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BY

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By A. K. Chalmers, M.D.

The influence of the house on the health of its inmates is no new theme. It has frequently been discussed in relation to surface density, (the number of houses or persons on a limited area), and in relation to the cubic space within the dwelling. I propose to-night to ask your attention to it from the point of view of the age of its inhabitants.

At the 1901 census I had an opportunity of comparing the death-rates obtaining in our Glasgow population among the inmates of houses of several sizes—i.e., according to whether they occupied one, two, three, or four and more rooms, and what seemed to demand an explanation was the very considerable interval which separated the rate obtaining among the occupants of the one-roomed house from those occupying two apartments, but more especially from those occupying three apartments and upwards. For example, among the one-apartment population, which numbered over 100,000 persons, the death-rate approached 33 per 1,000; the two-apartment population approached 350,000 and had a death-rate of 21 per 1,000; in nearly 152,000 persons occupying three-apartment houses the death-rate was under 14 per 1,000; while in over 136,000 persons occupying houses of four apartments and upwards it was only 11 per 1,000.

The difference between the extremes was so great as to suggest a discrepancy in the units compared, but lack of information regarding the age-distribution of the several populations made it impossible to carry the comparison beyond a simple statement of the relative prevalence of certain groups of disease among them. It was thus possible to show for the zymotic group (as then understood), for phthisis, and for the other diseases of respiration separately, that the rate followed the

direction of the general death-rate—in other words, that the death-rate increased as the size of house diminished.

The element which was lacking in the 1901 inquiry I have now been able to obtain from the 1911 census, and the first scrutiny of the age-distribution suggested that a very considerable portion of the differences in the death-rate could be ascribed to the larger proportion of children in the smaller houses. It showed, for example, that while 11 per cent. of the total population consisted of children under 5 years, in the one-apartment population they formed almost 19 per cent., and in the two-apartment almost 14 per cent.; while in houses of three and four apartments and upwards the proportions were 7 and 4 per cent. respectively. A further point of importance emerged when the deaths were cast for these several groups of the population in the disclosure that even when corrected for age-distribution the death-rate of the population occupying four apartments and upwards was slightly under 12 per 1,000 (in a population of over 160,000), a quite unlikely, if not indeed a wholly impossible, rate in any mixed population living under existing conditions. Both together inevitably raised the question whether it was possible to get any nearer the true significance of the relationship between house-room and death-rate, and I propose submitting for your consideration some features of the analysis which was undertaken in the endeavour to throw light on this question.

Few words are necessary to indicate the volume of the material employed. The census population (784,496) was taken as the central population of a period of three years, and the deaths were those occurring throughout a period of eighteen months on each side of the census date. The total deaths exceeded 39,000, and the aggregate population during the period exceeded 2,350,000. The age- and sex-distribution of the population occupying houses of the several sizes I have mentioned had been extracted for local purposes,[1] the ages being in twelve age-groups and the occupants of all houses of four apartments and upwards being taken together. The deaths were now similarly distributed, save in the first instance, those occurring in institutions and having no home address to which they could be allocated. To this I shall return.

Having reached this point, we were in a position to ask whether a comparison with the corresponding rates for 1901 afforded any information regarding the distribution of the reduction of the general

[1] Census Report, 1911. Glasgow and its Municipal Wards. By the Medical Officer of Health.

death-rate which had characterized the period generally. In 1901 the death-rate for the city as a whole and for all ages and both sexes was 20·6 per 1,000; in 1911 it was 16·6, a reduction of over 19 per cent. Could it be demonstrated that this reduction had been shared in equal degrees by all sections of the population? Subject to explanation afterwards I introduce the following table :—

REDUCTION IN DEATH-RATE DURING THE DECADE ACCORDING TO SIZE OF HOUSE.

Death-rate from all causes in houses of several sizes.

	Census population		Deaths		Death-rate		
	1901	1911	1901	1909-12*	1901	1909-12	Per cent. decrease
1 apartment	104,128	104,641	3,405	8,161	32·7	25·9	20·8
2 apartments	348,731	367,341	7,418	18,287	21·3	16·5	22·5
3 apartments	151,754	160,083	2,081	5,515	13·7	11·5	16·0
4 apartments and upwards	136,511	127,549	1,533	4,119	11·2	10·8	3·6
Institutions and harbour	20,588	24,882	1,072	2,942	52·3	39·3	24·9
Not traced	—	—	207	—	—	—	—
City	761,712	784,496	15,716	39,024	20·6	16·6	19·4

* Fourth quarter, 1909; first three quarters, 1912.

What significance are we to attach to this reduction in the general death-rate by almost one-fifth in ten years? Before considering this, certain changes in the age-distribution of the population are to be noted. Between 1901 and 1911 the population of Glasgow increased by barely 9,000,[1] but the increases were confined to age-periods over 35 years, save at ages 10 to 15 in males and 5 to 15 in females. In both the increase was purely nominal (0·1 and 0·69 per cent.), while of greater importance is the reduction at ages under 5, which in number amounted to 4,752, and represented a reduction of 5 per cent. on the 1901 population at these ages. In relation, however, to the total population this reduction was only about $\frac{2}{3}$ per cent., and as during the last twenty-five years the death-rate of children under 5 has fallen from 86[2] to

[1] Within the area as at 1911.

[2] A new Life Table for Glasgow, based on the mortality of the ten years, 1881-90, by A. K. Chalmers, M.D., D.P.H.

60 per 1,000 for boys and from 76 to 49 for girls, there is ground for regarding the decline in the death-rate of the last decennium as resulting to a considerable extent from a reduction in the rate among the inhabitants of the smaller-sized houses. This view is, I think, supported by the even greater decline in the death-rate of the institutional group, for, as we shall see, there are certain anomalies in the rates for the higher ages in small houses which arise, I think, from a drift of the sick and infirm among their population in the direction of institutions in later life.

In his address as President of the Preventive Medicine Section of the York Congress of the Royal Sanitary Institute, Sir Shirley Murphy approached this question of the incidence of the decline in the death-rate on the basis of the proportion of children of school age attending elementary schools, and regarded the evidence as suggesting not only that the decline in the death-rate in the total population might in part be related to improved environment, but that it was progressing more rapidly among the lower social grades. The preceding table shows a reduction which amounts to over 22 per cent. in our two-apartment houses, but falls to less than four in houses of four apartments and upwards. Our birth-rate fell by fully 12 per cent. during the decade, but the difference in the proportion of children under 5 in the two periods was less than 1 per cent., and difference in age-distribution alone will not account for the decrease.

Age- and Sex-distribution.

Meanwhile, in order to disintegrate the effect of age and sex, I insert the death-rates for males and females arranged in age-periods and grouped according to the size of house occupied.

Here the sexes, taken separately, maintain the features of their combined death-rate in relation to the size of house. Females at all ages have a rate of 25 per 1,000 in one-apartment houses; 16 in two-apartment houses; 11 in three-apartment houses; 9 in houses of four apartments and upwards; and 45 in institutions. For males the corresponding rates are 27, 17, 12, 13, and 37.

At each age-period also, as a rule, the death-rate is lower as the house increases in size, the main differences being at the later ages when, as I have suggested, the drift to institutions has become established. The exceptions otherwise have usually an obvious explanation. For example, the rate for males at ages 35 to 45 in four-apartment

1909-1912.—Death-rate from all Causes at several Age-periods in Houses of several Sizes.

Males, per 1,000 living.

Size of house in rooms	Ages												All ages
	—1	—5	—10	—15	—20	—25	—35	—45	—55	—65	—75	+ 75	
1 apartment	210·25	40·56	6·97	4·54	4·82	5·24	5·11	12·55	29·18	41·17	85·11	105·90	27·26
2 apartments	163·88	30·20	5·56	3·16	3·94	5·40	5·42	9·01	19·30	39·69	76·12	158·07	17·07
3 apartments	128·25	17·94	3·49	2·18	3·14	3·81	4·90	7·61	14·63	29·49	64·15	146·07	11·96
4 apartments and upwards	102·57	10·27	3·47	1·80	2·71	2·97	3·92	8·50	14·49	27·79	67·47	157·12	12·89
All houses	169·29	29·67	5·20	2·90	3·56	4·44	5·03	9·12	18·16	34·06	71·90	147·36	16·71
Institutions and shipping...	374·07	51·95	13·13	5·74	6·40	7·67	13·10	21·50	32·97	67·25	119·87	234·45	36·71
City	171·29	30·01	5·32	2·94	3·62	4·59	5·44	9·94	19·34	37·21	77·54	157·07	17·61

Females, per 1,000 living.

1 apartment	163·64	37·47	6·92	4·46	5·61	5·89	7·37	14·86	26·84	37·28	61·09	83·85	24·90
2 apartments	123·31	26·75	5·18	3·14	3·95	5·57	6·50	9·75	18·39	35·36	67·48	125·03	16·12
3 apartments	101·07	14·80	4·04	2·33	2·87	3·40	4·32	6·93	10·17	24·99	54·46	147·43	11·02
4 apartments and upwards	72·95	9·87	3·10	1·45	1·64	1·86	2·58	4·90	8·03	17·89	40·01	145·26	9·19
All houses	129·14	26·48	5·04	2·86	3·29	4·15	5·47	8·86	14·75	28·43	56·46	127·06	15·03
Institutions and shipping	365·45	51·65	9·55	8·37	12·43	7·72	10·05	32·33	48·51	82·61	159·73	213·98	45·47
City	131·26	26·77	5·10	2·95	3·44	4·25	5·57	9·20	15·31	29·77	60·68	133·51	15·61

houses exceeds that of three apartments, but digestive diseases are more prevalent, and phthisis reaches its maximum incidence in them. Phthisis also explains the higher rate in two-apartment males at ages 20 to 25.

Male v. Female Rate.—At the several age-periods also the male rate usually exceeds the female, the exceptions, however, being of some importance. In one-apartment houses the female rate exceeds the male at ages 15 to 45, and in two-apartment houses at ages 20 to 45. Puerperal fever and septic diseases prevail among females at these ages, while phthisis contributes partly to the excess at ages 25 to 45. In three-apartment houses the excess is confined to ages 5 to 15, when the female phthisis-rate exceeds that of males. Generally, therefore, the analysis, I think, warrants the suggestion that the variations in the death-rate at all ages associated with houses differing in size are not to be explained by simple differences in age and sex constitution.

The Death-rate as tested by a Standard Population.

But in order to get rid of the discrepancies arising from differences in age-distribution and to get all four groups of population on a fairly comparable basis, I have adopted the test of a standard population with the age and sex distribution of the whole city, and applied to the several age-groups constituting it the death-rate ascertained to exist at corresponding ages in the various sized houses. Calculated in this way, the differences become more intelligible. In 100,000 persons with the age and sex distribution of the whole population, the following differences emerge in association with the varying size of house.

Calculated Deaths occurring among 48,605 Males in One, Two, Three and Four Apartments and upwards, and in Institutions and Shipping.

Ages	Size of house in rooms				Institutions and shipping
	1	2	3	4 and upwards	
— 1	247	193	151	121	440
— 5	180	134	80	46	231
— 10	36	29	18	18	68
— 15	22	15	11	9	28
— 20	23	18	15	13	30
— 25	24	24	17	13	34
— 35	43	45	41	33	109
— 45	83	60	50	56	142
— 55	134	89	67	67	151
— 65	86	109	81	76	185
— 75	106	95	80	84	150
75+	29	43	39	42	63
Total	1,013	854	650	578	1,631

CALCULATED NUMBER OF DEATHS OCCURRING AMONG 51,395 FEMALES IN ONE, TWO, THREE AND FOUR APARTMENTS AND UPWARDS.

Ages	Size of house in rooms				Institutions and shipping
	1	2	3	4 and upwards	
— 1	192	145	119	86	429
— 5	166	119	66	44	229
— 10	36	27	21	16	50
— 15	22	15	11	7	41
— 20	28	19	14	8	61
— 25	30	28	17	9	39
— 35	37	33	22	13	90
— 45	99	65	46	33	215
— 55	130	89	49	39	235
— 65	111	106	75	53	247
— 75	105	116	94	69	276
75+	45	67	79	77	114
Total	1,001	829	613	454	2,026

We can now place the several groups on an approximately uniform basis with the following results :—

CALCULATED DEATHS.

Population	One apartment	Two apartments	Three apartments	Four apartments and upwards	Institutions and shipping	All ages
Males— 48,605	1,013	854	650	578	1,631	—
Females—51,395	1,001	829	613	454	2,026	—
Calculated death-rate per 1,000	20·14	16·83	12·63	10·32	36·57	—
Observed death-rate						
Males	27·3	17·0	11·9	12·9	36·7	17·6
Females	24·9	16·1	11·0	9·2	45·5	15·6
Both sexes	25·9	16·5	11·5	10·8	39·3	16·6

It will be observed that the rates for the two, three, and four-apartment houses are little altered in the above arrangement. The one apartment rate, however, is reduced by 22 per cent., and the rate for institutions by nearly 8 per cent. Even so, however, a population of 100,000 with the age and sex distribution here assumed would, with the rates obtaining in one-apartment houses, yield 2,014 deaths annually ; in two-apartment houses, 1,683 deaths ; in three-apartment houses, 1,263 deaths ; and in houses of four apartments and upwards, only 1,032 ; while in institutions they would number 3,657. These are substantial differences, and indicate very fairly, I think, the varying degrees of resistance to fatal disease presented by the several groups of populations we are considering. In this relative sense I believe them to be strictly comparable ; but at the same time none of them are, I believe, to be regarded as absolute rates, if for no other

reason than that in a stationary population, even the one-apartment rate would imply an expectation of life at birth of 49 years, or nearly five years more than the corresponding expectation for males in England and Wales, and only something less than four years below the expectation in the selected healthy districts according to the last English Life Table (1891-1900). I am disposed, however, to think that the one-apartment death-rate is understated, for you will observe that contrary to the almost uniform decrease in the number of deaths at each age as we go from one to four apartments, the *male* deaths in two-apartment houses at the ages 25-35 and 35-65, and the female deaths at ages 65-75, exceed in number these in one-apartment houses; while at ages 75+ in both sexes the one-apartment population has fewer deaths than any of the larger-sized houses. And the institutional rate, composed as it is very largely of deaths in Poor Law hospitals, suggests a population recruited largely from sick and infirm people.

In any case, the question has been answered in an analysis of the admissions to the institutions of the Parish of Glasgow during eight weeks of the present winter, kindly supplied me by Mr. Motion, Clerk to the Parish Council. During this period the admissions numbered 2,393, of whom 743 had houses of their own, 364 were from one-apartment, and 346 from two-apartment houses, while the two-apartment population is more than three times greater than the one-apartment.

Can these differences be explained?

Writing some years ago one would have been disposed to leave the inquiry at this point, and to have suggested that if the contrast did not completely establish the case against the smaller-sized house an appeal to the diminishing cubic space per inmate, as the number of rooms decreased, would supply what was wanting in the argument. All this is in a sense true, but the test of the uniform population has shown that the interval which separates the three from the four-apartment death-rate (18 per cent.) is relatively greater than the difference between the rates for the one and two-apartment population (17 per cent.), if we are to accept 20 per 1,000 as the true death-rate of the smallest size of house. It is to be remembered further, that in the population we are dealing with 66 per cent. of the houses are of not more than two rooms, and that 62 per cent. of the population inhabit them—that in six only of our City Divisions (or Wards) is the proportion of one-apartments below 10 per cent.; that in nine wards they form from 10 to 20 per cent., and in six wards vary from 20 to 30 per cent. of the total houses, while in five wards the proportion is above 30 per cent. The smaller-sized houses

are, therefore, distributed throughout the City in varying proportions, and their room density reaches a high average.

It is an old observation in Glasgow that the number of occupants per room increases as the number of rooms decrease, and during the period we are considering the average number of inmates in *one*-apartment houses was 3·2, varying, however, from 1·8 to 3·5 in the different wards; in *two*-apartment houses the occupants average 2·4 per room; in *three*-apartment houses 1·7, and in houses of *four* apartments 1·3.

I now propose to ask to what extent the influence of these varying conditions may be traced in the causes of death among the several age-groups, according to the size of house which they occupy.

The Causes of Death at Ages under 5.

I select the causes of death at these ages for further inquiry because of the importance attaching to them as indices of insanitary conditions. The following general statement shows the rate per 1,000 from all causes at these ages:—

	Under 1		1—5		Death-rate under 1 = 100
	Death-rate	Comparative number	Death-rate	Comparative number	Death-rate 1—5
1 apartment	210·25	100	40·56	100	= 19
2 apartments	163·8	78	30·20	74	18
3 apartments	128·5	61	17·94	44	14
4 apartments and upwards ...	102·57	49	10·29	25	10
Institutions and shipping ...	374·07	—	51·95	—	—

The contrast in the rates at each age-period associated with the house groups here shown is sufficiently striking, but what seems to me of almost equal significance is the rapid improvement in the rate at ages 1-5 in three- and four-apartment houses. Under 1 year the four-apartment rate is still equal to one-half the rate for one-apartments, but during the next four years of life the resistance of the child in three- and four-apartment houses to fatal disease increases so rapidly, or the risks of contracting infectious disease are so diminished, that the death-rate among children in three-apartment houses is less than

one-half, and in four-apartment houses only one-fourth that of one-apartment children.

If we attach a numerical value of 100 to the infant death-rate in each size of house, the one- and two-apartment child has still during the next four years to encounter a risk which can be represented by 19 and 18 respectively compared with 14 and 10 in three- and four-apartment children. A consideration of the causes of death at these ages may throw some light on the factors which produce these differences.

Causes of Death in Infancy.

If we represent the one-apartment infant death-rate by 100, then the two, three, and four and larger houses may be stated at 78, 61, and 49. Can this difference be ascribed wholly to housing conditions affecting the child directly? In the endeavour to find an answer I have taken out the rates for thirty separate causes of death, and two other groups to include cases where the causes of death were unknown, or were not further analysed.

It was submitted in evidence to the Committee on Physical Deterioration[1] that "in no single case has it ever been asserted that ill-nourished or unhealthy babies are more frequent at time of birth among the poor than among the rich. . . . The poorest and most ill-nourished women bring forth as hale and strong-looking babies as those in the very best conditions. In fact, it almost appears as though the unborn child fights strenuously for its own health at the expense of the mother and arrives in the world with a full chance of living a normal physical existence." If one applies to this the test which is afforded by the ability of the child to lead a separate existence apart from its mother, one finds, on the contrary, quite definite evidence, I think, that children do not enter life with an equal chance of surviving, and that the chances are least in the smallest size of house.

Among the causes of death of males under 1 year the rate for premature birth in *one*-apartment houses is equal to 30 per 1,000; in *two*- and *three*-apartments it is 24 and 25 respectively; in *four*-apartments 20, and in institutions 41. In the case of females the corresponding rates are 24, 21, 14, and 20; but the institution rate is 68 compared with 40 for females. These differences are not due to any direct influence which the smaller houses exert on the child after birth, but to a combination of influences acting on the mother during the

[1] Minutes of Evidence, p. 31, question 556.

ante-natal period at least, probably during the whole antecedent period of her life, and impairing, I believe, her own health and the vitality of her offspring.

A priori one would have been disposed to suggest deficiency in food and rest as being included among the deteriorating influences directly affecting the mother. Experimental feeding of pregnant animals might be appealed to in favour of the suggestion of deficiency in food supply. Evidence of a more direct character is, however, available in an inquiry into the dietary of the labouring classes in Glasgow carried out during the past year by Miss Dorothy Lindsay, B.Sc., formerly Carnegie Research Fellow in the University of Glasgow, and contained in a report recently issued by the Corporation. Her observations bear so directly on the inadequacy of the dietary which prevails to an unknown extent among the population in whom the excessive death-rate from prematurity occurs, that I quote from her observations on sample dietaries in families with regular wages under 20s. per week.

Number of Study	Protein in grammes	Fat in grammes	Carbohydrate in grammes	Calories
XVII	103·0	63·5	467·9	2931·2
XXV	82·6	75·0	320·7	2351·0
XXVIII	96·4	67·8	423·2	2760·9
XLII	98·9	88·1	377·4	2772·2
LII	108·1	87·1	337·1	2635·3
Standard	120·0	100·0	500·0	3472·0

Miss Lindsay observes : " In this section, which embraces those who may properly be called poor, not one diet reaches the minimum energy value of 3,000 calories," and, she adds, " the children are nearly all small and light in weight." It is beside the point at the moment to inquire whether this insufficiency in dietary is concurrent with other causes of inefficiency in the parents; my purpose is rather to suggest that it constitutes a handicap on the life of the child at birth, and that it becomes of importance to discover whether this handicap is extinguished by the excessive death-rate from prematurity, or is reinforced by the external influences into which the child is born. Is there, in point of fact, any evidence that in the later period of childhood he is more prone to diseases which are not the mere accidents of infection than a child born under more favourable surroundings ?

In Glasgow respiratory diseases are slightly more fatal to infant life than diseases of the digestive organs (29 and 28 per 1,000 births for male, and 24 and 21 for female infants), but I take the latter group first, because the diseases of which it is composed predominate from

the second to the sixth month of life, and probably more accurately represent the field in which the child carries on the struggle for an independent existence. I place the rates for the diarrhœal group, and for other diseases of digestion separately, and combined.

MALES, AGED UNDER 1. DISEASES OF DIGESTION.

	Death-rate per 1,000		
	Diarrhœa or enteritis	Other digestive disorders	Both
1 apartment	25·32 = 100	7·43 = 100	32·75
2 ,, ...	19·72	6·09	25·81
3 ,, ...	10·48	4·44	14·92
4 ,, and upwards	12·02 = 47	4·81 = 64	16·83

The outstanding features of this comparison are, I think, the exaggerated prevalence of what may be regarded as the results of food infection in the smaller-sized houses, and the more uniform distribution of the rate ascribed to the other forms of diseases of the digestive organs. With regard to these latter, however, which may be regarded as due to a low standard of innervation, I suggest that part at least of the difference is consistent with a continuance of the handicap which in the earlier months of life found expression as prematurity because, while at ages 0 to 5 the excess in the smaller houses is quite marked, from 5 to 35, and again after 65, the relationship is reversed, and the higher rates tend to fall on the larger houses.

DISEASES OF THE NERVOUS SYSTEM.

This view gains some support, I think, from the variations which occur in the incidence of diseases of the nervous system other than non-tubercular meningitis and cerebral hæmorrhage, which latter is, however, not properly a disease of the nervous system at all.

Until the completion of the twentieth year in both sexes the higher rates tend to prevail in the smaller houses, but after this age there is an increasing tendency to find the one-apartment rates exceeded among the inhabitants of houses of other sizes, and to become associated with a change in the type of disease from the convulsive to the degenerative variety. Owing to the differences in age constitution, however, these variations are obscured in a statement of the rate at all ages.

MALES UNDER 1. DEATH-RATES FROM DISEASES OF NERVOUS SYSTEM.

	Meningitis (not tubercular)	Cerebral hæmorrhage	Other diseases of nervous system	All diseases of nervous system
1 apartment ...	3·74	0·55	9·77	14·06
2 apartments ...	2·98	0·13	6·59	9·70
3 ,, ...	2·54	0·63	5·08	8·25
,, and upwards	3·21	0·80	7·21	11·22

Diseases of the Organs of Respiration.

In relation to house-incidence, the principal disease of this group—pneumonia—presents an almost complete contrast to the groups we have been considering. At each age-period almost without exception the higher rates fall on the houses of one and two apartments. It would therefore seem to be a disease entirely of environment and climatic conditions, resembling in its behaviour, indeed, those of a more definitely infectious type. In infancy the rate for the larger houses is equal to two-thirds that of one apartment, but a greater interval separates the rates from bronchitis, and is probably related to the increasing air impurity in houses of smaller size.

Diseases of Respiratory Organs. Males under 1.

	Pneumonia	Bronchitis	Other diseases of respiratory organs	All diseases of respiratory organs
1 apartment	21·46	13·35	4·95	39·76
2 apartments	21·05	11·54	2·92	35·51
3 ,, ...	15·56	6·67	4·44	26·67
4 ,, and upwards ...	14·42	5·61	—	20·03

The Principal Infectious Diseases of Childhood.

For the purposes of this comparison I have selected the principal infectious diseases of childhood—viz., measles, whooping-cough, scarlet fever, diphtheria, membranous croup, and cerebrospinal fever.

Males under 1: Death-rates per 1,000.

	Measles (1)	Whooping-cough (2)	Scarlet fever (3)	Diphtheria and membranous croup (4)	Cerebro-spinal fever (5)	Total of columns 1, 2, 4	Comparative number
1 apartment	11·70	10·46	0·28	1·10	0·28	23·26	= 100
2 apartments	9·57	7·42	0·32	1·01	0·51	18·00	—
3 ,, ...	3·49	5·71	0·32	0·95	—	10·15	—
,, and upwards	0·80	4·01	—	0·80	—	5·61	= 24

MALES, 1—5: DEATH-RATE PER 1,000.

	Measles (1)	Whooping-cough (2)	Scarlet fever (3)	Diphtheria and membranous croup (4)	Cerebro-spinal fever (5)	Total of columns 1, 2, 3, 4	Comparative number
1 apartment	8·63	4·36	1·26	2·02	0·13	16·27	= 100
2 apartments	5·90	2·79	0·97	1·56	0·18	11·22	—
3 ,, ...	2·85	1·42	0·22	1·87	0·30	6·36	—
4 ,, and upwards	1·01	0·67	—	1·01	—	2·69	= 17

In order to cover the age-period of greatest susceptibility, I have included the ages 0-5, and in them there is a definite grading in relation to house-room with the exception of cerebrospinal fever, the house distribution of which (in the period under review) was apparently quite erratic. The rate of "all ages" was greatest in one-apartment houses, but no fatal cases occurred in them after the age-period 10-15: it was less than in two-apartment houses at ages 0-5; whereas fatal cases do not appear in houses of four apartments and upwards until the age-period 5-10, and they continue till the age-period 35-65.

TUBERCULOUS DISEASES.

In the circumstances of the movement considerable interest attaches to the house distribution of diseases of this class. From pulmonary tuberculosis the overhead reduction during the decade has been about 25 per cent., and this is fairly maintained in each class of house, save in four apartments and upwards. For both sexes the rates in 1901 and 1909-12 are as follows:—

PULMONARY TUBERCULOSIS. ALL AGES. DEATH-RATE PER 1,000.

	1 apartment	2 apartments	3 apartments	4 apartments and upwards	All houses	Institutions, &c.	City
1901 (Both sexes)	2·4	1·8	1·2	0·7	—	7·4	1·8
1909-12 (Both sexes)	1·76	1·26	0·91	0·66	—	6·9	1·34
1909-12—							
Males ...	1·60	1·25	1·05	0·9	1·20	7·3	1·48
Females ...	1·90	1·27	0·78	0·49	1·11	6·4	1·21

Directly, however, we distinguish between the sexes we find that the female rate at all ages is higher than the male in houses of one and two apartments, and generally that in one-apartment houses it is below the male rate only at ages 20-25 and 45-75, and in two-apartment houses at ages 1-5, 20-25, and from 45 upwards. An excessive drift of male consumptives at these ages to parochial hospitals might tend somewhat to explain this excessive female incidence in houses, but there is no evidence of this in the institutional death-rate, which shows, indeed, a continuously excessive female rate at ages 5-55, save between 10 and 15, and again from 25-35.

In three- and four-apartment houses the rate for males of all ages exceeds that of females. In three-apartment houses, however, the female rate exceeds the rate at ages under 20, while in four apartments the female excess occurs only at the period 5-10, and again over 75. Applying the test of our standard population to these rates, the association with the house appears to be quite definite:—

CALCULATED DEATHS IN UNIFORM POPULATION.

Population		1 apartment	2 apartments	3 apartments	4 apartments	Institutions and shipping
Males	48,605	86	66	48	39	245
Females	51,395	102	70	39	22	327
Death-rate	100,000	188	136	87	61	572
Males only						
Tuberculous meningitis		15	15	14	10	18
Abdominal tuberculosis		12	10	7	3	11

I have placed the corresponding figures for tubercular meningitis and abdominal tubercle along with those relating to pulmonary tuberculosis because they seem to me to supply part at least of the answer to a question which frequently puzzled me—I mean the apparent lack of parallelism between the local distribution of pulmonary and the other forms of tuberculosis. When tested by the standard of a uniform population, however, they fall into line with the distribution of phthisis.

CANCER (MALIGNANT DISEASE).

The absence of association between new growths of a malignant character and housing, in the sense we are at present dealing with it, has not escaped attention in the past. In the present inquiry the rate for each sex at all ages in houses of three apartments and upwards is higher than in one and two apartments, but lower than in institutions.

At ages under 25 its distribution is irregular both in relation to age and housing, but it appears as a cause of death at every age-period thereafter and in every grade of house. At these ages the rate for males in one-apartments is lower than in larger houses, save from 35-55. In one-apartment females, the chief exception is at ages 45-55. In three-apartment females, the higher rates which properly belong to the later ages would appear to begin a decade earlier—i.e., at ages 35-45. The number of deaths in institutions, however, which cannot be allocated, but which occur among persons largely recruited from the one-apartment population, would probably affect the relationship of these rates.

Summary.

In endeavouring to summarize the results of this inquiry it is pertinent to ask whether the several groups of population we have been considering can be regarded as in any way permanent sections of a population. I think the death-rates which prevail among them forbid an assumption of this character. They are too low. They are not the rates of a stationary population, but to my thinking suggest an ebb and flow of families caught in successive waves of good or evil fortune. This interchange we have seen is actually taking place to a recognizable extent in the case of the one- and two-apartment population and the Poor Law. To what extent it is also in progress between the occupants of three and four apartments and upwards there are no present means of determining. That they do occur is, I think, evident from the low range of death-rates which the larger sized houses present.

It may be urged that selective forces are in operation determining the movement of population in the direction of a particular size of house and that these rather than the surroundings in which they are recognized are the determining factors in the death-rate. I think the inquiry suggests that this is the case in certain diseases of digestion and of the nervous system. It is otherwise with regard to infectious disease. Here the element "house" predominates, I think, for the death-rates per 1,000 from the principal infectious diseases of childhood and pneumonia at ages 1-5 are sixteen and six for one-apartment houses, twelve and six for two-apartment houses, but only seven and two for three-apartment houses, and three and one for four apartments and upwards. Before reaching these ages, however, the children born in the smaller sized houses display evidence of a serious

TABLE 1.—1909-1912. MALES—ONE-APARTMENT HOUSES. DEATH-RATES PER 1,000 FROM SEVERAL CAUSES AT VARIOUS AGE PERIODS.

Cause of death	Age												
	—1	—5	—10	—15	—20	—25	—35	—45	—55	—65	—75	75+	All ages
(1) Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—
(2) Diphtheria and membranous croup	1·10	2·02	0·19	—	—	—	0·03	0·05	—	—	—	—	0·40
(3) Enteric fever	—	0·09	—	0·21	0·29	0·18	0·40	0·16	0·20	—	—	—	0·19
(4) Typhus fever	—	—	—	—	—	—	—	0·05	—	—	—	—	0·01
(5) Scarlet fever	0·28	1·26	0·26	—	—	—	—	—	—	—	—	—	0·23
(6) Cerebro-spinal fever	0·28	0·13	0·32	0·21	—	—	—	—	—	—	—	—	0·08
(7) Measles	11·70	8·63	0·45	—	—	—	—	—	—	—	—	—	1·95
(8) Whooping cough	10·46	4·36	0·19	—	—	—	—	—	—	—	—	—	1·21
(9) Diarrhœa and enteritis	25·32	2·70	0·13	—	—	—	—	0·16	0·10	—	0·65	—	1·73
(10) Other digestive diseases	7·43	0·67	0·26	0·10	0·15	0·27	0·29	0·54	1·29	2·22	0·97	—	0·87
(11) Puerperal fever	—	—	—	—	—	—	—	—	—	—	—	—	—
(12) Erysipelas	0·28	0·09	—	—	—	—	—	0·05	0·10	—	0·32	—	0·05
(13) Other septic diseases	0·41	0·22	0·39	—	0·29	—	0·23	0·27	0·49	0·51	0·32	2·41	0·27
(14) Phthisis (pulmonary)	0·14	0·67	0·65	0·31	2·03	1·98	1·70	2·49	3·86	2·90	2·27	—	1·60
(15) Tuberculous meningitis	3·85	1·89	0·45	0·21	0·15	—	—	—	—	—	0·32	—	0·56
(16) Abdominal tuberculosis	2·75	1·30	0·19	0·21	0·15	0·09	0·03	—	—	—	—	—	0·39
(17) Other tuberculous diseases	2·61	0·58	0·45	0·31	0·29	0·36	0·12	—	0·10	0·34	0·65	—	0·39
(18) Cancer (malignant disease)	—	0·22	0·06	—	—	0·18	0·06	0·65	2·57	4·10	4·21	4·81	0·61
(19) Rheumatic fever	—	—	—	0·10	—	—	—	—	—	—	—	—	0·01
(20) Meningitis (not tuberculous)	3·71	1·12	0·39	0·10	0·15	0·18	0·06	—	0·10	—	0·65	—	0·46
(21) Cerebral hæmorrhage	0·55	0·07	0·06	—	—	—	—	0·38	1·38	4·44	10·68	9·63	0·65
(22) Other diseases of nervous system	9.77	1·12	0·13	0·21	0·15	—	—	0·38	0·69	1·20	3·24	6·02	0·94
(23) Circulatory diseases	2·61	0·22	0·19	0·31	0·44	0·36	0·52	1·57	5·14	8·54	16·83	32·49	1·82
(24) Pneumonia	21·46	6·34	0·45	0·41	0·15	0·72	0·40	2·28	4·25	3·08	4·85	1·20	3·09
(25) Bronchitis	13·35	2·52	0·13	—	—	0·09	0·12	0·54	2·77	5·30	17·47	13·24	2·02
(26) Other respiratory diseases	4·95	0·36	0·06	—	0·29	—	0·09	0·27	0·49	0·51	0·32	1·20	0·45
(27) Croup	0·28	0·27	—	—	—	—	—	—	—	—	—	—	0·05
(28) Influenza	0·14	0·07	—	—	—	—	—	—	—	—	—	2·41	0·03
(29) Violence	4·13	1·21	0·66	1·13	0·29	0·63	0·42	1·14	1·58	1·37	2·91	—	1·07
(30) Premature births	30·13	—	—	—	—	—	—	—	—	—	—	—	1·50
(31) Unknown	1·65	0·09	—	—	—	—	0·03	0·11	0·20	0·17	—	—	0·14
(32) All others	50·91	2·34	0·91	0·72	—	0·18	0·61	1·46	3·87	6·49	18·45	32·49	4·49
All causes	210·25	40·56	6·97	4·54	4·82	5·24	5·11	12·55	29·18	41·17	85·11	105·90	27·26
Deaths	1,528	902	108	44	33	58	177	232	295	241	263	88	3,969
Census population (× 3)	7,266	22,239	15,495	9,693	6,852	11,055	34,650	18,477	10,110	5,853	3,090	831	145,611

TABLE II.—1909-1912. MALES—TWO-APARTMENT HOUSES. DEATH-RATES PER 1,000 FROM SEVERAL CAUSES AT VARIOUS AGE PERIODS.

Cause of death	Age												
	—1	—5	—10	—15	—20	—25	—35	—45	—55	—65	—75	75+	All ages
(1) Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—
(2) Diphtheria and membranous croup ...	1·01	1·56	0·46	0·09	—	0·05	0·01	—	—	—	—	—	0·28
(3) Enteric fever	—	0·03	0·04	0·09	0·06	0·10	0·25	0·12	0·11	0·05	—	—	0·10
(4) Typhus fever	—	—	—	—	—	0·02	—	0·01	—	—	—	—	0·00
(5) Scarlet fever	0·32	0·97	0·36	0·06	—	0·02	0·02	0·01	—	—	0·11	—	0·18
(6) Cerebro-spinal fever	0·51	0·18	0·10	—	—	—	0·01	—	—	—	—	—	0·05
(7) Measles	9·57	5·90	0·38	—	—	—	—	—	—	—	—	—	0·99
(8) Whooping cough	7·42	2·79	0·14	—	—	—	—	—	—	—	—	—	0·54
(9) Diarrhœa and enteritis	19·72	1·59	0·10	0·02	0·06	0·05	0·02	0·03	0·22	0·27	0·74	1·15	0·82
(10) Other digestive diseases	6·09	0·60	0·42	0·22	0·31	0·17	0·34	0·52	0·72	1·59	2·55	5·15	0·69
(11) Puerperal fever	—	—	—	—	—	—	—	—	—	—	—	—	—
(12) Erysipelas	0·32	0·02	—	—	—	—	0·02	0·04	0·13	0·18	0·74	—	0·05
(13) Other septic diseases...	0·57	0·10	—	0·22	0·09	0·05	0·01	0·06	0·09	0·41	0·53	—	0·11
(14) Phthisis (pulmonary)	0·38	0·54	0·31	0·57	1·25	2·49	1·74	1·67	2·00	1·96	1·17	—	1·25
(15) Tuberculous meningitis	4·82	1·64	0·34	0·19	0·13	0·05	0·01	—	0·02	—	—	—	0·41
(16) Abdominal tuberculosis	2·22	0·96	0·44	0·16	0·04	0·02	0·02	0·01	—	0·05	—	—	0·26
(17) Other tuberculous diseases	1·01	0·50	0·18	0·17	0·17	0·27	0·06	0·06	0·18	0·09	0·21	—	0·21
(18) Cancer (malignant disease)	—	0·02	—	0·05	0·04	0·02	0·16	0·63	2·10	4·78	6·27	7·45	0·62
(19) Rheumatic fever	—	0·03	0·01	0·02	0·02	0·02	—	0·04	0·02	—	—	—	0·02
(20) Meningitis (not tuberculous)	2·98	1·02	0·21	0·05	0·08	0·02	0·02	0·04	0·04	0·05	—	—	0·26
(21) Cerebral hæmorrhage	0·13	0·05	—	0·02	0·02	0·02	0·06	0·14	0·90	3·82	8·40	20·62	0·48
(22) Other diseases of nervous system ...	6·59	1·15	0·16	0·09	0·15	0·07	0·17	0·18	0·65	0·86	3·30	5·15	0·58
(23) Circulatory diseases	2·09	0·18	0·19	0·25	0·46	0·61	0·46	1·34	3·12	7·15	16·59	28·06	1·40
(24) Pneumonia	21·05	5·75	0·49	0·21	0·27	0·37	0·50	1·20	2·83	4·00	6·16	7·45	2·16
(25) Bronchitis	11·54	1·19	0·08	0·02	0·06	0·15	0·18	0·36	1·64	5·42	11·27	23·48	1·19
(26) Other respiratory diseases	2·92	0·26	0·03	0·03	0·02	0·10	0·07	0·27	0·36	0·68	0·74	1·72	0·25
(27) Croup	1·71	0·21	0·01	—	—	—	—	—	—	—	—	—	0·07
(28) Influenza	0·25	0·06	0·01	—	—	—	0·03	0·03	0·22	0·27	0·42	—	0·06
(29) Violence	1·84	0·93	0·36	0·17	0·27	0·32	0·53	1·19	1·37	1·82	1·91	4·01	0·75
(30) Premature births	24·34	—	—	—	—	—	—	—	—	—	—	—	0·70
(31) Unknown	1·08	0·02	0·01	—	—	—	0·01	0·06	0·16	0·09	0·21	—	0·06
(32) All others	33·40	1·95	0·73	0·46	0·44	0·41	0·72	1·00	2·40	6·15	14·78	53·83	2·53
All causes	163·88	30·20	5·56	3·16	3·94	5·40	5·42	9·01	19·30	39·69	76·12	158·07	17·07
Deaths	2,585	1,859	407	200	205	222	474	700	860	872	716	276	9,376
Census population (× 3) ...	15,774	61,542	73,140	63,228	52,077	41,001	87,369	77,622	44,526	21,969	9,405	1,746	549,399

TABLE III.—1909-1912. MALES—THREE-APARTMENT HOUSES. DEATH-RATES PER 1,000 FROM SEVERAL CAUSES AT VARIOUS AGE PERIODS.

Cause of death	Age												
	—1	—5	—10	—15	—20	—25	—35	—45	—55	—65	—75	75+	All ages
(1) Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—
(2) Diphtheria and membranous croup	0·95	1·87	0·70	0·12	0·03	—	—	—	—	—	—	—	0·20
(3) Enteric fever	—	—	0·05	—	0·07	—	0·20	0·07	0·08	0·06	—	—	0·06
(4) Typhus fever	—	—	—	—	—	—	—	—	0·04	—	—	—	0·00
(5) Scarlet fever	0·32	0·22	0·19	0·12	0·03	0·04	—	—	—	—	—	—	0·06
(6) Cerebro-spinal fever	—	0·30	—	—	0·03	0·04	—	0·03	—	—	—	—	0·03
(7) Measles	3·49	2·85	0·19	—	—	—	—	—	—	—	—	—	0·23
(8) Whooping cough	5·71	1·42	0·05	—	—	—	—	—	—	—	—	—	0·16
(9) Diarrhœa and enteritis	10·48	1·12	0·05	—	0·03	—	0·03	0·07	0·04	0·31	0·94	4·66	0·30
(10) Other digestive diseases	4·44	0·45	0·24	0·26	0·23	0·29	0·34	0·24	0·66	1·38	0·94	1·55	0·48
(11) Puerperal fever	—	—	—	—	—	—	—	—	—	—	—	—	—
(12) Erysipelas	1·27	—	—	—	—	0·04	—	—	0·19	0·13	0·16	—	0·06
(13) Other septic diseases	—	—	—	0·04	0·10	—	—	0·07	—	0·06	0·16	—	0·03
(14) Phthisis (pulmonary)	0·32	0·30	0·05	0·19	0·86	1·33	1·68	1·02	2·07	1·57	0·79	—	1·05
(15) Tuberculous meningitis	2·54	1·79	0·14	0·12	0·27	0·07	—	0·03	0·04	0·06	0·16	—	0·22
(16) Abdominal tuberculosis	0·63	0·82	0·24	0·12	—	0·07	0·05	0·03	—	0·06	—	—	0·12
(17) Other tuberculous diseases	0·32	0·30	0·19	0·16	0·17	0·07	0·08	0·21	0·12	0·19	—	—	0·15
(18) Cancer (malignant disease)	—	—	0·09	—	0·03	0·04	0·25	0·49	1·21	4·01	8·64	6·22	0·79
(19) Rheumatic fever	—	—	—	—	0·03	0·04	—	—	0·04	0·06	0·16	—	0·02
(20) Meningitis (not tuberculous)	2·54	0·60	0·05	0·08	0·03	—	0·06	0·07	—	—	—	—	0·10
(21) Cerebral hæmorrhage	0·63	—	—	0·04	—	0·07	0·11	0·10	0·98	3·51	8·65	17·87	0·73
(22) Other diseases of nervous system	5·08	0·67	0·19	0·04	0·10	0·04	0·14	0·24	0·58	0·81	3·46	9·32	0·46
(23) Circulatory diseases	3·49	0·30	0·09	0·23	0·27	0·25	0·28	1·16	2·38	5·20	15·24	18·65	1·47
(24) Pneumonia	15·56	2·25	0·24	0·12	0·27	0·47	0·56	1·05	1·95	2·75	2·83	3·11	1·17
(25) Bronchitis	6·67	0·97	—	—	—	0·04	0·11	0·14	1·01	2·88	7·55	12·43	0·76
(26) Other respiratory diseases	4·44	0·15	—	0·04	—	0·07	0·03	0·24	0·43	0·56	1·26	0·78	0·24
(27) Croup	—	0·07	0·05	—	—	—	—	—	0·04	—	—	—	0·01
(28) Influenza	0·32	0·07	—	—	0·03	—	—	—	0·08	0·44	0·79	1·55	0·08
(29) Violence	1·27	0·30	0·28	0·08	0·13	0·22	0·42	0·88	0·86	0·69	0·63	1·55	0·45
(30) Premature births	25·40	—	—	—	—	—	—	—	—	—	—	—	0·34
(31) Unknown	—	0·07	—	—	—	—	—	0·07	—	0·06	0·16	0·78	0·02
(32) All others	32·38	1·05	0·41	0·42	0·43	0·62	0·56	1·40	1·83	4·70	11·63	67·60	2·17
All causes	128·25	17·94	3·49	2·18	3·14	3·81	4·90	7·61	14·63	29·49	64·15	146·07	11·96
Deaths	404	240	74	56	95	105	175	217	375	471	408	188	2,808
Census population (× 3)	3,150	13,377	21,273	25,644	30,171	27,549	35,718	28,521	25,626	15,972	6,360	1,287	234,648

TABLE IV.—1909-1912. MALES—FOUR-APARTMENT HOUSES AND UPWARDS. DEATH-RATES PER 1,000 FROM SEVERAL CAUSES AT VARIOUS AGE PERIODS.

Cause of death	AGE												
	—1	—5	—10	—15	—20	—25	—35	—45	—55	—65	—75	75+	All ages
(1) Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—
(2) Diphtheria and membranous croup	0·80	1·01	0·30	0·08	—	—	—	—	—	—	—	—	0·07
(3) Enteric fever	—	—	0·10	0·08	0·16	—	0·03	0·10	—	0·07	—	—	0·06
(4) Typhus fever	—	—	—	—	—	—	—	0·05	—	—	—	—	0·01
(5) Scarlet fever	—	—	0·77	0·21	0·05	—	0·03	—	—	—	—	—	0·08
(6) Cerebro-spinal fever	—	—	0·20	0·08	0·05	—	—	0·05	0·05	0·07	—	—	0·04
(7) Measles	0·80	1·01	0·30	—	—	—	—	—	—	—	0·14	—	0·07
(8) Whooping cough	4·01	0·67	0·20	—	—	—	—	—	—	—	—	—	0·07
(9) Diarrhœa and enteritis	12·02	0·50	0·20	—	0·16	0·09	0·14	0·29	0·42	0·14	0·28	1·68	0·31
(10) Other digestive diseases	4·81	—	0·10	0·15	0·16	0·24	0·49	0·39	1·14	1·22	3·23	5·05	0·68
(11) Puerperal fever	—	—	—	—	—	—	—	—	—	—	—	—	—
(12) Erysipelas	0·80	—	—	—	—	—	0·03	—	0·10	—	0·14	—	0·03
(13) Other septic diseases	0·80	—	—	—	—	—	0·03	—	—	0·14	0·14	0·56	0·04
(14) Phthisis (pulmonary)	—	0·34	0·10	0·15	0·53	1·04	1·29	1·66	1·08	0·88	0·56	—	0·90
(15) Tuberculous meningitis	2·40	1·35	0·20	0·15	0·11	—	—	—	—	—	—	—	0·10
(16) Abdominal tuberculosis	—	0·50	—	0·08	—	—	0·03	0·05	—	—	—	—	0·04
(17) Other tuberculous diseases	1·60	0·34	—	0·08	0·11	0·19	0·14	0·10	—	0·14	—	—	0·12
(18) Cancer (malignant disease)	—	0·17	0·10	—	—	0·09	0·21	0·24	1·30	3·53	8·15	9·54	1·03
(19) Rheumatic fever	—	—	—	—	—	—	0·03	—	—	0·07	—	—	0·01
(20) Meningitis (not tuberculous)	3·21	0·84	0·10	0·15	0·11	—	—	0·05	0·10	—	—	—	0·10
(21) Cerebral hæmorrhage	0·80	—	0·10	—	—	—	—	0·15	0·78	2·03	7·03	14·03	0·77
(22) Other diseases of nervous system	7·21	0·34	—	—	0·05	0·19	0·10	0·44	0·62	1·35	2·81	11·78	0·62
(23) Circulatory diseases	1·60	—	0·10	0·15	0·32	0·24	0·39	1·07	2·22	6·16	15·76	33·68	2·18
(24) Pneumonia	14·42	1·35	0·20	0·15	0·16	0·24	0·39	1·32	1·40	2·17	4·92	4·49	1·09
(25) Bronchitis	5·61	0·17	0·10	—	—	—	0·03	0·20	0·62	1·83	6·61	11·78	0·74
(26) Other respiratory diseases	—	0·34	—	—	0·11	0·09	0·03	0·20	0·26	0·47	0·84	2·24	0·20
(27) Croup	0·80	0·17	—	—	—	—	—	—	—	—	—	—	0·01
(28) Influenza	—	—	—	—	—	—	—	—	0·05	0·34	0·84	1·68	0·09
(29) Violence	—	0·17	0·30	0·08	0·26	0·14	0·17	0·68	0·52	0·75	1·12	2·24	0·40
(30) Premature births	20·04	—	—	—	—	—	—	—	—	—	—	—	0·15
(31) Unknown	0·80	—	—	—	—	—	—	0·05	0·05	0·20	—	—	0·04
(32) All others	20·04	1·00	—	0·21	0·37	0·42	0·36	1·42	3·78	6·23	14·90	58·37	2·84
All causes	102·57	10·27	3·47	1·80	2·71	2·97	3·92	8·50	14·49	27·79	67·47	157·12	12·89
Deaths	128	61	35	24	51	63	113	174	279	410	480	280	2,098
Census population (× 3)	1,248	5,946	10,086	13,299	18,810	21,219	28,725	20,475	19,266	14,751	7,113	1,782	162,720

TABLE V.—1909-1912. MALES—INSTITUTIONS AND HARBOUR. DEATH-RATES PER 1,000 FROM SEVERAL CAUSES AT VARIOUS AGE PERIODS.

Cause of death	Age												
	—1	—5	—10	—15	—20	—25	—35	—45	—55	—65	—75	75+	All ages
(1) Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—
(2) Diphtheria and membranous croup	—	0·67	—	—	—	—	—	—	—	—	—	—	0·02
(3) Enteric fever	—	—	—	—	—	0·20	0·20	0·19	—	0·16	—	—	0·12
(4) Typhus fever	—	—	—	—	—	—	—	—	—	—	—	—	—
(5) Scarlet fever	—	1·35	—	—	0·43	—	—	—	—	—	—	—	0·06
(6) Cerebro-spinal fever	—	—	—	—	0·43	—	—	—	—	—	—	—	0·02
(7) Measles	11·11	14·16	1·09	—	—	—	—	—	—	—	—	—	0·50
(8) Whooping cough	—	0·67	—	—	—	—	—	—	—	—	—	—	0·02
(9) Diarrhœa and enteritis	107·41	13·51	—	—	—	—	0·10	—	0·23	—	—	1·41	1·03
(10) Other digestive diseases	11·11	2·02	—	—	0·43	0 20	0·50	0·48	0·35	0 81	1·16	2·82	0·62
(11) Puerperal fever	—	—	—	—	—	—	—	—	—	—	—	—	—
(12) Erysipelas	—	—	—	—	—	—	—	—	0·23	0·16	0·29	2·82	0·12
(13) Other septic diseases	—	—	—	—	—	—	0·20	0·19	0·23	0·33	0·87	1·41	0·23
(14) Phthisis (pulmonary)	3·70	0·67	—	1·27	2·55	4·25	6·66	8·58	8·96	11·89	10·11	5 65	7·26
(15) Tuberculous meningitis	14·82	—	—	—	—	—	—	0·10	—	—	—	—	0·10
(16) Abdominal tuberculosis	—	0·67	1·64	—	—	—	—	—	—	—	—	—	0·08
(17) Other tuberculous diseases	33·33	4·05	7·12	0·64	1·28	0·20	0·30	0·67	0·59	0·49	0·87	—	1·05
(18) Cancer (malignant disease)	—	—	—	0·64	—	—	—	0·29	2·12	4·72	6·64	5·65	1·51
(19) Rheumatic fever	—	—	—	—	—	—	—	—	—	—	—	—	—
(20) Meningitis (not tuberculous)	—	—	—	0·64	—	—	0·10	0·10	—	—	—	—	0·06
(21) Cerebral hæmorrhage	—	—	—	—	—	—	0·30	0·19	2·47	6·35	12·71	15·54	2·33
(22) Other diseases of nervous system	—	0·67	1·09	—	—	0·20	0·40	0·87	1·53	1·30	2·60	7·06	1·01
(23) Circulatory diseases	3·70	0·67	—	0·64	0·43	1·01	1·11	2·12	2·12	13·69	32·64	88·97	6·21
(24) Pneumonia	25·93	2·70	—	0·64	—	0·61	1·01	2·80	4·01	7·00	10·69	7·06	3·36
(25) Bronchitis	29·63	6·75	—	—	—	0·20	—	0·77	2·24	6·51	17·62	24·01	3·18
(26) Other respiratory diseases	—	—	—	—	—	—	—	0·38	0·23	0·81	1·44	5·65	0·39
(27) Croup	—	—	—	—	—	—	—	—	—	—	—	—	—
(28) Influenza	—	—	—	—	—	—	—	—	—	—	—	—	—
(29) Violence	—	—	—	—	0·85	0·40	0·61	1·75	1·88	2·28	2·31	1·41	1·30
(30) Premature births	40·74	—	—	—	—	—	—	—	—	—	—	—	0·21
(31) Unknown	—	—	—	—	—	—	0·20	0·19	0·35	0·65	0·58	1·41	0·27
(32) All others	92·59	3·37	2·19	1·27	—	0·40	1·41	1 83	5·43	10·10	19·34	63·56	5·65
All causes	374·07	51·95	13·13	5·74	6·40	7·67	13·10	21·50	32·97	67·25	119·87	234·45	36·71
Deaths	101	77	24	9	15	38	130	223	280	413	415	166	1,891
Census population (× 3)	270	1,482	1,827	1,569	2,343	4,950	9,918	10,374	8,490	6,141	3,462	708	51,534
City (all males)	**171·29**	**30·01**	**5·32**	**2·94**	**3·62**	**4·59**	**5·44**	**9·94**	**19·34**	**37·21**	**77·54**	**157·07**	**17·61**
Deaths	4,746	3,139	648	333	399	486	1,069	1,546	2,089	2,407	2,282	998	20,142
Census population (× 3)	27,708	104,586	121,821	113,433	110,253	105,774	196,380	155,469	108,018	64,686	29,430	6,354	1,143,912

TABLE VI.—1909-1912. FEMALES—ONE-APARTMENT HOUSES. DEATH-RATES PER 1,000 FROM SEVERAL CAUSES AT VARIOUS AGE PERIODS.

Cause of death	AGE												
	—1	—5	—10	—15	—20	—25	—35	—45	—55	—65	—75	75+	All ages
(1) Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—
(2) Diphtheria and membranous croup	1·23	1·83	0·51	—	—	—	0·03	—	—	—	—	—	0·35
(3) Enteric fever	—	—	0·06	0·10	—	0·06	0·18	0·05	0·08	—	—	—	0·07
(4) Typhus fever	—	—	—	—	—	—	—	—	—	—	—	—	—
(5) Scarlet fever	0·41	1·03	0·51	—	—	—	—	—	—	—	—	—	0·20
(6) Cerebro-spinal fever	0·69	0·09	0·06	—	—	—	0·03	—	—	—	—	—	0·05
(7) Measles	7·68	7·85	0·57	—	—	—	—	—	—	—	—	—	1·43
(8) Whooping cough	10·84	4·10	0·13	0·10	—	—	—	—	—	—	—	—	1·03
(9) Diarrhœa and enteritis	19·62	2·63	0·13	0·20	—	0·06	0·05	—	0·15	0·44	0·89	2·53	1·35
(10) Other digestive diseases	5·08	0·62	0·13	0·42	0·23	0·22	0·18	0·64	0·86	1·65	1·94	2·11	0·75
(11) Puerperal fever	—	—	—	—	0·35	0·60	0·55	0·54	0·08	—	—	—	0·27
(12) Erysipelas	0·41	0·04	—	—	0·12	0·16	—	0·16	0·15	0·33	0·15	—	0·10
(13) Other septic diseases	0·27	0·13	—	0·20	0·12	0·44	0·26	0·38	0·23	0·22	—	0·42	0·23
(14) Phthisis (pulmonary)	0·96	0·67	0·57	1·33	2·10	1·96	2·32	4·04	2·97	1·43	0·74	1·26	1·90
(15) Tuberculous meningitis	2·47	1·38	0·51	—	0·12	—	0·03	0·05	—	—	—	—	0·36
(16) Abdominal tuberculosis	1·37	1·07	0·57	0·20	0·23	0·11	0·05	0·20	—	—	—	—	0·33
(17) Other tuberculous diseases	0·82	0·75	0·57	0·30	0·23	0·22	0·05	0·11	0·08	—	—	0·42	0·28
(18) Cancer (malignant disease)	—	—	—	0·10	—	0·06	0·26	0·86	3·50	4·40	6·26	2·53	0·96
(19) Rheumatic fever	—	—	0·06	—	—	—	—	0·05	—	0·11	—	—	0·02
(20) Meningitis (not tuberculous)	3·15	0·89	0·25	—	0·12	—	—	0·11	0·08	—	0·15	—	0·31
(21) Cerebral hæmorrhage	0·27	0·04	—	—	—	—	0·13	0·54	1·71	2·97	6·26	7·16	0·75
(22) Other diseases of nervous system	8·92	0·94	0·06	0·20	0·12	0·05	0·16	0·32	0·39	1·54	1·34	1·26	0·80
(23) Circulatory diseases	1·10	0·13	0·13	—	0·46	0·49	0·68	1·83	4·82	6·38	13·26	13·48	1·94
(24) Pneumonia	17·83	7·14	0·70	0·30	—	0·33	0·47	0·48	2·64	2·31	3·13	4·64	2·52
(25) Bronchitis	12·07	2·05	0·19	—	0·12	0·05	0·26	0·86	4·05	8·24	12·37	18·54	2·49
(26) Other respiratory diseases	2·47	0·35	0·13	—	0·12	0·05	0·05	0·32	0·62	1·10	0·89	1·26	0·39
(27) Croup	0·14	0·22	—	—	—	—	—	—	—	—	—	—	0·03
(28) Influenza	—	—	—	—	—	0·05	—	—	0·08	—	—	—	0·01
(29) Violence	3·57	1·25	0·70	0·30	0·35	—	0·13	0·75	0·93	1·10	1·19	2·53	0·75
(30) Premature births	24·28	—	—	—	—	—	—	—	—	—	—	—	1·05
(31) Unknown	1·37	0·04	—	—	0·12	—	0·08	0·11	0·31	0·22	0·30	—	0·15
(32) All others	36·62	2·23	0·38	0·71	0·70	0·98	1·40	2·42	3·11	4·84	12·22	25·71	4·03
All causes	163·64	37·47	6·92	4·46	5·61	5·89	7·37	14·86	26·84	37·28	61·09	83·85	24·90
Deaths	1,193	841	109	44	48	108	280	276	345	339	410	199	4,192
Census population (× 3)	7,290	22,437	15,720	9,870	8,556	18,324	36,510	18,573	12,855	9,093	6,711	2,373	168,312

TABLE VII.—1909-1912. FEMALES—TWO-APARTMENT HOUSES. DEATH-RATES PER 1,000 FROM SEVERAL CAUSES AT VARIOUS AGE PERIODS.

Cause of death	Age												
	—1	—5	—10	—15	—20	—25	—35	—45	—55	—65	—75	75+	All ages
(1) Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—
(2) Diphtheria and membranous croup ...	0·89	1·82	0·50	0·08	—	—	—	—	0 02	—	—	—	0·30
(3) Enteric fever	0·06	0·02	0·04	0·02	—	0·07	0·17	0·09	—	—	—	—	0·06
(4) Typhus fever	—	—	—	—	—	0·02	—	0·01	0·02	—	—	—	0·01
(5) Scarlet fever	0·32	0 95	0·39	0 05	0·06	0·05	0·03	0 03	—	—	—	—	0·19
(6) Cerebro-spinal fever	0·57	0·16	0·05	0·03	—	0 02	0·01	—	—	—	—	—	0·05
(7) Measles	5·78	5·44	0·46	0·01	—	—	0·01	—	—	—	—	—	0·83
(8) Whooping cough	8·26	2·93	0·20	—	—	—	—	—	—	—	—	—	0·59
(9) Diarrhœa and enteritis	13·20	1·69	0·12	0·01	—	—	—	0·05	0·21	0·16	0·94	1·72	0·65
(10) Other digestive diseases	3·56	0·39	0·15	0·19	0·18	0·20	0 33	0·47	0·76	1·31	1·88	5·72	0·53
(11) Puerperal fever	—	—	—	—	0 06	0·27	0·31	0·40	—	—	—	—	0·13
(12) Erysipelas	0·25	—	—	—	0·02	—	—	0·05	0·14	0·08	0 22	0·86	0·04
(13) Other septic diseases...	0·32	0·03	0·03	0·09	0·02	0·10	0·10	0·17	0·12	0·33	0·22	—	0·10
(14) Phthisis (pulmonary)	0·38	0·46	0·41	0·62	1·79	2·13	1·93	2·06	1·59	0·98	0·58	—	1·27
(15) Tuberculous meningitis	2·60	1·55	0·49	0·16	0·10	0·02	0·03	0·01	—	—	—	—	0·35
(16) Abdominal tuberculosis	1·65	0·57	0·34	0·22	0·16	0·10	0·05	0·04	0·07	—	0·07	—	0·22
(17) Other tuberculous diseases	1·90	0·51	0·24	0·19	0·20	0·20	0·09	0·09	0·09	—	—	—	0·23
(18) Cancer (malignant disease)	0·13	—	0·01	—	0·02	0·12	0·25	0·74	3·02	6·61	7·29	8·58	0·92
(19) Rheumatic fever	—	—	0·01	0·01	—	—	0·01	0·01	—	—	—	—	0·01
(20) Meningitis (not tuberculous)	1·71	0·61	0·27	0·11	0·02	0·02	—	0·01	0·05	—	0·07	—	0·18
(21) Cerebral hæmorrhage	0·32	0·03	0·01	0·02	0·06	—	0·07	0·35	1·20	3·82	8·73	9·44	0·62
(22) Other diseases of nervous system ...	6·73	0·69	0·15	0·08	0·12	0·15	0·12	0 23	0·55	0·82	2·09	5·15	0·53
(23) Circulatory diseases	1·08	0·05	0·22	0·38	0·46	0·52	0·85	1·46	3·00	6·28	11·91	19·46	1·45
(24) Pneumonia	15·94	4·96	0·36	0·30	0·22	0·40	0·46	0·74	1·52	2·79	3·97	4·86	1·68
(25) Bronchitis	6·35	1·43	0·05	0·05	0 04	0·07	0·23	0·40	1·82	5·62	12·34	20·60	1·28
(26) Other respiratory diseases	2·80	0·21	0·09	0·02	0·06	0·05	0·17	0·26	0·30	0 82	1·08	2·00	0·29
(27) Croup	0·63	0·18	0 01	—	—	—	—	—	—	—	0·07	—	0·04
(28) Influenza	0·25	0·08	0·03	—	—	—	0·01	0·01	0 09	0·25	0·58	0·86	0·06
(29) Violence	1·46	0·64	0·18	0·14	0·10	0·05	0·12	0·25	0·78	0·53	1·44	2·00	0·35
(30) Premature births	21·22	—	—	—	—	—	—	—	—	—	—	—	0·60
(31) Unknown	0·63	0·02	0·03	—	—	0·05	0·01	0·04	0·02	—	0·14	—	0·04
(32) All others	24·32	1·33	0·34	0·36	0·26	0·96	1·14	1·78	3·02	4·96	13·86	43·78	2·52
All causes	123·31	26·75	5·18	3·14	3·95	5·57	6·50	9·75	18·39	35·36	67·48	125·03	16·12
Deaths	1,942	1,628	384	199	200	224	574	728	798	862	935	437	8,911
Census population (× 3) ...	15,741	60,837	74,001	63,375	50,577	40,161	88,263	74,559	43,383	24,375	13,857	3,495	552,624

TABLE VIII.—1909-1912. FEMALES—THREE-APARTMENT HOUSES. DEATH-RATES PER 1,000 FROM SEVERAL CAUSES AT VARIOUS AGE PERIODS.

Cause of death	Age												
	–1	–5	–10	–15	–20	–25	–35	–45	–55	–65	–75	75+	All ages
(1) Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—
(2) Diphtheria and membranous croup	0·33	1·30	0·58	0·19	—	—	0·03	—	0·04	—	—	—	0·15
(3) Enteric fever	—	0·07	—	—	0·07	0·07	0·05	—	0·07	—	—	—	0·04
(4) Typhus fever	—	—	—	—	—	—	—	—	—	—	—	—	—
(5) Scarlet fever	0·33	0·72	0·24	0·11	—	0·04	—	—	—	—	0·12	—	0·08
(6) Cerebro-spinal fever	0·33	—	0·05	—	0·03	—	—	—	—	—	—	—	0·01
(7) Measles	5·35	2·02	0·10	—	—	—	0·03	—	—	—	—	—	0·19
(8) Whooping cough	4·35	1·37	0·10	—	—	—	—	—	—	—	—	—	0·14
(9) Diarrhœa and enteritis	10·37	0·94	0·24	0·04	0·03	—	0·05	0·19	0·17	0·30	0·98	0·30	0·33
(10) Other digestive diseases	5·02	0·07	0·24	0·26	0·20	0·18	0·27	0·45	0·53	1·18	1·59	3·03	0·48
(11) Puerperal fever	—	—	—	—	0·07	0·18	0·08	0·16	—	—	—	—	0·06
(12) Erysipelas	0·33	—	—	—	0·03	—	—	—	0·04	—	—	—	0·01
(13) Other septic diseases	—	—	0·14	—	0·10	—	0·13	0·03	0·04	0·12	0·61	0·86	0·09
(14) Phthisis (pulmonary)	0·33	0·29	0·29	0·34	1·06	1·28	1·28	0·80	0·77	0·59	0·12	—	0·78
(15) Tuberculous meningitis	3·35	1·01	0·10	0·04	—	—	—	—	—	—	—	—	0·11
(16) Abdominal tuberculosis	0·67	0·72	0·24	0·15	0·13	—	0·03	0·16	0·04	—	—	—	0·13
(17) Other tuberculous diseases	—	0·07	0·19	0·04	0·13	0·11	0·08	0·06	0·07	0·12	0·24	—	0·10
(18) Cancer (malignant disease)	—	—	—	—	—	—	0·27	1·07	2·21	5·91	8·67	9·51	1·22
(19) Rheumatic fever	—	—	—	0·04	0·03	—	—	—	—	—	—	—	0·01
(20) Meningitis (not tuberculous)	3·35	0·72	0·19	—	0·07	—	—	0·06	0·04	—	—	—	0·12
(21) Cerebral hæmorrhage	0·67	—	—	—	0·03	—	0·05	0·26	0·56	2·42	6·47	12·11	0·61
(22) Other diseases of nervous system	4·35	0·72	—	0·07	0·07	0·26	0·22	0·19	0·21	0·89	3·30	6·92	0·46
(23) Circulatory diseases	0·67	0·07	0·24	0·41	0·23	0·44	0·49	0·96	1·69	3·42	8·79	22·05	1·28
(24) Pneumonia	15·07	2·24	0·38	0·19	0·10	0·07	0·30	0·48	0·46	1·77	3·54	7·35	0·85
(25) Bronchitis	7·04	0·51	0·05	—	0·13	0·07	0·03	0·06	0·70	2·30	7·94	18·59	0·83
(26) Other respiratory diseases	1·67	0·22	0·05	0·11	0·03	0·04	0·08	0·10	0·14	0·47	0·37	3·46	0·18
(27) Croup	—	0·22	—	—	—	—	—	—	—	—	—	0·43	0·02
(28) Influenza	0·33	0·07	—	—	—	—	0·03	0·03	0·07	0·30	0·37	2·16	0·08
(29) Violence	1·00	0·29	0·38	0·08	0·13	0·11	—	0·19	0·25	0·24	0·12	1·73	0·19
(30) Premature births	14·39	—	—	—	—	—	—	—	—	—	—	—	0·17
(31) Unknown	—	—	0·05	—	—	—	0·03	—	—	0·06	0·12	—	0·02
(32) All others	21·77	1·16	0·19	0·26	0·20	0·55	0·79	1·68	2·07	4·90	11·11	57·93	2·28
All causes	101·07	14·80	4·04	2·33	2·87	3·40	4·32	6·93	10·17	24·99	54·46	147·43	11·02
Deaths	302	205	84	62	87	93	159	216	289	423	446	341	2,707
Census population (× 3)	2,988	13,845	20,844	26,583	30,219	27,297	36,837	31,122	28,428	16,935	8,190	2,313	245,601

TABLE IX.—1909-1912. FEMALES—FOUR-APARTMENT HOUSES AND UPWARDS. DEATH-RATES PER 1,000 FROM SEVERAL CAUSES AT VARIOUS AGE PERIODS.

Cause of death	Age												
	—1	—5	—10	—15	—20	—25	—35	—45	—55	—65	—75	75+	All ages
(1) Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—
(2) Diphtheria and membranous croup	—	1·13	0·60	0·29	—	—	—	—	—	—	—	—	0·08
(3) Enteric fever	—	—	0·10	—	0·04	0·03	0·05	0·07	—	0·06	—	0·29	0·04
(4) Typhus fever	—	—	—	—	—	—	—	—	—	—	—	—	—
(5) Scarlet fever	—	0·32	0·10	0·15	—	0·03	—	0·03	—	—	—	—	0·03
(6) Cerebro-spinal fever	—	—	—	—	—	—	—	0·03	—	—	—	—	0·00
(7) Measles	0·73	1·62	0·40	—	—	—	—	—	—	—	—	—	0·07
(8) Whooping cough	2·19	0·49	—	—	—	—	—	—	—	—	—	—	0·03
(9) Diarrhœa and enteritis	7·29	0·49	—	0·07	—	0·03	—	0·03	—	0·06	0·59	1·75	0·13
(10) Other digestive diseases	3·65	0·16	0·40	0·07	0·12	0·23	0·16	0·40	0·29	0·77	1·67	5·24	0·44
(11) Puerperal fever	—	—	—	—	0·04	0·03	0·02	0·10	—	—	—	—	0·03
(12) Erysipelas	—	—	—	—	—	—	—	0·03	0·04	0·22	—	0·29	0·03
(13) Other septic diseases	—	—	0·20	—	—	0·03	—	0·03	—	0·06	—	0·29	0·03
(14) Phthisis (pulmonary)	—	—	0·30	0·07	0·48	0·49	0·66	0·80	0·51	0·39	0·10	0·29	0·49
(15) Tuberculous meningitis	3·65	1·13	—	—	0·04	—	0·02	0·07	0·04	—	—	—	0·08
(16) Abdominal tuberculosis	1·46	—	—	0·07	0·08	—	0·05	0·10	—	—	0·10	—	0·05
(17) Other tuberculous diseases	—	0·32	—	—	0·08	0·10	0·05	0·07	0·11	0·06	—	—	0·07
(18) Cancer (malignant disease)	—	—	—	—	—	0·03	0·18	0·66	1·76	3·58	6·49	10·48	1·11
(19) Rheumatic fever	—	—	—	—	—	—	—	0·07	—	—	—	—	0·01
(20) Meningitis (not tuberculous)	2·19	0·65	0·10	0·07	—	—	0·02	—	—	—	—	—	0·05
(21) Cerebral hæmorrhage	—	—	—	—	—	—	—	0·13	0·55	1·99	4·33	10·48	0·61
(22) Other diseases of nervous system	3·65	0·16	—	0·15	—	0·10	0·05	0·13	0·40	1·27	2·85	6·11	0·46
(23) Circulatory diseases	1·46	—	0·20	0·22	0·28	0·37	0·52	0·70	0·99	3·36	8·55	21·83	1·45
(24) Pneumonia	4·38	0·97	0·20	0·07	—	0 03	0·13	0·16	0·70	1·38	1·87	6·11	0·50
(25) Bronchitis	4·38	0·49	—	—	—	—	—	0·03	0·37	0·77	3·14	14·85	0·53
(26) Other respiratory diseases	1·46	—	—	—	—	—	0·07	0·07	0·29	0·28	0·88	3·49	0·19
(27) Croup	0·73	—	—	—	—	—	—	—	—	—	—	—	0·00
(28) Influenza	—	0·16	—	—	—	—	—	0·07	0·18	0 06	0·69	0·58	0 08
(29) Violence	—	—	0·10	0 07	0·08	0·03	0·13	0·03	0·04	0·22	0·59	2·62	0·15
(30) Premature births	20·41	—	—	—	—	—	—	—	—	—	—	—	0·13
(31) Unknown	0·73	0·16	—	—	0·04	—	—	—	0·04	—	—	—	0·02
(32) All others	14·59	1·62	0·40	0·15	0·36	0·33	0·47	1·09	1·72	3·36	8·16	00·54	2·30
All causes	72·95	9·87	3·10	1·45	1·64	1·86	2·58	4·90	8·03	17·89	40·01	145·26	9·19
Deaths	100	61	31	20	41	57	114	148	219	324	407	499	2,021
Census population (× 3)	1,371	6,183	10,044	13,683	24,780	30,444	44,244	30,177	27,279	18,114	10,173	3,435	219,927

TABLE X.—1909-1912. FEMALES—INSTITUTIONS AND HARBOUR. DEATH-RATES PER 1,000 FROM SEVERAL CAUSES AT VARIOUS AGE PERIODS.

Cause of death	AGE												
	—1	—5	—10	—15	—20	—25	—35	—45	—55	—65	—75	75+	All ages
(1) Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—
(2) Diphtheria and membranous croup	—	0·83	—	—	—	—	—	—	—	—	—	—	0·04
(3) Enteric fever	—	—	—	—	0·54	—	0 67	0·44	—	—	—	—	0·22
(4) Typhus fever	—	—	—	—	—	—	—	—	—	—	—	—	—
(5) Scarlet fever	—	3·33	0·60	—	—	0·59	—	—	—	—	—	—	0·30
(6) Cerebro-spinal fever	—	—	0·60	—	—	—	—	—	—	—	—	—	0·04
(7) Measles	—	11·67	—	—	—	—	—	—	—	—	—	—	0·61
(8) Whooping cough	—	0·83	—	—	—	—	—	—	—	—	—	—	0·04
(9) Diarrhœa and enteritis	104·42	9·17	—	—	—	—	0·22	0·44	—	—	—	2·15	1·77
(10) Other digestive diseases	12·05	0·83	—	—	0·54	0·30	0 22	0·87	1·05	0·58	3·01	1·08	0·78
(11) Puerperal fever	—	—	—	—	—	0·30	—	—	—	—	—	—	0·04
(12) Erysipelas	—	—	—	—	—	—	—	—	—	—	—	—	—
(13) Other septic diseases	—	—	—	—	—	—	—	0·44	1·05	1·15	—	—	0·22
(14) Phthisis (pulmonary)	—	—	1·19	1·12	5·95	5·05	5·14	17·90	10·55	10·40	7·84	—	6·36
(15) Tuberculous meningitis	24·09	1·67	—	0·56	—	—	0·22	0·44	—	—	—	—	0·48
(16) Abdominal tuberculosis	—	0·83	1·19	—	—	—	—	—	—	—	—	—	0·13
(17) Other tuberculous diseases	24·09	10·83	3·58	1·67	1·08	—	0·45	—	—	—	—	—	1·38
(18) Cancer (malignant disease)	—	—	—	—	—	—	0·45	2·62	3·69	6·93	10·25	8·60	2·25
(19) Rheumatic fever	—	—	—	—	—	—	—	—	—	—	—	—	—
(20) Meningitis (not tuberculous)	—	—	—	—	—	—	—	—	—	—	—	—	—
(21) Cerebral hæmorrhage	—	—	—	—	—	—	0·22	0·87	2·11	10·98	21·70	17·20	3·37
(22) Other diseases of nervous system	4·02	—	—	—	—	—	0·45	0·87	3·16	2·89	3·62	5·38	1·17
(23) Circulatory diseases	4·02	—	—	0·56	2·16	—	0·67	2·62	10·55	20·80	53·65	93·55	10·69
(24) Pneumonia	8·03	—	—	1·67	—	0·59	0·45	1·31	1·58	5·20	9·64	5·38	1·95
(25) Bronchitis	16·06	8·33	—	—	—	—	0·22	0·44	5·27	6·93	19·89	24·73	4·07
(26) Other respiratory diseases	—	—	—	—	—	—	—	0·44	—	1·15	1·81	1·08	0·30
(27) Croup	4·02	—	—	—	—	—	—	—	—	—	—	—	0·04
(28) Influenza	—	—	—	—	—	—	—	—	—	0·58	—	—	0·04
(29) Violence	—	—	0·60	—	—	0·30	—	0·44	1·05	1·73	1·20	3·22	0·56
(30) Premature births	68·27	—	—	—	—	—	—	—	—	—	—	—	0·74
(31) Unknown	8·03	—	—	—	—	—	—	0·44	—	0·58	1·20	—	0·26
(32) All others	88·35	3·33	1·79	2·79	2·16	0·59	0·67	1·75	8·45	12 71	25·92	51·61	7·62
All causes	365·45	51·65	9·55	8·37	12·43	7·72	10·05	32·33	48·51	82 61	159·73	213·98	45·47
Deaths	91	62	16	15	23	26	45	74	92	143	265	199	1,051
Census population (× 3)	249	1,200	1,674	1,791	1,848	3,366	4,479	2,289	1,896	1,731	1,659	930	23,112
City (all females)	**131·26**	**26·77**	**5·10**	**2·95**	**3·44**	**4·25**	**5·57**	**9·20**	**15·31**	**29·77**	**60·68**	**133·51**	**15·61**
Deaths	3,628	2,797	624	340	399	508	1,172	1,442	1,743	2,091	2,463	1,675	18,882
Census population (× 3)	27,639	104,502	122,283	115,302	115,980	119,592	210,333	156,720	113,841	70,248	40,590	12,546	1,209,576

TABLE XI.—GLASGOW: TOTAL DEATHS, OCTOBER, 1909, TO SEPTEMBER, 1912.

Houses	Males	Females	Total
1 apartment	3,969	4,192	8,161
2 apartments	9,376	8,911	18,287
3 ,, ...	2,808	2,707	5,515
4 ,, and upwards ...	2,098	2,021	4,119
Institutions and harbour ...	1,891	1,051	2,942
Total	**20,142**	**18,882**	**39,024**

physical handicap, which I have endeavoured to illustrate by the difference in the rate of prematurity in the various types of houses. These differences are, I think, to some extent related to the food supply. I have suggested that the handicap is not extinguished by the high rate from prematurity, but may be traced in the disorders of digestion associated with low innervation and in the diseases of early life associated with an unstable nervous system. In later life the influences of the birth surroundings do not, I suppose, wholly disappear, but they are obscured by those which operate on adult life, and, as we have seen, diseases of the nervous system tend to become degenerative in type and appear more frequently among the occupants of houses of larger size.

In this review of the tables I cannot claim to have exhausted the suggestions which they contain. The varying incidence of fatal phthisis for example in the different classes of house suggests a wave of prevalence which has two crests, not always synchronizing as to age-periods, but with a tendency toward postponement of the earlier one as the external surroundings improve. They have associated themselves in my mind with the difference in age-incidence which might be assumed to arise in the earlier ages from an inherited bias and in the later ages from external conditions producing anew a susceptibility to the disease.

In any case the analysis may serve to emphasize the need for carrying inquiry beyond the falling death-rate at all ages to a discrimination of the age-periods at which it principally occurs. It may incidentally also serve to suggest that the whole economic condition of the poor among our population, and not their housing only, is a subject of national importance.

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