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St. Louis, May 16, 1927

THE COURSE
of
Paint and Varnish
Production
1914-1926 Inclusive

By George H. Priest, Jr., of the Editorial Staff
American Paint Journal Company

Based Upon and Including the Statistics
Gathered in the Quinquennial, the Biennial,
and the Semi-Annual Censuses of the
Bureau of the Census, Department
of Commerce

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Foreword

To secure a proper introduction to and understanding of the matter in the following pages, the reader's attention is called to the editorial in the American Paint Journal of May 2, 1927, which announced the forthcoming publication of Mr. Priest's article and outlined its background, as follows:

Paint and Varnish Production Declined in 1926

THE Journal has ample evidence that the paint and varnish industry, as a whole, has a full and lively appreciation of the value of accurate statistics, collected at regular intervals and published promptly.

The semi-annual census of the industry appears to be a modest program when it is considered that many other industries, which are utilizing the services of the Department of Commerce to the fullest extent, are enjoying the benefit of monthly, and in some cases weekly reports of their production, sales, stocks, etc. Yet the value of the semi-annual paint and varnish reports has been impaired very greatly by the increasing delay in their completion and issuance. Thus the statistics for the last half of 1926, which appear in this issue of the Journal, are released four months after the close of the period covered by the report. The only reason why these figures were not made available two or even three months earlier lies in the fact that the Department of Commerce has not received the whole-hearted co-operation of the entire industry.

Judge Gary has said that any man who wants to keep the facts of his business to himself still has the right to do so and he may protect that right by keeping his business so small that whatever he may do will be of no public consequence. This is true at least of this voluntary semi-annual paint and varnish census, which is conducted at the special request of the industry; for no one is under any compulsion to participate. * * *

It will be recalled that the first of these semi-annual censuses, upon which the Bureau of the Census bases the index numbers published on page 11, covered the production of the industry in 1922, and, according to the

bureau, was compiled from reports by 426 concerns, which in 1921 produced 39 per cent of the paste paints ground in oil, 95 per cent of the ready-mixed paints, and 90 per cent of the varnishes, japans, and lacquers—as shown in the biennial census for 1921. On the other hand, the Survey of Current Business, published by the Department of Commerce, inaugurated in January, 1923, its monthly index of manufacturing production, based upon the 1919 production of a wide range of commodities comprising about 40 per cent of the value of all goods manufactured in the United States in 1919.

Of the 1926 statistics published in today's Journal, it may be said that their most noteworthy features are that the industry's total production in 1926 was slightly below that of 1925, and also that apparently the production during the last half of 1926 was greater than during the first half, which unusual circumstance perhaps may be attributed to the generally late spring rather than to unusual activity during the last half year. This conclusion is supported by the fact that production in two of the three major groups, paste paints and the ready mixed and semi-paste paints, was less in the last half of 1926 than in the same period of 1925, though the production of varnishes, japans and lacquers showed an increase of more than 20 per cent, about three-quarters of which was due to the increased production of pyroxylin lacquers.

It has been the common practice in recent years to estimate the total production of the industry on a net weight basis by converting gallons to pounds on the basis of 14 pounds per gallon for ready-mixed and semi-paste paints and 7.5 pounds per gallon for varnishes, japans and lacquers. Using this method, it appears that the total

(Concluded on page 10)

AMERICAN PAINT JOURNAL

The Course of Paint and Varnish Production Since 1914

By George H. Priest, Jr., of the Editorial Staff
American Paint Journal Company

The recent report of the Department of Commerce on paint and varnish production in 1925, as shown by the biennial census, which was published in the American Paint Journal on February 21, 1927 (not the semi-annual report for last half of 1926, in the Journal of May 2), affords an opportunity for the intelligent study of the industry's growth since 1914.

Although 1925 statistics, based on voluntary returns from 555 firms in the special semi-annual census, were published a year ago, it must be remembered that the biennial census is conducted with congressional authority and is more complete and authoritative than these voluntary semi-annual reports, valuable though they might be in their current information if the manufacturers reported promptly, and accurately.

Value of the industry's products, as reported by 923 firms in this latest biennial census, taken in 1926 to cover the 1925 production, was \$470,736,624, or 16 per cent greater than in 1923 (\$404,134,231); 72 per cent greater than in 1921 (\$274,310,314); 38 per cent greater than in 1919, (\$340,346,803), and 222 per cent greater than in 1914 (\$145,623,691). However, with the general increase in prices from 1914 to 1919, and with the subsequent fluctuations, any comparisons based on value are of little use in revealing actual trends and conditions. In this study, therefore, all comparisons will be made upon the quantity basis, wherever possible.

The products of the industry, as

classified by the Bureau of the Census, may be divided into three general groups, pigments, paints, and varnishes. As pigments are used principally as raw materials in the manufacture of the finished products of the industry a considerable element of duplication is introduced if these three groups are totaled with respect to either quantity or value. It is the production of the finished products that furnishes the real criterion of the industry's position and progress, and this differentiation will be observed in this discussion.

For purposes of comparison a reasonably accurate figure for the total quantity of finished paint and varnish products can be obtained by converting gallons to pounds on the basis of 7.5 pounds per gallon for varnishes, japans and lacquers, other than enamels, and 14 pounds per gallon for ready mixed paints and enamels, and adding the resulting figures to those already available for paste paints ground in oil. This is the method that has been in general use by those calculating and comparing the industry's total production in recent years, though the inclusion of water paints and kalsomines would increase the total about 5 per cent.

On this basis it appears (as shown in Table B, on pages 4 and 5) that the total production in 1925, exclusive of "other paints" which were reported as such for the first time in that year, was 2,095,515,066 pounds, or 65 per cent more than in 1914 (1,263,185,748 pounds), 30 per cent more than in 1919 (1,602,796,628 pounds); 41 per cent more than in

Table B—U. S. Paint and Varnish Production
1914-1925 Inclusive

TOTAL PRODUCTION OF PAINTS IN OIL, VARNISHES, JAPANS AND LACQUERS ON NET
Calculated by American Paint Journal on Basis of 7.5 Pounds per Gallon for Varnishes, Japans and Lacquers
and 14 Pounds per Gallon for Ready Mixed Paints and Enamels; Using Detailed Production Figures of U. S.
Stated Below.

Paints in Oil—	1914	1919	1921*
In Paste Form.....(pounds)	420,012,061	398,269,118	428,156,109
Mixed for use....."	570,437,882	835,055,648	672,954,562
Varnishes, Japans and Lacquers—			
Other than Enamels....."	272,735,805	369,471,862	290,548,567
Enamels....."	(1)	(1)	89,281,250
Total....."	1,263,185,748	1,602,796,628	1,481,040,488

DETAILED REPORT OF PRODUCTION OF THE PAINT AND VARNISH INDUSTRY
As Reported in the Quinquennial Censuses of 1914 and 1919 and in the Biennial Censuses of 1921

PAINTS AND VARNISHES	1914	1919	1921*
Paints in Oil—			
In Paste Form, ground in Oil.....(pounds)	420,012,061	398,269,118	428,156,109
White Lead....."	281,417,600	287,358,672	329,668,223
Zinc Oxide....."	9,551,800	14,342,051	7,227,587
Other....."	129,042,700	146,568,395	91,260,293
Mixed for use.....(gallons)	40,745,563	59,646,832	48,068,183
Water Paints and Kalsomine—			
Dry or in Paste.....(pounds)	61,904,280	106,797,920	87,744,675
Mixed for use.....(gallons)	297,170	859,129	51,330
Other Paints—			
In Paste Form.....(pounds)	(3)	(3)	(3)
Mixed for use.....(gallons)	(3)	(3)	(3)
Varnishes, Japans and Lacquers—			
Total.....(gallons)	36,364,774	49,262,915	45,124,184
Oleoresinous Varnishes....."	17,801,440	28,116,160	22,172,145
Spirit Varnishes, not Turpentine....."	2,964,170	2,974,118	3,034,507
Damar and similar Turpentine and Benzine Varnishes....."	3,287,370	6,856,387	4,293,923

Pyroxylin Products	(gallons)	852,570	500,061	1,409,280	
Pyroxylin Lacquers and Enamels	"	(3)	(3)	(3)	
Pyroxylin Thinners and Solutions	"	(3)	(3)	(3)	
Drying Japans and Driers	"	5,560,400	5,940,969	4,315,329	
Baking Japans	"	4,838,800	5,375,220	3,464,625	
Enamels, Oil and Varnish Base	"	(4)	(4)	6,334,375	13
Other Products: Asphaltum, Color Varnishes, Varnish Stains, Removers, etc.	(value)	\$4,148,617	\$16,030,578	\$2,975,249	\$4

PIGMENTS		1914	1919	1921*	
Total—For Sale	(pounds)	459,051,698	1,039,688,238	743,606,130	1,30
Total Production	"	670,369,969	1,233,246,810	964,764,833	1,44
White Lead, dry	"	279,269,800	262,959,465	334,948,764	30
Lead Oxides	"	61,335,300	165,106,671	139,814,627	22
Lithopone	"	48,972,000	154,822,275	96,434,572	21
Zinc Oxide	"	(6)	279,321,235	117,127,315	33
Iron Oxides, Ocher, Sienna, Umber, etc.	"	92,897,006	202,181,787	85,128,338	12
Chrome Yellow, Orange, Green	"	14,771,700	9,494,800	13,429,231	2
Chrome Yellow	"	6,747,300		5,460,733	1
Chrome Orange or Green	"	8,024,400		7,968,498	1
Prussian Blue	"	1,239,400	944,649	1,668,004	
Other Colors	"	171,834,760	153,615,928	176,213,982	26
Other Mineral Colors	"	(8)	33,263,989	51,537,136	14
Ultramarine	"	2,698,600	(9)	(9)	
Vermillion	"	322,760	327,454	250,865	
Other Fine Colors	"	4,215,900	6,681,210	5,029,228	
Other Dry Colors, including Barytes	"	142,537,000	78,258,974	108,367,108	9
Pulp Colors	"	22,110,500	30,084,301	9,523,753	1
Coal Tar Color Lakes	"	(10)	(10)	1,265,892	

*Data for establishments with products under \$5,000 in value not included. Production of such establishments only 0.3 per cent of the total value.

- (1) Not available; included below with "other products," reported by value only.
- (2) "Other paints" first reported in 1925 totaling 282,742,640 pounds not included; if previously reported comparative total for 1925 would be 2,378,257,706 pounds.
- (3) First reported separately in 1925.
- (4) Included with "other products."
- (5) Includes estimate (7) for "other colors."
- (6) Not available; probably included with "other dry colors."
- (7) Estimate based on value, \$15,609,750, as compared with \$12,313,741 in 1923.
- (8) Included with "iron oxides."
- (9) Included with "other dry colors."
- (10) Included with "other fine colors."

1921 (1,481,040,488 pounds), and about 1 per cent less than in 1923 (2,114,191,309 pounds). These totals have been reduced to index numbers, with 1919 as the base, and appear in Table A, with similar index numbers for the individual items entering into the total, as well as for pigments.

Table A.

Table A—Index numbers (on 1919 base as 100) of production of the Paint and Varnish industry for 1914-1925; all calculations based on figures from United States quinquennial and biennial censuses. See Table B.

Finished Products					
	1914	1919	1921	1923	1925
Total Poundage,					
Oil Paints and					
Varnishes, Jap-					
ans & Lacquers†	79	100	92	132	131
Paints in Oil					
In Paste Form,					
Total	105	100	107	107	103
White Lead...	118	100	139	115	130
Zinc Oxide...	67	100	50	55	49
Other	88	100	62	99	65
Mixed for Use...	68	100	81	119	115
Water Paints and Kalsomine					
Dry or in Paste	53	100	82	115	104
Mixed for use...	83	100	14	3	20
Varnishes, Japans and Lacquers					
Total	74	100	92	163	169
Oleoresinous					
Varnishes ...	63	100	79	143	136
Spirit Varnishes,					
not turpentine	100	100	104	188	239
Damar and simi-					
lar Varnishes	52	100	68	61	64
Pyroxylin					
Products	171	100	282	651	1477
Drying Japans					
and Driers...	110	100	73	123	97
Baking Japans.	91	100	65	120	113
Enamels	*	*	100	210	231
Pigments					
Total—For Sale...	44	100	72	126	132
Total—Produc-					
tion	55	100	78	120	129
White Lead,					
dry	106	100	127	114	127
Lead Oxides ..	37	100	85	135	153
Lithopone	32	100	62	136	160
Zinc Oxide ...	**	100	42	115	115
Iron Oxides,					
Ocher, Sienna,					
Umber, etc...	46	100	42	63	33
Chrome Yellow,					
Orange,					
Green	156	100	142	278	302
Prussian Blue...	131	100	176	332	482
Other Colors...	112	100	115	173	211

†If "other paints" first reported separately in 1925, are included, index number for 1925 becomes 148.

*Not reported separately until 1921.

**Not reported separately until 1919.

It should be noted that the "other paints" mentioned as having been reported for the first time in 1925 amounted to 22,814,230 pounds of "paste" and 18,566,315 gallons of "mixed for use." Just what this class of "other paints" embraces is problematical, although it probably includes roofing paints, plastics, and other products which cannot be properly classified as oil or water paints. Officials of the Bureau of the Census say they are unable to state where the items included in this classification were reported previously, if at all, but it is evident that if appreciable quantities of these "other paints" have been reported as oil paints in previous years and it were possible to make proper deductions, the relative showing for 1925 would be improved accordingly. Or, assuming that all of these "other paints," aggregating 282,742,640 pounds, were included with oil paints prior to 1925, the comparative total for 1925 would be 2,378,257,706 pounds, or about 88 per cent more than in 1914, about 48 per cent more than in 1919, about 60 per cent more than in 1921, and about 12 per cent more than in 1923.

Some of the Gains, and Losses.

As it is, analysis of the figures furnished by the Bureau of the Census indicates a general decrease in the production of oil paints in 1925 as compared with 1923, with the exception of white lead in oil, which however, in spite of a 14 per cent increase over 1923, remained 6 per cent less than in 1921. The 1925 production of ready mixed oil paints was three per cent less than in 1923, but 43 per cent more than in 1921, about 15 per cent more than in 1919 and 68 per cent more than in 1914.

In spite of a 5 per cent decrease in the production of oleoresinous varnishes as compared with 1923, the 1925 volume was 73 per cent more than in 1921, while 1925 production of the varnish group as a whole, including pyroxylin products, was 4 per cent larger than in 1923, about 84 per cent more than in 1921, about 69 per cent more than in 1919, and 129 per cent more than in 1914.

The production of pigments in

1925, exclusive of those consumed by their manufacturers in the fabrication of other products, was probably about 1,375,000,000 pounds, including an estimated quantity of unenumerated pigments for which detailed quantity figures are not yet available, this estimate being based on the value reported for those pigments and with the assumption that the average price was the same as in 1923. This quantity represents an increase of 5 per cent over 1923, about 85 per cent over 1921, about 32 per cent over 1919, and about 200 per cent over 1914. The growth of this pigments branch of the industry, which was particularly pronounced from 1914 to 1919, has been influenced greatly by the development of other industries: lead and zinc oxides, for instance, which together constitute more than 40 per cent of the total, are used to a greater extent in the manufacture of storage batteries and in the compounding of rubber than in the making of paint and varnish products. The 1914 figures for zinc oxide are not separately available but are probably included in the total with the unenumerated pigments.

The Story of the Pigments.

Reference to Tables A and B indicates that the 1925 production of dry white lead, although recovering ground lost in 1923, showed no increase over 1921 and was but 20 per cent greater than in 1914; while dry zinc oxide in 1925 remained on a par with 1923 production which was about 175 per cent more than in 1921, though but 15 per cent more than in 1919. Iron oxides, ocher, umber, sienna, etc., were produced in 1925 in quantities considerably less than in any other of the years covered by the Census during this period. All of the other pigments, however, registered appreciable gains.

As already stated, the pigments, although reported as products of the paint and varnish industry, are used largely in other industries; consequently pigment production data are of little value in a consideration of the production of paints and varnishes, though to a certain extent

they may indicate changes in manufacturing practice when considered in connection with statistics of paint and varnish production.

For instance, the total production of dry white lead in 1925 was about 20 per cent more than in 1914. This increase was partly absorbed in the production of white lead in oil, which was about 10 per cent greater than in 1914, while it may be assumed that most of the remainder entered into the manufacture of ready mixed paints. The 1925 production of ready mixed paints, however, was almost 70 per cent greater than in 1914, so that, in spite of the large quantities of zinc oxide and lithopone consumed by other industries, it seems evident that they are being used more largely in the manufacture of ready mixed paints than ever before.

One of the most interesting developments of recent years has been the introduction of nitrocellulose lacquers for industrial and household consumption on a scale that was unthought of in 1914. It will be noted by reference to Table B that the increased production of these pyroxylin products in 1925 over 1923 was practically equivalent to the decrease in oleoresinous varnishes, drying japans and lacquers, and baking japans, and there is undoubtedly some basis for the opinion current in some quarters that the pyroxylin products are making inroads upon the older lines, although, as the Journal has pointed out before, the increased use of these pyroxylin varnishes or lacquers should benefit the entire industry by awakening a large number of new buyers to paint and varnish consciousness.

Some Discrepancies in the Reports of the Manufacturers.

In this connection it may be well to ponder the fact that the total quantity of pyroxylin products manufactured by the paint and varnish industry in 1925, as reported in the voluntary semi-annual census to which only 555 concerns made returns, was 11,104,000 gallons, or more than 50 per cent greater than

the 7,387,506 gallons shown later, in the biennial census, with its returns from 923 firms for the same year. The semi-annual census showed that 85 of the 555 firms filing returns reported the manufacture of pyroxylin products, and, while it is possible, it does not seem probable that none of the 368 additional firms reporting in the biennial census were making lacquers in 1925.

This discrepancy in the two sets of figures is not confined to pyroxylin products, for the total 1925 volume of varnishes, japans and lacquers, other than pyroxylin, as reported in the semi-annual census, was 70,913,400 gallons while only 61,312,730 gallons were reported in the biennial census for the same year. The latter figure has been obtained by deducting pyroxylin products and enamels from the total shown in Table B; enamels are not included in this group in the semi-annual census but are reported with ready mixed and semi-paste paints. Also, the production of zinc oxide in oil was reported as 13,631,300 pounds in the semi-annual census for 1925 and as only 6,975,414 pounds in the biennial census for the same year.

These important discrepancies are noted without any reflection on the Department of Commerce, which, in compliance with the special request of the industry, is seeking to render the trade a real service in collecting and disseminating the data furnished in these voluntary semi-annual reports. It is obvious, however, that both sets of figures cannot be correct, and as it is to be assumed that the biennial census, prescribed and conducted under the specific requirements of the law, is reasonably accurate, it seems apparent that some members of the industry have been imposing upon the Department of Commerce and upon the industry itself by making inaccurate semi-annual reports.

"Indicates the Biennial Figures Are Correct."

LeVerne Beales, Chief Statistician for Manufactures, Bureau of the Census, when asked for an explanation of these apparent discrepancies

by the Washington representative of the Journal, commented as follows:

"In most cases the manufacturers of varnishes, japans, and lacquers report, at the semi-annual censuses, their total output of these products, which includes those made and consumed in further manufacturing processes. The biennial report shows only the quantities produced for sale. Certain manufacturers report zinc oxide and white lead separately at the semi-annual censuses, but report at the biennial censuses only combination or graded whites (included with "other paste paints" in the biennial reports--Ed.). This indicates that the biennial figures are correct and that the semi-annual figures are incorrect."

It is quite evident from this statement that an element of duplication has been introduced into the semi-annual statistics which does not appear in the biennial reports. In the case of pyroxylin products, however, according to Mr. Beales, certain important manufacturers, classified for census purposes in the "Chemicals, not elsewhere classified" industry, report their pyroxylin products as solutions, the data for which are included in the "Pyroxylin plastics and solutions" report and do not appear in the biennial paint and varnish report. Inasmuch as certain firms in the paint and varnish industry report the manufacture of "pyroxylin thinners and solutions" in the biennial census, if this class can properly be considered as finished products of the industry it appears probable that in this instance the semi-annual reports give a more accurate picture of the development of pyroxylin finishes than the biennial reports.

Study the Detailed Figures.

Probably no better measure of the industry's progress exists, however, than that afforded by the two pages of detailed figures in Table B (pages 4 and 5). Attention already has been drawn to the method by which the total poundage of finished products is estimated and the way in which the totals may have been affected by the large group of "other paints" first reported in 1925. If

should be noted that the totals for 1914 and 1919 include no estimate for enamels, as they were first reported separately in 1921, this separation being chiefly responsible for the decrease of thirteen million dollars in the value of "other products" in 1921 as compared with 1919. Their inclusion in 1919 would have the effect of lowering the index numbers for succeeding years shown in Table A. On the other hand, all pyroxylin varnishes or lacquers have been calculated at 7.5 pounds per gallon, as separate figures are not available for pigmented lacquers, which, for this purpose, might better be grouped with enamels at 14 pounds per gallon.

There exists today a well accepted conception of the increasing competition between industries striving for the consumer's dollar, as distinguished from the competition between the individuals within an industry. How has the paint and varnish industry fared in this so-called "new competition"?

The Paint and Varnish Industry in "The New Competition."

In the Survey of Current Business, published monthly by the Department of Commerce, there appears a monthly index of manufacturing production, based on 1919 as 100, which includes sixty-four commodities in eleven groups. This index is based upon the quantity of production, weighted arithmetically with respect to the importance of the commodity as indicated by the "value added by manufacture" as shown in the 1919 Census of Manufactures. At the request of the Journal, the Survey of Current Business has furnished the index numbers of the eleven groups and the combined total for the years in which the biennial census has been conducted since 1919. These index numbers appear in Table C, and the Journal has calculated similar index numbers for the paint and varnish industry, based on the government's figures for quantity and value of production which have been presented in this article and the accompanying tables; also the index numbers for those two great indus-

tries, automotive and building construction whose processes not only consume vast annual volumes of paint and varnish products on new work, but—and of far greater importance—they create, increase and pyramid that volume of regularly repaintable surfaces that absorb by far the larger part of the industry's annual production. These index numbers for the automotive and building construction industries are based upon both actual quantity and value as published on pages 46 and 66 of the February issue of the Survey of Current Business.

Table C.

Table C.—Index numbers on production of the Paint and Varnish industry and other industries since 1919. Based on Department of Commerce figures, with 1919 as 100.

	1919	1921	1923	1925
Paint and Varnish (value)	100	81	119	138
Paint and Varnish (pounds)*	100	92	132	131
Automotive (value) ..	100	73	152	160
Automotive (number vehicles) ..	100	35	208	220
Building Construction (value)†	100	92	135	198
Building Construction (floor space)†	100	69	105	140
"Survey of Current Business" index figures based on quantities, weighted arithmetically —				
64 m a n u f a c -				
tured commodities. 100	79	119	126	
Foodstuffs	100	93	110	106
Textiles	100	93	112	104
Iron and Steel	100	58	129	124
Lumber	100	88	136	150
Sole Leather, Boots and Shoes	100	79	97	86
Paper and Printing. 100	89	108	111	
Chemicals and Oils. 100	104	140	170	
Stone and Clay Products	100	90	124	138
Metals—nonferrous. 100	82	156	130	
Tobacco	100	95	107	115
Miscellaneous	100	65	114	133

*If "other paints" first reported separately in 1925, are included, index number for 1925 becomes 148.

†Contracts awarded in 36 states, compiled by F. W. Dodge Corporation.

Examination of the index numbers in Table C discloses the fact that the progress of the paint and varnish industry since 1919, while above the average of that of industry as a whole, which has made notable gains,

especially in view of the slump in 1921, has been surpassed by various other industries, including especially the two, the automotive and the building construction industries, whose influence upon the immediate, continuing and increasing consumption of paint and varnish products is generally considered predominant.

According to the Survey of Current Business, manufacturing in general showed an increase in 1926 over 1925, the combined index for 64 commodities increasing from 126 in 1925 to 128 in 1926. Building construction was greater in value, although about five per cent less in floor space. Automobile production was greater in both value and in the number of vehicles. Eight of the eleven groups entering into the Survey of Current Business index of manufacturing production showed increases, lumber, leather, and non-ferrous metals being the only ones to decline. Paint and varnish production during 1926, however, if judged by the results of the volun-

tary semi-annual census published in last week's Journal, was about two per cent less than in 1925.

Surely, all these facts must command the serious thought of every paint and varnish manufacturer. The opportunities were never greater; more than thirty-five billion dollars worth of building construction, or more than three times the total value (\$11,496,439,543) of all farm buildings reported in the 1920 census, has been added to the nation's standing property since 1919; while the registration of motor vehicles has increased from about 6,000,000 to about 22,000,000. It seems evident that the activity of these two industries has contributed largely to the prosperity of the paint and varnish industry, but the fact of greatest significance to the industry is that but a small proportion of these new buildings and automobiles represent replacements and that on the whole they constitute an enormous addition to the repaintable surfaces existing in 1919.

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production in 1926 was slightly less than in 1925, as shown below. For purposes of comparison the production is also shown for the years 1922-1924, with index numbers based on 1922 production; all these calculations being made from the semi-annual census figures appearing on page 7.

Year	Total Production (Pounds) (1922=100)	Index Number
1922.....	1,779,106,500	100
1923.....	2,118,637,500	119
1924.....	2,251,822,000	126
1925.....	2,476,338,500	139
1926.....	2,425,690,000	136

As has been stated, all the above figures are based upon the voluntary semi-annual census reports, which are necessarily incomplete, being compiled from returns from concerns varying in number from 426 in 1922 to 581 in 1926, while the biennial reports were compiled from returns of 804 firms in 1921, from 826 firms in 1923, and from

923 firms in 1925.

The Journal has frequently commented on the fact that there are discrepancies between the two sets of figures, viz., the two separate censuses, for the same years, which cannot be accounted for by the difference in the number of firms reporting; for in some instances a greater production is shown by the semi-annual reports than by the biennial report for the same year.

As the biennial reports are prescribed and conducted by law it is to be assumed that they are more complete and more authoritative than the voluntary semi-annual reports, and as this whole matter is of such vital importance to the industry, the Journal will publish in its next issue a comprehensive and detailed review of paint and varnish production during the twelve-year period 1914-1925, based upon these official censuses—the quinquennial censuses of 1914 and 1919 and the biennial censuses of 1921, 1923, and 1925.

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AMERICAN PAINT JOURNAL

U. S. Statistics of Paint and Varnish Production and Sales, Last Half 1926

Washington, D. C., May 2.—The Department of Commerce announces that, according to data collected at the latest semi-annual canvass of paint and varnish manufacturers, the production during the six months' period from July 1 to December 31, 1926, was as follows: 212,536,900 pounds of paste paints, comprising 128,930,900 pounds of pure white lead in oil, 14,535,600 pounds of combination or graded whites, 4,362,500 pounds of zinc oxide in oil, and 64,707,900 pounds of other paste paints; 45,623,000 gallons of ready-mixed and semi-paste paints, including enamels; 36,242,900 gallons of varnishes, japans and lacquers, other than pyroxylin; 12,843,600 gallons of pyroxylin (nitrocellulose) varnishes or lacquers; and allied products comprising paint and varnish removers, 413,100 gallons; stains (not varnish stains) 2,159,800 gallons; liquid fillers, 376,900 gallons; paste fillers, 7,515,900 pounds; and putty, 30,837,400 pounds.

The statistics for paints and varnishes for the second half of 1926 as compared with the first half of that year show increases of 1.7 per cent and one-half of 1 per cent, respectively, for paste paints and ready-mixed and semi-paste paints, including enamels, a decrease of 4.8 per cent for varnishes, japans, and lacquers, other than pyroxylin, and an increase of 26.7 per cent for pyroxylin varnishes or lacquers.

The statistics for the second half of 1926 are based on returns from 581 establishments, of which 76 reported the manufacture of pure white lead in oil; 157, combination or graded whites; 137, zinc oxide in oil; 325, other paste paints; 435, ready-mixed and semi-paste paints; 372, varnishes, japans and lacquers, other than pyroxylin; and 138, pyroxylin varnishes or lacquers.

No data are included for thirty-one establishments which reported for the

(Concluded on page 15.)

Table 1.—Paint and Varnish Industry—Production and Index Numbers, by Classes of Products, for Half-Year Periods, 1922 to 1926.

Period	Production			Index Nos. Base, 1922		
	Paste paints 1,000 pounds	Ready-mixed and semi-paste paints 1,000 gals.	Varnishes japans and lacquers 1,000 gals.	Paste paints	Ready- mixed paints	Varnishes japans and lacquers
1926—year	421,560	91,025	97,304	97	138	175
2nd half	212,537	45,623	49,086	93	136	170
1st half	209,023	45,402	48,218	100	139	180
1925—year	465,285	99,709	82,017	107	151	147
2nd half	234,228	47,260	40,622	98	141	141
1st half	231,057	52,449	41,395	116	161	154
1924—year	487,611	88,274	70,450	112	134	126
2nd half	233,367	43,152	34,301	108	129	119
1st half	253,744	45,122	36,149	122	133	135
1923—year	439,175	82,070	70,731	101	124	127
2nd half	192,021	38,251	32,849	84	115	114
1st half	247,154	43,719	37,882	118	134	141
1922—year	436,295	66,071	55,709	100	100	100
2nd half	227,703	33,440	28,877	100	100	100
1st half	208,592	32,631	26,832	100	100	100

Table 3. — Paint and Varnish Industry — Production and Sales
of Products: 1926, First and Second Halves, and 1925, Second Half

	Number of Establish- ments,	Total Production Pounds	Production		Establishments Reporting Sales		
			Amount Pounds	% of Total	Sales Total Pounds	Sales Industrial ² Pounds	Sales All Other ³ Pounds
Paints							
Paste paints—							
1926, July-December	...	212,536,900	190,461,800	89.6	160,664,300	23,305,200	129,400,000
January-June	...	209,022,800	184,143,600	88.1	180,620,000	21,103,200	148,800,000
1925, July-December	...	224,228,100	194,499,500	86.7	173,110,200	28,040,300	135,900,000
White lead in oil, pure—							
1926, July-December	76	128,930,900	128,796,000	99.9	113,415,800	6,216,300	104,900,000
January-June	79	129,343,800	127,102,600	98.3	133,900,500	5,209,100	121,900,000
1925, July-December	102	132,841,700	130,459,300	98.2	123,101,500	7,843,100	109,800,000
Combination or graded whites—							
1926, July-December	157	14,535,600	8,312,900	57.2	8,389,900	1,964,600	5,300,000
January-June	159	11,634,300	8,119,000	69.8	7,328,000	1,191,100	5,700,000
1925, July-December	127	5,221,600	3,559,000	68.2	3,429,400	1,226,700	1,700,000
Zinc oxide in oil—							
1926, July-December	137	4,362,500	3,821,200	87.6	3,349,900	343,100	2,100,000
January-June	131	3,602,500	1,793,100	51.2	2,032,700	348,700	1,400,000
1925, July-December	163	6,334,100	4,373,500	69.0	4,057,000	330,900	3,400,000
Other paste paints—							
1926, July-December	...	64,707,900	49,531,700	76.5	35,508,700	14,784,200	17,000,000
Colors in oil	268	13,460,900	9,625,200	71.5	9,122,700	1,461,000	6,100,000
Colors in Japan	129	2,616,500	2,075,400	79.3	1,874,800	718,800	1,000,000
Other	223	48,630,500	37,831,100	77.8	24,511,200	12,604,400	9,800,000
1925, January-June	...	61,542,200	47,128,900	73.0	30,858,800	14,354,300	19,600,000
Colors in oil	234	12,399,500	8,747,500	70.5	8,694,400	1,714,800	5,900,000
Colors in Japan	119	2,809,800	2,317,800	82.5	2,273,100	795,900	1,300,000
Other	224	49,332,900	36,063,600	73.1	25,886,300	11,843,600	12,300,000
1925, July-December	326	79,830,700	56,107,700	70.3	42,622,300	18,639,600	20,800,000

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Ready-mixed and semipaste paints, including enamels—						
1926, July-December	...	Gallons	Gallons		Gallons	Gallons
Undercoating and primers...	245	45,623,000	36,920,500	81.1	36,683,700	14,132,300
Wall paints and mill whites.	331	3,873,400	3,449,800	89.1	3,410,400	2,178,200
Enamels, oil and varnish base	320	7,116,200	5,787,000	81.3	5,740,600	1,508,000
Other	412	7,929,200	6,488,700	81.8	6,399,900	2,923,700
1926, January-June	...	26,704,200	21,265,000	79.6	21,132,800	7,517,400
Undercoating and primers...	210	45,402,100	37,314,300	82.2	36,878,900	11,861,100
Wall paints and mill whites.	307	2,744,000	2,325,000	84.7	2,299,800	1,324,100
Enamels, oil and varnish base	269	7,393,100	6,149,300	83.2	6,166,300	1,409,300
Other	377	8,104,600	6,648,600	82.0	6,465,900	3,081,400
1925, July-December	450	27,160,400	22,191,400	81.7	21,946,900	6,046,200
Varnishes, japans, and lacquers, other than nitrocellulose—		47,260,300	36,351,000	76.9	34,744,900	11,487,200
1926, July-December	...	36,242,900	29,365,000	81.0	26,303,800	15,012,900
Oleoresinous varnishes and varnish stains	305	21,659,800	16,694,800	77.1	14,166,200	7,230,700
Shellac varnishes	130	2,547,200	2,293,500	90.3	2,274,900	1,165,200
Other varnishes	159	6,048,600	4,977,500	82.3	4,669,200	3,163,500
Drying japans and dryers...	225	2,797,300	2,342,800	83.7	2,213,700	1,203,200
Baking japans	106	3,189,500	3,050,600	95.6	2,979,800	2,250,300
1926, January-June	...	38,081,400	30,423,000	79.9	27,335,100	14,547,000
Oleoresinous varnishes and varnish stains	263	23,739,400	18,012,600	75.9	16,603,500	7,284,100
Shellac varnishes	148	1,765,800	1,614,500	91.4	1,587,900	558,500
Other varnishes	142	5,830,706	4,598,900	78.9	4,265,700	2,489,500
Drying japans and dryers...	191	3,152,000	2,776,000	88.1	2,519,600	1,369,000
Baking japans	94	3,593,500	3,421,000	95.2	3,358,400	2,845,900
1925, July-December	297	34,399,000	24,962,200	72.6	20,969,000	12,682,100
Nitrocellulose products—						
1926, July-December	...	12,843,600	12,059,200	93.9	11,247,500	7,565,300
Clear lacquers	117	3,244,200	2,763,900	84.9	2,546,500	1,730,500
Lacquer enamels	113	4,376,800	4,264,500	97.4	3,897,900	2,400,200
Thinners for nitrocellulose lacquers	106	4,327,100	4,185,700	96.7	3,869,700	2,553,600
Other	46	895,500	855,100	95.5	993,400	881,600

(Table 3 Continued on Page 14.)

Table 3, Cont'd.—Paint and Varnish Production and Sales,
of Products: 1926, First and Second Halves, and 1925, Second Half

(Nitrocellulose Products Continued.)	Number of Establish- ments ¹	Total Production Gallons	Production		Establishments Reporting Sales ²		
			Amount Gallons	% of Total	Total Gallons	Sales Industrial Gallons	Trade Sales and All Other Gallons
1926, January-June	...	10,136,800	9,639,800	95.1	8,842,300	5,654,500	1,846,800
Clear lacquers	92	2,512,000	2,329,200	92.7	2,076,000	1,247,400	440,600
Lacquer enamels	86	3,528,500	3,375,600	95.7	3,176,000	1,891,700	874,300
Thinners for nitrocellulose lacquers	80	3,378,200	3,262,600	96.5	2,054,900	2,155,900	445,000
Other	32	717,800	672,400	93.7	536,400	449,500	86,900
1925, July-December	85	6,223,200	5,836,700	93.8	5,634,900	4,628,800	671,100
Allied Products							
Paint and varnish removers—							
1926, July-December	126	413,100	376,300	91.1	393,900	60,800	294,100
January-June	102	361,200	320,100	88.6	471,500	74,100	379,400
Stains (not varnish stains)—							
1926, July-December	226	2,159,800	1,979,100	91.6	1,954,300	369,800	440,500
January-June	188	1,489,700	887,700	59.6	828,300	276,800	460,500
Liquid fillers—							
1926, July-December	173	376,900	333,400	88.5	331,100	102,000	169,100
January-June	152	422,200	372,800	88.3	366,500	199,000	163,500
Paste fillers—		Pounds	Pounds		Pounds	Pounds	Pounds
1926, July-December	282	7,515,900	6,802,000	90.5	6,593,800	4,626,000	1,469,800
January-June	203	6,566,400	5,906,400	90.0	5,616,900	3,970,500	1,485,400
Putty—							
1926, July-December	163	30,837,400	22,823,600	74.0	22,780,400	5,261,000	9,382,400
January-June	143	23,862,400	19,543,800	81.9	19,609,000	4,933,200	8,393,800

¹Total number reporting paints and varnishes: Second half, 1926—581; first half, 1926—549; second half, 1925—549.
²Sales to manufacturing establishments and builders, including shipbuilders, for use on the product manufactured, and sales to railroads, both steam and electric.

(For tables issued as part of these statistics see page 11 for Table 1; below for Table 2, and pages 12, 13 and 14 for Table 3.—Editor.)

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