Big Market Yet Open to Automobile Trade, Is Statistician Figures

BY FRED C. KELLY.

Everybody who drives an automobile, or has tried to find a vacant space in which to park one, and every pedestrian who is daily obliged to dodge automobiles, or to wait on the endless stream of them to pass so that he may cross a busy street—every one of these persons, or nearly everybody—must have asked himself at some time:

"What is going to happen when there are several times as many automobiles as there are now? How many automobiles are there going to be in this country, anyhow? Where are we going to put them all? Will city streets have to be built one on top of another? What will the situation be in ten or 15 years, if the present annual increase in the use of automobiles. About 9,000,000 are now in use, but there are something like 105,000,000 people in the United States, so that there are still many millions who do not own their own cars. How many of these 105,000,000 are eventually going to buy? Not nearly so many as might be expected. Indeed, it appears doubtful if there ever will be even twice as many cars in use as there are today. The point of saturation is probably only a few years ahead.

A thorough, painstaking investigation into the present and future status of the automobile industry has just been made by Leonard P. Ayres, vice president of the Cleveland Trust company and a recognized statistical expert. Many of Ayres' conclusions are rather startling. For example, he found that the capacity of the automobile factories in this country was more than 4,000,000 cars a year in excess of the present demand. If these factories were run at their full capacity for a few years they would soon supply every potential buyer in the United States. There would be so many automobiles in use that the gasoline supply would be inadequate, and some other kind of motive power would have to be developed.

It seems improbable that either the export or domestic markets can ever absorb the full capacity of the American automobile industry, and hence it is likely that we shall see extensive readjustments in prices, due to sharp competition and to the fact, also, that people's buying power all over the world has recently been much reduced.

Although the population of the country is about 105,000,000, the greatest number of possible automobile buyers, even by a liberal estimate, is less than 20,000,000. The figure of 20,000,000 is about the number of white American families. It is about the number, too, of persons whose occupations and earning power are such that they might buy automobiles. Not every man who has the price of an automobile will buy one. For example, there are fishermen, lumbermen, sailors, soldiers, lighthouse keepers and others who would have scant opportunity to drive a car after they get it. Almost anybody will agree that for a lighthouse keeper to invest his earnings in a high-powered touring car would be a downright extravagance. Then there are thousands of people living in cities whose earnings might permit them to keep automobiles if they were in a smaller place, where garage rents are less and also where there is less traffic. Highway congestion, so thick as to spoil the pleasure of automobiling, usually occurs where the garage costs are the highest.

12 Cars to Every 100 White Men.

Mr. Ayres finds that, at the end of 1920, there were about 12 cars in use for each 100 white men of voting age. In several states the entire population might crowd into the automobiles there registered and all go riding at once. Each car lasts, on the average, about six seasons. It may be resold once or twice within that time, but it runs six seasons before it is finally out of commission. From now on the better grade of cars will doubtless last much longer.

It seems altogether doubtful if the sale of the higher-priced cars will ever be much more than it is now. Since 1916, the increases in the annual output of automobiles have been largely accounted for by the mounting number of sales of Fords and other less expensive makes. Ayres believes that for several years new users of cars will be confined largely to people of limited means who will buy these less costly machines.

Let us take a look now at the Ayres method of arriving at conclusions. From here on I shall quote from all parts of his report of the results of his inquiry:

Fairly reliable figures for the registration of automobiles in each state are available, beginning with the year 1912. They have been compiled from year to year by automotive industries, the office of public roads and rural engineering, in the department of agriculture and other agencies. Where figures have been missing in the original records they have been supplied by using data based on those of neighboring states. Similar methods have been used where the data were based on three-year registrations, or perennial systems. The figures shown in Table 1 are in round thousands, because it was believed that greater detail would not increase their reliability. The data include both passenger and commercial cars, but not motorcycles, tractors or dealers' cars. Table two represents an attempt to give the essential data with regard to the production and use of automobiles since the beginning of the industry in this country. Its production figures have been taken from the reports of the census each five years beginning with 1899, supplemented by data for the intervening years compiled by the national chamber of commerce. In addition, the War Industries board reported official figures for the years 1917 and 1918.

After making allowance for imports and exports, it is found that the total number of new cars put into use in this country since the beginning has been 11,075,813. Since the number registered last year was somewhat in excess of 9,000,000, and the number in use at the end of the year undoubtedly rather about 2,000,000 cars have been eliminated. The next question is how these eliminations have been distributed. Now, registration can only consist of two kinds of cars—new ones made during the year, and old ones carried over from the previous year. Since this is true, less than that number, it follows that the carryover can always be found by substracting the new cars registered in 1920 were more from the total registration. The than 9,000,000. Since about 2,000,000 were new cars made in that year, the carryover from 1919 was about 7,000,000. But the registration in 1919 was about 7,500,000, so that the elimination in that year was in the neighborhood of 500,000. The actual figure given is 446,819.

Some cars, of course, are destroyed almost as soon as they are put into service, while others, that were first registered ten years or more ago, are still running; but the outstanding fact about the registration figures is that they have been for the past nine years about equal each year to the sum of the cars produced in that year and the five previous years. This means that the average length of life of the cars has been about six registrations. The fact that some individual cars have much longer or much shorter terms of use does not alter the inference about the average term of use.

There is available additional evidence tending to substantiate the proposition that the average length of service of automobiles is about six registrations, which is equal to something more than five full years. For example, the report of the postmaster general for 1916 indicates that the depreciation of cars in the postal service has been at the average rate of 22.9 per cent per year. The annual reports of the statistics of express companies, published by the interstate commerce commission, show substantially the same depreciation. These cars receive exceptionally hard usage.

How Many Cars Can Be Used?

Such figures as these bring to mind the question of the limits of the ability of the country to purchase and use cars. Estimates regarding this limit of using capacity of the country have varied enormously. On the one hand, as already suggested, states, such as South Dakota, Iowa, Nebraska, Kansas and California, are so well supplied with automobiles that the entire population could probably go riding simultaneously. On the other hand, it may be argued that with only about 9,000,000 motor vehicles in use, in a country of more than 105,000,000 people, great possible markets still exist.

This last suggestion is worthy of more detailed consideration and perhaps the most enlightening way to approach it is through studying the composition of the population with reference to its probable purchasing power for automobiles. Unfortunately the census data for 1920 are not yet available, but those of 1910 give us a fairly reliable basis for discovering the proportions of the whole population found in certain great groups.

The number of persons in the entire population for each car in use in 1912, 1916 and 1920 is shown in the following table:

People Per Car in Use.

Division.	1912	1916	1920.
New England	76	28	13
Middle Atlantic	109	36	16
East No. Central	94	25	10
West No. Central	84	18	9
South Atlantic	473	89	27
East So. Central	473	89	27
West So. Central	262	38	14
Mountain	144	27	10
Pacific	57	17	7
United States	114	30	12

These figures impressively illustrate the great rapidity with which the automobile has been adopted by the American people. So short a time ago as in 1912 there were 114 people for each car in use, while eight years later there was one car for each 12 people. The table that exists between the several divisions of the country with respect to the use of motor cars. The extremes are found in the states of the Pacific division, with one car for every seven persons, and those of the East South Central division, with one car for each 27 persons.

Here are figures showing the percentage of the population found at the previous census period in each of three age groups and five racially groups.

Group.	Under 21.	From 21 to 65.	Over 65.	Total
Native-born white males	18	18	1	37
Native-born white females	18	17	1	36
Foreign-born white males	1	7	1	9
Foreign-born white females	1	5	1	7
Colored	6	5		11
Total	44	52	4	100

The table shows that great deductions must be made from the total population of the country as soon as we begin the attempt to estimate the possible purchasers of automobiles. To begin with, some 44 out of each 100 are less than 21 years of age, while 4 in each 100 are over 65 years of age. This leaves 52 per cent of the people from whom most of the purchasers must clearly come. Seventeen of these 52 are immigrants and colored people. While there are in the aggregate many motor owners in these groups, a very large number, among them, it seems entirely probable, that persons who do not already own cars will be able to purchase them during the next few years.

The remaining possible purchasers are the remaining 35 per cent consisting of the native born white men and women between the ages of 21 and 65. About half of them are women who are, in the main, the wives of the men. It seems to be a fair conclusion that the purchasers of automobiles will in their overwhelming majority come from the 35 per cent of the population who are native white men between the ages of 21 and 65. Since the population consists of some 105,000,000 people, this group comprises about 19,000,000. Probably about half of them already own cars. This seems to be a safe conclusion, even after the allowance has been made for the ownership of more than one car by one individual and the ownership of trucks and passenger cars by corporations.

Those Who Can Afford Autos.

Computations have been made to discover the number of cars in use each year in each division of the country for every 100 native white men above the age of 21, for it is believed that this is a safer basis for estimating possible future automobile markets than most of the figures that have been used. These computations are based on the data that have already been reviewed, except that all native white men over 21 have been included, instead of only those between the ages of 21 and 65. The group used includes all native white men of voting age, and the approximate number of them in each geographical division has been computed. The results are presented in the following table:

Cars in use for each 100 native white voting age.

Division	1917	1919	1920
New England	29	42	
North Atlantic	35	54	
East North Central	39	4	
West North Central	35	57	
South Atlantic	19	37	
East South Central	13	25	
West South Central	17	28	
Mountain	29	45	
Pacific	41	60	
United States	31	4	

The important fact revealed by these figures is that the number of potential purchasers in this country who are still unsupplied with cars is much smaller than had generally been supposed. Another significant fact is that the method for computing the possible limits of the domestic market leads to results that vary much less between the different sections of the country than do the figures based merely on the relationship between the number of people and the cars in use. Now, if we wish to make a passenger automobile that will sell in every section of the country, we must make it so that it will be possible for people in the less favored sections to buy it. Perhaps a large proportion of the people coming after the cars will be able to pay the cash for them, but many will need to buy them on the time payment plan, and for this reason a large proportion of the purchasers will be able to buy only the cheaper cars. The Wealth and Income of the People of the United States. These figures are now necessarily out of date, and do not represent present conditions. Within a few months a new series of carefully compiled estimates will be published by the National Bureau of Economic Research in New York City. The new figures will show that the old days when a few men made large profits from the income realized on less than $1,000 a year.

It is sometimes suggested that the number of cars in use may actually decrease now that the abnormal wages of the war period are past. Mr. Ayres believes it improbable that anything short of a prolonged era of serious business depression can force many people who now have cars to give them up. He asked many people in different walks of life under what conditions they would sell their machines and he estimate them. The replies were uniformly to the effect that only prolonged adversity of a severe sort would force such a sacrifice. It seems plain that after people have become accustomed to using automobiles they will not give them up unless virtually forced to do so.

The productive capacity of the automobile industry in this country has been stated to be 2,500,000 a year at the close of 1920. This figure is probably accurate. Six cars produced in 1920 were about 2,250,000, with curtailed operations prevailing in the last three or four months. As new plants have been completed the country's present annual capacity is somewhat greater and may be in the neighborhood of 2,750,000. It should apparently lie somewhere between 2,500,000 and 3,000,000.

If all these plants should produce as at their full capacity and if the cars should last on the average long enough to be replaced during six years, the annual registration would need to be from 15,000,000 to 18,000,000.

If improved construction, more efficient use and better roads should increase the average term of service of the cars to eight years instead of six, the number to use would have to be about 17,000,000 to 18,000,000 to take care of the production. This would mean that the number of cars in use would have to be twice as great as it is now. The use in the near future of anything like twice the present number of motor vehicles seems most unlikely. It is probably true at present that not far from half the white American families already have them, and this half includes practically all the wealthy, the comfortably well-to-do, and a large number who can barely afford to purchase and run their cars. The families and the businesses that have not yet become users of motor cars are largely those who so far have been unable to afford them, and it seems quite unreasonable to suppose that the poorer half of American families and firms will purchase motor cars with anything like the ease and rapidity that has marked their acceptance by their wealthier neighbors. Another consideration of no small importance, as already mentioned, is that if the number of automobiles should be doubled in the near future, some other motive power than gasoline would probably have to be developed to propel them.

The area, it appears to be, then, that competition between these manufacturing establishments will be sharper than ever, and prices of automobiles will be lower.

Two Bean Pods on One Stem.

COLUMBUS, Ohio, Sept. 3.—"My yard is full of them," declared Thomas J. Riley, local resident, as he displayed two bean pods on one stem. One pod was 14 1-4 inches long and the other 13 3-4 inches in length. And Mr. Riley does not claim to be a champion bean raiser.

Curfew Rings in Missouri.

Mexico City, Mo., Sept. 3.—"The curfew tolls the knell of parting day." It also tolls the knell of "parting ways." Nine o'clock now is the limit for small boys on the streets here. When the curfew rings, those under 18 years old must be missing from the thoroughfares.

He Quit.

Operator, at telephone picnic—"I hear your husband is giving up smoking in spite of his age. Doesn't that require a strong will?"

Mrs. Cable-splicing Foreman—"Yes, child, but I have one."

TABLE 1. THOUSANDS OF MOTOR CARS REGISTERED IN EACH STATE AND IN THE GEOGRAPHIC DIVISIONS EACH YEAR FROM 1912 TO 1920.

	1912	1913	1914	1915	1916	1917	1918	1919	1920
Maine	8	11	16	22	31	41	49	53	63
New Hampshire	6	7	10	13	18	26	25	32	35
Vermont	4	5	8	11	18	18	22	27	32
Massachusetts	59	64	71	108	137	154	192	247	302
Rhode Island	9	10	12	18	31	37	36	45	50
Connecticut	24	27	31	44	62	86	92	110	132
New England	101	124	156	209	285	330	409	514	604
New York	167	174	179	274	318	412	464	532	609
New Jersey	41	45	60	78	104	125	156	187	228
Pennsylvania	59	70	104	120	231	335	394	446	610
Middle Atlantic	209	259	343	472	653	872	1,014	1,245	1,467
Ohio	63	86	95	151	252	347	413	511	615
Indiana	34	47	65	97	133	192	227	277	315
Illinois	68	93	131	181	249	316	356	478	549
Michigan	49	61	76	115	146	247	262	326	413
Wisconsin	39	52	52	80	116	156	197	257	293
East No. Central	239	317	419	654	915	1,292	1,489	1,829	2,223
Minnesota	29	38	65	93	118	163	145	195	224
Iowa	42	75	112	152	193	254	278	364	437
Missouri	24	36	51	76	104	149	198	314	293
North Dakota	9	13	15	25	30	32	32	43	51
South Dakota	11	16	21	29	40	47	57	76	100
Nebraska	18	26	41	69	101	144	175	192	212
Kansas	22	34	49	73	112	159	179	228	285
West No. Central	161	239	361	507	738	1,002	1,158	1,411	1,657
Delaware	2	2	3	5	7	11	12	16	18
Maryland	19	14	25	31	44	61	75	96	112
Dist. of Columbia	2	2	3	8	13	15	19	23	40
Virginia	5	9	14	21	35	55	71	94	134
West Virginia	3	3	6	11	21	24	29	50	79
North Carolina	8	10	15	21	34	58	72	108	141
South Carolina	10	12	15	15	19	40	55	70	93
Georgia	10	19	21	26	48	70	100	122	144
Florida	2	2	3	3	5	8	14	20	31
So. Atlantic	62	75	102	151	242	366	510	652	853
Kentucky	5	7	12	20	32	47	66	81	115
Tennessee	5	12	20	25	39	48	63	80	102
Alabama	3	5	8	11	22	32	46	59	75
Mississippi	3	3	6	10	22	27	48	65	61
East So. Central	20	27	46	67	109	165	223	285	353
Arkansas	2	3	6	8	15	26	41	49	63
Louisiana	7	7	12	11	17	28	40	51	66
Oklahoma	7	8	14	25	32	106	122	145	204
Texas	35	54	65	138	198	210	251	333	424
West So. Central	51	72	97	182	283	370	454	578	757
Montana	7	6	10	14	24	42	51	59	61
Idaho	2	2	3	7	13	26	32	42	51
Wyoming	1	2	2	4	7	13	16	21	24
Colorado	9	13	18	28	42	67	84	105	129
New Mexico	1	1	3	5	8	12	15	18	22
Arizona	2	3	5	7	13	20	24	29	35
Utah	3	4	7	9	14	24	32	35	43
Nevada	1	1	1	1	3	7	7	9	10
Mountain	21	33	49	76	126	207	262	328	375
Washington	14	24	29	41	61	91	117	149	174
Oregon	10	14	16	24	34	45	62	81	104
California	65	105	124	164	252	327	366	477	569
Pacific	89	143	170	237	347	417	545	709	847
United States	914	1,287	1,723	2,545	3,678	5,101	6,064	7,539	9,118

TABLE 2—PRODUCTION AND USE OF AUTOMOBILES IN THE UNITED STATES SINCE THE BEGINNING OF THE INDUSTRY.

Year.	Electric Vehicles Produced.	Steam Vehicles Produced.	Gasoline Vehicles Produced.	Total Vehicles Produced.	Electric Vehicles Imported.	Steam Vehicles Imported.	Gasoline Vehicles Imported.	Total Vehicles Imported.	Electric Vehicles Exported.	Steam Vehicles Exported.	Gasoline Vehicles Exported.	Total Vehicles Exported.	Electric Vehicles Net Added to Use.	Steam Vehicles Net Added to Use.	Gasoline Vehicles Net Added to Use.	Total Vehicles Net Added to Use.
1895	....	....	300	300	....	....	....	....	....	....	....	....	....	....	300	300
1896	100	....	800	900	....	....	....	....	....	....	....	....	....	....	900	900
1897	930	....	1200	....	....	....	1200	1200	....	....	....	....	....	....	2100	2100
1898	2100	....	2400	4500	100	....	2700	2800	....	....	....	....	....	....	4600	4600
1899	4600	....	3874	8474	150	....	4524	4674	....	....	....	....	....	....	8674	8674
1900	9674	....	5600	15274	200	....	5700	5900	....	....	....	....	....	....	15174	15174
1901	15274	....	7000	22274	250	184	7005	7439	....	....	....	....	....	....	22524	22524
1902	19999	....	9000	28999	300	535	8746	9581	....	....	....	....	1299	....	27599	28898
1903	27555	168	10292	38015	350	872	10524	11746	....	....	....	....	2500	....	35183	37683
1904	35183	1000	14420	49603	400	948	12224	13572	....	....	....	....	4024	....	52180	56204
1905	52180	1800	22305	75485	450	1148	24148	25746	....	....	....	....	7278	....	73757	81035
1906	73757	1339	32491	107587	1295	1165	34140	36600	....	....	....	....	7866	....	99852	107718
1907	99852	8421	43577	143429	1694	2894	42199	46787	....	....	....	....	8765	....	134756	143521
1908	127296	6291	58607	192194	1847	2164	64147	68158	....	....	....	....	10528	....	186861	197389
1909	186861	10697	106848	304406	1848	4496	125246	131590	....	....	....	....	22281	....	288918	311199
1910	288876	19664	168236	476776	1674	8443	175583	185700	....	....	....	....	28148	....	444249	472397
1911	444249	25352	213472	683073	2172	11397	245162	258731	....	....	....	....	33654	....	649267	682921
1912	648852	28446	238509	915807	2520	13726	336148	352394	....	....	....	....	116603	....	1048213	1164816
1913	928297	168220	31670	1128187	492	26889	458882	486263	....	....	....	....	61570	....	1225918	1287488
1914	1225918	244357	324723	1795998	1629	35430	1594198	1631257	....	....	....	....	56443	....	1776113	1832556
1915	1776113	362313	44403	2182829	221	57928	2243441	2301590	....	....	....	....	171196	....	2372904	2544100
1916	2172904	523874	1058844	3755622	1629	85450	3594198	3681277	....	....	....	....	357390	....	5349424	5706814
1917	2512214	733216	1519631	[illegible]	74	89238	3788796	3878108	....	....	....	....	81139	....	5831743	5912882
1918	3012741	795531	447053	4255325	73	109491	3144219	3253783	....	....	....	....	263009	....	1744994	2008003
1919	4744991	730954	1985492	7461437	117	83464	1784969	1868550	....	....	....	....	446019	....	7015908	7461927
1920	7895990	1027817	1177526	10101333	108	140247	2635018	2775373	....	....	....	....	[illegible]	....	[illegible]	[illegible]

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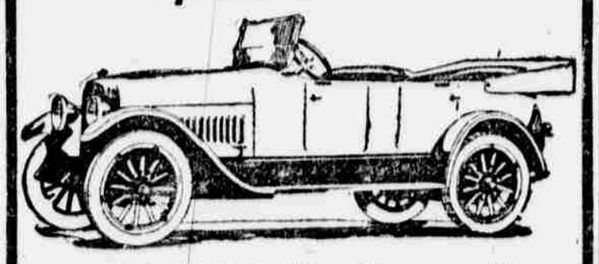

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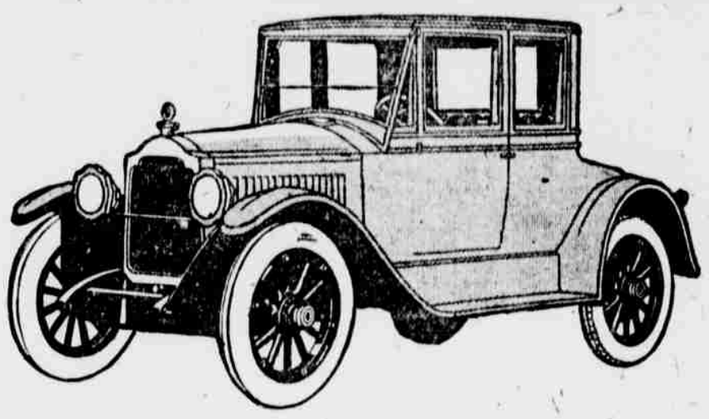

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