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FRENCH CHEMICAL INDUSTRY AND TRADE IN 1930



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FRENCH CHEMICAL INDUSTRY AND TRADE IN 1930

By American Trade Commissioner Earle C. Taylor, Paris

The French chemical industry entered upon the year 1930 with high hopes for the future. During 1929 considerable progress had been made in plant development and organization, and a hitherto untouched point in production had been reached. Plans for the future included a continued increase in production and plant construction, but, aside from the first few months, the year 1930 proved in many respects a period of disappointment.

The chemical industry and trade operated in a more or less normal fashion during the first half of 1930, but without any startling developments. By the middle of the year the result of the world crisis was felt, and consumption began a decline which continued until the end of the year.

In its foreign trade France showed the smallest decline among the four major producing and exporting countries, with a loss of 9 per cent in total exports of chemicals and allied products from the 1929 figure, or a total value in 1930 of \$126,176,000. Imports recorded even a smaller decline, of 3 per cent to \$106,600,000. France continued to retain its foremost position as the world's leading exporter of toilet preparations, which accounted for approximately one-fifth of the total exports.

The agricultural situation was reflected in the lower autumn sales of fertilizers. It is reported that the French potash consumption declined 20 per cent from March, 1930, as compared with the similar period of 1929, although the potash production for the year was slightly larger than for 1929. The consumption of nitrogen and superphosphate also dropped, although exports of superphosphates were about the same.

CONSTRUCTION AND MERGERS

One of the noteworthy developments of the year was the voting of a credit of 90,000,000 francs to be used for the construction of a new nitric acid plant at the Government plant at Toulouse. Other events of interest were the proposals made to increase the capital of the Electro-Chimie et Electro-Métallurgie d'Ugine from 88,000,000 to 120,000,000 francs, and that of the Kali-Sainte-Thérèse from 40,000,000 to 80,000,000 francs. The Kuhlmann company decided upon a bond issue of 150,000,000 francs.

There was some further development toward amalgamations, although less than during previous years. The Kuhlmann company, for example, purchased the entire 2,000,000-franc stock issue of the Compagnie Bordelaise des Produits Chimiques, thus increasing Kuhlmann's importance in the superphosphate field.

A combine of considerable interest was the absorption of the Usines Dior by the Phosphates Tunisiens. The Dior company is the owner of the well-known process for the manufacture of sulphuric acid, and the Phosphates Tunisiens is already a large producer of phosphoric acid. The merger will allow the latter concern to increase its production of mixed and compound fertilizer at its plants in the Pyrenees.

FINANCIAL CHANGES

Among the principal French chemical companies there were five important capital increases (amounting to 204,500,000 francs) during 1930, as compared with eight increases during 1929. In one case the company increasing its capital (Electro-Chimie et Electro-Metallurgie d'Ugine) was authorized to increase the capital by another 60,000,000 francs, but to date no movement has been made to take advantage of this further authorization. In addition to the above capital increases, one important new chemical company, Société Potasse et Engrais Chimiques, with a capital of 40,000,000 francs was formed. The details of the capital increases mentioned above are as follows:

CAPITAL INCREASES AMONG FRENCH CHEMICAL COMPANIES FROM 1929 TO 1930

Company	Capital		Increase
	1929	1930	
Saint-Gobain.....	225,000,000	310,000,000	85,000,000
Bordelaise des Produits Chimiques.....	50,000,000	70,000,000	20,000,000
Auby.....	27,500,000	55,000,000	27,500,000
Kali-Sainte-Thérèse.....	40,000,000	80,000,000	40,000,000
Ugine.....	88,000,000	120,000,000	32,000,000

In 1930 the Société Potasse et Engrais Chimiques was formed by the Kali-Sainte-Thérèse and the Mines Domaniales de Potasse to manufacture fertilizers with a high potash content. The capital was originally fixed at 20,000,000 francs, but was soon increased to 40,000,000 francs. The new company, backed by the influential French potash interests, is expected to have an interesting future.

The Saint-Gobain capital increase follows the action of the special meeting of that company on December 20, 1929, when the board was authorized to increase the capital from 225,000,000 to 450,000,000 francs. The above-noted capital increase of 85,000,000 francs is the first step toward taking advantage of the authorization accorded in 1929.

The following table shows the capital of the leading French chemical producers outstanding on January, 1931:

	Thousands of francs
Etablissements Kuhlmann.....	312,500
Air Liquide.....	88,000
Alais, Forges & Camargue.....	262,500
Compagnie Bordelaise des Produits Chimiques.....	70,000

	Thousands of francs
Bozel Maetra.....	100,000
Centrale de Dynamite.....	15,400
Nobel Française (Cie. Gle. de Dynamite & Matières Plastiques).....	21,000
Explosifs et Produits Chimiques.....	20,000
Société Matières Colorantes et Produits Chimiques de St. Denis.....	40,000
Oyonithe.....	3,000
Rhône-Poulenc.....	36,000
Produits Azotés.....	22,000
Produits Chimiques de St. Denis.....	1,500
Richer, St. Moritz & Cie.....	17,400
Ripolin.....	5,000
Saint-Gobain.....	310,000
Soie Artificielle Givet.....	1,500
Soie Artificielle d'Izyeux.....	7,900
Stéarinerie Fournier.....	21,500
Ternois Guinon.....	4,500
Société Lum. (An. Union Phot. Ind.).....	40,000
Usines Dior.....	12,000
Société Phosphates Tunisiens Engrais & Produits Chimiques (Ancien Engrais Azotés Composés).....	81,750
Explosifs Cheddites.....	4,000
Algérienne de Produits Chimiques.....	28,000
Azoté Français.....	30,000
Baignières & Dewismes.....	6,300
Explosifs Minélite.....	6,000
Georget et Fils.....	5,000
Oxydrique Français.....	6,000
Produits Barytiques.....	5,500
Salpêtre & Produits Chimiques Bordeaux.....	20,000
Union Espagnole de Fabrication d'Engrais.....	20,000
Tencé-Fac.....	10,000
Auby.....	55,000
Société Potasse et Engrais Chimique.....	40,000
Kali-Sainte-Thérèse.....	80,000
Electro-Chimie et Electro-Metallurgie d'Ugine.....	120,000

BOURSE QUOTATIONS ON FRENCH CHEMICAL SECURITIES

In the general decline affecting securities both in the United States and abroad, those quoted on the French stock exchange were by no means exempt. Below are given the Bourse quotations on 11 of the leading French chemical stocks, showing the practically steady decline in the prices of these securities from January, 1930, to January, 1931.

BOURSE QUOTATIONS ON ELEVEN LEADING FRENCH CHEMICAL STOCKS

Company	1930				January, 1931
	January	April	July	December	
Kuhlmann.....	1,230	1,120	1,008	710	611
Alais, Froges et Carmagues.....	3,890	3,620	2,995	2,150	1,820
Saint-Gobain.....	6,885	5,585	4,765	3,920	3,200
Air Liquide.....	2,225	2,145	1,810	1,227	895
Rhône-Poulenc.....	3,140	2,650	2,400	1,650	745
Auby.....	610	598	666	305	280
Phosphates Tunisiens.....	462	425	367	260	231
Usines Dior.....	805	780	705	567	460
Richer Moritz Cie.....	1,795	1,750	1,630	1,460	1,350
Matières Colorantes de St. Denis.....	1,437	1,343	1,200	1,022	780
Bozel Maetra.....	879	840	660	515	407

HEAVY CHEMICALS

Looking at the year 1930 as a whole, it can be said that the tonnages produced by the French heavy-chemical industry were fairly satisfactory. In certain cases the production of 1929 was surpassed. However, when viewing the question from the standpoint of the production programs planned for 1930, it is at once evident that in most branches of the industry these plans were not realized. Large increases had been expected in the production and consumption of mineral acids, nitrogenous products, paints, and fertilizers.

During a part of 1930 both consumption and production exceeded that of the corresponding period of 1929, and, up to the end of May, increased for a number of products. From May to October sales showed a slowing up, and there was no increase over the previous year's figures. Finally, from the 15th of October to the end of the year consumption for a large number of products diminished considerably and producers were obliged to take the necessary steps to lower production to meet the slackened demand and foreign competition.

The raw materials used in the chemical industry did not undergo the sharply vertical drop in prices which occurred in the raw materials of some other industries. Prices of chemicals did not therefore drop to any extent; and this fact rendered the exportation of French chemical products especially difficult. Import duties in some of France's customer countries were raised, and world markets became more difficult generally, as a result of the economic situation. Foreign competition increased, mostly from Germany, England, and Italy, where the chemical industries had been able to bring about lower selling prices than those of the French chemical industry.

SULPHURIC ACID

Sales of sulphuric acid were active following the heavy demands of the first five months of the year, and the situation in this commodity remained practically normal up to the month of October. The consumption of sulphuric acid registered increases in certain of the secondary industries; this increase amounted to probably 6,000 to 8,000 metric tons, the sales being divided about equally between Kuhlmann and Saint-Gobain. There was a small increase in the manufacture of sulphate of ammonia, entailing an increased consumption of around 8,000 metric tons of sulphuric acid.

On the other hand, there was a very marked decrease in the use of sulphuric acid for the manufacture of superphosphate. (The majority of the superphosphate manufacturers employ sulphuric acid of their own manufacture.) The decrease in the manufacture of superphosphate may be roughly placed at 30 per cent as compared with the 1929 production, which would, then, mean a diminution of production and consumption of sulphuric acid of around 333,000 metric tons.

The production of sulphuric acid in France during 1930 showed an approximate decrease of 19 per cent as compared with the previous year—1,332,000 metric tons in 1930 as against 1,650,000 in 1929. Imports of sulphuric acid amounted to 47,300 metric tons in 1930 as compared with 20,700 metric tons in 1929, while exports were 16,400 and 21,000 metric tons for 1930 and 1929, respectively.

Prices have shown a slight decrease since the early part of the year, quotations per 100 kilos on sulphuric acid 53° at Paris being 29 francs in January, 28.50 francs in April, 28 francs in July, 28 francs in October, and 27 francs in December.

The consumption of concentrated sulphuric acid would also appear to have suffered some decrease—probably around 6 per cent for sulphuric acid 66° as compared with 1929.

The principal producers of sulphuric acid are Kuhlmann and Saint-Gobain. Kuhlmann somewhat increased its importance in this field during the year by subscribing to the entire 20,000,000 francs stock issue of the Compagnie Bordelaise, also one of the big producers. Another event of interest was that with the absorption of the Usines Dior by the Phosphates Tunisiens, this latter company became an important factor in the sulphuric acid industry.

SULPHUR AND PYRITES

Following the decreased production of sulphuric acid, the production as well as the importation of pyrites decreased somewhat. The Saint Bel mines in France, exploited by Saint-Gobain produced 172,000 tons of pyrites in 1930, a decrease of about 12½ per cent as compared with 1929. Imports amounted to 846,636 metric tons, as compared with 922,569 metric tons the preceding year. Spain continued to be the largest supplier.

Imports of sulphur ore other than pyrites rose from 17,838 metric tons in 1929 to 36,520 in 1930, of which Spain furnished some 21,000 tons. Imports of crude sulphur dropped from 201,700 metric tons in 1929 to 192,525 in 1930. Of the 1930 imports of crude sulphur, the United States furnished 65,157 metric tons (only about 50 per cent as much as in 1929), Italy 42,616, and other countries 84,752, this latter an increase of more than 50,000 metric tons over the preceding year.

NITRIC ACID

The production capacity of the French nitric acid plants increased very largely toward the end of 1929 and the beginning of 1930, through the installation of plants forming a part of the expansion of the nitrogen industry. At the close of 1930 the approximate monthly production capacity (in metric tons) of the principal producers was about as follows, including completed plants; Kuhlmann, 2,400; Saint-Gobain, 900; Soulom, 600; Usine du Midi and others, 650; total, 4,550.

Aside from the manufacture of calcium nitrate and ammonium nitrate, which employs large quantities, the industrial uses of nitric acid (such as for explosives, plastics, etc.) reached approximately 1,800 tons a month. Of this quantity Kuhlmann furnished around 1,000 tons, Saint-Gobain 400 tons, Soulom 300 tons, and other plants 100 tons, a total of 22,000 tons for the year, including that used in the dyestuffs industry. The remainder of the domestic production, about 30,000 tons, was employed in the manufacture of fertilizers.

Production of nitric acid was around 51,000 metric tons as compared with 46,000 tons in 1929, and consumption 50,000 tons as against 44,000 tons. Imports of nitric acid into France in 1930 amounted to 1,152 metric tons, in comparison with 943 tons during the previous year. Exports remained about the same, at 315 tons.

Stocks of nitric acid, which were fairly important during the summer, decreased considerably toward the end of the year, as a result of purchases by the powder plants. Prices were approximately as follows, per 100 kilos, for yellow nitric acid 36°: January, 170 francs; April, 150 francs; July, 149 francs; October, 150 francs; and December, 148 francs. An item of interest in the nitric acid industry during 1930 was the voting of a credit of 90,000,000 francs for the construction of a new nitric acid plant at the Government's works at Toulouse. This new plant, now under construction, will have a daily production capacity of 200 metric tons.

HYDROCHLORIC ACID

The production of hydrochloric acid decreased somewhat during 1930, partially because of reductions in the output of sodium sulphate. Stocks, however, remained about normal as the demand was somewhat less than during 1929, on account of the slowing up of activity in the metallurgical industry and, it is said, the development of certain electrolytic processes.

Imports of hydrochloric acid into France during 1930 amounted to 1,246 metric tons, compared with 970 tons in 1929; exports, at 1,920 tons, were about 100 tons greater than in the previous year.

ALKALIES

The French soda industry is located almost entirely in the departments of Meurthe and Moselle. Vice Consul James D. Child, of Strausbourg, has furnished the following information:

Actual figures covering French soda production are not available, but certain figures have been secured on plant capacity. The principal French producers are Solvay, Saint-Gobain, and Marcheville-Daguin & Cie. The largest plant is that of Solvay, located at Haraucourt. The capacity of this plant (in sodium carbonate) is reported as being 425,000 tons annually. Solvay also has a smaller plant at Sarralbe. Marcheville-Daguin has a plant at La Madeleine with an annual output of 75,000 tons, while the Saint-Gobain plant capacity is given as 70,000 tons per year. There are also a few companies of minor importance, several of which work in conjunction with Solvay. As far as we have been able to learn, all soda produced in France is by the Solvay process.

The demand for alkalis generally was fairly good up to the month of October, and it is probable that the production of sodium carbonate was slightly over that of 1929 (possibly 6 or 7 per cent). The demand for caustic soda remained normal until the month of November, after which period a decline was noted which continued into the early part of 1931.

The production of sodium sulphate declined somewhat, because of smaller purchases on the part of the glass industry, where it is used in large quantities, and, beginning with the month of October, certain producers reduced their activity.

French imports of sodium are negligible. The export trade in this category was as follows:

FRENCH EXPORTS OF SODIUM, 1929 AND 1930

Item	1929	1930
Caustic soda.....	Metric tons 37, 310	Metric tons 36, 205
Sodium carbonate:		
Crude.....	42, 628	19, 175
Refined.....	130, 540	129, 220

BROMINE

The production of bromine in France during 1930 totaled 565 metric tons, compared with approximately 300 metric tons during 1929.

The bromine industry is closely connected with the potash industry of Alsace. Of the 565 tons produced in 1930, 258 tons were produced by the plants connected with the State potash mines, 200 tons by the Kali-Sainte-Thérèse, and 107 tons by the Compagnie Alais, Froges et Camargue (Péchiney).

Consumption of bromine in France in 1930 amounted to but 205 metric tons. Exports more than doubled, amounting to 782 metric tons, compared with but 347 in 1929. In addition, exports of bromine derivatives in 1930 were 50 metric tons, compared with 38 in 1929. The spread between production and exports is accounted for by the fact that stocks of bromine at the beginning of 1929 were large.

Late in 1930 the German bromine syndicate entered into an agreement with French (Alsatian) producers on sales.

GLUE, GELATIN, AND CASEIN

The French glue industry is located in the neighborhood of large cities convenient to supplies of raw material. The industry also imports large quantities of bones from the Mediterranean countries and from South America. The annual production of bone glue is around 7,000 metric tons.

French production of gelatin from bones amounts to but from 2,000 to 2,500 metric tons annually. This production, however, allows a small export trade. The principal outlet for the French production is in the field of edible gelatins.

The French hide-glue plants, consuming some 35,000 to 45,000 metric tons of hide residues annually, have an approximate yearly production of 4,500 tons of gelatin and glue.

The manufacture of fish glues has not developed in France to nearly the same extent as in some other countries. France does, however, produce enough for domestic needs, and even has a small surplus for export.

Inasmuch as there has been some slowing up in the woodworking industries in France, it is probable that the French production of glue during 1930 was somewhat under normal, but no figures are available.

The manufacture of casein is developing steadily in France especially in those regions where milk is comparatively cheap. French imports of casein during the past few years have been practically negligible, whereas exports are scarcely ever less than 12,000 metric tons annually.

GLYCERIN

During 1930 the French glycerin industry showed very little change. The French production made no great progress, although it would be possible to increase the production considerably. Both French and Belgian glycerin production are more or less under the control of the English license known as the Lever process.

French exports amounted to 4,630 metric tons of crude and 1,652 metric tons of refined glycerin. Imports of glycerin into France were 1,003 metric tons of crude and 434 metric tons of refined.

ALCOHOLS AND CARBURETANTS

In France the purchase and sale of industrial alcohols is reserved to the State by the laws of June 30, 1916, and February 27, 1926. These laws reserve to the State all quantities of alcohol obtained from substances other than wine, cider, or fruits, which alcohol is resold for industrial and medical uses only. The production of these alcohols during 1930 was as follows:

FRENCH ALCOHOL PRODUCTION IN 1930

Source	Alcohols controlled by the State	Free alcohols
	Hectoliters	Hectoliters
Wine.....		205, 794
"Piquettes," residues, and dregs of wine.....		288, 783
Apples and pears and by-products.....		482, 924
Gin.....		20, 179
Farinaceous substances.....	685	
Beet roots.....	1, 014, 738	
Molasses.....	469, 324	
Other substances.....	13, 303	
Total.....	1, 498, 050	997, 680

An outlet was found for these alcohols through the researches of the scientist Berthelot in the field of the utilization of alcohol as a carburetant. On February 28, 1923, the French parliament passed a law requiring importers of gasoline to purchase a certain proportion of their gasoline imports in alcohol from the State, this alcohol to be used for mixing with the gasoline. The proportion to be purchased varies, but is supposed to be not less than 10 per cent. However, in actual practice purchases have never as yet reached that percentage.

This mixture, which is known as the national carburetant, is evidently growing in importance. It is used almost entirely by the Paris autobuses, and the consumption by private consumers is also increasing. In 1929, 234,328 hectoliters of alcohol were used for mixing with gasoline in the fabrication of the national carburetant, and in 1930 the amount had increased to 424,551 hectoliters. Even with this larger consumption the Service des Alcohols (attached to the Ministry of War and charged with the administration of the alcohol laws) is holding large stocks of alcohol, the disposal of which is a question still to be solved.

The petroleum industry in general looks with considerable disfavor on this obligation to purchase alcohol, as the cost of the alcohol is higher than that of gasoline and, consequently, increases the cost of the carburetant placed on the market.

The general question of petroleum was placed on a more definite basis early in 1931, when the French Chamber of Deputies settled the status of the Compagnie Française des Pétroles, to which concern was allotted the right of exploitation of the French share of

the Mesopotamian petroleum deposits. At the same time, the French Journal Officiel published the decrees covering the importation of crude petroleum for refining within France, thus giving impetus to the growth of a national refining industry. Several refineries are already under construction, while others are planned for completion in the near future.

SYNTHETIC ALCOHOLS

There has been some interest shown during the past two years in the production of ethyl alcohol synthetically from coke-oven gases. The principal activity in this line has been shown by the Campagnie de Béthune, and the Société Marles-Kuhlmann.

More progress has been made in the production of synthetic methanol. Such companies as Lens, Béthune, Courrières and Kuhlmann, have constructed plants for this purpose, working with a mixture of hydrogen and oxide of carbon—residues of coke-oven gasses. The production of these concerns is generally sold as a pure chemical product, at prices which prevent its use as a carburetant. The Courrières-Kuhlmann group, using the Patart process, make their raw-material gas with a mixture of oxide of carbon and hydrogen furnished by cracking methane at high temperatures. This is of especial interest as Courrières plans at an early date to start operation of a low-temperature distillation plant (Illingworth), where the gas will be very rich in methane.

It is difficult to attempt to establish a total figure for the methanol produced in France. The Kuhlmann company's plant, near Harnes, has a capacity of 300 metric tons a month. The Courrières plant is producing monthly in the neighborhood of 200 metric tons and Béthune around 100 tons. The plant belonging to the Mines de Lens was not placed in operation until toward the end of the year.

That the interest in the production of butyl alcohol still continues is evidenced by the fact that during 1930 the Fabrique Alsacienne de Levures et Alcools, at Strasbourg, constructed a new plant for the production of butyl alcohol and acetone. This new plant will have a daily production of several tons of normal butyl alcohol and acetone 99 per cent pure.

French foreign trade in butyl alcohol and methanol showed a decline in both imports and exports during 1930. France is primarily an importer rather than an exporter of these alcohols, as will be seen from the following table. Of especial interest is the sudden drop in imports of pure methanol from 876 metric tons in 1929 to 1 metric ton in 1930.

FRENCH FOREIGN TRADE IN BUTYL ALCOHOL AND METHANOL IN 1930

Item	Imports	Exports
Butyl alcohol.....	<i>Metric tons</i>	<i>Metric tons</i>
Methanol:	334	6
Crude.....	12	57
Rectified.....	903	99
Pure.....	1	4

FERTILIZERS

During 1930 the French fertilizer industry was beset with difficulties, brought about by the general economic conditions, low prices, and slackened demand, but France fared better than some of the neighboring countries. French wheat quotations remained low during 1930, going down to 135 francs per quintal.

PHOSPHATE FERTILIZERS

Phosphate fertilizers suffered the greatest setback in 1930, for after March purchases were not particularly good. The production of phosphate rock in continental France is small, amounting to probably some 180,000 metric tons in 1930. This production is largely used directly on the soil in the regions where it is mined.

Of the vast French North African shipments of phosphate, amounting to 5,200,000 metric tons in 1930, France took 1,562,000 tons. European countries took the greatest portion of the shipments, the leading destinations being Italy, over 700,000 tons; Spain, 500,000; British Isles, 400,000; and Germany, 400,000.

The decline in consumption of phosphates is largely accounted for by the sharp drop in the French production of superphosphate (to 1,800,000 metric tons in 1930 from 2,400,000 in 1929).

The French superphosphate plants produced normally until about April and May, 1930, for the manufacturers counted upon a normal demand for the summer and autumn. Unfortunately, after March the bad weather prevented anything like a normal consumption, and this condition continued until the end of the year. The producers were therefore forced to reduce considerably the production of their factories. The falling off in consumption during 1930, as compared with that of 1929, is estimated at 30 per cent, and that of production for the same comparative periods at 20 to 25 per cent. This necessarily left considerable stocks in the factories and on hand at certain dealers.

FRENCH PRODUCTION, IMPORTATION, AND EXPORTATION OF SUPERPHOSPHATES,
1929 AND 1930

Year	Production	Imports	Exports	Available for consumption
	<i>Metric tons</i>	<i>Metric tons</i>	<i>Metric tons</i>	<i>Metric tons</i>
1929.....	2,430,000	15,000	220,800	2,225,000
1930.....	1,822,500	20,700	199,700	1,642,500

The prices fixed by agreement between the producers for the autumn season of 1930 underwent marked modifications. This may have been done in order to offset the possibility of foreign importations (from Belgium and the Netherlands).

French production of basic slag diminished in 1930 on account of the reduced production of metallurgical plants.

FRENCH PRODUCTION, IMPORTATION, AND EXPORTATION OF BASIC SLAG, 1929 AND 1930

Year	Production	Imports	Exports
	<i>Metric tons</i>	<i>Metric tons</i>	<i>Metric tons</i>
1929.....	1 1, 501, 000	3, 815	2 980, 000
1930.....	1 1, 478, 574	6, 552	2 992, 955

¹ Not including the Sarre (300,000 tons in 1929, 278,000 tons in 1930).

² Including the Sarre.

NITROGENOUS FERTILIZERS

The nitrogenous fertilizer industry was probably less affected than some of the other branches of the fertilizer industry, but the situation was very difficult, especially in the first six months of 1930. The production program for 1930 planned large increases, with the idea of manufacturing the greater part of the French nitrogenous fertilizer consumption.

The negotiations which were carried on for several months, first at Ostend, then at Paris, for the constitution of a European nitrogen cartel,¹ were brought to a close the 9th of August by the signature of the European nitrogen convention, good for one year, and the signing of this agreement was quickly followed by an accord with the producers of Chilean nitrate. Thus 98 per cent of the European production of nitrogen and 80 per cent of the world's production (the United States not being included) were covered by the two agreements.

Negotiations which were begun in May for the creation of a European nitrogen cartel resulted in the creation of an international calcium cyanamide syndicate, to which adhered the German, French, Belgian, Italian, Swiss, Yugo-Slav, Czecho-Slovak, Norwegian, and Swedish producers (a very large percentage of the world production of calcium cyanamide). The calcium cyanamide agreement, which served as a model for the nitrogen agreement, is for a period of eight years; the producers of cyanamide retain their independence as regards their domestic markets, and regulate the export trade, as well as prices, for each country by means of special accords concluded every six months.

Agreement was more difficult for the other synthetic nitrogenous fertilizers. Production is less concentrated than that of cyanamide (which includes three German groups, of which the I. G. holds 40 per cent of the world production) and the producers of synthetic nitrogen have to reckon with competition both from ammonia recovered from the coke ovens, and from natural Chilean nitrates.

The situation in regard to France is to be seen in the few figures presented at Ostend at the beginning of July by one of the French representatives. French consumption, converted into pure nitrogen, may be estimated at 200,000 metric tons yearly; the production capacity of the plants at present operating amounts to 100,000 metric tons. Therefore, France would be obliged to import 100,000 tons of pure nitrogen if the national production was not freely developed in order to meet domestic requirements.

¹ The nitrogen cartel expired by limitation June 30, 1931.

Reduction in production varied according to countries—30 per cent for Germany, Norway, Belgium, Netherlands, Czechoslovakia, and Italy; 40 per cent for Poland; 50 per cent for England; and only 10 per cent for France.

The accord was organized on the same lines as the cyanamide agreement, each country to retain control of its domestic market and to supply its domestic trade as far as it was able, the requirements of the importing countries adhering to the agreement to be filled according to special agreements fixing the export contingent of the producing countries. A central organization to be charged with the maintenance of prices at a stable and reasonable level, and a fund for the compensation of adherents suffering as a result of limitation of production is to be built up by means of dues levied on the various producers in proportion to their individual production.

French producers of calcium nitrate reserved for themselves the French market for the 13 per cent nitrate up to a total production of 63,000 tons. This figure left the producers a margin for the expansion of production.

SODIUM NITRATE

France imported 280,000 metric tons of Chilean nitrate in 1930, as against 578,000 in 1929; consumption dropped to 340,000 metric tons in 1930, against 405,000 in 1929. Stocks at the end of the year were estimated at some 250,000 metric tons, a very high figure.

CALCIUM NITRATE

The calcium nitrate production program for 1930, if carried out, would have resulted in an output of 75,000 metric tons, as compared with but 25,800 tons in 1929. In reality, however, only 52,000 tons were produced. Fairly heavy imports (15,000 metric tons) of calcium nitrate 15½ per cent came from Germany and Norway. Although the French market for 13 per cent calcium nitrate was reserved by the nitrogen accord to the French producers (up to a total production of 63,000 metric tons per year), 11,000 tons of 13 per cent calcium nitrate were imported during 1930, as compared with 10,800 tons in 1929.

AMMONIUM SULPHATE

The first part of 1930 was fairly favorable for the trade in sulphate of ammonia, but from September onward, sales slowed up considerably, entailing a decrease in production programs for the remainder of the year. Taken as a whole, the 1930 situation was better than that of 1929. Total production for 1930 was 298,000 metric tons, as against 275,000 in 1929, and imports, including those from parties not adhering to the nitrogen agreement, reached 92,300 metric tons. Consumption, however, showed a drop, due to agricultural conditions, the 1930 figure being 380,000 metric tons, while that of 1929 was 420,000 tons.

CYANAMIDE

The cyanamide production program was also curtailed, France actually producing 70,000 metric tons in 1930, a figure somewhat less than the amount planned, though 6,000 tons greater than in 1929.

SUMMARY OF NITROGENOUS FERTILIZERS

The situation regarding nitrogenous fertilizers in France during 1930 may be briefly summarized in the following figures:

FRENCH PRODUCTION, IMPORTATION, CONSUMPTION, AND EXPORTATION OF NITROGENOUS FERTILIZERS, 1929 AND 1930

Item	1929	1930	Item	1929	1930
PRODUCTION			CONSUMPTION		
	<i>Metric tons</i>	<i>Metric tons</i>		<i>Metric tons</i>	<i>Metric tons</i>
Calcium nitrate.....	25,800	52,000	Sodium nitrate.....	405,000	345,000
Ammonium sulphate.....	275,000	298,000	Calcium nitrate.....	46,200	55,000
Cyanamide.....	64,000	70,000	Ammonium sulphate.....	420,000	380,000
Other nitrogenous fertilizers.....	15,000	17,000	Cyanamide.....	70,000	62,500
			Other nitrogenous fertilizers.....	40,000	34,200
IMPORTS			EXPORTS		
Sodium nitrate.....	578,000	280,000	Sodium nitrate.....	2,982	2,054
Calcium nitrate.....	20,500	28,300	Calcium nitrate.....	2,699	2,332
Ammonium sulphate.....	416,600	92,300	Ammonium sulphate.....	5,155	8,177
Cyanamide.....	12,674	19,013	Cyanamide.....	2,595	1,243
Other nitrogenous fertilizers.....	25,000	18,000			

POTASH

During the entire year, in spite of the world crisis, French production of potash remained stable, and even exceeded slightly the 1929 figure. Domestic sales dropped around 20 per cent after the month of March, and exports are reported to have declined about 5 per cent. Prices remained stable. In exports to the United States the decrease figured in terms of pure potash was small, but no figures are given, since as published they are largely credited to Belgium, inasmuch as the exports are stocked and shipped from Antwerp.

The following table shows the somewhat small changes in production from 1929 and 1930.

FRENCH PRODUCTION OF POTASH IN 1929 AND 1930

Product	1929	1930
	<i>Metric tons</i>	<i>Metric tons</i>
Crude salts.....	3,124,700	3,139,000
Sylvinite, 12 to 16 per cent.....	259,000	209,000
Sylvinite, 20 to 22 per cent.....	716,000	705,000
Chloride of potash, 30 to 40 per cent.....	227,000	204,000
Chloride of potash, 50 to 60 per cent.....	409,000	476,000
Pure potash content.....	493,000	505,000

The Société Potasse et Engrais Chimiques, formed in 1930 for the purpose of producing sulphate of potash and eventually of fertilizers with a high potash content, is said to have purchased, toward the end of 1930, the Hakspiel license for the manufacture of nitrogen.

MIXED FERTILIZERS

From the point of view of production, the mixed fertilizer industry has made progress. The prepared fertilizers produced commercially are:

Nitramo-Kuhlmann.....	20 per cent nitrogen (10 per cent nitrate and 10 per cent ammoniate).
Ammonitre, of the ONIA....	15.5 per cent (7.75 per cent nitrate and 7.75 per cent ammoniate).
Nitropotash.....	16 per cent nitrogen and 25 per cent potash.
Potazote.....	12.5 per cent nitrogen and 25 per cent potash.

These products are not yet used widely in French agriculture and production is not heavy, totaling only a few thousand tons.

The Société des Engrais d'Auby, with a capital of 55,000,000 francs, has done much toward developing the manufacture and use of compound fertilizers in France.

PAINTS

Taken as a whole, the paint industry had a very favorable year in 1930. This is undoubtedly due to the fact that building activity in France continued active, especially in the Paris district, until almost the end of the year, and even when building activity declined in the months of November and December, the paint business did not suffer correspondingly, as most of the manufacturers were selling under contract with the building trades.

Sales of such basic products as zinc oxide, lithopone, and white lead showed an increase of 6 to 7 per cent over the preceding year. The sudden drops in prices of raw material (zinc, for example) were at times a disquieting factor in the paint industry. However, the manufacturers of paint materials, purchasing under different conditions, were less affected by these price changes than were the paint manufacturers. Paint prices underwent several changes, and were much lower at the end of 1930 than in the preceding January.

Sales of paint and varnish to the automobile industry were small, inasmuch as the French automotive industry had been working on much reduced schedules throughout 1930.

Considerable interest was shown in the French market during the year by foreign paint concerns. It was generally found, however, that customs duties were practically prohibitive. Foreign paint companies are well represented in France by means of their own establishments manufacturing there. It is reported that much of the paint imported, especially from Germany, is being sold at prices which leave a very small margin of profit for the foreign exporter.

BARIUM PRODUCTS

A marked change took place in the production of barium carbonate during the year. The production dropped to about 50 per cent of that for 1929. The reason given for this decrease is that the manufacture of hydrogen peroxide, in which large quantities of barium carbonate were formerly consumed, is now carried on by electrolysis. Because of the decreased demand occasioned by the closing of this outlet, production declined 50 to 60 per cent and prices underwent a very considerable decline.

The trade in barium chloride remained fairly active, with little or no change in prices.

COAL-TAR PRODUCTS

BENZOL

Benzol production in France increased in 1930 partly as a result of the installation of new debenzolizing plants at the gas factories, following Government decrees in execution of the law of July 22, 1923, and also following the construction of new coke ovens at the coal mines and metallurgical plants.

The following table shows the French production of benzol during the last five years (excluding the Saar).

FRENCH PRODUCTION AND DISTRIBUTION OF BENZOL, 1926-1930

Item	1926	1927	1928	1929	1930
PRODUCTION					
Gas plants.....	Metric tons 10,300	Metric tons 12,700	Metric tons 14,100	Metric tons 15,300	Metric tons 15,800
Coal-tar distillery and coke ovens.....	43,000	48,500	55,100	63,900	65,600
Total.....	53,300	61,200	69,200	79,200	81,400
DISTRIBUTION					
Benzol 90 per cent.....	22,550	24,300	24,800	25,700	21,000
Benzol (motor benzol).....	13,400	20,000	28,300	32,200	40,000
Toluol.....	1,200	2,300	2,500	2,500	2,400
Solvent.....	4,900	6,000	6,700	6,300	5,900
Pure products (benzene, toluenes, xylenes).....	2,450	3,000	4,150	6,650	9,600
Various products or products not distributed.....	8,800	5,600	2,750	15,850	12,500
Total.....	53,300	61,200	69,200	69,200	81,400

¹ Of which 3,850 metric tons of crude products were refined in installations other than those at producing plants.

² Of which 2,000 metric tons of crude products were refined in installations other than producing plants.

The Saar production in 1930 shows a large increase over 1929—40,000 as compared with 34,000 metric tons. Twenty-seven thousand metric tons of motor benzol were exported to Germany, and of the remaining amount 8,500 metric tons were consumed in the Saar (2,500 tons by the producing plants for their own requirements) and the remainder (4,500 metric tons) was utilized in France.

FOREIGN TRADE

The exportation of benzol beyond the Franco-Saar customs limits is forbidden in execution of the decree of March 2, 1920, but modifications may be obtained in certain cases and for special products, upon recommendation of the Office National des Produits Chimiques et Pharmaceutiques. During 1930 French exports amounted to approximately 1,200 metric tons, consisting chiefly of pure benzol products, 53 tons to Switzerland, 400 to Germany, and 100 to Belgium.

CONSUMPTION

Benzol available for consumption in France in 1930, and the industries which made up the chief consuming outlets were as follows:

	Metric tons
French production.....	81,400
Contributed by the Saar.....	4,500
Imports from other countries—	
For industrial uses.....	2,050
For motors.....	3,450
	<hr/> <hr/>
Consumption:	
Production of chemical and pharmaceutical products.....	12,000
Varnishes.....	3,000
Rubber.....	6,000
Dyeing and cleaning.....	2,000
Ink.....	1,000
Various (bones).....	1,000
Carburetants.....	64,700

COAL-TAR PRODUCTION

During 1930, the French production of coal tar showed a slight increase. The French Coal Tar Producers and Distillers' Association represents for France and the Saar district 93.5 per cent of the production of coal tar and more than 99 per cent of the coal distillation.

The production for 1930 in France was as follows:

	Metric tons
Gas plants:	
Distilled (Paris, E. C. F. M., Lyon).....	109,000
Others.....	130,000
Coke ovens.....	342,000
Glass plants.....	14,000
	<hr/>
Total.....	595,000

This production of 595,000 metric tons during 1930 is an increase of 34,000 tons over that of 1929.

SAAR DISTRICT

The production of coal tar in the Saar district amounted to 140,000 metric tons, of which 5,000 tons were from gas plants; of the 90,000 metric tons distilled in the Saar district itself, 30,000 tons were for road work and steel mills.

ASSOCIATION OF COAL-TAR PRODUCERS

The following is a list of the members of the French Coal Tar Distillers and Producers' Association, showing their production and distillation for 1930.

FRENCH COAL TAR PRODUCERS AND PRODUCTION

Member	Production	Totally or partially distilled
	Metric tons	Metric tons
Société du Gaz de Paris.....	73,311	67,984
Groupe Huiles, Goudrons et Dérivés:		
Société Huiles Goudrons et Dérivés.....		96,667
Compagnie des Mines de Vicoigne, Noeux et Drocourt.....	24,307	20,718
Compagnie des Mines de Bethune.....	17,405	16,806
Société des Mines de Lens.....	39,840	
Compagnie des Mines d'Aniche.....	15,825	11,823
Société des Mines de Doures.....	13,515	
Société des Hauts-Fourneaux et Fonderies de Pont-à-Mousson.....	10,869	
Société Houillère de Sarre et Moselle.....	8,024	
Compagnie des Mines de Marles.....	6,369	
Société Houillère de Lévin.....	4,673	
Société des Hauts-Fourneaux de Denain-Anzin.....	2,954	
Compagnie des Mines de l'Escarpelle.....	2,303	
Forges de la Sarre.....	121,147	46,153
Groupe Cochery:		
Etablissements Albert Cochery.....		33,494
Verreries Souchon-Neuvesel.....	14,000	10,380
Société d'Eclairage, Chauffage et Force Motrice (E. C. F. M.).....	25,171	26,005
Comptoir Gazier des Goudrons.....	69,564	
Burt, Boulton & Haywood (Ltd.).....		26,564
U. C. P. M. I. (Union des Consommateurs des Produits Metal. et Ind.).....	15,243	13,906
Compagnie des Forges de la Marine et d'Homecourt.....	16,897	12,896
Société Metallurgique de Normandie.....	13,242	12,991
Compagnie du Gaz de Lyon.....	10,745	11,162
Mines Domaniales Françaises de la Sarre.....	14,004	9,393
Société Lorraine de Carbonisation.....	10,250	9,870
Société des Forges de Chatillon-Commentry et Neuves-Maisons.....	11,008	8,499
Société Chimique de Gerland.....		13,551
Société Lorraine Minière et Metallurgique.....	9,553	8,932
Société Nouvelle des Usines de Libercourt.....		13,240
Compagnie des Mines d'Anzin.....	8,696	8,887
Groupe des Mines de la Loire:		
Société Anonyme des Mines de la Loire.....	5,201	5,222
Société Anonyme des Houillères de Saint-Etienne.....	3,047	2,925
Société des Cokeries de la Seine.....	6,439	
Compagnie Parisienne des Asphaltes.....		3,206
Compagnie Générale des Goudrons et Bitumes.....		3,200
Société du Gaz et de l'Electricité de Marseille.....	6,352	
Union Gazière de l'Est.....	6,320	
Alcock.....	5,875	
Compagnie des Mines de Crespin-Nord.....	5,435	
Société Anonyme des Hauts-Fourneaux de Rouen.....	5,196	
AGED (Société d'Application des Goudrons et Dérivés).....		2,500
Société des Acieries de Longwy.....	4,992	
Groupe Gaz France-Etranger-Gazello:		
Compagnie Gie. du Gaz pour la France et l'Etranger.....	3,365	
Compagnie Generale pour l'Eclair. et le Chauffage par le Gaz et l'Electricité.....	1,476	
Frossard, Robert et Cie.....		1,574
Société Anonyme des Goudrons, Bitumes et Dérivés.....		1,500
Etablissements J. J. Carnaud et Forges de Basse-Indre.....	2,170	
Etablissements Ad. Staub.....		931
Société Chimique de la Gironde.....		811
Société E. C. F. M. de Montbéliard, Audincourt et extensions.....	1,269	
Compagnie Lyonnaise des Goudrons et Bitumes.....		600
Messieurs Ithier Père et Fils.....		504
Société Industrielle du Port de Noméx.....		446
Société Départementale d'Usine à Gaz.....	459	
Compagnie des Mines de Houille de Courrières.....	6,473	5,354
Société Salvian.....		8,037
Ernst Hugo Saarg & Co.....		7,830
Messieurs Schneider & Co.....	4,535	4,535
Régie Municipale du Gaz et de l'Electricité de la Ville de Bordeaux.....	5,779	3,670
Les Petits-Fils de François de Wendel.....	12,589	
Etablissements Lassailly & Bichebois.....		5,845
Compagnie Generale Industrielle.....	6,330	2,650
Messieurs Melin et Houguenague.....		5,800
Société Metallurgique de Senelle-Maubeuge (Mines de Douchy).....	6,517	2,100
Acieries de Paris et d'Outreau.....	3,595	3,435
Société Anonyme de Commentry-Fourchambault et Decazeville.....	3,457	3,427
Groupe Vautier:		
Compagnies Réunies du Gaz et de l'Electricité.....	6,481	1,111
Compagnie Hydro-Electrique d'Auvergne.....	1,084	
Société des Acieries de Micheville.....	2,818	2,740
Société Anonyme des Carbonisation et de Distillation des Combustibles.....	7,286	
Compagnie du Bourbonnais.....	7,003	
Total.....	690,458	559,876

FOREIGN TRADE IN COAL TAR

According to the figures furnished by the French customs, French foreign trade in coal tar during 1930 was as follows:

	Metric tons
Imports	94,000
From Great Britain.....	44,000
From Germany.....	22,000
From Belgium.....	20,000
From other sources.....	8,000
Exports	22,000

The exports of coal tar include 6,600 metric tons (crude or prepared) shipped from the Saar to Germany; 7,700 metric tons of French coal tar shipped to North Africa; 1,000 metric tons shipped to Indo-China and Madagascar, and 5,900 metric tons of prepared coal tar shipped first to Belgium and reexported later on to French or Belgian Africa.

The German customs figures agree with the French figures as regards the exports from the Saar into Germany. They show, however, French imports of coal tar from Germany as 27,500 metric tons and German shipments to the Saar as 2,500 metric tons, against 22,000 metric tons given by the French customs. This difference represents the tonnage of coal tar passing through Belgium in transit and charged to Belgium by the French customs.

UTILIZATION OF COAL TAR IN FRANCE

Utilization of coal tar in France (including the Saar) for the year 1930 was about as follows:

	Metric tons
French production.....	595,000
Saar production.....	140,000
Imports.....	94,000
Total.....	829,000
Total distillation:	
France.....	279,500
Saar.....	50,500
Coal tar for steel mills:	
France.....	6,000
Saar.....	10,000
Exports.....	22,000
Road making:	
France.....	450,000
Saar.....	1,000
Various uses.....	10,000
Total.....	829,000

Consumption of coal tar for road making has been increasing steadily.

The 79,000 metric tons indicated in 1930 under "Various uses" include the quantities used in the preparation of tar-macadam (40,000 metric tons, approximately) and the quantities of crude coal tar purchased by the various municipalities or by contractors for various public and private works (35,000 metric tons). It includes also the amounts of coal tar used in the preparation of emulsions (about 4,000 metric tons).

CONSUMPTION OF COAL TAR IN ROAD MAKING IN FRANCE

Year	Ordinary	Parish and urban	Various	Total
	<i>Metric tons</i>	<i>Metric tons</i>	<i>Metric tons</i>	<i>Metric tons</i>
1922.....	16,000	(1)	14,000	30,000
1923.....	27,000	(1)	18,000	45,000
1924.....	53,000	32,000	12,000	97,000
1925.....	73,000	54,000	8,000	135,000
1926.....	73,000	64,000	8,000	137,000
1927.....	94,000	78,000	10,000	182,000
1928.....	104,000	113,000	22,000	239,000
1929.....	143,000	184,500	40,000	367,500
1930.....	151,000	220,000	79,000	450,000

¹ Included in "Various."

BY-PRODUCTS

Pitch.—The production of pitch in France and the Saar district amounted to 200,000 metric tons; part was utilized in the manufacture of bitumen paper; 180,000 metric tons were utilized in the making of briquets.

Imports reached 409,000 metric tons, of which 183,000 metric tons came from England and 139,000 metric tons from Germany. Imports from Russia, amounting to 31,000 tons, were destined to the Mediterranean region. Imports from Canada amounted to 21,000 metric tons; from the United States, 19,000 tons; from the Netherlands, 9,000 tons and from Belgium 7,000 tons.

There has been a noticeable tendency on the part of coal companies to burn their smalls in the form of pulverized coal or in special grates to produce electric energy. Should this practice continue, the consumption of pitch in the making of briquets will decrease.

Heavy oils.—The production in the Saar district and in France amounted to 100,000 metric tons. Imports amounted to 13,000 metric tons, of which 6,000 tons came from Germany to be used in connection with the construction of German railroads; 3,700 tons of creosote from England were imported into the southwest; 3,000 tons of Belgian heavy oils were used mostly for regenerating purposes or for the extraction of phenols.

The French consumption amounted to 60,000 metric tons of creosote for the railroads; 10,000 tons were for various consumers of especially treated wood (ports, telegraphs and telephones, and wood for building purposes). The consumption of the railroads remained stationary.

Washing and debenzolizing oils represent the major part of the remainder of the consumption; however, a certain amount was used as motor oil (Diesel motors).

Naphthaline.—The refining factories have developed their capacity. French exports and imports balance within a margin of 1,500 tons. Imports of pure naphthaline were 290 tons and exports 95 tons. The naphthaline market was fairly good during 1930.

Other products.—The French market for pyridine and anthracine was quiet. Imports amounted to 2,850 tons of anthracine to be used principally by manufacturers of lampblack. Exports amounted to 970 tons, principally of anthracine of 40 per cent content.

Eight tons of pyridine were imported (4 from Switzerland and 4 from Germany), and 165 tons of pyridine were exported (159 to Germany and 5 to Italy).

The consumption of phenols and cresols is developing in France for the manufacture of artificial plastics. Imports of crude products amount to 1,200 tons, as against exports amounting to 150 tons.

EXPORTS

The Office National des Produits Chimiques et Pharmaceutiques, attached to the Ministry of Commerce and Industry, is charged with preparing the decisions concerning suspensions of export prohibitions of coal tar and its by-products established by the decree of March 2, 1920. Upon favorable advice of the office, the following exports were authorized in 1930:

Phenol.—153 tons of not less than 20 per cent and not more than 40 per cent phenique acid, of which 85 tons to Germany, 40 to Belgium, 30 for various French colonies.

Crude naphthaline.—1,500 tons, of which 595 to Belgium, 514 to Germany, 206 to the United States, 137 to England.

Pure naphthaline.—85 tons, principally for the French colonies.

Anthracine.—970 tons, principally in the form of 40 per cent anthracine.

Heavy oils.—5,180 tons, of which 2,000 tons to Germany, 3,000 to Belgium (first destination).

Pitch.—6,950 tons, of which 3,200 tons from Saar to Germany, 2,300 to Belgium, 1,000 to Switzerland.

Pyridine.—165 tons, of which 159 to Germany.

Coal tar.—22,000 tons.

DYESTUFFS

Conditions in the French dyestuffs industry during 1930 remained normal until the close of the year, although in the last months there was some decline in production. The Kuhlmann interests continue to be the dominating factors in the French dyestuffs situation, controlling directly some 70 per cent of the entire French production (Kuhlmann plants and those of Saint-Claire du Rhone). The Société des Matières Colorantes et Produits Chimiques de Saint-Denis, with whom Kuhlmann has a trade agreement, controls approximately 24 per cent of the entire production, and the remaining 6 per cent is divided among a few small firms located at Saint-Fons, Saint-Etienne and Nancy.

According to the best figures available, the French dye production during 1930 was as follows:

	Metric tons (dry or paste form)
Aniline dyes.....	6, 610
Vat and indigo dyes, etc.....	4, 250
Sulphur dyes.....	2, 410
Diphenyl and triphenyl methane dyes.....	1, 085
Alizarine dyes.....	610
Indophenol azines, oxazines, thiazines.....	115
Other.....	870
Total.....	15, 950

The production of 15,950 metric tons during 1930 represents a decrease of some 500 tons from the 1929 production. This slight decrease is no doubt accounted for by the lower consumption toward the end of the year. At the close of the year stocks of dyestuffs on hand in France were from 500 to 600 metric tons.

During 1930 the dyestuffs agreement between Germany, France, and Switzerland continued to function satisfactorily. So far as is

known the accords were well respected. French exports, which are primarily to Spain, Italy, Greece, the French colonies, and certain Latin-American countries, dropped from 3,066 metric tons in 1929 to 2,217 metric tons during 1930, a drop which can probably be attributed to the general economic crisis. Lower imports, 1,362 tons as compared with 1,518 tons in the previous year, are doubtless due to the same cause.

The following table shows the French production, imports, exports, and theoretical consumption of dyes for 1919 to 1930.

FRENCH PRODUCTION, IMPORTS, EXPORTS, AND THEORETICAL CONSUMPTION OF DYES

Year	Production	Imports	Exports	Theoretical consumption
	<i>Metric tons</i>	<i>Metric tons</i>	<i>Metric tons</i>	<i>Metric tons</i>
1919.....	4,523	2,600	240	6,883
1920.....	8,556	5,887	3,334	11,109
1921.....	7,969	1,148	2,698	5,819
1922.....	9,566	1,826	566	10,826
1923.....	12,468	1,371	2,114	11,725
1924.....	16,478	2,445	3,973	14,950
1925.....	16,054	1,451	4,937	12,568
1926.....	17,107	1,448	4,681	13,874
1927.....	14,015	1,541	5,082	10,474
1928.....	15,603	1,559	3,653	13,509
1929.....	16,431	1,518	3,066	14,883
1930.....	15,950	1,362	2,217	15,095

PHARMACEUTICALS

The manufacture of fine chemical products for use as raw materials in the production of pharmaceutical specialties, has, during the past 20 years, made very considerable progress in France largely as a result of the evolution of the pharmaceutical specialties industry, in which empiricism has given place to the science of chemistry and pharmacology.

The French chemical industry has long been sufficient to supply the domestic consumption for most pharmaceutical products. In the last 10 years the production of synthetic pharmaceutical products has developed and has had an extension only little less imposing than that made in Germany, although that country is still far in the lead. At the present time the French plants manufacturing pharmaceutical chemicals and specialties almost all have research laboratories fitted with the most modern equipment and directed by expert technicians.

Among the pharmaceutical raw materials produced in France should be mentioned the iodine produced in Brittany from seaweed—a production of some 100 metric tons annually. Bromine, which was formerly produced (in insufficient quantities) from the waters of the salt marshes, is now produced on an important scale in Alsace in connection with the potash mines—565 metric tons in 1930. Phosphorus and its derivatives are produced in considerable quantities, as is arsenic, which is prepared through the exploitation of the deposits of mispickel in the south of France. The wine industry furnishes an abundant source of raw material for the production of tartars.

The principal firms supplying raw materials—and, in some cases, finished products—to the French pharmaceutical industry are Etab-

lissements Kuhlman, Société des Matières Colorantes de Saint Denis, Etablissements Tance, Billaut, Etablissements Rhone-Poulenc, and Etablissements Roques, S. A.

It has never been possible to secure figures covering the French production of pharmaceutical products. This is probably due to the fact that production is decentralized, being scattered among some 250 large manufacturing pharmaceutical laboratories. France is, however, primarily an exporter of pharmaceutical specialties, rather than an importer. In 1930 exports of prepared medicines amounted to 16,420 metric tons (value, 408,500,000 francs) as compared with slightly over 20,000 metric tons (value, 446,800,000 francs) in 1929. In addition, exports of synthetic organic chemicals destined for use as pharmaceuticals amounted to 69 tons valued at 1,714,000 francs (91 tons valued at 1,860,000 francs in 1929); serums, vaccines, toxins, and similar products, to 80 tons, valued at 4,180,000 francs (45 tons valued at 2,864,000 francs in 1929); and medical plasters, to some 10 tons valued at 360,000 francs (23 tons valued at 1,002,000 francs in 1929).

Imports of various types of pharmaceutical products into France during the past two years have been as follows:

IMPORTS OF PHARMACEUTICAL PRODUCTS INTO FRANCE IN 1929 AND 1930

	1929		1930	
	Metric tons	Thousands of francs	Metric tons	Thousands of francs
Serums, vaccins, toxines, etc.....	13	229	34	481
Medicinal plasters.....	8	326	15	735
Prepared medicines (official pharmacopœia):				
Ready for sale.....	240	8,022	277	10,475
Not ready for sale.....	47	703	55	871
Legal but not in official pharmacopœia.....	95	2,137	354	5,962
Synthetic organic chemicals for pharmaceuticals.....	18	4,124	16	3,011
Total.....	421	15,541	731	21,535

From the foregoing it will be seen that French imports of pharmaceutical products are growing, especially those products which, while legal, do not figure in any official pharmacopœia. The number of trade-marked pharmaceutical products, both of domestic and of foreign origin, on the French market is constantly increasing. Products of American manufacture are now obtainable in practically all the pharmacies of the larger cities and tourist centers, and to a somewhat lesser extent in the Provinces. Although France is not one of the most important outlets for United States exports of this kind, it is, nevertheless, of growing importance, if the ease with which American products may be obtained can be offered as evidence.

According to statistics established during 1929, there are 2,231 drug stores in the Department of the Seine (Paris and suburbs) and 9,835 pharmacies in the rest of France, Algeria, and Tunisia—a total of 12,066. French pharmacies sell pharmaceutical products used in doctors' prescriptions and simple chemical compounds. These products are not generally sold under a trade-mark and are purchased by

pharmacists wholesale from the factory. They also sell all kinds of pharmaceutical specialties, and perfumes and soap to some extent. They are protected by laws which forbid the sale of pharmaceutical specialties by department or other stores. For example, while ordinary talcum powder could be sold by any department store, borated talcum may be sold only by druggists.

Pharmacies in France are required by law to belong to the pharmacist-proprietor, and not to a company or other individual. Two pharmacists could, for example, cooperate in running a pharmacy, but it would be illegal for one pharmacist to own or operate more than one pharmacy. For this reason there has never been any chain development in the retail drug business in France.

PSYLLIUM SEED

The French psyllium-seed industry centers in the Department of Vaucluse, in a small triangular area roughly formed by a line drawn through Avignon, Orange, and Carpentras. In this small area, which is not much more than 15 to 20 kilometers wide at the base of the triangle (Orange to Avignon) and 25 to 30 kilometers from the base to the peak (at Carpentras), there are some 600 to 700 seed growers, most of whom grow psyllium seed. The farmers themselves sort the seed, eliminating some 5 to 8 per cent of waste, thus saving transportation costs and providing a somewhat uniform product.

These growers are not of the peasant type, but are usually well-to-do farmers owning their own properties, and it is they who fix the price of psyllium seed in France. While these growers are not grouped in any special association or union, they are located in such a small area and are in such close touch with each other as to be always aware of the arrival of buyers, especially foreign buyers, and of large orders. Largely for this reason they have been successful in fixing whatever prices they wished.

Until recent years the normal crop of psyllium ran from 700 to 800 metric tons annually, but the increasing use of the seed resulted in a production in 1930 estimated at 1,200 to 1,400 metric tons. It is probable that the 1931 crop will be even larger, as plantings were nearly 50 per cent larger than for the previous year.

Practically the entire French psyllium crop is purchased for consumption in the United States.

ESSENTIAL OILS

During recent years, especially in 1929 and 1930, French producers of essential oils have made real progress in cooperative efforts to increase the yields of aromatic plants and to further diversify production. Although handicapped by the division of land into small holdings in the southern area of France (where the essential oil industry is largely located) there has been a growing trend toward plantation cultivation or the combination of small growers. Overproduction and resulting low prices for lavender, orange, and several other oils have made small-scale production unprofitable, and certain of the larger distilling perfumers have been forced to maintain their own plantations to supply their requirements.

There has been a marked recession in the establishment of new plantations during 1930, owing to the large stocks of oil and the slackened demand, both in the French industry and abroad. Though producers claim the yields of jasmine, orange flower, rose, violet, lavender, and other oils were considerably below normal for 1930, stock movement was relatively stagnant at the end of the year and the beginning of 1931. Purchases of fertilizers were considerably reduced, and there has been a retrenchment in French distillation.

CHIEF SOURCES

The principal plants harvested in France for the production of essential oils, and the district of cultivation, are as follows:

Orange blossoms.....	Cannes, Le Cannet, Golf-Juan, Antibes.
Jasmine.....	Mouans-Sartoux, Grasse, Pegomas.
Roses.....	Grasse, La Colle, St. Paul, Le Bar, Vance.
Sage.....	Grasse-Montaurox.
Peppermint.....	Pegomas, Villeneuve, Loubet.
Lavender.....	Alpes-Maritimes, Vaucluse, Basses-Alpes.
Spike.....	Mediterranean coast.
Tuberose.....	Pegomas, Mouans-Sartoux.
Geranium.....	Grasse, Pegomas.
Cassia.....	Vallauris, Cannes.
Violet.....	Grasse, Hyères.
Mimosa.....	Alpes-Maritimes, various departments, Italian Riviera.
Thyme.....	Grasse, southern mountainous region.
Rosemary.....	Gard, Harnault.
Muscatel sage.....	Vaucluse, various districts.

PRINCIPAL PRODUCERS

The principal syndicates of flower growers are the following: Coopérative des Producteurs de Fleurs d'Oranger de Vallauris, with factories at Golfe-Juan and Bar, which during the six years immediately prior to the war distilled almost 10,000 tons of flowers; Société Cooperative de Fleurs Naturelles pour la Parfumerie de la Colle, formed in 1908 and having about 500 members (this group claims to have been able to force an important increase in the manufacturers' prices for roses and operates its factory only when the market price shows a tendency to fall off); Société Coopérative des Producteurs de Fleurs pour la Parfumerie de l'Arrondissement de Grasse et des Communes de Caillan et de Tanneron, also formed in 1908, which groups a large number of growers of jasmine, tuberose, geraniums, violets, and roses, and which has a model factory; and the Société Coopérative des Propriétaires de Cassiers de Cannes et de ses Environs, a sales organization with a membership of about 275.

While most of the flower fields of Grasse are privately owned, an increasing proportion is being bought up by essential-oil manufacturers who wish to be independent of growers. These factories operate at capacity during the summer months when the various aromatic plants are blossoming. They also keep fairly active during the winter months, when most of their work is on essential oils derived from colonial products. These latter are purchased by agents of the Grasse factories sent out to the colonial districts, and are imported largely through the port of Marseille during the late fall months.

VARIETIES IMPORTED

The principal essential oils imported into France are aniseed, from Indo-China and China; cedar-wood, from the United States; rosewood, from French Guiana; cananga, or ylang-ylang, from Java, Reunion, and the Philippines; cinnamon, from China and Ceylon; citronella, from Ceylon and Java; eucalyptus, from Australia and Algeria; geranium, from Algeria and Reunion; clove from Zanzibar and Reunion; lemon-grass, from India and certain French colonies; lemon, bergamot, mandarin, and orange, from Italy; and attar of roses, from Bulgaria.

FOREIGN TRADE

The French foreign trade in essential oils during 1929 and 1930 was as follows:

FRENCH FOREIGN TRADE IN ESSENTIAL OILS IN 1929 AND 1930

Essential oil	1929		1930	
	Kilos	Thousands of francs	Kilos	Thousands of francs
IMPORTS				
Rose.....	2,308	29,148	1,114	20,399
Geranium.....	14,627	2,603	13,088	1,858
Ylang-ylang.....	32,783	11,166	15,982	3,263
Lemon, bergamot, orange, and mandarin.....	249,646	33,524	230,675	16,665
All other.....	1,210,242	82,978	1,118,319	62,863
Terpeneless.....	7,799	524	19,099	907
Total.....	1,517,405	159,943	1,398,277	105,955
EXPORTS				
Rose.....	1,618	6,695	1,424	4,133
Geranium.....	24,674	3,033	21,774	3,255
Ylang-ylang.....	13,058	3,381	10,974	1,807
Lemon, bergamot, orange, and mandarin.....	26,318	1,969	30,956	2,678
Britain.....	164,760	(1)	175,325	(1)
.....	90,918	(1)	89,463	(1)
.....	55,764	(1)	47,897	(1)
.....	81,761	(1)	91,612	(1)
.....	295,110	(1)	326,720	(1)
.....	413,708	(1)	325,642	(1)
.....	1,102,021	100,896	1,056,659	87,887
.....	1,566	194	3,319	462
.....	1,169,255	116,168	1,125,106	100,222

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