INDUSTRIAL AND ENGINEERING CHEMISTRY

# REPORTS ON THE CHEMICAL WORLD TODAY

## Commerce and Industry

**Economic Problem No. 2.** I. & E. C. editors have written voluminously on the problem of cartels, describing them as our second major economic problem (the first is the national debt). We have commented on cartels in the Reports of January, February, April, and June of this year, pointing out that mere castigation of cartels by the Department of Justice does not serve as a solution to the problem.

First and foremost is a simple fact—namely, there are problems in international trade which can be solved only by agreements between companies, in much the same way that international difficulties between governments are solved by agreements. A second fact to be remembered is that other countries not only approve of cartels but freely foster their development. The two nations that we are now fighting specialize in this type of thinking, but cartels are not *ipso facto* signs of fascism, for several democratic nations adhere to a similar economic philosophy.

Projection of our thoughts into postwar serves to emphasize the problem. Suppose the German cartel in dyestuffs and an American concern are trying to sell materials in the South American market. The German cartel, blessed by its government, will have no difficulty in forcing the American concern out of business, if the American is unable by government edict to partake in agreements about markets, prices, and patent rights. Economic conditions in the conquered countries will be such that all their energies will be devoted to developing world markets; if judicious horse trading is not to be allowed, we may as well step out of foreign trade immediately. But let us realize that this question is of greater importance than the mere establishment of a certain amount of foreign trade. The lifeblood of the United States in peace and war is dependent, to some degree, upon access to certain raw materials controlled by foreign countries.

The State Department recognizes these facts; the United States has entered into an agreement on petroleum and soon will begin talks on rubber. We applaud the action of Cordell Hull in recognizing the practical implications of this problem and in doing something constructive about such major items in world trade.

More remains on the horizon, however. We will not have finished when we sign treaties covering oil and rubber. Problems ever will be recurring in both markets, and there are other materials that must be considered in the same way. When the Dutch regain control of quinine, we must correlate our activities in antimalarials. There will be a battle between silk and synthetics, and even air commerce will require constant negotiation between countries. Either these agreements will be approved, or we will not enjoy the benefits of foreign trade.

We are at the crossroads, and a clear-cut workable plan must be promulgated in Washington and agreed to, at least in major principle, by the government departments and agencies concerned. There appears to be little opposition to the idea that appropriate government spokesmen participate in and even initiate necessary international agreements. But industry should not be viewed as a suspicious character and relegated to a bench in the anteroom while negotiations are in progress. Is it hopeless to assume that industry and government officials can cooperate constructively? We believe they can, and much good can evolve from such planning if suspicion is ruled out and certain irreconcilable individuals are no longer permitted carte-blanche veto power.

**Chemical Profits.** Time was when popular belief held to the proposition that war was a profitable adventure for industry. And because chemicals necessarily played an important role in modern warfare, the chemical industry, it was alleged, was more than slightly interested in the periodic misery of mankind. Cold statistics are available to show that the chemical industry for even the most selfish of reasons (profits) desires peace, not war. This premise is supported not only by results obtained in the period following World War I but is confirmed by the latest report of the Securities and Exchange Commission reporting on net profits of forty-one chemical companies in 1942 and for the six preceding years.

Net profit in 1942 was reported at 8.7%, as contrasted with 1936, a depression year, when chemical manufacturers showed a profit of 21.9%. If abnormal war-swollen profits were ever an incentive leading nations to adjudicate their differences by the sword, that incentive has disappeared in the face of taxes which make war an unprofitable venture for victor, vanquished, and "munition makers". *(Continued on page 8)*

*An interpretative monthly digest for chemists, chemical engineers, and executives in the chemical producing and chemical consuming industries*


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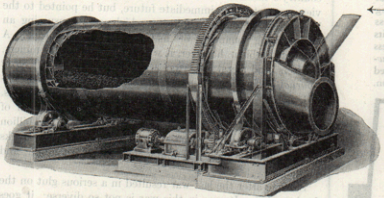

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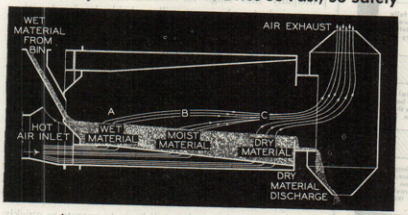


**A**
Large heat passages send a large volume of hot gases through a thin layer of wet material.

**B**
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Near discharge end, smallest amount of heat enters; material lies in thickest layer. No danger of burning or overheating.

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## I. & E. C. Reports on the Chemical World Today

## Commerce and Industry

The following table eloquently illustrates the futility of war even as a profit motive:

| Year | Sales (in Thousands)[a] | Operating Profit, % | Net Profit[b], % |
|---|---|---|---|
| 1936 | $ 904,279 | 19.5 | 21.9 |
| 1937 | 1,004,584 | 18.5 | 20.3 |
| 1938 | 849,680 | 13.2 | 13.8 |
| 1939 | 1,030,446 | 18.0 | 19.0 |
| 1940 | 1,264,217 | 21.8 | 16.6 |
| 1941 | 1,771,470 | 24.4 | 12.6 |
| 1942 | 2,068,333 | 22.1 | 8.7 |

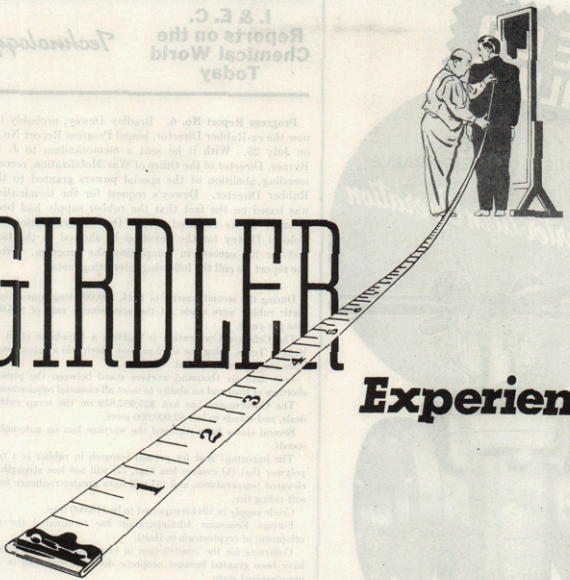
[a] Registrant companies number 32 in 1936, 33 in 1937, 37 in 1938, 37 in 1939, 38 in 1940, 38 in 1941, and 41 in 1942.
[b] After income taxes in relation to sales.

**Mineral Plethora.** Late in June a representative of the War Production Board sounded a warning to the meeting of the American Society for Testing Materials that this country's mineral reserves are in danger of depletion. His view was not of the immediate future, but he pointed to the huge maws of modern industry which were consuming an ever-growing quantity of metal even in peacetime. A different problem, however, is wrinkling the brows of miners, smelters, and metal importers. A survey in *The Wall Street Journal* of Uncle Sam's mineral stock pile shows 13,636,290,551 pounds on hand, comprising upward of fifty items. This includes 5.6 billion pounds of bauxite, 2.1 billion of manganese ore, 2.1 billion of chrome ore, and 1 billion of zinc concentrates and ore. *It also includes* stocks of beryllium, iridium, osmium, palladium, rhodium, and ruthenium.

Salvage after the last war resulted in a serious glut on the lead market. Its use in this war is not so diverse; it goes principally into slugs for small-arms ammunition. The copper industry, however, will probably be faced with a tremendous scrap return, *and the combined* stock pile in all hands is currently about 1287 million pounds. A lead scrap return amounting to billions of pounds would not be surprising. The same is true of aluminum, where scrap is already beginning to affect the market.

The mercury stock pile is 5.8 million pounds, compared to a national consumption in 1940 of 2.1 million. Already the market has *suffered a break, although* the present price is still far beyond the normal peacetime figure. This picture will be further complicated when the mercury mines of Italy, supplying about 40% of the world's total, get back into production. Half of them are now in recaptured territory; although no report has been made on their condition, it is expected that they will begin to operate as quickly as possible. The last time mercury *made news was when* Italy dropped out of the domestic market, and sent the price from 76 to 215 dollars a flask.

*Returning* to the speech of the WPB representative, his chief point was a plea to strengthen our mineral reserves against increased peacetime consumption with an emergency margin. He urged a program in which the Government would exert a beneficial control over industry. *In the light* of these figures, however, miners, smelters, and importers would probably like to peek into the future now and then, to see *what is needed and when.* *(Continued on page 10)*



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On any gas processing problem, however difficult it may seem, we urge you to take advantage of Girdler's long and successful engineering and technical experience and unexcelled laboratory facilities. If you are concerned with the manufacture or purification of gaseous mixtures or liquid hydrocarbons, take advantage of this experience and consult Girdler without delay.

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CHEMICAL ENGINEERS AND CONSTRUCTORS

## I. & E. C. Reports on the Chemical World Today

*Technology*

**Progress Report No. 6.** Bradley Dewey, probably by now the ex-Rubber Director, issued Progress Report No. 6 on July 25. With it he sent a memorandum to J. F. Byrnes, Director of the Office of War Mobilization, recommending abolition of the special powers granted to the Rubber Director. Dewey's request for the termination was based on the fact that the rubber supply had been brought to its required level. Our congratulations to Colonel Dewey for the devotion he showed to the task and for his success in completing the program. From the report we cull the following interesting facts:

During the second quarter of 1944, 209,004 long tons of synthetic rubber were made (at the approximate rate of 836,000 tons per year).

The Celanese Corporation is building a butadiene plant at Bishop, Texas, using the aldol process which will employ petroleum gases as raw material.

Less than six thousand workers stand between the present shortage of tires and an ability to meet *all* essential requirements.

The Government has lost $25,952,639 on the scrap rubber deals, and stands to lose $2,000,000 more.

Several states have removed the wartime ban on automobile speeds.

The important goal for present research in rubber is a new polymer that (1) evolves less heat, (2) will not lose strength at elevated tetaperatures, and (3) will have greater resilience for a soft-riding tire.

Crude supply in 1944 is expected to be 118,000 tons.

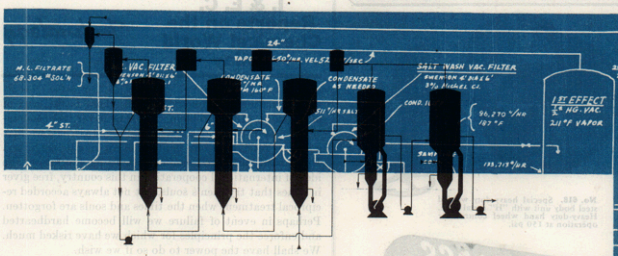
Foreign Economic Administration has terminated the development of cryptostegia in Haiti.

Contracts for the construction of neoprene plants in Russia have been granted because neoprene does not ship well in the unvulcanized state.

**Oil, Sand, and the Starry-Eyed.** *Oil* is the modern lubricant to international agreements. We hope that the recent accord between the United States and Great Britain on the division of the world's petroleum resources does not prove too slippery an understanding, and that the agreers will not soon find themselves skidding on their international ears. We view this as more than a possibility. *In essence, the agreement* is based merely on the fact that the United States and Great Britain need oil; the Atlantic Charter recommends that all nations have access to raw materials; therefore, oil-producing nations ought to make available to these two countries, and the rest of the world, their oil resources. Q.E.D.

But suppose other nations do not wish to share their oil resources and do not feel bound by the Atlantic Charter—then what? Another depressing vista opens up in the oil picture. The United States which, for the second time in history, has floated her allies to victory on a sea of oil will not be in a position to do so again, should the need arise. We are more than likely to become an oil-importing nation, and importation of oil is risky business in time of war.

*The new oil agreement calls for proposals to other* governments on establishing *(Continued on page 14)*




# Swenson-Engineered System for Recovery of Dried Distiller's Solubles

The fine stillage from distillery slop contains in solution and suspension materials that are rich in protein, minerals, fats, riboflavin, and other factors of the Vitamin B Complex. These materials are a valuable feed for poultry and animals...especially important during the wartime shortage of feedstuffs.

To recover the solids in convenient dried form, Swenson engineers designed a continuous system for reducing the fine stillage to syrup by multiple-effect evaporation, and then spray-drying it to a solid.

Highly efficient evaporation is accomplished by the judicious combination of Swenson Long-Tube Vertical and Forced Circulation Evaporators.

The Douthitt Gray-Jensen process of spray-drying distiller's solubles has been recently introduced by Swenson. It reduces the syrup to solids consisting of uniform size particles. The drying is done instantaneously under temperature conditions which eliminate scorching and assure maximum retention of vitamin values... necessary to secure top market prices.

Swenson engineers have also designed and installed continuous mash cooking and mash cooling systems... providing increased efficiency.

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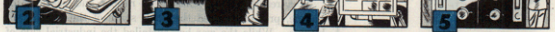
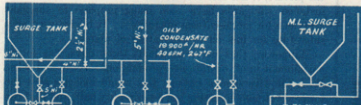



Design and Layout | Manufacture of Equipment | Test Operation | Periodic Check-ups

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## I. & E. C. Reports on the Chemical World Today

*Technology*

an international petroleum council; here is the crux of one portion of the problem. Now or never will cooperation between nations be tested, and the brave new world is going to receive an oily baptism of diplomatic sophistry. Upon such plans and conferences hangs the fate of the idea of international cooperation in this country, free giver in times that try men's souls, but not always accorded reciprocal treatment when the times and souls are forgotten. Perhaps in event of failure we will become hardhearted and enforce the principles for which we have risked much. We shall have the power to do so if we wish.

But there is another solution to all these problems which we advocate as being more certain than the dreams of the starry-eyed. Let us turn loose research teams on the problem of developing fuels from other plentiful resources, as well as motors to utilize the fuels, that will be as powerful as corresponding gasoline and oil motors. These motors need not be economical, for their avowed use will be only the uneconomical purpose of war. We wager that if the country developed within three years after World War II a jet propulsion motor, for example, utilizing powdered coal, sawdust, or mixtures of chemicals, world cooperation in matters concerning petroleum would become automatic. Let us become practical internationalists about the best way to prevent the sand of necessity from wrecking the intricate peace machinery of the starry-eyed. We often suspect that the dawn of civilization will begin only when every nation can produce all its needs with what it has. When power is obtained from the untapped sources of the atom, when food and fibers are synthesized from air, sunshine, and water, and man fears not for his material wants, peace shall be. Let us insist that the peace conference put a research team to work on it. They might do so if we (the scientists) explain to them (the diplomats) that only when such problems are solved will their treaties (seem to) accomplish what they propose.

**Liquefied Gas, Forward March!** Although the war has diverted a great deal of butane into aviation gasoline and synthetic rubber, the forward march of liquefied petroleum gases continues. Latest official figures register a gain in sales of 19% during the past year. The necessary diversion of butane for war purposes becomes most evident by contrast. Sales jumped 40% in 1940 and 47.7% in 1941.

As a result of the demands of rubber and gasoline for butane, propane carried the lion's share of the commercial burden. While the war has curtailed the industrial side of the picture, it has also contributed in certain channels. For instance, shipyards have been using propane to supplant acetylene for metal-cutting operations. It is also used as a substitute for fuel oil in preheating of plates.

Manpower, that universal plaint these days, has forced curtailment in all operations—production, service, and sales. With the diversion of butane, this would indicate that the lowered volume represents but a temporary halt, and that the march will proceed on the double-quick when normal conditions are restored.

(*Continued on page 16*)

# I. & E. C. Reports on the Chemical World Today

## *War and Postwar*

**Magnesium Cutback.** Magnesium is the second metal to be cut back under the War Production Board program. This removal of allocations is not being accepted so quietly as was that on aluminum a few months ago. The reason is obvious. Aluminum was established solidly in hundreds of commercial uses long before the war, whereas magnesium was just securing a competitive foothold when the Government demanded multiplication of the industry's entire production; in fact, it has jumped from 18,000,000 to 600,000,000 pounds since 1941. A series of cutbacks already issued has halved magnesium production, and there is talk in the metal trade that WPB will want no more than 22,000,000 pounds a month this fall.

Willard H. Dow, president of Dow Chemical Company which nurtured the industry in prewar days, has complained to Donald M. Nelson, chairman of WPB, not of the cutbacks but of the manner in which they are being handled. He points out that Order M-2-b is being represented as removing the material from government control. He claims the order only modifies the control and, in support of this contention, points out that magnesium ingots are still under allocation:

> As matters now stand, the industry is entirely capable . . . of supplying all possible needs of the Government, either for domestic use or export, and the stock pile is of such proportions as to give ample insurance against any kind of shortage . . . The uses of magnesium in war have been impressive. The metal has proved itself. But as yet there has not been the opportunity to promote the peacetime use of the metal . . . If the industry now had the opportunity, it could go ahead developing markets for peacetime consumption and, in so doing, would be developing opportunities for the employment of our boys, as and when they return to civilian life.

The tremendous upswing in production was occasioned chiefly by the erection of government plants, two of which are operated by Dow Chemical Company. One of these has been ordered out of production. Just what will happen to the magnesium industry in the course of the next few months may be the first clue as to what disposition will be made of government-owned plants when reconversion begins in earnest.

**U. S. Nubun.** One of the most forward-looking announcements of recent months was U. S. Rubber Company's introduction of Nubun, a synthetic rubber latex insulation for power, lighting, and communication cable. The development, according to C. W. Higbee, manager of the wire and cable department, is expected to be of little use in the war effort. It is strictly a postwar possibility as matters now stand. U. S. Rubber researchers have long sought an insulating material which could be applied to wire by the latex process. Buna S seemed to be the best possibility, but it was found necessary to modify and improve on the basic Buna S polymer through changes in its composition, through changes in the process of polymerization, and through other fundamental modifications.