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HIGHWAY ACCIDENTS IN THE CITY OF NEW YORK.*

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For many years past the mortality resulting from accidents in the City has attracted the attention of the Department of Health, and while the prevention of this cause of death does not fall within the province of this department, it has been felt, nevertheless, that since the department is charged with guarding the health and lives of the residents of and visitors to the City it is but logical that it should be interested in such a numerically important cause of death; and since the death toll of highway accidents has been on the increase this group presents itself as our first point of attack.

The following table gives the deaths resulting from street accidents segregated according to the character of the vehicle and the death rates per 100,000:

TABLE I.

Deaths and Death Rates from Street Accidents in the City of New York.

Year.	Horse-Drawn Vehicles.	Rate Per 100,000.	Cars (Horse, Trolley, and Cable).	Rate Per 100,000.	Auto-mobiles.	Rate Per 100,000.
1898.....	88	2.69	113	3.45	..	....
1899.....	103	3.07	167	4.97	1	0.03
1900.....	105	3.04	181	5.25	5	0.14
1901.....	106	2.93	185	5.25	6	0.17
1902.....	156	4.26	175	4.77	9	0.24
1903.....	184	4.87	180	4.76	12	0.32
1904.....	192	4.92	167	4.28	14	0.36
1905.....	176	4.37	212	5.26	36	0.89
1906.....	223	5.35	252	6.05	64	1.53
1907.....	236	5.47	318	7.37	42	0.97
1908.....	158	3.53	257	5.75	81	1.81
1909.....	161	3.47	186	4.01	84	1.81
1910.....	169	3.52	168	3.50	111	2.31
1911.....	271	5.50	124	2.51	128	2.60
1912.....	194	3.83	111	2.19	188	3.71
1913.....	186	3.58	130	2.50	293	5.64
1914.....	168	3.15	121	2.27	310	5.81
1915.....	119	2.18	85	1.55	346	6.33
1916.....	144	2.57	110	1.96	407	7.26
1917.....	119	2.07	159	2.77	525	9.15

The death rate resulting from accidents caused by wagons increased from 1898 to 1907, when the mortality rose to 5.47 per 100,000. After that, while the rate of deaths caused by wagons fell steadily, there was a compensating increase in the death rate of automobile accidents, which in 1917 rose to 9.15. The reduction, therefore, in the mortality of accidents resulting from horse-drawn vehicles has been caused by a diminution of the number of this class of vehicles operated. On the other hand, while the mortality of street-car accidents rose steadily until 1907, it steadily decreased from

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that time until 1915. In 1916 there was a slight increase and in 1917 a still further increase, due probably to the construction work in connection with the new subways being carried forward on many of the important streets and avenues.

TABLE II.

Deaths and Death Rates from Street Accidents, Borough of Manhattan.

Year.	Wagons, Trucks, Etc.	Rate Per 100,000.	Cars (Horse, Trolley, and Cable).	Rate Per 100,000.	Auto-mobiles.	Rate Per 100,000.
1898.....	65	3.59	60	3.31	..	....
1899.....	80	4.37	87	4.75	1	0.05
1900.....	79	4.26	81	4.37	5	0.27
1901.....	80	4.20	102	5.36	6	0.31
1902.....	123	6.29	93	4.76	7	0.36
1903.....	142	7.07	81	4.04	8	0.40
1904.....	148	7.18	75	3.64	8	0.39
1905.....	132	6.24	83	3.92	22	1.04
1906.....	157	7.27	83	3.84	27	1.25
1907.....	163	7.40	136	6.17	23	1.04
1908.....	108	4.80	135	6.00	51	2.27
1909.....	102	4.44	98	4.27	54	2.35
1910.....	110	4.70	77	3.29	63	2.69
1911.....	174	7.28	65	2.72	77	3.22
1912.....	109	4.47	55	2.25	120	4.92
1913.....	121	4.86	51	2.05	173	6.95
1914.....	107	4.22	56	2.21	168	6.62
1915.....	78	3.02	37	1.43	202	7.81
1916.....	95	3.61	50	1.90	217	8.24
1917.....	68	2.53	76	2.83	275	10.25

Table II gives similar data for the Borough of Manhattan alone and the results correspond very closely with those found in the first table which dealt with the statistics of the City as a whole. The mortality from accidents caused by horse-drawn vehicles rose steadily until 1907, from that year on decreased. On the other hand, the automobile accidents increased steadily since they first made their appearance on the streets. The mortality from street-car accidents increased until 1907 and thereafter decreased until 1916, since when there has been a small increase due to the construction of the new subways, which has blocked many streets and added the congestion of others. We may conclude, therefore, that an actual decrease in the number of deaths caused by street-car accidents has been accomplished through more careful operation and the use of safety devices. We may further conclude that while there has been a decrease in the deaths caused by horse-drawn vehicles it is to be accounted for by the substitution of motor vehicles for horse-drawn vehicles, rather than by more careful operation.

Since there has been an increase in the number of automobile accidents and also in the rate per 100,000 of population, it is only fair to inquire whether the increase has been due to increased negligence or to the increase in the number of vehicles operated. The next tabulation shows conclusively that in proportion to the number of automobiles operated the deaths caused by them have steadily decreased since 1908.

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TABLE III.

Number of Deaths Caused by Automobiles in New York City and the Number of Cars Licensed in New York State and the Ratio of Deaths to Cars Licensed.*

Year.	Number of Automobiles in State.	Number of Deaths in City.	Rate of Deaths to Automobiles Per 1,000.
1898	....	....	....
1899	....	1	....
1900	....	5	....
1901	954	6	6.29
1902	1,082	9	8.32
1903	6,412	12	1.87
1904	6,799	14	2.06
1905	8,625	36	4.20
1906	11,753	64	5.45
1907	13,985	42	3.00
1908	15,480	81	5.23
1909	24,059	84	3.49
1910	62,655	111	1.77
1911	83,969	128	1.52
1912	105,749	188	1.78
1913	132,220	293	2.22
1914	170,171	310	1.82
1915	234,032	346	1.54
1916	317,866	407	1.28
1917	411,567	525	1.27

* Secretary of State is unable to state the number of automobiles licensed in New York City.

In 1908 the ratio of deaths caused by automobiles to the number of automobiles licensed in the State was 5.23 per 1,000. In 1917, the rate was 1.27 per 1,000 cars licensed. In other words, had the ratio of 1908 prevailed in 1917 over 2,100 persons would have been killed by automobiles instead of 525, and if we assume that the ratio of deaths to accidents remains fairly constant year after year, about 50,000 persons would have been injured instead of 10,000. There has, therefore, been a real saving of life and suffering accomplished by the traffic regulations enforced by the Police Department. But notwithstanding the efforts of that department the yearly toll in persons injured and killed by motor vehicles remains so large that the most active measures to reduce this needless suffering and waste of human life are called for.

It must be remembered, when studying street accidents in New York, that in no other city in the world do the same conditions of traffic exist as exist in New York and more particularly in the Borough of Manhattan, for the reason that in no other city in the world is there the extreme congestion of population during the business day as there is in New York. In no other city are there to be found the immense business skyscrapers, the huge hotels, colossal department stores, the multitude of theatres.

The Police Department in its 1915 report segregated street accidents into those that were the fault of the injured person and those that were the fault of the driver, and it is particularly worthy of note that 8,661 accidents resulted from carelessness or incapacity of the injured person, while but 700 accidents were caused directly through the fault of drivers, and 851 were caused by defects of vehicles and skidding. If the latter groups are also charged to drivers of vehicles, since they are responsible for

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the condition of their vehicles and are forbidden by law to drive and operate defective vehicles upon the highways, the total number of accidents chargeable to drivers is still less than one-fifth of the number chargeable to carelessness of pedestrians. This very pertinent fact suggests that the next step in traffic regulations is the regulations of foot traffic. The police report further shows approximately one-third of the accidents chargeable to the carelessness of pedestrians result from their crossing streets elsewhere than at the crossings, and it would therefore seem that an ordinance prohibiting pedestrians crossing streets save at crossings and crossing streets other than in accordance with the signals of the traffic officer stationed at the crossings should be immediately passed and vigorously enforced. The next most frequent accidents were those resulting from passengers improperly boarding and alighting from vehicles. The

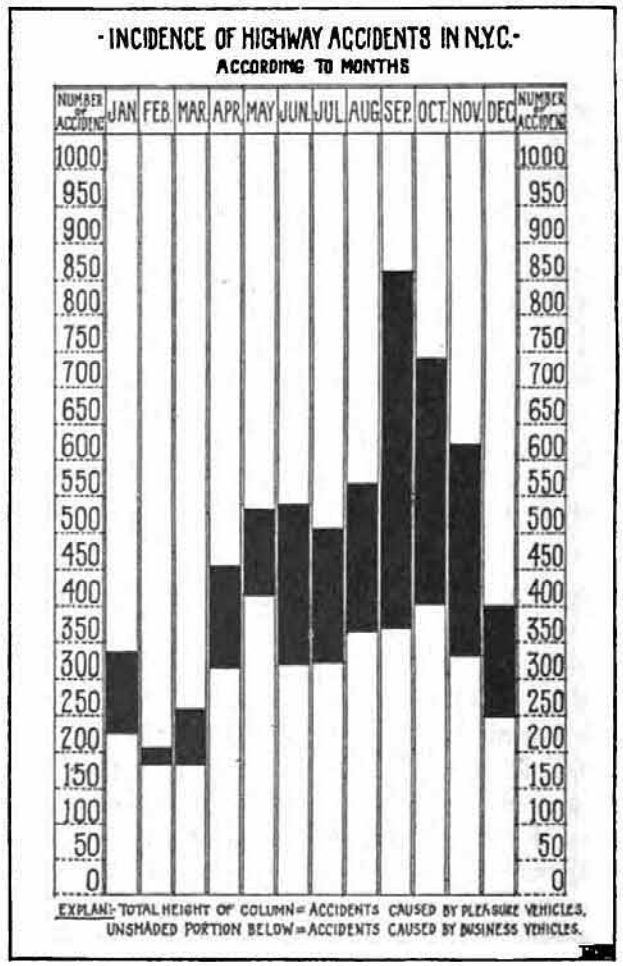

FIG. 1.—Incidence of highway accidents in New York according to months.

universal adoption of safety doors that cannot be opened until the car has been brought to a stop should eliminate these accidents as far as street railway cars are concerned. Next in order of frequency of accidents chargeable to the carelessness of pedestrians were those resulting from children playing in the streets. This source of injury can only be eliminated by supplying adequate playgrounds for the children of the City.

Accidents chargeable to the drivers of vehicles can be eliminated or certainly greatly reduced by vigorous and impartial enforcement of the traffic regulations. If drivers of vehicles are made to understand that they are granted the privilege of using the streets of the City upon the condition that they drive or operate their vehicles so as to avoid accidents and that if they do not exercise great care in the operation of their vehicles they will be summarily and severely punished and that the second offense

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will cause the revocation of their licenses, there is no question but that accidents from this source can be reduced to the minimum.

The chart (Fig. 1), which is based upon the data published in the 1916 report of the Police Department, and which shows the incidence of the accidents caused by business and pleasure vehicles during each month of the year, indicates that the number of vehicles operated in the streets is a most important factor in determining the number of accidents. During the winter months, the number of cars are few and the accidents are correspondingly few. As the spring advances the number of cars and the number of accidents increase. The great increase in the number of accidents in Sep-

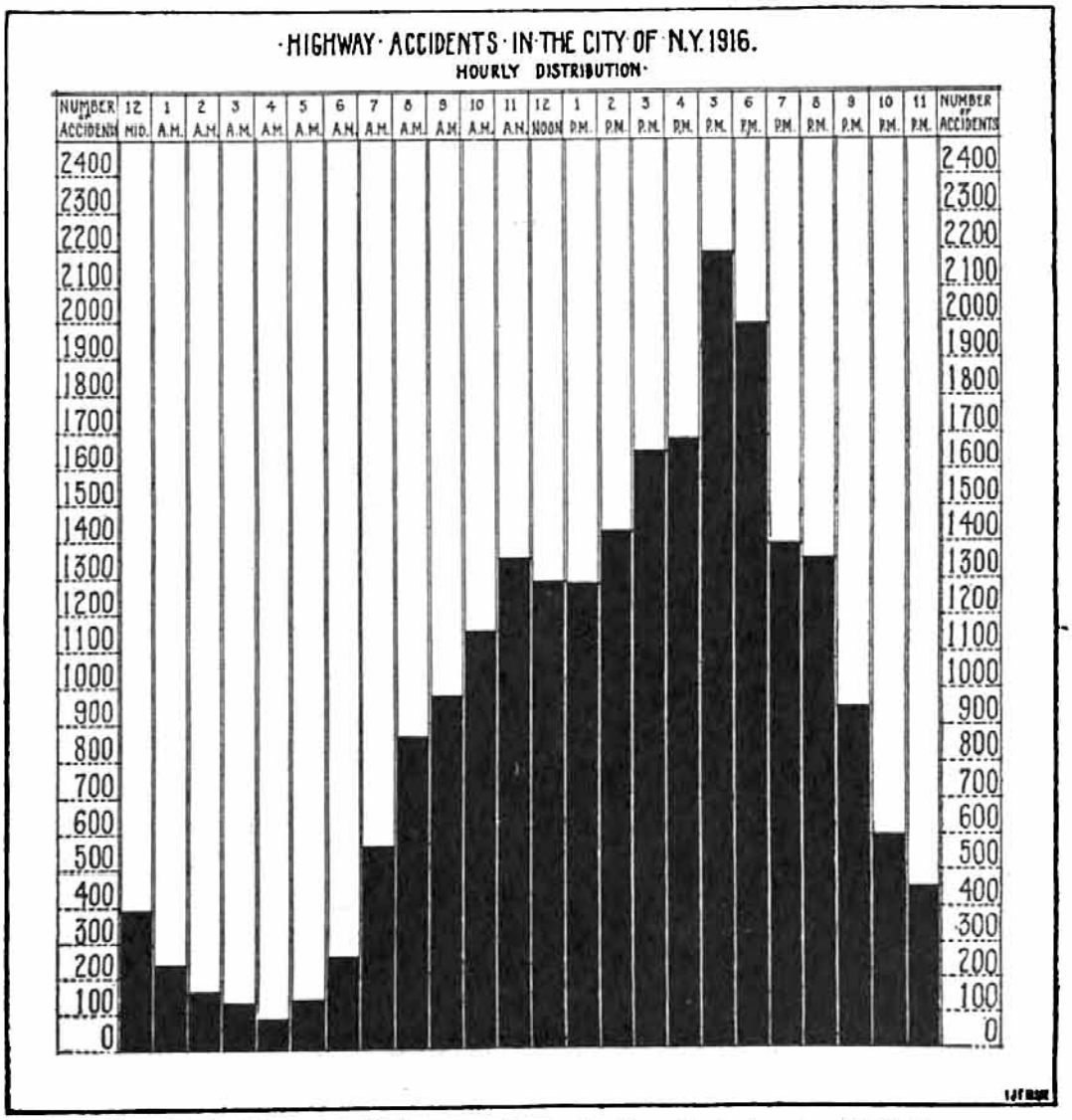

FIG. 2.—Incidence of highway accidents in New York, hourly distribution.

tember indicates, not only the return of many cars to the City, but that the drivers absent from the City during the summer months, become accustomed to country driving and are, therefore, more apt to meet with accidents in the congested traffic of the City.

The next chart (Fig. 2), which is also based upon data published in the 1916 report of the Police Department, shows the relative frequency of street accidents during every hour of the day and night. This chart confirms the evident fact that the degree of congestion determines the frequency of the accidents. The number of accidents increases from the hour beginning 4 a. m. to the hour beginning 11 a. m.;

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TABLE IV.

Deaths Caused by Surface Cars, Automobiles, and Horse Drawn Vehicles (1914-1917, Inclusive), Death Rate per 10,000 Estimated Population at Different Age Groups, Average for Three Years, City of New York.

Year.	Total All Ages.		Total Under																				55 Yrs. and Over	
			Under 1 Yr.		1 to 2 Yrs.		2 to 3 Yrs.		3 to 4 Yrs.		4 to 5 Yrs.		5 Yrs.		5 to 9 Yrs.		10 to 14 Yrs.		15 to 24 Yrs.		25 to 54 Yrs.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
1914	483	113	3	..	7	2	11	7	14	5	22	5	57	19	110	27	56	9	47	6	145	23	68	29
1915	435	120	...	...	3	1	11	3	13	12	20	7	47	23	93	21	59	9	35	11	148	28	53	28
1916	522	130	1	3	3	2	3	3	12	15	14	5	33	28	120	27	47	6	54	9	183	39	85	21
Three years total	1,440	363	4	3	13	5	25	13	39	32	56	17	1.37	70	323	75	162	24	136	26	476	90	206	78
Average	480	121	1	1	4	2	8	4	13	11	19	6	46	23	108	25	54	8	45	9	159	30	69	26
Rate on average	1.76	.44	.02	.02	.07	.03	1.40	.71	2.28	1.97	3.42	1.10	1.57	.80	4.29	.99	2.23	.33	.84	.15	1.31	.26	3.60	1.22
1917	594	188	...	...	1	4	4	8	16	9	23	9	44	30	152	47	51	10	45	14	200	40	102	47
Rate	2.07	.65	...	...	.02	.06	.66	1.35	2.68	1.54	3.94	1.58	1.42	.99	5.76	1.78	2.02	.39	.80	.22	1.57	.33	5.08	2.11

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from 12 noon until 2 p. m. the accidents decrease; from 2 p. m. to 6 p. m. they increase very rapidly. Coincident with the dismissal of children from school in the afternoon, the frequency of accidents increases, but the greatest increase is during the hour from 5 to 6 p. m., due to the congestion of the streets by persons hurrying home from business and shopping. During the hour from 6 to 7 p. m. the frequency of accidents is second only to the frequency between 5 and 6 p. m. Between 7 and 8 p. m. the number of accidents drops almost one-third and thereafter there is a gradual decline in the number of accidents until 5 a. m.

Based upon the number of highway accidents in the City as published in the 1916 report of the Police Department, the accident rates for males is almost three times as high as for females, the respective rates being 64.9 and 22.5 per 10,000 of the estimated number of males and females living in the City. The rate for children under six years of age was 28.8 per 10,000 of the children at this age. This rate, however, is misleading for the reason that it is based upon a population which includes all the children from the moment of birth to six years of age and it is evident that few children under two years of age are exposed to highway accidents, therefore their inclusion reduces the rate for children between two and six. A rate for the latter group would probably be higher than for any other age group. Between six and fifteen years of age, inclusive, the rate rose to 33.4 per 10,000; between the ages of sixteen and forty-nine years, inclusive, the rate was 41.5 per 10,000, and after the fiftieth year the rate was 59.7 per 10,000. It is to be regretted that the Police Department did not in their tabulation segregate the accidents of each sex by ages, as it is impossible from the present tabulation to tell at which ages the accident rate is greater for males than females. The tabulation (Table IV) of the deaths, compiled in this office, however, indicates that shortly after children commence to walk and consequently play upon the streets, their liability to highway accidents commences; for a short period the rate increases for both male and female alike and then the rate for males rises rapidly, whereas, the rate for females remains stationary. The cause of this interesting phenomenon is that as boys reach the age of four and five they indulge in the more active sports that necessitate the use of the streets; also they are less cautious and are prone to steal rides on wagons and cars, whereas girls are more cautious and naturally take to the less active forms of amusement.

CONCLUSIONS.

1. The number of accidents in New York caused by horse-drawn vehicles has decreased since 1907. The decrease has been accompanied by an increase in the number of accidents caused by automobiles.

2. The number of accidents in New York caused by automobiles has increased, but the ratio of automobile accidents to automobiles operated has very markedly and very steadily decreased since 1908.

3. The increase in pedestrian traffic in certain districts of the City, business, theatre and shopping, has been a most important factor in causing the increase in highway accidents. It is quite clear that, as the congestion in these districts increases, additional measures for the prevention of accidents must be instituted, because, while the present traffic regulations are the best that can be devised under present conditions they increase to a very great extent the conditions they seek to overcome; in other words, the necessity of shutting off north and south bound traffic to permit east and west bound traffic to pass increases congestion on the avenue, which is still further augmented because traffic is not stopped and started at all the streets crossing the avenue at the same time.

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RECOMMENDATIONS.

1. More stringent enforcement of the traffic regulation and the vigorous prosecution of reckless drivers.

2. Amendment to the present traffic regulations forbidding pedestrians to cross streets elsewhere than at the crossings and to cross streets, except in accordance with the signals of the traffic officers stationed at the crossings.

3. Provision of more public parks in the congested areas of the City. The closing of certain streets or portions of streets to vehicular traffic has partly met this problem.

4. The above recommendations are but palliative and in order to permanently improve traffic conditions, to prevent the immense yearly toll of traffic accidents in injury and death, to increase efficiency and comfort of travel in the City streets, more radical measures must be adopted, such as the old suggestion of sinking the cross streets below the level of the avenues in congested districts; the building of at least one subway in Manhattan for north and south bound traffic, this subway to be reserved for traffic between distant points by having entrances and exits not less than ten blocks apart.

Some time ago the Police Commissioner suggested a viaduct or elevated roadway for north and south bound traffic. While it would be less expensive than a subway, it would create greater opposition upon the part of owners of property fronting on the avenue upon which such a viaduct might be built, as it is generally conceded that elevated structures have depreciated property values on every avenue or street on which they have been erected. Until some such radical methods of handling traffic in congested districts are adopted, traffic accidents, other than those due to speeding and reckless driving, cannot be eliminated.

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