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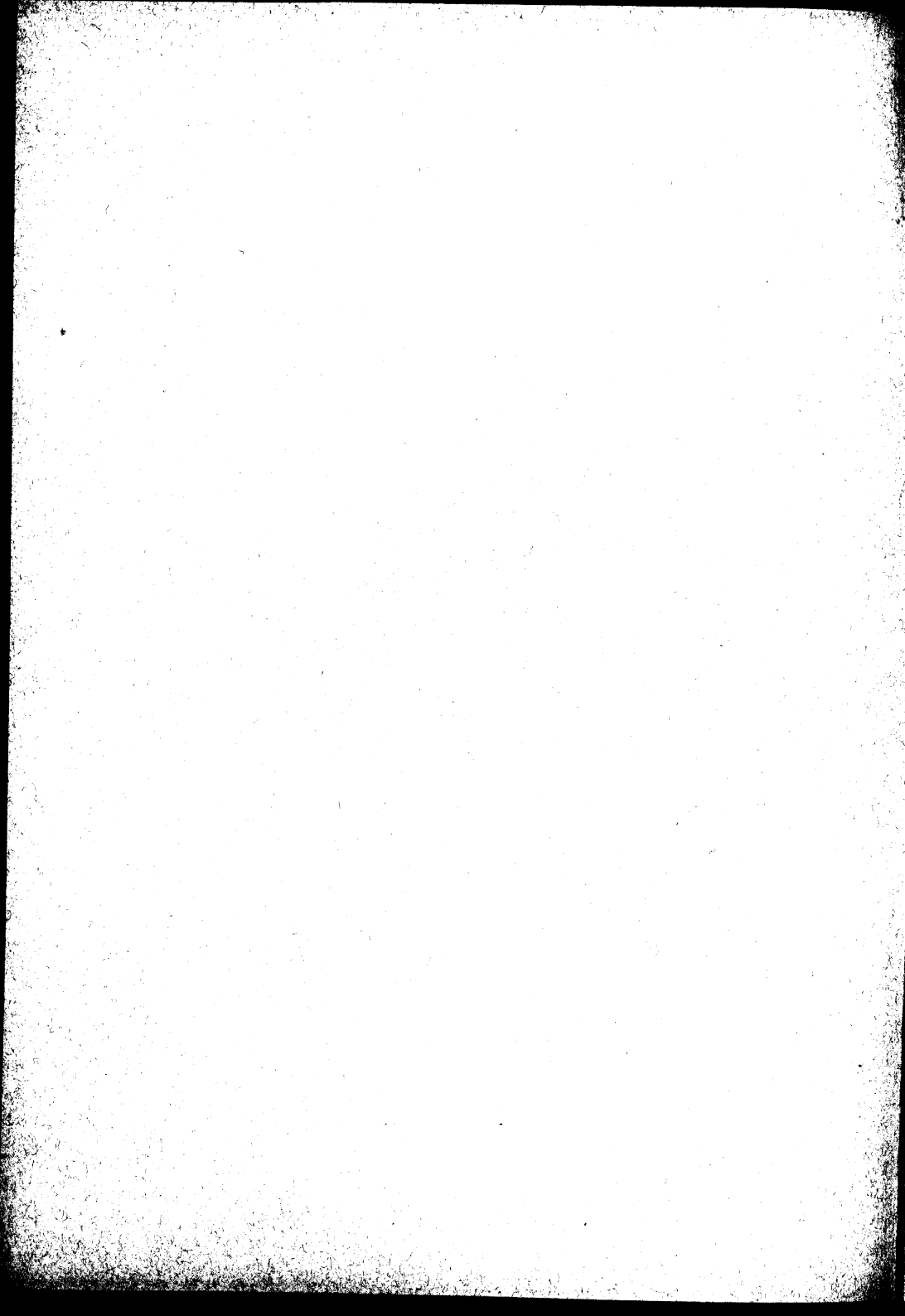
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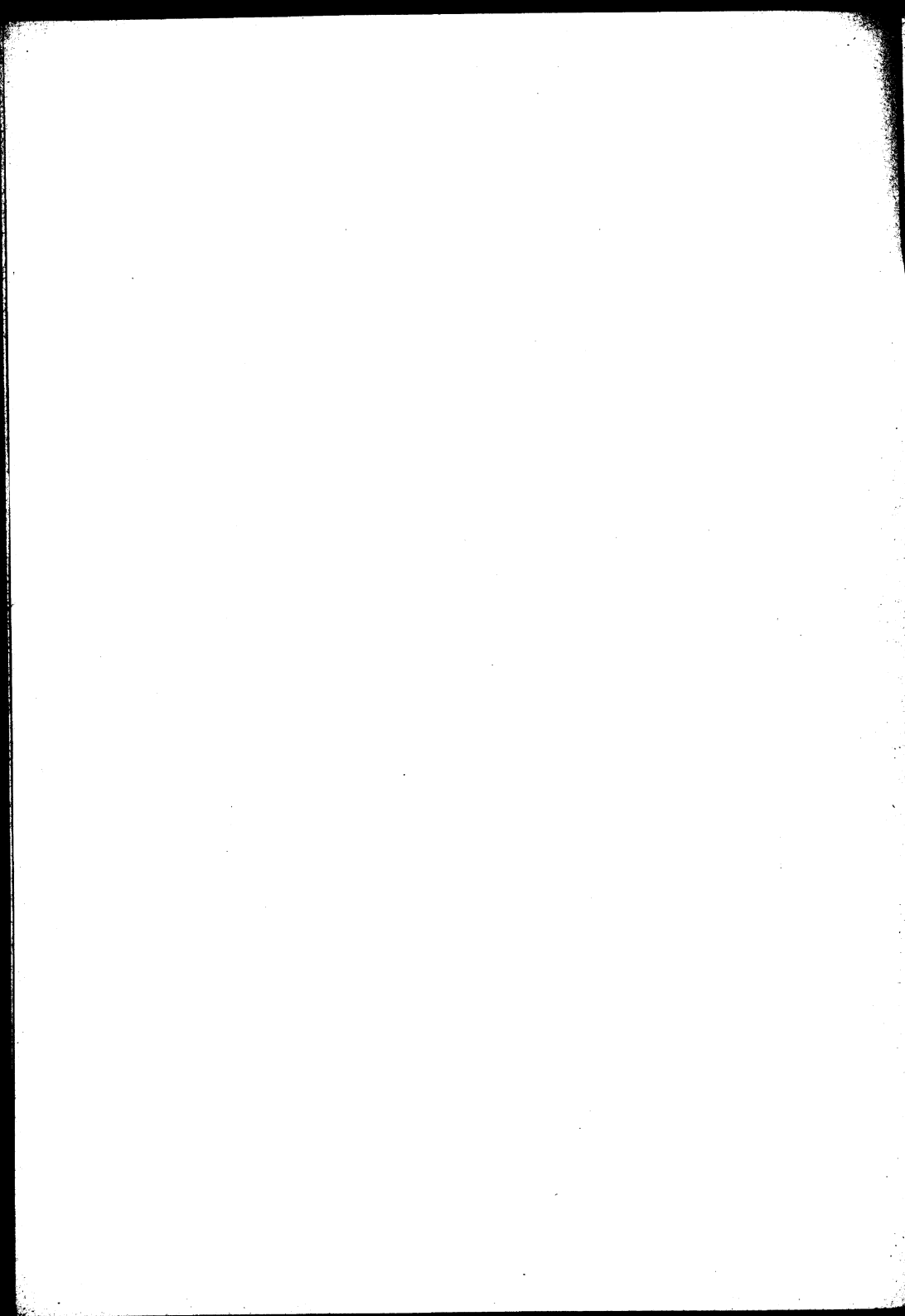
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Sex-Ratio of Births in India

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It is a well recognised fact that in almost all parts of the world more boy-babies are born into the world than girl-babies. Explanations of such a phenomenon in the present condition of human knowledge must be hazardous in the extreme, but the process of evolution may afford one. Darwin has pointed out that the male sex is more variable in structure than the female, and variations in important organs would generally be injurious. According to the same authority female infanticide, if long continued, would tend to cause an excess of males at birth. Girls being killed in families where the majority of the children are females, and spared in those where the majority are males, those who survive and become mothers would belong to a stock with a male-producing tendency. Parents to-day are anxious for male children and in earlier stages of civilization this has been more obviously true. The favourite wife was the wife who bore sons to her husband, and the father of many sons established his race at the expense of others. So ardently are sons longed for by the Hindus that, in all parts of India, when a woman becomes pregnant, a special ceremony « *Pumsavanam* » is performed in order to induce the birth of a male child. Thus families in which there was a tendency to breed male offspring survived while others did not. A process in such a manner probably helped to evolve the human race which at present seems to produce something like 21 boys to 20 girls, and its different development would produce what statisticians have found to exist, namely, different ratios between the sexes at birth in different races.

There is evidence of this greater masculinity at birth in the higher proportion of women in certain aboriginal and Hill Tribes in Bengal than among the great mass of Bengalis, but vital statistics are not prepared according to race and within the Province. Therefore,

it is not possible to compare the actual proportion between female births and male births according to race. Apart from groping in the dark to find explanations of the facts of the case, there are incidental variations of « masculinity at birth », which have been and are being investigated ; and are interesting in themselves.

A proposition which was advanced during the earlier part of the last century was the « Hofacher-Sadler law ». It laid down that masculinity is slightly higher among the first-born than among others, and held the field for many years, but it is now said to have been based on insufficient data and to be unsupported by the figures for large numbers of instances. But some Bengal statistics lend support to the law. At the time of the last Census in 1931, an enquiry was made into the fertility of marriages (from certain families) and certain relevant statistics were obtained (1). They are summarised below :

	Number of families from which the statistics were extracted	Number of female first born to 1000 male first born	Number of female births to 1000 male births (1921-1930)
Bengal.	2,406	730	922
West Bengal . . .	246	558	937
Central » . . .	693	740	919
North » . . .	858	727	931
East » . . .	609	808	911

The number of families involved is very small ; and no definite conclusions should be drawn therefrom.

Mr. S. de Jastrzebski (2) considers that there is evidence to show that masculinity at birth is affected by race, that it is greater in rural than in urban populations, that it is probably slightly greater in first than in subsequent births, and that so far as present evidence goes, war raises the rates of masculinity.

We propose to examine how far in Bengal masculinity at birth is affected by urban conditions. The following table speaks for itself.

(1) Bengal Census Report, 1931, Pt. I, p. 169.

(2) *The Sex Ratio at Birth*.

Number of female-births per 1000 male births.

YEARS	Bengal	Calcutta	Difference
1921	928	855	73
1922	919	870	49
1923	926	885	41
1924	927	888	39
1925	919	916	3
1926	924	867	57
1927	920	887	33
1928	917	898	19
1929	919	869	50
1930	923	874	49
Average 1921-1930 . . .	922	881	41

Although variations in individual years is considerable, in no year has the masculinity at birth in Calcutta been lower than the all Bengal figure. Taking all Bengal average as the standard, we find that masculinity at Calcutta is greater by 41 per 1000 male-births. This is just the opposite to what Jastrzebski expects.

The total urban population at the time of the Census of Bengal in 1931, is 37,11,940. Of this Calcutta accounts for 11,96,734. Of the remaining 25,15,000 the municipalities account for some 23 lakhs. The vital statistics for places classified as urban other than municipalities are included in the district statistics along with those for rural areas. Again «most of the municipalities are the market towns of country districts; the district and the sub-divisional courts and the bazars form the centre, and the rest of the town often consists of little more than groups of villages interspersed with fields (1). And the registration of vital statistics is in them defective.

Previous to 1933 the respective numbers of male and female births in the municipalities (or towns which are always classed as urban at the different Censuses) were not shown separately in the annual Bengal Public Health Reports. The relevant statistics are given below.

(1) Report on the Working of the Reformed Constitution, 1929, p. 62.

YEARS	BIRTHS				MASCULINITY		
	Calcutta		Municipalities excluding Calcutta		Calcutta	Municipalities	Bengal
	Male	Female	Male	Female			
1933	13.445	12.650	25.843	23.066	937	892	929
1934	13.416	12.301	24.939	22.370	917	897	928
1935	13.585	11.753	27.397	24.604	865	898	926
1936	16.793	13.702	28.672	25.688	816	896	927
1937	14.767	11.871	29.931	26.282	804	908	926
Average for 5 years 1933-37					868	898	927

It would thus appear that the masculinity at birth in Calcutta is greater than that of the municipalities (or towns smaller than Calcutta); and that the masculinity at birth in the municipalities is greater than that of all Bengal. Thus in Bengal masculinity is not only greater in urban areas, but it seems to increase with the urbanisation.

The density of population in Calcutta is 36,265 per sq.mile. The density in municipalities varies from town to town. Is is densest at Titagarh, being 38,142 per sq.mile (greater than that at Calcutta); and lowest at Dum Dum (594 persons per sq.mile). The median density of population in municipalities is 4,000 per sq.mile; while the average density is 4,531. The above figures are for the census year 1931.

Let us now analyse the Bengal figures by administrative Divisions. The relevant statistics for the decade 1921-1930 are given below:

YEARS	Burdwan	Presidency	Rajshahi	Dacca	Chittagong (1)
1921	931	925	944	922	908
1922	931	912	932	916	898
1923	940	921	935	920	911
1924	942	924	929	926	899
1925	935	919	931	907	898
1926	940	923	931	916	898
1927	937	920	930	910	893
1928	931	920	925	909	895
1929	942	920	922	913	895
1930	938	912	930	921	910
Average for 1921-30 . .	937	919	931	916	902

(1) Excluding the area and population of Chittagong Hill tracts for which vital statistics are not recorded.

Broadly speaking masculinity at birth increases from the west in Burdwan to the extreme east in Chittagong. The respective density of population per sq.mile in 1931 was :

	Density	Masculinity (1000 — x)
Burdwan	618	63
Presidency	566	81
Rajsahi	557	69
Dacca	935	84
Chittagong (1)	989	98

As a first approximation, it seems that the greater the mean density of population per sq.mile the greater the masculinity.

But if we analyse further the divisional figures into district figures, the connection between masculinity at birth and mean density of population per sq.mile disappears. There seems to be no connection between the density and masculinity e.g. for the same masculinity (921), we have Khulna with a density of 347 per sq.mile ; Dacca with 1,265. This may partly be due to the inclusion of cities and towns or municipalities in the district figures.

The following table speaks for itself.

	Average number of female births per 1000 male births (1921-1930)	Density/ per sq.mile		Average number of female births per 1000 male births (1921-1930)	Density per sq.mile
Birbhum	954	558	Khulna	921	347
Rajsahi	951	548	Dacca	921	1,265
Midnapur	949	534	Bakarganj	917	834
Darjeeling	945	264	Mymensingh	916	823
Jalpaiguri	944	335	Hooghly	915	938
Bankura	944	424	Tipperah	909	1,197
Murshidabad	910	656	Faridpore	908	1,003
Dinajpur	937	445	Howrah	906	2,105
Nadia	933	531	Noakhali	901	1,124
Burdwan	930	583	24 Parganas	900	516
Rangpur	927	742	Pabna	899	795
Malda	926	597	Chittagong	895	699
Bogra	925	785	Calcutta	882	36,265
Jessore	923	576			

(1) Excluding the area and population of Chittagong Hill tracts for which vital statistics are not recorded.

The following table compiled from the Bengal Census Report 1931, Pt. I, p. 67 shows the percentage distribution of population according to density in 1931.

AREA	Under per 150 sq.mile	150-300 per sq.mile	300-450 per sq.mile	450-600 per sq.mile	Total of cls. 2 to 5	600-750 per sq.mile	Total of cls. 6 and 7	750-900 per sq.m	Total of cls. 8 and 9
1	2	3	4	5	6	7	8	9	10
Bengal	1.0	2.2	11.3	15.4	29.9	14.0	43.9	14.1	58.0
Burdwan. . . .	—	4.4	18.2	21.7	44.3	18.9	63.2	9.2	72.4
Presidency . . .	0.1	1.0	9.7	24.8	35.6	18.9	54.5	17.6	72.1
Rajshahi	0.1	4.2	19.6	23.3	47.2	18.9	65.1	18.4	73.5
Dacca	—	0.2	3.5	6.0	9.7	10.2	19.9	15.8	35.7
Chittagong (1) .	—	0.6	7.6	2.4	10.6	0.8	11.4	5.2	16.6

In those regions where a larger proportion of population live thinly spread the proportion of girlbabies is greater.

This confirms our previous conclusion that masculinity is greater in urban areas; and that the greater the urbanisation (or non-ruralisation) the greater is the masculinity at birth.

The masculinity at birth in Bengal since 1891 is tabulated below.

Number of female-births per 1000 male births.

1891	936	1901	944	1911	941	1921	928	1931	922
1892	920	1902	944	1912	937	1922	919	1932	920
1893	927	1903	941	1913	936	1923	926	1933	929
1894	938	1904	944	1914	930	1924	927	1934	928
1895	937	1905	944	1915	932	1925	919	1935	926
1896	941	1906	935	1916	929	1926	924		
1897	935	1907	946	1917	933	1927	920	Average	925
1898	939	1908	936	1918	931	1928	917		
1899	944	1909	938	1919	927	1929	919		
1900	941	1910	936	1920	935	1930	923		
Average	936	Average	941	Average	933	Average	922		

(1) Figures for Chittagong Division are calculated after excluding the Chittagong Hill tracts, as the vital statistics for that area are not recorded.

It was in 1892 that statistics were first collected for rural areas; and it seems that the system took a little time to be set in working order.

For these reasons, if we take the average for the years 1896-1900 as the average for the decade 1891-1900 we shall not be far wrong. We then get the average masculinity and the change in masculinity during the several decades to be :

PERIODS	Masculinity	Increase or decrease
1891-1900	940	—
1901-1910	941	— 1
1911-1920	933	+ 8
1921-1930	922	+ 11
1931-1935	925	— 3

and it is increasing generally with slight variations.

The growth of the urban population (i. e. the population regarded by the Census authorities as urban at the time of the different censuses, though not necessarily the same area) in Bengal is disclosed by the following figures obtained at successive censuses.

YEARS	Urban population	Increase during the inter-censal period	Increase per cent
1872	1,857,504	—	—
1881	1,991,832	134,327	7.2
1891	2,223,378	231,546	11.6
1901	2,599,158	375,780	16.1
1911	2,968,247	369,082	14.2
1921	3,211,304	243,064	8.2
1931	3,711,940	500,636	13.4

The urban population has nearly doubled since 1872, but a considerable proportion of this growth is due to fresh areas *having become urban*, or come to be treated as urban from time to time, while the urban population has increased, the general population of the country has also increased. To eliminate the effect of the growth of population in Bengal, we put the urban population as a percentage of the whole population in the Table below; and take

the difference between successive percentage figures as the measure of «urbanisation» of the population during the inter-censal period.

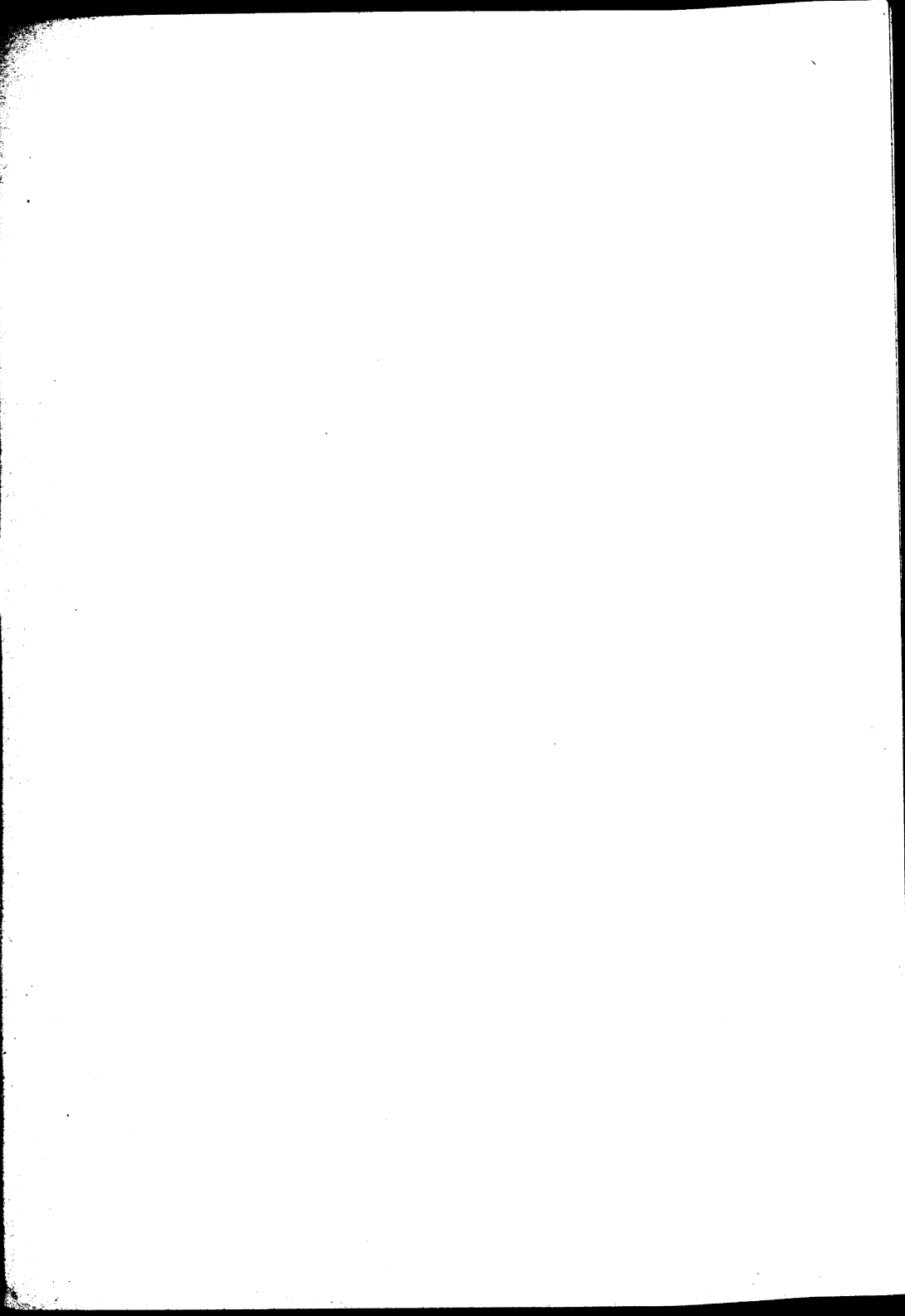
YEARS	Percentage of urban population	«Urbanisation» during the decade
1872	5.35	—
1881	5.38	0.03
1891	5.58	0.20
1901	6.06	0.48
1911	6.52	0.46
1921	6.75	0.23
1931	7.26	0.51

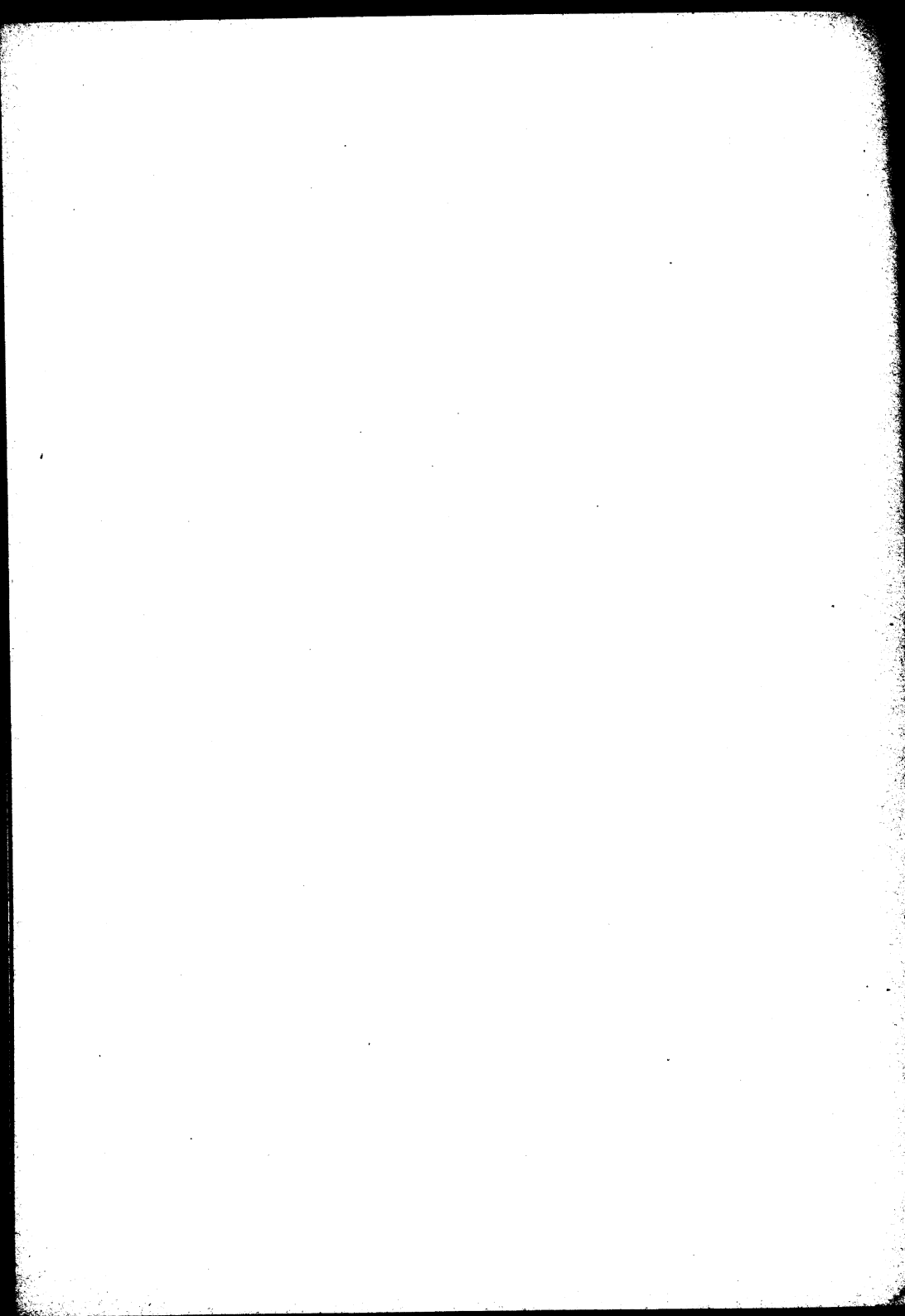
Do we find any connection between the change in masculinity as noted above and the growth of urbanisation?

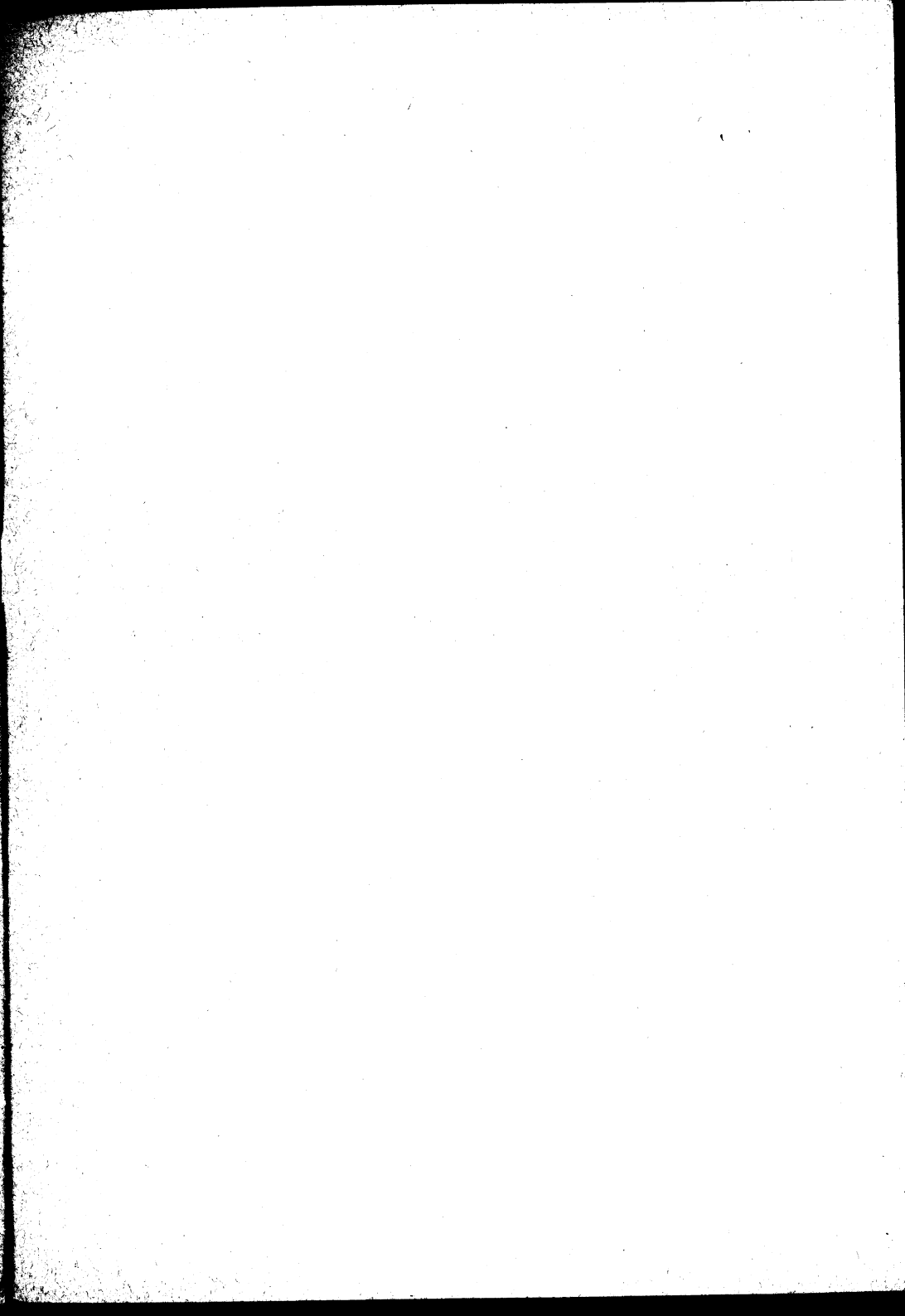
Excepting the fact that urbanisation is increasing steadily while the masculinity has generally increased from 940 to 925, there is no very close connection between the two. If we take the quinquennial averages of masculinity there seems to be a periodicity super-imposed upon a generally decreasing masculinity, as the following figures will show:

PERIODS	Masculinity
1891-1895	929
1896-1900	940
1901-1905	944
1906-1910	938
1911-1915	935
1916-1920	935
1921-1925	926
1926-1930	922
1931-1935	925

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