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Contributors

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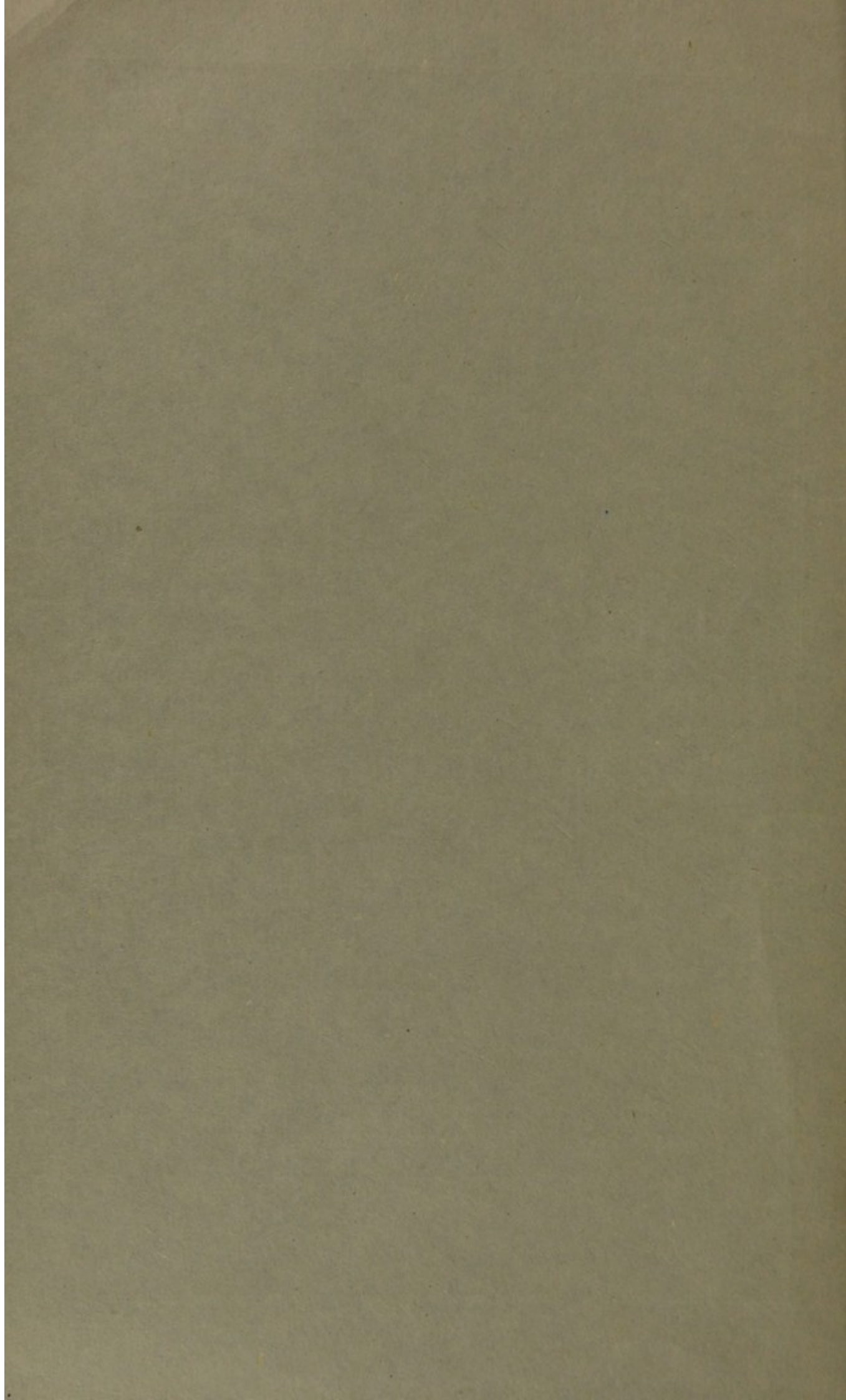
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COUNTY BOROUGH OF CORK.



ANNUAL REPORT
OF THE
MEDICAL OFFICER OF HEALTH
FOR THE YEAR 1931.

J. C. SAUNDERS, M.B., B.Ch., D.P.H.,
Medical Officer of Health.



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CORK:
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1932.

TO THE LORD MAYOR, ALDERMEN AND COUNCILLORS
OF THE COUNTY BOROUGH OF CORK.

MY LORD MAYOR AND GENTLEMEN,

I beg to submit herewith my Annual Report for the year 1931.

I am pleased to be able to relate that there has been a marked improvement in the health of the City during the year, particularly in regard to the incidence of Diphtheria which was particularly severe during the year 1930 and for several years preceding it. There has also been a definite fall in the general Death Rate and in the Infantile Mortality Rate.

I have again to acknowledge the assistance which I have received from Dr. W. J. O'Donovan, University College, Cork, in connection with the section dealing with water supply; from Mr. S. R. J. Cussen, Chief Veterinary Officer, in the control of meat and milk supplies; from Mr. D. J. O'Sullivan, B.Sc., A.I.C., City Analyst's Office, in connection with the administration of the Food and Drugs Acts, and from Capt. J. J. Lawlor, University College, Cork who kindly brought the section dealing with Meteorology up to date.

I have the honour to remain,

Your obedient servant,

J. C. SAUNDERS.

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Maternity and Child Welfare : Nurses :

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MISS C. STOCKER.

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SUMMARY OF STATISTICS.

Area (in Acres)	2,618
Population (Census 1926)	78,490
Density of Population (persons to the acre)	29.2
Rateable Value	£219,498
Sum represented by a penny rate	£914
No. of Births	1,921
Birth Rate	24.4
No. of Deaths	1,159
Death Rate	14.7
Percentage of deaths occurring in Public Institutions	40.3
No. of women dying in, or in consequence of childbirth :	
(a) from sepsis	1
(b) from other causes	7
Maternal Mortality Rate	4.1
Infantile mortality, per 1,000 births	71
Deaths from Diarrhoea (under 2 years)	34

COUNTY BOROUGH OF CORK

ANNUAL REPORT

OF THE

MEDICAL OFFICER OF HEALTH

FOR THE YEAR 1931.

Section I—Physical Features of the Area

The City of Cork is situated on the river Lee, fifteen miles from its mouth in Cork Harbour. On the north bank of the river there is a steep rising ground almost prohibiting building development, save in the form of hillside roads and open building of large houses, with the exception of the marked break of the Blackpool valley, very full use of which has been made. Next comes the flat island comprising the centre of the City. This island is almost entirely artificial, and consists of six feet of filled-in material, with ten feet of slob below that and then gravel overlying old red sandstone. Southwards is a gently undulating tract of land about one and a half miles wide enclosed by a range of hills. There is a considerable amount of land liable to flood in the Lee valley, west of the city, towards Carrigrohane and the flatness of the islands on which the city is built and the height to which unusual tides ascend being nearly to the crown of the arches of the old bridges, render certain portions of the city itself also liable to flooding.

The geological formation of the city region is simple and clearly marked in its effect on the landscape. There are only two systems visible, both paleozoic rocks, the carboniferous limestone and the older underlying Devonian, representing the old red sandstone. Each of these formations is in two series: the carboniferous in a crystalline limestone and in a dark shale (with some 10 feet slate); the Devonian in the upper old red sandstone (yellowish and reddish) and in the lower, old red sandstone (red and purple). The characteristic aspect of the countryside has been caused by the crinkling of these strata into regular parallel folds. Further the limestone which should have formed the ridge of the anticlines has been denuded or dissolved away, so that the highest ground consists of old red sandstone, and even the lower series of this: the hollow folds, floored by limestone, have been subsequently protected from further denudation by a covering of boulder clay. In this immediate region there are thus three old red sandstone ridges and two limestone valleys in the northern of which the city stands under the brow of the northern sandstone ridge. If this sandstone ridge had possessed its original limestone capping it would probably have been at least 2,000 feet high.

Section II—Vital Statistics

1.—POPULATION.

The population of the City, according to the figures of the 1926 census, was 78,490. This may be regarded as an approximately accurate estimate of the population at the present time as the variation from decade to decade has been very slight indeed.

2.—BIRTHS.

The number of births recorded during the year was 1921, which is equivalent to a birth rate of 24.4. The corresponding figure for last year was 25.4. The figure for 1930 was the highest for the past six years, as is shown by the following figures:—

BIRTH RATE—10 Years ending 1931.

1922	1923	1924	1925	1926	1927	1928	1929	1930	1931
24.2	26.2	25.5	23.8	21.5	21.7	21.7	20.9	25.4	24.4

The large increase in the birth rate for the year 1930 is probably related to the temporary wave of prosperity which marked the economic state of the city during the previous year. The birth rate for the country as a whole during 1931 was 19.3 per 1,000. The rate for England and Wales for 1930 was 16.3 per 1,000. There were 41 illegitimate births (as compared with 29 in 1930) equivalent to a rate of 0.5 per 1,000 of population (0.3 in 1929).

TABLE 1.

Birth Rates for Cork City and Saorstat Eireann from 1881 to 1931.

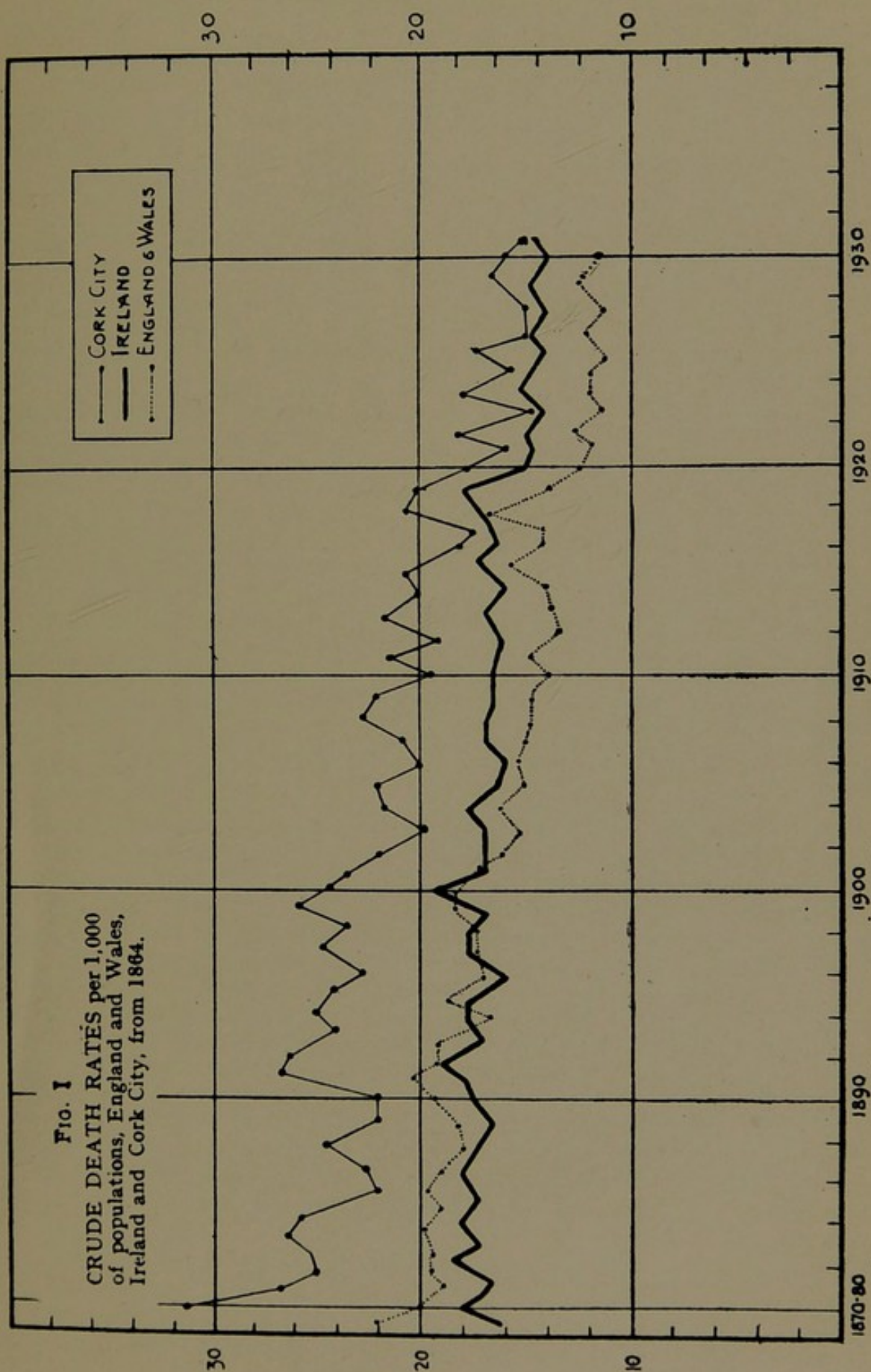
Year	Cork	S.E.	Year	Cork	S.E.
1881	27.7	24.0	1907	25.6	22.4
1882	28.2	23.8	1908	27.3	22.7
1883	27.0	23.4	1909	26.3	22.9
1884	27.4	23.5	1910	25.8	22.8
1885	25.6	23.1			
1886	25.4	22.7	1911	26.0	22.8
1887	25.5	22.5	1912	24.8	22.7
1888	25.7	22.1	1913	24.2	22.6
1889	25.2	22.0	1914	24.3	22.3
1890	25.0	21.6	1915	23.2	22.0
			1916	22.6	21.1
1891	26.9	22.3	1917	20.2	20.0
1892	24.6	21.7	1918	20.8	19.9
1893	27.8	22.1	1919	23.8	19.9
1894	27.4	22.1	1920	28.3	21.6
1895	28.9	22.3			
1896	29.2	22.7	1921	24.6	19.7
1897	27.5	22.5	1922	24.2	19.5
1898	28.7	22.3	1923	26.2	20.5
1899	27.3	22.1	1924	25.5	21.0
1900	25.8	21.8	1925	23.8	20.8
			1926	21.5	20.6
1901	25.6	21.8	1927	21.7	20.3
1902	26.2	22.2	1928	21.7	20.1
1903	27.1	22.1	1929	20.9	19.8
1904	27.4	22.7	1930	25.4	19.8
1905	27.6	22.6			
1906	27.5	22.8	1931	24.4	19.3

3.—DEATHS.

A comparison between the number of deaths recorded by this department during the year 1930 and that recorded by the Registrar General in his Annual Report for the same year showed a number of rather marked discrepancies which were difficult to explain. A system of collecting the weekly returns from the District Registrars was initiated in the beginning of that year but it was found that the Inspectors did not quite grasp the nature of their instructions with the results that deaths of persons normally resident in the city who had died in outside institutions had not been included in their returns. The institutions involved included the Mental Hospital, the Bon Secours Hospital and Shanakiel Hospital. In view of this fact the figures of the Registrar General were accepted in toto for 1930 and included in my report for that year. The figures for these institutions were afterwards collected and checked against our previous returns but it was found that they did not explain away all the discrepancies. In addition there were discrepancies as regards certain diseases such as diphtheria and puerperal sepsis and under the headings of maternal mortality and infant mortality which could not possibly be explained by such circumstance. The explanation would appear to lie in the probability that the weekly returns sent by the District Registrars to the Registrar General may not always be correct as to the designation of the district in which the deaths have occurred, and that deaths which have actually occurred in the county area have been allocated to the city. In certain districts there are large aggregations of dwellings part of which are in the city and part in the county, and it would appear that a certain amount of error has crept in in connection with these places. It is extremely difficult to maintain a check over these returns, particularly owing to the manner in which they are sent to the Registrar General. The form used for the purpose does not provide for the actual address of the deceased person but simply for the district, and in view of this fact it seems almost impossible to avoid a certain amount of error.

A careful check was made during 1930, and the figures set out in the present report are based on the returns collected in this office which may now be regarded as being as accurate as it is possible for such figures to be, but in view of what has been said above it is likely that there will still be discrepancies between them and the figures of the Registrar General when the latter appear. The accurate collection of vital statistics is a matter of considerable importance and it would be very desirable indeed if some better method could be devised than the present one which would undoubtedly appear to put this city in a more unfavourable light than is actually the case. Under the provisions of the Local Government Act of 1929, Medical Officers of Health of Counties and County Boroughs in England have been made responsible for the collection of such statistics and there is no doubt that a similar arrangement for a city of the size of Cork would be very desirable. I am convinced that more accurate records would tend to show that the city is really more healthy than would appear from the figures which have been published hitherto.

The number of deaths registered during the past year was 1,159, equivalent to a rate of 14.7 per 1,000 of the population as compared with 1,264 deaths (16.1 per 1,000) in 1930. These figures represent crude



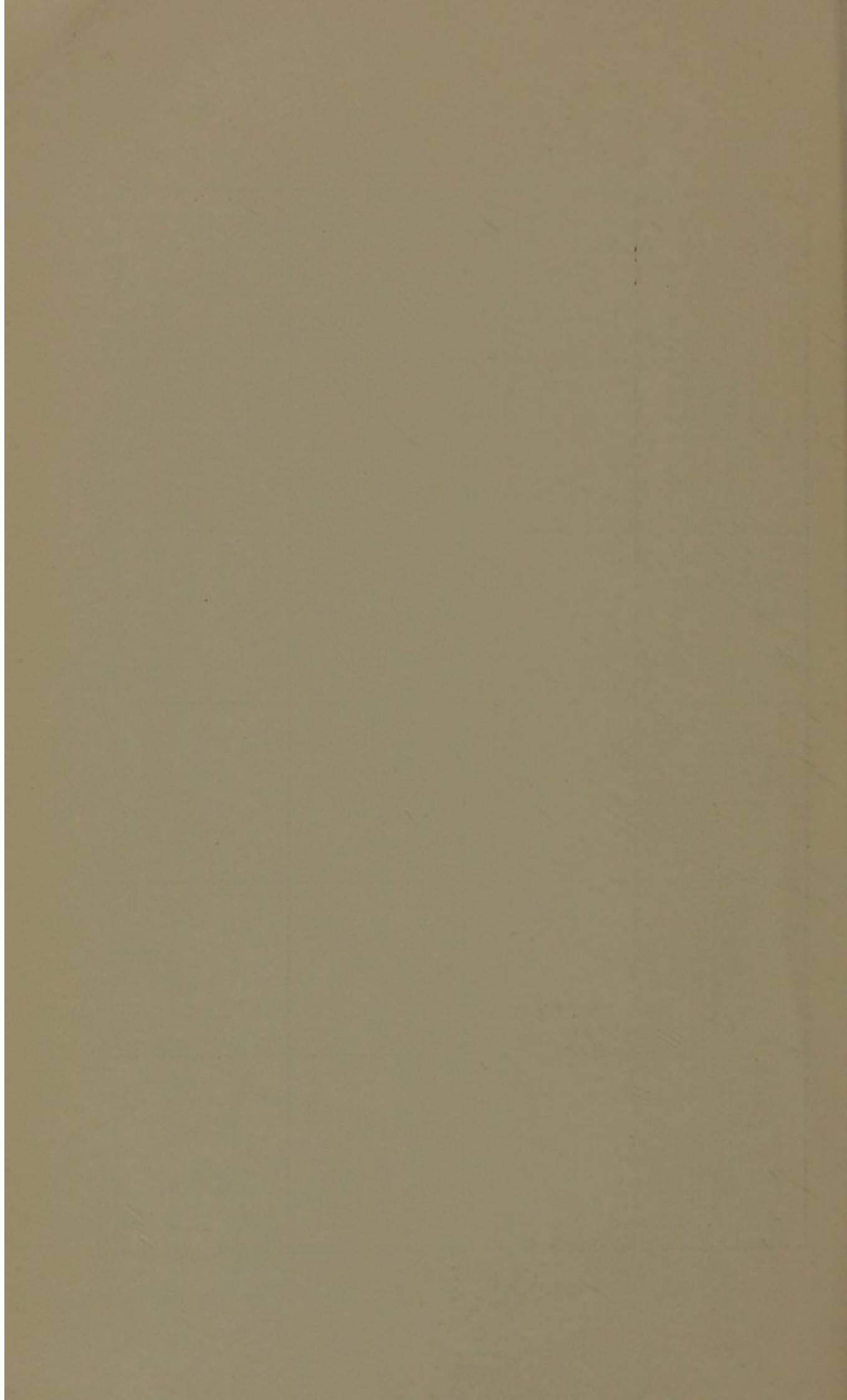


Table 2.—Analysis of **Causes of Death**—Continued.

Causes of Death.	Sex		Un. 1 yr.	1 to 5	5 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 and up.
	M.	F.										
Lobar Pneumonia ...	22	21	2	—	—	2	6	5	3	13	10	2
Broncho Pneumonia ...	37	16	8	19	1	6	5	3	1	5	4	1
Influenzal Pneumonia	14	8	—	—	—	1	2	5	6	6	2	—
Other Respiratory Diseases ...	6	7	—	—	—	2	1	2	3	1	4	—
Gastric and Duodenal Ulcer ...	4	7	—	—	—	1	4	1	1	4	—	—
Diarrhoea & Enteritis (Under 2 years)	17	17	31	3	—	—	—	—	—	—	—	—
Appendicitis ...	4	2	—	—	1	2	1	—	1	—	—	1
Hepatic Cirrhosis ...	—	1	—	—	—	—	—	1	—	—	—	—
Acute and Chronic Nephritis ...	10	11	—	—	1	1	4	5	4	2	1	3
Puerperal Sepsis ...	—	1	—	—	—	—	1	—	—	—	—	—
Other Accidents and Diseases of Pregnancy	—	7	—	—	—	1	3	3	—	—	—	—
Premature Birth & Congenital Malformation	12	16	27	1	—	—	—	—	—	—	—	—
Congenital Debility ...	11	5	16	—	—	—	—	—	—	—	—	—
Suicide ...	5	—	—	—	—	—	2	1	—	2	—	—
Other Violence ...	12	9	1	7	1	3	—	2	4	1	—	2
Other Defined Diseases:—												
(a) Gastro-intestinal	10	12	—	3	2	—	1	2	4	5	4	1
(b) Central Nervous System	11	12	—	3	1	—	1	2	7	3	4	2
(c) Convulsions ...	10	12	16	4	1	1	—	—	—	—	—	—
(d) Marasmus ...	5	2	7	—	—	—	—	—	—	—	—	—
(e) Congen. Syphilis ...	1	1	2	—	—	—	—	—	—	—	—	—
(f) Blood Diseases ...	4	4	—	1	—	—	1	1	3	2	—	—
(g) Senile Decay ...	42	61	—	—	—	—	—	—	1	1	13	88
(h) Miscellaneous ...	22	17	3	5	5	1	5	4	5	5	2	4
Ill defined or unknown Causes ...	4	3	—	—	—	—	—	1	1	2	1	2

The compilation of this table, the keeping of the necessary records and the analysis of same has involved a good deal of work, but the result has been interesting and instructive and one has been impressed by the enormous difficulties by which a Registrar General must be confronted in the matter of classifying deaths on the basis of medical certification as to the cause of same. This applies not only to the segregation of primary and secondary causes but to actual nomenclature as well. In the above analysis this difficulty has been experienced in a very marked degree and it seems scarcely possible that the allocation of causes will be found identical with that of the Registrar General when his Annual Report for the year is forthcoming. The following examples, grouped according to their classification in the table, will indicate not only the difficulty of segregation but the diversity of terminology which has been used to denote the various causes of death:—

A. Heart Disease.

- (1) Asthenia, general debility, cardiac failure.
- (2) Cardiac debility.
- (3) Cardiac affection.
- (4) Asthma, heart disease.
- (5) Influenza, heart disease.
- (6) Bronchitis, heart disease.

B. Bronchitis.

- (1) Bronchitis, morbus cordis.
- (2) Bronchitis, broncho-pneumonia.
- (3) Myocarditis, bronchitis.

C. Acute and chronic nephritis.

- (1) Suppression of urine, uraemia.
- (2) Chronic nephritis, chronic pulmonary tuberculosis.
- (3) Uraemia, coma.

D. Other defined diseases—

- (1) Gastritis, myocardial degeneration.
- (2) Dermatitis, convulsions.
- (3) Septic dental abscess.
- (4) Primary helminthiosis, acute fever (6 days), secondary convulsions (8 hours).
- (5) Endometritis, toxæmia, cardiac failure.
- (6) Obstruction (no further details)
- (7) Meningitis.
- (8) Abscess of the head.
- (9) Retention of urine, cystitis, asthenia and cardiac failure.
- (10) Anaemia, asthenia, debility and cardiac failure.

E. Ill defined or unknown causes.

- (1) Senility, debility and hæmoptysis.
- (2) Cardiac failure, uraemia and senile gangrene
- (3) Rheumatic neuritis, cardiac asthenia.
- (4) Syncope, internal hæmorrhage.
- (5) Gastritis, cardiac debility.

The examples quoted represent only a portion of the cases in which there has been a complete lack of clarity as to what was the primary cause of death. In many cases the cause has been attributed to conditions which obviously are but symptoms of some other underlying condition and as such could hardly be accepted as the real cause of death. In addition there is nomenclature of a very unusual kind to be found amongst the returns. For example, under the group "other defined diseases," there is recorded one death from primary helminthiosis which presumably is intended to convey that death was due to infection with some form of parasitic worm, which must surely be unique. Endometritis is also another very unusual cause of death, as are also dental abscess and dermatitis. No doubt it is extremely difficult to definitely specify in many instances what the cause of death is, particularly where there is in existence a series of different conditions or complications, but nevertheless it is a matter of importance to secure returns of the most accurate description possible, if we are to derive correct information from vital statistics. That this information is of the greatest possible value no one doubts, particularly as it enables us to shape our future policy in regard to the conservation of life and the postponement of death.

The principal causes of death during 1931 were (in order of importance) as follows:—Heart disease, 250; pulmonary tuberculosis, 124; cancer, 103; senile decay, 103; bronchitis, 80; broncho-pneumonia and cerebral hæmorrhage, 53 each; lobar pneumonia, 42; diarrhoea, 34; and influenzal pneumonia, 22.

An examination of the returns of deaths which have been classified under the heading of "heart disease" reveals some very interesting information, and it is very doubtful if the figures reveal the true position of affairs in regard to this condition. Reference to Table 2 shows that deaths under this heading bulk very largely in the later age-groups, particularly in those from 65 years and onwards. Of the 250 deaths recorded 66 occurred in 56-65 age-group, 87 in the 66-75 group and 34 in the 75 and upwards group. In the process of decay which characterises the later years of life it is inevitable that the muscular system of the heart must become involved giving rise to the condition which is termed by the clinician myocardial degeneration, and this term looms very large in the returns and again in the later age-groups.

The term has been used specifically in 64 instances, but that it has been implied in a great many others is shown in the following analysis of the returns of death for heart disease:—

(1) Myocardial degeneration	...	...	64
(2) Myocarditis	...	...	26
(3) Morbus cordis	...	...	28
(4) Cardiac disease	...	...	32
(5) Valvular heart disease	...	...	26
(6) Cardiac failure...	...	...	19
(7) "Heart disease"	...	...	9
(8) "Probably heart disease"	...	...	8
(9) Angina pectoris	...	...	9
(10) Cardiac dropsy	...	...	3
(11) Cardiac debility	...	...	5
(12) Auricular fibrillation	...	...	2
(13) Miscellaneous	...	...	19

Here again one is confronted by looseness of terminology and in consequence it is difficult to assign the cause of death with absolute certainty; but it is apparent that groups (1), (2) and (3) and probably group (4) might be classed together, or, at least, that a very large proportion of their constituent units suffered from some form of myocardial degeneration, and in view of the fact that 121 of the deaths occurred amongst people over 65 it seems probable that a large proportion of deaths from heart disease should more properly be assigned to senile decay. Much has been made in recent years of the supposed increase in deaths from heart disease, but a more likely explanation would appear to be that this increase is more apparent than real and that it is due, in part at least, to the increased expectation of life, whereby there is now a greater proportion of the population of such age as to be subject to the degenerative changes of senility much in the same way as the proportion of deaths from cancer shows an increase as compared with former years, from the same cause. These facts should be borne in mind and carefully weighed before any deductions are made from the figures..

It is, perhaps, in connection with the classification of deaths from heart disease that the greatest difficulty is experienced in the interpretation of medical certification of the cause of death. This is borne out by a further examination of the above analysis in this light. With the exception of groups (1), (2), (5), (9) and (12) the terminology is vague and indefinite and until such time as terms like "morbus cordis," "cardiac disease," "cardiac failure," etc., are definitely excluded from death certificates it will be extremely difficult to assign the exact cause of death.

Thirty-three deaths were recorded during the year without any form of medical certification, exclusive of those returned on coroner's certificates, and were as follows:—

Heart disease	...	...	11
Senile decay	...	...	9
Cerebral haemorrhage	...	...	3
Premature birth	...	...	2
Congenital debility	...	...	2
Convulsions	...	...	2
Pneumonia	...	...	1
Unknown or ill defined causes	...	...	3
Total			33

The three deaths from unknown or ill-defined causes included one from "gastritis, cardiac debility," one from "probably debility," and one from "natural causes." Of the eleven from heart disease in eight cases the register stated "probably heart disease." There is undoubtedly a great need for stricter regulations in regard to death registration and interment in this country, and it is felt that no death should be registered in the absence of doctor's or coroner's certificate. There is undoubtedly an aversion on the part of relatives to the holding of inquests, but one cannot help feeling that this is an entirely erroneous view for, after all, the coroner's court is one of the oldest institutions in existence and is, not only in conception but in actual function, the greatest safeguard of life for the common people of the country. A great many inquests, however, are held and verdicts recorded in the absence of post-mortem examination. One cannot help feeling that this should not be so and that in the event of a death occurring where there has been no medical attendance, not only should an inquest be held but a post-mortem examination should also be made and that at least one of those performing it should be a skilled pathologist. Also, it should not be possible for a body to be interred without production of proof of registration of death as is the case at present. All these matters concern the safety and welfare of the people, and call for more rigid supervision than now exists.

Twenty-four deaths were recorded during the year on coroners' certificates. Their classification is as follows:—

Burns and scalds	...	...	6
Motor Vehicles	...	...	5
Drowning	...	...	4
Fractures	...	...	3
Heart disease	...	...	2
Cerebral haemorrhage	...	...	1
Others	...	...	3
Total			24

In five instances death was due to suicide.

CANCER.—The number of deaths registered as due to malignant disease amounted to 107, which is equivalent to a rate of 1.3 per 1,000 of the population. For 1930 the corresponding figures were 96 and 1.2. The figures for deaths from this cause do not appear to be available (at present, any rate) for years previous to 1906. In that year the number of deaths recorded was 62 and there has been a steady increase up to

the present year when, as has been stated, 107 deaths occurred. The gradient during this period has been so steep that one cannot help feeling that the figures do not reflect the actual position of affairs and that some other factor or factors besides actual increase in the disease itself must be at work. Allusion has already been made to the increased expectation of life enjoyed by the community with the consequent increase in the number of people living at the later years who are more liable to contract malignant disease than those at earlier years. This would undoubtedly appear to be a factor in the increased mortality from the disease. In addition improved methods of diagnosis have played their part so that, in this respect at least, a proportion of the increase is only apparent.

Of the 107 deaths from cancer, 49 were due to disease affecting the gastro-intestinal tract. The frequency of occurrence was as follows:—

1.—Cancer of stomach	...	...	16
2.—Cancer of liver	...	...	10
3.—Cancer of intestines	...	...	11
4.—Cancer of rectum	...	...	7
5.—Cancer of gall bladder	...	...	2
6.—Cancer of pancreas	...	...	1
7.—Unclassified	...	...	2
			—
			49

The remaining 58 deaths were distributed as follows:—

1.—Cancer of breast	...	...	7
2.—Cancer of face, nose and eye	...	...	6
3.—Cancer of jaw	...	...	6
4.—Cancer of oesophagus	...	...	5
5.—Cerebral tumour	...	...	4
6.—Cancer of uterus	...	...	4
7.—Cancer of larynx	...	...	3
8.—Cancer of mouth and soft palate	...	...	3
9.—Cancer of tongue	...	...	2
10.—Cancer of neck	...	...	2
11.—Cancer of lung	...	...	1
12.—Miscellaneous	...	...	15
			—
			58

SENILE DECAY.—103 deaths were attributed to this cause. A study of the age-groups into which these cases fall is of some interest. They were as follows:—

55—59 years	...	...	1
60—64 years	...	...	1
65—69 years	...	...	2
70—74 years	...	...	24
75—79 years	...	...	27
80—84 years	...	...	28
85—89 years	...	...	13
90—94 years	...	...	6
95—99 years	...	...	1
			—

PHTHISIS DEATH RATE.—The deaths from pulmonary tuberculosis numbered 124, equivalent to a rate of 1.58 per 1,000 of the population. Last year the number of deaths was 114 and the rate 1.45 per 1,000. It would appear, however, that the number of deaths from this cause in 1930 was underestimated as some occurred in institutions outside the city, which were omitted from the returns.

INFANTILE MORTALITY.—The number of deaths of infants under one year of age was 138, which is equivalent to a rate of 71 per 1,000 live births. For 1930 the number of deaths was 155, and the rate 77 per 1,000 births. The figures for infant mortality were the second lowest in the records of the city, 66 per 1,000 being reached in the year 1923.

MATERNAL MORTALITY.—The figures for maternal mortality do not make such a satisfactory showing as in the previous two years. The number of deaths which occurred during the year in consequence of pregnancy was 8, equivalent to a rate of 4.1 per 1,000 births. Last year the number of deaths was 4 and the rate 1.83 per 1,000. In that year, however, maternal mortality not only reached the lowest figures in the history of the city, but the figures for Cork were probably amongst the lowest in these countries. As noted, there was a considerable increase in the figures for last year but there is at least this much satisfaction to be derived from them that only one of the eight deaths was due to sepsis.

INFECTIOUS DISEASE DEATH RATE.—The number of deaths from infectious disease per 1,000 of the population during 1931 was 0.6. The corresponding figure for 1930, 1.82, so that there has been an appreciable reduction in this respect.

Table 3 shows the death rates per 1,000 persons living in Cork City, Saorstát Éireann and England and Wales for the 51 years ended 1931. The figures set forth do not serve as an estimate of the relative healthiness of the communities compared as they are based on crude death rates. In order to compare such conditions the figures would have to be based on standardised death rates. Standardised death rates based on age and sex constitutions have been drawn up by the Registrar General for Saorstát Éireann in his annual report for the year 1930 based upon the distribution of the population according to the census of 1926. Taking 14.16 as the standard death rate for Saorstát Éireann in 1930, then the standard death rate for England and Wales becomes 12.86, while that for Cork City becomes 20.37 instead of 16.1. The table, however indicates that the general trend of the death rate is distinctly downward and that there has been a marked annual saving of life in recent years as compared with the earlier period.

This tendency is shown more clearly in Fig. 1 in which the figures for crude deaths are set out. It will be noted in this diagram that the death rate for the city has fallen from 30.8 (the mean for the period 1870—1880) to 14.7 for 1931. This indicates a very great improvement in the sanitary environment of the people as well as an improvement in their standards of living

TABLE 4.—Showing for the year 1931 (52 weeks) ended 2nd January, 1932, the mortality from all causes and from some of the Principal Causes of the several REGISTRARS' DISTRICTS comprising the CITY OF CORK; also the Deaths at certain age periods and the number of Uncertified Deaths.

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												Principal Epidemic Diseases											Tuber- culosis.		Diseases of the Respirat'ry System			Other Causes	Inquest Cases	In Public Institutions	Number of Uncertified Deaths																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
				From All Causes	From Prin- cipal Epi- demic Dis- eases	Under 1 year	1 and under 2	2 and under 5	5 and under 15	15 and under 25	25 and under 45	45 and under 65	65 and upwards.	Enteric Fever, Typhus, Small-pox, Dysentery	Measles	Scarlet Fever	Whooping Cough	Diphtheria	Diarrhoea & Enter- itis under 2 years	Influenza	Pulmonary	Other Forms	Cancer	Pneumonia	Other	Violence																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

NOTE.—This Table is taken from the Annual Summary of the Registrar General, the returns of which are uncorrected. Other sources of error have been alluded to in the body of this Report which will explain discrepancies between the figures set out above and those appearing in other parts of the Report. The principal value of the Table is as a comparative estimate of the healthiness of the different districts.

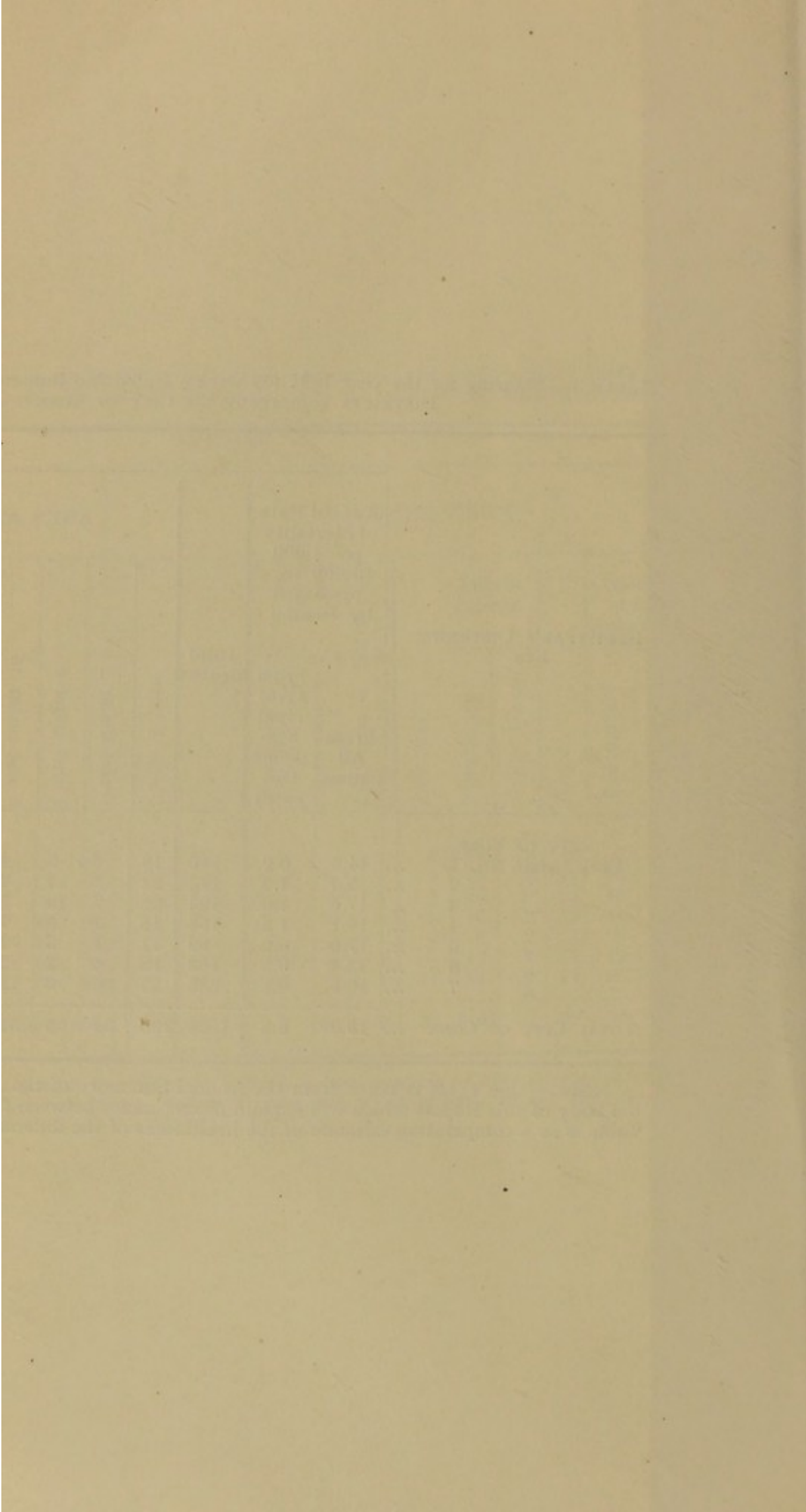


TABLE 3.—Crude Death Rates per 1,000 living for Cork City, Saorstát Éireann and England and Wales, 1881—1931.

Year	Cork	S.E.	E. & W.	Year	Cork	S.E.	E. & W.
1881	26.8	17.1	18.9	1906	20.2	16.2	15.5
1882	24.7	16.9	19.6	1907	20.6	17.0	15.1
1883	24.9	18.6	19.6	1908	22.2	17.1	14.8
1884	26.7	17.4	19.7	1909	22.1	16.8	14.6
1885	26.2	18.0	19.2	1910	19.3	16.6	13.5
1886	22.1	17.4	19.5				
1887	22.4	17.9	19.1	1911	21.2	16.3	14.6
1888	24.1	17.4	18.1	1912	19.1	16.2	13.4
1889	22.3	16.9	18.2	1913	21.5	16.8	13.8
1890	22.2	17.6	19.5	1914	20.2	16.1	14.0
				1915	20.7	17.5	15.7
1891	26.9	17.6	20.2	1916	18.2	16.5	14.3
1892	26.4	18.7	19.0	1917	17.47	16.9	14.2
1893	24.5	17.3	19.2	1918	20.48	17.5	17.3
1894	24.9	17.7	16.6	1919	20.22	17.9	14.0
1895	23.9	17.7	18.7	1920	17.5	14.7	12.4
1896	22.6	15.9	17.1				
1897	24.7	17.8	17.4	1921	15.4	14.3	12.1
1898	23.7	17.7	17.5	1922	18.0	14.7	12.8
1899	26.3	17.0	18.2	1923	14.0	14.0	11.6
1900	24.2	19.1	18.2	1924	17.8	15.0	12.2
				1925	15.5	14.7	12.2
1901	23.0	17.1	16.9	1926	17.3	14.0	11.6
1902	21.5	17.0	16.3	1927	14.7	14.8	12.3
1903	19.4	17.0	15.5	1928	15.0	14.2	11.7
1904	21.6	17.6	16.3	1929	16.7	14.6	13.4
1905	21.7	16.4	15.3	1930	16.1	14.1	11.4
				1931	14.7	14.5	—

TABLE 5.—Showing the number of deaths from the principal epidemic diseases during the past ten years.

Year	Small Pox	Typhus Fever	Typhoid Fever	Simple Contd. Fever	Scarlatina	Puerperal Fever	Membranous Croup	Diphtheria	Measles	Diarrhoea	Whooping Cough.
1922 ...	—	—	2	—	—	—	1	42	38	—	—
1923 ...	—	1	1	—	—	—	1	23	—	30	—
1924 ...	—	—	2	—	—	2	1	12	—	11	81
1925 ...	—	—	5	1	2	1	—	6	—	45	2
1926 ...	—	1	2	—	6	2	1	18	75	53	32
1927 ...	—	—	2	—	6	5	2	7	1	24	—
1928 ...	—	—	2	—	4	3	1	21	—	26	8
1929 ...	—	1	1	—	3	—	1	32	12	24	30
1930 ...	—	—	—	—	6	1	1	64	26	31	4
1931 ...	—	—	1	—	—	1	—	24	—	34	5

Summary of Births and Deaths Registered during the years 1878 to 1931, inclusive, in the Cork Urban Sanitary District (exclusive of Deaths in Public Institutions of persons admitted from other localities), with the number of Deaths from some of the principal causes

Year	Area in statute Acres	Census Statistics		Rate per 1,000 persons represented by	BIRTHS										Total Number	Under 1 year of age	At 65 years & upwards	Number caused by													Inquest Cases	No. in Public Institutions	Number of Uncertified																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		Population	Persons to an acre		BIRTHS	All Causes	Deaths from	Popl. Zymo- tic Diseases	Typhus	Scarlet Fever	Whooping Cough	Diphtheria	Simple, contid. & Ill-defined Fever	Enteric Fever				Diarrhoea	Influenza	Pneumonia	Tubercu- lous Diseases	Cancer	Diseases of Res- piratory System	Violence																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
1878...		31,7	27,0	...	2,546	2,464	350	681	61	1	59	1	58	75</

* Including 23 from Influenzal Pneumonia.

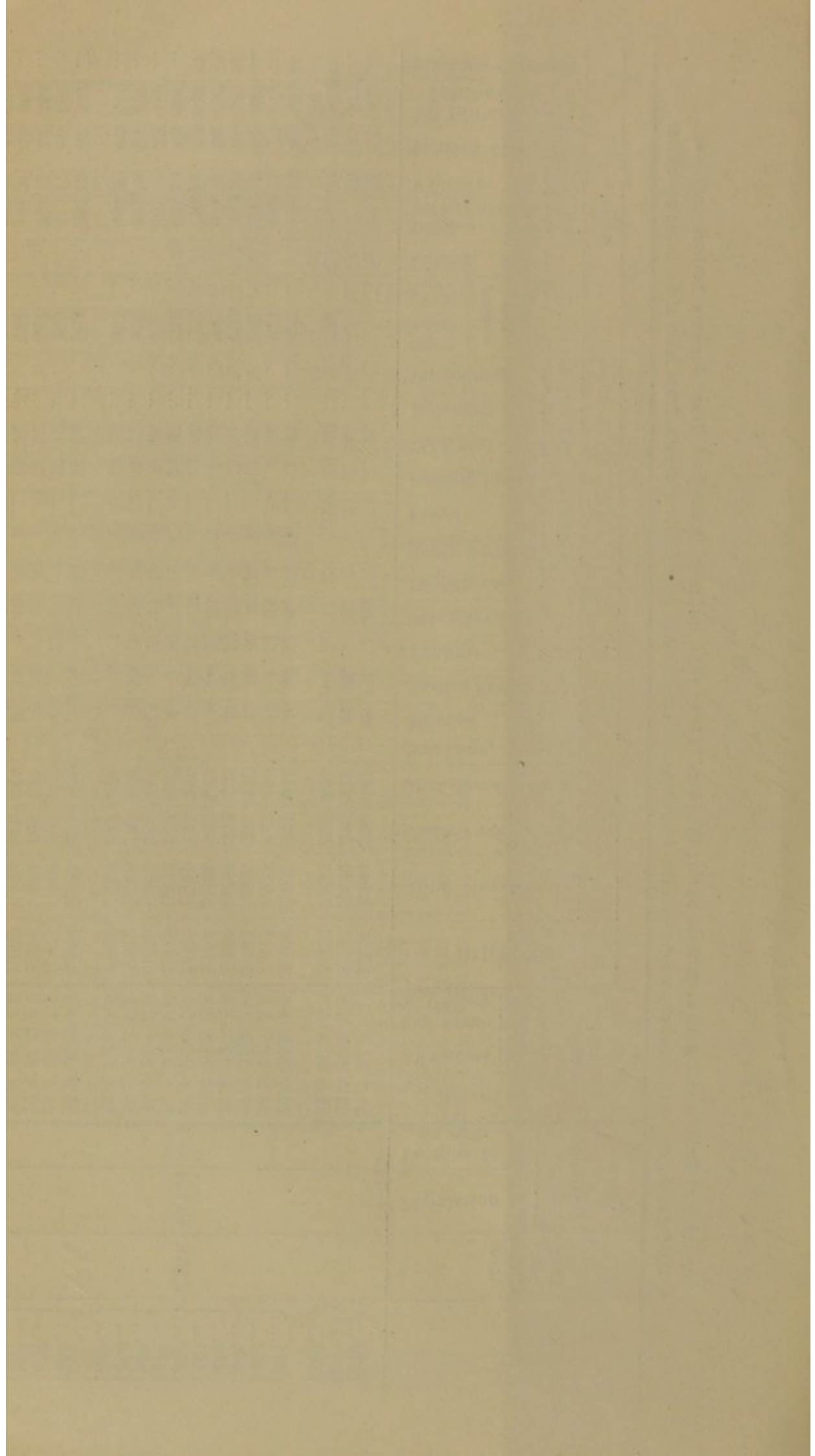


TABLE 6.—INFANTILE DEATH RATE.

Year	Births	Deaths under 1 year	Deaths per 1000 Births	Year	Births	Deaths under 1 year	Deaths per 1000 Births
1878	2546	350	137	1905	2099	276	131
1879	2707	319	117	1906	2094	279	133
1880	2620	376	143	1907	1946	254	139
1881	2167	271	124	1908	2084	281	134
1882	2212	282	127	1909	2000	251	125
1883	2161	236	109	1910	1965	189	96
1884	2199	253	110	1911	1992	277	139
1885	2054	247	120	1912	1903	204	107
1886	2037	225	110	1913	1853	253	136
1887	2042	252	123	1914	1897	226	119
1888	2058	288	139	1915	1778	235	132
1889	2023	253	125	1916	1732	182	105
1890	2005	214	106	1917	1552	169	108
1891	2024	281	138	1918	1559	189	118
1892	1978	297	150	1919	1825	183	100
1893	2092	268	132	1920	2169	173	79
1894	2062	310	150	1921	1887	144	76
1895	2179	287	131	1922	1853	173	93
1896	2144	229	106	1923	2007	133	66
1897	2073	316	152	1924	1990	175	87
1898	2160	285	131	1925	1827	136	74
1899	2060	276	133	1926	1687	220	130
1900	1944	235	120	1927	1701	148	87
1901	1942	272	139	1928	1764	135	76
1902	2031	258	127	1929	1816	156	85
1903	2066	232	112	1930	1998	155	77
1904	2089	249	118	1931	1921	138	71

Section III—Infectious Diseases

The following diseases are compulsorily notifiable in this area :—

Small Pox.	Measles.
Cholera.	Diarrhoea.
Typhus.	Acute Primary Pneumonia.
Typhoid (Enteric Fever).	Acute Influenzal Pneumonia.
Simple Continued Fever.	Malaria
Scarlatina.	Dysentery.
Puerperal Fever.	Encephalitis Lethargica.
Diphtheria	Varicella.
Membranous Croup.	Cerebro Spinal Meningitis.
Erysipelas.	Poliomyelitis.

The Infectious Disease (Notification) Act; 1889; was by a resolution of the Corporation, dated 7th February, 1890, adopted in the County Borough.

The Act was subsequently made to apply to the following diseases :—

Name of Disease	Date of Resolution making Act applicable.	Period in force.
Cerebro-Spinal Meningitis ...	13 July, 1900 ...	Till 31st December, 1900
do. ...	22 February, 1907	Till revoked
Varicella or Chicken Pox ...	7 March, 1902 ...	do.
Measles ...	26 May, 1905 ...	do.
Diarrhoea ...	14 December, 1906	1 July, 1907, to 31 Oct., 1907
do. ...	12 February, 1909	1 July, 1909, until revoked
Poliomyelitis or Infantile Paralysis ...	10 November, 1916	Till revoked.

The Infectious Disease (Prevention) act, 1890, was, by a resolution of the Corporation, dated 11th March, 1892, adopted and put in force in the County Borough.

The Public Health Acts Amendment Acts, 1907, was adopted and put in force by a resolution dated the 24th January, 1908, save as regards Sections 21, 24 to 33, 48, 66, 78 to 86 and 91 to 95.

By a General Order of the Local Government Board, dated the 7th March, 1919, known as the Public Health (Ireland), (Pneumonia, Malaria, Dysentery, etc.) Regulations, 1919, the Notification of cases of Malaria, Dysentery, Trench Fever, Acute Primary Pneumonia, and Acute Influenzal Pneumonia occurring in the District was made notifiable by Medical Practitioners, and at the same time the provisions of the Order were extended to cases of Enteric, Typhus and Relapsing Fevers.

The following Table shows the number of cases of Infectious disease notified each year for the past ten years.

Table 8.—Prevalence of Infectious Disease over a period of ten years, 1922—1931.

Disease	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931
Small Pox ...	—	—	—	—	—	—	—	—	—	—
Typhus ...	—	1	1	—	4	4	1	1	—	—
S. Continued Fever ...	—	1	—	—	2	1	—	—	1	—
Scarlatina ...	29	44	41	81	278	205	208	216	238	98
Puerperal Fever ...	1	1	3	4	4	14	7	6	6	1
Memb. Croup ...	5	4	3	9	11	11	15	4	5	1
Diphtheria ...	379	440	217	265	469	344	385	369	588*	288
Erysipelas ...	14	45	30	35	34	25	24	24	38	19
Measles ...	324	10	5	94	534	7	6	226	241	3
Malaria ...	—	—	4	—	—	—	—	—	—	—
Diarrhoea ...	19	35	30	142	108	76	79	78	59	85
Acute Primary Pneumonia	—	—	—	5	—	—	12	7	3	49
Acute Influenzal „	—	—	—	—	—	—	—	—	—	41
Varicella ...	29	30	54	117	59	76	64	80	72	71
Encephalitis Lethargica ...	—	—	2	1	1	3	—	2	1	1
Cerebro-Spinal Meningitis	—	—	—	—	—	1	1	—	—	1
Poliomyelitis ...	—	—	—	—	—	1	—	—	—	—
Typhoid ...	6	7	12	27	11	10	17	6	—	1
Para-Typhoid (B) ...	—	—	—	—	—	—	—	—	—	1

*In addition to the 588 cases of diphtheria notified during 1930, there were 36 cases of diphtheria and scarlatina, two cases of diphtheria and measles, and one case which was notified as "Diphtheria, Scarlatina and Measles." To the 369 cases notified in 1929, must be added three cases of Scarlatina and Diphtheria, and two cases of Diphtheria and Measles.

DIPHTHERIA.

In last year's Annual Report attention was directed to the very severe visitation of diphtheria which persisted throughout the year. This epidemic still manifested itself for the first few weeks of the present year and then began to dwindle very appreciably towards the middle of the first quarter. There was a slight recrudescence towards the end of the second quarter, and thereafter the diminution was very marked indeed, and was maintained up to the end of the year. The total number of notifications amounted to 288 as compared with 627 in 1930. The number of deaths registered was 24, as compared with 64 in the previous year. It is obvious, therefore, that there was a considerable diminution in the severity of the outbreak and the position of affairs during the latter months of the year justified one in hoping that we are at last within sight of the end of this scourge, which has been firmly entrenched in the city for the past fourteen years.

It is possible at this juncture to take stock and to examine the circumstances associated with the epidemic. Shortly after assuming duties in 1929 an examination was made of the former records of the Public Health Department in regard to infectious diseases with a view to ascertaining what the position then was. It was at once apparent that there was an undue prevalence of diphtheria and that the abnormal incidence dated from the year 1919. Further inquiries were instituted

in regard to the actual incidence per thousand of the population, and the case mortality as compared with other centres of population in this country and in England. A disquieting situation was revealed.

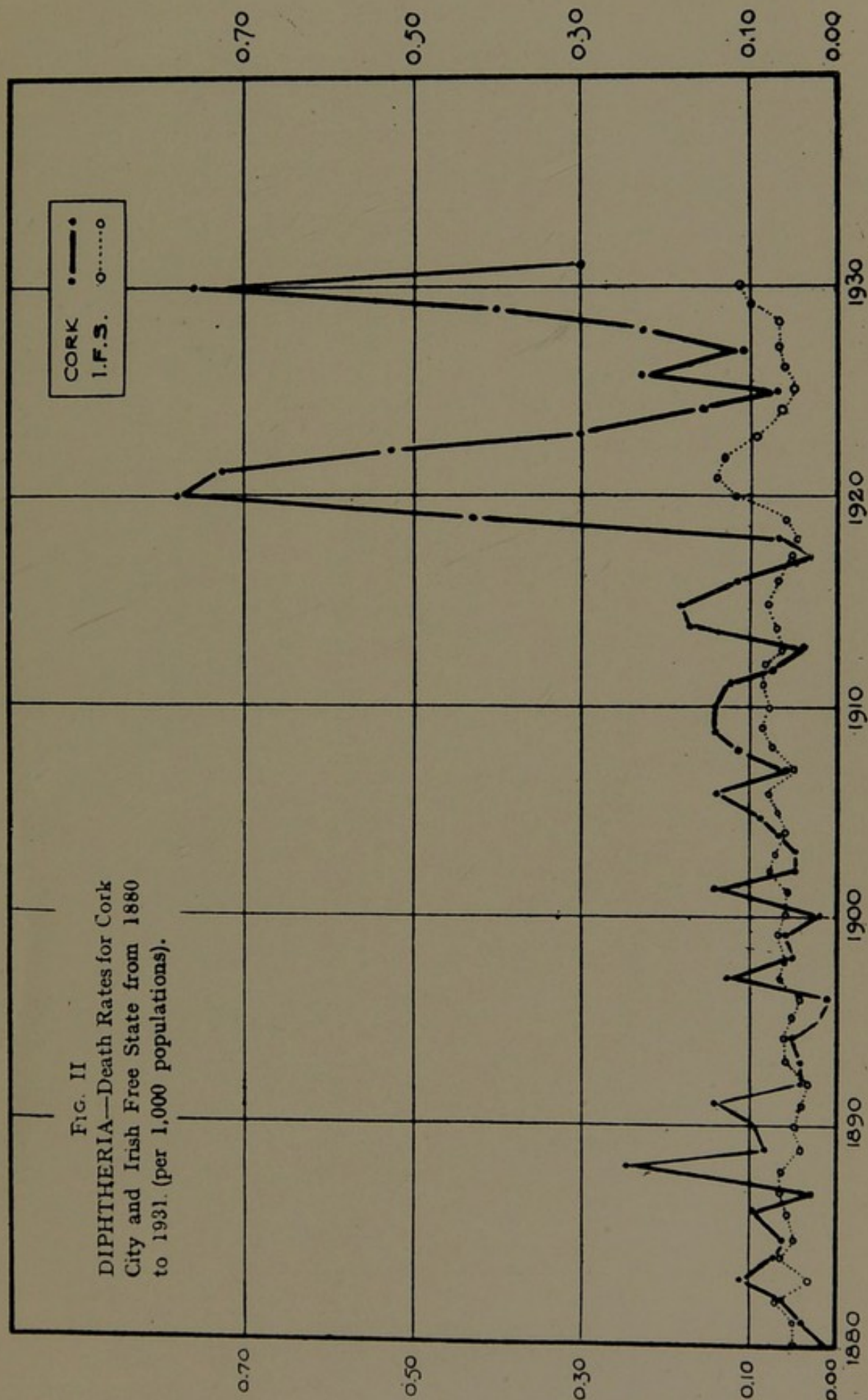
So far as this city is concerned notifications were available from the year 1889 onwards, but for comparative purposes one was restricted to the year 1906 and those subsequent to it. From 1906 to 1918 the number of cases notified was quite moderate, averaging about 30 each year. In the latter year there were actually 34 cases notified. In 1919 the number rose to 260, in the following year it was 420, and in 1921 the number of cases was 540. This was the highest number ever recorded prior to 1929. Subsequent to 1921 there was a slight falling off in the number of cases but nothing like the rate existent prior to 1919. 379 cases were reported in 1922, 440 in 1923; 217 in 1924; 265 in 1925; 469 in 1926. In 1927 the number fell again to 344, but thereafter it increased steadily in each subsequent year until it reached its peak in 1930 with a total of 588 cases equivalent to a rate of 7.9 per 1,000 of the population, which must be one of the highest figures ever recorded. The figures for the present year are equivalent to a rate of 3.5 per 1,000, and are still greatly in excess of what may be termed standard rates.

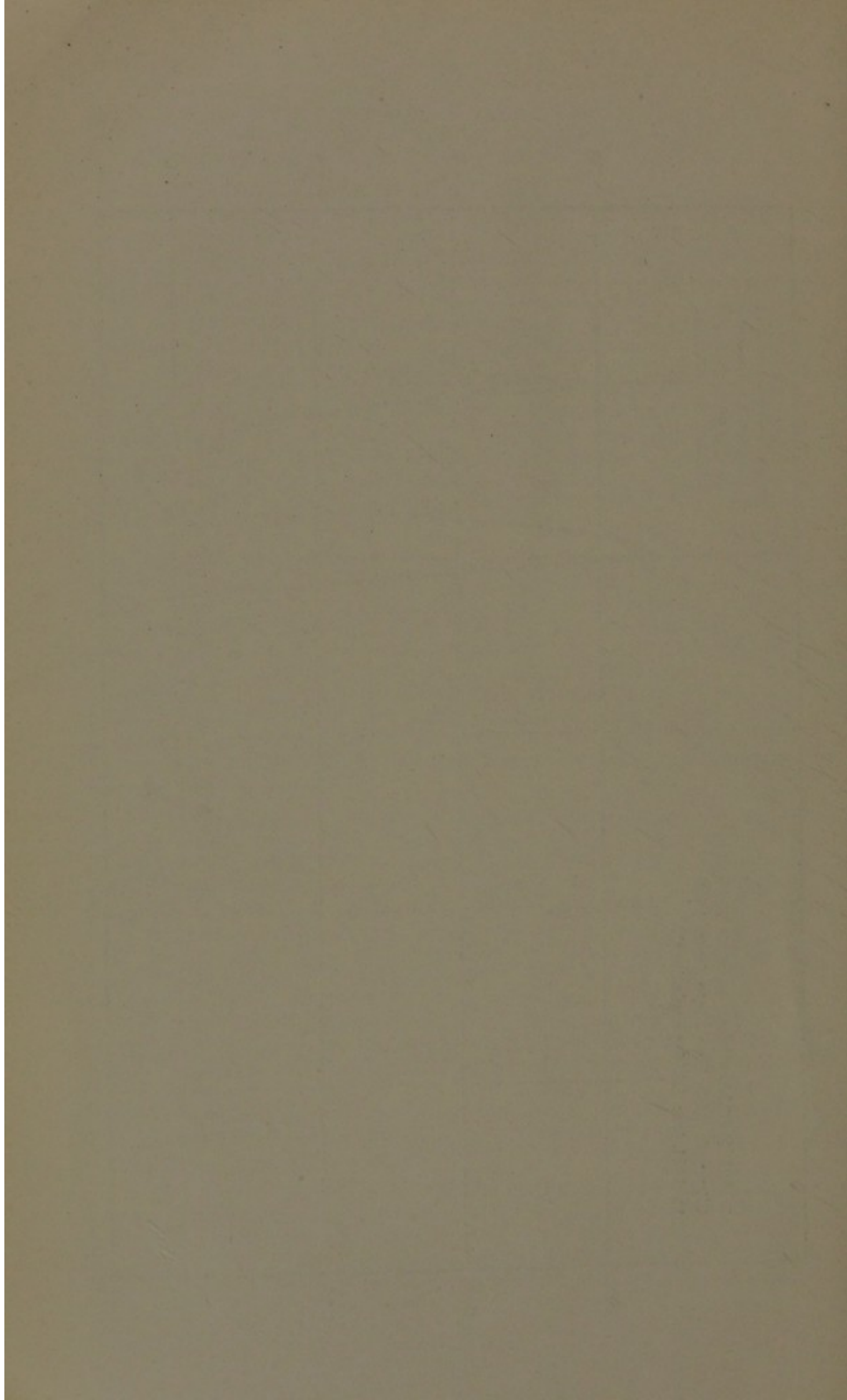
As regards the number of deaths from the disease, the records of the Department go back to the year 1878. During the forty years covered in the period 1878 to 1918, with the exception of two years (1880, 13 deaths, and 1888, 18 deaths) the number of deaths was not unduly high and averaged 5 to 7 per annum. Synchronising with the increased number of cases in 1919 there was a sharp rise in the death rate. In 1918 there were 7 deaths, in 1919 thirty-two, and in 1920 there were sixty deaths. After that year the number fell. In 1921 there were 56 deaths; 47 in 1922, 27 in 1923, and in 1926 the number fell to 6, but thereafter it rose again until 1930 when 64 deaths were recorded. The figures are set out in Tables 5 and 7.

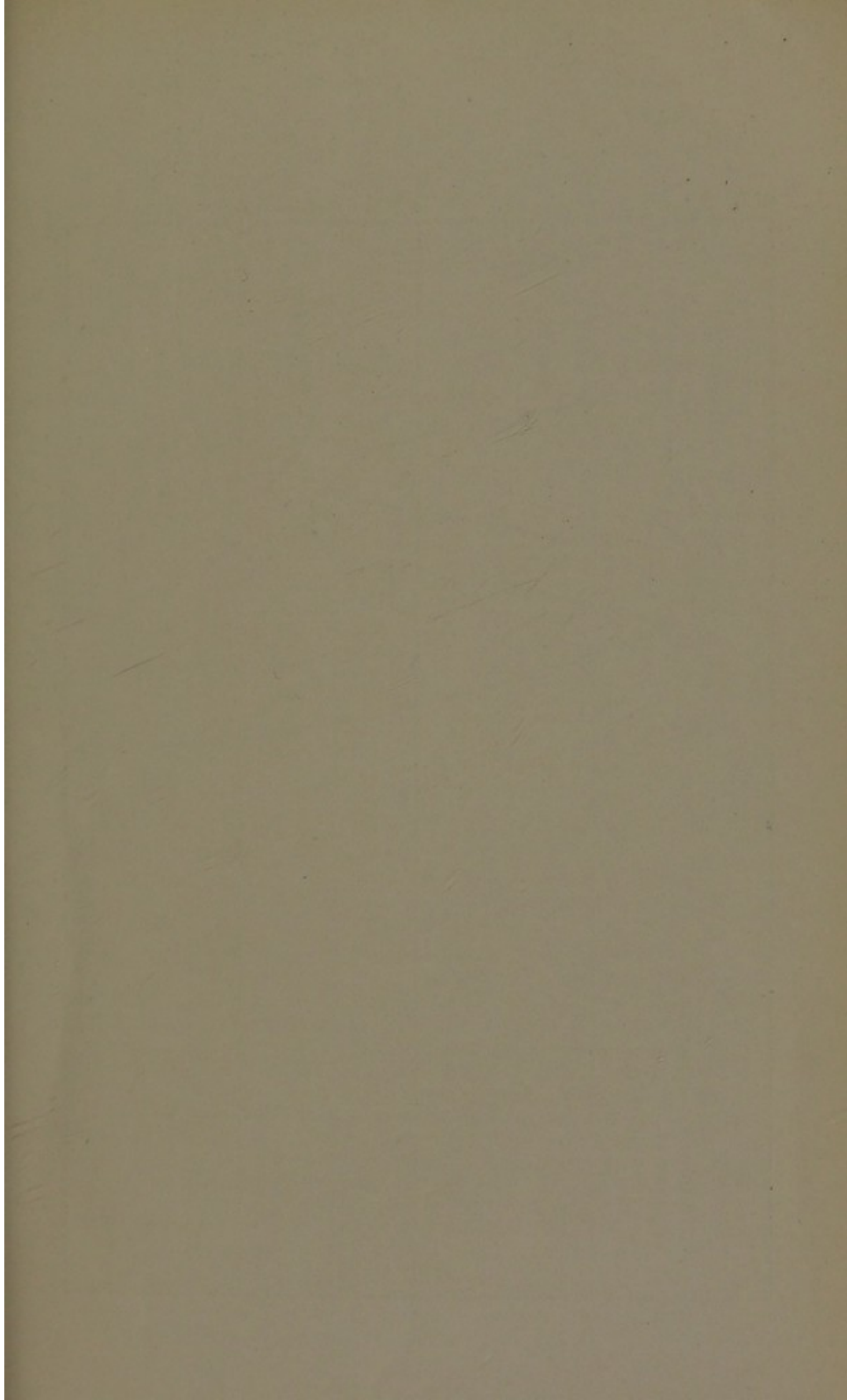
It may be argued that these figures do not represent the true picture, that notification was defective in former years and that consequently the discrepancy between the figures for these years and those subsequent to 1918 is not in reality so great as it appears to be. This possibility was borne in mind and in order to test it an examination was made of the death returns for diphtheria for the country as a whole and for Cork City. The result of this enquiry is set forth in diagrammatic form in Fig. II. An examination of this diagram shows clearly that there are no grounds for this supposition and that the figures actually represent the true position. It will be noted that while the figures for Cork City from 1880 to 1918, range somewhat higher than those for the whole country there is a very marked divergence from the year 1919 onwards corresponding exactly with the period of epidemicity in the city. On the basis of the numbers of figures for deaths represented by this Graph, there is no doubt that there was a great increase in the number of cases of diphtheria occurring in Cork City during this period.

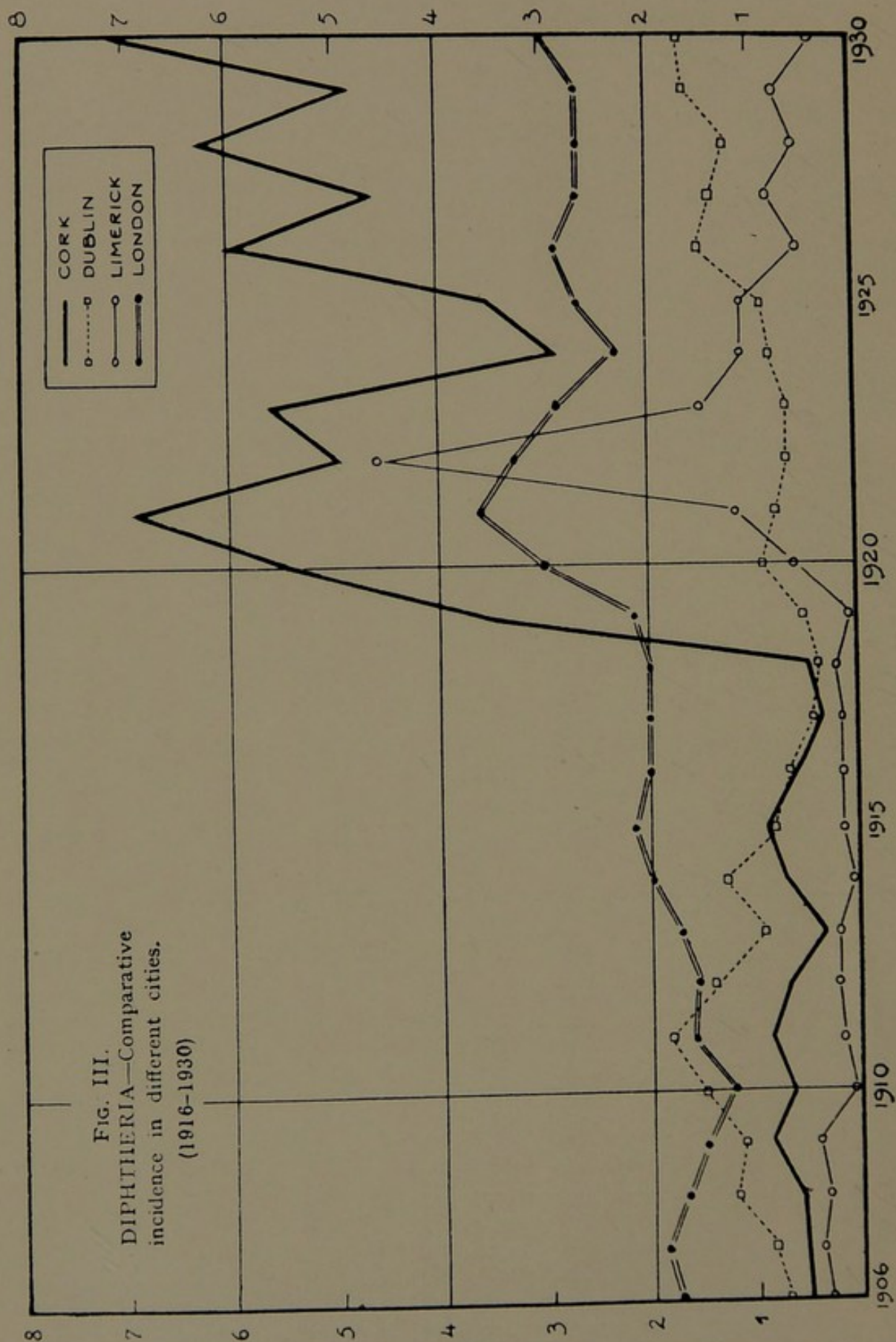
It was further decided to institute a comparison between the incidence and mortality from the disease in Cork City and in other urban areas. In this connection I have to acknowledge the invaluable assistance which I have received from the Chief Medical Officer of the Ministry of Health and the Medical Officers of Health of the London County Council and

FIG. II
DIPHTHERIA—Death Rates for Cork
City and Irish Free State from 1880
to 1931. (per 1,000 populations).









of the cities of Birmingham, Manchester, Dublin, and Limerick, who kindly supplied me with the figures for their respective areas. Subsequent to 1928 these figures are supplemented from the annual reports of the Bodies concerned. Owing to the fact that the central collection of notifications was not instituted until 1911 figures for England and Wales are not available prior to that year. The results of this enquiry are set forth in Table 9.

Table 9.—Shewing the incidence (per 1,000 of population) of Diphtheria in England and Wales, Cork City and other Urban areas from 1906 to 1931.

Year	Cork	Dublin	Limerick	London	M'chester	B'ham	E. & W.
1906	0.48	0.7	0.33	1.80	0.86	1.46	—
1907	0.48	0.8	0.41	1.90	0.78	1.81	—
1908	0.56	1.2	0.31	1.70	0.83	1.49	—
1909	0.86	1.1	0.39	1.50	0.91	1.38	—
1910	0.65	1.5	0.07	1.20	0.70	1.28	—
1911	0.91	1.8	0.15	1.64	0.81	1.32	1.33
1912	0.67	1.4	0.18	1.57	0.80	1.17	1.24
1913	0.31	0.9	0.18	1.70	1.01	1.42	1.39
1914	0.70	1.3	0.02	2.02	1.20	2.22	1.59
1915	0.88	0.8	0.05	2.11	0.82	1.43	1.52
1916	0.55	0.6	0.07	2.06	0.94	1.17	1.50
1917	0.33	0.4	0.07	2.06	0.92	0.92	1.28
1918	0.43	0.4	0.15	2.07	0.92	1.07	1.31
1919	3.37	0.5	0.02	2.18	0.77	1.17	1.50
1920	5.50	0.9	0.72	3.05	1.30	2.03	1.86
1921	6.93	0.8	1.13	3.62	1.40	1.82	1.76
1922	4.86	0.7	4.70	3.37	1.12	1.42	1.37
1923	5.68	0.7	1.56	2.27	0.73	1.75	1.05
1924	2.85	0.8	1.17	2.31	0.75	2.12	1.07
1925	3.50	0.9	0.53	2.73	1.37	2.37	1.23
1926	6.10	1.5	0.81	2.96	1.53	2.47	1.31
1927	4.55	1.4	0.81	2.70	1.57	1.60	1.33
1928	6.37	1.3	0.32	2.70	1.58	1.66	1.55
1929	4.7	1.7	0.75	2.7	1.20	2.38	1.59
1930	7.9	1.7	0.56	3.0	1.37	2.35	1.84
1931	3.5	1.5	1.74	1.9	0.75	1.16	—

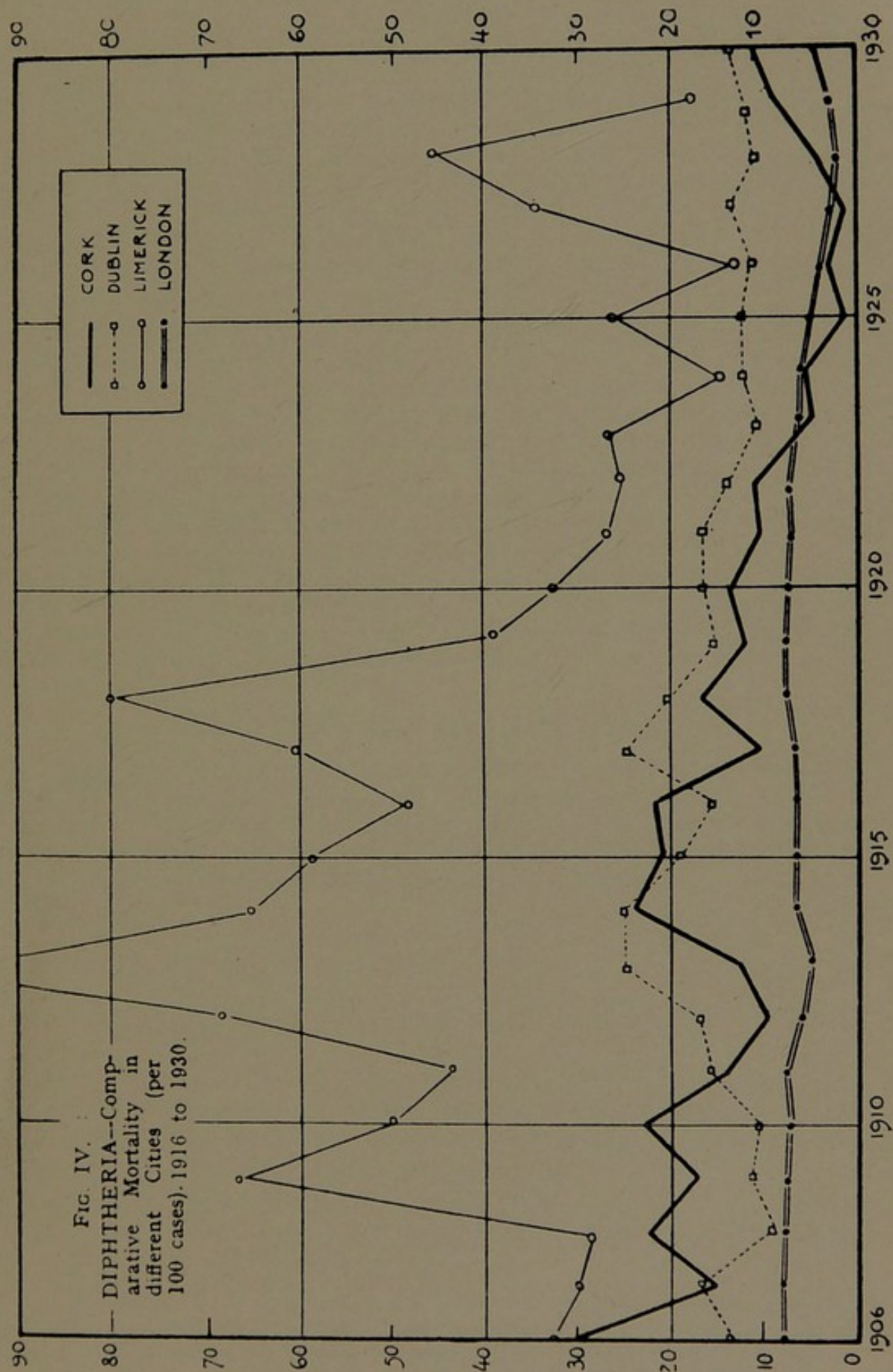
From these figures it has been possible to construct a graphical record shewing the comparative incidence in the different areas. This diagram, which is complete up to the end of 1930 only, appeared in last year's Report and is included again this year for reference (Fig. III.). Of the English Cities, London only has been included, nor does England and Wales as a whole appear. Additional curves would only serve to render the picture confused and since the incidence in London has been distinctly higher than any other part of England and Wales it will be sufficient for the purpose of comparison. It will be perceived that from 1906 to 1918 the incidence in Cork City was slight and indeed one would go so far as to say that in all probability it was the lowest of the group, notwithstanding the apparent position occupied by the City of Limerick, which will be considered in further detail when discussing the question of mortality. From 1919 onwards the incidence was very heavy and far greater than any other city. One would particularly draw attention to our position in relation to the City of London. In the latter there would appear to be a slight tendency to rise (although a very appreciable

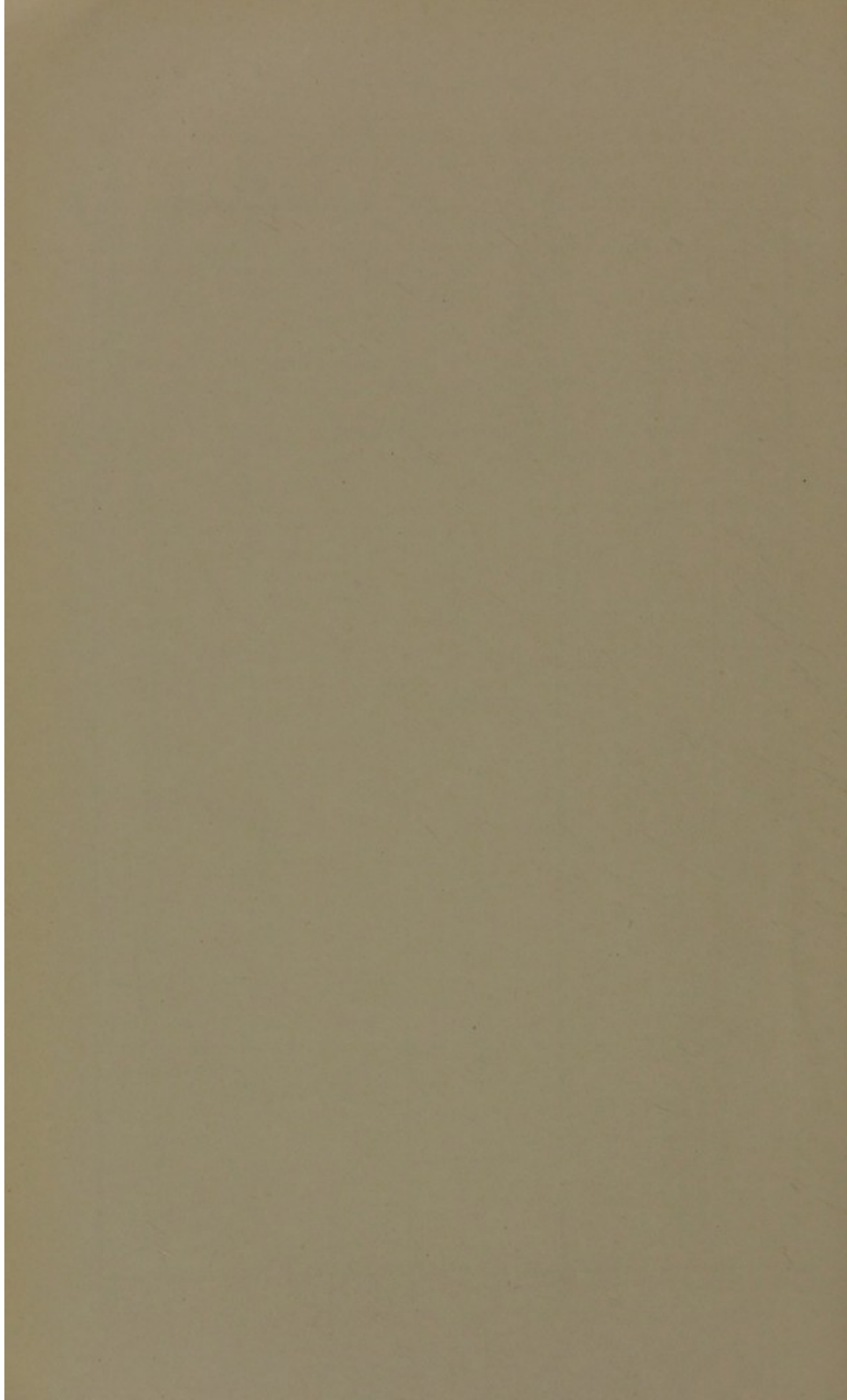
fall has been recorded for the present year as shown in Table 9.). Prior to 1918 the incidence was considerably greater than ours. In 1920 and 1921 it rose sharply (as did Limerick a year later) but to nothing like the same extent as in Cork. It has been shown (Forbes—"Prevention of Diphtheria") that the average incidence of diphtheria in London has been higher than any other city in England for the past fifteen years and indeed London is said to have a higher incidence than any other European city. The relative incidence of the disease in our own city may be estimated from these facts.

Table 10.—Case-mortality from Diphtheria in England and Wales, Cork City and other Urban areas from 1906 to 1931.

Year	Cork	Dublin	Limerick	London	B'ham.	E. & W.
1906	29.7	14.0	33.3	8.8	11.8	—
1907	13.5	15.1	30.7	8.9	10.9	—
1908	22.5	9.3	28.5	9.0	13.7	—
1909	16.6	12.3	66.5	8.9	14.7	—
1910	19.2	10.3	50.0	8.1	10.5	—
1911	14.2	15.6	42.8	8.5	10.0	10.3
1912	11.5	17.1	—	6.5	13.0	9.6
1913	12.5	24.5	100.0	5.6	17.0	8.7
1914	24.0	14.9	66.6	7.8	16.0	9.8
1915	20.5	19.5	—	7.7	13.0	10.9
1916	20.9	16.1	50.0	7.0	12.0	10.4
1917	11.5	25.2	60.0	7.2	14.0	10.3
1918	17.6	20.5	85.5	8.2	18.0	11.0
1919	12.2	14.4	38.4	8.2	13.0	9.1
1920	14.0	16.4	32.7	7.4	11.0	8.1
1921	10.3	17.8	26.4	7.0	7.0	7.2
1922	11.0	12.8	26.2	7.5	7.0	7.8
1923	5.1	10.5	27.2	5.9	9.0	6.8
1924	5.4	12.1	13.7	5.3	5.0	6.0
1925	2.1	11.9	25.0	3.9	4.0	5.8
1926	3.7	11.4	8.5	4.0	5.0	5.9
1927	2.5	13.6	25.0	3.2	4.0	5.2
1928	4.7	10.8	15.3	3.2	4.4	5.0
1929	8.4	11.2	10.3	2.9	5.3	5.4
1930	10.0	12.2	18.1	3.4	5.2	4.7
1931	8.3	11.4	10.2	3.0	5.3	—

The case mortality from the disease is set out in Table 10 and, diagrammatically, in Fig. IV, in both of which comparisons are also instituted with the areas already specified. Some striking facts are brought to light by the graph, the principal of which is the heavy mortality in Irish cities as compared with the City of London which is fairly typical of English cities generally. There is also the steady downward trend so far as Cork is concerned and a similar, though less marked trend for Dublin. For Cork this trend reached its lowest phase in 1924 and 1927 since when it has taken an upward course. The marked fall in the incidence which characterised 1931 has not been accompanied by a corresponding fall in the case mortality which was 8.3 per cent as compared with 10 per cent in 1930. Perhaps the most remarkable feature of the graph is the apparently enormous mortality of the disease in Limerick. So great was this in the year 1913 that it could not be included within the scope of the diagram. On comparing the figures





of mortality with those for incidence there is but one of two conclusions to be reached, (a) that the nature of the prevalent infection in Limerick is one of extraordinary virulence or (b) that there has been widespread neglect of notification in that city. The latter is, of course, the more likely explanation and there is evidence that up to the last two years notification has indeed been so neglected. In constructing Fig. III, it was evident that the incidence (with the exception of the years 1922 and 1923) was abnormally low and the cause of this became at once apparent when the graph for mortality was constructed. Probably if all the cases of Diphtheria which had occurred in Limerick during the years under review had been notified, the curve of mortality from the disease would have been much more in conformity with those of the other three cities.

The main facts emerging from this enquiry are (1) that since the year 1919 the incidence of diphtheria in this City has been abnormally high, greater probably than any other city in Europe and (2) that notwithstanding the relatively low case mortality as compared with other Irish cities it has taken a very heavy toll of child life. Since 1919 no less than 401 children have died from it. The position of affairs outlined above was what was revealed by the enquiry undertaken early in 1929 and it would be difficult to picture anything more serious. The question then arose as to the best means of effecting a reduction to normal limits of the very high incidence and the consequential reduction in the mortality. Before recommending a definite policy it was necessary to consider all the available means at our disposal for combatting the disease and the manner in which they were being utilized.

THE PREVENTION OF DIPHTHERIA.

The introduction of anti-toxin in 1890 was followed by a remarkable fall in the mortality from diphtheria. Unfortunately there has been no comparable reduction in the incidence. If anything, there appears to be a tendency for it to increase. Hitherto the methods relied upon for the prevention of the disease have consisted mainly of :—

- (1) Notification.
- (2) Prompt isolation of the patients.
- (3) Period of quarantine for contacts with exclusion from school of all children.
- (4) Steam disinfection of bedding, wearing-apparel and other clothing used by the patient. (Under this heading should also be included sterilization by boiling of cups, saucers and all other utensils used by the patient).
- (5) Disinfection by fumigation of the apartment occupied by the patient. This practise is now being abandoned by a large number of sanitary authorities.

The object of notification is, of course, to enable the local authority to take steps to prevent the spread of infection, by means of the subsequent steps outlined above. Of these by far the most important is the isolation of the patient by removal to an hospital for infectious diseases and it is

only in very exceptional cases that the sanitary authority permits the case to be nursed at home. Owing to the peculiar circumstances associated with the spread of this disease (which will be discussed later) these measures have met with limited success, and the disease continues to be a source of anxiety to those concerned with the health of the community. Owing to the partial failure then of the current practice of administrative control it was necessary to seek for other means of preventing the disease, but before doing so it was advisable to consider the means by which it was spread and their relation to our particular problem.

Diphtheria is due to a specific micro-organism found in the nasal and throat secretions of persons suffering from the disease. The presence of this organism is essential for the development of the disease. It is generally recognized as not being of a very high degree of infectivity and fairly close contact is necessary between the persons concerned before it can be transmitted from one to another. In the main transmission from the sick to the healthy takes place during the acts of coughing and sneezing whereby large numbers of the bacteria may be projected in the form of an invisible spray to a certain distance from the patient. The suspended organisms are then inhaled by other persons and may set up the disease in them. This form is known as "droplet infection." The disease, may, of course, also be spread indirectly through the media of spoons, cups and other utensils used by the infected person or his clothing. A very common means of transmission in schools is the habit which children have of sucking their pencils and then handing them around to one another.

A most potent factor in the spread of the disease is the "carrier." As is now becoming generally understood, the carrier is a person who may harbour the germs of the disease in his throat and nose and yet remain quite healthy but who nevertheless is capable of transmitting it in virulent form to others who are less resistant than himself. It is particularly in the case of schools that the role of carrier is important and experience both in the County and City had shown that epidemics in schools were undoubtedly initiated and maintained by children who were carriers. In several cases children were found to harbour the germ for many months after suffering from the disease and in many other cases they had never even had an attack of the disease. The part which the carrier plays in the spread of the disease illustrates the difficult nature of the problem which faces sanitarians in preventing it.

As has been said above a certain number of children harbour the germs of the disease in their throats after suffering from the disease. The period during which they will remain infective is very variable, but it is certain that nearly all of them will be infective for some period after convalescence has been attained. In order to reduce the risk of such children spreading the disease after discharge from hospital it was arranged that their throats and noses should be swabbed and examined and that no child be discharged until two successive negative swabs had been returned. This is not an absolute safeguard, as it is well known that patients may again become positive after such negative returns, but it was the most that could be imposed on the hospitals at the time and certainly has served as a check on the spread of the disease by such cases. "Return" cases are not so frequent now as they were before

this system was introduced. The hospitals were working to full capacity and one could not look to them further to check the spread of the disease by longer detention of patients. Any such innovation would have meant an inability to deal with fresh cases arising and a far greater likelihood of the disease being spread, further afield. The only alternative would appear to have been an extension of the hospital premises together with more stringent regulations in regard to swabbing and detention. A procedure such as this would have added enormously to the expenses of administering the hospitals in addition to the large capital expenditure necessary for extending them.

The position of affairs was apparently very gloomy. We had the highest incidence of diphtheria in the British Isles. A large number of children died from the disease every year. Our hospitals were taxed to their fullest capacity and the over-crowded nature of many of our schools favoured the propagation of the disease. Large sums of public money were being expended annually in treating the disease and if reliance was to be continued in existent methods still more expenditure would have to be incurred to check its spread. There was, fortunately at our disposal a simpler and more speedy method of preventing the occurrence of diphtheria.

ACTIVE IMMUNISATION AGAINST DIPHTHERIA.

Since the introduction of the Schick Test for immunity to diphtheria in Vienna in 1913 and the standardization of toxin-antitoxin and its application to children in New York in 1913-14 by Park and Zingher, this method of prevention of diphtheria has made enormous strides and has been practised with success in many parts of the world. In New York alone over quarter of a million children have been immunised since 1918 and reference to the statistics shows in a very striking manner the beneficial effects not only on the incidence but also the mortality of the disease. In Chicago over 179,000 children have been immunized, in Boston 58,000, and in other cities of the United States similar figures and results are shown. The method has been extensively practised in European countries also, particularly France, Belgium and Holland. In Great Britain it has not been practised on such an extensive scale. Up to the end of the year 1925, 54,000 persons had been tested for immunity and of this number 26,000 were immunised.

These figures are quoted to demonstrate that diphtheria immunization is now an established fact, based on sound scientific principles. It is not necessary at this stage to go into the details of its technique or to dilate further on its merits than to state that it afforded a safe and reliable solution to most of the problems which faced us in this city. In the light of established facts one has no hesitation in saying that if practised on a sufficiently extensive scale over a few years it would reduce the incidence of the disease amongst us to vanishing point. One thing is perfectly clear concerning it, that after three injections of the immunizing agent something like 90 per cent of those who have been so injected will be immune to diphtheria after three to six months. This being so it only remained to place at the disposal of the citizens the means of protecting their children against this very dangerous disease, the hazards of which were so much greater in this city than practically any other in Europe.

It was in these circumstances that it was decided in June 1929 to introduce immunisation against diphtheria and to initiate a public campaign in favour of it. The first opportunity of doing so was afforded by the local Rotary Club which extended an invitation to the Medical Officer of Health to address one of its weekly meetings on the subject. This address was given full publicity by the press and was followed in short time by another to the teachers of the City and County, which, in the light of subsequent events, achieved a marked degree of success. School managers and clergy were interviewed all over the City and gave their whole-hearted support to the project. In addition to numerous lantern slides which were exhibited free in all the local cinemas three cinematographic pictures dealing with the subject were also shown during the campaign. A large amount of literature in pamphlet form was distributed throughout the City. Active canvassing was undertaken by sanitary inspectors, school nurses and health visitors and in addition to all these agencies there was the ever present menace of the disease itself which undoubtedly was a big factor in inducing many parents to submit their children for treatment.

It has been stated, and with a certain amount of justification, that an epidemic period is an unsuitable time for the introduction of immunisation. Development of immunity after treatment is slow and there are bound to be cases in which the disease will ensue before there has been time for the full development of protection. Such cases are liable to react unfavourably against the scheme. (Such cases did actually occur, but they were more than offset by numerous others in which the disease picked-out the only non-immunised child in a household for attack). This risk had to be faced and an additional one from the fact that cases of diphtheria were steadily mounting up and that the stage seemed all set for another big epidemic. It might be said that such increase was due to the introduction of immunisation—and such was actually stated subsequently. But what was the alternative to immunisation? There was only one—to adopt an attitude of *laissez faire* and allow the disease to run its course.

One had only to re-consider the history of the disease for the previous nine years in order to realise that such a policy could lead nowhere that, so far as one could judge, there was no prospect that the disease would actually run its course and come to an end if allowed to do so. Up to this time all available methods had failed to check the disease. Hospitalisation and quarantine had been rigidly enforced. The hospitals themselves were old and inadequate and numerous cases of cross-infection had been reported. Many children were dying from the disease and there was a marked sense of uneasiness all over the City in regard to it. The previous history of the disease gave no indication that there was any finality within sight for years to come. All these circumstances were carefully considered and the conclusion was reached—based on the experience of other cities—that the only hope of amelioration lay in the widespread application of immunisation and for this reason it was decided to incur the risks alluded to above in the interest of the community as distinct from that of individuals.

The first clinic was held during the first week in June, 1929, and in the course of a few weeks the attendances assumed large proportions. By the end of the year, 1,802 children had received the full course of

treatment, In 1930; 2,857 cases were treated and during last year, 1,777. This brings to the end of 1931 a total of 6,436 children who have been fully treated. In addition there were 941 cases who did not complete the full course. It is not necessary to go into details further than this at the moment. The cases treated up to the end of 1930 have been dealt with in my report for that year and the cases treated in 1931 will be considered later.

It is regrettable that there has been a falling off in the number of attendances in 1931 as compared with 1930 but this has been due to many causes, in particular the abatement in the severity of the epidemic which appears to have lulled a good many parents into a false sense of security. In addition a special drive was made in the schools in 1930 in which large numbers of children were handled. It was not possible to repeat this in 1931. There is one satisfactory feature in regard to the 1931 figures and that is the large proportion of infants. Owing to limitation of staff it is not possible at this juncture to present the actual numbers, but there is no doubt that children of twelve months and under figured very largely among the cases treated. This is very important and if one could but insure a steady flow of such cases there would be much cause for satisfaction.

The following is an analysis of the cases dealt with in 1931 :—

A.—Primary Schick Tests (i.e., before treatment).

Positive	...	...	...	...	274
Negative	...	...	...	...	324
Total	...	...	...	...	598

It will be noted that only 45.8 per cent of these results were positive, this is in marked contradistinction to the results obtained in 1929, when out of a total 1,170 test, 78.3 per cent were positive. The great majority of the primary test of 1931, however, were made upon children in institutions and it has been found in similar institutions in England that there is a higher level of negative results among such than amongst children generally. At the same time one noted that amongst children receiving primary tests at the clinic the proportion of positive results was much lower than formerly.

B.—Secondary Schick Tests (i.e., after treatment).

Positive	...	...	...	...	175
Negative	...	...	...	...	991
Total	...	...	...	...	1166

It will be noted that 85 per cent of the cases were negative after treatment (as compared with 82 per cent in 1930). As a good number of these tests were carried out upon the institutional children referred to above within six weeks of treatment it is probable that the percentage of negative reactors has been affected thereby and that it would have been still higher if the test had been performed after the lapse of the usual four or five months. The figures emphasize the necessity for the secondary Schick Test. It is a matter of the greatest importance that all children should be tested some time after the treatment in order to ascertain whether they are fully immunised or not. It is seen that

some 15 per cent are not fully protected by the three doses and that a further dose is necessary. These cases are liable to develop diphtheria if exposed to infection and even though, as our experience has shown the infection is almost invariably of comparatively mild character, they are always a source of anxiety. It is a matter though of some satisfaction to be able to say that parents now realise that the secondary test is an integral part of the treatment and that they realise that the blame, if any, attached to such cases lies in their own default rather than in any inherent defect in the method of immunisation. During 1931 there was no single instance of diphtheria in an immunised child who was known to be Schick negative after treatment. Only one such case has been reported so far in the whole series of cases treated by us, and in that instance the diagnosis was not absolutely unequivocal.

Each of the 175 positive reactors enumerated above received a further injection and of this number 67 re-attended for further tests, the results of which were as follows:—

Positive	...	...	...	...	7
Negative	...	...	...	...	60
Total					67

The seven positive reactors received a further dose and two of them subsequently attended for a third Schick Test and were found to be negative.

These cases illustrate the fact that there are certain children whom it is very difficult to immunise. Such individuals are referred to as "immunologically obstinate," but it is evident that they can be eventually immunised and there is evidence that with improved technique in the preparation of material protection will be more readily forthcoming in the future.

C.—New cases treated during the year.

Number who completed treatment	...	...	1,777
„ „ received TWO injections only	...	...	216
„ „ „ ONE injection „	...	...	220
TOTAL			2,213

There was a fairly considerable falling off in the number of cases who received the full course during 1931, as compared with the two previous years (2,857 in 1930 and 1,802 during six months in 1929) but this is, in large measure, due to the causes which have been stated above. A special effort is now about to be made to reach the very young children in order to ensure that as large as possible a proportion of them shall have been protected before they reach school-age and are exposed to the hazards associated with that period of life. That these dangers are real, particularly so far as diphtheria is concerned, is clearly shown in the next section which deals with the trend of the disease during the year.

Of the twenty-four children who died from diphtheria in 1931, none had been immunised, either completely or partially. Such a death has yet to be recorded. There seems no doubt that, while in a few cases the treatment does not completely protect against attack, it certainly modifies the severity of the disease.

That the benefits of immunisation have come to be appreciated by the citizens generally there is very little room to doubt. The fact that over 6,400 children have received the full course of treatment and that 1,768 primary and 2,099 secondary Schick Tests have been performed is sufficient evidence of that. The immunisation clinic has now become part of the routine administrative services of the Public Health Department and if the attendances continue at their present level there is every justification for continuing it as such.

TREND OF DIPHTHERIA DURING 1931.

As stated in the opening paragraph of this section the number of recorded cases during the year was 288, less than half of the total during the previous year. In addition to these 288 cases quite a large number of notifications were received by this Department in which the diagnosis was not confirmed after admission to hospital. These cases amounted to 97. It was possible to arrange for a closer supervision over notifications in 1931 than in former years and in this matter we had the co-operation of the Medical officers of the two hospitals. In addition, the decline in the number of cases enabled us to have swab examinations made of all admissions during the year. Swabbing of admissions had never been practised hitherto, and was of some considerable assistance to the Resident Medical officers in doubtful cases. The onus of providing this service should not rest in the Public Health Department but on the hospitals concerned and should be a routine procedure in all cases. An analysis of such cases is made in the following table:—

Table 11.—1931. Analysis of notifications in which a revision of diagnosis was made after admission to hospital.

Age groups	Males	Females	Total
0—1 year ...	1	1	2
1—5 years ...	5	10	15
5—10 years ...	5	26	31
10—15 years	5	5	10
15—20 years	1	9	10
20 and over ...	12	17	29
Totals ...	29	68	97

It will be noted that over a third of these cases fall into the group of fifteen years and upwards and it is probable that a somewhat similar proportion of wrongly diagnosed cases was represented in previous years when no special attention was directed towards the subject. This suggestion was thrown out in my report last year on the basis of our findings in connection with immunised cases reported as suffering from diphtheria which were specially investigated by us. Against the supposition was the high death rate (10 per cent of all reported cases) so that if one eliminated approximately one-third of the cases the mortality would have been still higher. On the other hand if all the reported cases were included in this year's returns the mortality would be reduced from 8.3 per cent to 6.2 per cent. There seems no doubt however that the figures given are the true ones.

Table 12.—1931. Analysis of Diphtheria cases.

Age Groups	Males	Females	Total
0—1 year	2	1	3
1—5 years ...	56	45	101
5—10 years ...	42	57	99
10—15 years	19	27	46
15—20 years	2	9	11
20 and over ...	9	19	28
Totals ...	130	158	288

As was the case last year the incidence fell most heavily on the 1-5 and the 5-10 years groups illustrating not only the greater susceptibility of children of these ages but the influence of school attendance in spreading the disease. 200 of the 288 cases are included in these two groups. Of the remaining 88 cases 28 occurred in the group 20 years and over. This is a fairly high proportion and there has been no question as to the diagnosis as all these cases were suspect from this point of view. There seems to have been a tendency of late years for the disease to shift towards this group. The increased incidence amongst females is marked particularly in the older groups. This tendency is no doubt due to the greater risk of exposure in nursing and more the intimate contact in general of females with cases suffering from the disease.

Table 13.—1931. Deaths from Diphtheria. (Age and sex distribution).

Age Groups	Males	Females	Total
0—1 year ...	—	—	—
1—5 years ...	8	6	14
5—10 years ...	3	5	8
10—15 years	—	1	1
15—20 years	1	—	1
20 and over ...	—	—	—
Totals ...	12	12	24

The greatest mortality occurred amongst the 1-5 years group which accounted for 58.3 per cent of the total deaths (as compared with 57.8 per cent in 1930) while the 5-10 years group accounted for 33.3 per cent (34.3 in 1930). These two groups combined accounted for 92.8 per cent of the mortality (92.2 per cent in 1930). There is a remarkable similarity between each of these figures for the two years and they illustrate strikingly the vulnerability of these age groups to diphtheria. In no case had any of the children received immunising treatment. Attention has been repeatedly drawn to this feature, that though the treatment may fail in a few instances to induce immunity to infection it seems almost invariably to protect against death from the disease. These facts re-inforce the remarks which were made in last year's Report as to the great importance of immunising pre-school children so that they may be protected before entering upon the dangerous era of school life.

The general trend of the disease during 1931 as compared with the two previous years and the normal expectancy is shown in graphical form in Fig. V. This diagram is based on the monthly returns (four-weekly periods) for 1929, 1930 and 1931 and the expectancy curve is based on the median for the previous nine years. The vertical bars represent actual figures of notification for the three years in question—those for 1931 being all black, for 1930 unshaded and for 1929 shaded. Several points are illustrated by the diagram. In the first place it will be noted that the number of cases in the first month of 1931 was in excess of those of both 1930 and 1929 and that thereafter they are a good deal less. This represents the last of the acute phase of the epidemic. The reduction in incidence in 1931 is steadily maintained until the sixth and seventh months when it again rises but is still considerably less than in 1930. After the seventh month the reduction is very marked. There is a slight rise again towards the end of the year which is the usual occurrence at this season. It will be noticed also that in this respect the bars follow closely the trend of the expectancy curve throughout the year.

How far immunisation has influenced the reduction it is still difficult to say as there are other factors concerned which it is not possible to estimate, but nevertheless it is significant that with the exception the first, the sixth and the seventh months the incidence of the disease in 1931 was far below the normal expectancy based on the figures for the previous nine years while the figures for 1930 without exception are well above the expectancy curve. Up to the time of writing the diminution has even become more pronounced and there seems no likelihood of a further increase in the immediate future at any rate.

In the ordinary course of events one expects an epidemic to die out when a certain degree of saturation of infection has taken place amongst the population at risk and herd immunity has been developed. Subsequent events will depend largely upon the proportion of susceptibles to insusceptibles and if this does not rise above a certain figure the population will remain free from epidemics. It seems reasonable to assume that active immunisation must have an important role in accelerating the production of a sufficiently high level of insusceptibles to induce a termination of the epidemic. It would appear that we are now approaching this level in Cork and one has little hesitation in stating that if sufficient number of children are presented for immunisation in the next few years there is every prospect of eradicating diphtheria finally from our midst.

I have to record also the establishment during the year of a special clinic at the Public Health Department for dealing with cases discharged from hospital after treatment for diphtheria and scarlet fever. It was felt that a number of these cases could be usefully kept under observation for a short time after discharge, particularly those who had to be discharged before swab reports were returned as negative. I am satisfied that it has served a useful purpose. Before leaving hospital the parents are instructed to bring the children to the clinic. Of the 107 cases who were asked 91 attended. In most cases it was only necessary to secure one or two attendances. Instructions (written and oral) are given to the parents as to the precautions which are to be adopted in order to prevent further spread of infection, nasal and throat swabs are taken and in

suitable cases anti-septic gargles and insufflations are issued. The latter have been found quite successful in cases which had remained positive over prolonged periods while in hospital. A number of such cases were dealt with during the year. They had spent long periods in hospital but the nasal swabs continued to yield positive results. Eventually they were discharged (while still positive) as one did not feel justified in keeping them any longer in hospital. It was remarkable how quickly most of them cleared up and became negative after their return home and with the use of the measures stated. 35 swabs were examined in connection with this clinic of this number 12 were positive and 23 negative.

SWAB EXAMINATIONS.

The number of swabs examined during the year amounted to 1,936. Routine examination of swabs (discharge) was not practised by the Hospitals prior to 1928, clinical conditions apparently being the only criterion of discharge. The system was introduced by the Public Health Department in that year and has been maintained by it since. The following statement summarises the number of swabs examined in each year since :—

Year.				No. of swabs examined.
1928	...	...	...	980
1929	...	...	...	1353
1930	...	...	...	2872
1931	...	...	...	1936

In addition to the ordinary discharge swabs, swabs from admission cases were also submitted to examination this year for diagnostic purposes. This innovation, allusion to which has already been made, was also initiated by the Public Health Department and took effect from the 14th April. From that date to the year end the following results were obtained :—

Number of Swabs	Positive	...	...	130 (41.9%).
" " "	Negative	...	...	180 (58.1%).
Total				310

SCARLATINA.

98 cases of scarlatina were notified during the year (as compared with 238 in 1930. There were no deaths from the disease. Both in regard to incidence and mortality the course of the disease has been of a very mild character and in this respect it continues to follow the trend of diphtheria. This characteristic is also preserved in connection with the age distribution of the disease which, for 1931, was as shown in the following table.

Table 14.—1931. Age and sex distribution of Scarlet Fever.

Age Group	Males	Females	Total
0—1 year ...	—	—	—
1—5 years ...	12	17	29
5—10 years ...	9	23	32
10—15 years	10	9	19
15—20 years	—	3	3
20 and over ...	6	9	15
Total ...	37	61	98

INFLUENZA.

The early weeks of the year were characterised by a sharp out-break of influenza. The disease first made its appearance in the City during the third week in January and assumed epidemic proportions with great rapidity. Owing to the fact that it is not ordinarily notifiable it is not possible to form an accurate estimate of the actual number of cases which occurred but a fairly close approximation is available from the figures supplied by Dispensary doctors of the numbers of cases attended to by them during the period. These figures of course refer to Poor Law patients only and represent but a fraction (although a fairly large one) of the total number of cases which occurred in the whole City. They serve, however, to show the course of the epidemic in a fairly definite manner.

Week ending	No. of cases.
24th Jany. ...	210
31st „ ...	295
7th Feby. ...	186
14th „ ...	100
21st „ ...	37
27th „ ...	10

The epidemic reached maximum intensity by the end of the second week, after which period it diminished. The decline proceeded at a slower rate than that which marked its progress from onset to peak—a characteristic feature of influenza epidemics. On the whole the epidemic was of a mild character. Fourteen deaths were registered as having occurred from influenza pneumonia during the epidemic period and eight from influenza. To these twenty-two deaths might possibly be added seven others which occurred some time after the apparent termination of the epidemic (towards the end of March). There were approximately 1,000 known cases and probably at least twice that number of actual cases, so that the mortality could not have been said to be high. Among the cases who developed influenzal pneumonia the mortality was more severe. 87 such cases were notified during the epidemic period and on the basis of this figure the mortality of these cases was approximately 16 per cent. This, of course, is considerably less than that which marked the progress of the pandemic of 1918-'19.

CEREBRO-SPINAL MENINGITIS.

One case of this disease which, fortunately is a rare visitant, occurred during the year. It was notified from the South District Fever Hospital. The history of the patient (a child $3\frac{1}{2}$ years of age) was that she was taken ill on the 9th February, complaining of severe headache and vomiting which continued for several days. The parents also stated that a rash ("a few red spots") made its appearance a few days after the commencement of the illness. Home remedies were administered at first and as no improvement took place, medical aid was summoned and the child was admitted to hospital on 13th February. A quantity of cerebro-spinal fluid was withdrawn for the diagnostic purposes and the diagnosis of cerebro-spinal meningitis was confirmed. There was a marked polymorphonuclear leucocytosis with intra-cellular Gram-negative diplococci present. The condition of the patient became steadily worse and she died on 14th March thirty-three days after the onset of the disease.

The last previous case of cerebro-spinal fever occurred in 1928, when one case was notified. One case was also notified in 1927. There were no cases between 1919 and 1927 so that for a period of over twelve years there have only been three cases of this disease in the City. It is impossible to say where the infection arose in the present instance. It was the only case of its kind in the city for two years and there certainly have been no cases since. Cases of cerebro-spinal fever were being reported in England about this period (mainly from military centres) but there was absolutely no connection, direct or indirect, between any of them and the case which occurred here. This may possibly have been an instance in which the child had normally harboured meningococci in her naso-pharynx and through intercurrent illness or other cause lost her immunity with the consequent invasion of the body tissues by the organism and the development of the characteristic symptoms pointing to involvement of the brain and spinal cord. It is difficult to explain such occurrences on any other supposition.

ENTERIC FEVER (TYPHOID).

Three cases of enteric were notified during the year. In two of these cases it was clearly shown that infection was incurred outside the City area and in the third (which transpired to be a case of para-typhoid fever) the dates showed that infection must have taken place within the City. This is the first case to occur in the City for over eighteen months.

In the first case referred to above, notification reached the Department on the 8th January after the patient's admission to hospital. In this instance it was possible to secure a full and detailed account of the patient's movements for more than two months prior to the onset of his illness. He left Bombay on the 1st November, landed at Suez on the 11th following, Port Said on the 12th and remained at Marseilles from 18th to 21st November. He finally landed at Liverpool on 26th of November whence he proceeded to Birmingham where he remained until 4th December before going to London. He remained in London from the 4th to 6th December, after which he went to Somerset which

he left on the 16th December arriving in Cork on the following day. Three days later (i.e., 20th December) the first symptoms of his illness made their appearance. It is clear therefore that infection did not occur in this City. Allowing twenty-one days for the incubation period it is evident that infection must have taken place somewhere and at some time between his arrival in Birmingham and his stay in Somerset. Although enquiries were made with a view to tracing the source of infection it was not possible to do so in the absence of any evidence of enteric in the localities which he visited. On 3rd January (10 days after the onset of the illness) there was a positive Widal reaction in a dilution of 1 in 25. There was agglutination also of *B. Enteritidis* in 1 in 25 dilution, while there was no reaction with *B. Paratyphoid A* and, *B. Paratyphoid B*. On 7th January the Widal reaction was much more marked and yielded agglutination in a dilution of 1 in 125. The illness took a severe turn and the patient died. In view of the facts in regard to source of infection and that the patient's normal residence was not in this City, the death does not appear in the tables.

The second case was notified on 13th January. In this instance the patient was a commercial traveller resident in the City the greater portion of whose time was spent in travelling about the country. It was possible in this case also to trace the patient's movements for some time prior to the commencement of his illness, although with nothing like the same clarity as in the previous case. The investigation pointed to infection having been incurred in the western portion of Cork County. The diagnosis was confirmed by the Widal test which was performed on 12th January (8 days after the apparent onset). *B. Typhosus* was agglutinated in a dilution of 1 in 250.

The remaining case was reported on the second of November. The history in this case was rather interesting. The operation of tonsillectomy was performed on 12th October and the patient returned home from hospital on the 20th. She did not pick up and was seen by her private physician on the 22nd and went into hospital again on the 27th. The clinical picture was puzzling, particularly in view of the previous operation, and it was eventually decided to have a Widal test performed with a view to ascertaining if the infection was due to typhoid. This was performed on 1st November. In all such cases the routine is to put up the patient's serum against several organisms, including paratyphoid A and B. The reaction with paratyphoid B was remarkable, that organism being clumped in a few minutes in as high a dilution as 1 in 5,000. *B. typhosus* showed faint clumping in 1 in 25 dilution after two hours. *B. para-typhoid A* gave a negative reaction.

It was impossible to trace the source of infection in this case. The whole of the incubation period had been spent at home, and there was no history of contact with any suspicious case of illness and there had been no case of typhoid in the city for more than nine months previously. Cases of paratyphoid fever are usually associated with contamination of food stuffs by contacts or carriers rather than with infected water supplies and the improvement of the figures for this disease during recent years may be regarded as a reflection of the improved water supply during the same period. The incidence and mortality from this disease will be found in Tables 15 and 7, both of which demonstrate the improvement

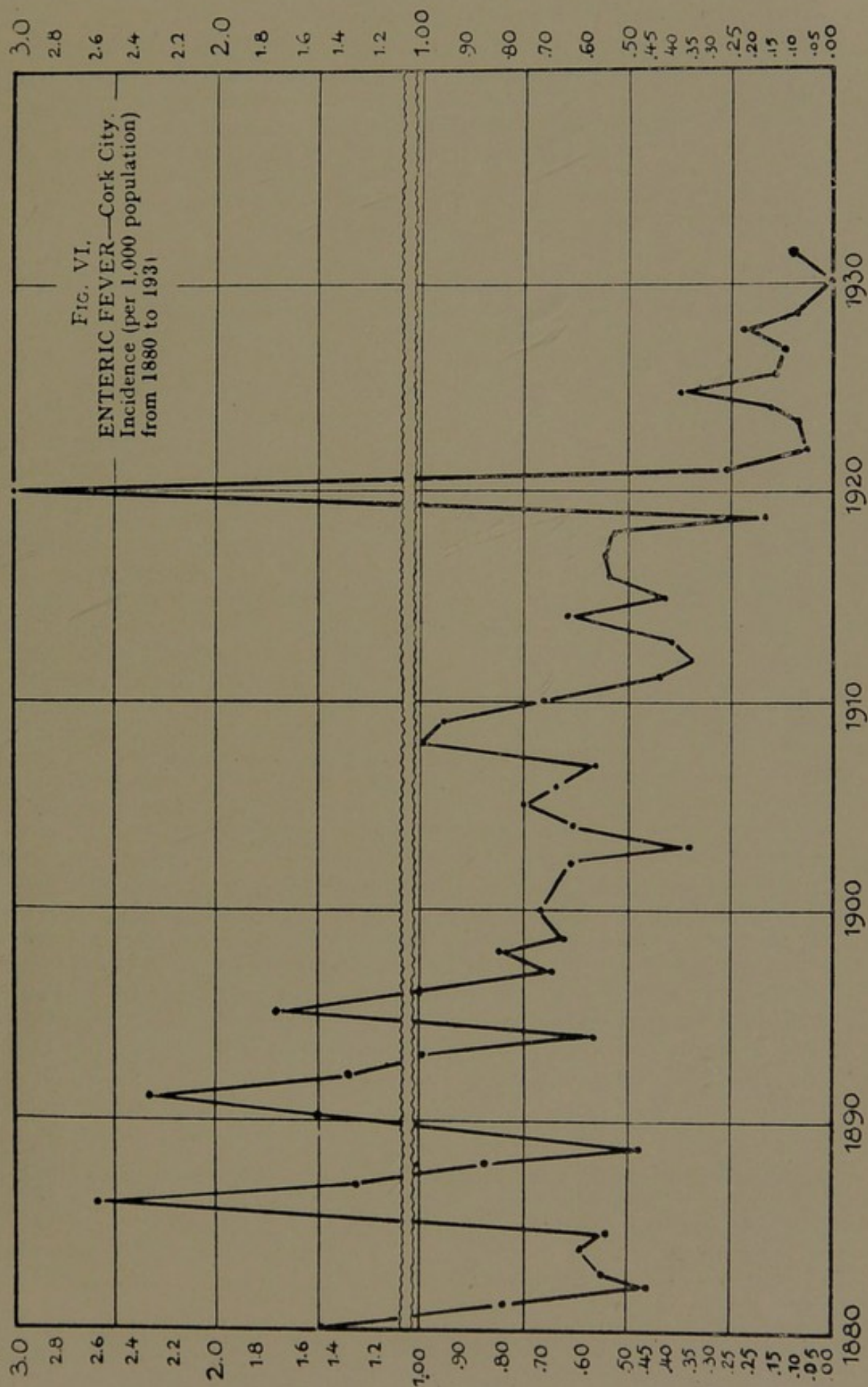
referred to. The general trend of the disease will be inferred from Fig. VI, in which the figures for incidence have been constructed in diagrammatic form and in which the various phases are strikingly demonstrated. The improvement is, in reality, more marked than would appear in the diagram which had to be broken, in order to accomodate the fluctuations which have occurred and it is to be borne in mind that the values above the broken portion are twice as great as those below it. The high peak of the year 1920, is due to a great epidemic which occurred in that year and to which reference was made in my last report. It is evident now that a most satisfactory standard of purity has been attained, so far as the water supply of the City is concerned.

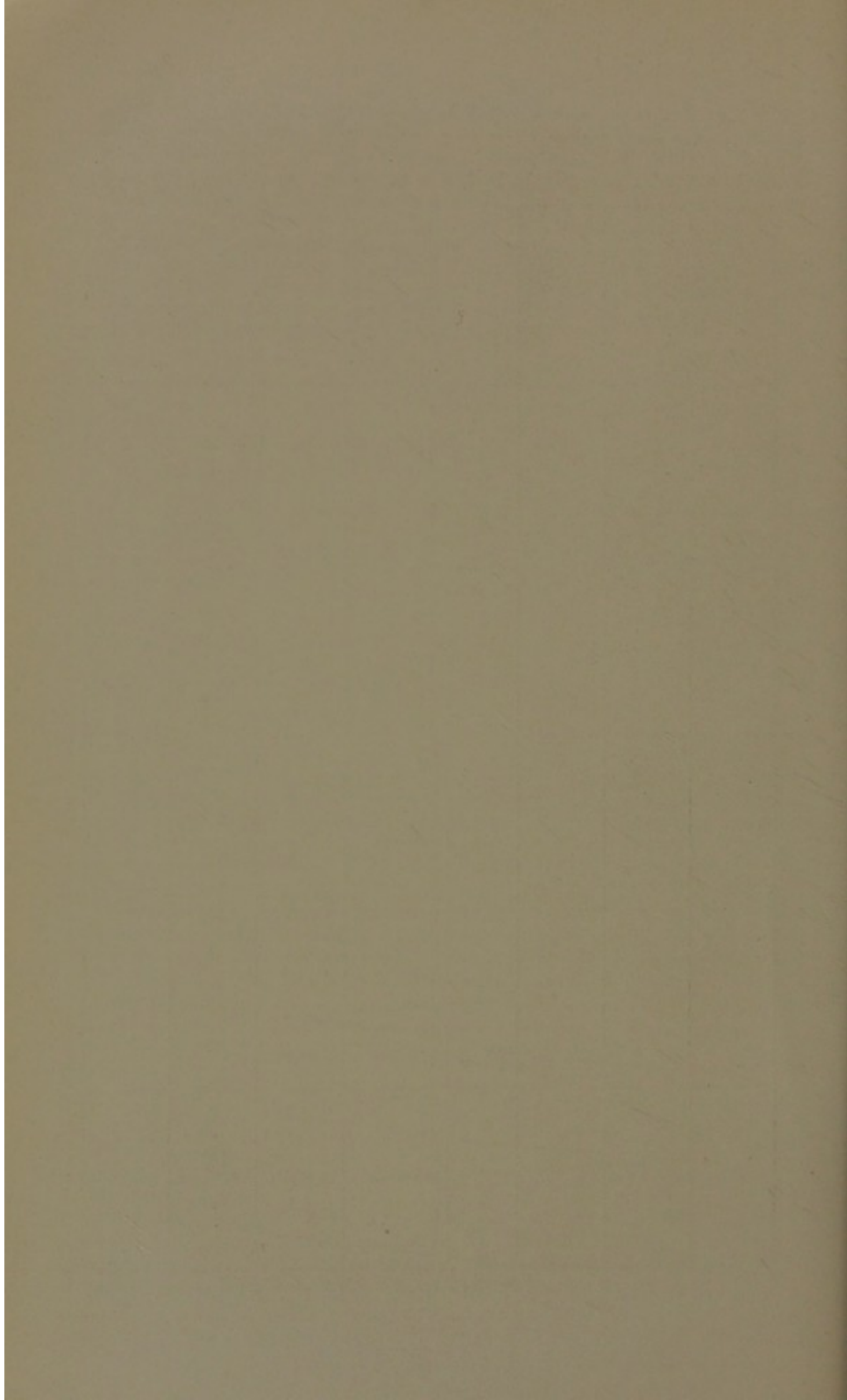
TYPHUS.

For the second successive year there was no case of this disease. Reference to Tables 8 and 15 will show the very marked improvement which has been effected in the health of the City in respect of Typhus. In the decade 1879-88, nearly 5,000 cases occurred in the City (including an epidemic 1,406 in 1881) whereas in the last decade only 10 cases were notified. Two cases were reported in the year 1929, but one of them was subsequently proved not to be typhus. It was impossible to trace the source of the one case which did occur. Typhus still occurs sporadically in certain portions of this and other counties, and the danger of its importation into the City must always be borne in mind. That this risk is now considerably less than in former years is largely due to the energetic action taken by the Department of Local Government and Public Health together with the appointment of County Medical Officers of Health in the affected counties. The latter has been mainly responsible for the provision of better means of diagnosis for local practitioners so that many cases which in former years would have passed as typhoid are now recognised as typhus and adequate measures are at once put into effect to prevent further spread of the disease. It has always been difficult to trace the source of infection in the first cases which have cropped up in the City but it seems likely that it has been imported from outlying districts largely by the vagrant class. Fortunately the steps taken to deal with such cases have always been effective in preventing any further spread. A detention home is maintained specially for this purpose in which contacts are quarantined for the incubation period of the disease, and kept under supervision until it is safe to allow them to return to their homes.

SIMPLE CONTINUED FEVER.

There was no notification of this disease during the year. Occasionally the disease is represented in the tables, but the numbers have been declining steadily for the past twenty years. This is in marked contrast to the figures for former years as will be seen by reference to the appropriate tables. Many, if not all, of the cases which in former years were labelled simple continued fever were, in all probability, really cases of typhus, typhoid, influenza or tuberculosis and with further improvement in technical knowledge and diagnostic methods very likely it will disappear altogether from the returns.





PUERPERAL FEVER.

Only one case of puerperal fever occurred during the year. Five such cases were actually reported. In two of them the diagnosis was not confirmed after admission to hospital, in two others the patients were resident in the County area. Further reference to these cases is made in the section dealing with Maternity and child welfare.

DIARRHOEA.

Eighty-five cases of diarrhoea in children under two years of age were notified during the year. This was a considerable increase over the number reported during 1930 (fifty-nine cases). The case mortality in both years was excessive (36.4 per cent in 1931 and 50.5 per cent in 1930). This disease is still the main contributing factor to infant mortality. That there was no element of an epidemic infection was revealed by the investigation made into each of the cases. The great majority of them were due to gastric and intestinal disturbances of a non-infective character due, in most instances, to dietetic errors coupled with lack of hygienic precautions in regard to the storage and distribution of milk and other foods. This disease makes its appearance in the warm summer months when milk is liable to rapid fermentation and when flies are numerous. There is little doubt that unsatisfactory methods of milk production play a very large part in the incidence of summer diarrhoea, not alone in regard to the increased liability to fermentation in the milk, but by the actual introduction of dangerous organisms in stable dust and manure. A study of the incidence and mortality of infantile diarrhoea lends added force to what is said in another section dealing with the supervision of the milk supply of the City.

WHOOPIING COUGH.

This disease is not notifiable. In the absence of figures it is impossible to state definitely the number of cases which occurred during the year. Five deaths from the disease were registered during the year (as compared with five in 1930 and thirty in 1929). It is evident therefore that, as a whole, the incidence of the disease was relatively slight although there was evidence towards the end of the year which pointed towards a definite increase in the number of cases.

OTHER INFECTIOUS DISEASES.

Notifications in respect of other diseases during the year were as follows:—Measles, 3; Membranous Croup, 1; Erysipelas, 19; Varicella, 71; Encephalitis Lethargica, 1; Acute Primary Pneumonia, 49; Acute influenzal pneumonia, 41.

Table 15.—Yearly Summary of Infectious Diseases, 1879—1931.

Year	Small Pox	Typhus	Typhoid or Enteric Fever.	Simple Continued Fever	Scarlatina	Puerperal Fever	Membranous Croup	Diphtheria	Erysipelas	Whooping Cough	Measles	Diarrhoea	Chicken Pox	Cerebro-Spinal Meningitis	Poliomyelitis	Malaria	Dysentery	Other Zymotic or Infectious Diseases	Encephalitis Lethargica		Pneumonia	
																			Acute Primary	Acute Influenza	Acute Primary	Acute Influenza
1879		337	91	335	386	—	—	2	30	10	269	107	—	—	—	—	—	13	—	—	—	—
1880		756	117	420	616	—	—	9	37	19	282	48	—	—	—	—	—	1	—	—	—	—
1881		1406	66	364	103	—	—	—	31	13	240	5	—	—	—	—	—	1	—	—	—	—
1882		683	37	239	25	—	—	3	11	4	146	3	—	—	—	—	—	—	—	—	—	—
1883		844	45	164	105	—	—	6	—	—	109	1	—	—	—	—	—	—	—	—	—	—
1884		456	48	221	158	—	—	2	14	18	106	3	—	—	—	—	—	—	—	—	—	—
1885	1	159	43	94	143	—	—	2	17	—	35	—	—	—	—	—	—	—	—	—	—	—
1886		83	180	70	86	—	—	1	14	3	24	—	—	—	—	—	—	—	—	—	—	—
1887		67	100	46	17	—	—	4	25	1	182	1	—	—	—	—	—	—	—	—	—	—
1888		72	66	40	55	—	—	7	25	2	232	—	—	—	—	—	—	—	—	—	—	—
1889		48	37	24	90	—	—	9	12	4	—	—	—	—	—	—	—	—	—	—	—	—
1890		54	113	36	128	5	3	20	27	—	3	2	—	—	—	—	—	—	—	—	—	—
1891	1	24	165	46	64	3	3	37	27	—	2	—	—	—	—	—	—	—	—	—	—	—
1892	1	162	104	53	19	—	3	11	45	—	74	1	—	—	—	—	—	1	—	—	—	—
1893		92	78	26	91	3	—	18	70	—	4	2	—	—	—	—	—	—	—	—	—	—
1894		25	43	29	301	5	6	14	65	—	11	2	—	—	—	—	—	—	—	—	—	—
1895		29	132	23	53	3	1	6	45	—	2	—	—	—	—	—	—	—	—	—	—	—
1896		22	94	29	69	6	—	7	54	—	3	2	—	—	—	—	—	—	—	—	—	—
1897		30	51	23	34	7	4	21	35	1	9	—	—	—	—	—	—	1	—	—	—	—
1898		61	62	30	30	6	7	18	20	1	2	—	—	—	—	—	—	—	—	—	—	—
1899		9	47	14	22	2	10	18	60	—	23	—	—	—	—	—	—	—	—	—	—	—
1900		28	50	27	401	2	2	23	36	—	—	—	—	8	—	—	—	1	—	—	—	—
1901		13	51	29	288	3	12	26	38	—	—	—	—	8	—	—	—	—	—	—	—	—
1902		6	49	16	119	4	1	8	49	5	8	—	7	3	—	—	—	—	—	—	—	—
1903	3	7	27	16	51	2	6	17	58	—	5	—	49	1	—	—	—	—	—	—	—	—
1904	1	11	50	33	29	4	3	29	43	—	2	—	39	4	—	—	—	—	—	—	—	—
1905	1	9	58	47	35	7	8	18	50	—	7	—	33	4	—	—	—	—	—	—	—	—
1906		6	48	31	23	10	1	37	48	—	8	—	49	3	—	—	—	2	—	—	—	—
1907		10	44	44	50	6	4	37	42	—	4	413	63	8	—	—	—	—	—	—	—	—
1908		23	88	55	114	4	6	40	26	—	379	524	14	1	—	—	—	1	—	—	—	—
1909		18	74	42	119	10	4	66	25	—	44	514	21	—	—	—	—	22	—	—	—	—
1910		8	54	24	38	4	6	51	26	—	14	159	16	—	—	—	—	—	—	—	—	—
1911		10	32	22	39	4	13	70	31	—	433	352	1	1	—	—	—	—	—	—	—	—
1912		1	26	17	93	6	5	52	29	—	53	71	7	—	—	—	—	—	—	—	—	—
1913		5	29	13	81	4	10	24	28	—	254	320	2	—	—	—	—	—	—	—	—	—
1914		1	50	12	230	11	15	54	38	11	161	188	8	—	—	—	—	—	—	—	—	—
1915		—	32	4	245	2	8	68	44	1	160	177	10	6	—	—	—	—	—	—	—	—
1916		1	42	9	112	8	11	43	41	—	86	139	13	6	1	—	—	—	—	—	—	—
1917		3	43	6	46	1	9	26	24	—	28	83	8	3	—	—	—	—	—	—	—	—
1918		1	42	10	21	2	18	34	16	—	750	121	19	4	—	—	—	—	—	—	—	—
1919		15	12	3	16	4	21	262	18	—	3	85	26	2	—	30	3	—	—	—	37	—
1920		2	244	8	70	6	3	428	18	—	9	54	30	—	—	30	—	—	—	—	—	—
1921		—	21	1	14	4	8	541	17	—	2	105	28	—	—	—	—	—	—	—	—	—
1922		—	6	—	29	1	5	379	14	—	324	19	29	—	—	—	—	—	—	—	—	—
1923		1	7	1	44	1	4	440	45	—	10	35	30	—	—	—	—	—	—	—	—	—
1924		1	12	—	41	3	3	217	30	—	5	30	54	—	—	4	—	—	2	—	—	—
1925		—	27	—	81	4	9	265	35	—	94	142	117	—	—	—	—	—	1	—	5	—
1926		4	11	2	278	4	11	469	34	—	534	108	59	—	—	—	—	—	1	—	—	—
1927		4	10	1	205	14	11	344	25	—	7	76	76	1	1	—	—	—	3	—	—	—
1928		1	17	—	208	7	15	385	24	—	6	79	64	1	—	—	—	—	—	—	12	—
1929		1	6	—	216	6	4	369	24	—	226	78	80	—	—	—	—	—	2	—	7	—
1930		—	—	1	238	6	5	588*	38	—	241	59	72	—	—	—	—	—	1	—	3	—
1931		—	1	—	98	1	1	288	19	—	3	85	71	1	—	—	—	—	1	49	41	—

*See footnote to Table 8 re Notifications of Diphtheria in 1930.

DISINFECTION.

Table 16.—Showing the number of Articles Disinfected during the year 1931.

	No. of Beds	No. of Mat- tresses	No. of articles of Bedding	No. of articles of Wearing Apparel	Miscel- laneous Articles	Total No. of Articles
January ...	47	90	714	101	35	987
February ...	19	61	396	39	28	543
March ...	7	47	363	30	35	482
April ...	15	67	449	54	16	601
May ...	22	69	470	45	20	626
June ...	40	85	589	99	47	860
July ...	19	50	365	37	26	497
August ...	11	28	191	10	288	528
September ...	14	34	235	21	11	315
October ...	28	53	409	36	17	543
November ...	30	58	439	47	21	595
December ...	13	53	442	127	30	665
	265	695	5,062	646	574	7,242

The practice of disinfecting premises by fumigation after the occurrence of cases of infectious disease was abandoned in this City in the year 1927. Our experience during the four years which have since elapsed has amply proved that fumigation has no influence in the prevention of the ordinary infectious diseases. In every case, however, the fomites are still removed for steam disinfection at the disinfecting station in the Cornmarket. Disinfection of premises by fumigation or spraying has been reserved for three diseases—tuberculosis, typhus and small pox. The latter disease is, fortunately, unknown in this country. Occasional cases of typhus are still liable to occur, and when this is so prolonged fumigation with sulphur dioxide is carried out with a view to destroying lice which spread the disease. In the case of tuberculosis the walls, ceilings and floors are sprayed down with a solution of formalin, and the premises re-washed or re-papered. Most sanitarians are agreed that the liberal use of ordinary soap and water combined with thorough ventilation is a more effective means of disinfection than the burning of sulphur in infected households.

Section IV—Tuberculosis

The tuberculosis death rate for the year was 1.50 per 1,000 of the population as compared with 1.42 for the previous year. The following Table shows the death rates from pulmonary tuberculosis for each year from 1911 to 1931.

Table 17.—Death rates from pulmonary tuberculosis, 1911—1931.

Year	No. of Deaths	Rate per 1,000 pop.	Year	No. of Deaths	Rate per 1,000 pop.
1911	252	3.29	1922	176	2.30
1912	231	3.01	1923	130	1.64
1913	202	2.62	1924	164	2.09
1914	231	3.01	1925	134	1.71
1915	211	2.88	1926	126	1.60
1916	189	2.46	1927	129	1.60
1917	202	2.63	1928	109	1.39
1918	187	2.43	1929	141	1.79
1919	156	2.04	1930	114	1.45
1920	159	2.07	1931	124	1.58
1921	125	1.64			

It will be noted that the figure for 1931 is the third lowest during the period covered by the Table and that the general trend is in a downward direction. It is hoped that a material reduction will be effected in these figures when the present scheme for dealing with tuberculosis in the Borough has become fully established. The recent appointment of an assistant M.O.H., who is also clinical Tuberculosis Officer should be effective in speeding up the work of this branch.

The number of new patients who were examined at the Tuberculosis Dispensary during the year amounted to 271, of whom 165 were adults and 106 children. Of these 80 adults and 46 children were found to be suffering from some form of tuberculosis and the appropriate treatment afforded.

Sanatorium treatment is provided for all cases in which there is a reasonable prospect of cure or arrest of the disease. Unfortunately a great number of applicants for such treatment do not come under the notice of the tuberculosis department until the disease has reached an advanced stage. This militates greatly against the chances of a cure, and is responsible for the large proportion of relapses which occur when the patients return to their homes. The number of patients admitted to sanatorium was as follows:—

	Males	Females	Total
Insured ...	33	5	38
Uninsured ...	15	12	27
Children ...	0	0	0
Total ...	48	17	65

The question of institutional treatment has a very important bearing on the general working of tuberculosis schemes. The success of sanatorium treatment is almost entirely dependent upon the patient coming under treatment at an early stage of the disease. Even in the moderately advanced cases the most that can be expected is an amelioration of the

symptoms. As has been mentioned above, it is unfortunately true that a large proportion of those cases who attend the tuberculosis clinic for the first time have to be classed in the latter category or in the advanced stage. In last years report an analysis was made of 100 new cases attending the clinic for the first time and it was found that only 15 per cent could be classified as early cases while the moderately advanced and advanced cases comprised 36 per cent and 49 per cent respectively—a deplorably high percentage. A similar analysis was made of the new cases who attended during 1931, and the result was as follows:—

Stage I. (early)	...	...	5 (6.6%).
Stage II. (moderately advanced)	...	...	38 (50.6%).
Stage III. (advanced)	...	...	32 (42.8%).

75

These figures are no improvement on those of last year. The proportion of early cases has been reduced from 15 per cent to 6 per cent, while the proportion of moderately advanced cases has been increased from 30 per cent to 50.6 per cent, and that of advanced cases has been reduced slightly from 49 per cent to 42.8 per cent. A great number of these cases unfortunately do not consult their medical advisers in time and very often it is not until the disease has made considerable headway that they come under observation. However, quite apart from the physical benefit derived from sanatorium treatment by the patient himself, as a result of such treatment he acquires habits of cleanliness and hygiene which are of value in regard to prevention when he has returned home. For this reason a good many patients are recommended for such treatment who might otherwise be referred for hospital treatment. Every patient is provided at the clinic with a flask and disinfectant for the disposal of his sputum, and is instructed in its use and in preventive measures generally.

The number of patients discharged from sanatorium during the year was as follows:—

	Males	Females	Total
Insured ...	34	10	44
Uninsured ...	12	10	22
Children ...	0	1	1
Total ...	46	21	67

Advanced cases who are unlikely to derive benefit from sanatorium treatment and who cannot receive adequate treatment in their own homes are admitted to St. Patrick's Hospital. The following cases were admitted during the year:—

	Males	Females	Total
Insured ...	37	4	41
Uninsured ...	19	27	46
Total ...	56	31	87

The following cases died or where discharged from this institution:—

	Males	Females	Total
Insured ...	51	4	55
Uninsured ...	23	23	46
Total ...	74	27	101

St. Patrick's Hospital is a suitable institution for dealing with this class of tuberculosis, and it is satisfactory to note there is now considerably less reluctance to avail of it than was formerly experienced. Hospital isolation for advanced cases is an outstanding factor in the prevention of tuberculosis and in this respect St. Patrick's constitutes an important link in our preventive work.

Fifteen cases were admitted to Cappagh open-air Hospital, Dublin. Of these five were females and ten males. During the same period five males and seven females were discharged. These were all cases of joint tuberculosis requiring prolonged treatment under open-air conditions for which there are no facilities in the city at present. The need of such an institution to serve the city and the south of Ireland generally is great and it is to be hoped that suitable premises for this purpose may be acquired in the near future. Such an hospital could also serve as a convalescent home for delicate and pre-tuberculous children for which there is also a great need.

In addition to those sent to Cappagh 35 patients were admitted to the local Infirmaries. Of these five were adults and 30 children. The latter were mostly gland cases requiring surgical treatment. A few were admitted for supervision pending transfer to Cappagh. Thirty-three patients (7 adult and 26 children) were discharged from the hospitals.

Examination of sputum is carried out in the laboratory of the tuberculosis clinic. 440 specimens were examined, of which 94 were found to contain tubercle bacilli, while 346 were negative. Of the 440 specimens examined, 73 were submitted by medical practitioners. About two years ago arrangements were made for the free examination of such specimens for practitioners in order to assist them in the diagnosis of suspected pulmonary tuberculosis. Supplies of outfits were accepted for this purpose by all the city Chemists, and stocks were also provided at the dispensaries for the convenience of doctors. The response has been disappointing, particularly in view of the very high proportion of advanced cases, which is to be found amongst patients attending the tuberculosis clinic for the first time. It is not an exaggeration to state that sputum examination is a most important factor in correct diagnosis in patients presenting other suspicious symptoms. In some cases it is an invaluable aid. It is hoped therefore, that the scheme will be more widely availed of in the future.

In all cases attending the clinic sputum examination is a routine procedure, and pocket flasks are issued to all those who are found to be positive. A register is kept of such cases and attention in regard to prevention is concentrated on them. Twenty flasks were issued during the year.

The number of notifications received during the year was 196. Prior to 1930 such notifications were for the period from the 1st April to 31st March following. Notifications for the previous five years were as follows :—

1925—26	...	110
1926—27	...	108
1927—28	...	73
1928—29	...	116
1929—30	...	179
1930 (Apr.—Dec.)		133
1931	...	196

X-Ray examinations are utilised for diagnostic purposes in cases presenting doubtful features and also for the purpose of estimating progress in pulmonary cases. All cases suggestive of bone or joint disease are submitted to X-Ray examination as routine. Fifty-eight such examinations were made during the year.

The number of home visits made by the Tuberculosis Nurse was 193. A considerable amount of importance is attached to the home visiting of tuberculosis patients, for although in many cases little can be done for the patient himself a good deal of useful preventive work can be carried out by instructions as to the proper disposal of sputum and precautions to be taken by contacts. Unfortunately in many instances this work is negated by the wretched conditions under which the patients live, particularly in the poorer parts of the City where overcrowding is very marked and a great many of the dwellings are in an insanitary condition. Ignorance of the nature of the disease is one of the principal factors in its spread and it is felt that no effort should be spared in the effort to enlighten people about the danger from indiscriminate coughing and spitting, the use of infected utensils, bed clothes, and the value of fresh air and sunlight in combatting this disease. Very often, of course, it is a case of the seed falling upon barren ground, but nevertheless it is felt that the visits of the tuberculosis nurse are of very great importance from the preventive point of view for the reasons outlined above. It is particularly in the case of patients with positive sputum that supervision is called for and it is largely upon this class that our efforts are concentrated. Dramatic results are not to be expected in dealing with a disease such as tuberculosis. The most that can be looked for is a steady improvement in the death rate, and a gradual decrease in the number of cases which arise each year.

Table 18.—Showing particulars of patients who received sanatorium treatment during the year.

	Under treatment on 1st Jan. 1931	New cases admitted during the year	Cases discharged during the year	Under treatment on 31st Dec., 1931	No. of Cases treated during the year
Insured Males ...	15	24	24	15	39
„ Females ...	2	5	7	—	7
Uninsured Males ...	2	15	12	5	17
„ Females ...	2	12	10	4	14
Ex-Service men ...	3	9	10	2	12
Male children ...	—	—	—	—	—
Female children ...	1	—	1	—	1
Totals ...	25	65	64	26	90

Table 19.—Particulars of patients treated in St. Patrick's Hospital during 1931.

	Under treatment on 1st Jan. 1931	New cases admitted during the year	Cases discharged during the year	Under treatment on 31st Dec., 1931	No. of Cases treated during the year
Insured Males ...	12	26	32	6	38
„ Females ...	1	4	4	1	5
Uninsured Males ...	10	19	23	6	29
„ Females ...	5	27	23	9	32
Ex-Servicemen ...	11	11	19	3	22
Totals ...	39	87	101	25	126

Table 20.—Particulars of cases treated in the North Infirmary during 1931.

	Under treatment on 1st Jan. 1931	New cases admitted during the year	Cases discharged during the year	Under treatment on 31st Dec., 1931	No. of Cases treated during the year
Male children ...	2	3	5	—	5
„ adults ...	—	—	—	—	—
Female children ...	—	3	2	1	3
„ adults ...	—	2	—	2	2
Totals ...	2	8	7	3	10

Table 21.—Particulars of cases treated in the South Infirmary during 1931.

	Under treatment on 1st Jan. 1931	New cases admitted during the year	Cases discharged during the year	Under treatment on 31st Dec., 1931	No. of Cases treated during the year
Male children ...	—	17	15	2	17
„ adults ...	—	1	1	—	1
Female Children ...	1	8	9	—	9
„ adults ...	—	1	1	—	1
Totals ...	1	27	26	2	28

Table 22.—Particulars of cases treated in St. Mary's Open-Air Hospital, Cappagh, Co. Dublin.

	Under treatment on 1st Jan. 1931	New cases admitted during the year	Cases discharged during the year	Under treatment on 31st Dec., 1931	No. of Cases treated during the year
Female children ...	6	5	7	4	11
Male children ...	4	10	5	9	14
Totals	10	15	12	13	25

Table 23.—Return of number of patients treated under the Tuberculosis Scheme, during the year ended 31st December, 1931.

	Pulmonary Tuberculosis			Non-Pulmonary Tuberculosis			Total
	Children under 15 yrs.	Other Persons		Children under 15 yrs.	Other Persons		
		Males	Females		Males	Females	
1. INSURED PATIENTS:							
(i.) No. remaining under treatment							
(a) On 1st. Jan, 1931 ...	—	117	12	—	5	—	134
(b) On 31st Dec., 1931 ...	—	116	6	—	4	5	131
(ii). No. of new patients treated during year ...	—	48	5	—	2	3	58
(iii). No of cases under observation at close of year 1931 ...	—	44	14	—	—	—	58
2. OTHER PATIENTS :							
(i) No. remaining under treatment							
(a) On 1st Jan., 1931 ...	10	24	26	51	2	5	118
(b) on 31st Dec., 1931 ...	5	23	27	75	3	7	140
(ii). No. of new patients treated during year ...	4	18	23	50	3	6	104
(iii.) No of cases under observation at close of year 1931 ...	71	25	54	3	—	1	154

Section V—Maternity & Child Welfare

(A) INFANTILE MORTALITY.

The number of deaths of infants under one year of age was 138, equivalent to a rate of 71 per 1,000 live births (the corresponding figures last year were 155 and 77 per 1,000). Table 7 shows the number of deaths each year and the mortality rates for Cork City from 1878 to 1931. On Table 24 is shown the comparative infantile death rates for Cork City, the Irish Free State and England and Wales from 1881 to 1931. The reduction in the figure for 1931 as compared with that for 1930 is not only satisfactory, but encouraging, and is probably in no small measure a reflection of the increased activities of the child Welfare Services which marked the past year, and one feels justified in hoping that this improvement will now become progressive. Allowance, however, will have to be made for epidemic periods and as an epidemic of measles is expected during the coming winter, an increase in infant deaths due to this disease will have to be anticipated. There is little doubt, however, that with the expanding influence of the Service there will be a further saving of child life in other directions, particularly in regard to deaths due to nutritional disorders.

The principal causes of infant deaths during 1931 were as follows:—

Diarrhoea and Enteritis	...	...	31
Premature Birth and Congenital Malformation	...	...	27
Congenital Debility	...	...	16
Convulsions	...	...	16
Broncho Pneumonia	...	...	8
Marasmus	...	...	7
Tuberculous Marasmus	...	...	7
Tuberculous Meningitis	...	...	4
Whooping Cough	...	...	3

Of these deaths 47 are accounted for by enteritis and convulsions, which are in the main caused by dietetic errors due to ignorance on the part of the mothers, and it is to be hoped that the Child Welfare clinics will be influential in effecting a reduction in this direction in future years.

The general trend of infantile mortality is shown diagrammatically in Fig. VII. The most striking feature of this Graph is the marked decline which has taken place in England and Wales from 1900 onwards as compared with both Cork and the Irish Free State. The curve for Saorstát Éireann exhibits, however, a comparatively low mortality over the whole period with a steady downward trend at the same time. The curve for Cork City is characterised by marked fluctuations, but the trend is definitely and decidedly downward. This trend is particularly marked from the year 1905 onwards and continues until 1926 when there is a marked rise followed by a further drop. The principal contributing diseases to the 1926 peak (when 220 infant deaths occurred) were—measles 75, diarrhoea 53, whooping cough, 32, and diphtheria 18. The mortality in 1892 was 150, as compared with 71 last year—a reduction of more than one-half.

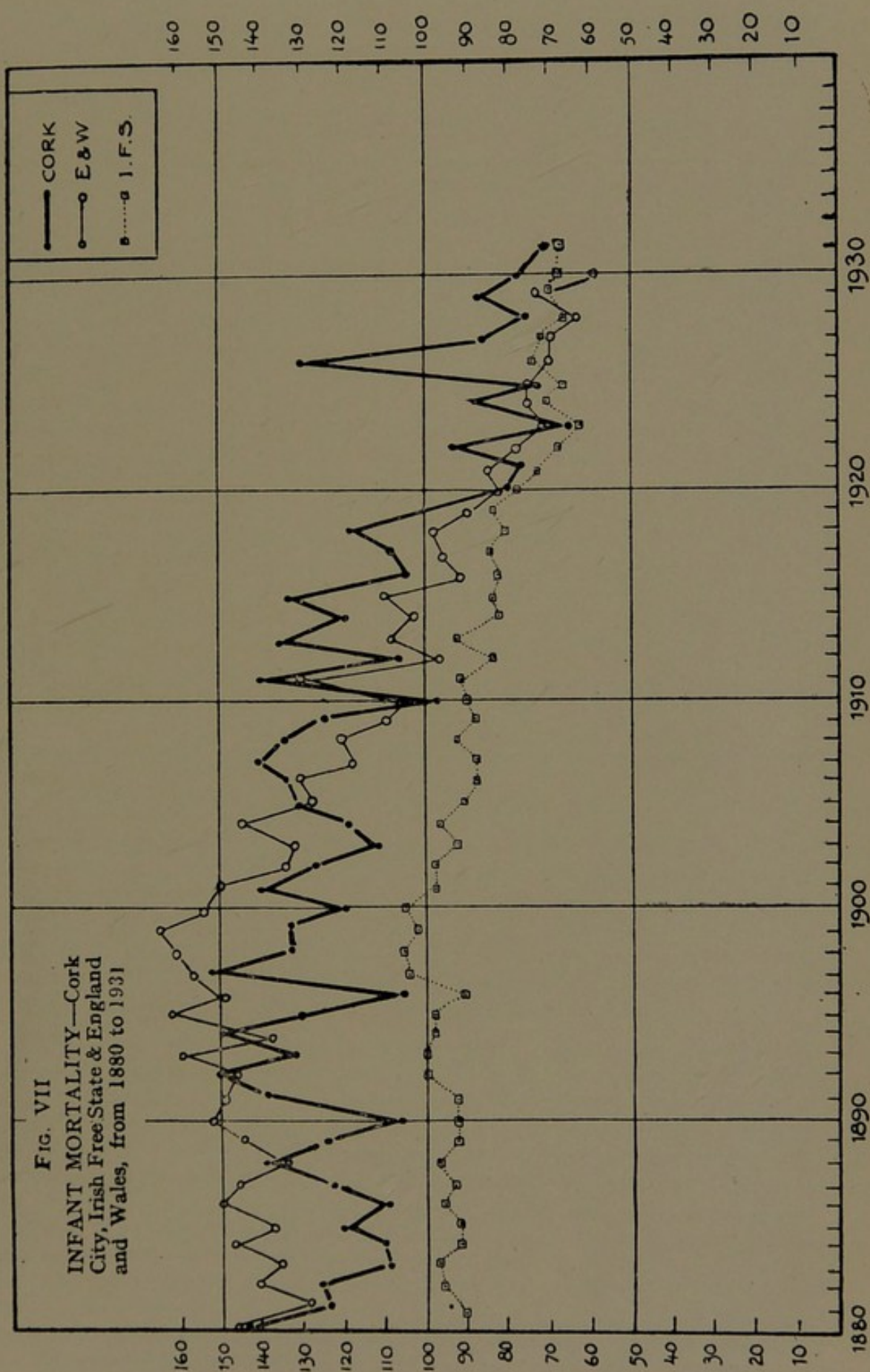




Table 24.—Infantile Mortality, Cork City, Irish Free State and England and Wales from 1881 to 1931.

Year	Cork	I.F.S.	E. & W.	Year	Cork	I.F.S.	E. & W.
1881	124	89.4	139	1906	133	88.0	132
1882	127	94.9		1907	139	88.5	118
1883	109	95.9		1908	134	91.2	120
1884	110	91.9		1909	125	87.3	109
1885	120	91.3		1910	96	89.1	105
1886	110	93.9	145	1911	139	91.3	130
1887	123	93.6		1912	107	82.1	95
1888	139	96.0	136	1913	136	93.1	108
1889	125	92.0	144	1914	119	81.0	105
1890	106	91.6	151	1915	132	85.2	110
1891	138	91.4	149	1916	105	81.3	91
1892	150	99.9	148	1917	108	84.0	96
1893	132	99.8	159	1918	118	80.2	97
1894	150	97.4	137	1919	100	84.4	89
1895	131	98.0	161	1920	79	77.5	80
1896	106	91.0	148	1921	76	72.6	83
1897	152	104.0	156	1922	93	68.9	77
1898	131	105.2	160	1923	66	66.4	69
1899	133	103.2	163	1924	87	71.6	75
1900	120	105.3	154	1925	74	67.9	75
1901	139	95.5	151	1926	130	74.4	70
1902	127	95.5	133	1927	87	70.8	70
1903	112	92.2	132	1928	76	67.9	65
1904	118	95.8	145	1929	81	70.4	74
1905	131	90.2	128	1930	77	68	60
				1931	71	68	

(B) NOTIFICATION OF BIRTHS.

The Acts bearing on this subject are the Notification of Births Acts, 1907, which was adopted by the Corporation in September, 1922 and the Notification of Births (Extension) Act, 1915. These Acts place an obligation on certain individuals to notify to the Medical Officer of Health within thirty-six hours, births which have occurred in the area. The object of the Acts is to enable the Local Authority to afford advice and assistance to parents on the care and upbringing of children.

During the year 1930 there was a distinct increase in the numbers of the notifications of births as compared with previous years. This was due to the increased activity of this department in regard to following up cases. The actual number notified in that year was 1182; during the same period 1,998 births were registered so that the total percentage of notifications was 59.3. It was felt that these figures could be still further improved, and so a special effort was made during 1931 to secure the highest possible number of notifications. This was directed along the lines of closer supervision of midwives, checking of births registered with District Registrars and general enquiries made in the different districts. The effect of this was an immediate increase in the number of notifications sent to the Public Health Department. The total number of such notifications for the year was 2,015, which the actual number of

births registered during the same period was only 1,921. The discrepancy between the two figures is accounted for by the fact there were 98 notifications of still births. Deducting these cases, there remains a total of 1,917 notifications of live births out of 1,921 registered births which is for all practical purposes one hundred per cent.

On 30.4 per cent of the births notified doctors were in attendance.

Notification of births is a matter of considerable importance, particularly in districts where there is in existence a scheme for Maternity and Child Welfare as it enables the Local Authority to get into direct touch with the mothers and their children by means of their Health Visitors and to afford them advice and assistance which would not otherwise be available for them. It may be said that the great preponderance of infant mortality is due to the ignorance of the mothers and it is in order to combat this ignorance that such schemes have been inaugurated. Their importance to the community is considerable but to function effectively they are dependant upon proper notification; otherwise the Health Authority is not in a position to know those mothers who are likely to require the advice which is necessary for the proper upbringing of their children. All such cases are visited by our Health Visitors as soon as possible after the tenth day after the child's birth, provided the doctor and midwife have ceased attendance. When necessary such cases are advised to attend the Child Welfare Clinic for further advice from the doctor in charge and it is significant that coincident with the marked increase in notifications of births, the attendances at the Clinic during the past year were greater than ever before.

(C) MATERNAL MORTALITY.

Maternal mortality is defined as the number of deaths of women in, or in consequence of, childbirth in any given year per 1,000 births occurring in that year. During 1931 eight such deaths occurred in the City as compared with four in 1930. This is equivalent to a rate of 4.1 per 1,000 births. Last year I drew attention to the low rate of maternal mortality for this City, 1.83, which was one of the lowest for any district in these countries, but urged a cautionary outlook on the future in view of the figures of past years which were unduly high. We have been able to investigate all the deaths associated with pregnancy in the City during the past year and, despite the high figure which they represent, there is this satisfactory feature about them that only one was attributable to puerperal sepsis. Reference to table 25 will show that the figure was the same for 1930, while in 1929 there was no death from this cause, but in previous years the record was not so satisfactory. There would appear then to be an upward trend so far as this disease is concerned, for it is shown also in another section that there is a concurrent improvement in the figures for incidence of puerperal sepsis. Of the remaining seven deaths, three were due to post-partum haemorrhage, two to concealed accidental haemorrhage, one to rupture of the uterus secondary to contracted elvis and one to "anaemia and missed labour (six months) cardiac failure." For the period under review the maternal mortality rate for Saorstát Éireann was 4.0 for Dublin, 2.7 for Limerick, 3.1, and for Waterford 6.5. The rate for England and Wales in 1930 was 4.40.

Table 25.—The number of deaths of women directly attributable to or associated with pregnancy or childbirth during each of the years 1924—31, together with the rate per 1,000 births during each of these years, for the City of Cork. (Corrected for Births and Deaths in public institutions.)

Year	Deaths from Puerperal Septic Diseases.		Deaths from accidents of Pregnancy or Childbirth		Total Deaths from Puerperal Septic Diseases and accidents of Pregnancy or Childbirth		Deaths from causes associated with Pregnancy of Childbirth (not included in foregoing).		Total Deaths caused by, or associated with Pregnancy or Childbirth	
	No.	Rate per 1000 Births.	No.	Rate per 1000 Births.	No.	Rate per 100 Births.	No.	Rate per 1000 Births.	No.	Rate per 1,000 Births.
1924...	5	2.55	6	3.05	11	5.60	1	0.51	12	6.11
1925...	5	2.54	5	2.54	10	5.08	1	0.51	11	5.59
1926...	3	1.66	8	4.42	11	6.08	—	—	11	6.08
1927...	5	2.74	6	3.28	11	6.02	—	—	11	6.02
1928...	3	1.64	9	4.92	12	6.56	1	0.55	13	7.11
1929...	—	—	4	2.24	4	2.24	—	—	4	2.24
1930...	1	0.46	3	1.37	4	1.83	—	—	4	1.83
1931..	1	0.52	7	3.63	8	4.10	—	—	3	4.10

(D) SUPERVISION OF MIDWIVES.

1. Number of Midwives in Practice :—

Certificate of C.M.B. ...	...	...	37
Other recognised certificates ...	...	...	47
Total ...	...	...	84
2. Number of midwives according to type of practice.

Attached to public institutions ...	...	...	4
Conducting only private maternity or nursing homes ...	...	...	10
Dealing with less than five cases per year ...	...	...	10
Monthly nurses ...	...	...	16
Others ...	...	...	44
Total ...	...	...	84
3. Number of visits of inspection of midwives ... 260
4. Disinfection of appliances ... 6
5. Reasons for summoning Medical help :—

Miscarriage ...	...	2	
Haemorrhage ...	...	1	
Albuminuria, oedema, etc. ...	...	1	
Abnormal presentation ...	...	20	
Premature labour ...	...	2	
Obstructed and delayed labour ...	...	41	
Placenta praevia ...	...	12	
Post partum haemorrhage ...	...	4	
Retained and adherent placenta ...	...	6	
Ruptured perineum ...	...	6	
Secondary post partum haemorrhage ...	...	1	
Other causes ...	...	15	

6. Notifications of still births	...	...	98
7. Notifications of artificial feeding	...	...	24
8. Notifications of having laid-out dead bodies	...	...	2
9. Suspensions for twenty-four hours on account of contact with cases of infectious disease	...	...	2

The number of visits of inspection made by the Inspector of midwives during the year amounted to 260 (as compared with 161 during 1930). This increase was made possible by transferring the visits to homes after notifications of births from Miss Dunne to the Health Visitors of the district concerned. In this way more attention has been able to be paid to the inspection of midwives during the year and, incidentally, to the notification of births as already mentioned. On the whole it may be said that the standard of midwifery in the district has been satisfactory and the midwives have shown a readiness to comply with the requirements of the Local Authority in regard to cleanliness and methods of practice. As will be shown more fully in another section there were 5 cases of puerperal fever notified during the year but subsequent investigation showed that in two of them infection was undoubtedly incurred in outside areas while in two others the diagnosis was changed so that in actual fact there was only one case of puerperal fever so far as the City is concerned. This may be regarded as a satisfactory showing as the average for the previous five years was 7.4 cases per annum. At the same time we have had reason to suspect that a midwife whose name had been previously removed from the Roll of Midwives of the Central Midwives Board was carrying on practice during the year, by attending on occasional cases. It was impossible, however, to obtain direct evidence of this and similar difficulty was experienced in 1930, when this midwife was prosecuted by the Corporation for practising in contravention of the Midwives Acts. The circumstances under which this midwife's name was removed from the Roll were very exceptional so far as they relate to her knowledge of midwifery and her methods of practice, both of which were primitive in the extreme and it is most unfortunate that it is the poorest and most ignorant classes of the community which suffer for the defaults of individuals such as this. One is naturally glad to be able to say that such cases are now rare and likely to become still more so with the course of time for there seems to be no reason to doubt that as those midwives who have passed the examination of the Central Midwives board, gradually replace those who do not hold this qualification the standard of midwifery practice will be still further improved.

It is hoped that during the coming year it may be possible to arrange refresher courses for practising midwives on the lines of those organised in other places. Negotiations are at present taking place between the staff of the Erinville Hospital and the Corporation with a view to initiating some such course and if they materialise the result should be of considerable value not only to the midwives concerned but to their patients as well.

(E) WORK OF THE MATERNITY AND CHILD WELFARE SCHEME.

The past year was an important one so far as the administration of this service is concerned inasmuch as it marked the opening of the central Clinic in Tuckey Street and the complete transfer of the maternity and

child welfare services to the Corporation. The events leading up to this change were outlined in my report of last year and do not need to be referred to again. It will suffice to say that the change has marked a very big step forward in the administration of these services. That this advance is appreciated by those for whose benefit it was brought about is amply demonstrated by the increased attendances at the Centre throughout the year. The popularity of the new clinic has been undoubted, so much so, that in one respect it has become inconvenient. This is due to the fact that a great many mothers regard it as a curative institution and bring their ailing babies for treatment there. It is necessary therefore to emphasize once more that the function of the clinic is preventive not curative and that it is necessary to discourage the attendance of mothers with sick children unless under very special circumstances. The treatment of such children is merely usurping the functions of the general hospital and is no part of the work of a child welfare clinic. The ways in which such a clinic may be of benefit to the community which it serves are manifold ; antenatal and postnatal supervision of the mother, instruction in dietary and feeding, in dress and in the regulation of habits of living. To maintain normal health and development in healthy children. The detection and correction of grosser ailments at an early stage in their development and the general supervision of the health of children from birth to school going age. These are the lines on which our work is being pursued at present and to which we intend to adhere as closely as possible in the future.

For administrative purposes the City has been divided into three districts, north, middle and south, each in charge of a Health Visitor whose duties embrace the home visiting of nursing mothers and their babies. As mentioned in a previous section, the information as to these cases is derived from the notifications of births submitted by the midwives. On receipt of such intimation the Health Visitor proceeds to the home and having ascertained that both the doctor and midwife have ceased attendance, offers advice to the mother as to the care of the child. It is true that on occasion these visits have been resented but such cases are few and far between and, on the whole the Health Visitors have been very well received and their services gladly availed of and there is little reason to doubt that they have played their part in effecting the reduction in infant mortality of recent years. It is, however, still true that there is a great deal of leeway to make up as the amount of ignorance prevalent concerning the management of children is astonishing. This statement is not applicable to the poorer classes alone for there is undoubtedly a great lack of knowledge of such subjects among the well-to-do classes also. This is all the more regrettable when one realises that many of the seeds of future ill health are sown by faulty management and wrong methods of feeding in infancy just as the most important traits of the individual's future character are acquired also at this period, surprising as it may seem to some. Be that as it may, the fact remains that the care and management of infants and young children is conducted in very haphazard manner to the detriment of their future character and health. It may appear to be somewhat out of place here to refer to the social habits of our people but, nevertheless, they have an important bearing on the subject under discussion, and our experiences of the many thousands of children who have passed through our hands at the various clinics compels me to say that very much more could be

done for many of them in the way of intelligent parental supervision than is being done now. Very many of them, I regret to say, present all the signs of lack of parental control of any sort to the detriment not only of their own health and character, but to those of the community to which they belong as well. I venture to suggest that no amount of education in school or State supervision outside it will in any degree compensate for the absence of reasonably administered control in the home and there is no doubt that so far as large numbers of our children are concerned that control is completely lacking. While dealing with this matter it is pertinent to suggest that a greater share in the upbringing of the children should be undertaken by the father than has been the case hitherto in this country. It would relieve the mother to some extent from the drudgery which is her lot at present and predispose to the benefit of everyone concerned.

It is hoped that the Child Welfare Centre will play its part in bringing about all these necessary changes, principally by reason of its educative function which has already done good work in dispelling some of the ancient superstitions about children which have been characteristic of the City for generations. As an instance of this may be cited the reluctance of many mothers to have their babies weighed, which we experienced when the clinic was first started. Very many of them considered this to be unlucky and could only with difficulty be persuaded to submit to it. This type of mother is now the exception but another and more difficult obstacle is the influence exercised by the older generation of women, often semi-illiterate and entirely ignorant, over the younger mothers. Doubtless, however, in the course of time with the progress of knowledge and education the influence of this class will disappear to be replaced by an enlightened understanding as to the proper care and management of children. At any rate that is the task to be faced by the Child Welfare Service and the progress made up to date seems to indicate that it is in a fair way to push the undertaking to a successful conclusion.

The following as a summary of the work carried out during the year by the staff of the Centre :—

Attendances of children under one year :—

(a) New Cases	...	...	...	867
(b) Old Cases	...	...	...	4428
Attendances of Mothers with Children	...	...	...	5970
Cases seen by the Medical Officer :—				
(A). Under one year				
(1) New Cases	...	...	...	546
(2) Old Cases	...	...	...	972
(B). One to two years				
(1) New Cases	...	...	...	118
(2) Old Cases	...	...	...	139
(C). Two to five years				
(1) New Cases	...	...	...	129
(2) Old Cases	...	...	...	78
(D). Expectant Mothers				
(1) New Cases	...	...	...	72
(2) Old Cases	...	...	...	34

Analysis of cases dealt with by the Medical Officer :—

Consultations on infant feeding	...	...	411
Diseases of respiratory system	...	...	83
" " new born	...	...	3
" " reproductive system	...	...	3
" " urinary system	...	...	23
" " nervous system	...	...	6
" " circulatory system	...	...	3
" " alimentary system	...	...	87
" " skin	...	...	35
" " ears	...	...	39
" " eyes	...	...	23
Exanthemata	...	...	15
Mental defects	...	...	5
Congenital Defects	...	...	6
Orthopoeedic defects	...	...	6
Rickets	...	...	45
Number of cases dealt with	...	...	793
Number of attendances	...	...	1982
Ante natal work :			
Number of cases dealt with	...	...	72
Number of attendances	...	...	106
Return of Health Visitors' work :—			
(A). Under one year			
(1) Primary visits	...	...	1424
(2) Secondary visits	...	...	3166
(B). One to two years			
(1) Primary visits	...	...	437
(2) Secondary visits	...	...	1792
(C). Two to five years			
(1) Primary visits	...	...	744
(2) Secondary visits	...	...	1932
(D). Expectant mothers			
(1) Primary visits	...	...	347
(2) Secondary visits	...	...	258
(E). Nursing mothers			
(1) Primary visits	...	...	1606
(2) Secondary visits	...	...	1058

VOLUNTARY WORKERS.

This section would not be complete without some reference to those ladies who came to our assistance during the year. Soon after the opening of the new clinic in Tuckey Street it became apparent that the staff of nurses would not be able to cope with the numbers of mothers and children that were beginning to avail of its services and on this account an appeal for voluntary assistance was made to the lady members of the Child Welfare League who were asked to attend at the clinics and to help the nurses in their work and to bring some of their friends to assist also. For some considerable time past these ladies have been attending the centre and it is no exaggeration to say that their services have been invaluable. They have relieved the nurses of a great deal of routine clerical work and so freed them for attendance on the doctor when interviewing mothers, they help to maintain order, assist in weighing babies and generally

have made themselves so useful towards the working of the clinics that it is hard to imagine now how they could be carried on without their assistance. All have been most assiduous in their attendance and the help which they have afforded has been much appreciated not only by the staff but also by the mothers. Mrs. M. Lynch, Hon. Sec. of the League, with Mrs. M. Murphy, is in charge of the voluntary work of one centre, Mrs. F. Daly and Miss E. Tivy of another, and Miss Mullane of the third. Special credit is due to Miss Mullane who has given several years to this work and has been unfailing in her attendances. In addition to these ladies the following also gave their help :—Miss R. Daly, Miss N. Madden, Miss A. M. Olden and Miss M. Kelleher.

(F) PUERPERAL SEPSIS.

Information concerning five cases of puerperal sepsis reached the Department during the year. Each of these was investigated and as a result of the information forthcoming from the enquiries it transpired that in two of them the diagnosis of puerperal fever was not sustained in hospital, the condition in each of them being considered to be sapraemia. In two others the patients resided in the county area had been treated in their homes prior to transfer to hospital in the City for completion of confinement ; these were both difficult cases and had been subjected to a good deal of manipulation before their admission to hospital and there seems to be no doubt that this was responsible for the development of the septic condition. In the remaining instance the patient resided in the city and in her case difficulty was experienced owing to the abnormal size of the child. This was the only City case in which the diagnosis of puerperal fever was confirmed after admission to hospital, although there was still an element of doubt as she was suffering from concurrent tuberculous disease. She was admitted to hospital on 28/3/31 with a history of ante partum haemorrhage and was confined on the same day, with considerable difficulty, owing to abnormal distension of the child's abdomen ; the child only survived 24 hours, death being attributed to tuberculous peritonitis, a very unusual condition in a child so young. The patient's temperature rose two days later and remained raised until her death on 11/4/31. This patient was not attended by a doctor before her admission to hospital and no arrangements had been made for her confinement beforehand.

(G) MATERNITY HOMES.

During the year a survey was made of the homes and hospitals which were known to the Department to be used for the purpose of receiving cases for confinement. It would seem from the weekly announcements which appear in the press, that a number of such homes were engaged in a sort of competition for patronage and it was partly in consequence of this that it was decided to embark on the inquiry. Unfortunately there are no legal enactments in this country which would strengthen the hands of the Local Authority in the matter of supervision over such establishments and one is therefore limited entirely to powers of entry and inspection granted by the Midwives Acts. Some of the premises investigated are primarily intended for reception of surgical and nursing cases and only take occasional midwifery cases, generally speaking these establishments are of a high class as are also a number

of the homes which are devoted entirely to maternity cases. The same cannot be said of some of the smaller houses which are used for this purpose. The results of the inquiry are set-forth herewith.

Total number of Homes investigated	...	22
Used for both surgical and maternity cases		2
Standards of accomodation satisfactory	...	9
Standards of accomodation unsatisfactory	...	13

Defects discovered :—

1. Cubical capacity insufficient	...	...	5
2. No bathroom	...	...	13
3. Water closet outside building	...	...	10
4. Water closet defective	...	...	4
5. General standards very unsatisfactory	...	...	4
6. House sublet to other occupants	...	...	4
7. Workshop on same premises	...	...	4
8. Dilapidation of premises	...	...	1

Clearly there is a necessity for extended powers in the control of these establishments, as matters stand this power is lacking and there is nothing to prevent any person so inclined from converting her house, no matter how unsuitable, into a so-called maternity home and from receiving confinement cases into it. The absence of bathrooms, as noted in no less than thirteen instances, should be an absolute bar to the use of such houses for confinements as should also outside water closets. In two of the cases investigated the conditions were particularly bad ; in one the house itself was dilapidated, there was no bathroom, a defective water closet was situated in the yard, portions of the house were sub-let to two other families, and to complete the picture it was found that pigs were kept on the premises. In the other the conditions while not quite so bad were sufficiently so to attract special notice. In this instance portion of the premises was used as a factory and the accomodation was of a very primitive character. The results of this inquiry show the necessity for closer supervision of such places in the interests of the patients by whom they are likely to be utilized. As already stated such supervision is limited to entry and inspection without any power of laying down conditions and standards or of enforcing penalties in cases of default ; for practical purposes therefore it might just as well not exist. One might not object to some of the less well equipped premises being usee for occasional cases, but they should certainly not be allowed to describe themselves as maternity homes or to be used habitually for such purpose. Trouble is bound to ensue sooner or later if they are allowed to carry on unchecked as at present.

Section VI—Control of Food Supplies

In last year's Report I outlined the development of the services for the control and supervision of food supplies from the year 1924 up to the present time and reference to that report will show the remarkable improvements that have been effected as a result of the ability and industry of our Chief Veterinary Inspector, Mr. S. R. J. Cussen. Considering all the circumstances very remarkable progress has been made during this period although we are still very far from the standard desired and which we are entitled to look for from a city of the size of Cork. The principal foodstuffs coming under the supervision of this department are meat and milk, and when one considers how largely they are availed of by the community, the necessity for their close control will be appreciated. Most, if not all, of the legal enactments framed for the control of these and other commodities have been based on the relationship of food to human disease, the knowledge of which has come to light as a result of scientific research in different fields. It is a matter, therefore, of the greatest importance to the community that not only should the existent laws be thoroughly administered and enforced, but that further powers should be sought and obtained where necessary for the protection of the people against disease which may be introduced by impure or adulterated food. It is not sufficient to say that the people got on very well in the past without all these laws and regulations. We know now that a lot of illness and very many deaths have been caused which could have been prevented. Many of these causes are still operative and it will be our duty to refer to them until they have been reduced to the lowest possible minimum. This applies particularly to milk and, to a lesser extent, to meat.

(A) MEAT INSPECTION.

In the 1930 report, reference was made to two matters of prime importance in regard to the marketing of meat in the City, and it is a matter of regret to have to state that there has been no improvement observable in either of them during the past year. The unsightly and unhygienic manner in which meat has been transported through the city for generations, still holds. Similarly the exposure to dirt, dust and other contamination continues unabated in the manner in which the meat is exposed for sale in the butchers' shops. It is really remarkable that the trade custom in this respect does not ever appear to have called for criticism hitherto. So far as I know there is only one shop in the City at the present time which conforms to modern hygienic requirements in respect to windows and fittings. The mistaken notion still holds that the open shop-front is necessary to preserve the meat and so we have the anomaly of the meat exposed unprotected to all the dust and dirt from the street and, in summertime as anyone can observe, the prey of innumerable flies. Last year I expressed the hope that reform would come from within the trade itself, which is of course the desirable thing, but there does not appear to be much likelihood of this materialising and it seems inevitable that the Sanitary Authority shall eventually seek the necessary powers to bring about the reform.

The question of central inspection of meat supplies is still undecided. It may be as well to recapitulate the circumstances which led up to this subject being discussed by the Corporation. The two important factors which operated in bringing this matter to a head were (a) that there were no Bye-laws regulating the hours at which slaughtering could be carried on in the City slaughter-houses, and so it was impossible to exercise adequate supervision over the beasts before slaughter and of the carcasses afterwards. In consequence reliance had to be placed in most instances on inspection at the retail shops and stalls, at best a most unsatisfactory method, not only from the point of view of the inspector but also of the butcher who unwittingly exposed unsound meat for sale. (b) Owing to the existence of a large number of slaughter-houses in the rural area adjacent to the City from which the great bulk of the City meat supply is derived and which were subject to no supervision whatever and which are likely to remain indefinitely without our control, it was felt essential to recommend central inspection and stamping for all meat sold in the City. It was particularly in respect to the meat from these outside slaughter-houses that control and inspection was felt to be necessary as there seems to be no doubt that many of them were availed of for the sole purpose of evading the Corporation Bye-laws, such as they were. There is no doubt that the sub-committee that dealt with this matter was disposed to recommend the adoption of central inspection and stamping or alternatively the erection of a central municipal abbatoir. It is well, perhaps, to make clear what is meant by central inspection and stamping. Under this system it is proposed to erect a central depot to which all meat shall be taken before distribution to the butchers' shops, and where it shall be subjected to a close and rigid inspection by the Corporation Veterinary staff. All meat found to be unsound or otherwise unfit for food to be destroyed and other meat marked with a stamp to show that it had been inspected and was passed as sound. Apart from the assurance which it will afford the public stamping is necessary for the prevention of fraud. Not only will central inspection afford adequate protection (at present lacking) to the public, but it will also save the butcher from the vexatious prosecutions which it is now necessary to initiate when unsound meat has been detected exposed for sale. It is difficult therefore to understand the opposition which has been offered to the project.

The only satisfactory alternative to central inspection is the establishment of an abbatoir on the lines mentioned above and of the two there is no doubt that this is the more satisfactory method of dealing with the problem. Concentration of slaughtering is the only certain method of detecting diseased conditions in a meat supply. The inspection of carcasses and their offals in a central meat inspection depot may be regarded as a reasonably satisfactory alternative. Uniformity of inspection cannot be expected in a city where there exists a large number of slaughter houses. In Cork City there are twenty-seven such slaughter-houses and in these circumstances it is not possible to maintain a satisfactory system of inspection with present staff. Added to this difficulty is the large quantity of meat slaughtered in the rural area where no system of meat inspection obtains. The amount of this meat which reaches the consumer without undergoing any form of inspection, must be very great in present circumstances. The examination to which meat is subjected in the course of routine shop inspection is often neces-

sarily of a cursory nature and it must be emphasized that no system of inspection is of any real use unless the whole carcass and its offals are available for examination, which is, of course, impossible under the present system of shop inspection. It should be mentioned at this juncture that the activities of our staff of inspectors are almost completely absorbed by their duties under the Agricultural Produce (Fresh Meat) Act which involve long hours in the bacon factories and approved slaughter-houses.

An efficient system of inspection has another important aspect ; it places us in the position of being able to collect very valuable evidence as to the incidence of disease among live stock. In this connection the introduction of the Agricultural Produce (Fresh Meat) Act, which provides for the antemortem and postmortem examination of all animals, the flesh or offals of which are intended for export, has paved the way for the collection of interesting and most important evidence in regard to the incidence of tuberculosis in cattle. There are six premises registered in Cork under this Act (three bacon factories and three other slaughter-houses). These premises are under the control of the municipal authorities ; every animal slaughtered in them is subjected to thorough examination whether the flesh is intended for export or for home consumption. Careful records are kept of all diseased carcasses. Our records show that the disease chiefly responsible for the condemnation of beef and pork is tuberculosis, and that in regard to pigs that the disease is more prevalent among animals coming from dairying districts and it would appear that the inference to be drawn from this fact is that creamery milk contaminated with tubercle bacilli is being fed to pigs.

A review of the facts outlined above shows clearly that there is need of reform in the handling and distribution of the meat supply of our City and that the problem will have to be tackled sooner or later.

As will be seen from the subjoined tables a large quantity of meat was condemned during the year as being diseased or otherwise unfit for food. This meat is disposed of in various ways. In the case of meat seized or surrendered in slaughter-houses, shops or other such places preliminary dosage with a strong disinfectant is given to prevent the possibility of the meat being used for human consumption after it has passed out of our supervision, it is then removed to a local chemical works where it is converted into manure and other bye-products of a more or less valuable nature such as fats used for soapmaking. During the process of extraction the meat is subjected to such a temperature as to ensure that the resultant products are absolutely sterile.

Table 26.—Showing the number of animals examined in the slaughtering premises registered under the Fresh Meat Act, and the number of carcasses totally and partially condemned.

Species of Animal		SLAUGHTER HOUSES.				
		Number slaughtered	Carcasses Condemned			
			Totally condemned	Per-centage	Partially Con-demned	Per-centage
Cattle*	...	2148	145	6.75	615	28.63
Calves §	...	3995	20	0.50	58	1.45
Sheep	...	2736	2	0.70	5	0.18
Pigs	...	37537	116	0.30	4976	13.25
		BACON FACTORIES.				
Pigs	...	133770	457	0.34	24120	18.03

*Cattle include all bovine animals over 100 lbs. in weight.

§ Calves include all bovine animals under 100 lbs. in weight.

Table 27.—Quantity of Meat including Offals condemned for Tuberculosis and other diseases in Slaughter Houses and Bacon Factories.

VARIETY		SLAUGHTER HOUSES.				
		Quantity Examined	Tuberculosis Quantity Condemned	Per-centage	Other Diseases Quantity Condemned	Per-centage
Beef	...	lbs. 1,181,400	lbs. 75,576	6.39	lbs. 24,884	2.10
Veal	...	317,600	988	0.31	1,332	0.41
Mutton	...	164,160	—	—	1,405	0.85
Pork	...	3,002,960	86,771	2.88	24,224	0.80
		BACON FACTORIES.				
Pork	...	21,403,200	304,847	1.42	62,659	0.29

Table 28.—Carcasses Condemned for Tuberculosis in Slaughter Houses and Bacon Factories.

Species of ANIMAL		SLAUGHTER HOUSES.						
		No. slaughtered	Affected		Totally Condemned.		Partially Condemned.	
			Number	Per- centage	Number	Per- centage	Number	Per- centage
Cattle	...	2148	666	31.00	121	5.63	545	25.37
Calves	...	3995	53	1.32	5	0.12	48	1.20
Sheep	...	2736	—	—	—	—	—	—
Pigs	...	37537	4322	11.51	58	0.15	4264	11.35
Pigs		BACON FACTORIES						
		133770	23980	17.92	257	0.19	23723	17.73

Table 29—Quantities of Offals Condemned for Tuberculosis and other Diseases in Slaughter Houses and Bacon Factories.

Offals	TUBERCULOSIS.									
	SLAUGHTER HOUSES.								BACON FACTORIES	
	Beef		Veal		Mutton		Pork		Pork	
	No.	Wt. lbs.	No.	Wt. lbs.	No.	Wt. lbs.	No.	Wt. lbs.	No.	Wt. lbs.
Heads ...	411	9042	11	121	—	—	2234	22340	10113	121356
Lungs ...	958	4790	84	210	—	—	2316	2316	14586	14586
Hearts ...	392	1960	28	70	—	—	1126	563	7098	3549
Livers ...	159	1908	15	90	—	—	1106	3318	6451	19353
Stomachs ...	176	5280	5	75	—	—	1106	1106	6451	6451
Intestines ...	351	10530	4	60	—	—	2165	17320	12736	101888
Spleens ...	103	309	2	2	—	—	178	44½	1348	337
Kidneys ...	95	71¼	2	1	—	—	46	23	458	229
Udders ...	20	280	—	—	—	—	—	—	—	—
Other Organs	19	57	—	—	—	—	—	—	—	—

OTHER DISEASES.										
		lbs.		lbs.		lbs.		lbs.		lbs.
Heads ...	2	44	1	11	1	5	—	—	—	—
Lungs ...	17	85	66	165	652	652	6437	6437	7370	7370
Hearts ...	12	60	3	7½	18	4½	611	305½	563	281½
Livers ...	669	8028	28	168	428	642	3034	9102	7671	23013
Stomachs ...	—	—	1	15	1	6	10	10	—	—
Intestines ...	—	—	1	15	1	6	10	80	—	—
Spleens ...	—	—	—	—	—	—	—	—	—	—
Kidneys ...	1	¾	2	1	—	—	34	17	83	41½
Udders ...	9	126	—	—	—	—	—	—	—	—
Other Organs	—	—	—	—	—	—	—	—	—	—

Table 30.—Showing number of carcasses inspected and the quantity of meat including offals condemned in Slaughter Houses other than those registered under the Fresh Meat Act.

Class of Animal.	Number of Carcasses Examined	Condemned.		
		Wholly	Partially	Quantity of Meat and Offals
Cattle ...	1017	1	108	lbs. 3808
Calves ...	361	—	11	280
Sheep ...	9157	1	243	1400
Pigs ...	70	—	5	60

In the case of private slaughter-houses, inspection is by no means as efficient as that carried out in the approved slaughter-houses under the Fresh Meat Act. Under the provisions of this act it is illegal to slaughter unless a veterinary surgeon is present on the premises, and all slaughtering must take place between the hours of 8 a.m. and 6 p.m.

There are no such restrictions on the conduct of private slaughter-houses, so that inspection is more or less dependent on the co-operation of the butchers by retaining carcasses for inspection, especially those affected with disease, before removal to the shops for sale.

PROSECUTIONS.

(a) For offences against the Public Health Act :—

Sale of unsound meat—9 prosecutions—amount of fines, £5 0s. 0d.

Sale of unsound Tomatoes—1 prosecution—amount of fines, 3s. 6d.

Sale of unsound apples—2 prosecutions—amount of fines, 7s. 6d.

(b) For offences against Corporation Bye-Laws :—

5 prosecutions—amount of fines, £1 18s. 6d.

Table 31.—Nature and Quantity of Meat Seized and Surrendered for condemnation in Shops.

		SEIZED		SURRENDERED	
		Tuberculosis	Other Diseases	Tuberculosis	Other Diseases
		lbs.	lbs.	lbs.	lbs.
Beef	...	487½	70	979½	—
Veal	...	—	13	—	—
Mutton	...	—	32¾	—	—
Pork	...	—	58	—	54½
Bacon	...	137	82	—	634½

Table 32.—Nature and Quantity of Foodstuffs, other than Meat, Seized and Surrendered for condemnation in Shops.

		Seized.	Surrendered
		lbs.	lbs.
Fish	...	—	119½
Cheese	...	—	388
Bread	...	—	14
Mushrooms	...	—	24
Apples	...	42½	672
Oranges	...	10½	—
Plums	...	—	28
Currants	...	—	28
Dates	...	—	14
Tomatoes	...	12	—

(B) SUPERVISION OF MILK SUPPLIES.

The chief enactments under which control of the milk supplies is exercised are (a) The Public Health Acts, (b) the Dairies, Cowsheds and Milk Shops Order, 1908, and (c) the Bovine Tuberculosis Order, 1926.

The Public Health (Ireland) Act, 1878, provides, inter alia, for the inspection and examination of milk, exposed for sale, or being conveyed for sale, or deposited in any place for the purpose of sale, and in pre-

paration for sale and intended for the food of man. It also provides for the seizure and destruction of milk which appears to be diseased, or unsound, or unwholesome, or unfit for the food of man.

The Dairies, Cowsheds and Milkshops Order provides for (a) the registration with the Local Authority of cowkeepers, dairymen or purveyors of milk, (b) the inspection of cows in dairies, (c) prescribing the lighting, ventilation, cleansing, drainage and water supplies of dairies and cowsheds, (d) securing the cleanliness of milk stores, milk shops and milk vessels, (e) prescribing precautions to be taken for protecting milk against contamination or infection.

The Bovine Tuberculosis Order aims at lessening the amount of tuberculous milk reaching the consumer.

495 persons are registered as milk vendors, of whom 296 sell milk from shops and the remaining 199 from vans.

During the year 14,051 inspections were made of milk shops and 1,242 of milk vans. Inspection extended to the provisions made for the cleanliness of the shops, vans and utensils, the manner in which the milk was stored and handled, and to the cleanliness of the persons engaged in the handling of the milk. 431 visits were made to cowsheds. These were found to be in a satisfactory condition of cleanliness. 79 milch cows were inspected. A thorough clinical examination was made of each animal, and milk samples were taken for microscopical examination. In the case of two of these samples acid-fast bacilli were found which were suggestive of tubercle. The tuberculin test was applied to the cows from which the suspicious samples were taken, they both yielded negative reactions.

80 notices were issued under the Dairies, Cowsheds and Milk Shops Order. They have been satisfactorily complied with. The serving of these notices coupled with the closer supervision of the veterinary staff has been responsible for the greater attention which has been paid to the cleanliness of milk shops and vans. 21 prosecutions were instituted against persons who failed in their obligations under the Dairy Order, convictions were obtained with fines to the total amount of £3 4s. 6d.

During the year 408 samples of milk were taken for bacteriological examination. The tests employed were (a) the sedimentation (or dirt) test, (b) the Reductase Test, (c) the Fermentation Test, and (d) the Microscopic Test.

(a) The Dirt Test.—This is a naked eye test. A certain quantity of milk is forced under pressure through a cotton wool pad and the latter is then examined for the presence of visible dirt. The chief value of this test lies in the fact that by means of it one is able to demonstrate beyond any possible doubt to the producer himself the presence of dirt in his milk. The pads will separate dirt which in the ordinary course would remain in suspension in the milk and would otherwise never become apparent to the naked eye, even on the milk standing. Furthermore the pads can be filed away for future reference and in this way a rough

check is to hand which enables one to judge the improvements (if any) effected in the handling of the milk. 412 samples of milk were submitted to this test during the year and the results were classified as under :—

Very dirty	...	...	103
Dirty	...	...	139
Fairly clean	...	...	82
Clean	...	...	61
Very clean	...	...	23
Total			408

(b) The Reductase Test.—This test is performed by the addition of 1 cubic centimetre of a standard solution of methylene blue to 40 cubic centimetres of the milk under examination. The immediate effect of the addition of the methylene blue is the development of a marked blue colouration in the mixture. The latter is then placed in a water-bath which is maintained at a temperature between 100° F and 104° F and the resultant change in colour noted. As a result of the action of the bacteria which are present in the milk the mixture gradually loses its colour and the speed at which this decolourisation takes place is used as an index of the amount of bacterial contamination present. The following are accepted standards used in connection with this test :—

- 1.—Change of colour in 20 minutes or less—over 20,000,000 organisms per c.c. (Grade IV. Milk).
- 2.—No change in 20 minutes, but change in 2 hours—4,000,000 to 20,000,000 organisms per c.c. (Grade III. Milk).
- 3.—No change in 2 hours, but change in 5½ hours—500,000 to 4,000,000 organisms per c.c. (Grade II. Milk).
- 4.—No change in 5½ hours—less than 500,000 organisms per c.c. (Grade I. Milk).

On the basis of this test the classification of samples examined during the year was as follows :—

Grade I.	...	...	...	293
Grade II.	...	...	...	89
Grade III.	...	...	...	13
Grade IV.	...	...	...	13
Total				408

(c) The Fermentation Test.—In this test the milk is placed in the water bath at a temperature of 100° F. to 104° F. for 24 hours. The fermentation is then noted and the clot classified as follows :—

- 1.—Normal jelly-like clot—presence of normal bacteria only.
- 2.—Cheesy (clot broken up and quantity of turbid fluid present)—presence of peptonising bacteria indicative of contamination by dust from cow-sheds, etc.
- 3.—Gassy (large number of gas bubbles together with disintegrated clot and turbid fluid)—presence of manurial contamination.

The classification of samples examined according to this test was as under :—

(1) Normal Clot	...	...	183
(2) Cheesy Clot	...	...	164
(3) Gassy Clot	...	...	61
Total	...	...	408

(d) The Microscopic Test.—In addition to the tests outlined above all samples of milk were submitted to microscopic examination. The milk is first centrifuged and a portion of the resultant deposit is transferred to a slide and stained by the Ziehl-Nielson method. The main object of this test is the detection of bacilli of the acid-fast group, to which the tubercle bacilli belong. The following is the result of the examinations :

(1) Acid-fast bacilli	...	...	16
(2) Streptococci	...	...	29
(3) Pus cells	...	...	19
(4) Free from (1), (2) and (3)	...	...	345

When, as a result of the various tests outlined above, attention is directed to a milk supply in which there is evidence of careless or defective production or when microscopic examination reveals the presence of acid-fast bacilli (or the other organisms included in this test) our findings are reported at once to the County Medical Officer of Health. The premises of the producers are inspected by the veterinary officer for the Rural Area. This is not always effective. Failure is due largely to the fact that the provisions under the existing legislation relating to cleanliness of cows, cowsheds, milk utensils and milkers have never been seriously enforced in the past by those directly responsible for their administration. The result of this default is that, while there is a high standard of cleanliness maintained in those cowsheds and dairies situated within the city boundaries, the reverse is the case in the vast majority of premises outside them, from which the great bulk of city milk supply is drawn. There are some notable exceptions, and milk of the highest standard is at present being produced in a few localities in the rural area. There is a great demand for such milk and it is able to fetch a higher price in the open market than that of the general supply.

It will be noted that the filter test for the presence of visible shows no less than 59.5 per cent of the samples examined to be of such a nature to be classified as "dirty" or "very dirty." In this respect the figures are even more unsatisfactory than those of last year, when they were slightly more than 50 per cent. Only 20.5 per cent of the samples came under the description "clean" or "very clean." This is very unsatisfactory. Many of the samples examined afforded evidence of gross contamination, mainly of a manurial nature and indicative of very primitive methods of production and handling at the source. As mentioned in my previous report strict control is exercised by the veterinary staff over the dairies and cowsheds situate within the City boundaries, in view of the fact that the great bulk of the milk supply comes from the rural area and in the light of our tests for cleanliness this seems at times a farcical procedure. It would seem, therefore, that practically all the milk coming into the City comes from premises subject to no sort of super-

vision worthy of the name. As has been shown above there are some exceptions to this rule and there seems to be no reason why the majority of the milk producers should not at least approximate to the standards of those who are marketing high grade milk. Our experience during the past year has demonstrated clearly that we can expect no further improvement in the standard of our milk supply until new and more stringent legislation has been introduced which will strengthen the hands of the Sanitary Authority in dealing with offenders. It does not appear to be any exaggeration, in the light of actual experience, to say that the existing laws controlling the sale and distribution of milk were framed with the rights of the vested interests in view rather than the protection of the common people. At any rate it is very depressing to have to witness day after day gross infringements of the most elementary rules of hygiene on the part of the so-called "milkboys" who distribute milk in the City and to know at the same time that one's hands are tied so far as taking legal action is concerned. Similarly one knows that little or nothing can or will be done in the matter of remedying the conditions responsible for the large amount of unclean milk coming into the city. It has always been the practice of this Department to co-operate with the dairymen in order to improve the milk supply and it is regrettable therefore to have to report that this policy has not been a success and to have to advocate more stringent legislation to control the situation. Indeed the veterinary officers have experienced an attitude of growing independence, if not actual truculence, on the part of milk dealers who are, apparently, becoming more and more cognisant of the loopholes afforded them by the law. It is not, I think, generally appreciated that quite a large bulk of the milk supply is handled by a class of individuals known to the trade as "churn boys." These buy the milk in bulk from farmers and retail it to the consumer. More often than not they have had no experience whatever of milk production and handling, their only concern being to buy the milk as cheaply as possible and to obtain the highest price for it. It will be readily appreciated that a good deal of trouble should be forthcoming from this class and that is actually so. Not only are their methods of distribution primitive in the extreme but they have been found, on the whole, to be unamenable to suggestion with the result that our staff of inspectors has experienced considerable difficulty in dealing with them.

In his very valuable report on "Urban Milk Supply" published in 1925, dealing with his investigations into conditions in Cork City, Dr. Grimes reported findings so similar to our own obtained during the past year that one is forced to the conclusion that there has been no material improvement in methods of production during the intervening period. Dealing with the results obtained in connection with the test for visible dirt, Dr. Grimes says:—

"It will be seen that this reveals a very unsatisfactory state of affairs and shows the lack of care in preventing the entrance of dirt into the milk. Much of the milk sold in Cork is so dirty, owing to the presence of manure, fodder and dust, that if the milk were transparent like water, probably few would ever drink it. Being an opaque fluid the dirt in it passes unnoticed, unless the milk is allowed to stand for some time in a glass container. when it is realised that a

large part of fresh manure is soluble and does not appear in the sediment, the lack of cleanliness is made more evident. Scouring and diarrhoea in cows is often the cause of highly polluted milk, since the inevitable soiling of the tail and flanks of the cow with highly-infected faeces greatly increases the risk of contamination. It is hardly an exaggeration to state that dirty milk, with its possibility of conveying pathogenic bacteria, is a menace to the health of the community, particularly to the infant portion."

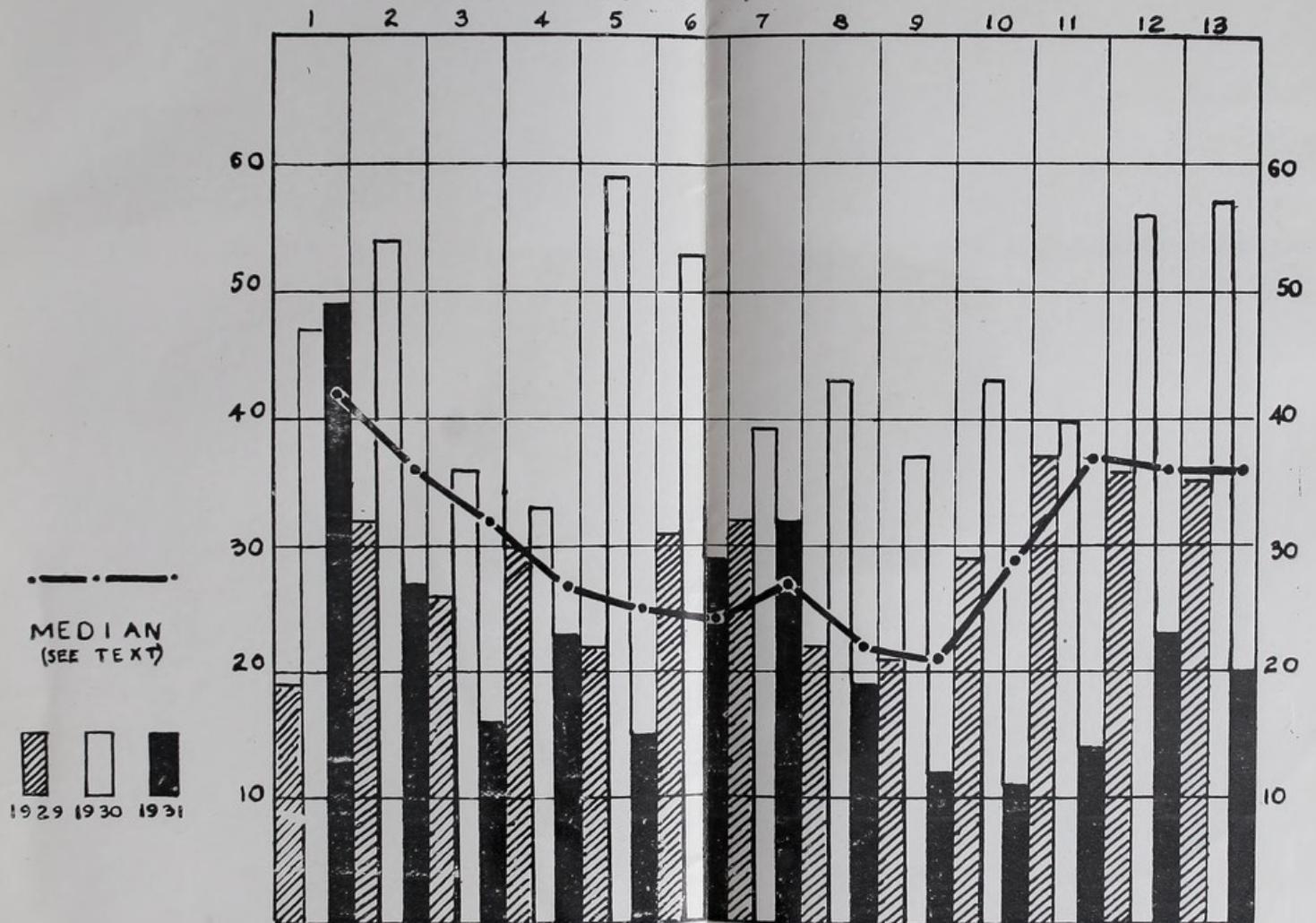
This statement is as appropriate to-day as when it was written seven years ago. In one respect only, perhaps, may it be modified. There is not nowadays the same tendency for the milk to form visible sediment on standing which was so characteristic of it in former times. It is to be regretted however, that this difference is not to be attributed to any essential improvement in production, but merely to the introduction of the cotton-wool strainer which by separating-out the gross elements of contamination results in a milk which to the naked eye, any rate has the appearance of being pure and clean. This is, however but a delusion for, as has been pointed out above, the filter pad used by the Departmental inspectors will demonstrate dirt which under ordinary conditions would remain in suspension in the milk and never become apparent even on standing. This matter has also been dealt with by Dr. Grimes in his Report of which the following is an extract:—

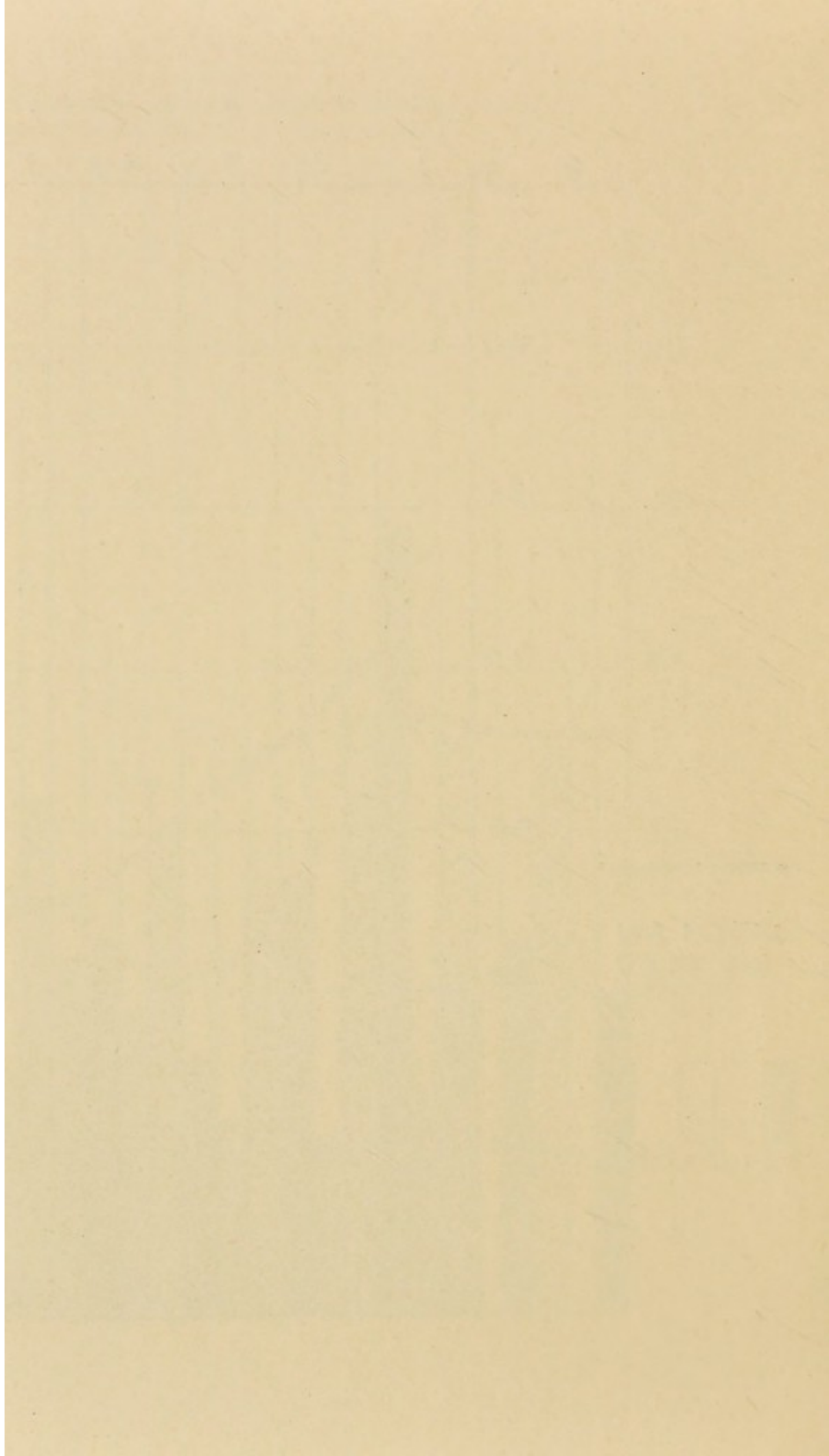
"The removal of dirt from milk does not necessarily mean the removal of the bacteria associated with it. A strainer which removes the greater part of the sediment from milk will allow the bacteria to pass, owing to the small size of the latter. The straining of milk does not improve its healthfulness or keeping qualities. Where strainer cloths are not sterilised after using, they are often an added source of contamination. The harm done by the introduction of dirt cannot be remedied by the removal of the dirt, and it leads the consumer to draw false conclusions as to the conditions of cleanliness under which the milk was produced. Prevention of the entrance of dirt is the only effective remedy, and this means the education of the cowkeeper as to the best means of clean milk production."

Education may possibly hold the key to the problem, but our experiences have made us sceptical in regard to it. So far from wishing to learn how to improve their methods the majority of handlers seem to think that they already possess all the necessary knowledge and are resentful of any "interference" in their methods and practice. It is mainly for this reason that I have found it necessary to allude to the necessity for an element of compulsion in dealing with the situation. The necessary powers have already been outlined in the Report of the Inter-Departmental Committee published in 1928, and as there seems to be no immediate prospect of the recommendation being put into effect I would urge the advisability of incorporating them in the form of Byelaws to regulate the methods of production of milk intended for sale and distribution in the City. This seems to me to be the only practicable solution to the question as it presents itself now. The problem will have to be faced seriously sooner or later, for there can be no reasonable doubt that a great deal of sickness, suffering and even death is attributed directly to an improperly controlled milk supply.

FIG. V

DIPHTHERIA, Cork City. Monthly incidence during 1929, 1930 and 1931 together with Expectancy for 1931, based on the median of the previous nine years.





Attention has been drawn to the fact that there are a few dairymen who are producing milk of a first class quality and in the circumstances they are deserving of great credit ; but at the same time I have to draw attention to a practice which has crept in in one or two instances, and for which there is no justification. I refer to the use of the terms " Grade A " and " Tuberculin Tested " in connection with their milk supplies. In the absence of state or municipal control the use of these terms is misleading and erroneous and indeed it has come to our knowledge that one vendor on account of the increase of his trade has found it necessary to supplement his supply by purchasing a considerable proportion of his milk from neighbouring farmers. In these circumstances, of course, the use of the terms is entirely misleading and should not be countenanced but in the present chaotic state of the law in regard to milk supply there is nothing to prevent him, or for that matter, any milk producer in the country from describing his produce as Grade A and tuberculin tested. The granting of licences for the use of the terms in countries where it is in force is very strictly regulated and it is not an exaggeration to say that none of the producers here comply with the necessary condition even in the slightest degree so far, although we have reason to believe that one or two are making a reasonable effort to do so. These facts emphasise the importance of introducing some form of municipal control in the absence of state control, for under some such system it would be an easy matter to regulate the production of Grade A, and Tuberculin Tested milk thus safeguarding not only the public, but also the producers. As matters stand now both are at the mercy of any charlatan that chooses to call himself a producer of this class of milk.

(C) FOOD AND DRUGS ACTS.

Prior to the year 1922 these Acts were administered by members of the R.I.C. From 1922 to June, 1925, they were administered by the Sanitary Inspectors of the Public Health Department and on the latter date their duties were taken over by the members of the Garda Siothchana, who have since been administering the Acts in a very satisfactory manner.

MILK.

Table 33.—Shewing the number of samples of milk submitted for Analysis during the year 1931, and the results thereof.

Quarter ending	No. of Samples	Genuine	Adulterated.
March 31st, 1931 ...	115	108	7
June 30th, 1931 ...	156	135	21
Sept. 30th, 1931 ...	109	109	—
Dec. 31st, 1931 ...	123	122	1
Totals ...	503	474	29

Table 34.—Shewing results of proceedings against vendors of adulterated samples and fines imposed.

Extent and form of Adulteration.				Fines Imposed.	Observations.
Deficient in Milk Fat, 20%	...			—	Dismissed
" " " 6%	...			—	"
" " " 6%	...			—	"
" " " 6%	...			Fine Costs 5/- 15/8	
" " " 8%	...			—	Dismissed
" " " 6%	...			—	"
" " " 13%	...			—	"
" " " 6%	...			—	"
" " " 10%	...			—	"
" " " 6%	...			—	"
" " " 6%	...			—	"
" " " 6%	...			—	"
" " " 6%	...			—	"
" " " 20%	...			Fine costs 2/6 15/8	
" " " 10%	...			—	Dismissed
" " " 20%	...			—	"
Added Water 6.2%	...			Fine Costs £1 17/8½	
" " 6.2%	...			1 17/9½	
" " 7.5%	...			1 17/9½	

It will be seen that, so far as milk is concerned, the administration of the Foods and Drugs Acts is in a very unsatisfactory condition and is a source of grave uneasiness from the point of view of those concerned with the public health. As has been stated in another section, milk is the most important single foodstuff at our disposal and it is essential that it should be sold to the public not only in the cleanest possible condition but also absolutely unadulterated so far as its constituent elements are concerned. This is all the more important when it is realised that milk is the staple diet of infants and young children, and very serious consequences may result if there is any tampering by way of abstraction of cream or addition of water. Over 75 per cent of the prosecutions undertaken by the inspectors during the year were dismissed on the grounds that the milk was "as it came from the cow." In one instance where the case was dismissed the milk was deficient in fat no less than 13 per cent, and in two others 20 per cent each. Cases such as these emphasise the fact that it is high time that the law was so amended that the public shall be protected against the unscrupulous dealer and that when milk is purchased an article should be supplied which will comply with certain definite standards.

Most cases of adulteration occur during the first two quarters of the year and in those in which there is no fraudulent intent they may be ascribed to carelessness on the part of the producers in not checking up the quality of their milk in regard to fat content, combined with improper feeding of the cattle. The necessary tests can be easily applied by the producer himself or they may be performed at the laboratory of the City Analyst for a nominal fee.

In over half the cases outlined in the above table there is evidence of abstraction of cream. Generally speaking it may be said that any deficiency over 10 per cent may be regarded in this light, even allowing for seasonal variation in the amount of cream given by the individual cow. In mixed milks, such as comprise our city supply, the percentage deficiency should be considerably less than 10. Only very gross mismanagement would account for deficiencies in mixed milks of over 10 per cent, and when the deficiency ranges as high as 20 and even 26 per cent, the conclusion is forced on one that there has been deliberate abstraction of fat, notwithstanding any defence to the contrary which may be put forward.

BUTTER.

Table 35.—Shewing number of samples of butter submitted for analysis during the year, and the results thereof.

Quarter ending		No. of Samples	Genuine	Adulterated
March 31st, 1931	...	44	43	1
June 30th, 1931	...	47	45	2
Sept. 30th, 1931	...	43	42	1
Dec. 31st, 1931	...	45	45	—
Totals	...	179	175	4

Table 36.—Shewing the results of proceedings against Vendors of adulterated samples of butter and fines imposed.

Extent and form of Adulteration					Fines	Costs	Observations
Contained	1.2%	Excess water			3/6	16/8	
"	2.0%	"	"	...	5/-	16/6	
"	7.1%	"	"	...	2/6	15/8	
"	2.6%	"	"	...	2/6	16/9	

MARGARINE.

Table 37.—Showing the number of samples of Margarine submitted for analysis during the year, and the results thereof.

Quarter ending		No. of Samples	Genuine	Adulterated.
March 31st, 1931	...	11	11	—
June 30th, 1931	...	12	12	—
Sept. 30th, 1931	...	13	13	—
Dec. 31st, 1931	...	13	13	—
Totals	...	49	49	—

SPIRITS.

Table 38.—Showing the number of samples of spirits submitted for analysis during the year and the results thereof.

Quarter ending		No. of Samples	Genuine	Adul- terated .
March 31st, 1931	...	14	14	—
June 30th, 1931	...	10	10	—
Sept. 30th, 1931	...	8	8	—
Dec. 31st, 1931	...	13	13	—
Totals	...	45	45	—

Table 39.—Showing number of miscellaneous samples submitted for analysis during the year and the results thereof.

Quarter ending		No. of Samples	Genuine	Adul- terated.
March 31st, 1931	...	74	73	1
June 30th, 1931	...	29	29	—
Sept. 30th, 1931	...	36	36	—
Dec. 31st, 1931	...	55	53	2
Totals	...	194	191	3

Table 40.—Showing details in regard to miscellaneous samples examined during the year.

	Mar. 31st 1931	June 30th 1931	Sept. 30th 1931	Dec. 31st, 1931
Cheese ...	6	4	4	8
Applerings ...	—	—	1	—
Coffee ...	—	—	—	1
Cream ...	1	2	3	—
Cocoa ...	1	—	—	1
Dripping ...	3	2	1	3
Drugs ...	2	1	1	3
Beef ...	—	—	—	1
Flour ...	4	1	1	2
Jam ...	7	7	4	2
Lard ...	—	—	—	1
Pepper ...	—	—	1	—
Rice ...	—	—	2	2
Stout ...	8	1	3	5
Wine ...	2	—	2	4
Sugar ...	1	2	2	3
Tea ...	1	3	2	2
Candied Peel ...	—	—	—	2
Sauce ...	—	—	1	—
Sweets ...	—	1	—	2
Cakes ...	13	1	1	8
Vinegar ...	3	—	—	2
Tinned Fruits ...	3	—	—	1
Skim Milk ...	1	—	—	—
Sausages ...	12	1	—	1
Bacon ...	4	—	—	1
Lemonade ...	1	—	1	—
Currants ...	1	—	—	—
Gooseberries ...	—	2	—	—
Ice Cream ...	—	1	3	—
Custard Powder ...	—	—	3	—
Total ...	74	29	36	55

Table 41.—Showing results of proceedings against Vendors of adulterated samples and fines imposed.

Extent and form of Adulteration	Fine	Costs	Observations.
Cakes containing 0.4% Boric Acid ...	2/6	15/10	
" " 0.2% " ...	3/6	16/-	

Summary of Examinations carried out during the year, 1931.

		Total	No. adulterated
Milk	...	503	29
Butter	...	179	4
Spirits	...	45	—
Margarine	...	49	—
Miscellaneous	...	194	3
Totals	...	970	32

The percentage of samples adulterated was 3.3 as against 7.6 for the previous year.

MILK.

The number of samples deficient in fat during the first six months of the year is still excessive. This will probably continue while the "as it came from the cow" plea succeeds in the Courts—thirteen of fifteen prosecutions for deficiency in fat were dismissed on these grounds during the year. It is notable that a neighbouring public body, in advertising for a contract for milk requires that it shall contain:—in April, May and June—a minimum of 3.25 per cent of fat; during the rest of the year—a minimum of 3.5 per cent. Presumably it will get milk to this specification.

A further point that requires investigation is the source of the cream supplied by dairymen.

During this year special attention was given to the milk supplied in restaurants and tea shops. This is often obviously of very poor quality. A general warning was issued by the City Manager. A successful prosecution was subsequently taken in one instance.

MISCELLANEOUS.

CAKES—Two bakers were proceeded against for selling cakes containing boric acid—a preservative probably introduced by the liquid eggs used in manufacture. Convictions were obtained in both cases.

WHISKEY AND WINE MIXTURE—A prosecution against a retailer for selling with a false label was investigated in Court. The wholesaler of the article appeared and proved a warranty on his part to the retailer, against whom the proceedings were accordingly dismissed. Further action against the wholesaler is pending.

ICE CREAM—Four samples were examined. The fat in this product is the most expensive item. It had been, in three cases, reduced to the minimum. One sample had pieces of gelatine throughout the bulk, due probably to carelessness or ignorance in manufacture. In view of the large quantities of this product consumed the fixing of some minimum standards is desirable.

CUSTARD POWDERS—Three samples. These consisted of cornflour with a small amount of colouring matter. The price paid for them is considerably in excess of the price of cornflour.

Section VII—Water Supply

The total supply is drawn from two sources—(1) a horizontal well or tunnel approximately a quarter of a mile long driven through a layer of gravel some thirteen feet below the surface level adjacent to the river Lee; (2) the river Lee.

(1).—The water taken from the gravel tunnel is generally classifiable as a potable water and is delivered to the clear water basin without treatment; it constitutes probably two-thirds of the total supply and mixes in the clear water basin with the water from source No. 2 after the latter has been filtered as described below. The mixture of waters from the two sources is chlorinated in the clear water basin by the addition of a measured quantity of chlorine gas. The quantity of chlorine varies with the condition of the water, and is fixed approximately on the following criterion: the minimum dose which will give a noticeable ortho tolidine reaction for free chlorine after standing for half-an-hour. The sterilised water is pumped to the service reservoirs undergoing a certain amount of aeration in the pumping process. It is delivered from the reservoirs to the mains.

(2).—The water from source No. 2 (river Lee) comprises about one-third of the average total supply. This is an auxiliary to the main source (the gravel tunnel) and in favourable circumstances is not in use at all. The maximum demand on the river water is some one and a half million gallons per day, that is after a spell of dry weather when the yield of the tunnel is low. The water of the Lee is not drawn upon when the river is in flood since on these occasions the yield of the tunnel is sufficient in itself.

Under normal conditions the river water varies from clear to light yellow, and in this state is passed to the filters for treatment before delivery to the clear water basin. The treatment consists of the following processes:—(1) screening; (2) dosage; (3) mixing, and (4) filtration. Screening is in two stages and is designed to remove small floating matter which might tend to foul the filters to an unnecessary degree. After screening the water is dosed with a measured quantity of alumino ferric, which acting on the lime in the water produces a coagulant precipitate. The coagulant is thoroughly mixed with the water by passing through a turbulent race or chute from which it is discharged on the filter beds. The filtration process proper consists in percolation downwards by gravity at a carefully controlled speed through a bed of sand about three or four feet thick composed of graded materials. After filtration the water flows to the clear water basin and is mixed with the main supply. The process is carried out by means of a Candy Rapid Gravity Filtration plant which was put into commission in June 1928.

In last year's Report I outlined the procedure adopted in connection with the examination of the water supply at the bacteriological laboratories of University College, Cork; commencing with the year 1928 in which a very detailed investigation was carried out, and the modifications which were adopted in the subsequent years. During 1931 the modified method was continued in use. Samples of water were collected on five days in each week, each alternate sample being taken

from the laboratory tap and from different districts in the City. In this way every part of the City was covered during the year and it is a matter of considerable satisfaction to have to report that throughout the standard of purity of the supply was maintained at a consistently high level as will be seen by reference to the appropriate table summarising the results of the examinations. These tables bring out an interesting feature; namely, that there has been a steady improvement in the quality of the water in each year since the installation of the Candy filtration plant in 1928. This feature is not, perhaps, quite so definite in the findings for the year 1929 when 60.9 per cent of the samples were negative for *B. Coli* in 100 c.c's. as compared with 76.3 per cent in 1928; 80.6 per cent in 1930 and 93.0 per cent in 1931. The fact that no less than 93 per cent of the samples examined last year came up to the standard aimed at indicates a high degree of efficiency in the working of the filtration plant.

As stated above the procedure adopted in 1931 was similar to that of 1929 and 1930, but in addition an estimation was made of the number of bacteria per c.c. growing at 37° C in 24 hours. The total number of samples examined during the year amounted to 277, of this number 148 were collected by Inspectors of the Public Health Department in various parts of the City; 112 were collected from the laboratory tap; 11 were collected specially to serve as checks on samples previously examined and found defective. In practically every instance the check samples were found to be satisfactory, indicating faulty technique in the collection of the original samples. Six samples were taken from the waterworks for complete examination. The bacterial count was consistently low throughout the year except during the months of July and August when it is usual to find bacterial counts above the average. Samples examined in 1931 have been found to be more satisfactory in this respect than samples examined in previous years.

The following table summarises the results of the routine examinations carried out during the year:—

Total Routine Samples of Tap Water	Bacillus Coli Test				Average daily No. of Bacteria per c.c.	No. of Samples sterile in 1c.c
	100 c.c's —ive	100 c.c's +ive	50 c.c's +ive	20 c.c's +ive		
260	242	9	8	1	7.57	89

As stated above an additional feature of the examinations last year was the estimation of the numbers of bacteria growing at 37° C in 24 hours per c.c. The findings are set out in the following table.

Average number of bacteria per cubic centimetre growing at 37° C from daily samples for each month:—

January	...	00.80 per c.c.
February	...	00.60 „
March	...	00.90 „
April	...	01.80 „
May	...	00.70 „
June	...	02.80 „
July	...	42.00 „
August	...	15.00 „
September	...	03.60 „
October	...	04.00 „
November	...	11.00 „
December	...	02.20 „

Control sampling of the reservoirs was considered necessary on two occasions during the month of August. On one occasion *B. Coli* were found in 100 c.c.'s. of the Low Level Reservoir water. The other samples were up to standard. The following table shows the results of examinations made during the past four years.

Table 42.—Comparative results of examinations of tap water made during the years, 1928, 1929, 1930 and 1931.

Year	Total number of Samples examined	Bacillus Coli Test.				
		100 c.c's —ive	100 c.c's +ive	50 c.c's +ive	10 c.c's +ive	1 c.c. +ive
1928	245	187 (76.3%)	10 (4.0%)	32 (13.1%)	14 (5.7%)	2 (0.8%)
1929	251	153 (60.9%)	44 (17.5%)	40 (15.9%)	9 (3.6%)	5 (2.0%)
1930	268	216 (80.6%)	15 (5.6%)	14 (5.2%)	13 (4.5%)	10 (3.7%)
1931	260	242 (93.0%)	9 (3.5%)	9 (3.5%)	— —	— —

The results on the whole are very satisfactory. In no case has there been any indication of failure of the filtration system and the high bacteriological standard maintained throughout the year shows that the supply is a consistently safe and pure drinking water.

Section VIII—Sanitary Department

Table 43.—Return of Work performed by Sanitary Inspectors during the year :—

	No. of Inspections
Houses, yards, etc	54,308
Tenement Houses	17,123
Tenement Rooms	2,871
Infected Dwellings	673
Common Lodging Houses	653
Bakeries	193
Workshops	4,516
Factories	561
Number of Notices to abate nuisances	2,284
Number of Justices' Orders	63
Number of prosecutions for Sanitary Offences	84
Amounts of fines imposed in respect of same	£3 1 0

Table 44.—Return of Work Carried out by Veterinary Staff during the year :—

Slaughter Houses	5,921
Meat Shops	21,061
Tripe Houses	2,253
Meat Markets	936
Milk Shops	14,846
Milk Vans	1,258
Cowsheds	28
Sausage Factories	2,220
Hawkers Stands	1,152
No. of Prosecutions	
Amount of fines imposed	See Section VI, Prosecutions

Section IX—Meteorology

I am indebted to Capt. J. J. Lalor, University College, for the following particulars concerning the weather conditions during the year, and more especially for the trouble which he has gone to bring up to date the Tables which follow. The rainfall for the year 1931, was 44.26 inches.

TABLE 45.

Rainfall in inches for each quarter and for each year, 1901/1931.

Year	I.	II.	III.	IV.	Total.
1901	10.07	7.62	10.75	10.12	38.56
1902	9.29	7.80	7.31	12.88	37.28
1903	16.89	8.80	14.95	12.13	52.77
1904	13.63	5.71	10.41	7.47	37.22
1905	11.70	6.59	9.82	9.14	37.25
1906	9.46	5.76	5.58	9.03	29.83
1907	4.06	10.10	7.40	16.02	37.58
1908	7.67	5.28	10.16	9.53	32.64
1909	7.61	9.94	2.62	9.74	29.91
1910	10.70	7.24	8.64	11.98	38.56
1911	5.94	6.89	7.87	18.47	39.17
1912	13.46	7.07	9.30	7.05	36.88
1913	13.92	10.32	7.73	12.49	44.46
*1914	13.72	3.60	9.85	15.20	42.42
1915	11.62	6.27	9.26	15.68	42.83
1916	8.68	9.19	7.37	21.11	46.35
1917	8.75	6.93	9.40	7.25	32.33
1918	14.75	5.59	13.37	13.73	47.44
1919	10.78	7.11	6.77	6.97	31.63
1920	11.75	14.12	8.90	13.24	48.01
1921	8.04	2.22	8.71	9.90	28.87
1922	13.08	5.45	10.57	8.15	37.25
1923	14.41	5.38	10.71	10.54	41.04
1924	12.32	9.76	11.82	17.66	51.56
1925	10.31	10.49	8.43	11.92	41.15
1926	15.42	8.19	4.68	9.55	37.84
1927	12.20	6.16	11.45	16.06	45.87
1928	16.14	13.86	8.31	17.35	55.66
1929	11.28	6.72	7.27	20.91	46.18
1930	14.98	5.91	12.67	14.35	47.91
1931	12.30	10.35	8.34	13.27	44.26

*Since 1914 the returns in Tables 45, 46, 47 and 48 are taken from observations made at University College, Cork.

The mean temperature for 1931 was 50.1 °F. The warmest day in 1931 was the 4th August, with a maximum shade temperature, 76 °F., and the warmest night was the 6th August and the 18th and 19th Sept., with a maximum shade temperature of 59 °F., The coldest day was the 7th March with a maximum shade temperature of 36 °F., and the coldest night was the 26th Oct., with a maximum shade temperature of 23 °F.

SUNSHINE.

The total number of hours of bright sunshine received in 1930 was 1,478.1, and in 1931 the amount was 1,313.8 hours.

TABLE 46.

Mean Temperature (°F.) for each quarter and for each year from 1901 to 1931, inclusive.

Year.	I.	II.	III.	IV.	Total
	°	°	°	°	°
1901	37.5	50.4	57.2	41.9	46.8
1902	40.4	48.1	55.3	43.3	46.8
1903	41.1	49.4	54.4	41.4	46.6
1904	38.3	49.1	55.4	45.6	47.1
1905	42.1	52.4	56.9	42.4	48.4
1906	40.6	50.6	57.9	44.0	48.3
1907	41.3	49.1	57.5	42.1	47.5
1908	40.6	50.4	57.0	46.6	48.6
1909	40.2	50.6	56.9	41.8	47.5
1910	39.5	50.3	56.3	43.2	47.4
1911	39.7	51.3	58.5	42.4	47.5
1912	40.9	50.4	53.5	47.9	48.2
1913	43.0	49.4	57.4	48.7	49.6
1914	40.3	51.4	56.7	43.5	48.1
1915	38.3	49.2	52.7	39.2	44.9
1916	40.0	45.9	53.7	39.7	44.8
1917	36.7	48.1	54.2	43.9	45.7
1918	40.0	51.3	55.0	42.0	47.0
1919	37.6	48.5	54.4	40.0	45.5
1920	40.3	48.9	52.6	42.0	45.9
1921	39.6	48.3	54.3	42.7	46.2
1922	40.2	49.9	57.8	46.4	48.6
1923	44.0	50.7	58.4	43.8	49.2
1924	42.6	51.4	56.7	47.6	49.6
1925	43.3	51.8	57.9	44.5	49.4
1926	45.1	52.1	61.1	44.0	50.6
1927	44.1	52.2	58.5	45.5	50.1
1928	44.7	52.0	58.0	46.4	50.3
1929	43.2	52.3	59.4	45.7	50.1
1930	40.7	52.9	57.8	46.5	49.5
1931	42.3	53.1	58.2	46.7	50.1

BAROMETER.

The mean reading for 1931 was 29.96 inches; the highest, 30.68 inches on the 20th December; the lowest, 28.54 inches, on the 10th November. (Observations made at 9 a.m. only, G.M.T.)

TABLE 47.—Temperature at Cork (in the Shade) for 49 years ending 1931.

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Year	January			February			March			April			May			June			July			August			September			October			Nov.			Dec.			Mean Temperature of Year
	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean				
	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees	Degrees					
1883	54-32-41.7	54-28-42.0	55-25-41.0	66-32-48.0	69-35-50.7	69-44-57.7	70-47-58.5	71-47-60.0	65-41-56.5	61-35-52.0	57-33-44.8	55-27-42.0	49.6																								
1884	55-31-45.5	54-31-46.5	54-30-45.5	57-34-48.5	68-37-55.5	73-40-59.0	72-45-61.5	74-44-62.2	71-45-58.5	60-34-52.2	60-28-45.2	55-28-41.3	51.8																								
1885	54-27-41.7	50-27-43.5	54-30-43.5	62-30-48.2	61-34-52.0	72-42-59.2	80-43-62.0	74-46-60.5	65-36-55.2	57-35-46.7	58-31-46.7	54-25-39.5	49.9																								
1886	52-23-38.0	52-28-41.5	57-25-41.5	65-32-46.7	65-33-50.5	76-45-57.7	79-44-59.5	76-45-60.5	65-39-56.5	64-37-51.5	58-29-45.0	50-22-39.0	49.0																								
1887	54-30-43.0	54-27-43.5	58-25-42.0	62-26-44.5	70-35-52.5	81-47-62.5	80-47-64.2	76-42-60.7	69-39-55.0	61-28-48.2	54-24-42.0	55-25-39.7	50.0																								
1888	54-26-43.0	52-26-38.2	56-26-40.7	59-28-46.5	68-39-53.2	73-39-57.0	70-40-57.5	74-42-60.0	66-37-55.5	63-31-50.5	58-27-48.0	56-28-44.7	49.6																								
1889	58-26-43.0	57-27-42.2	59-29-44.7	58-32-46.7	68-40-48.0	77-46-58.0	77-45-60.0	72-43-58.7	70-38-57.2	59-32-48.2	60-29-48.2	56-29-44.2	49.9																								
1890	55-29-44.0	54-29-42.5	58-28-45.2	61-29-48.0	70-39-53.0	73-45-58.0	72-43-58.4	72-40-58.0	75-42-50.2	66-34-53.0	60-24-44.6	52-25-39.0	50.3																								
1891	53-23-40.3	56-31-45.7	61-22-42.1	60-31-46.9	73-34-50.0	78-40-58.6	75-44-59.0	73-40-58.0	71-39-56.5	61-29-48.5	53-28-42.6	55-26-44.0	49.4																								
1892	55-20-39.2	55-25-42.3	57-24-40.0	62-27-47.2	66-37-53.1	73-39-56.2	73-44-59.0	70-44-60.0	68-37-55.0	56-28-45.0	56-31-47.2	53-27-42.7	49.7																								
1893	53-21-40.5	53-24-42.5	60-34-47.5	67-31-51.5	69-43-56.5	80-46-59.8	74-46-61.2	77-45-61.7	71-33-55.2	63-31-49.0	59-30-43.0	53-26-42.5	50.9																								
1894	53-11-39.5	56-28-44.6	57-33-44.8	62-37-49.0	67-34-50.0	71-38-57.0	72-45-69.0	71-44-57.5	66-36-53.5	66-33-49.5	59-28-46.0	54-29-44.5	49.6																								
1895	47-23-36.5	48-22-34.5	63-27-44.0	61-31-48.2	70-33-53.0	74-40-58.7	77-44-58.7	70-43-59.0	71-46-58.9	62-28-46.0	56-30-45.0	54-26-42.5	48.7																								
1896	53-26-43.0	55-32-45.2	56-31-46.5	65-34-50.0	74-33-56.2	82-47-60.5	75-42-60.0	73-41-57.5	68-41-55.0	65-30-43.2	53-29-42.0	53-23-40.0	49.9																								
1897	50-22-37.5	56-32-46.0	55-31-44.0	58-29-46.0	70-35-51.0	75-41-59.0	77-43-61.0	80-45-59.5	67-38-53.2	61-37-52.2	58-32-47.2	53-29-44.0	50.1																								
1898	55-32-45.8	54-26-41.5	58-28-41.0	60-31-47.7	67-34-51.0	74-39-56.8	78-44-59.5	73-46-69.5	72-40-58.7	64-34-51.3	59-30-44.0	55-27-45.4	50.3																								
1899	53-26-40.1	52-29-43.0	64-22-43.0	63-29-46.6	65-34-50.6	78-41-59.5	76-45-60.0	76-46-62.3	71-31-54.1	60-29-47.9	55-39-47.2	51-24-40.0	49.5																								
1900	54-27-39.5	52-14-35.4	51-25-38.6	65-33-47.8	68-36-50.7	75-42-56.8	75-45-60.1	71-42-57.0	67-38-55.1	63-32-48.1	57-29-41.7	52-26-42.3	47.9																								
1901	49-24-37.8	49-22-35.8	51-24-38.9	59-39-45.0	68-34-51.9	72-37-54.2	76-46-60.2	75-41-57.5	67-39-54.0	61-31-47.0	54-19-41.2	51-26-37.5	46.8																								
1902	50-25-40.6	52-19-36.6	57-30-44.0	57-29-44.0	67-31-47.3	74-38-53.1	74-40-56.0	68-40-56.2	68-36-53.6	62-34-47.4	55-30-43.5	52-25-39.0	46.8																								
1903	50-22-39.5	52-29-42.7	52-29-41.1	57-27-43.7	69-36-50.4	70-35-54.0	74-43-56.6	68-40-54.3	64-36-52.4	60-28-46.2	55-24-41.0	48-22-37.0	46.4																								
1904	49-27-38.5	49-24-37.2	52-25-39.1	60-32-44.4	65-32-48.6	69-49-54.2	73-40-57.3	69-41-56.4	63-38-52.5	63-35-50.2	57-25-43.5	52-28-43.0	47.4																								
1905	51-29-42.0	55-23-41.6	53-30-42.6	58-33-46.4	68-36-52.6	75-42-58.0	76-45-60.0	70-42-55.5	68-39-53.6	62-26-45.0	52-23-39.0	50-30-43.3	48.3																								
1906	50-28-41.1	47-25-38.0	58-30-42.6	59-29-44.3	64-33-49.7	75-42-57.8	74-44-59.0	73-44-59.8	71-40-55.0	63-29-49.0	55-29-44.0	53-20-39.0	48.4																								
1907	49-18-39.6	52-25-38.4	57-32-45.8	64-30-45.4	65-35-48.7	68-49-53.5	78-41-58.6	68-43-57.0	68-38-57.0	60-28-45.9	52-28-49.8	49-27-39.5	47.5																								
1908	52-23-38.5	53-31-43.0	52-29-40.4	56-26-43.4	68-37-52.0	71-40-55.7	80-46-59.5	74-44-58.2	67-38-53.5	64-33-53.0	56-29-45.7	51-30-41.1	49.0																								
1909	51-28-40.3	52-22-39.6	56-23-40.6	61-31-46.8	66-33-51.0	69-41-54.0	71-45-58.6	79-43-59.7	65-37-52.3	64-26-49.0	55-20-38.2	50-24-38.3	47.4																								
1910	50-25-38.5	53-27-39.0	55-30-41.0	60-29-43.9	68-34-51.4	66-44-55.5	70-45-57.5	69-46-57.0	68-37-54.5	62-34-49.0	53-24-39.0	50-28-41.5	47.3																								
1911	50-27-39.2	53-22-39.7	56-29-40.3	59-27-40.9	70-37-52.2	72-45-56.7	79-44-61.0	73-45-60.2	73-39-54.3	57-31-48.0	53-26-39.9	49-27-39.3	48.0																								
1912	50-27-40.8	50-32-40.0	57-32-41.8	61-32-47.0	64-36-51.2	66-32-52.9	74-44-55.7	71-36-51.3	68-36-53.5	61-31-50.1	59-33-49.2	54-30-44.3	48.1																								
1913	52-27-40.6	54-32-43.6	55-34-45.0	59-29-44.7	64-36-49.5	75-38-54.0	74-47-55.9	74-40-58.8	72-44-57.6	61-32-51.5	60-34-48.9	56-33-45.6	49.6																								
1914	54-43-48.5	55-50-53.0	55-50-52.4	60-53-56.9	62-55-58.2	70-59-64.4	69-53-64.8	67-63-64.6	66-60-62.6	62-55-58.4	58-50-53.4	53-46-50.0	47.2																								
1915	50-37-43.5	45-25-35.0	58-35-46.5	50-35-42.5	62-40-51.0	64-40-52.0	62-42-52.0	65-43-54.0	62-40-51.0	55-37-46.0	48-28-38.0	40-28-34.0	44.9																								
1916	50-36-43.3	47-30-39.1	45-30-37.8	49-36-42.6	60-34-47.4	55-40-47.8	66-40-53.4	65-49-57.7	60-40-50.0	56-36-46.4	47-32-40.4	40-24-32.5	44.8																								
1917	52-22-36.0	50-24-35.0	52-28-39.25	59-30-41.5	70-32-50.25	66-40-52.25	68-40-55.4	70-46-56.12	66-26-51.25	56-30-44.8	58-30-44.5	56-26-38.4	45.7																								
1918	50-22-36.0	54-32-43.0	56-26-41.0	64-32-48.0	67-33-50.0	76-36-56.0	76-40-58.0	74-40-57.0	64-36-50.0	62-30-46.0	54-26-40.0	54-26-40.0	47.0																								
1919	54-24-36.0	50-26-39.0	50-24-37.8	56-30-43.2	72-34-51.2	68-36-51.0	74-40-56.0	80-40-57.5	64-34-49.7	62-36-44.6	56-14-34.5	54-28-41.0	46.0																								
1920	52-30-40.0	50-30-39.8	50-30-41.3	56-36-46.3	66-28-46.3	68-34-53.7	66-42-53.5	66-40-53.2	68-32-51.2	60-36-48.5	56-24-41.6	50-20-36.0	45.9																								
1921	60-25-44.7	50-24-36.2	50-24-37.5	58-26-41.5	70-34-48.4	76-32-55.0	80-40-60.0	74-38-54.2	64-32-48.2	62-28-47.4	46-20-39.7	50-28-41.2	46.2																								
1922	56-20-49.1	48-24-37.2	46-24-34.5	48-22-34.8	80-30-61.0	74-40-54.0	72-38-67.2	72-36-54.0	66-36-52.3	60-20-56.0	66-30-44.0	54-26-39.2	48.6																								
1923	54-27-43.4	55-29-43.6	56-30-45.1	58-31-46.2	65-33-49.3	65-33-49.3	79-48-62.2	78-42-59.6	69-37-53.4	61-30-49.5	58-20-38.8	53-25-43.0	49.2																								
1924	53-29-43.8	51-26-41.4	56-25-42.5	62-27-46.0	65-35-51.5	70-41-56.7	68-42-57.9	70-40-57.8	71-40-54.4	64-37-50.8	59-29-46.0	56-33-46.0	49.6																								
1925	55-31-44.4	55-28-41.8	60-29-43.8	57-30-45.6	62-34-50.3	81-44-59.5	75-45-60.2	74-43-60.2	68-35-53.3	69-32-52.5	59-24-41.2	56-21-39.8	49.4																								
1926	53-28-43.1	57-32-46.5	61-31-45.7	63-31-49.8	64-33-51.1	72-39-55.5	83-45-63.3	75-46-61.8	72-37-58.2	74-25-48.3	57-27-42.3	55-21-41.5	50.6																								
1927	60-28-42.3	57-26-44.1	57-27-45.9	65-29-48.4	72-36-53.5	70-38-54.5	74-50-61.1	76-46-59.9	70-36-54.5	65-35-52.2	61-23-43.5	52-26-40.8	50.1																								
1928	55-30-44.1	57-33-45.6	57-27-44.4	64-30-46.2	75-37-54.0	69-40-55.8	78-43-60.6	72-41-58.8	70-34-54.7	65-32-50.8	58-27-46.5	55-28-41.9	50.3																								
1929	54-23-39.8	56-28-43.5	69-26-46.3	65-33-47.9	75-31-52.4	71-41-56.7	75-42-59.8	72-44-59.6	74-39-58.9	63-31-49.5	59-24-44.8	56-27-42.7	50.2																								
1930	53-26-41.3	52-24-37.7	57-26-43.2	66-30-47.4	68-36-53.0	76-40-58.3	78-45-59.3	69-42-57.5	70-40-56.5	61-35-51.6	60-27-44.6	54-29-43.3	49.5																								
1931	53-27-41.2	55-30-42.2	56-25-43.5	64-34-48.3	65-35-52.7	72-43-58.4	71-43-59.5	76-37-59.4	65-23-49.8	61-29-45.8	58-27-44.5	58-27-44.5	50.1																								

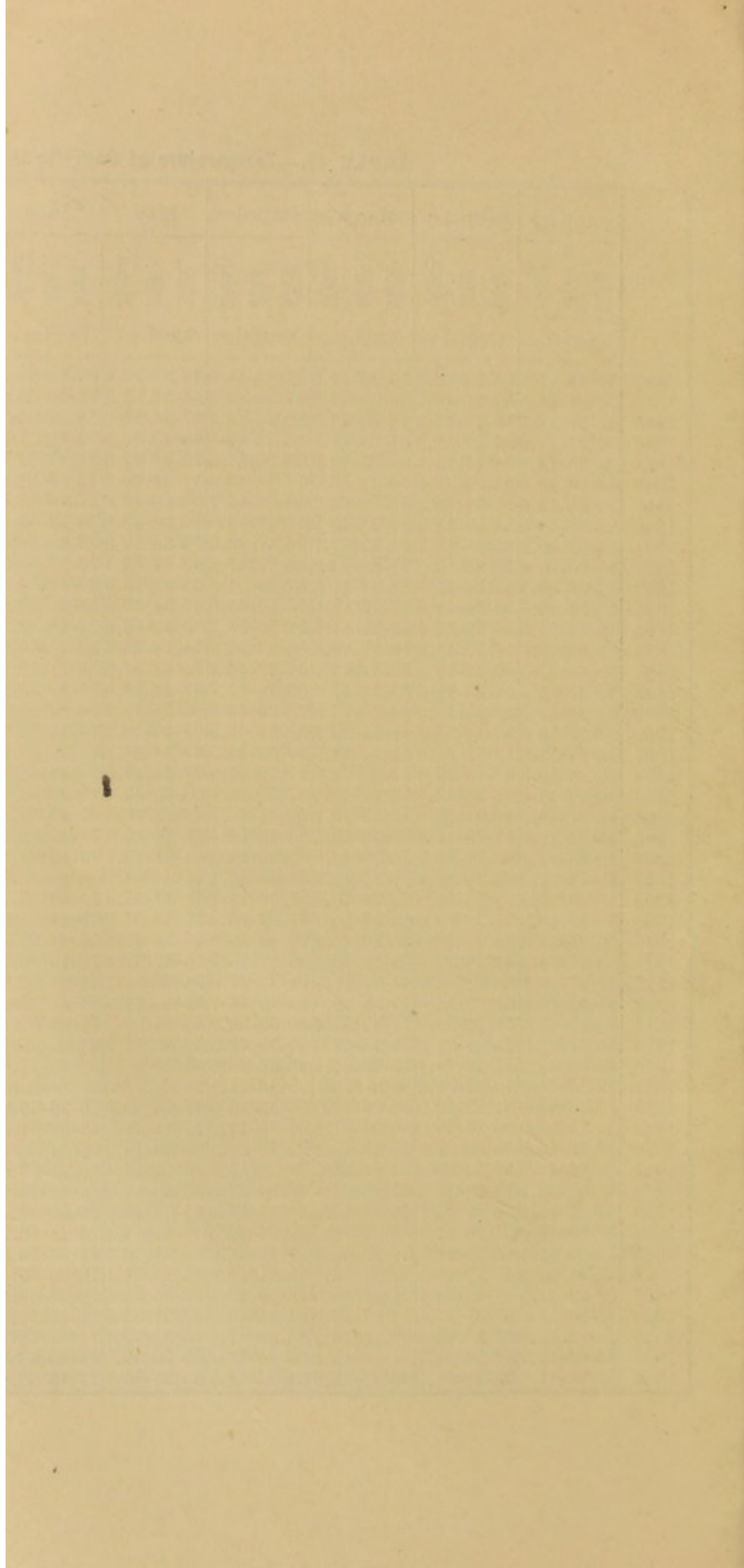


TABLE 48.—Showing Monthly Rainfall in Cork for 54 Years ending 1931

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Month	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.				
January	2.28	8.32	1.70	1.39	8.91	6.43	5.14	2.60	3.05	4.35	4.09	2.99	5.96	2.57	2.28	5.43	7.02	5.48	1.11	4.00	2.27	5.05	3.43	5.33	1.64	8.07	5.30	3.46	5.42	1.07	2.52	2.69	2.79	0.76	5.91	7.52	1.92	3.46	2.04	3.97	4.94	4.64	5.94	2.37	6.44	1.92	8.04	5.64	9.14	4.75	5.39	2.33	7.07	1.67
Feb.	2.80	4.77	4.78	5.46	4.86	6.88	6.20	6.28	3.29	1.62	0.34	2.32	2.66	0.50	3.98	4.04	1.96	1.79	1.70	2.74	1.62	4.39	4.96	1.44	5.92	3.37	5.78	1.42	2.88	1.86	1.15	2.55	5.42	2.37	4.76	2.36	6.46	7.44	4.30	1.45	6.12	3.98	1.67	2.56	4.42	8.53	2.97	4.45	4.74	2.66	3.42	8.16	1.03	2.62
March	0.95	1.23	3.28	5.20	2.00	1.78	4.69	2.41	4.94	1.75	2.93	1.55	4.64	1.37	1.15	0.40	1.64	3.29	2.84	3.57	0.56	1.38	0.78	3.39	1.73	5.45	2.55	6.82	1.19	1.15	4.09	3.17	2.49	2.81	3.69	4.94	5.33	0.72	2.84	3.325	3.69	2.65	4.14	2.91	2.22	3.36	1.31	0.22	1.50	4.79	7.33	0.89	6.88	8.01
April	4.55	3.70	2.84	1.64	5.65	2.66	1.71	3.73	2.38	1.12	1.69	3.99	1.38	2.34	0.32	1.35	6.32	2.70	0.47	6.00	4.00	3.01	1.55	4.07	2.92	1.82	1.28	2.27	1.06	2.99	2.27	3.67	1.66	2.13	0.54	2.61	1.37	1.59	3.25	1.12	1.73	1.10	5.54	0.34	2.98	4.28	2.44	5.51	3.04	1.23	5.66	1.46	2.09	2.72
May	4.84	1.83	0.80	1.76	2.31	1.35	1.47	2.91	2.60	0.92	2.88	4.26	4.01	2.65	2.60	1.80	0.75	0.98	0.14	1.49	2.24	3.95	2.42	2.07	1.61	3.04	2.26	0.90	3.68	3.58	2.28	1.80	1.65	1.82	1.36	4.39	1.49	2.52	2.91	4.615	2.75	3.18	3.56	1.66	1.67	0.96	3.62	4.35	2.47	2.28	2.60	4.05	1.47	4.36
June	6.74	8.27	1.93	4.79	3.36	2.39	0.63	1.01	1.17	0.40	4.24	1.53	5.52	3.43	2.69	1.54	1.87	2.87	2.17	5.16	1.76	1.37	4.64	1.48	3.27	3.91	2.17	2.42	1.62	3.53	3.73	2.37	3.93	2.94	5.17	5.12	0.88	2.16	3.63	1.77	1.11	0.43	2.22	0.62	0.80	0.14	3.70	0.63	2.28	2.57	5.60	1.21	2.15	3.27
July	1.23	4.24	1.68	1.85	4.85	3.05	2.17	1.29	4.79	1.37	5.16	1.15	2.33	1.57	3.12	1.57	1.41	3.75	5.28	1.19	1.67	1.82	1.56	0.47	2.40	6.42	3.56	1.70	3.27	2.20	2.49	0.97	2.12	2.97	5.68	0.155	3.60	5.22	2.49	1.57	4.81	4.19	3.96	3.77	3.21	2.37	3.81	2.77	1.67	4.35	1.61	4.29	2.79	2.73
August	5.06	2.84	1.07	4.95	3.20	4.12	0.90	3.63	2.58	1.39	5.08	4.41	2.19	4.30	8.50	5.42	2.85	5.13	1.19	4.33	4.21	2.51	3.73	2.47	2.89	4.46	2.97	0.77	1.47	2.98	3.38	0.25	5.24	2.32	3.21	2.27	3.78	2.22	3.76	6.34	2.53	3.13	2.18	3.29	3.91	3.38	2.15	3.63	2.50	3.68	5.04	2.16	5.36	4.74
Sept.	2.42	3.25	1.80	2.38	2.65	5.02	1.83	4.69	3.78	2.15	0.86	0.97	2.09	3.24	3.41	1.31	1.27	1.12	5.09	2.08	2.79	1.21	0.83	7.81	2.02	4.07	3.88	1.35	0.84	2.22	4.38	1.40	1.28	2.58	1.01	5.27	3.07	1.82	1.12	1.29	6.41	3.15	2.66	1.35	3.45	2.96	3.68	2.63	0.51	3.82	2.29	0.82	4.52	0.87
Oct.	2.97	0.59	2.49	3.99	4.90	2.85	1.47	2.35	0.39	2.32	2.30	3.15	1.26	6.80	3.08	2.49	5.80	2.28	3.12	4.84	7.37	1.52	5.21	2.82	1.30	5.82	3.06	0.92	4.14	5.07	3.21	5.72	4.03	4.50	2.52	6.625	1.31	5.64	9.13	3.51	3.29	0.51	3.96	2.90	1.96	4.81	4.22	5.31	2.87	3.68	0.41	3.22	5.12	1.17
Nov.	1.88	0.65	5.24	0.95	4.67	4.03	3.16	2.89	2.24	2.28	6.71	2.36	4.75	4.46	7.87	1.97	5.72	7.06	1.52	4.86	2.96	2.75	4.52	1.52	6.32	1.91	1.63	4.54	3.14	3.92	2.52	0.73	3.33	5.23	1.27	4.455	2.96	2.48	9.64	1.68	3.22	1.99	4.16	5.56	1.85	3.46	5.96	2.48	6.39	4.15	5.33	6.91	3.26	9.85
Dec.	2.24	1.76	3.13	5.50	4.87	1.06	3.84	1.66	4.12	2.58	6.78	3.30	3.89	6.16	2.37	4.98	3.12	10.16	6.47	4.23	2.95	13.72	5.58	5.78	3.66	4.67	2.58	3.58	1.75	7.02	3.89	3.49	4.62	8.72	3.16	1.41	10.75	6.56	2.94	2.66	7.12	8.55	5.12	1.84	4.34	2.27	7.48	4.13	0.48	8.43	0.61	10.78	3.97	2.25
Year's Rainfall	38.69	41.41	30.74	40.86	45.98	42.18	34.22	36.57	49.31	22.25	41.89	31.61	39.19	39.24	42.85	37.50	40.14	46.62	31.49	44.36	33.80	41.85	38.41	38.56	37.38	52.57	37.22	37.25	29.46	37.38	36.44	29.91	38.56	39.17	36.88	44.46	42.42	42.83	46.35	32.35	45.44	31.63	48.01	28.87	37.25	41.64	31.56	41.15	37.84	45.87	55.66	40.18	47.91	44.26
Days	180	212	170	229	212	221	211	265	225	148	191	179	212	188	194	175	199	182	213	222	203	208	178	175	249	214	188	192	224	196	170	225	189	244	21	212	198	211	182	119	169	217	178	261	214	225	197	209	220	231	198	198	207	

Greatest month's rainfall 13.72 inches in December, 1899. Least month's rainfall, 0.14 inches in May, 1896, and 0.62 in June 1921.
Greatest number of consecutive days with rain was 31, ending February 12th, 1918. Greatest number of days without rain (absolute drought) was 26, ending July 3rd, 1887.

	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
	5.94	2.57	6.44	1.92	8.04	5.64	9.18	4.75	5.39	2.23	7.07	1.67
	1.67	2.56	4.42	8.53	2.97	4.45	4.74	2.66	3.42	8.16	1.03	2.62
	4.14	2.91	2.22	3.96	1.31	0.22	1.50	4.79	7.33	0.89	6.88	8.01
	5.54	0.54	2.98	4.28	2.44	5.51	3.04	1.21	5.66	1.46	2.09	2.72
	5.36	1.66	1.67	0.96	3.62	4.35	2.87	2.38	2.60	4.05	1.67	4.36
	3.22	0.02	0.80	0.14	3.70	0.63	2.28	2.57	5.60	1.21	2.15	3.27
	3.96	3.77	3.21	2.37	3.81	2.77	1.67	4.35	1.01	4.29	2.79	2.73
	2.28	3.59	3.91	5.38	2.15	3.03	2.50	3.68	5.04	2.16	5.36	4.74
	2.66	1.35	3.45	2.96	5.86	2.63	0.51	3.42	2.26	0.82	4.52	0.87
	3.96	2.90	1.96	4.81	4.22	5.31	2.87	3.48	6.41	3.22	5.12	1.17
	4.16	5.16	1.85	3.46	5.96	2.48	6.20	4.15	5.33	6.91	5.26	9.85
	5.12	1.84	4.34	2.27	7.48	4.13	0.48	8.43	5.61	10.78	3.97	2.25
33	48.01	28.87	37.25	41.04	51.56	41.15	37.84	45.87	55.66	46.18	47.91	44.26
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