soluble flocculent precipitate in the solution, adding open type filter aid, filtering, and recovering filter aid by dissolving the precipitate in acid. No. 422,170. Robert Boyd.
Firing device for use in bomb of pyrotechnic device. No. 422,176. Hugh Charles Hebard.
Device for sharpening razor blades of fired, glazed ceramic body in arc form. No. 422,181. John Joseph McWatters.
Apparatus for use in the manufacture of capsules. No. 422,183. Robert P. Scherer.
Improved process for the manufacture of artificial dentures by employing thin flakes of polymerized methyl methacrylate. No. 422,188. The Amalgamated Dental Co. Ltd. (Sidney William Wilding).
Process for producing fatty acid ester of an hydroxylalkyl cellulose. No. 422,209. Carbide and Carbon Chemicals Ltd. (Aubrey E. Broderick).
Electrical surge absorber of inductance type. No. 422,214. Ferranti Ltd. (John Edward Miller).
Focal plane shutter for a camera. No. 422,220. The Houghton-Buther Manufacturing Co. Ltd. (Douglas Gordon Hunter).
Water gas and producer gas generator design. No. 422,221. Humphreys & Glasgow Ltd. (Norman Henry Williams).
Roofing granule coated with glazing material including ingredients in following proportions: red lead 70; borax 45; silica 45; chrome oxide 26. No. 422,235. Minnesota Mining and Manufacturing Co. (G. W. Swanson).
Preparation of self-bonding enamel or glass composition for use in enamel coating processes, which comprises preparation of lead borosilicate glass frit, reducing to milled slip, and then incorporating therein a solution of ferric sulphate. No. 422,249. Poor & Company (William C. Morris).
Improving filtering properties of viscous cellulose acetate solutions by addition of 0.01 to 0.2 per cent of fibrous material thereto. No. 422,292. Camille Dreyfus (Clifford I. Haney).
Electrode arrangement adaptable for the production of light weight metal by electrolysis of fused compounds. No. 422,294. Sigurd Kloumann.
Apparatus for sealing the overlapping edges of a thermoplastic wrapper. No. 422,295. Leopold Rado.

Granted and Published August 29, 1944

Process for the production of yarn of high voluminosity, by spinning together two kinds of staple fibres, one cellulose acetate and the other cellulose, and treating with organic shrinking agent for first mentioned component. No. 422,298. Angus Smith Bell, William Campbell Angus.
Gauging reagent for mixing Portland cement compositions comprised of aqueous solution of 0.2 to 1.0 per cent chromic anhydride. No. 422,312. Calvin Arthur Owens.
Preformed sheet or strip of construction material consisting of body of asphalt and coating of hardened hydrous Portland cement. No. 422,313. Frank D. Parmenter.
Process for the manufacture of coated building board from fibrous pulp, pigments, and by application of heat and pressure. No. 422,320. Aktiebolaget Defibrator (Johann Wilhelm Holst).
Process for ucleat'ng and hydrolyzing titanium salt solutions to obtain a hydrolysate which on calcination yields a titanium dioxide pigment of uniformly small particle size, improved hiding power, tinting strength and colour. No. 422,334. Canadian Industries Ltd. (Carl Marcus Olson).
Process for hydrolyzing titanium sulphate solution to produce precipitated titanium dioxide. No. 422,335. Canadian Industries Ltd. (Carl Marcus Olson).
Solid ethylene polymer composition, containing carbon black, which is substantially improved in tensile strength, hardness, and electrical conductivity. No. 422,336. Canadian Industries Ltd. (Bernard James Habgood).
Preparation of polystyrene plastic with nacreous sheen by incorporation therein of aluminum salt of 12-18 carbon atom aliphatic acid. No. 422,337. Canadian Industries Ltd. (David Adams Fletcher).
Manufacture of calcium silicate pigments by heating mixture of 1 to 3 mols of calcium oxide and 1 mol of silica between 1000 and 1300 Cent., until free CaO is between 0.3 and 0.8 per cent. No. 422,338. Canadian Industries Ltd. (Ladislaus Balassa).
Acceleration of hydrolysis of titanium sulphate solution by admixture of negatively-charged titanium dioxide sol. No. 422,339. Canadian Industries Ltd. (Henry Moroni Stark).
Pigment dispersion and deflocculation in oil-grinding by addition of small amount of fatty oil acid and oxide or carbonate of Group 2 metal. No. 422,340. Canadian Industries Ltd. (Ernest A. Rodman).
Water-soluble electroplating composition for deposition of bright, yellow brass, containing sodium cyanide, copper cyanide, and zinc cyanide in stated ratios. No. 422,341. Canadian Industries Ltd. (Christian John Wernlund, Chas. Edw. MacKinnon, Eugene Frederick Sullivan).
Method for the fractional separation of methanol and butyraldehyde from an aqueous mixture of same. No. 422,342. Canadian Industries Ltd. (Barnard Mitchell Marks, John Hall Hopkins).
Detachable cathode insert for use in electrolytic cell. No. 422,343. Canadian Industries Ltd. (Robert Edward Hulse, David Springer Nantz).
Water-softening agent consisting of alkali metal salt of halogensubstituted polyacrylic acid. No. 422,344. Canadian Industries Ltd. (Harry Robert Dittmar).
Coating composition containing oil modified alkyd resin, vermiculite calcined at 600 to 750 Cent., other pigment, solvent, and drier. No. 422,345. Canadian Industries Ltd. (Ladislaus Balassa).
Preparation of moulded articles, e. g., artificial dentures, having colour gradation by dye diffusion in methyl methacrylate monomer-methyl methacrylate polymer dough. No. 422,346. Canadian Industries Ltd. (William Elliott Frew Gates).
Coating composition for deposition of thin, uniform coating in luminiscent light tubes containing dynamite cellulose nitrate as an essential ingredient. No. 422,347. Canadian Industries Ltd. (Earle Carver Pitman).
Flexible regenerated cellulose pellicle, containing as softener therefor, 8 to 25 per cent of synthetic linear polymer of molecular weight greater than 400, boiling point of at least 170 Cent., 1 mm. of mercury, and 4 per cent water soluble. No. 422,348. Canadian Industries Ltd. (Henry Shirley Rothrock).
Flexible, durable, regenerated cellulose pellicle containing as softener therefor an alkylene oxide polymer with molecular weight between 400 and 5000 and having 4 per cent solubility in water. No. 422,349. Canadian Industries Ltd. (Henry Shirley Rothrock).
Raising the shrinkage temperature of oriented ethylene polymer filaments by outlined heat treatment. No. 422,350. Canadian Industries Ltd. (Henry Gilbert Ingersoll).
Process for making an aliphatic acid anhydride by direct oxidation of an aliphatic aldehyde with molecular oxygen. No. 422,351. Carbide and Carbon Chemicals Ltd. (Irvin L. Murray, Frederick H. Roberts).
Method of vulcanizing rubber which comprises applying external heat to electrically conductive unvulcanized rubber to be vulcanized and passing an electric current through the electrically conductive rubber. No. 422,355. Dunlop Tire and Rubber Goods Co. Ltd. (Ernest Frederick Powell, Douglas Bulgin, Philip Walter Badham).
Manufacture of yarn for rubber reinforcing by twisting cotton rovings to a high degree without draft, subsequently twisting together plurality of such twisted rovings, and stretching. No. 422,356. Dunlop Tire and Rubber Goods Co. Ltd. (John Anderson, Melon Langstreth).
Non-skid tire tread design. No. 422,357. Dunlop Tire and Rubber Goods Co. Ltd. (Frank George William King).
Process for printing fabrics of natural silk and mixed fabrics, employing chromium salt-tragacanth paste. No. 422,360. Durand & Huguenin S. A. (Heinrich Werdenberg)).
Apparatus for locating and counting faults in electric cable insulation. No. 422,369. International Standard Electric Corp. (Edward Chas. Lee, James Harold Gosden).
Self-lustering aqueous wax suspension and process of making same. No. 422,370. S. C. Johnson & Son, Inc. (John Vernon Steinle, Anton E. Budner).
Spark plug design. No. 422,371. K. L. G. Sparking Plugs Ltd. (Chas. M. Carington, Geo. Wm. Shoobert, C. C. Hope Wheatley).

Granted and Published September 5, 1944

Puncture sealing fluid container, having a wall comprised of directly united layers of rubber composition, one layer containing a non-volatile oil diffused therein, and the other layer composed of oil resistant synthetic rubber. No. 417,243. Dominion Rubber Co. Ltd. (Alfred N. Iknayan) (Withheld from publication Dec. 21, 1943).
Electrically operated rotary paint brush. No. 422,408. George R. Dillin.
Fuze capsule for use with detonating mechanism. No. 422,420. Jack Imber.
Alloy for soldering aluminum which consists of: tin 56 to 92 per cent; cadmium, 2 to 24 per cent; zinc, 3 to 16 per cent; copper, 1¼ to 5 per cent; silver, 1½ to 3 per cent. No. 422,421. John Johnson.
Apparatus for testing spark plugs. No. 422,432. Frank Stanley Saunders.
Apparatus for use in the manufacture of paper bags. No. 422,449. Canada Paper Co. (Edward K. Robinson, John Bagnall).
Method of preparing diamino s-triazinyl orthohydroxyphenyl-carbamylmethyl sulphide. No. 422,452. Canadian General Electric Co. Ltd. (G. F. D'Alelio).
Diamino s-triazinyl carbophenoxyphenyl-carbamyl methyl sulphide and method of preparation. No. 422,453. Canadian General Electric Co. Ltd. (G. F. D'Alelio).
Steps in the injection molding of polyhexamethylene adipamide. No. 422,457. Canadian Industries Ltd. (Wallace Emerson Gordon).
Lightning arrester housing design. No. 422,458. Canadian Line Materials Ltd. (Ralph H. Earle).
Process for making clear and homogeneous plastic compositions free of uncolloided particles from polyvinyl partial acetal resins. No. 422,460. Carbide and Carbon Chemicals Ltd. (Henry L. Cox, Jacob D. Matlack).
Heat-stable vinyl resin composition containing a stabilizing material of the group consisting of organo-metallic lead and tin salts of a carboxylic acid. No. 422,461. Carbide and Carbon Chemicals Ltd. (Victor Yngve).
Vinyl resin textile fibre stabilized by means of an organic tin salt of an aliphatic acid having a phenyl group in the acid radical. No. 422,462. Carbide and Carbon Chemicals Ltd. (Edward W. Rugeley, Wm. M. Quattlebaum Jr.).
Metallic abrasive and blasting material made of cast iron chilled particles of carbide and austenite microstructure. No. 422,482. The International Nickel Co. of Canada Ltd. (Franklin B. Rote).
Metallic abrasive and blasting material made of cast iron chilled particles of stated composition, primarily carbide and martensite in microstructure. No. 422,483. The International Nickel Co. of Canada Ltd. (John T. Eash, Kenneth A. De Longe).
Electric power cable insulated with polystyrene impregnated material. No. 422,495. Northern Electric Co. Ltd. (Thomas Scott Robertson, John Krauss Webb).
Volatile welding flux composed essentially of an approximately azeotropic mixture of a distilled alkyl borate and volatile organic solvent. No. 422,516. Union Carbide and Carbon Research Laboratories Inc. (Arthur R. Ltyle)—(Thomas H. Vaughn).
Furnace chamber and reciprocating conveyer for heat treatment of articles which roll over readily. No. 422,526. James McDonald & G. W. B. Electric Furnaces Ltd.
Apparatus for the production of metal articles from feltable, sponge-like, porous metal powder. No. 422,536. Hans Vogt, Kurt Kaschke.

Granted and Published September 12, 1944

Match splint holder for the simultaneous tipping of a plurality of match splints. No. 422,549. Frederick W. Bruning.
Heat-resisting cover for impact-resisting helmet. No. 422,574. Wm. Ivan Taylor.
Thermal expansion device for hydraulic remote control apparatus. No. 422,591. Associated Messier Investments Ltd. (Alfred Arnot).
Electrical resistance wire consisting of an alloy of 10 to 80 per cent platinum; 12 to 90 per cent palladium; and 1 to 15 per cent ruthenium. No. 422,593. Baker & Co. Inc. (Cecil Spencer Sivil).
Method of preparing an oil-soluble resin by refluxing para-hydroxy amyl benzoate and formalin, in the presence of oxalic acid, and dehydrating. No. 422,604. Canadian General Electric Co. Ltd. (G. F. D'Alelio).
An alcohol modified, heat hardened, condensation product of urea, an aliphatic aldehyde, and chlorinated acetamide. No. 422,605. Canadian General Electric Co. Ltd. (G. F. D'Alelio).
Purification of kraft wood pulp by chlorination to solubilize lignin and metallic compounds and removing same by extraction. No. 422,608. Canadian General Electric Co. Ltd. (Harry F. Miller).
Improvement in the deposition of manganese from manganese sulphate electrolytes, by addition thereto of controlled quantity of hydrogen sulphide. No. 422,614. The Consolidated Mining and Smelting Co. of Canada Ltd. (William Henry Hannay, Basil Joseph Walsh).

Trademarks of the Month

A Checklist of Chemical and Chemical Specialties Trademarks

409,195. Western Auto Supply Co., Los Angeles, Calif.; filed June 8, 1943; serial No. 461,235; for paints; since May 20, 1943.
409,197. McConnon & Co., Winona, Minn.; filed June 10, 1943; serial No. 461,282; for insecticides; since May 1, 1943.
462,913. Fine Organics, Inc., N. Y.; filed Aug. 21, 1943; for germicide; since Jan. 1, 1943.
463,860. Acme Chemical Co., Milwaukee, Wis.; filed Oct. 4, 1943; for cleanser; since Jan. 1, 1927.
465,359. Gallowhur Chemical Corp., Windsor, Vt.; filed Nov. 29, 1943; for preventing fogging; since Oct. 21, 1943.
465,721. Sun Oil Co., Philadelphia, Pa.; filed Dec. 11, 1943; for motor fuel; since Nov. 8, 1943.
466,024. E. H. Sargent & Co., Chicago, Ill.; filed Dec. 23, 1943; under 10-year proviso; for lab. equipment; since Jan. 2, 1880.
466,543. The Resinous Products & Chemical Co., Philadelphia, Pa.; filed Jan. 13, 1944; for resinous materials; since March 1936.
466,548. Rohm & Haas Co., Philadelphia, Pa.; filed Jan. 13, 1944; for resinous bonds; since Nov. 5, 1929.
467,121. Francis W. Boyde, as F. W. Boyde Co., Philadelphia, Pa.; filed Feb. 3, 1944; for cleaning compound; since Aug. 3, 1943.
467,137. Reichhold Chemicals, Inc., Detroit, Mich.; filed Feb. 3, 1944; for oils; since June 30, 1943.
467,931. H. Muller Touraine, as Touraine Chemical Co., N. Y.; filed Mar. 2, 1944; for paint cleaners; since Feb. 9, 1944.
468,677. The Glenn L. Martin Co., Middle River, Md.; filed Mar. 25, 1944; for plastics; since Sept. 17, 1943.
469,021. Roxalin Flexible Finishes, Inc., Elizabeth, N. J.; filed Apr. 4, 1944; for chemical specialties; since 1925.
469,800. The Wilbur & Williams Co., Boston, Mass.; filed Apr. 28, 1944; for paints; since Nov. 1, 1929.
469,939. The Pennsylvania Salt Mfg. Co., Philadelphia, Pa.; filed May 4, 1944; for washing powders; since March 1937.
470,201. Leo Corp., Chicago, Ill.; filed May 12, 1944; for additive for motor fuels; since July 31, 1936.
470,345; 466,544. The Resinous Products & Chemical Co., Philadelphia, Pa.; filed May 17, 1944; for resinous materials; since Apr. 25, 1944; since Mar., 1936.
470,462. National Wax Co., Chicago, Ill.; filed May 20, 1944; for petroleum wax; since May 5, 1944.
470,476. Aulwood Mfg. Co., St. Paul, Minn.; filed May 22, 1944; for gum deposits; since July 16, 1942.
470,577. Mann Fine Chemicals, Inc., Woodside, Long Island, N. Y.; filed May 24, 1944; for pharmaceuticals; since May, 1939.
470,732. The Peerless Carbon Black Co., Pittsburgh, Pa.; filed May 27, 1944; for carbon black; since May 18, 1944.
470,837. The Miami Products & Chemical Co.; Dayton, Ohio; filed June 1, 1944; for sodium hypochlorite; since Dec. 8, 1943.
470,840. Socony-Vacuum Oil Co., Inc., N. Y.; filed June 1, 1944; for plasticizing oils; since May 13, 1944.
470,872. The Wilbert Products Co., Inc., N. Y.; filed June 2, 1944; for insect spray; since Jan. 3, 1944.
470,893-4. The Pennsylvania Salt Mfg. Co., Philadelphia, Pa.; filed June 3, 1944; for chemicals; since 1933.
470,955. Arvey Corp., Chicago, Ill.; filed June 7, 1944; for adhesive; since Nov. 15, 1940.
470,971. Grant Photo Products, Inc., N. Y.; filed June 7, 1944; for toning solutions; since 1907.
470,972. Grant Photo Products, Inc., N. Y.; filed June 7, 1944; for toning solutions; since 1907.
470,973. Grant Photo Products, Inc., N. Y.; filed June 7, 1944; for toning solution; since 1907.
470,985. Monsanto Chemical Co., St. Louis, Mo.; filed June 7, 1944; for resins; since May 15, 1944.
471,057. Spencer-Adams Paint Co., Inc., Atlanta, Ga.; filed June 8, 1944; for paints; since May 9, 1944.
471,081. Gray Co., Inc., Minneapolis, Minn.; filed June 9, 1944; for absorbent powder; since Nov. 1938.
471,156. S. W. Landsberger Chemical Works, Inc., N. Y.; filed June 12, 1944; for detergents; since Mar. 10, 1944.
471,278. Paint Engineers, Inc., N. Y.; filed June 15, 1944; for paints; since Mar. 15, 1940.
471,447. Ecco Chemical Corp., Weehawken, N. J.; filed June 20, 1944; for cyanide compound; since August 1942.
471,456. K. J. Quinn & Co., Inc., Boston, Mass.; filed June 20, 1944; for leather finish; since Apr. 24, 1944.
471,457. K. J. Quinn & Co., Inc., Boston, Mass.; filed June 20, 1944; for leather finish; since Apr. 24, 1944.
471,495. Richard W. Taylor, as R. W. Taylor & Co., Boston, Mass.; filed June 21, 1944; for textile finishing compound; since Oct. 2, 1941.
471,590. Columbia Naval Stores, Savannah, Ga.; filed June 24, 1944; for gum rosin; since September 1943.
471,595. The Edwal Labs. Inc., Chicago, Ill.; filed June 24, 1944; for photographic fixers; since May 15, 1943.
471,615. The Ohio Chemical & Mfg. Co., Cleveland, Ohio; filed June 24, 1944; for anesthetic; since Sept. 2, 1943.
471,939. Chemotek Mfg. Co., Houston, Tex.; filed July 6, 1944; for grease; since Jan. 1, 1944.
471,943. Chemotek Mfg. Co., Houston, Tex.; filed July 6, 1944; for lubricating grease; since Jan. 1, 1944.
472,051. John D. Farber, as Briggs Bituminous Composition Co., Philadelphia, Pa.; filed July 10, 1944; for coal tar; since June 23, 1944.
472,201-5. The J. E. Harris Co., as Arlington Paint & Varnish Co., Wooster, Ohio; filed July 13, 1944; for paints; since December 1935; since May, 1926.
472,313. The Arco Co., Cleveland, Ohio; filed July 17, 1944; for paints; since June 8, 1944.

Westwood *Supreme Quality* NU-TONE
409,195

MACK·O·BLEND
409,197

SKOG
465,359

PEROXO
463,860

GERM-I-TROL
462,913

DYNAFUEL
465,721

SARGENT
466,024

TRADE MARK
466,544

466,548

Los-Toy-Do
467,121

RESYNTHETICS
467,137

"GLAMOL"
467,931

MARTIN MARVINOL
468,677

ROXALIN
469,021

469,800

469,939

"PD"
470,201

REDUX
470,345

SEMORPHOUS
470,462

SOLVATANE
470,476

470,577

FLOTONE
470,732

SANYGEN SODIUM HYPOCHLORITE
470,837

SOVALOID
470,840

FLAK
470,872

PENNEX
470,893

PENNEX-B
470,894

THISTLEBRAND
470,955

Nigratone
470,971

Seepitone A
470,972

Seepitone B
470,973

VYNATE
470,985

COVEREX
471,057

G-A
471,081

ESWEL
471,156

Protechnic
471,278

NITRON
471,447

CERALINE
471,456

CERANIZE
471,457

TRANSITEX
471,495

COLROS
471,590

THIAMATE
471,595

PROPETHYLENE
471,615

LAVASEAL
471,939

STYROSEAL
471,943

Farbertite
472,051

COLOREX
472,201

TUNGALITE
472,205

OPTONIC
472,313

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