[Report 1941] / Medical Officer of Health, Cork County Borough.

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COUNTY BOROUGH OF CORK

REPORT OF THE MEDICAL OFFICER OF HEALTH

FOR THE YEAR

1941

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

CORK:
Eagle Printing Works Limited, 90 South Mall.
1942.

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 1941. Taking into consideration the circumstances created by the war it may be said that our progress has been satisfactory. The general death rate (16.1 per 1,000 of the population) was the highest recorded for a number of years and compares with 14.6 recorded in 1940. It would seem that this increase is more apparent than real and that it has been due to (a) the migration of large numbers of young adult males from the city and (b) calculations based on an appreciably smaller population due to this migration. This matter is discussed in the section on Vital Statistics. The infant mortality rate (85 per 1,000) was an appreciable reduction in last year's figure (95) and was the lowest of the four County Boroughs. The figures for infant mortality in this Country cannot be regarded as satisfactory. There was also a reduction in the number of deaths both from pulmonary and non-pulmonary tuberculosis (106 as compared with 125) and the rate was reduced from 1.54 to 1.38. Maternal mortality was 2.8 per 1,000 births which is a low figure. The rate in 1940 was 4.9.

I have acknowledged in the text the assistance received in connection with subjects which do not come within my direct purview.

I have the honour to remain,

Your obedient servant,

J. C. SAUNDERS.

PUBLIC HEALTH STAFF

Medical Officer of Health :
J. C. Saunders, M.D., D.P.H.

Assistant Medical Officer of Health :
Patrick F. Fitzpatrick, M.B., B.Ch., B.A.O., D.P.H.

School Medical Officer :
Annie M. Sullivan, M.B., B.Ch., B.A.O., D.P.H.

Public Analyst :
Daniel J. O'Sullivan, M.Sc., F.I.C.

Chief Veterinary Officer :
S. R. J. Cussen, D.V.S.M., M.R.C.V.S.

Assistant Veterinary Officer :
J. C. Brown, M.R.C.V.S.

Sanitary Inspectors :

John O'Brien
Timothy Newman
Thomas F. Murray
Daniel Murphy
James V. Nerney
Miss N. Dunn

Tuberculosis Nurse :
Miss L. Lyndon.

Maternity and Child Welfare Nurses :
Miss M. Gillespie
Miss H. Neville
Miss H. A. Crowley

School Nurses :
Miss M. Lordan
Miss M. O'Sullivan
Miss N. Dillon

Clerk and Inspector to Port Sanitary Authority:
J. P. Kieran

CONTENTS.

SUMMARY OF STATISTICS.

Area (in Acres)	2,618
Population (Census 1936)	76,750
Density of Population (persons to the acre)	29.3
Rateable Value	£238,551 0 0
Sum represented by a Penny Rate...	£913
Number of Births	1,680
Birth Rate	21.8
Number of Deaths	1,239
Death Rate	16.1
Maternal Mortality Rate	2.8
Infantile Mortality	85
Zymotic Death Rate	0.5

Section 1.—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 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.

According to the provisional figures issued by the Registrar-General in connection with the compilation of the Register of Population in 1941 the population of this city has undergone a very material alteration, which does not appear to have been paralleled by any other urban area in the country. The 1936 census gives the population as approximately 80,800 while that of 1941 puts the figure at 76,800 (the figures for both years being given to the nearest hundred). There has therefore been in round numbers, a reduction of 4,000 in the population of the city, a circumstance which has not been recorded since the census of 1891 (when a reduction of approximately 5,000 was noted as compared with the previous census). The populations during the various years of census-taking can now be shown as follows :—

1881	...	...	...	80,124
1891	...	...	...	75,345
1901	...	...	...	76,122
1911	...	...	...	76,673
1926	...	...	...	78,464
1936	...	...	...	80,765
1941	...	...	...	76,758

In the other three County Boroughs the alterations were in the opposite direction. In the case of Dublin a very material increase, amounting to over 21,000 persons was noted, in Limerick the increase was 1,400 ; and in Waterford 500. (In all these cases figures are again given to the nearest hundred).

It is a matter of some considerable importance that the figures for this area should be further analysed to ascertain if the reduction has been spread evenly over the whole population or whether it has been confined to one or two age-groups only. At the time of writing this information is not available. The figures for the different areas have not yet been subdivided according to age constitution, consequently it is not possible to discuss this important detail with any degree of precision. However one very interesting fact emerges from the information now at our disposal. The reduction has been almost entirely among males, the decrease for them being recorded as 3,400 as against 607 for females. As already mentioned, in the absence of precise information as to the age groups involved it is not possible to say definitely what effect this change is likely to produce in our vital statistics. It is common knowledge, however, that there has been a very marked migration of young men from the area over the past year or two and this would now seem to be reflected in the population figures. If this assumption is correct (and there are grounds for so assuming) it will have a very important bearing on the interpretation of statistical data, especially

in relation to death-rates, for some time to come. The death-rate is heavy among very young children and falls with increasing age to a minimum at ages from 10 to 15. From this it rises, as age advances, to a maximum at ages over 85 years. This tendency is shewn in the following table in which the death-rates in England and Wales in the year 1935 for each of the 12 age groups are given :—

Age	Deaths per 1000
0—5	17.9
5—10	2.1
10—15	1.3
15—20	2.1
20—25	2.9
25—35	3.1
35—45	5.0
45—55	10.8
55—65	23.2
65—75	55.5
75—85	131.8
85—	269.2
All Ages	11.7

If we compare the death-rates of a school for boys with that of a home for old people, it is obvious that, even if the care given to the health of the inmates of the two is identical, the death-rate of the latter will exceed that of the former, merely because of their different age compositions. For this reason it is impossible to draw any conclusions as to the relative healthiness of two communities from a consideration of their recorded death-rates. Such conclusions can be drawn concerning the same community in different years, if these are not too far apart (and if no violent fluctuation in population has taken place meanwhile) but not for different communities, until the rates have been corrected to eliminate differences due merely to differences in the age and sex composition of the two populations. There is every reason to believe that the reduction of 4,000 in our population has been almost entirely made up of young men and young women who would be included in the groups from 20 to 35 years in the above table, that is to say in the groups characterised by low death-rates. This would then mean a relative increase in the population at the two extremes of age, the groups with high death-rates. In such circumstances an increase in the general death-rate would have to be expected, but such increase would by no means necessarily indicate that there had been a deterioration in the social or environmental circumstances of the population concerned. The tendency for young adults to be attracted from the country to the city is well-known, it is now generally referred to as "the flight from the land." Is there any evidence that this factor has been at work in the alteration in the population revealed by the census ? There seems to be. Excepting Cork City, the principal urban areas show an aggregate increase of 23,000 (to which, perhaps, should be added a very large proportion of the increase of 10,100 recorded for Dublin County) while

most of the country areas show definite decreases. The exceptions to this general statement are the counties of Kildare, Meath and Westmeath which show substantial increases in population reflecting, probably, settlements of people from uneconomic holdings in the West. On the whole, the increased urban population has been accompanied by a decrease in the rural population and one is therefore justified in assuming that the increase in the towns is due to migration from the country areas rather than a natural increase in the population. Seeing that this migration will have been made up very largely of the young adult type it will mean a relative increase in the age groups not subject to high death-rates and a consequent apparent improvement in the vital statistics of the area concerned in comparsion with areas which have not been subjected to such alterations in the age composition of the inhabitants. In the institution of any comparison between say, the death-rate of this area and that of any other urban area in the immediate future this important factor must be borne in mind, that such other area may have had a substantial access to its young adult population whereas we have had a pronounced reduction in ours, the tendency in the first instance being to bring about a reduction in the recorded death-rate and in the latter an increase, neither of which reflects the real healthiness of the areas concerned.

2.—Births.

According to the Annual Summary of the Registrar General, the total number of births *registered* in Cork during 1939 was 1,680. The number of live births *notified* to the Public Health Department (in accordance with the provisions of the Notification of Births Act) was 1,665. In addition to this latter figure there were 65 still births notified, bringing the total *notified* births to 1,730 for the year. There is therefore a difference of 15 between the number of registered live births and the number of notified live births, the latter being in excess. On the basis of the Registration General's figures the birth-rate for the year was 21.8. The birth-rate in this city has preserved a remarkable steadiness of character over the past fifty-seven years as shown in Table 1. The deccenial averages during this period were as follows :—

1881–90	...	...	...	26.2
1891–1900	...	...	...	27.2
1901–10	...	...	...	26.0
1911–20	...	...	...	24.7
1921–30	...	...	...	23.5
1931–36	...	...	...	24.0
1937	...	...	...	22.0
1938	...	...	...	21.1
1939	...	...	...	21.1
1940	...	...	...	20.0
1941	...	...	...	21.8

Table 1.—Birth Rates for Cork City and Éire from 1881.

Year	Cork	Éire	Year	Cork	Éire
1881	27.7	24.0	1911	26.0	22.8
1882	28.2	23.8	1912	24.8	22.7
1883	27.0	23.4	1913	24.2	22.6
1884	27.4	23.5	1914	24.3	22.3
1885	25.6	23.1	1915	23.2	22.0
1886	25.4	22.7	1916	22.6	21.1
1887	25.5	22.5	1917	20.2	20.0
1888	25.7	22.1	1918	20.8	19.9
1889	25.2	22.0	1919	23.8	19.9
1890	25.0	21.6	1920	28.3	21.6
1891	26.9	22.3	1921	24.6	19.7
1892	24.6	21.7	1922	24.2	19.5
1893	27.8	22.1	1923	26.2	20.5
1894	27.4	22.1	1924	25.5	21.0
1895	28.9	22.3	1925	23.8	20.8
1896	29.2	22.7	1926	21.5	20.6
1897	27.5	22.5	1927	21.7	20.3
1898	28.7	22.3	1928	21.7	20.1
1899	27.3	22.1	1929	20.9	19.8
1900	25.8	21.8	1930	25.4	19.9
1901	25.6	21.8	1931	24.4	19.4
1902	26.2	22.2	1932	23.0	19.0
1903	27.1	22.1	1933	23.7	19.3
1904	27.4	22.7	1934	24.4	19.5
1905	27.6	22.6	1935	24.8	19.6
1906	27.5	22.8	1936	23.7	19.6
1907	25.6	22.4	1937	22.3	19.1
1908	27.3	22.7	1938	21.1	19.4
1909	26.3	22.9	1939	21.1	19.1
1910	25.8	22.8	1940	20.7	19.1
			1941	21.8	19.0*

* From *Annual Summary* of Register General.

3.—Deaths.

The number of deaths assigned to this area by the Registrar-General in his Annual Summary (subject to correction) was 1,239. This figure differs from our own computation in Table 4 which is based on returns collected weekly by the staff from the District Registrar's records. The former must be regarded as the more accurate since it includes deaths transferred *inwards* of which we would have no knowledge. The Registrar General's figure yields a death-rate of 16.1 per 1,000 which by reference to Table 2 will be seen to be in excess of the average figure for some years. Not only is it in excess of the average figure for this area but there is also a marked discrepancy between it and the comparable figures for other urban areas for the current year as recorded in

the Annual Summary of the Registrar General and which, for comparitive purposes, are set out as follows:—

City of Dublin	...	...	14.1
Borough of Dun Laoghaire		...	14.5
Cork County Borough	...	...	16.1
Limerick County Borough		...	13.0
Waterford County Borough		...	15.5
Galway Urban District	...	...	12.7
Dundalk Urban District		...	14.8
Drogheda Urban District		...	13.2
Sligo Urban District		...	14.3
Wexford Urban District		...	18.0
Tralee Urban District	...	...	11.9
Kilkenny Urban District		...	15.9
Bray Urban District	...	...	16.6
Total of 13 Towns	...	...	14.1

At first sight it would appear that the death-rate for this area compares very unfavourably with those for the other areas cited but there are two considerations which attract attention and suggest that this interpretation may be very much open to question. In the first place why should the rate suddenly rise in this fashion in comparison with the rates for the preceding years and secondly why should it be so much greater than those for the other urban areas for the current period One conclusion might be that social and environmental circumstances here were relatively inferior to those in the other areas but, taking the known facts into consideration, it seems must unlikely that there would be such a marked discrepancy between them as *appears* from the recorded figures, and again it is improbable that there should be a sudden and marked deterioration from one year to the next as would seem to be the case if we compare the figure for 1941 with that of 1940 (and 1939). The true explanation would seem to be that suggested above in relation to the decline in population and the alteration in its age-constitution. It is quite possible also that this factor has been at work for some little time and that the increase in the rate for 1940 as compared with 1939 may have been due to it. Point is added to this view if we take into consideration the facts concerning such a locality as Bray. Here is a well-known and reputed watering-place in which one would expect that all circumstances would be conducive to a very low death-rate ; but actually we find that it is higher than our own (16.6 per 1,000). The explanation is obvious for it is well known that such places are largely resorted to by retired elderly people who form a large proportion of the population and furnish them with unduly high mortality rates. In this particular instance the supposition is amply comfirmed by the very low *birth-rate* (14.7 per 1,000) which is by far the lowest of all the urban areas. It is, therefore, clear that any area which may have a disproportionate number of elderly people and (as already stated) of very young children will shew a very high *recorded* death-rate in comparison with areas in which the population is more favourably distributed in regard to age consitution. In order to overcome this disturbing factor and to give a true picture of the relative healthiness of different places it is necessary to compute *standardised* death-rates—a process both complicated and laborious and, with the data now available, impossible to put into effect.

Nevertheless, in view of the circumstances in which we are now living, it seemed prudent to bear in mind that there might be some sociological factor at work which may have been responsible for the high rate of mortality and to examine the question further from this point of view.

In a recent issue of THE LANCET, *DR. PERCY STOCKS, discusses and summarises the statistics (for England and Wales) published by the Registrar-General in so far as they reveal the effects of the World War in the trend of mortality in these countries. For this purpose he utilises the Quarterly Returns of the Registrar-General and compares the deaths and death-rates under various headings for the four quarters in each year from 1936 up to and including the third quarter of 1941. Commenting on the figures adduced an editorial article notes that a reduction of deaths due to bombing and other deaths due to violence reveals a reasonably satisfactory position. It is pointed out that in the first quarter of both 1940 and 1941 mortality was relatively high but that both years had severe winters superimposed on special war-effects. Underlying this general picture there was a *decided increase in deaths from respiratory tuberculosis* (about 6% in the first year of the war and 10% in the second), an increase in other forms of tuberculosis, mainly tuberculous meningitis and a large increase in cerebro-spinal fever. There was also an increase in *infant mortality*, the first four quarters of the war shewed an average rise of 2 and the second four an average rise of $6\frac{1}{2}$ in the rate per 1,000 births. Infant mortality and tuberculosis are referred to by the commentator as being the best indices of the state of social well-being. So far the increases have not been spectacular; but we are warned that no effort should be spared to prevent the indirect toll which war exacts.

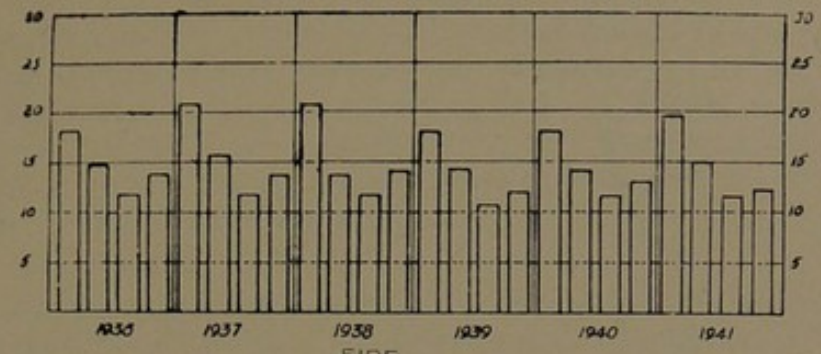
The nature and presentation of these figures was of some considerable interest and it seemed worth while to make a similar examination into the statistics of this Country (if the figures were available) with a view to deducing from them the effect of the war on the country. Fortunately the figures were found and in relatively convenient form in the Quarterly Returns of the Registrar-General which were available from 1936 to the present year (No doubt the figures could be easily obtained for earlier years but, for comparitive purposes, the evidence from this number of years is ample). The original intention was to compile a table showing the general death-rates and the death-rates from certain conditions for the country as a whole and for the City of Cork firstly for comparitive purposes and then to observe what had been happening over the period covered by the examination. As the work proceeded it seemed sufficiently interesting to examine the figures for the other County Boroughs also and the eventual result was a composite table in which the figures for the country as a whole and the four County Boroughs could be compared side by side. Since the presentation of figures in tabular form (especially when a large amount of numerals is involved) does not readily lend itself to interpretation it was decided to call in the visual help of graphical representation. The results of the compilation are seen in Table 3 and in the appropriate diagrams as designated. The figures for tuberculosis are dealt with in detail in the appropriate section, those shewn here relate to the general death-rates for the areas concerned. Taking both sets of figures as a whole it may be said that, so far at any rate, the war does not appear to have had any deleterious effect on the trend of mortality.

†Feb., 14, 1942.

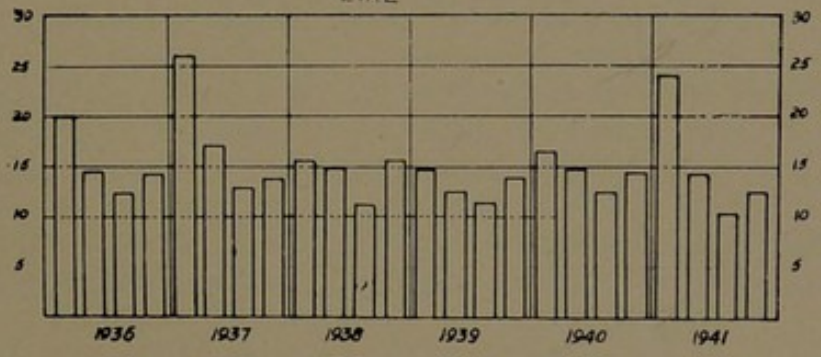
Table 2.—Deaths and Death-Rates (all Causes) by Quarters 1936 to 1941

Year	Consecutive Quarter	Eire		Cork		Dublin		Limerick		Waterford	
		Number of Deaths	Rate per 1,000	Number of Deaths	Rate per 1,000	Number of Deaths	Rate per 1,000	Number of Deaths	Rate per 1,000	Number of Deaths	Rate per 1,000
1936	1	12,869	17.0	395	20.1	2,048	18.9	201	20.4	102	15.3
	2	10,801	14.6	118	14.3	1,669	14.3	281	15.8	156	14.9
	3	8,667	11.7	227	12.2	1,442	12.3	123	11.9	96	13.7
	4	10,253	13.8	285	14.1	1,837	15.7	141	13.6	97	13.9
1937	5	15,366	20.8	524	26.0	2,503	21.2	215	20.8	149	21.3
	6	11,214	15.2	346	17.1	1,624	13.8	137	13.2	85	12.2
	7	8,615	11.7	256	12.7	1,347	11.4	120	11.6	80	11.4
	8	9,920	13.5	277	13.7	1,549	13.1	131	12.7	115	16.4
1938	9	11,442	15.7	308	15.3	1,912	16.0	157	15.5	144	20.6
	10	9,814	13.4	297	14.7	1,486	12.5	135	13.2	103	14.7
	11	8,587	11.7	227	11.2	1,321	11.1	121	11.8	72	10.3
	12	10,198	13.9	308	15.3	1,636	13.7	138	13.4	90	12.9
1939	13	13,313	18.2	294	14.6	1,990	16.5	145	14.1	93	13.3
	14	10,372	14.2	253	12.5	1,537	12.7	157	15.3	119	17.0
	15	8,600	11.7	232	11.5	1,339	11.1	121	11.8	80	11.4
	16	9,432	12.9	281	13.9	1,537	12.7	125	12.2	84	12.0
1940	17	13,376	18.1	332	16.4	2,623	21.5	182	17.7	190	27.2
	18	10,506	14.2	299	14.8	1,599	13.1	141	13.7	117	16.7
	19	8,530	11.5	252	12.5	1,334	10.9	131	12.8	85	12.2
	20	9,621	13.0	293	14.5	1,509	12.4	150	14.6	98	14.0
1941	21	14,648	19.6	490	24.3	2,060	16.8	188	18.3	131	18.7
	22	11,328	15.1	291	14.4	1,746	14.2	133	13.0	120	17.2
	23	8,683	11.6	216	10.7	1,485	12.1	109	10.6	89	12.7
	24	9,164	12.3	242	12.6	1,612	13.2	122	11.5	101	14.2

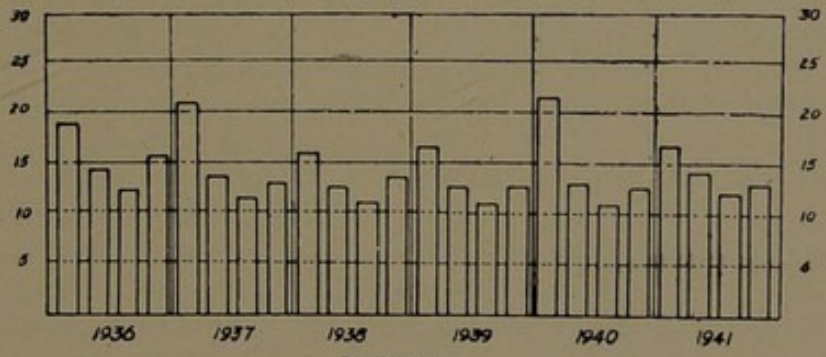
FIG. 1.—DEATH RATES (ALL CAUSES)
BY QUARTERS 1936—1941



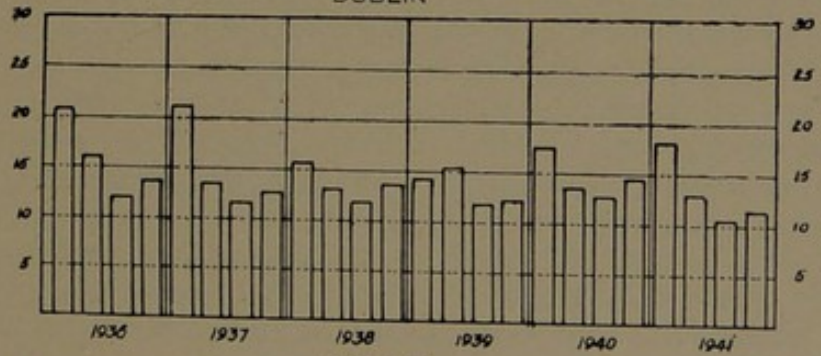
EIRE



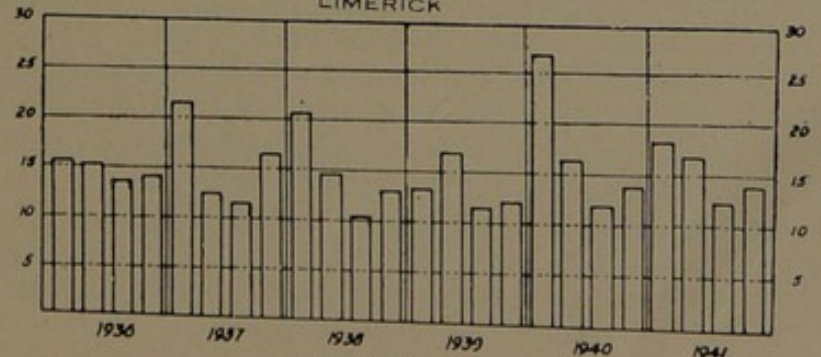
CORK



DUBLIN



LIMERICK



WATERFORD

One feature strikingly illustrated by the diagrams is the marked tendency to a seasonal increase in the death-rate in the first quarter of each year. This is, no doubt, due to the effect of the severe winter weather conditions on the older people in the community. In some localities this seasonal increase has, on occasion, been very marked indeed and is probably related to the recurrence of outbreaks of influenza and concurrent increase in the incidence and severity of respiratory infections. These fluctuations illustrate the fallacy of taking limited periods of observation for the purpose of making deductions. Such limited periods, more often than not, give an entirely wrong picture of the general trend of the circumstances to which they are related.

Examining the graph for the whole country the general impression is that there has been no material difference in the figures covered by the period represented in the diagram. This may be said to be a reasonably truthful interpretation of the facts for, examining the *annual* figures for the whole period it will be noticed, in the first place, that the general death-rate in 1936 was 14.41 while the figure for 1941 was 14.7. The first impression which might be created by such figures is that here is a clear case of an increase in the death-rate due to war conditions but, on examining them atter a little more closely, we find that in 1937 the rate was definitely higher at 15.3 per 1,000 of the population.

It may be, of course, that the figure of 14.7 for 1941 does represent a rising death-rate but it is impossible at this juncture to support such a conclusion and the lapse of time alone will decide the correct interpretation. With the facts now at our disposal all that we can say is that such a supposition is not supported by the figures. Concerning the figures for this area special consideration has to be given to the material alteration in the population which has taken place during the past few years (which has been alluded to elsewhere) and which has had a disturbing effect on the calculation of statistics. In effect this is comparable to the withdrawal of a considerable force from the community for military purposes which Dr. Stocks (in the article already quoted) refers to by saying that the civilian death-rate must be expected to rise as more and more young people of low death expectation are transferred to the Services and that it is, in consequence, difficult to evaluate the health-significance of the trend of such an index. The migration of young male adults from this area has been considerable and was only fully revealed in the recent census, the publication of which necessitated a sudden readjustment of the basal figure in which most of our rates were calculated. This alteration is reflected in the rather sharp rise in the death-rate (as calculated) for the present year but, in the light of what has been said, can scarcely be taken as indicating a sudden and sharp deterioration in the social circumstances of the locality due to the war or any other condition. Indeed, apart from the sharp rise indicated in the diagram, for the first quarter of 1941 the figures for the other quarters compare favourably with those for the corresponding quarters of other years. The sharp rise for the first quarter of 1937 was undoubtedly related to the heavy epidemic of influenza which occurred in that year and which was reflected in the very marked increase in the number of deaths from bronchitis which were registered during the period.

The figures and diagrams for the other areas (Dublin, Limerick and Waterford) seem of sufficient interest to merit a little consideration. On the whole they may be said to illustrate what has been said above for the whole country and for Cork City, that the impact of the war on the community so far, at any rate, has produced no material effect on the mortality tables. In the case of Dublin the diagram shows a somewhat wider fluctuation in the seasonal occurrence of death as compared with Cork and this feature is still more marked in the case of Waterford a circumstance which suggests that it is not so much the *occurrence* of death as the *registration* of the event which fluctuates in the different areas. From this point of view, indeed, it might well be suggested that the quarterly returns of deaths should not be compiled with reference to the time at which the deaths were registered but rather in relation to the time at which they occurred. This, at any rate would give a much more accurate picture of the effect of season on the death-rate.

It must not, however, be assumed that circumstances will not worsen in the future and with the difficulties now multiplying there would seem to be grounds, ample enough, for pessimism in regard to the future. The principal danger to be feared is shortage of food but we may be encouraged to take heart from the experience of Denmark during the last World War when the blockade prevented imports of animal feeding stuffs and forced them to kill off four-fifths of their pigs and one-third of their cows. The wheat-bran and potatoes normally fed to the animals were reserved for human consumption, and the dairy produce normally exported was added to the human diet, so that the Danes were living mainly on dairy-produce, coarse wholemeal bread made from wheat and rye, barley porridge and potatoes. The diet differed from the pre-war diet of the country in that meat protein was largely replaced by protein from dairy produce. The change was accompanied by a drop of 17 per cent. in the mortality for the whole country down to 10.4 per thousand, the lowest known in any country. There is evidence so far that the war has not produced any marked deleterious effect and it may well be that if circumstancesdo not deteriorate very materially that the health of the community may be maintained at a satisfactory level.

Table 2 shows the death rates per 1,000 persons living in Cork City, Éire and England and Wales for the 61 years ended 1941. 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. 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.

Table 3—Crude Death Rates per 1,000 living for Cork City, Eire and England and Wales, 1881–1941.

Year	Cork	Éire	E. & W.	Year	Cork	Éire	E. & W.
1881	26.8	17.1	18.9	1911	21.2	16.3	14.6
1882	24.7	16.9	19.6	1912	19.1	16.2	13.4
1883	24.9	18.6	19·6	1913	21.5	16.8	13.8
1884	26.7	17.4	19.7	1914	20.2	16.1	14.0
1885	26.2	18.0	19.2	1915	20.7	17.5	15.7
1886	22.1	17.4	19.5	1916	18.2	16.5	14.3
1887	22.4	17.9	19.1	1917	17.4	16.9	14.2
1888	24.1	17.4	18.1	1918	20.4	17.5	17.3
1889	22.3	16.9	18.2	1919	20.2	17.9	14.0
1890	22.2	17.6	19.5	1920	17.5	14.7	12.4
1891	26.9	17.6	20.2	1921	15.4	14.3	12.1
1892	26.4	18.7	19.0	1922	18.0	14.7	12.8
1893	24.5	17.3	19.2	1923	14.0	14.0	11.6
1894	24.9	17.7	16.6	1924	17.8	15.0	12.2
1895	23.9	17.7	18.7	1925	15.5	14.7	12.2
1896	22.6	15.9	17.1	1926	17.3	14.0	11.6
1897	24.7	17.8	17.4	1927	14.7	14.8	12.3
1898	23.7	17.7	17.5	1928	15.2	14.2	11.7
1899	26.3	17.0	18.2	1929	16.9	14.6	13.4
1900	24.2	19.1	18.2	1930	17.3	14.1	11.4
1901	23.0	17.1	16.9	1931	16.4	14.5	12.3
1902	21.5	17.0	16.3	1932	15.7	14.4	12.0
1903	19.4	17.0	15.5	1933	14.9	13.6	12.3
1904	21.6	17.6	16.3	1934	14.7	12.9	11.8
1905	21.7	16.4	15.3	1935	14.8	13.9	11.7
1906	20.2	16.2	15.5	1936	14.7	14.3	12.1
1907	20.6	17.0	15.1	1937	17.4	15.3	12.4
1908	22.2	17.1	14.8	1938	14.1	13.6	11.6
1909	22.1	16.8	14.6	1939	13.1	14.2	—
1910	19.3	16.6	13.5	1940	14.6	14.1	—
				1941	16.1	14.7	—

Table 4, which is based on Abstract V. of the Registrar-General's Annual Report, is an analysis of the causes of death during the year 1941. It differs from Abstract V. in this respect that the age-groups are more extended and that the causes of death have been sub-divided in some instances. For example, under the headings " other forms of tuberculosis " and " other defined diseases " the various causes of death are more fully set out. This has been made possible by the system of weekly collection of deaths from the district Registrar's registers and the card-index system of filing which has been adopted in connection with it. This table is compiled from the weekly returns collected by us from the local Registrars and the totals do not correspond with those of the Registrar-General in his Summary, which are not fully corrected. The number of deaths in this table amounts to 1,217 (as compared with 1,239 in the Summary) so that the error is but slight and probably due to deaths in other places which have been allocated by the Registrar-General to this area. Once again I have to acknowledge the assistance received from the Registrar-General in the compilation of these figures.

Table 4.—Analysis of **Causes of Death** at different age-periods during the year 1941.

Causes of Death	TOTAL	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 to 85	85 and up
		M.	F.											
Measles ...	6	5	1	1	5	–	–	–	–	–	–	–	–	–
Whooping Cough ...	3	–	3	1	2	–	–	–	–	–	–	–	–	–
Diphtheria ...	5	2	3	–	3	–	–	–	1	–	1	–	–	–
*Influenza ...	29	10	19	–	–	–	2	1	1	3	5	5	9	3
Pulmonary Tuberculosis ...	88	46	42	–	–	–	13	21	26	18	10	–	–	–
Other Tuberculous Diseases :—														
(a) Meningitis ...	10	5	5	1	1	5	3	–	–	–	–	–	–	–
(b) Joints ...	5	1	4	–	–	–	1	1	1	–	–	2	–	–
(c) Other ...	5	4	1	1	1	1	–	2	–	–	–	–	–	–
Cancer ...	125	59	66	1	–	1	1	2	4	26	36	50	4	–
Diabetes ...	4	2	2	–	–	–	–	–	–	–	2	2	–	–
Cerebral Haemorrhage ...	73	25	48	–	–	–	2	–	–	7	20	29	14	1
Heart Disease ...	306	131	175	–	–	3	2	6	12	22	82	108	61	10
Arterio Sclerosis ...	13	11	2	–	–	–	–	–	–	2	1	5	4	1
Bronchitis ...	114	51	63	6	–	–	–	2	1	10	30	40	24	1
Pneumonia :—														
(a) Lobar ...	17	6	11	1	1	–	–	2	1	2	6	3	1	–
(b) Broncho ...	50	22	28	15	14	1	–	3	1	3	6	5	1	1
Other Respiratory Diseases	23	11	12	2	–	–	1	–	2	3	9	4	2	–
Gastric and Duodenal Ulcer	9	7	2	–	–	–	–	–	3	2	1	3	–	–
Diarrhoea and Enteritis ...	36	14	22	33	3	–	–	–	–	–	–	–	–	–
Appendicitis ...	4	3	1	–	–	1	–	2	–	1	–	–	–	–
Cirrhosis of Liver ...	1	1	–	–	–	–	–	–	–	–	1	–	–	–
Nephritis ...	19	9	10	–	–	–	2	2	1	4	3	4	3	–
†Puerperal Conditions ...	5	–	5	–	–	–	1	2	2	–	–	–	–	–
Congenital Debility and Premature Birth	50	27	23	49	1	–	–	–	–	–	–	–	–	–
Suicide ...	4	3	1	–	–	–	–	1	2	1	–	–	–	–
Other Violence ...	25	14	11	1	4	2	1	2	3	1	2	4	3	2
Other Defined Diseases :—														
(1) Gastro-Intestinal ...	14	8	6	1	5	1	–	–	1	–	2	3	1	–
(2) Convulsions ...	11	10	1	11	–	–	–	–	–	–	–	–	–	–
(3) Central Nervous System ...	9	4	5	–	–	–	2	–	1	2	–	3	1	–
(4) Anaemia and Blood Diseases ...	8	2	6	–	–	–	1	–	1	3	1	1	1	–
(5) Genito-Urinary ...	11	9	2	–	–	–	–	–	–	1	4	5	1	–
(6) Marasmus ...	8	6	2	8	–	–	–	–	–	–	–	–	–	–
(7) Rheumatic Diseases	15	5	10	1	–	–	1	1	1	2	5	4	–	–
(8) Meningitis ...	4	3	1	1	1	2	–	–	–	–	–	–	–	–
(9) Hepatic Diseases ...	8	4	4	–	–	–	1	1	–	1	–	5	–	–
(10) Toxic Goitre ...	3	1	2	–	–	–	–	1	1	1	–	–	–	–
(11) Idiopathic Hypertension ...	4	3	1	–	–	–	–	–	1	2	1	–	–	–
(12) Gangrene ...	4	1	3	–	–	–	–	–	–	–	1	1	2	–
(13) Senile Decay ...	48	14	34	–	–	–	–	–	–	–	1	8	28	11
(14) Miscellaneous ...	32	14	18	7	2	1	–	1	3	5	6	5	1	1
Ill Defined or Unknown Causes ...	9	2	7	2	–	–	–	–	1	–	2	1	3	–
Totals ...	1217	555	662	143	43	18	34	55	71	121	237	300	164	31

*Mostly Occurred in January. †No deaths from Puerperal Sepsis.

The principal causes of death (in order of importance) were as follows :—

1.	Heart Disease ...	306	(293)
2.	Cancer	125	(114)
3.	Bronchitis ...	114	(78)
4.	Pulmonary Tuberculosis	88	(96)
5.	Cerebral Haemorrhage	73	(56)
6.	Broncho-pneumonia...	50	(42)
7.	Premature Birth ...	50	(42)
8.	Senile Decay ...	48	(53)
9.	Diarrhoea and Enteritis	36	(52)
10.	Violence ...	29	(21)
11.	Nephritis ...	19	(28)
12.	Lobar Pneumonia ...	17	(17)

The figures in parenthesis denote the corresponding number in 1940.

Cardiac Disease. As usual this condition accounts for the great bulk of the deaths. Stress has been laid on deaths from heart disease and allusion made to the fact that the majority of them are found to be recorded in the later age-groups which gives rise to the supposition that they represent a degenerative condition rather than an infective one. This feature has been reproduced this year as shewn in the following table.

Table 5.—Analysis of deaths from heart disease from 1931.

Year	Under 5 years	5 /15 years	15 /25 years	25 /35 years	35 /45 years	45 /55 years	55 /65 years	65 /75 years	75 yrs and up	Total
1931	—	6	3	5	18	31	66	87	34	250
1932	—	6	2	9	17	39	50	99	36	258
1933	—	2	4	5	15	31	58	83	42	240
1934	1	3	4	5	20	17	66	103	39	258
1935	2	3	1	7	11	29	63	93	36	245
1936	4	3	3	7	6	32	64	98	48	265
1937	—	5	6	9	16	24	72	112	64	308
1938	1	2	2	2	12	35	67	106	76	304
1939	—	1	4	2	12	27	63	108	61	278
1940	2	—	5	4	12	21	66	109	74	293
1941	—	3	2	6	12	22	82	108	71	306

The general trend of deaths from heart disease is shewn in the following table and a comparison made with deaths from cancer and pulmonary tuberculosis.

Table 6.—Trend of mortality from the three principal causes of death in Cork City from 1931.

	Condition		
Year	Heart Disease	Cancer	Pulmonary Tuberculosis
1931	250	124	103
1932	258	98	111
1933	240	114	106
1934	258	111	107
1935	245	133	115
1936	265	121	85
1937	308	117	96
1938	304	106	99
1939	278	143	86
1940	293	114	96
1941	306	125	88

Cancer. The number of deaths attributable to this disease recorded by us was 125 as compared with 114 in 1940. The corresponding figures of the Registrar-General are 123 (uncorrected) and 114. The discrepancy observable here, no doubt, is due to a difference in classification, all forms of malignant disease being classed by us under this heading. For comparative purposes the Registrar-General's are the more correct figures. On the basis of 123 deaths the rate was 1.6 per 1,000 of the population.

Phthisis Death Rate. The deaths from pulmonary tuberculosis numbered 88 equivalent to a rate of 1.1 per 1,000 of the population. The corresponding figures for last year were 96 and 1.1 per 1,000 respectively. The figures for the years from 1911 onwards are set out in Section IV.

Infant Mortality. The number of deaths of children under one year of age was 143 which is equivalent to a rate of 85 per 1,000 live births. In 1940 the number of deaths was 156 and the rate 95 per 1,000. The contributary factors are discussed in Section V.

Maternal Mortality. There were 5 deaths from causes under this heading during the year. The maternal mortality rate was 2.8.

Infectious Disease Death Rate. The number of deaths from the principal infectious diseases was 42 equivalent to 0.5 per 1,000 of the population.

Table 7.—Deaths registered during the year 1941, for the County Borough of Cork by Registrars' Districts, with the mortality per 1,000 of the population from causes and from the Principal Epidemic Disease.

REGISTRAR'S DISTRICTS, &c.	Infant Mortality per 1,000 Births	Annual Rate per 1,000 Population Census 1936		DEATHS																										
					Ages at Death								Deaths from																	
													Principal Epidemic Diseases								Tuber-culosis			Diseases of Respiratory System					
		From all causes.	From Principal Epidemic Diseases	Total Deaths	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.	Typhoid fever Typhus, Small pox, Dysentery	Measles	Scarlet fever.	Whooping cough.	Diphtheria.	Diarrhoea and Enteritis (under 2 years).	Influenza.	Pulmonary	Other Forms.	Cancer	Pneumonia.	Other	Violence	Other Causes.	Inquest Cases.	In Public Institutions	Number of Uncertified Deaths.
CITY OF CORK																														
Cork Urban No. 1	—	14.6	0.1	192	13	.	1	2	7	14	54	101	.	.	.	1	.	.	4	9	1	22	6	25	5	119	5	78	7
„ No. 2†	—	—	—																											
„ No. 3†	—	—	—	569	73	16	11	11	13	65	170	210	.	4	.	2	2	18	16	39	15	47	38	62	12	314	18	311	6
„ No. 4†	—	—	—																											
„ No. 5†	—	—	—																											
„ No. 6	—	14.4	0.4	170	19	3	4	1	6	14	48	75	.	.	.	.	.	5	5	15	.	19	12	29	7	78	9	83	1
„ No. 7	—	15.7	0.5	308	37	11	2	2	10	40	99	116	..	2	.	.	2	6	7	23	3	35	15	27	6	182	9	186	4
TOTAL CITY OF CORK	85	16.1	0.5†	1,239	142	30	18	16	36	133	362	502	.	6	.	3	4	29	32	86	19	123	71	143	30	693	41	658	18

† The boundaries of these districts were altered on 1st April 1941; the populations, for the existing districts are not at present available

Table taken from Annual Summary of Registrar General, the returns for which are not fully corrected.

Table 8.

Summary of Births and Deaths Registered during the Years 1878 to 1941, inclusive, in the Cork Urban Sanitary District with the number of Deaths from some of the principal causes.

YEAR	POPULATION	Rate per 1,000 persons represented by			NUMBER REGISTERED																				
			DEATHS from			DEATHS.																			
									NUMBER CAUSED BY																
		BIRTHS	All Causes	Principal Zymotic Diseases	BIRTHS	TOTAL NUMBER	Under 1 year of age	At 65 years & upwards	Smallpox	Measles	Scarlet Fever	Typhus	Whooping Cough	Diphtheria	Enteric Fever	Diarrhoea	Influenza	Pneumonia	Tuberculous Disease: Pulmonary	Tuberculous Disease: Other forms	Cancer	Violence	Inquest Cases	No. in Public Institutions	Number of Uncertified
1878...		31.7	27.0	—	2,646	2,464	380	681	...	61	1	...	59	1	...	75	...	...	...	...	...	23	87	863	...
1879...		33.5	29.0	3.8	2,707	2,689	319	711	...	49	65	...	19	2	...	48	...	...	...	...	...	30	113	977	...
1880...		28.5	30.8	5.9	2,620	2,837	376	624	...	73	204	...	47	13	...	86	...	...	289	...	...	23	99	1026	...
1881...		27.7	26.8	4.1	2,167	2,101	271	611	...	36	30	88	61	4	4	87	...	...	237	...	...	14	82	673	...
1882...		28.2	24.7	2.3	2,212	1,935	282	490	...	20	8	54	25	5	4	55	...	...	274	...	...	11	77	574	...
1883...		27.0	24.9	2.0	2,161	1,993	236	572	...	35	8	46	5	10	11	38	...	...	271	...	...	9	50	646	...
1884...		27.4	26.7	2.8	2,199	2,139	253	553	...	41	27	37	45	6	13	51	...	...	292	...	...	12	50	671	...
1885...		25.6	26.2	3.3	2,054	2,098	247	614	...	6	48	21	55	5	9	35	...	...	287	...	...	7	36	587	...
1886...	80,124	25.4	22.1	2.1	2,037	1,769	225	430	...	12	30	17	5	8	42	50	...	...	263	...	...	11	40	525	...
1887...		25.5	22.4	1.8	2,042	1,792	252	490	...	34	1	12	6	2	20	67	...	...	236	...	...	15	43	490	...
1888...		25.7	24.1	3.5	2,058	1,934	288	501	...	146	6	21	49	18	9	30	...	...	231	...	...	7	32	499	...
1889...		25.2	22.3	1.9	2,023	1,786	253	497	...	1	10	5	88	7	9	32	...	...	278	...	...	8	34	433	...
1890...		25.0	22.2	1.0	2,005	1,778	214	571	...	1	5	7	14	8	12	29	...	...	295	...	...	20	43	479	...
1891...		26.9	26.9	1.4	2,024	2,025	281	630	...	—	4	5	29	11	17	34	...	...	295	...	...	15	35	557	...
1892...		24.6	26.4	1.9	1,978	1,988	297	560	...	40	...	23	42	3	17	17	...	...	203	...	...	17	65	682	...
1893...		27.8	24.5	1.3	2,092	1,844	268	517	...	6	2	7	14	3	14	51	...	...	314	...	...	15	58	596	...
1894...		27.4	24.9	1.8	2,062	1,874	310	517	...	51	15	2	16	4	13	32	...	...	296	...	...	31	63	609	...
1895...		28.9	23.9	1.6	2,179	1,798	287	494	...	1	3	8	65	2	16	28	...	...	261	...	...	24	68	657	...
1896...	75,345	29.2	22.6	1.2	2,144	1,706	229	477	...	2	2	7	16	1	24	40	...	...	299	...	...	14	66	619	...
1897...		27.5	24.7	2.7	2,073	1,858	316	452	...	75	1	3	59	10	9	47	...	...	260	...	...	22	64	680	...
1898...		28.7	23.7	1.9	2,160	1,787	285	493	...	3	1	11	25	4	13	86	...	...	283	...	...	14	75	640	...
1899...		27.3	26.3	2.8	2,060	1,980	276	525	...	34	1	6	33	5	8	121	...	...	320	...	...	9	79	749	...
1900...		25.8	24.2	1.4	1,944	1,821	235	496	...	9	22	4	1	2	5	59	...	...	281	...	...	7	51	597	...
1901...		25.6	23.0	1.9	1,942	1,745	272	440	...	3	17	2	36	11	5	73	...	...	289	...	...	13	54	558	...
1902...		26.2	21.5	1.3	2,031	1,667	258	430	...	21	3	...	30	4	5	34	...	...	287	...	...	25	65	554	...
1903...		27.1	19.4	1.3	2,066	1,476	232	336	...	2	4	...	44	4	5	37	...	...	279	...	...	19	46	518	...
1904...		27.4	21.6	1.0	2,089	1,642	249	408	...	8	1	1	27	6	8	27	...	...	352	...	...	39	75	563	...
1905...		27.6	21.7	1.0	2,099	1,650	276	468	...	14	...	2	...	7	8	47	...	103	294	...	...	18	50	605	...
1906...	76,122	27.5	20.2	1.7	2,094	1,535	279	406	...	...	...	4	14	11	5	92	...	65	261	81	62	20	54	593	...
1907...		25.6	20.6	1.5	1,946	1,570	254	427	...	...	2	6	52	5	4	48	...	77	278	84	77	14	53	609	84
1908...		27.3	22.3	1.9	2,084	1,700	281	472	...	13	6	6	13	9	16	79	...	62	245	93	59	12	53	651	83
1909...		26.3	22.1	2.3	2,000	1,680	251	457	...	3	15	5	72	11	15	54	...	106	264	78	62	13	75	673	91
1910...		25.8	19.3	0.9	1,965	1,469	189	489	...	...	2	3	7	11	13	34	...	71	233	75	73	25	50	630	77
1911...		26.0	21.2	1.9	1,992	1,622	277	377	...	17	2	...	28	10	5	78	...	91	252	73	64	28	61	627	81
1912...		24.8	19.1	0.7	1,903	1,464	204	412	...	6	5	...	11	6	6	18	...	69	231	71	66	16	56	560	58
1913...		24.2	21.5	1.9	1,853	1,645	253	424	...	16	4	2	...	3	6	114	...	110	202	79	95	14	57	643	60
1914...		24.3	19.9	2.1	1,897	1,551	226	367	...	9	9	1	64	13	4	67	...	85	231	79	74	15	48	581	60
1915...		23.1	20.7	1.5	1,778	1,584	235	418	...	14	12	...	22	14	5	49	...	152	211	72	66	13	50	590	79
1916...		22.6	18.2	1.0	1,732	1,394	182	387	...	6	6	1	11	9	6	35	...	97	189	69	66	14	31	564	51
1917...		20.2	17.5	0.8	1,552	1,340	169	395	...	...	1	1	14	3	3	34	...	74	202	78	62	24	40	51	60
1918...	76,673	20.8	20.5	2.2	1,599	1,570	189	326	...	88	1	1	27	6	8	40	...	247	187	75	61	20	29	596	43
1919...		23.8	20.2	1.1	1,825	1,551	183	414	...	1	2	3	7	32	1	40	...	248	155	58	69	19	26	564	50
1920...		28.3	17.5	1.9	2,169	1,341	173	355	...	2	5	...	40	60	13	22	...	69	159	46	86	30	32	574	59
1921...		24.6	15.4	1.4	1,887	1,181	144	313	...	...	...	1	1	56	4	1	...	40	125	34	75	71	82	482	59
1922...		24.2	18.0	1.06	1,853	1,383	173	392	...	38	...	...	...	42	2	...	37	128	176	39	70	39	28	571	67
1923...		26.2	14.0	0.7	2,007	1,071	133	332	...	...	...	1	...	23	1	24	4	55	130	32	84	28	38	446	42
1924...		25.5	17.8	1.4	1,990	1,386	175	396	...	...	...	...	81	12	2	10	25	148	164	32	94	18	29	568	40
1925...		23.8	15.5	0.8	1,827	1,185	136	397	...	...	2	...	2	6	5	45	8	60	134	31	92	25	38	457	32
1926...		21.5	17.3	2.4	1,687	1,359	220	361	...	75	6	1	32	18	2	53	13	116	126	46	82	25	27	501	37
1927...		21.7	14.7	0.5	1,101	1,152	148	343	...	1	6	...	...	9	2	24	17	63	129	35	78	28	27	449	52
1928...		21.7	15.0	0.8	1,767	1,179	135	398	...	...	4	...	8	22	2	28	17	80	109	29	101	27	34	459	34
1929...		20.9	16.7	1.4	1,816	1,308	156	404	...	15	3	1	30	33	1	25	12	81	141	17	92	26	44	552	42
1930...		25.4	16.1	1.8	1,998	1,264	155	399	...	22	8	...	5	64	...	37	5	88	117	25	96	22	36	584	25
1931...	78,490	24.4	16.2	0.5	1,921	1,275	138	388	...	...	...	...	5	24	1	34	34	96	124	46	107	26	24	515	33
1932...		23.0	15.8	0.7	1,819	1,239	163	400	...	1	1	...	18	17	1	46	11	82	111	45	98	27	40	607	18
1933...		23.7	14.9	0.8	1,852	1,168	165	367	...	1	1	...	3	14	†2	45	20	60	106	19	104	22	43	557	22
1934...		24.4	14.7	1.0	1,922	1,151	139	403	...	3	2	...	16	25	...	36	6	61	107	21	111	21	43	542	13
1935...		24.8	14.8	0.9	1,945	1,158	162	386	...	11	...	...	1	7	...	56	5	29	115	29	133	24	29	552	19
1936...		23.8	14.7	0.9	1,921	1,188	154	404	...	7	7	...	5	8		41	6	35	85	20	121	32	49	628	10
1937...		22.5	17.4	1.2	1,818	1,403	187	493	...	10	10	...	12	17	...	52	55	36	96	24	117	44	47	706	19
1938...	80,765	21.1	14.1	0.6	1,708	1,140	129	430	...	...	3	...	3	7	*1	33	6	33	99	16	106	28	47	590	18
1939...		21.1	13.1	0.5	1,711	1,060	125	418	...	...	1	...	6	3	...	39	2	24	86	14	143	22	40	558	19
1940...		20.7	14.5	1.0	1,670	1,172	153	433	...	21	1	...	...	5	...	52	8	17	96	29	114	21	35	508	8
1941...	76,758	21.9	16.1	0.5	1,680	1,239	142	502	...	6	...	...	...	5	...	36	32	17	88	19	125	29	41	658	18

*Infection incurred outside City area.

†Both were resident in Mental Hospital (outside City area) for several years.

Table 9.—Showing the number of deaths from theprincipal epidemic diseases during the past ten years.

Year	Small Pox	Typhus Fever	Typhoid Fever	Scarlatina	Puerperal Fever	MembraneousCroup	Diphtheria	Measles	Diarrhoea	Whooping Cough
1930 ...	—	—	—	6	1	1	64	—	31	4
1931 ...	—	—	1*	—	1	—	24	1	34	5
1932	—	—	1*	1	1	—	17	1	46	18
1933 ...	—	—	2†	—	2	—	14	3	45	3
1934 ...	—	—	—	2	5	—	25	11	36	16
1935 ...	—	—	—	—	1	—	7	7	56	1
1936 ...	—	—	—	7	1	—	8	10	41	5
1937 ...	—	—	—	10	—	—	17	—	52	12
1938 ...	—	—	1*	3	—	—	7	—	33	3
1939 ...	—	—	—	1	1	—	3	—	39	6
1940 ...	—	—	—	1	—	—	5	21	52	—
1941 ...	—	—	—	—	—	—	5	6	36	—

* Infection in these cases was incurred outside the City area.

† Both these cases had been resident many years in the Mental Hospital (outside City area).

Uncertified Deaths. Eighteen uncertified deaths were recorded during the year as compared with eight in 1940.

The following table shows the number of uncertified deaths each year since 1920. (Figures compiled from Annual Report of Registrar-General) :—

1920	...	59	1931	...	33
1921	...	59	1932	...	18
1922	...	67	1933	...	22
1923	...	42	1934	...	13
1924	...	40	1935	...	19
1925	...	32	1936	...	11
1926	...	37	1937	...	19
1927	...	52	1938	...	18
1928	...	34	1939	...	19
1929	...	49	1940	...	8
1930	...	25	1941	...	18

Deaths from Violence. In the 29 recorded instances the cause of death was as follows :—

Falls	...	...	10
Drowning	...	...	5
Suicide	...	...	4
Burns	...	...	3
Motor Car Accidents		...	3
Homocide	...	...	1
Miscellaneous	...	...	3

Table 10.—INFANT DEATH RATE.

Year	Births	Deaths under 1 year	Deaths per 1000 Births	Year	Births	Deaths under 1 year	Deaths per 1000 Births
1881	2167	271	124	1912	1903	204	107
1882	2212	283	127	1913	1853	253	136
1883	2161	236	109	1914	1897	226	119
1884	2199	253	110	1915	1778	235	132
1885	2054	247	120	1916	1732	182	105
1886	2037	225	110	1917	1552	169	108
1887	2042	252	123	1918	1559	189	118
1888	2058	288	139	1919	1825	183	100
1889	2023	253	125	1920	2169	173	79
1890	2005	214	106	1921	1887	144	76
1891	2024	281	138	1922	1853	173	93
1892	1978	297	150	1923	2007	133	66
1893	2092	268	132	1924	1990	175	87
1894	2063	310	150	1925	1827	136	74
1895	2179	287	131	1926	1687	220	130
1896	2144	229	106	1927	1701	148	87
1897	2073	316	152	1928	1764	135	76
1898	2160	285	131	1929	1816	156	85
1899	2060	276	133	1930	1998	155	77
1900	1944	235	120	1931	1921	138	71
1901	1942	272	139	1932	1819	168	89
1902	2031	258	127	1933	1852	165	89
1903	2066	232	112	1934	1922	139	72
1904	2089	249	118	1935	1945	162	83
1905	2099	276	131	1936	1921	154	80
1906	2094	279	133	1937	1818	187	103
1907	1946	254	139	1938	1708	129	76
1908	2084	281	134	1939	1711	125	73
1909	2000	251	125	1940	1670	153	92
1910	1965	189	96	1941	1680	142	85
1911	1992	277	139				

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	Dysentry
Puerperal Fever	Encephalitis Lethargica
Diphtheria	Varicella
Membraneous 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 into force in the County Borough.

The Public Health Acts Amendment Acts, 1907, was adopted and put into 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.

The Public Health (Ireland) (Pneumonia, Malaria, Dysentry, etc.) Regulations, 1919 were revoked and are replaced by " The Public Health (Infectious Diseases) Regulations, 1929." Trench Fever, which was included in the 1919 Regulations, has been withdrawn in the new order.*

* These Regulations are now revoked and replaced by the Public Health (Infectious Diseases) Regulations, 1941 (see below).

Two important legal enactments in regard to the control of infectious disease came into force during the year. The first of these, the Emergency Powers (No. 46) Order, 1940 relates to the control of carriers. The principal feature of this Order is that it gives power for the detention or isolation of any person who is a probable source of infection with any disease. This would embrace carriers and in this respect it is radical departure from pre-existing practice. Section 12 of the Infectious Disease (Prevention) Act, 1890, provides for the detention of persons suffering from an infectious *disease* only after they had been admitted to a hospital or institution. The use of the word " disease " here would seem to preclude the " carrier " condition since it could hardly be held that a person was suffering from a particular disease in the absence of its clinical manifestations; notwithstanding the fact that as a carrier he would be much more likely to be a source of danger to the community than if suffering from a frank clinical attack of the disease in question. Section 141 of the Public Health (Ireland) Act, 1878 would appear to have provided more power in this respect since it provides for the segregation of persons suffering from " dangerous infectious *disorder* " without actually specifying *disease.* Actually we had a test case some years ago in the District Court in which a diphtheria carrier was involved. When this case came for hearing the District Justice suggested an adjournment in the hope that wiser counsel would prevail and, as a result, the parents consented to the child's admission to hospital. The present Order empowers the removal of persons whether actually suffering from active disease or not. Such removal, however, can only be enforced after the issue of a warrant signed by the Minister of Local Government and Public Health. The relevant articles are as follows :—

Art. 3 (1) Whenever the Minister is of the opinion that a particular person is a probable source of infection with any disease and that the compulsory isolation of such person is necessary or expedient in the interests of public safety, the Minister may by warrant under his hand order the detention and isolation of such person until a medical officer specified in such warrant has certified that such person is no longer a probable source of infection.

(2) Whenever the Minister has by warrant under this Article Ordered the detention and isolation of a person, such person shall be detained and isolated accordingly under this Order, and for that purpose any member of the Garda Siochana may without warrant arrest the said person.

Art. 6 The Minister may by writing under his hand, if and whenever he thinks proper to do so, order the release of any person who is for the time being detained and isolated under this Order, and thereupon such person shall forthwith be released from such detention and isolation.

Art. 5 Provides for the proper disposal of the detained person's clothing which may either be disinfected or, where considered necessary for the prevention of infection, destroyed and replaced by other clothing. It also provides for the compulsory bathing of the person on admission if deemed necessary and for his proper and seemly behaviour while under detention.

As already stated the provisions of this Order are a very radical departure for the established practice but in view of the present emergency it can hardly be held that they constitute an undue interference with the liberty of the individual. During war there is an ever present danger of the introduction of dangerous infectious disease which, so far as non-belligerent countries are concerned, differs only in degree from those actively participating and this danger undoubtedly calls for measures of control which may, possibly, not be regarded as necessary in normal peace times. The Order, nevertheless, does not specify any particular circumstance (e.g., the disembarkation of passengers) but applies over the whole country. Some may question the wisdom of conferring such wide powers upon the administrative officers of local authorities, but when one takes into consideration the increased risk in war time of such a disease as typhus fever, the manner of its spread and the kind of person who is likely to disseminate it will be agreed that the Order does not err in this direction. It only remains, then, for the officers concerned to exercise their discretion in employing the powers thus accorded them.

The Public Health (Infectious Diseases) Regulations, 1941 came into operation on the 1st July, 1941 and they revoke the Public Health (Infectious Diseases) Regulations, 1929 [Art. 1 (31).] Under the Regulations the following diseases are compulsorily notifiable (these expressed in *italics* were not hitherto notifiable in this area) :—

Cerebro-spinal Fever	Pneumonia (Acute Influenzal)
Dysentry	Pneumonia (Acute Primary)
Encephalitis Lethargica	Poliomyelitis (Acute Anterior)
Malaria	*Puerperal Pyrexia*
Measles	*Trachoma*
Ophthalmia Neonatorum	*Undulant Fever*
Pemphijus Neonatorum	*Whooping Cough*

Puerperal Pyrexia is defined as any febrile condition (other than a condition which is required to be notified as puerperal fever) occurring in a woman within twenty-one days after childbirth or miscarriage, in which a temperature of 100.4°F. (38°C) or more has been sustained during a period of twenty-four hours or has recurred during that period. The definition of this condition enables the medical practitioner to make up his mind in a case of doubt as to whether a case should be notified or not. Hitherto notification has been limited to " puerperal fever " a disease not usually diagnosed until some days have elapsed. In cases such as the latter much valuable time may be lost in instituting preventive measures. Under the new Regulations any doubt as to notification is removed.

The general laws as to notification by practitioners are now applied to the above-named diseases except that it is no longer necessary to notify a case of *measles or whooping cough* occurring in a family if a previous case of the disease had occurred in that family and had (to his knowledge) been notified within the preceding period of two months [Art. 4 (3) (ii).] This Article does not appear to prohibit the practitioner from notifying such case if he feels so disposed. So far as the medical officer of a hospital

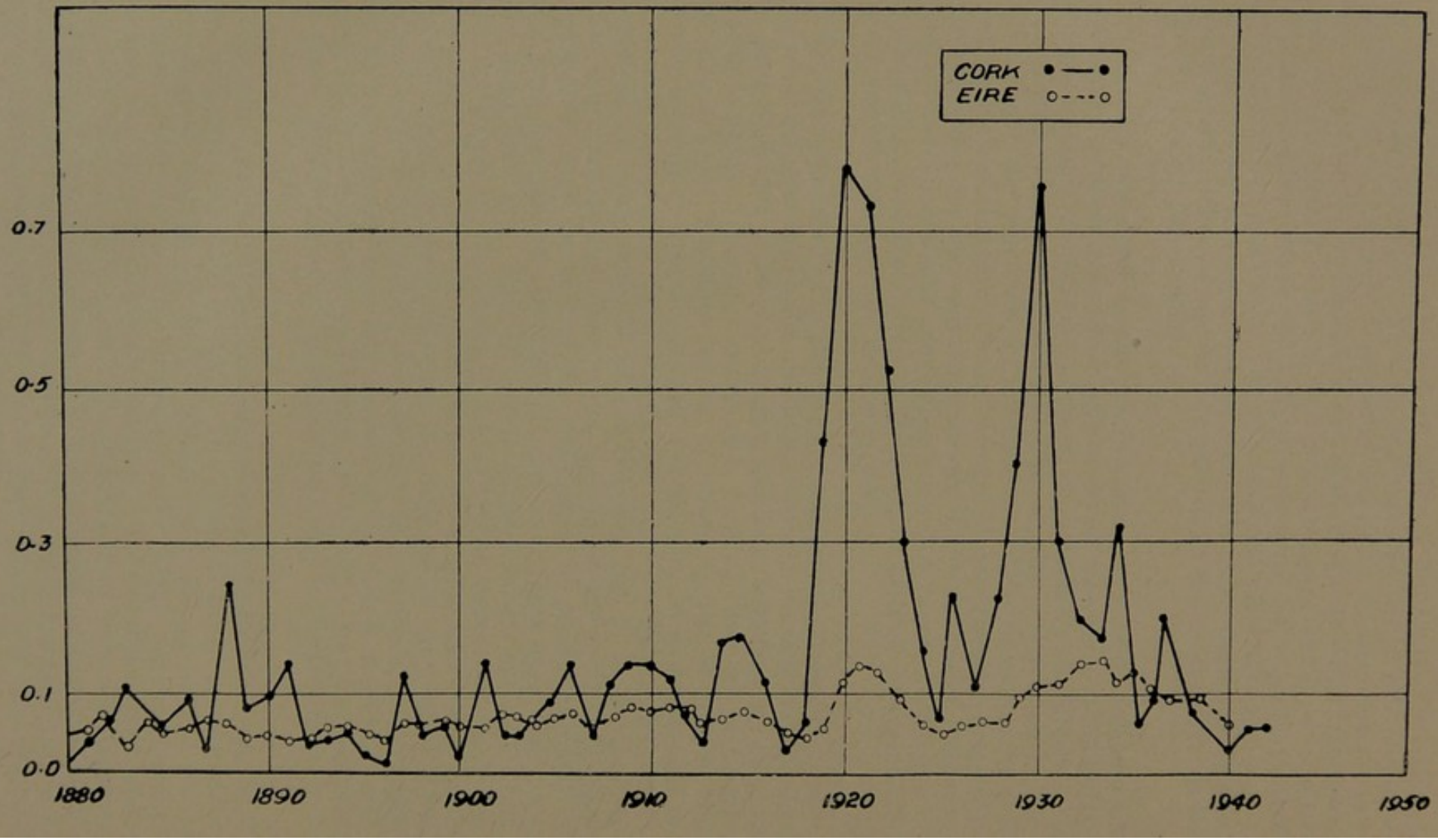
for infectious diseases is concerned, compulsory notification is confined to the following categories : (1) cases in which the patient was admitted to the institution as a case of suspected infectious disease without any definite diagnosis and the disease is definitely diagnosed after admission to hospital, (2) cases in which it has been necessary to revise or alter the diagnosis made before the patient was admitted. Again in this case it seems to be open to the M.O. to notify *all* cases admitted and it is hoped that this practice will continue since it is by no means exceptional that such notifications are the first intimation of the cases which reach the Public Health Department.

Article 14 empowers sanitary authorities to provide schemes of *immunisation* against diphtheria, scarlet fever, measles and whooping cough and makes it compulsory on them, if required by the Minister, to formulate such scheme or schemes. The various sub-sections of this Article set out the privileges and obligations of the authority in this connection such as the purchase and storage of the necessary materials, the arrangements for their administration, the hire for use of buildings, the employment of persons considered necessary to the fulfilment of such schemes and for the supply to medical practitioners on reasonable terms of agents necessary for immunisation.

The First Schedule to the Regulations specifies the disease (outlined above) to which they apply, the second specifies the Form of Notification to be used while the third (and most important, Schedule is divided into four sections. Part I deals with *Typhus Fever* and Relapsing Fever and sets out the measures to be taken by the M.O.H. in the occurrence of such a case in his area. Inter alia, he is empowered to take measures to procure the complete destruction of lice in the person and clothing of *every occupant* of the building and to secure the destruction of lice and their products in the building as well as the temporary segregation of other inmates of the building or of persons recently in contact with the patient until their persons or clothing have been completely freed from lice. Part II confers certain powers on the M.O.H. (acting on behalf of the sanitary authority) in connection with the employment of *carriers* of enteric fever, diphtheria and dysentry in trades or occupations connected with the handling of food. Part III is concerned with the control of the sale and distribution of milk where it has been established that any one connected with it is (or has been) suffering from *scarlet fever* while Part IV provides for the measures to be taken in the case of an individual suffering from *malaria*.

The total number of notifications received during the year was 799 as compared with 2,204 in 1940. The principal reduction was under the heading of measles (of which disease there was an exceptionally widespread epidemic in the previous year). There were substantial reductions also in scarlatina and diarrhoea. On the other hand there was a very marked increase in the notifications of varicella (chicken pox) which is a very mild disease. There was also an increase in typhoid fever due, in the main, to the occurrence of a small localised outbreak during the last quarter of the year. The investigations into this epidemic are described under the appropriate heading.

FIG. II.
DIPHTHERIA. CORK CITY AND EIRE
DEATH RATES (PER 1,000 POPULATION)
FROM 1880 TO PRESENT TIME



DIPHTHERIA.

The number of cases notified was 62 (as compared with 41 in the previous year). Five deaths were recorded, representing a case fatality of 8.0 per cent. The corresponding figures in the previous year were 3 and 7.4 per cent.). In comparison with former years these figures may be regarded with some satisfaction, but it is, of course, a great reproach that we should have to refer to *deaths* from diphtheria at all considering the means at our disposal for their prevention. As will be seen in the subjoined table three of the recorded deaths related to children under 6 years. The other two deaths were of adults—one a woman aged 60 years and the other, also a woman, age 38. The ages of these latter cases are very unusual and we are reminded by them that diphtheria is not confined entirely to children and that it may be dangerous at all ages. With regard to the child deaths we have that history to which I have so often referred in these reports—the failure of the parents to avail of the opportunity of prophylactic inoculation for the protection of their children. The scheme for voluntary immunisation was commenced in this area in 1929 and it will be noted that from that year to the end of the year now under review no less than 17,915 children have been treated. It is a very significant fact that among this very large number *there has not been a single death from diphtheria* but on examining the other side of the picture a lamentable state of affairs is revealed, for during this period no fewer than 223 unprotected children have died from the disease. In the face of facts such as these it is impossible to understand the attitude of mind of those parents who neglect such a simple precaution in favour of the welfare of their children.

It will be noted from the figures in the appropriate tables that there has been a distinct tendency towards increased incidence during the past year or two which, as I have often before pointed out, is characteristic of what happens when attendances at the immunisation clinic falls off. In such circumstances, while sporadic cases of diphtheria continue to recur, it is merely a question of time as to the occurrence of another major outbreak. This is due to the building-up of an unprotected community of children in which the proportion of immunes falls to a very low level and this is what has been happening here for a number of years. Facilities for protection against diphtheria have been in existence in this area for the past fourteen years consequently the blame for such deaths as occur must fall entirely upon these parents who have been so negligent as not to avail of them.

Table 11.—Analysis of cases and deaths.

Age Groups	CASES		DEATHS
	Number	Proportion to Total	Number
0–2 years	4	6.45 per cent.	1
2–4 ,,	13	20.98 ,,	–
4–6 ,,	7	11.28 ,,	2
6–8 ,,	12	19.35 ,,	—
8–10 ,,	8	12.91 ,,	—
10–15 ,,	6	9.68 ,,	–
15 and over	12	19.35 ,,	2
Total ...	62	100 per cent.	5

The incidence (per 1,000 of population) and the case-fatality rates of diphtheria from 1890 to the present year are set out in Table 12. In Figure II the *mortality* (i.e., the number of deaths per 1,000 of population) is graphically compared with that for the country generally.

In a large proportion of cases the reports received transpired not to be diphtheria. The actual number was 40 (approximately 40 per cent. of all notifications received). The age distribution of these was as follows :—

0–2 years	...	...	...	1 cases
2–4 ,,	...	...	...	5 ,,
4–6 ,,	...	...	...	6 ,,
6–8 ,,	...	...	...	6 ,,
8–10 ,,	...	...	...	1 ,,
10–15 ,,	...	...	...	2 ,,
15–20 ,,	...	...	...	6 ,,
Over 20 ,,	...	...	...	13 ,,
		Total	...	40

Table 12.—Incidence and Case Fatality of Dipththeria from 1890 to 1941.

Year	Cases	Rate per 1000 Population	Deaths	Fatality Rate
1890	20	0.26	8	40.00
1891	37	0.49	11	29.97
1892	11	0.14	3	27.27
1893	18	0.23	3	16.66
1894	14	0.18	4	28.57
1895	6	0.07	2	33.33
1896	7	0.09	1	14.28
1897	21	0.27	10	47.61
1898	18	0.23	4	22.22
1899	18	0.23	5	27.77
1900	23	0.30	2	0.86
1901	26	0.34	11	42.30
1902	8	0.10	4	50.00
1903	17	0.22	4	17.53
1904	29	0.38	6	20.60
1905	18	0.23	6	33.33
1906	37	0.48	11	29.73
1907	37	0.48	5	13.51
1908	40	0.56	9	22.50
1909	66	0.86	11	16.66
1910	51	0.65	11	19.29
1911	70	0.91	10	14.28
1912	52	0.67	6	11.54
1913	24	0.31	3	12.50
1914	54	0.70	13	24.07
1915	68	0.88	14	20.59
1916	43	0.55	9	20.93
1917	26	0.33	3	11.53
1918	34	0.43	6	17.64
1919	262	3.37	32	12.21
1920	428	5.50	60	14.02
1921	541	6.93	56	10.37
1922	379	4.86	42	11.08
1923	440	5.68	23	5.18
1924	217	2.85	12	5.40
1925	265	3.50	6	2.19
1926	469	6.10	18	3.75
1927	344	4.55	9	2.52
1928	385	6.37	19	4.75
1929	369	4.81	32	8.46
1930	627	7.86	59	10.00
1931	288	3.66	24	8.61
1932	85	1.08	17	20.00
1933	109	1.32	14	12.83
1934	109	1.32	25	22.10
1935	56	0.71	7	12.50
1936	25	0.31	8	32.00
1937	80	0.99	17	21.20
1938	54	0.66	7	12.77
1939	41	0.50	3	7.40
1940	52	0.67	5	9.61
1941	62	0.80	5	8.06

Note :—The Infectious Disease (Notification) Act, 1889, was adopted on 7th February, 1890.

DIPHTHERIA IMMUNISATION.

There was little improvement in the numbers who attended for treatment during the year. In previous reports I have alluded to the tendency for such an occurrence whenever the incidence of the disease has been low (as it has been, relatively speaking, for the past few years). Apart from this there have been other factors at play too, over which we had no control, which mitigated against a good attendance during the year. The total number of children who completed the full course was 576 (compared with 552 in 1940) and the total number who attended was 745.

Table 13.—Attendance at Diphtheria Prevention Clinic 1929–41.

Year	Primary Schick Negative	Completed Full Course	Total	Not Completed Course
1929	—	1,802	1,802	—
1930	154	2,857	3,011	505*
1931	324	1,777	2,101	436
1932	91	422	513	208
1933	159	592	751	61
1934	826	1,716	2,542	432
1935	173	1,118	1,291	8
1936	458	1,741	2,199	22
1937	165	960	1,125	212
1938	106	708	814	205
1939	87	355	442	69
1940	87	552	639	90
1941	109	576	685	60
Totals	2,739	15,176	17,915	2,308

* Includes figures for *both* 1929 *and* 1930.

The figures for primary Schick tests in this table do not, of course, represent the *total* number of such tests performed but merely the number that proved *negative*. They are stated here for the purpose of estimating the number of children who have passed through our hands and who may be regarded as presumably immune. The number of primary tests has been reduced to a minimum. It is now confined to children over seven years. The great bulk of our cases are now under this age, so that the necessity for the primary test is comparatively rare.

Table 14.—Primary Schick Tests performed during 1941.

Age Group	Number of Cases	Positive	Negative	Proportion **Positive**
0–5 years	1	—	1	Nil
5–10 ,,	55	17	38	30.9 %
10 and over	90	20	70	22.2 %
Totals ...	146	37	109	25.3 %

Table 15.—Primary Schick Tests, 1929–41. Analysis showing proportion positive in each year.

Year	Number Tested	Positive	Negative	Proportion Positive
1929–30	1170	916	254	78.2 per cent.
1931	598	274	324	45.8 ,,
1932	301	210	91	69.7 ,,
1933	435	276	159	63.4 ,,
1934	1474	648	826	44.0 ,,
1935	309	136	173	44.0 ,,
1936	626	168	458	26.8 ,,
1937	266	101	165	38.0 ,,
1938	152	46	106	30.2 ,,
1939	110	23	87	20.9 ,,
1940	131	34	87	25.9 ,,
1941	146	37	109	25.3 ,,

Apart from record purposes this table is of little value as, obviously, the proportion of *positive* reactions will depend almost entirely on the age constitution of the groups of children tested and as this factor will fluctuate widely from year to year, so also will the results vary from one year to another. In this respect the next table is much more informative as the results in the different years have been analysed in accordance with the age groups of the children.

Table 16.—Primary Schick Tests, 1929–41. Analysis of proportion positive each year in different age groups.

Age Group	Proportion POSITIVE (expressed as percentages)											
	1929–30	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
0–5 years	—		88.4	79.7	65.8	66.6	66.6	—	—	50.0	25.0	—
5–10 ,,	—	—	60.1	63.3	44.2	49.5	41.5	43.8	25.0	28.6	20.4	30.9
10 and over	—	—	37.7	28.9	27.5	30.3	15.5	33.0	35.7	18.4	32.9	22.2
Whole Group	78.2	45.8	69.6	63.4	44.0	44.0	25.2	37.9	30.2	20.9	25.9	25.3

Owing to the smallness in the number of cases tested, no results can be adduced for the figures for the years 1937 to 1941.

The number of attendances in the different age groups is shewn in the following figures.

(1) Treatment Incomplete—			
0–5 years	...	...	42	
5–10 years	...	...	18	
10 and over	...	...	—	
			——	60
(2) Treatment Complete—			
0–5 years	...	...	448	
5–10 years	...	...	101	
10 and over	...	...	27	
			——	576
Total number treated	...	...		636
Number negative on Primary Schick Test		...		109
		Total	...	745

Table 17.—Secondary Schick Tests, 1930–1941.

Year	Total	Negative	Positive	Proportion Negative
1930	805	752	53	94.6 per cent.
1931	1166	991	175	85.2 ,,
1932	913	858	55	92.8 ,,
1933	893	801	92	89.0 ,,
1934	1105	1058	47	95.7 ,,
1935	1405	1388	17	98.8 ,,
1936	1272	1259	13	98.9 ,,
1937	732	722	10	98.6 ,,
1938	581	498	83	85.7 ,,
1939	215	205	10	95.3 ,,
1940	353	350	3	99.1 ,,
1941	488	464	24	95.0 ,,
Totals ...	9,928	9,346	582	94.1 per cent.

Alum-precipated toxoid (A.P.T.) and toxoid anti-toxin floccules (T.A.F.) were the prophylactics used. The former was administered by the two-dose method (0.1 c.c. followed by 0.5 c.c.) and the latter in three doses of 1 c.c. each at intervals of a fortnight or three weeks.

The twenty-four children who yielded positive *secondary* Schick tests each received further treatment. In addition to these, 140 children who had previously been Schick negative were presented for further test after a lapse of three or more years and of this number 132 were found to be still negative while 8 had reverted to a positive state and got further treatment. The findings here are of some interest and suggest that in epidemic periods it is advisable that all children previously immunised should be re-tested if a period of three or more years has elapsed.

SCARLET FEVER.

A further substantial reduction was recorded in the number of cases notified. This amounted to 42 altogether (as compared with 158 in 1939 and 143 in 1940.) Scarlet fever has always been more or less prevalent in this area, assuming epidemic proportions fairly frequently (as shown in the following table). The characteristicmildness has been maintained and no deaths were recorded. Reference to the table will illustrate the remarkable modification which has taken place in the character of this disease since notification was first introduced.

FIG. III.—ENTERIC FEVER INCIDENCE (PER 1,000 POPULATION) FROM 1881 TO PRESENT

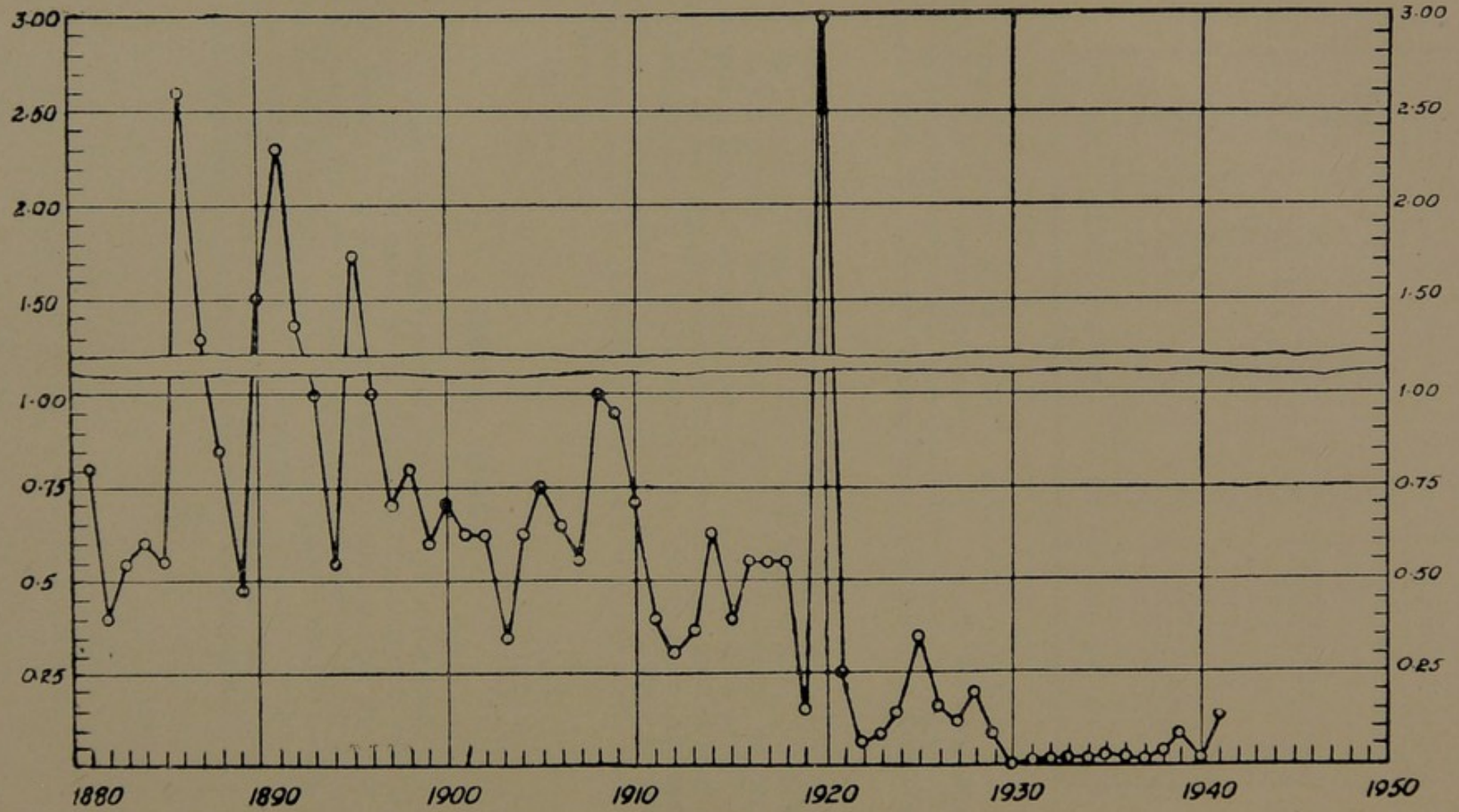


Table 18.—Incidence and Case Fatality in Scarlet Fever *Epidemics* in Cork City.

Year	No. of Cases	No. of Deaths	Fatality Rate
1879	386	65	16.8 per cent.
1880	616	202	32.7 ,,
1881	103	30	29.1 ,,
1884	158	27	17.2 ,,
1885	143	48	33.2 ,,
1894	304	15	4.9 ,,
1900	401	22	5.5 ,,
1901	288	17	5.9 ,,
1914	230	9	3.9 ,,
1915	245	12	4.9 ,,
1916	112	6	5.3 ,,
1926	278	6	2.1 ,,
1927	205	6	2.8 ,,
1928	208	4	1.9 ,,
1929	216	3	1.4 ,,
1930	238	8	3.3 ,,
1933	181	1	0.5 ,,
1934	118	2	1.5 ,,
1936	437	7	1.6 ,,
1937	454	10	2.2 ,,
1938	228	3	1.3 ,,
1939	158	1	0.6 ,,
1940	143	1	0.7 ,,
1941	42	—	—

In general, practitioners have been encouraged to treat cases of scarlet fever at home whenever the circumstances justify it. This policy was first adopted in 1936 and has fully justified itself in the intervening years. The main consideration has been whether the patient will have a room for his sole use and if one member of the household can be told off for the duty of nursing him. It can be said that the experience in regard to the occurrence of secondary cases has been such as to give every encouragement for the continuance of this arrangement. Recent advances in the knowledge of the epidemiology and, particularly of the bacteriology of scarlet fever have made it clear that many of the measures adopted in the past were not only uncalled for, but useless in the prevention of the disease. It is not the patient suffering from scarlet fever who is mostly responsible for its spread but the healthy carrier, adult or child, harbouring haemolytic streptococci in the throat or elsewhere. In consequence, it is no longer regarded as necessary to isolate every case of scarlet fever and, provided the circumstances are suitable, home treatment is regarded as being the best from every point of view.

It will be noted that there was a very marked preponderance of females over males. A similar disparity was noted in 1936, while in 1937 there was only a relatively slight excess of female cases.

TYPHOID FEVER.

Twelve cases were notified during the year. These all occurred about the same time and constituted a minor epidemic. There were no deaths. An account of this outbreak was published in *The Irish Journal of Medical Science*, May, 1942 and by kind permission of the Editor is reproduced herewith.

These notes relate to an outbreak of typhoid fever which occurred in the City of Cork during the latter months of 1941 and to three further cases which had no relation to it. Eleven cases were reported altogether between September and the end of the year, and to these must be added another which may be regarded as the starting-point of the epidemic referred to. By the time that this particular case came under notice all symptoms had subsided and it was never notified.

The first report was received on September 25th. It related to a woman (A.W., senior), aged 47 years, and preliminary investigation revealed the following facts : On August 9th this woman left Cork with her daughter (A. W., junior), for a holiday in the neighbourhood of Killarney. In the series of events which followed this daughter was undoubtedly a very important link and, it is interesting to note, it was she who gave the information concerning the history and movements of both her mother and herself. For three days before leaving Cork this girl was ill and confined to bed. She complained mostly of pain and swelling in the neck. There was no history of vomiting, diarrhoea or other abdominal trouble and her condition was diagnosed as rheumatism. There was no improvement in her condition after her arrival in the house of relatives in Kerry, and during the whole of the seven days they were there (as well as for a further seven days after their return to Cork) she had to keep to her bed. During this period she was looked after by her mother (A. W., senior). The date of their return to Cork was August 15th.

On September 1st A. W. (senior) was first taken ill. For some days she took little notice of her condition, but gradually became worse complaining of severe headache (accompanied by pain " out through the eyes "), pain in the neck, vomiting and diarrhoea. It was now the turn of the daughter to look after the mother, which she continued to do until September 15th, when the doctor was called who had the patient removed to hospital for observation. The case was not diagnosed at this stage, and it was not until the 25th (ten days later) when a Widal test had been carried out that it was recognised as typhoid fever and notified. She was then, of course, removed to a fever hospital.

A preliminary investigation was made by the District Sanitary Officer on the afternoon of receipt of notification and a personal one by me on the following morning. At this stage the main facts alluded to above were elicited (technical details having been ascertained in subsequent inquiries at the hospitals concerned). The informant was the daughter (A. W., junior), already referred to, who then appeared to be in excellent health. The dwelling-house is a tenement occupied by two families with a common water supply and sanitary accommodation. The general standard of hygiene was definitely bad. During this interview it was elicited that the symptoms of the mother necessitated frequent attention and there seemed to be every likelihood that the bedding had been contaminated which, in view of the poor sanitary circumstances, pointed to the probability of spread of infection.

It was known that another member of the family (T. W., 20 years) had had typhoid four years previously : This was believed to have been incurred by bathing in a portion of the River Lee, very subject to sewage contamination. As he seemed to be a very likely source of infection in the present instance, it was decided to interview him at once with a view to obtaining material for bacteriological examination. He was seen at his place of work and readily gave his consent to the proposal. He appeared to be in very good health, but mentioned that two of his brothers had been off colour for a few days. One of these brothers (P. W., 19 years) was in the same employment and was seen at the same time. He complained of headache with pain in the eyes, pain in the neck, loss of appetite and general uneasiness for the previous four or five days. He felt sure, however, that he would be " alright in a few days." His pulse was found to be 106 and his temperature 99.6° F., and in view of the history he was transferred home at once and the family doctor informed. The other brother (D. W.) was a boy 14 years of age, who was not at home when the investigation was made. The doctor was also informed about him and it subsequently transpired that, having seen them both that afternoon, he had the two brothers removed to hospital. (Both were afterwards confirmed to be suffering from typhoid fever).

Up to this point the brother (T. W., 20 years) had been regarded as the most likely source of infection of the present series, but it was noted that all three cases had presented one prominent symptom—pain in the region of the neck (which may be regarded as a manifestation of meningismus), and it was recalled that this had been particularly marked in the case of the daughter (A. W., junior) and was, in fact, practically the only thing of which she had complained. In view of the prominence which marked it in the other three cases it was deemed advisable to review her illness in the light of this subsequent knowledge. A sample of blood was submitted for examination ; on October 1st this was reported on as follows : " Serum agglutinates B. typhosum H. 1/125 ; B. typhosum O 1/125. Paratyphoid A and B negative." In view of this finding one was forced to the conclusion that it was this girl who was the most likely source of the cases, as it seems quite clear now that the illness from which she was suffering when she left Cork was a mild attack of typhoid fever.

It must be mentioned at this stage that as soon as the early facts had become available communication was made with Dr. G. Fitzgerald, County M.O.H. of Kerry, as it appeared possible at that stage that infection may have taken place while Mrs. W. and her daughter were in his area. The subsequent facts were also brought to his notice and a communication received later from him indicated that there was no typhoid in that particular place, nor had been for a long time before.

On September 28th, that is, three days before the role of the girl (A. W.) had become definitely established, another notification was received. This related to a boy (J. C., aged 15 years), who resided two doors away from the previous cases. It may be mentioned that most of the houses in the neighbourhood are tenements and that there is free intercourse between the various families. At first sight it seemed likely that this boy had received infection through one or other of the W. family or in their house, but the case here was complicated by the fact that his own sister (B. C., 14 years) had had typhoid fever during the previous year (August, 1940). On investigation, it was found that he had been ailing since September 15th (13 days), no doctor having been called in until the day of his removal to hospital. The diagnosis in his case was subsequently confirmed by Widal test.

At this stage there were, therefore, three possible sources of infection ; the youth T.W., his sister A.W. and their neighbour, the girl B.C. (sister to the latest case). Specimens of urine and faeces were obtained from each of these sources and examined for typhoid bacilli, but all were found to be *negative*. This was during the first week in October. Specimens were examined again at the end of the month, but were also *negative*. (Details of these and other examinations will be found in tabular form in the appropriate table).

A very disquieting feature came to light in connection with the investigation of this case, for it was found that up to the time of his illnes he had been working as a " milk boy " for a vendor with a very extensive round in the neighbourhood. Up to that particular point there had been no evidence that the epidemic was either milk-borne or water-borne, but the stage then seemed to have been set for a very extensive outbreak indeed, and it was further complicated by the fact that the vendor concerned also supplied the neighbouring military barracks as well as a shop which was commonly frequented by soldiers for light refreshments. Liaison had already been made with the military authorities in view of the proximity of these cases and the possibility of contact being made with relatives of some of them. The new facts connected with the last case were, naturally, brought to their notice at once and we were able to supply them with a list of personnel who had been accustomed to favour the shop concerned. At the same time information was handed on to the County Medical Officer of Health with a view to having investigations made at the source of the milk supply. (These investigations proved

to be entirely negative, there being no history of previous or subsequent illness at any of the farms from which the vendor received supplies of milk). From the vendor himself a complete list of names and addresses of all his customers was obtained and concurrently with this action a circular letter was sent to all members of the medical profession in the city drawing their attention to the circumstances and requesting that they should be on the alert for any suspicious cases arising in their practice. At the time that this boy's case came under our notice it had been some thirteen days since he had worked on his round and it was, indeed, a fortunate circumstance that no further cases arose as a result of his activities in this direction.

The sixth case in this series came to light with the notification, on October 3rd, of Mrs. K. S. (41 years), who resided nine houses away from the original cases and who carried on the business of a licensed vintner at her address. This report was received from the Medical Officer of the Fever Hospital to which she had been admitted on the day before. As in most of the previous cases, it transpired that she too had been sick for some time (since September 12th). She visited her doctor seven teen days later (September 29th), and was sent by him to a general hospital for observation and was transferred thence to the Fever Hospital three days afterwards on the result of the Widal reaction becoming known. A careful inquiry into this case failed to establish any definite connection between this and the previous cases. The information was supplied by the patient's sister and was verified by the patient herself when questioned by the M.O. of the Fever Hospital. A possible chance contact, in the way of business, may have taken place, as the father of the W. family occasionally called at the premises of Mrs. S., but this man has always been quite healthy. At one time it appeared possible that this might be the first case to arise through the milk supply, but this proved to be a false alarm, resulting from mistaken identity. No satisfactory explanation has been forthcoming as to the manner in which this woman incurred infection.

The next case to come under our notice was that of a child, G. O'N., aged 7½ years, reported from the North Fever Hospital on November 8th. He resided in the neighbourhood, but at some distance from the original cases. It was, however, established that he was a near relation of the W. family (first cousin) and was in the habit of constantly visiting their house. The question arises as to the source of infection in this case. He had been ill since November 3rd, and the last previous case with which he could have made contact (J. C.) had been removed to hospital on September 28th, about 36 days previously, but there still remained as potential sources of infection the three persons already alluded to, although attempts to isolate the specific infecting organism from their discharges had failed. One has, however, to take into consideration the fact that such discharge is very often intermittent and, besides, the general standard of sanitation in the houses concerned was such as to conduce to the spread of infection and to its persistence if once introduced. One or other of these factors, at any rate, appeared to be the most likely source in this case and in the two others which followed it before the epidemic came to an end.

The two last cases to be reported were notified within twenty-four hours of each other. They were sisters of the last named case, being 8½ and 12 years, respectively. The first was notified on December 8th, and the second on the following day. The circumstances were identical with those of their brother and illustrate the difficulty of maintaining surveillance over such cases. The mother had been repeatedly warned by the Sanitary Officer not to allow the children to visit the W. family, but, notwithstanding, he had frequent cause to complain of such visits and it seems likely, therefore, that all three children received infection at this source.

It will have been apparent that all these cases were, comparatively speaking, of a mild character, a common feature being the prolonged period which occurred before medical attention was directed to them. This feature is one which would naturally favour the extension of infection since the cases would not have been under medical or nursing supervision during the most infective period of the disease. An increasing exaltation in the virulence of the disease, however, became apparent towards the

end of the epidemic and was most manifest in the case of the O'N. children (who, it will be noted, were ill for only short periods before removal to hospital) and reached its climax in the death of a nurse in the institution in which they were treated. This latter case was not officially reported to us aand, consequently, was not investigated. It was the only death connected with this series and the others now about to be described.

During the period covered by the events above described three further cases of typhoid fever were reported. They are dealt with separately, because they occurred in other parts of the city and could not be connected with previous ones. Two of the cases came from the same house (again a tenement), but from different families. The first of these notifications (received on October 8th) related to a man (W. C., aged 50 years), a dock labourer, and all inquiries failed to discover any connection with the cases which were occurring at the same time in the other locality. It was, in fact, impossible to trace the source of infection in this case. A careful study was made as to his movements and habits, sources of food, etc., but all yielded negative results. One clue which was followed up related to a companion who was reported to have suffered from typhoid some years previously. Contact was made with this man and he acknowledged to have suffered from the disease in 1918 (twenty-four years earlier). Specimens of urine and faeces were submitted to bacteriological examination and yielded negative results. On October 23rd (twenty-one days after the removal of W. C. to hospital) a child L. O'C., aged 7½ years), fell ill in the same house. He was removed to hospital, and the diagnosis of typhoid was confirmed by the finding of typhoid bacilli in the stools. As already stated these two cases were of different families, but in this instance also there was the common water supply and sanitary accommodation. The water tap was in a bathroom adjacent to the water-closet and there was every possibility of contamination taking place given the source of specific infection. This is a very large house and on the whole well-kept, being of a definitely higher standard from the hygienic point of view than the tenement involved in the other outbreak, but the common lavatory and water supply comprised a decided weakness. The number of families occupying rooms in it was seven and the number of inhabitants 34, so that it is fortunate that there was not a further extension of the disease.

The third, and last, case though included in this series, is in no way connected with the two cases just described and should, perhaps, more properly have been included with the first and major outbreak as it seems probable that his infection was related to it. The patient (J. L., aged 53 years) was admitted to one of the Fever Hospitals (in which typhoid cases were being treated) on October 27th suffering from erysipelas. He remained there until November 10th, when he returned home. So far as could be gathered he was more or less unwell from the beginning of his return. He became definitely ill on December 1st and was then seen by his doctor. He continued unwell and was admitted to Hospital on December 11th. The Widal reaction was strongly positive (H./1 : 1,000, O./1 : 250), so that it was evident that the disease was well established by that date. Apart from his previous sojourn in the Fever Hospital already alluded to, no likely source of infection could be traced, and since several cases of active typhoid were being treated there at the time it must be inferred that this was the probable source of infection. Apart from the patient, there were four other persons (all adults) in this family, but there was no extension of the disease. The house is a private one of the cottage class with separate sanitary accommodation, so that the liability to spread would not have been so great as in the other two instances.

All these patients, with one exception, recovered from the disease and are now apparently quite well. One of them, however, does not yet appear to have completely recovered from the ill effects of the disease. This is the patient, G. O'N., one of the family of three affected in the first outbreak and in whom it was noted that there was a definite increase in the severity of the disease. One of his sisters (E. O'N.) was very severely affected, and the typhoid state was very marked in her case. She was in hospital for 64 days altogether, during which period she received 66 c.c.'s of anti-typhoid serum. It was while nursing this case that the nurse, who died from the disease, succumbed to it. This nurse, it appears, was accustomed to suffer from " bilious trouble" and apparently neglected the onset of the disease. It would seem that she was sick about a fortnight before reporting ill and was then found to have a temperature of 104° F. She developed pneumonia, and died within eight days. In the accompanying table the various data in regard to biological examinations are set out and an attempt has been made to correlate same to the probable date of onset.

TABLE I.—PARTICULARS OF BIOLOGICAL TESTS AND EXAMINATIONS.

Identity	Age	Date of Onset of Illness	Widal Reaction					Fæces		Urine		Remarks
			Date of Test	H.	O.	Para A.	Para B.	Date	Result	Date	Result	
A.W. (Snr.	47	1/9/'41	25/9/'41	1:250	Nil	Nil	Nil	Combined	Spec.	13/11/'41	Neg.	—
								,,	,,	24/11/'41	Neg.	—
								,,	,,	27/11/'41	Neg.	—
P.W.	19	23/9/'41 (?)	4/10/'41	1:50	Nil	Nil	Nil	Combined	Spec.	17/10/'41	Neg.	—
			13/10/'41	Nil	Nil	Nil	Nil	,,	,,	30/10/'41	Neg.	—
								,,	,,	6/11/'41	Neg.	—
D.W.	14	23/9/'41 (?)	4/10/'41	1:125	Nil	Nil	Nil	Combined	Spec.	30/11/'41	Neg.	—
					Nil	Nil	Nil	,,	,,	6/11/'41	Neg.	—
								,,	,,	13/11/'41	Neg.	—
J.C.	15	15/9/'41	30/9/'41	1:50	1:250	Nil	Nil	Combined	Spec.	17/10/'41	Neg.	—
								,,	,,	25/10/'41	Neg.	—
								,,	,,	5/11/'41	Neg.	—
K.S.	41	12/9/'41	2/10/'41	1:250	1:125	Nil	Nil	,,	,,	24/10/'41	Neg.	—
								,,	,,	30/10/'41	Neg.	—
								,,	,,	6/10/'41	Neg.	—
G.O.N.	7½	3/11/'41	—	—	—	—	—	14/10/'41	POS.	—	—	—
								27/11/'41	POS.	27/11/'41	Neg.	—
								5/12/'41	Neg.	5/12/'41	Neg.	—
								12/12/'41	Neg.	—	—	—
								20/12/'41	Neg.	20/12/'41	Neg.	—
E.O'N.	12	8/12/'41	10/12/'41	Nil	Nil	Nil	Nil	28/1/'41	Neg.	23/1/'42	Neg.	13/12/'41
								28/1/'41	Neg.	28/1/'42	Neg.	Blood Culture POS.
								5/2/'42	Neg.	5/2/'42	Neg.	—

TABLE I..—PARTICULARS OF BIOLOGICAL—TESTS AND EXAMINATIONS—*continued*

Identity	Age	Date of Onset of Ilness	Widal Reaction					Fæces		Urine		Remarks
			Date of Test	H.	O.	Para A.	Para B.	Date	Result	Date	Result	
K.O'N.	8½	6/12/'41	9/2/'42	Nil	Nil	Nil	Nil	20/12/'41 15/1/'42 23/1/'42 28/1/'42	POS. Neg. Neg. Neg.	— 15/1/'42 23/1/'42 28/1/'42	— Neg. Neg. Neg.	13/12/'41 Blood Culture Negative
A.W. (Jnr.)	17½	—	1/10/'41	1:125	1:125	Nil	Nil	9/10/'41 30/10/'41	Neg. Neg.	9/10/'41 30/10/'41	Neg. Neg.	Suspect Carrier.
T.W.	20	—	3/10/'41	Nil	1:50	Nil	Nil	3/10/'41 30/10/'41	Neg. Neg.	3/10/'41 30/10/'41	Neg. Neg.	Suspect Carrier.
B.C.	15	—	—	—	—	—	—	9/10/'41 27/1/'41	Neg. Neg.	9/10/'41 27/10/'41	Neg. Neg.	Suspect Carrier
W.C.	50	19/9/'41	6/10/'41	1:500	1:250	Nil	Nil	Combined ,, ,,	Spec. ,, ,,	14/11/'41 24/11/'41 27/11/'41	POS. POS. Neg.	— — —
L.O'C.	7½	23/10/'41	—	—	—	—	—	6/11/'41 21/11/'41 27/11/'41 5/12/'41	POS. Neg. Neg. Neg.	27/11/'41 5/12/'41 12/12/'41 —	Neg. Neg. Neg. —	— — — —
J.L.	53	15/11/41' (?)	12/12/'41	1:1000	1:250	Nil	Nil	8/1/'42 19/1/'42 23/1/'42 30/1/'42	POS. Neg. Neg. Neg.	8/1/'42 19/1/'42 23/1/'42 30/1/'42	Neg. Neg. Neg. Neg.	— — — —

Water and Milk Supplies.—Though there has been no suggestion that either of these services was involved in these outbreaks a careful watch was, of course, kept over them. In milk or water borne epidemics one would expect a much more extensive spread of the disease of a definitely explosive character which (in the case of milk) would have been more or less confined to the route of distribution. It did appear at one time that a milk supply might become involved in a secondary character, but this, fortunately, did not materialise. For many years past the city water supply has been bacteriologically examined on five days of every week (samples are not examined on Saturdays and Sundays), so that any deterioration would be liable to detection at once. There was nothing to indicate that there was any such deterioration either before or during the course of the epidemic, but as a further precaution regional samples were taken from five points in the neighbourhood as well as at the house from which the first cases originated. In every sample B. Coli were absent in 100 c.c. fractions. Five fractions of 10 c.c. of sample were put up with McConkey's medium and all were negative. The average number of organisms per c.c. growing on agar (37°C/48 hours) was 3, and two of the samples were sterile. A general idea of the quality of the water supply may be got from the following table which sets out the comparative results of examinations of tap water for the past 13 years.

TABLE II.—*Comparative Results of Examinations of Tap Water from 1928 to 1904.*

YEAR	Number of Samples Examined	B. COLI TEST				
		100 c.c. Neg.	100 c.c. Pos.	50 c.c. Pos.	10 c.c. Pos.	1 c.c. Pos.
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 (5.6%)	13 (4.5%)	10 (3.7%)
1931	260	242 (93.0%)	9 (3.5%)	9 (3.5%)	— —	— —
1932	260	245 (94.2%)	3 (1.2%)	12 (4.6%)	— —	— —
1933	253	244 (96.4%)	4 (1.6%)	4 (1.6%)	1 (0.4%)	—
1934	261	249 (95.4%)	4 (1.5%)	6 (2.3%)	2 (0.8%)	—
1935	252	235 (93.2%)	3 (1.2%)	7 (2.8%)	5 (2%)	2 (0.8%)
1936	252	244 (96.8%)	2 (0.8%)	5 (2%)	1 (0.4%)	
1937	253	235 (92.9%)	11 (4.3%)	6 (2.4%)	— —	1 (0.4%)
1938	254	251 (98.8%)	1 (0.4%)	— —	1 (0.4%)	1 (0.4%)
1939	259	254 (98%)	1 (0.4%)	3 (1.2%)	1 (0.4%)	—
1940	261	244 (92.7%)	2 (0.8%)	10 (3.8%)	5 (1.9%)	2 (0.8%)

It will be noted from these figures that a very high degree of efficiency in the purification plant has been maintained over a number of years and to this fact must be attributed the freedom of the city from epidemic typhoid of a widespread character for a good many years past. The proportion of samples which yielded fractions of 100 c.c. free from B. Coli has been very high for several years, and concurrently with such results one can certainly say that we have been free from water-borne typhoid during this period. The more or less well-defined localisation of the present cases definitely rules out the possibility of either water or milk having had a part to play in any of the cases here related.

Discussion.

It does not seem possible to say definitely where the origin of these cases lies. The girl (A.W., junior) was almost certainly the first of the series from the clinical point of view and it is more than likely that her mother (A.W., senior) incurred infection from her during the period in which she was nursing her. This case would also explain all of the subsequent ones in this series, her two brothers (P. W. and D. W.), her three cousins (G. O'N., E. O'N., and K. O'N.) as well as her neighbour (J. C.), although the latter case is complicated by the history of his sister (B. C.) who had typhoid a year previously. But it does not explain the case of Mrs. S., living some little distance away, in which instance it was impossible to trace any direct contact with any of the W. family except the very doubtful one alluded to already in that the father of the W. family made an occasional call to Mrs. S.'s premises. It is conceivable, of course, that the hands of Mr. W. may have been contaminated from the seat of the water closet in his home and that he may have left some infection on a glass from which he had drunk and that Mrs. S. may have subsequently become infected by handling this glass. Bearing in mind the topographical circumstances of the premises in question one is inclined to attach a great deal of importance to that particular water closet. It must be remembered that while Mrs. W. was ill at home there was a definite history of diarrhoea, the discharges would necessarily have been received into some vessel and from such they were admittedly discharged into the water closet by her daughter. The seat of this closet was a fixed one and must, almost of necessity, have become contaminated during the process. At any rate such a supposition explains a number of features which are otherwise apparently inexplicable. The house is a tenement and the sanitary arrangements are not of the best, there being but a single closet for all the occupants. As is usual in such cases, this has not been well kept and since it is customary in such houses for the various families to empty the contents of slop-buckets with night-soilage, etc., into the common pedestal it is not difficult to see how this may be contaminated and constitute a source of infection. In cases like this, where there is divided responsibility, it is difficult to maintain high standards of cleanliness.

Assuming that the cases just enumerated had their origin in the girl A. W. (and it appears to be a reasonable assumption), the real problem remains in determining the origin of her infection. At first sight this would appear to be simple enough, and naturally when the case

came first to our notice the most likely source appeared to be her brother, T. W., who had had typhoid four years previously. This, however, could not be confirmed by bacteriological examination. His blood yielded a weak positive Widal reaction, but two examinations each of the faeces and urine yielded negative results. This case, therefore, cannot with certainty be designated as the probable source of infection unless allowance is made for the well-known factor of intermittency in the discharge of typhoid bacilli, in which case the evidence would be purely inferential. On epidemiological grounds we have little or no reason to regard him as a carrier, since from the time of his own illness four years previously up to the present there has been no evidence that he has been responsible for any outbreaks of disease. During this period there was no case of typhoid in his own house and the only case in the neighbourhood was the girl (B. C.), who became ill in August, 1940. Notwithstanding such facts it is, of course, conceivable that he still was responsible for the outbreak under review, and in the absence of a more definite source he should be regarded with suspicion. We have on our records particulars of a case in which a domestic servant became infected by a carrier who had had typhoid 15 years previously and who (so far as we knew) had not caused any other cases of typhoid (*Annual Report 1935*). Such instances make for reserve in expressing opinions as to the potentialities of people who have had typhoid fever.

With regard to the remaining three cases ; the first of these was the man W. C., residing in a tenement in another portion of the city, and concerning him it must be said that it has been quite impossible to trace the source of infection. Since his case came under our notice during the period in which the other reports were being received it was naturally assumed that there may have been some link between them, but no such connection was brought to light. The investigations into the case of a companion of his who had a history of typhoid yielded negative results. In the case of L. O'C. it was assumed that his infection was transmitted indirectly from the previous case, and in that of the last of the series (J. L.) it would seem clear enough that his infection was the result of his sojourn in a fever hospital. Certainly there was no question of any contacts, direct or indirect, with any of the other cases.

Table 19.—Incidence and Case Fatality of Enteric Fever in Cork City from 1881.

Year	Cases	Incidence per 1,000	Deaths	Fatality Rate
1881	66	0.82	4	6.5
1882	37	0.46	4	10.8
1883	45	0.56	11	24.4
1884	48	0.61	13	27.0
1885	43	0.55	9	20.9
1886	180	2.57	42	23.3
1887	100	1.30	20	20.0
1888	66	0.86	9	13.6
1889	37	0.48	9	24.3
1890	113	1.50	12	10.6
1891	165	2.33	17	10.3
1892	104	1.37	17	18.3
1893	78	1.03	14	17.9
1894	43	0.57	13	30.2
1895	132	1.74	16	12.1
1896	94	1.00	24	25.5
1897	51	0.70	9	17.6
1898	62	0.81	13	20.9
1899	47	0.62	8	17.0
1900	50	0.70	5	10.0
1901	51	0.67	5	9.8
1902	49	0.64	5	10.2
1903	27	0.35	5	18.5
1904	50	0.64	8	16.0
1905	58	0.76	8	13.8
1906	48	0.66	5	10.4
1907	44	0.57	4	9.1
1908	88	1.02	16	18.2
1909	74	0.95	15	20.2
1910	54	0.70	13	24.0
1911	32	0.41	5	15.6
1912	26	0.33	6	23.0
1913	29	0.38	6	20.7
1914	50	0.64	4	8.0
1915	32	0.41	5	15.6
1916	42	0.54	6	14.3
1917	43	0.55	3	6.9
1918	42	0.54	8	19.0
1919	12	0.15	1	8.3
1920	244	3.13	13	5.3
1921	21	0.26	4	19.0
1922	6	0.07	2	33.3
1923	7	0.09	1	14.2
1924	11	0.14	2	18.1
1925	27	0.34	5	18.5
1926	11	0.14	2	18.2
1927	10	0.12	2	20.0
1928	17	0.21	2	11.7
1929	6	0.08	1	16.6
1930	0	—	—	—
1931	1 (a)	0.01	1	100.0
1932	1 (a)	0.01	1	100.0
1933	2 (a)	0.02	—	(b)
1934	1	0.01	—	—
1935	3	0.03	—	—
1936	2	0.02	—	—
1937	1	0.01	—	—
1938	3 (a)	0.03	1	33.3
1939	7	0.08	—	—
1940	2	0.02	—	—
1941	12	0.15	—	—

(a) Infection in all these cases was incurred outside the City.
(b) Two deaths were recorded in Cork Mental Hospital (Co. Area) of Inmates who formerly resided in the City.

TYPHUS.

For the twelfth year in succession there has been no case. As a matter of interest the table relative to this disease, first published in 1935, is reproduced in this report.

Table 20.—Incidence and Case Fatality of Typhus Fever in Cork City from 1881.

Year	Cases	Incidence per 1,000	Deaths	Fatality Rate
1881	1406	17.42	88	6.2
1882	683	8.57	54	7.9
1883	844	10.66	46	5.4
1884	456	5.65	37	8.1
1885	159	2.03	21	3.2
1886	83	1.06	17	18.0
1887	67	0.86	12	17.9
1888	72	0.93	21	27.7
1889	48	0.63	5	10.4
1890	54	0.71	7	12.9
1891	24	0.30	5	20.8
1892	162	2.28	23	14.1
1893	92	1.20	7	7.6
1894	25	0.33	2	8.0
1895	29	0.38	8	31.0
1896	22	0.29	7	31.8
1897	30	0.39	3	10.0
1898	61	0.80	11	18.0
1899	9	0.10	6	66.6
1900	28	0.36	4	14.3
1901	13	0.17	2	15.38
1902	6	0.07	—	—
1903	7	0.09	—	—
1904	11	0.14	1	9.1
1905	9	0.11	2	22.2
1906	6	0.07	4	66.6
1907	10	0.13	6	60.0
1908	23	0.30	6	26.1
1909	18	0.24	5	27.7
1910	8	0.10	3	37.5
1911	10	0.13	—	—
1912	1	0.01	—	—
1913	5	0.06	2	40.0
1914	1	0.01	1	100.0
1915	—	—	—	—
1916	1	0.01	1	100.0
1917	3	0.04	1	33.3
1918	1	0.01	1	100.0
1919	15	0.19	3	20.0
1920	2	0.03	—	—
1921	1	0.01	1	100.0
1922	—	—	—	—
1923	1	0.01	1	100.0
1924	1	0.01	—	—
1925	—	—	—	—
1926	3	0.04	1	33.3
1927	4	0.05	—	—
1928	1	0.01	—	—
1929	1	0.01	1	100.0

There has been no case since 1929.

EPIDEMIC DIARRHOEA.

197 cases were notified and 39 deaths recorded, equivalent to a fatality rate of 19.8 per cent. This disease continues to be one of the main causes of infant mortality and the principal contributing factor was (as in every year since investigation has taken place) the substitution of artificial feeding for breast feeding. This point has been emphasised time and again in previous reports and therefore need not be stressed now. The following table sets out the particulars and speaks for itself in regard to the baneful effects of bottle-feeding.

Year	Number of Cases according to Manner of Feeding			Cases Untraced	Total
	Breast	Cow's Milk	Dried Milk		
1935	18	128	6	26	178
1936	7	198	5	51	261
1937	18	204	8	16	246
1938	14	108	5	15	142
1939	9	148	13	27	197
1940	13	202	9	62	286
1941	4	173	6	35	218
Totals ...	83	1161	52	232	1528

Of the 173 cases fed on cows' milk, 90 were *under* one year and 83 *over* one year, all the other cases were under one year. Of the cases *traced and investigated* (183 in number) it will be noted that 94.5 per cent. were artificially fed. It would appear that there is far too much readiness to recommend and resort to artificial feeding on the part of midwives and professional attendants. The results can only be said to be disastrous.

The epidemiological features appear to indicate that we are dealing with a state of affairs which has been brought about by widespread dietetic error rather than by epidemic spread of infection. In the first place we note from the above table the enormous preponderance of artificially-fed infants, representing no less than 94 per cent. of the total cases which we were able to investigate. This in itself would suggest at once that the source of the trouble was the administration of unsuitable food to the affected children and in actual fact it has been found that this is so in the great majority of cases. So far as chronological order is concerned it will be noted that during September there was a considerable increase in the number of cases as compared with the preceding months. This is the usual order of events—that the disease is much more prevalent during warm, dry weather than in the colder months. It will be recalled that September last year was exceptionally warm and dry. Such conditions favour the growth of micro-organisms and, consequently, the rapid fermentation of milk, factors which promote the spread of epidemic diarrhoea. In view of the enormous risk to which bottle-fed children are exposed it is impossible to have patience with

MEASLES.

94 cases were notified during the year. That these cases were the tail-end of the very heavy epidemic which was recorded in last year's report may be inferred from the following table which sets out, in chronological order the occurrence of the cases as they were reported to this department.

Month	1940	1941
January ...	—	18
February ...	—	33
March ...	—	15
April ...	3	12
May	2	6
June ...	11	5
July	16	2
August ...	10	—
September ...	176	—
October ...	982	—
November ...	339	2
December ...	74	—
Total ...	1613	94

It may be said, therefore, that before this outbreak expended itself there was a grand total of 1,707 *notified* cases. This epidemic has attracted some attention, in view of which it may be considered appropriate to reproduce here the somewhat brief remarks which described it in the report in question :

> In the light of previous experience the extent of the epidemic which made its appearance during the year past was little short of phenomenal. Records of measles in this city go back to 1879 and the nearest approach to this outbreak was in 1918 when 750 cases were recorded. The first increase in cases was noted during the latter half of August and before the epidemic had expended itself in December, 1,613 cases were recorded. The numbers increased steadily each week throughout September and with an increasing rate during October until the third week, in which the full intensity of the epidemic was experienced and during which no less than 302 cases were recorded. Thereafter a steady decline set in and the outbreak had expended itself by the end of the year. From facts elicited during the enquiries made by this Department it is quite obvious that the recorded figure of 1,613 notifications referred to above represents only a fraction of the children who actually contracted the disease. They represent only the cases to whom doctors were called. There must have been an immense number of children who were never seen by a doctor and, consequently never notified. Indeed one got a very strong impression that very few children escaped this visitation. And yet many children who never had had measles did escape. It would be of very great interest to ascertain what were the factors which determined the immunity of such children. Was it nutrition or diminished risk ? Absence of undue fatigue and regularity of habits ? In an epidemic of such intensity it would have been practically impossible for anyone to avoid exposure to infection and therefore there must have been some factor or combination of factors which determined the protection of these children.
>
> Mortality in connection with this epidemic was, fortunately, very low, 19 deaths being recorded. On the basis of notified cases this represents a fatality rate slightly over 1 per cent. In actual fact, it is highly probable that this rate was nearer 0.5 or even 0.1 per cent.

The following commentary which appeared in *The Medical Officer*, issue of 17th January, 1942, is of considerable interest not only because of its local application but also on account of its able analysis of the general epidemiological trends in regard to measles.

> Dr. J. C. Saunders, M.O.H., in his annual report for 1940 says that the epidemic of measles which struck the city of Cork in the latter part of the year was " little short of phenomenal." Nothing approaching it in extent is recorded in the local history of measles which goes back to 1879, but fortunately its fatality was low. Altogether 1,613 cases were recorded, but an immense number of mild cases were not seen by a doctor and consequently were not notified. " Indeed one got a very strong impression that very few children escaped this visitation." Only 19 deaths were attributed to measles, but a review of the child-deaths certified as due to other causes during the epidemic period suggests that the toll was considerably higher. But in any case the mortality was comparatively slight, for though on the basis of notified cases the fatality is over one per cent., the rate was probably "nearer 0.5 or even 0.1 per cent." of true incidence. Since 1936 the annual incidence of notified measles in Cork was 233, 88, 12, 3, and 1,613.
>
> Between the two great wars, measles behaved in an orderly manner with a fairly regular tide of waning magnitude and steadily decreasing fatality. The interval between the flows varied in different places between 90 and 110 weeks, but it was fairly constant locally, so epidemics were predictable. The first dramatic change in the behaviour of the disease was the great epidemic in New Zealand which started in November, 1937. As measles is not notifiable in that dominion, the prevalence of the disease in the epidemic is not known, but the death roll was 163, the highest since 1901 when it was 277. In North Auckland the number of cases was estimated between 3,000 and 4,000, and in several districts the incidence was believed to have been 50 per cent. of all susceptibles. This epidemic was unusually severe for modern times. In London and New York measles had for some time been epidemic in even years and low in odd years, but in both cities the expected epidemic of 1940 did not materialise but it made up the default with interest in 1941. In many parts of the United States during the past four years measles has occurred in epidemics of unprecedented magnitude but of very low fatality and complication. In this country we have experienced a steady reduction of measles fatality during the present century, but owing to the high incidence of the disease its mortality rate has remained considerable—about three times as high as that of scarlet fever. This gave rise to a belief widely expressed that measles was a more serious disease than scarlet fever, though there is abundant evidence that this has never been the case. At present the fatality rate of scarlet fever is about 3 per 1,000 and that of measles about 1.5 per 1,000 and though both diseases have sensationally declined in severity, their relative seriousness has not altered. The reduction in fatality of both diseases has mainly come about from reduction in their complications for which we can claim much credit, but in part to the almost complete elimination of the toxic forms for which we can claim no credit at all. The toxic form of measles—" black measles "—was not infrequent as late as the beginning of the present century, but it has almost completely disappeared.
>
> If, as recent events seem to indicate, measles is going to occur in vast epidemics at irregular intervals, its control will become more difficult, for however mild the visitations may be there will always be a fair number of cases which require hospital treatment, and few diseases are more awkward to accommodate in hospitals. Suppression of the disease is not at present practicable for the only prophylactic we possess against it is injection of immune serum within the incubation period. The serum, which must be of human origin, has not been found of value in treatment of the established reaction and gives but brief immunity to contacts unless they are incubating, in which state it modifies the subsequent reaction. This modified reaction is, however, little different from the natural reaction of over 95 per cent. of those not inoculated, so this protective treatment has but a limited sphere of utility.

That the epidemic in Cork was of an exceptional character was evident from the figures alone and only pressure of time prevented a more extended account in the Report of last year. In view of this

commentary it has seemed necessary that a further examination of the figures should be made especially in regard to the fatality rate associated with it. One interesting implication is that the increased infantile mortality in 1940 was in part, at least, due to the measles outbreak. This suggestion, in particular, seemed worth investigating and with this end in view as well as a general examination of the records a further analysis was made, including the figures for 1941 as well as those of 1940. In Table 21 the notifications are classified according to time of occurrence and are further sub-divided into age-groups.

Table 21—Measles—1940–41.

Month	Under One Year	1–5 Years	6–10 Years	11–20 Years	Over 20 Years	Total
1940						
Jan. ...	—	—	—	—	—	—
Feb. ...	—	—	—	—	—	—
March ...	—	—	—	—	—	—
April ...	—	—	—	2	1	3
May ...	—	—	2	—	—	2
June ...	—	4	6	1	—	11
July ...	—	10	6	—	—	16
Aug. ...	—	6	4	—	—	10
Sep. ...	—	81	88	7	—	176
Oct. ...	46	596	316	21	3	982
Nov. ...	20	192	93	24	10	339
Dec. ...	4	30	18	17	5	74
Total ...	70	919	533	72	19	1613
1941						
Jan. ...	—	1	3	6	8	18
Feb. ...	—	6	2	8	17	33
March ...	1	6	1	5	2	15
April ...	3	4	—	5	—	12
May ...	1	2	—	1	2	6
June ...	1	2	—	—	2	5
Total	6	21	6	25	31	89
Grand Total ...	76	940	539	97	50	1702

After June 1941 only 4 cases were notified (2 in July and 2 in December,) consequently it was not deemed necessary to continue the investigation after that month. We note that the major incidence was in the ages under 10 years, which accounted for 1,479 of the 1,702 cases altogether reported. It is interesting, however, to remark that there were 50 cases over 20 years of age which shows that measles is not entirely confined to young children. We may assume however that the majority of such older cases would probably have escaped if the epidemic were of more normal proportions. The very widespread nature of this outbreak made the risk of infection to older susceptibles much gréater than it would have been under ordinary circumstances. The comparative freedom of children under one year seems to suggest some degree of inherited immunity (but it must be remembered that this group is much smaller than the others.).

Table 22.—Correlation of MEASLES incidence and infant deaths(under one year) 1940.

Month	Notifications of Measles	Infant Deaths Registered (in certain diseases)										
		Measles	Bronchitis	Broncho-Pneumonia	Diarrhoea	Gastro-Intestinal	Marasmus	Meningitis	Congen-Debility	Convulsions	Total	Total less Diarrhoea
January ...	—	—	—	1	4	—	—	—	6	—	11	7
February ...	—	—	—	1	1	—	—	1	1	1	5	4
March ...	—	—	1	3	2	—	2	—	5	—	13	11
April ...	3	—	—	1	4	—	3	2	4	—	14	10
May ...	2	—	—	1	5	—	1	—	5	—	12	7
June ...	11	—	—	2	3	—	—	1	5	—	11	8
July ...	16	—	—	—	—	—	—	—	—	1	1	1
August ...	10	—	—	—	4	—	—	—	1	1	6	2
September ...	176	—	1	—	11	1	—	—	4	—	17	6
October ...	982	2	—	1	7	1	1	—	3	—	15	8
November ...	339	4	—	1	1	—	—	—	2	1	9	8
December ...	74	2	2	7	3	1	3	—	5	3	26	23
TOTAL ...	1613	8	4	18	45	3	10	4	41	7	140	95

An attempt was next made to correlate infant deaths (under 1 year) with measles incidence and the result is shewn in Table 22. In this case the investigation was confined to 1940.

The principal complications of measles are generally accepted to be broncho-pneumonia, lobar pneumonia, pleurisy, enteritis, alimentary diseases, convulsions and otitis media. It would not appear, from the results obtained, that the view of the commentator in the article above has been borne out. With the exception of broncho-pneumonia there has been no very marked increase in infant deaths from the causes listed during the period in which the epidemic was at its height. There is some slight increase in deaths from marasmus and convulsions. These two, together with broncho-pneumonia account for 15 of the 26 deaths recorded during December. The total number of infant deaths (23) in December, however, is somewhat in excess of those recorded during the other months of the year and from this point of view it may be said that measles may have played some part. The last column (total deaths, less diarrhoea), was included for comparitive purposes as deaths from this condition are such a constant feature of our vital statistics.

Since the incidence of the disease was so heavy in the age-groups 1 to 5 years it was decided to further investigate the trend of mortality among this group during the year and to compare it with that for infants under 1 year. The results are shewn in table 23. The results obtained are, in general, similar to those yielded by Table 22. We note a somewhat pronounced increase in October (considerably reduced by deducting deaths from diarrhoea) and a definite increase in December, not materially reduced by a similar deduction. In the case of broncho-pneumonia there is no material increase in deaths among the older age group such as that which is recorded for children under one year. A similar comment may be applied to all the other conditions with the exception of that of measles itself. With regard to lobar pneumonia, only one death in the under 5 years group was recorded during the year and that in the 1 to 5 group.

Table 23.—Correlation of Deaths from Measles with deaths for Children from various Causes.

Month	Notifications of Measles	NUMBER OF INFANT DEATHS REGISTERED IN CERTAIN (DISEASES), 1940.																										
		Measles			Bronchitis			Broncho-pneumonia			Diarrhoea			Marasmus			Meningitis			Congenital Debility			Convulsions			Total		Grand Total	Total less diarrhoea
		0–1 yr.	1–5 yrs.	Total	0–1 yr.	1–5 yrs.	Total	0–1 yr.	1–5 yrs.	Total	0–1 yr.	1–5 yrs.	Total	0–1 yr.	1–5 yrs.	Total	0–1 yr.	1–5 yrs.	Total	0–1 yr.	1–5 yrs.	Total	0–1 yr.	1–5 yrs.	Total	0–1 yr.	1–5 yrs.	0–5 yrs.	0–5 yrs.
January ...	—	—	—	—	—	1	1	1	2	3	4	—	4	—	—	—	—	1	1	6	—	6	—	—	—	11	4	15	11
February ...	—	—	—	—	—	—	—	1	—	1	1	—	1	—	—	—	1	1	2	1	—	1	1	—	1	5	1	6	5
March ...	—	—	—	—	1	—	1	3	2	5	2	1	3	2	—	2	—	—	—	5	—	5	—	—	—	13	3	16	13
April ...	3	—	—	—	—	—	—	1	1	2	4	—	4	3	—	3	2	—	2	4	1	5	—	—	—	14	2	16	12
May ...	2	—	—	—	—	—	—	1	1	2	5	1	6	1	—	1	—	—	—	5	—	5	—	—	—	12	2	14	8
June ...	11	—	—	—	—	—	—	2	1	3	3	1	4	—	—	—	1	—	1	5	—	5	—	—	—	11	2	13	9
July ...	16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	1	—	1	1
August ...	10	—	—	—	—	—	—	—	—	—	4	1	5	—	—	—	—	—	—	1	—	1	1	—	1	6	1	7	2
September ...	176	—	—	—	1	—	1	—	—	—	11	1	12	—	—	—	—	—	—	4	—	4	—	—	—	17	2	19	7
October ...	982	2	2	4	—	—	—	1	1	2	7	3	10	1	—	1	—	1	1	3	—	3	—	—	—	15	7	22	12
November ...	339	4	5	9	—	—	—	1	1	2	1	—	1	—	—	—	—	—	—	2	—	2	1	—	1	9	6	15	14
December ...	74	2	3	5	2	—	2	7	3	10	3	1	4	3	—	3	—	—	—	5	—	5	3	—	3	26	7	33	29
Total ...	1613	8	10	18	4	1	5	18	12	30	45	9	54	10	—	10	4	3	7	41	—	42	7	—	7	140	37	177	123

OTHER INFECTIOUS DISEASES.

Notifications in regard to other infectious diseases during the year were as follows :—

Erysipelas	... 29
Acute Primary Pneumonia ...	... 21
Acute Influenzal Pneumonia ...	... 1
Varicella	... 254
Puerperal Fever	... 1

Table 24.—Showing the number of Articles Disinfected during the year 1941.

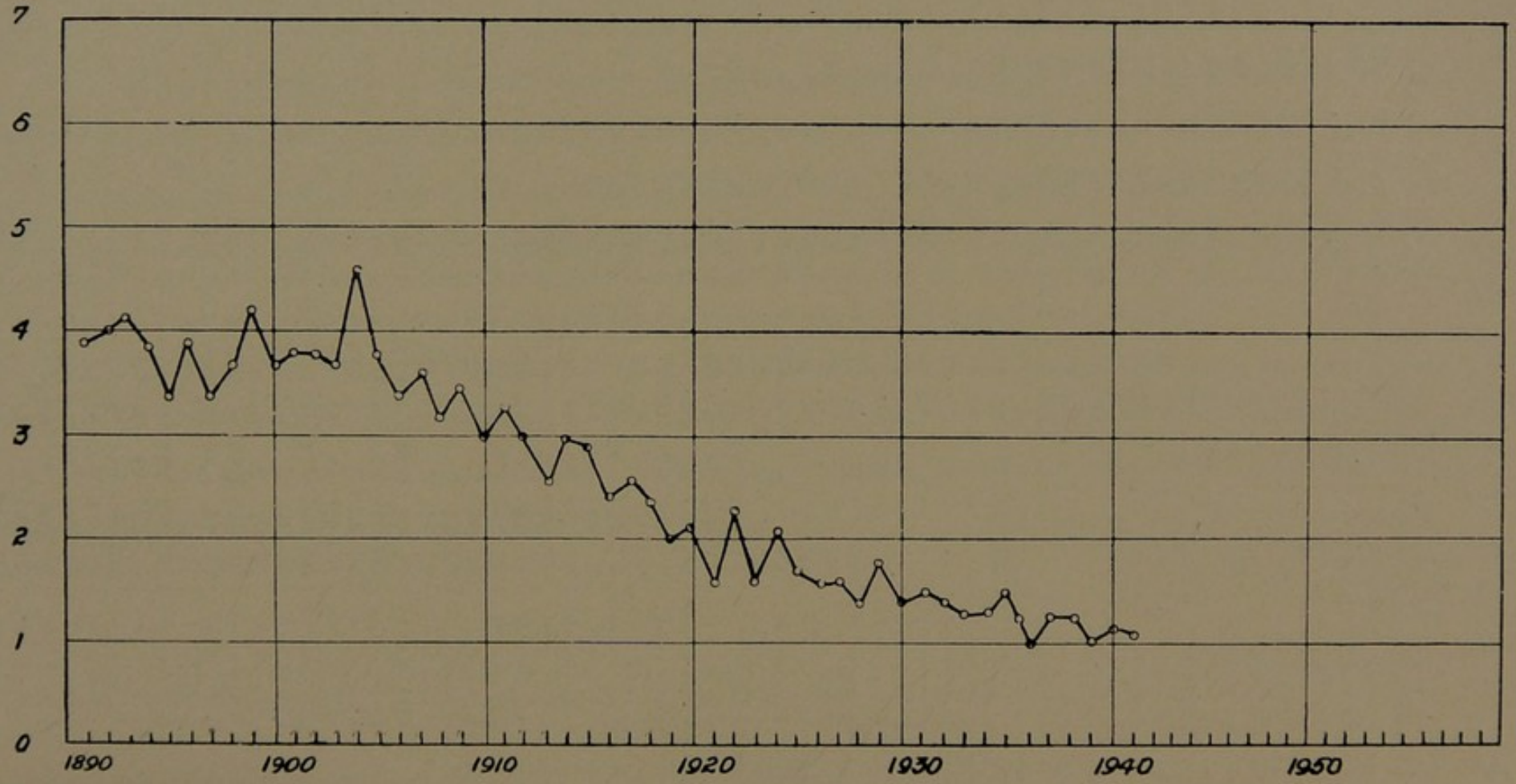
	Bed Ticks	Mat-tresses	Articles of Bedding	Articles of Wearing Apparel	Miscel-laneous Articles	Total No. of Articles
January ...	2	19	83	3	4	111
February ...	2	25	108	32	9	176
March ...	3	52	243	52	3	354
April ...	5	30	178	28	28	269
May ...	4	12	116	21	18	171
June ...	3	14	89	6	14	126
July ...	3	20	167	21	41	252
August ...	4	16	98	9	5	132
September ...	3	28	123	10	26	190
October ...	2	23	114	6	9	154
November	4	18	129	34	11	196
December	6	21	162	32	16	237
	41	278	1610	255	184	2368

Table 25.—Yearly Summary of Infectious Diseases from 1879.

Year	Small Pox	Typhus	Typhoid or Enteric Fever	Simple Continued Fever	Scarlatina	Puerperal Fever	Membraneous Croup	Diphtheria	Erysipelas	Measles	Diarrhoea	Chicken Pox	Cerebro-Spinal Meningitis	Poliomyelitis	Encephalitis Lethargica	Pneumonia	
																Acute Primary	Acute Influenza
1879	—	337	91	335	386	—	—	2	30	269	107	—	—	—	—	—	—
1880	—	756	117	420	616	—	—	9	37	282	48	—	—	—	—	—	—
1881	—	1406	66	364	103	—	—	—	31	240	5	—	—	—	—	—	—
1882	—	683	37	239	25	—	—	3	11	146	3	—	—	—	—	—	—
1883	—	844	45	164	105	—	—	6	—	109	1	—	—	—	—	—	—
1884	—	456	48	221	158	—	—	2	14	106	3	—	—	—	—	—	—
1885	1	159	43	94	143	—	—	2	17	35	—	—	—	—	—	—	—
1886	—	83	180	70	86	—	—	1	14	24	—	—	—	—	—	—	—
1887	—	67	100	46	17	—	—	4	25	182	1	—	—	—	—	—	—
1888	—	72	66	40	55	—	—	7	25	232	—	—	—	—	—	—	—
1889	—	48	37	24	90	—	—	9	12	—	—	—	—	—	—	—	—
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	—	—	—	—	—	—
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	9	—	—	—	—	—	—	—
1898	—	61	62	30	30	6	7	18	20	2	—	—	—	—	—	—	—
1899	—	9	47	14	22	2	10	18	60	23	—	—	—	—	—	—	—
1900	—	28	50	27	401	2	2	23	36	—	—	—	8	—	—	—	—
1901	—	13	51	29	288	3	12	26	38	—	—	—	8	—	—	—	—
1902	—	6	49	16	119	4	1	8	49	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	—	—	—	—
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	—	—	—	—
1909	—	18	74	42	119	10	4	66	25	44	514	21	—	—	—	—	—
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	161	188	8	—	—	—	—	—
1915	—	—	32	4	245	2	8	68	44	160	177	10	6	—	—	—	—
1916	—	1	42	9	112	8	11	43	41	86	139	13	6	—	—	—	—
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	—	—	—	37
1920	—	2	244	8	70	6	3	428	18	9	54	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	—	—	—	—	—
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
1932	—	—	1	—	80	9	1	85	13	242	178	99	—	—	2	28	7
1933	—	—	2	—	181	9	—	109	24	49	189	79	—	—	1	3	2
1934	—	—	1	—	118	10	—	109	28	126	80	158	—	—	—	2	1
1935	—	—	3	—	52	11	1	56	24	300	178	53	—	—	—	5	2
1936	—	—	2	—	437	12	1	24	18	233	261	69	3	—	—	14	14
1937	—	—	1	—	454	6	—	79	26	88	246	218	5	1	—	21	45
1938	—	—	3	—	228	1	—	54	18	12	142	83	14	—	—	19	3
1939	—	—	7	—	158	4	—	41	31	3	197	28	1	—	—	14	1
1940	—	—	2	—	143	1	—	52	23	1613	286	52	2	1	1	27	1
1941	—	—	12	—	42	1	—	62	29	94	218	254	2	—	—	21	1

FIG. IV.

PULMONARY TUBERCULOSIS. DEATH RATES PER 1,000 POPULATION FROM 1891 TO PRESENT TIME



Section IV.—Tuberculosis

The death rate from pulmonary tuberculosis for the year was 1.12 per 1,000 of the population. The following table shows the death-rates each year from 1891 to the present time.

Table 26.—Deaths and Death Rates Pulmonary Tuberculosis.

Year	No. of Deaths	Rate per 1,000 pop.	Year	No. of Deaths	Rate per 1,000 pop.
1891	295	3.93	1917	202	2.63
1892	303	4.04	1918	187	2 43
1893	314	4.18	1919	156	2.04
1894	296	3.94	1920	159	2.07
1895	261	3.48	1921	125	1.64
1896	299	3.98	1922	176	2.30
1897	260	3.46	1923	130	1.64
1898	283	3.77	1924	164	2.09
1899	320	4.26	1925	134	1.71
1900	281	3.74	1926	126	1.60
1901	289	3.80	1927	129	1.60
1902	287	3.79	1928	109	1.39
1903	279	3.67	1929	141	1.79
1904	352	4.63	1930	114	1.45
1905	294	3.86	1931	124	1.56
1906	261	3.43	1932	111	1.40
1907	278	3.65	1933	106	1.35
1908	245	3.22	1934	104	1.34
1909	264	3.47	1935	115	1.46
1910	233	3.06	1936	85	1.06
1911	252	3.29	1937	96	1.20
1912	231	3.01	1938	99	1.21
1913	202	2.62	1939	86	1.06
1914	231	3.01	1940	96	1.17
1915	211	2.88	1941	86	1.12
1916	189	2.46			

This is the second lowest rate recorded. In 1936 and 1939 the figure was 1.06. The figures shewn in this table are instructive inasmuch as they demonstrate the steady decline in deaths from this disease over the past half-century but they do not afford any information as to the distribution of mortality in regard to sex and age groups. Knowledge concerning such points is important because it shows us where the disease falls most heavily and gives us some idea as to the economic consequences involved. In the following table particulars are set out showing the deaths grouped according to sex and ages. This table was first published in the 1938 Report and I am indebted to the staff of the Registrar General's office for the particulars. It has not been possible to go further back than 1923 since before that year deaths from tuberculosis were not distributed according to the area of residence of the deceased.

Table 27.—Cork City. Deaths from Pulmonary Tuberculosis.

Year	Sex	All Ages	Under 1 year	1–5	5–15	15–25	25–35	35–45	45–55	55–65	65 and over
1923	M	70	—	2	4	16	12	17	14	4	1
	F	66	—	2	4	13	19	14	8	4	2
1924	M	80	—	2	1	13	16	20	16	9	3
	F	73	—	—	2	17	23	16	7	5	3
1925	M	59	1	3	2	10	17	15	8	3	—
	F	77	1	2	5	23	20	13	6	4	3
1926	M	65	1	2	4	14	14	16	7	5	2
	F	60	—	—	5	11	19	12	9	2	2
1927	M	62	1	1	1	1	15	22	10	4	1
	F	72	—	4	3	16	18	16	10	4	1
1928	M	49	—	1	1	11	10	11	10	4	1
	F	67	—	1	4	15	21	12	7	7	—
1929	M	65	—	2	—	16	14	16	11	2	4
	F	80	—	—	2	24	24	17	7	2	4
1930	M	58	—	—	1	16	16	14	9	2	—
	F	46	—	1	2	9	14	10	5	3	2
1931	M	62	—	1	—	12	16	11	13	8	1
	F	61	—	1	4	15	17	14	6	3	1
1932	M	58	—	—	1	7	22	15	8	4	1
	F	54	—	1	3	14	21	5	7	3	—
1933	M	52	—	—	—	8	17	14	11	1	1
	F	53	—	—	—	18	12	10	9	3	1
1934	M	53	—	—	2	6	13	16	12	3	1
	F	50	—	—	1	14	12	16	3	3	1
1935	M	58	1	1	—	10	9	20	13	4	—
	F	54	—	—	2	11	18	9	11	3	—
1936	M	38	—	—	2	7	11	15	8	5	—
	F	34	—	1	—	6	8	7	5	6	1
1937	M	56	—	—	—	9	10	13	13	8	2
	F	40	—	—	2	10	9	10	4	5	—
1938	M	61	—	—	—	12	12	13	17	4	3
	F	38	—	—	—	4	15	10	7	2	—
1939	M	53	—	—	1	10	6	13	16	6	1
	F	33	—	—	2	11	4	6	6	4	—
1940	M	48	—	—	—	12	9	10	9	8	—
	F	48	1	—	—	12	13	14	4	2	2
1941	M	46	—	—	—	8	11	12	9	6	—
	F	42	—	—	—	5	10	14	9	4	—

Table 28—records the deaths due to *non-pulmonary* tuberculosis from 1906 down to the present year, together with rates per 1,000 of the population computed from these figures. Deaths from the non-pulmonary type of the disease are only available from 1906, in contra distinction to the pulmonary form in which they are available from 1891 (as shewn in Table 26.)

Table 28.—Deaths and Death Rates from *non-pulmonary* Tuberculosis.

Year	No. of Deaths	Rate per 1,000 pop.	Year	No. of Deaths	Rate per 1,000 pop.
1906	81	1.06	1924	32	0.40
1907	84	1.10	1925	31	0.39
1908	93	1.08	1926	46	0.58
1909	78	1.02	1927	35	0.44
1910	75	0.97	1928	29	0.36
1911	73	0.95	1929	17	0.21
1912	71	0.92	1930	25	0.31
1913	79	1.02	1931	46	0.57
1914	79	1.02	1932	45	0.56
1915	72	0.93	1933	19	0.24
1916	69	0.89	1934	21	0.25
1917	78	1.00	1935	29	0.36
1918	75	0.96	1936	20	0.25
1918	58	0.74	1937	24	0.29
1920	46	0.59	1938	13	0.16
1921	34	0.43	1939	14	0.17
1922	39	0.50	1940	29	0.35
1923	32	0.40	1941	20	0.26

There has been a steady decline in the number of recorded deaths for the whole period for which figures are available. This trend has been characteristic of the statistics for both forms of the disease and has been more pronounced for the non-pulmonary than the pulmonary type. In the case of the former this reduction has been three-fold but with the latter a six-fold reduction has been noted. As with all diseases there are more or less pronounced variations from year to year in the records of tuberculosis. Sometimes there may be a very pronounced drop in the figures and when this is the case it is nearly always followed by a rise in the following year and this rise may be maintained for a year or two afterwards, or there may be a slight fall in the figure for a number of years running. Whichever feature manifests itself there is almost certain to be an occasional increase above the average in the course of years. Such variations are characteristic of all diseases and are not to be taken as indication of increased incidence or increased virulence of the disease unless repeated over a number of years in succession. An examination of the graph for deaths from pulmonary tuberculosis illustrates this tendency but shews, at the same time, that the trend of the disease is definitely downward.

A fall of the nature just referred to was a noticeable feature of the figures for non-pulmonary tuberculosis in the year 1938 and the reduction was so marked in that year and in the year following that special attention was drawn to them and a warning was given against any undue optimism in regard to a continuance of such favourable figures. As was to be expected there was a sharp rise in the year 1940 when the mortality rate rose from 0.17 per 1,000 to 0.35. There has been a substantial reduction from the latter figure for the current year. In table 29 is shewn the effect of combining the deaths (and death-rates) for the two forms of the disease.

Table 29.— Combined Deaths and Death rates from Pulmonary and Non-pulmonary Tuberculosis.

Year	Pulmonary Deaths	Non-pulmonary Deaths	Total	Rate per 1,000 pop.
1906	261	81	342	4.49
1907	278	84	362	4.74
1908	245	93	338	4.42
1909	264	78	342	4.47
1910	233	75	308	4.01
1911	252	73	325	4.23
1912	231	71	302	3.92
1913	202	79	381	3.64
1914	231	79	310	4.02
1915	211	72	383	3.66
1916	189	69	258	3.33
1917	202	78	280	3.61
1918	187	75	262	3.37
1919	156	58	214	2.75
1920	159	46	205	2.64
1921	125	34	159	2.03
1922	176	39	215	2.75
1923	130	32	162	2.05
1924	164	32	196	2.50
1925	134	31	165	2.10
1926	126	46	172	2.18
1927	129	35	164	2.08
1928	108	29	138	1.74
1929	141	17	158	2.00
1930	117	25	142	1.78
1931	124	46	170	2.13
1932	111	45	156	1.95
1933	106	19	125	1.56
1934	107	21	128	1.59
1935	115	29	144	1.78
1936	85	20	105	1.29
1937	96	24	120	1.48
1938	99	13	112	1.38
1939	86	14	100	1.23
1940	96	29	125	1.54
1941	86	20	106	1.38

As already referred to in the section on Vital Statistics variations in the mortality from tuberculosis during war time are regarded as being of great importance as indices of the state of social well-being. During the last war there was a definite increase which affected especially the belligerent nations. This effect was much more pronounced in the nations of the Central European powers, in which the figures reached alarming proportions. It was not so marked in England and Wales

but, nevertheless, there was a very appreciable increase in the mortality from the disease as is shewn in the following table (from *A Synopsis of Hygiene*—Jameson and Parkinson 1930).

Year	Deaths from Tuberculosis	
	Pulmonary	Non-Pulmonary
1911	38,422	14,698
1912	37,269	12,782
1913	36,203	13,273
1914	37,838	12,460
1915	40,803	13,492
1916	40,769	13,089
1917	42,335	13,599
1918	45,338	12,735
1919	35,984	10,328
1920	32,797	9,745
1921	33,505	9,173
1922	33,919	8,858
1923	32,097	8,691
1924	32,690	8,413
1925	32,382	8,005
1926	30,108	7,415
1927	31,066	7,107

The position of affairs in the Central European countries, resulting from the war, are reflected by the following tables (from *Experimental Bacteriology*—Kolle and Helsch 1934). The next table has been constructed from a graphic record of the mortality from tuberculosis per 10,000 population in Prussia and records in a remarkable manner one of the repercussions of war in that country. The figures are as follows :—

Year	Mortality per 10,000	Year	Mortality per 10,000
1911	15.3	1920	19.0
1912	14.7	1921	14.0
1913	14.3	1922	13.5
1914	13.6	1923	14.5
1915	14.0	1924	13.0
1916	15.2	1925	11.5
1917	19.2	1926	10.5
1918	22.0	1927	10.0
1919	23.5		

The authors note that the tuberculosis mortality in Prussia declined during the period extending from 1866 to the beginning of the World War. During the War, because of the impossibility of providing the same care for the patients and the great difficulty experienced with regard to correct feeding, there was a steep rise in the curve, but after the removal of these unfavourable conditions the curve is found to fall again. The first years after the War witnessed a further reduction in the mortality rate due to the introduction of official measures in the Ruhr district,

while the period 1921–23 was marked by a fresh rise in the curve which soon receded, and in recent years there has been a still greater diminution in the mortality. By comparing these figures with those for Germany

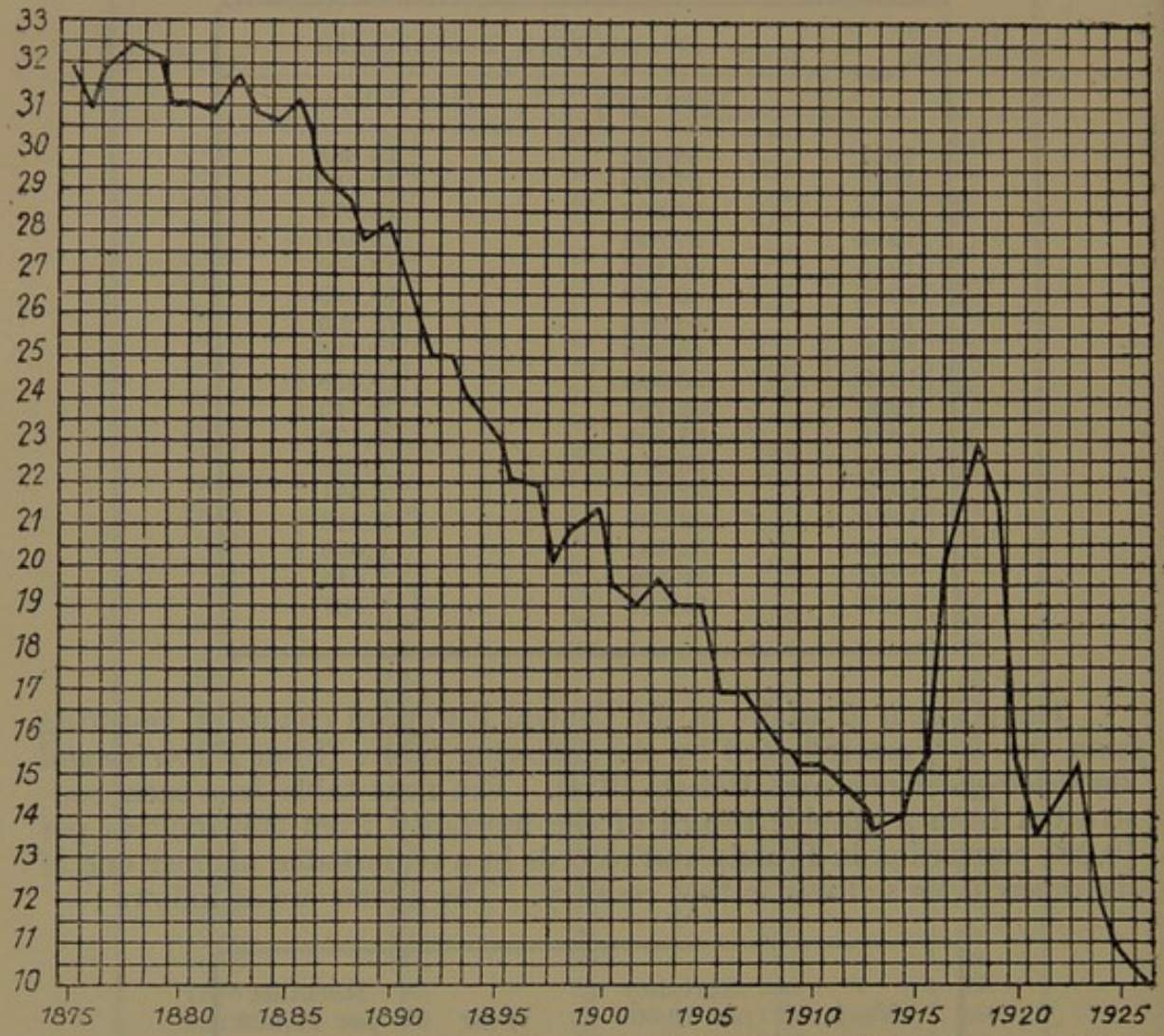


Fig. V.—Mortality from Tuberculosis per 10,000 Population in Prussia. (from Kolle and Hetsch: Experimental Bacteriology, by permission of Messrs. George Allen & Unwin, Ltd).

as a whole and also with others taken from other countries they were able to construct a table which presented a picture of conditions as they were immediately after the war and during the years following :

Country	Deaths per 10,000 from Tuberculosis			
	1919	1920	1922	1924
Germany ...	21.1	15.4	14.1	12.0
Austria ...	35.3	29.2	22.8	—
Hungary ...	33.5	24.9	30.9	32.0
Finland ...	21.7	21.9	24.0	—
Norway ...	19.4	—	20.4	—
France ...	20.6	—	—	—
Switzerland	20.0	18.4	15.7	—
Belgium ...	11.6	11.4	11.2	—
England ...	12.6	11.3	11.2	10.6
Holland ...	17.3	14.7	11.4	10.5
Denmark ...	12.1	11.6	9.4	10.6

From this table the authors conclude that countries which are predominantly agricultural such as Austria, Hungary, Finland and Norway, have a very high death-rate, while those which are mainly industrial such as Belgium and England, have a comparatively low rate. We are not now, however, concerned with this aspect of the problem. It is apparent that one of the principal effects of the war, so far as it relates to tuberculosis, was to cause a marked increase in the mortality from the disease and that the principal determining factors were difficulties in providing adequate treatment and sufficient feeding for the patients. It will be remarked that it was the belligerent nations which were principally affected and that neutral countries do not appear to have suffered to anything like the same degree.

We have therefore a general picture of the position of affairs in England and Wales and in Europe during the last World War and it only remains to examine the position during that period as it affected this country and the portion of it with which this report is primarily concerned before proceeding to discuss the reactions of the present War. The appended figures and the diagrams based on them are taken from the Annual Reports of the Registrar–General and from the recorded statistics of this city for the period noted. The period selected is same as that covered by table 30 above and covers the years immediately preceding the War and a number of years after it.

Table 30.—Mortality from TUBERCULOSIS 1912–27—(from Annual Reports of Registrar–General).

Year	Éire		Cork City	
	Number of Deaths	Rate per 1000 of Population	Number of Deaths	Rate per 1000 of Population
1912	6,561	2.09	302	3.92
1913	6,516	2.08	281	3.64
1914	6,344	2.03	310	4.02
1915	6,725	2.16	283	3.36
1916	6,471	2.07	258	3.33
1917	6,666	2.12	280	3.61
1918	6,492	2.06	262	3.37
1919	5,839	1.82	214	2.75
1920	5,122	1.59	205	2.64
1921	4,824	1.56	159	2.03
1922	4,614	1.53	215	2.75
1923	4,468	1.48	162	2.05
1924	4,582	1.52	196	2.50
1925	4,673	1.57	165	2.10
1926	4,362	1.47	172	2.18
1927	4,301	1.45	164	2.08

These figures reveal that there was no material increase in the mortality from the disease as a result of the war. Taking the country as a whole we note that there was a slight increase in the year 1915 but this was of a transient character and was followed the next year by a figure which was actually less than those of the pre-war years. Another slight increase occurred in the year 1917 to be succeeded in the following year by a figure lower than any previously recorded and after that

there was a steady decline in the rate. In the case of Cork City there was an appreciable increase for the first year of the war but this was followed immediately by a very marked reduction in the rate and thereafter a regular reduction was maintained throughout the war period and the ensuing year. It has been noted by the Registrar General for this country in his Annual Report for 1929 that a similar trend has characterised the statistics for Scotland while those for Northern Ireland pursued a course analogous to that for England and Wales. We are

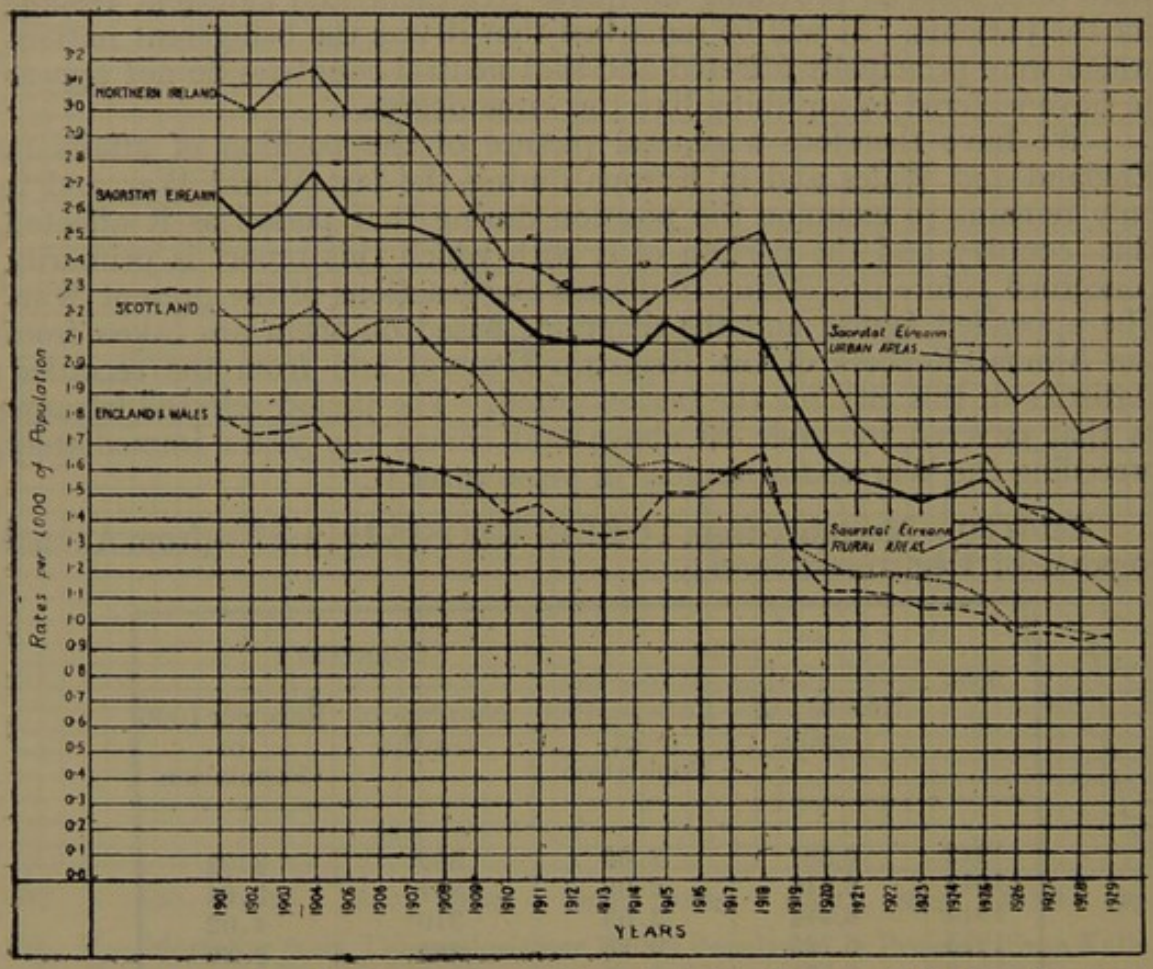


Fig. VI.—Death Rates from Tuberculosis in Saorstat Eireann, Northern Ireland, England and Wales and Scotland during each of the years from 1901 to 1929 (from Annual Report for 1929 of Registrar General for Saorstat Eireann).

therefore in a position to state that, so far as the last World War is concerned, there were no detrimental effects in this country in so far as it is possible to judge by the recorded statistics of the period.

In examining the present position the same plan has been followed as that alluded to above in connection with the general death-rate. In his anlaysis of the tuberculosis figures for England and Wales Dr. Stocks has found that a real increase in the deaths from respiratory tuberculosis has occurred since the war began. Comparing with the year from mid-1938 to mid-1939 as standard, the increase amounted to about 6% in the first year of the war and 10% in the second year. For other forms of tuberculosis the increase was later in appearing but was then proportionately greater. Comparing with the year preceding mid-1939, the increase in deaths from non-respiratory tuberculosis amounted to 2.4% in the first year and 17.6% in the second year the bulk of the more recent increase being due to tuberculous meningitis.

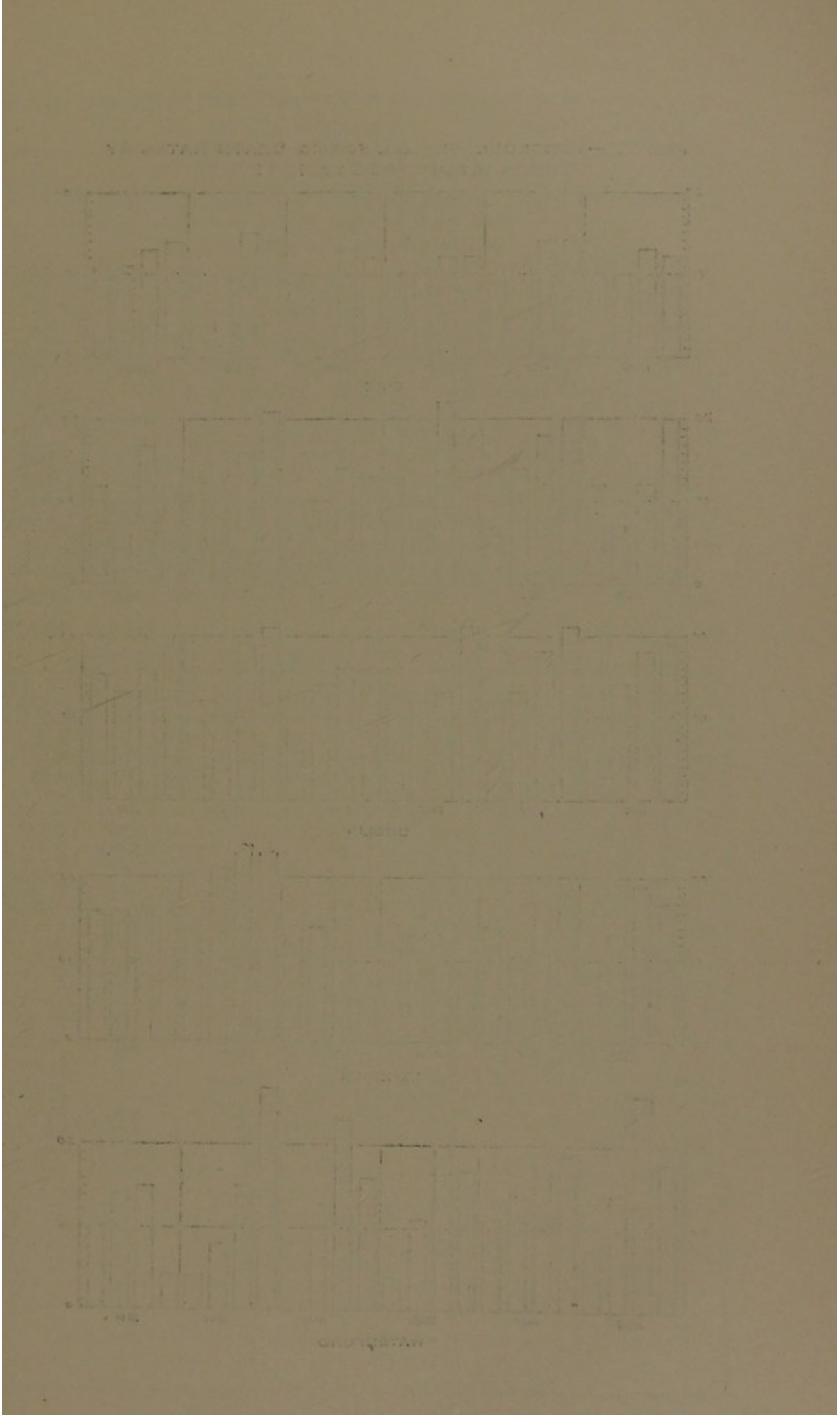
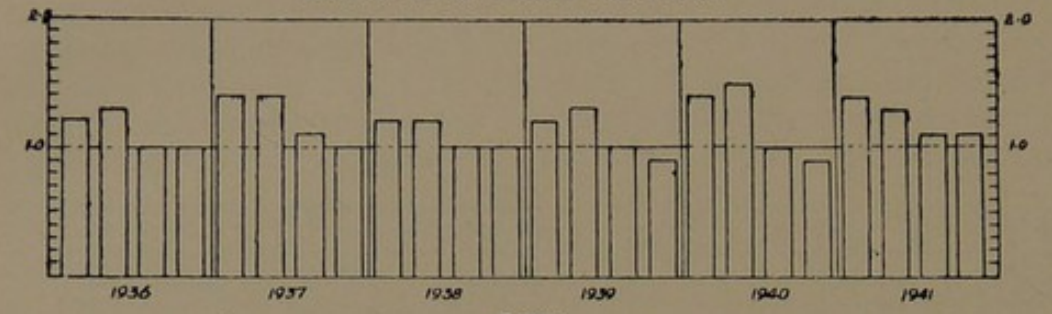
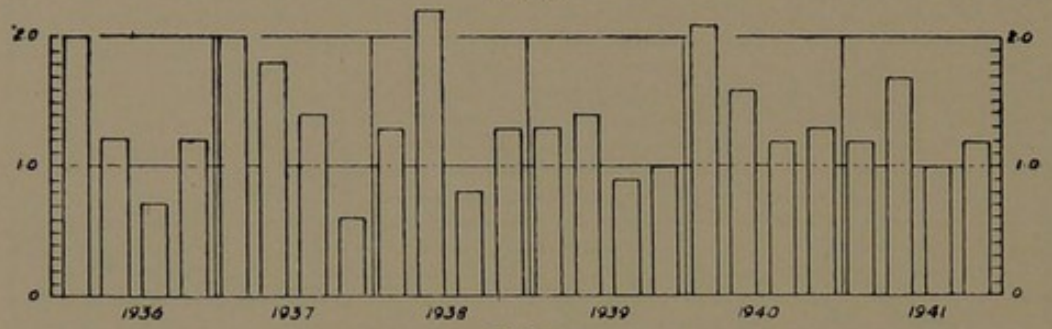


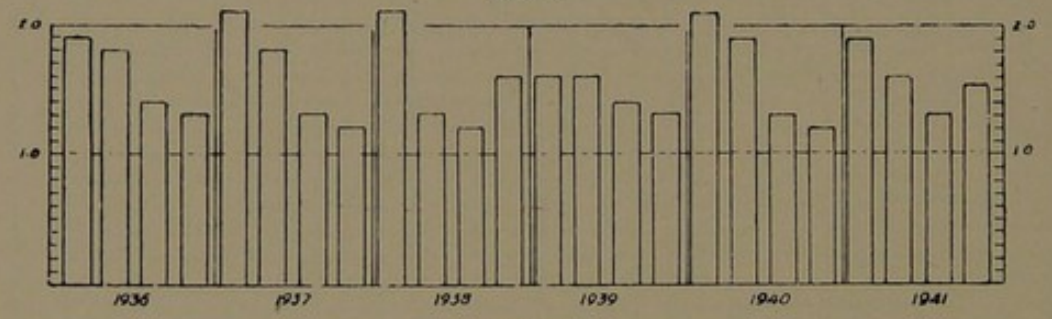
FIG. VII.—TUBERCULOSIS (ALL FORMS) DEATH RATES BY QUARTERS 1936 TO 1941



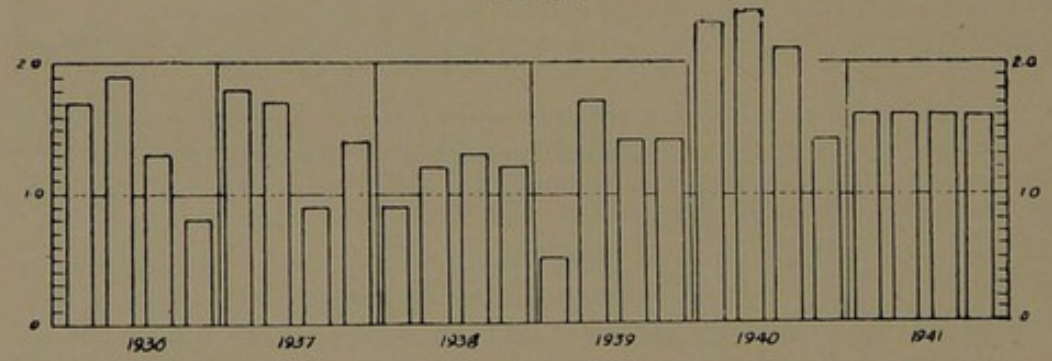
EIRE



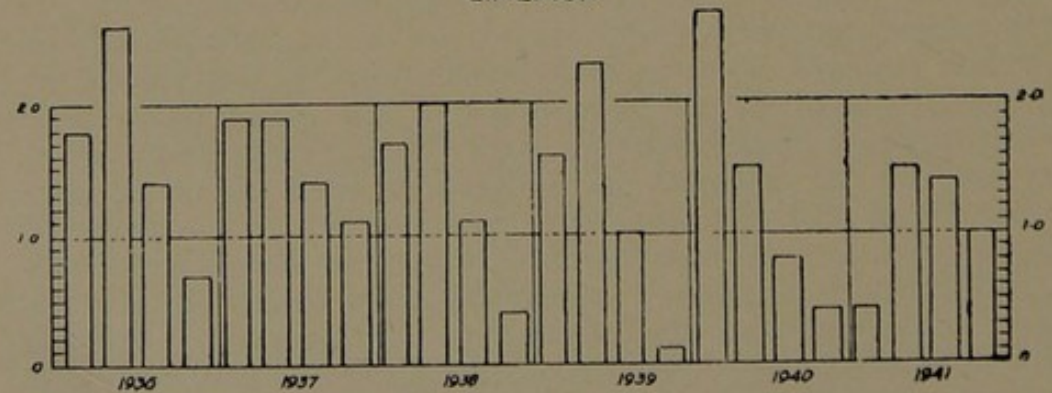
CORK



DUBLIN



LIMERICK



WATERFORD

The figures on which these observations are based are as follows :—

TUBERCULOSIS

Quarter	Males			Females		
	1938/39	1939–40	1940–41	1938–39	1939–40	1940–41
	RESPIRATORY TUBERCULOSIS DEATHS					
3rd	2662	2542	2665	2032	1934	2062
4th	2991	2091	3328	2163	2118	2283
1st	3780	4533	4226	2539	2974	2789
2nd	3291	3394	3849 ...	2249	2421	2640
Total	12724	13560	14068	8983	9447	9774
	DEATHS FROM OTHER FORMS OF TUBERCULOSIS.					
3rd	503	492	539	456	426	496
4th	481	476	531	453	414	461
1st	625	596	731	492	552	606
2nd	635	715	778	520	594	758
Total	2244	2279	2579	1921	1986	2321

In addition to the table of figures relating to the quarterly returns of deaths from tuberculosis in Éire and the four County Boroughs a graphical representation (based on the table) is also presented. This

Table 31—TUBERCULOSIS (all forms) Deaths and Death-rates (by quarters) for Éire and the four County Boroughs.

Year	Consecutive Quarters	Eire		Cork		Dublin		Limerick		Waterford	
		Deaths	Rate per 1000	Deaths	Rate per 1000	Deaths	Rate per 1000	Deaths	Rate per 1000	Deaths	Rate per 1000
1936	1	969	1.2	44	2.0	208	1.9	17	1.7	12	1.8
	2	989	1.3	22	1.2	213	1.8	19	1.9	17	2.6
	3	792	1.0	16	0.7	165	1.4	13	1.3	10	1.4
	4	730	1.0	24	1.2	153	1.3	8	0.8	5	0.7
1937	5	1040	1.4	43	2.0	247	2.1	19	1.8	13	1.9
	6	1031	1.4	35	1.8	209	1.8	18	1.7	13	1.9
	7	823	1.1	28	1.4	148	1.3	9	0.9	10	1.4
	8	745	1.0	10	0.6	143	1.2	14	1.4	8	1.1
1938	9	878	1.2	27	1.3	187	1.5	8	0.8	12	1.7
	10	892	1.2	44	2.2	164	1.3	12	1.2	14	2.0
	11	696	1.0	17	0.8	149	1.2	13	1.3	8	1.1
	12	750	1.0	26	1.3	193	1.6	12	1.2	3	0.4
1939	13	894	1.2	26	1.3	191	1.6	5	0.5	11	1.6
	14	944	1.3	30	1.4	198	1.6	17	1.7	16	2.3
	15	770	1.0	20	0.9	163	1.4	14	1.4	7	1.0
	16	693	0.9	20	1.0	164	1.4	14	1.4	1	0.1
1940	17	1000	1.4	42	2.1	254	2.1	23	2.3	19	2.7
	18	1107	1.5	33	1.6	230	1.9	25	2.4	11	1.5
	19	800	1.0	25	1.2	154	1.3	21	2.1	6	0.8
	20	693	0.9	28	1.3	151	1.2	14	1.4	3	0.4
1941	21	1028	1.4	25	1.2	226	1.9	16	1.6	13	1.9
	22	980	1.3	35	1.7	197	1.6	16	1.6	11	1.5
	23	832	1.1	21	1.0	158	1.3	16	1.6	10	1 4
	24	818	1.1	24	1.2	180	1.5	17	1.6	7	1.0

diagram is helpful in giving us a picture of what has been happening during the period of review. In the first place we are enabled to say that, so far, there has been no material deterioration as a result of the war in comparison with the years preceding it or, at any rate, nothing analagous to that which has been noted in England and Wales or on the continent in connection with the last war. Taken by themselves the figures for the first two quarters of 1940 might at first sight appear to indicate some such effect, but we note that this is only a seasonal increase in deaths which is common to all periods and all localities and which is undoubtedly related to the ill-effects of the winter months on respiratory complaints especially. One characteristic feature which is illlustrated by the diagram is the unfavourable position of the urban areas individually in comparison with that for the country as a whole which is of course, preponderantly rural in character. In this connection we may be permitted to comment upon the observation of Kolle and Hetsch referred to above to the effect that countries which are predominantly agricultural have high tuberculosis death-rates when compared with those which are mainly industrial. On the basis of recorded facts, this statement is no doubt true but it requires qualification inasmuch as it applies to countries such as England, Belgium and portions of Germany which have been industrialised for a long time and in which the movement from the the rural areas to the towns has either ceased or else has long become stabilised. In such countries the mortality from tuberculosis at the beginning of the industrial era was very heavy indeed but the populations have long since become " tuberculised." This, together with improved social and environmental circumstances brought about an arrest in the rising death-rates followed by a continuous reduction.

It is a well-known fact of course, that the town-dweller (in which sense one means the person who has lived his whole life in an urban area) is more resistant to tuberculosis than the country-dweller because of his more frequent contacts with the disease in sub-infective doses. The latter living in widely dispersed communities is brought into contact with the disease much less frequently, consequently we find the incidence of the disease to be much less in rural areas than in towns but, when it does occur, it tends to be much more virulent in character. It is important too to remember that, when the peasant incurs infection, he usually does so in " massive " doses that is by close and continued contact in the home with previous cases. From the epidemiological point of view the wide dispersion of the population in rural areas ensures that the *incidence* of the disease remains low hence the favourable position of the rural districts in comparison with the urban areas in the statistical tables. But it is very important to bear in mind that, man for man, the rural dweller is less resistant to tuberculosis than the town-dweller.

The importance of this observation has a particular bearing upon our own problems especially in relation to the " flight from the land " which seems to have lost nothing in momentum in recent years. There is a steady drift of young men and women into the cities in search of employment. In effect this means a continuous access of non-resistant

individuals to a *milieu* heavily charged with infection. There can be no doubt that this continuous migration must have played a very important part in maintaining the relatively high tuberculosis death-rate in towns as compared with the country as a whole, and in this country as compared with those which have long been industralised. It is a factor too which must not be lost sight of in the immediate future in relation to the industrial development of this country. On the basis of past experience, one must envisage some increase in tuberculosis mortality as a direct result of industrial expansion in a community hitherto almost entirely agricultural. If this trend is not reflected in an actual increase in the death-rate it will almost certainly effect a slowing-down in the rate of decrease. From this point of view it is a matter of the utmost importance that every precaution should be taken to ensure that working conditions in the new factories should be in keeping with modern hygienic conceptions and, in so far as is possible, to ensure that the living conditions of the worker and his family shall be such as to minimise the risk of spread of infections. This will, of course, include the availability of sufficient nourishing food for him and his family as well as the provision of suitable housing.

From the historical point of view and from the point of view of its social implications tuberculosis stands in a class by itself. In common with all infectious diseases we know that it is transmitted by contact from individual to individual and that its spread is encouraged by poverty and bad social conditions. But there its resemblance to most of the other infectious diseases ends. Most of these occur in waves or epidemics whereas tuberculosis is always present in the community slowly retreating, it is true, but fighting a very strong rearguard action all the time. It is our problem to speed up that retreat and to turn it into a major defeat if possible. " It cannot possibly be expected that tuberculosis will be eradicated in a few years, for the disease is so chronic in nature that wherever there are sick persons they will become a source of infection to others. Nevertheless, in view of the steady decline in the morbidity figures, the hope is justified that there will finally come a day when the disease as a general infection will have disappeared from civilised countries. The case of leprosy affords a precedent, since at one time it was very widely distributed in Europe, but has now almost entirely disappeared from that continent. With that aim in view, it is of the utmost importance to segregate all incurable tuberculous persons, without exception, in special institutes where they will cease be a source of infection to others." (Kolle and Hetsch, Experimental Bacteriology.)

While, no doubt, the recommendation here, if applied, would go a long way to eradicate tuberculosis it is somewhat draconian in character and it is very doubtful that it would receive the commendation of everyone. Nevertheless it points the way to one of the most important administrative measures for dealing with the disease (isolation of the infective patient). In the armamentarium of the hygienist segregation will always be an important weapon, but only one of them. It is quite true that several of the measures which were so confidently put forward in the past have been failures. In this connection may be cited the

examination of contacts, which at one time was believed to be the most likely method of detecting the early case but which, it is now agreed, has by no means justified the time and energy devoted to it. Earlier still it was believed that the discovery of the causative organism by Koch would lead to a speedy conquest of the disease. Sanatorium treatment, hospital treatment and the other administrative measures have, taken as a whole, proved disappointing. At least there are no spectacular successes to their credit. In the light of modern research it would now seem that these failures were largely due to a mis-conception of the pathological nature of the disease, that is of its effects on the human body or, rather, of the reaction of the human host to the organism. Out of the immense amount of painstaking labour expended on this disease there at last appears to be light emerging which holds out some hope. Tuberculosis does not behave like other infectious diseases in so far as the reaction of the host is concerned. In the majority of cases the victim acquires a primary infection in childhood which may develop into the adult type but which, in most instances subsides and leaves him with a basal immunity which may stand him in good stead for the rest of his life. In the case of town dwellers this infection is usually acquired early in life but in the case of rural dwellers it may not be until they have reached adolescence and when they have migrated to some town or city. Whichever be the case it is of prime importance that the condition should be recognized and the person involved should be placed in the most suitable possible environment and under adequate supervision should the necessity arise. The majority of persons, it is believed, pass this stage without notice but there are others who react with varying degrees of severity and several clinical conditions (such as, for example, erythema nodosum) are now recognised as being manifestations of this state. This is the stage at which extension of the disease is most liable to occur and it is of the greatest importance that it should be recognised and dealt with. The newer knowledge of the spread of tuberculosis implies a revision of our methods of dealing with it, amplification is indicated in some directions and scrapping in others. Mass examinations of certain groups by radiology, and tuberculin testing on a large scale undoubtedly seem to afford hope of bringing the early detection of the disease within the realm of practical politics and in a way that has not been attained by existent methods. The needs of the situation were ably summed up in an editorial which appeared in the issue of *The Lancet* of 24th January, 1942 which on account of its importance and its practical bearing on present-day problems is presented herewith :

> Many medical problems must be left for a decision until the end of the war ; either the material facts are not now available or they must be used in the light of post-war conditions which we can hardly even guess at. But tuberculosis is an exception. We know more about it than we do about any three or four other diseases If we fail to act it is not our knowledge but our application of it that is at fault. Nor can the solution be left for a year or two with impunity. The pains which our official mentors are at to explain away the Registrar-General's figures reveal rather than conceal their anxiety that tubercle will get away with it in this war as it has done in every other. The first thing is to be frank about the

danger. The public will only agree to pay for, accept and submit to a policy which they feel is an investment against their own conception of the fearsomeness of a particular disease. They have been taught that tuberculosis is preventable, that its early detection is simple, that treatment instituted in good time leads to arrest and recovery, that sanatorium treatment is available for all who may be unfortunate enough to become affected, and that a stay of a few months in delightful country surroundings will ensure an early return to home and duty. There is scarcely one of these teachings true in the strict sense ; for it is impossible to prevent infection in the community as a whole (it has been argued, in fact, that minor degrees of infection may actually be beneficial) ; the early detection of the disease is one of the most formidable problems confronting doctors ; treatment cannot be instituted in good time for the great majority of cases because the lesions are relatively advanced when they are first detected ; and if we could detect all cases there would be a lamentable shortage of beds for their treatment, assuming they would enter institutions at all. The slogan of 1911 that three months in the open air was the passport to pulmonary security is a will-o'-the-wisp.

This may sound to some like dialectic, an unsympathetic thought-process reflecting too hastily the underlying world-process. It needs to be said, but it should not lead to despair or inertia. The results so far achieved may not have been commensurate with the " new hope " which TRUDEAU proclaimed at the beginning of the century, but no-one can walk around colonies like Saranac or Papworth without becoming aware that infection with the tubercle bacillus in a good environment is not necessarily prejudicial to health. Here is the ideal conception, the very paradigm, of the problem of seed and soil, Here are object lessons in combining all the beneficial factors in infection and environment. Apply these principles by and large and the problem is solved. Of course these institutions cannot be multiplied indefinitely, but the lessons they teach are capable of much wider application than they have hitherto received. Let us turn for a moment to some recent epidemiological surveys and consider in broad terms what has come out of them. BUSHNELL, CUMMINS and others, attempting to explain the incidence of the disease in different countries, have shown that where tuberculosis is common, as in England, the disease assumes the chronic and relatively benign type ; where, on the other hand, the disease is rare the cases that do occur are as a rule rapidly fatal. Certain individuals and communities are much more resistant to tuberculosis than others of the same race. BRADBURY (Lancs) and EDWARDS (New York) have taken special districts and tried to determine the responsibility for the higher attack-rate in certain groups of the population, but they have found it impossible to isolate the various factors included under the term " environment " and to allocate to each factor its proper role in the spread of the disease. Some would even dispute BRADBURY'S conclusion that the Irish of Tyneside are a specially susceptible group. It is true that certain towns like Manchester, Liverpool and Cardiff, which

have had a consistently high tuberculosis mortality-rate, have large congregations of Irish in their populations ; but, as PICKEN has pointed out, Glasgow seems to provide an exception to the rule. In a third type of survey a selected group of the population has been investigated, as at Saranac Lake, in some of the Welsh inquiries, and at Preston Hall in Kent. To these belongs BARDSWELL's discovery that in Cyprus, where poverty, bad housing, overcrowding, malnutrition and other bad environmental factors coexist, tuberculosis need not assume serious proportions so long as massive infection is controlled. Per contra experience at Saranac and Preston Hall shows that in communities where large numbers of open cases are congregated but where there is no poverty, no bad housing, no overcrowding, no malnutrition—but where close watch is kept on families as a whole—healthy individuals nearly all escape.

The lesson is this. Infection and environment must be considered together and not separately as we have been wont to do. Infection is itself an environmental factor. Germs may lurk in dark damp places, but the darkest and dampest is the cavity in the lung which remains uncontrolled or uncollapsed, and all the public health measures in th world will not sanitate these, the most important source of infection. Infection being present, other environmental factors must be brought up to a specified standard if massive infection is to be avoided. In our own world at the moment tuberculosis must be prevented, not by entire elimination of the infecting agent, but by reducing its degree of infectivity. We know what the tubercle bacillus does in the unfavourable environmental conditions of Wales and among the homeless and non-settled males of New York City. Let our own public-health service set itself to search out the sources of infection, many of them completely unknown, and eradicate them, not waiting for the interplay of other environmental factors which sooner or later will lead to the spread of disease. This is what Prof. E. S. GODFREY jun., of New York, calls " shoe-leather " epidemiology to distinguish it from the " swivel-chair " epidemiology based on card-indexing mixed groups of the population. It may involve, as he remarks, going out on the highways, byways and alleys, walking the streets and climbing the stairs, or bumping over country roads in order to ferret out the sources of infection. Perhaps we are too prone to be satisfied with lining up contacts of known cases. When a source of infection has been found, any environmental conditions which are unsatisfactory must be improved or the case must be removed.

Finally there is no logic in widening our range for the detection of new cases if we are not prepared to provide facilities for dealing with them when they are discovered. No brief has been made out for the wholesale segregation of open cases ; there is no justification for the statement that improved housing conditions in themselves will contribute materially to the reduction of the tuberculosis death-rate, as MCGONIGLE has shown in Stockton-on-Tees. There is in fact no proof that any single environmental factor—not even infection under good environmental conditions—will increase the

attack-rate from tuberculosis. But there is proof that by raising the standard of environment in the presence of infection from bad environment we have the surest method of limiting the spread of infection and therefore of reducing the morbidity. So long as tuberculosis remains a clinical entity we may not slacken any effort to bring relief to the individual patient. But the time has come to take much more active steps in the preventive field. We have been attending to casualties without dealing with the human factories which create these casualties. Mass radiology will help us to detect them. Until public opinion empowers us to investigate by clinical radiologicial, statistical or any other means the nests of infection which keep up the death-rate and maintain the morbidity from tuberculosis we shall not obtain the results we desire and which our enthusiasm deserves.

The National Association for the Prevention of Tuberculosis has been so impressed by the evidence in favour of the extended use of X-Rays in the detection of early tuberculosis that it recently issued a special memorandum on the subject under the title of " The Discovery of Symptomless Pulmonary Tuberculosis," in which it has outlined its policy in this regard. The detection of the disease in an early stage is an extraordinarily difficult one by ordinary clinical means (and, in the majority of cases, an impossible one) consequently it is imperative that any new technical advance should be explored as fully as possible if it holds out reasonable hopes in this direction. The text of the memorandum is as follows :—

1. Tuberculosis of the lungs begins without any warning to the patient. By the time patients voluntarily come for treatment, the disease is in an advanced stage, and such patients have perhaps already infected numerous other people. There are about a quarter of a million actual cases of pulmonary tuberculosis in the British Isles, and of these about 1,500 between the ages of 15 and 50 die each month. In spite of this, the total number is kept up by a steady flow of recruits. To prevent the disease in the future we must try more persistently to discover patients in the early stages, before they have become infectious, since this endeavour will ultimately mean the conquest of tuberculosis.

Under war-time conditions the disease shows a tendency to increase, as it did in the last war.

2. The only method of detecting tuberculosis before it produces symptoms is by X-Ray examination of the chest. This is a simple, painless and rapid procedure. By modern methods it can be carried out for large numbers of people at one time. We need more X-Ray examinations, particularly of those in the 'teens and the early twenties, and we need more X-Ray examinations of those apparently healthy.

3. The National Association believes that when these facts are known, public opinion will insist that this modern method of discovering early disease shall take the place of older, less effective methods. People will face the risks of tuberculosis with greater confidence when they know that the latest knowledge is being fully used to benefit the individual and the community. The worker stricken by tuberculosis is under a heavy handicap, and his family suffers in proportion to the length of his absence from work, or his compulsory acceptance of lower paid employment. Anything that can minimise industrial hardships and domestic tragedies of this disease will be welcomed by the workers. The National Association welcomes heartily a resolution in favour of X-Ray examinations for young workers passed by the Trades Union Congress (September, 1941) and now under consideration by the Council :—

> " That this Congress urges the Government to take all necessary steps to ensure that Local Authorities fully comply with the regulations affecting the medical examination of school children, and that the examination prior to leaving school shall be of such a thorough character that incipient or hereditary disease or weaknesses may be detected.
>
> Congress also urges that in addition to the examinations prescribed under Section 99 of the Factories Act, 1937, there should be a further thorough examination, including an X-Ray lung examination, not later than twelve months after entering employment in factories or workshops and every succeeding twelve months up to the age of 18 years."

4. The ideal would be for every young person to be examined by X-Rays on leaving School, and at intervals during early adult life. Those who enter the forces can most easily be included in such a scheme, but all—both men and women—ought to be re-examined from time to time. The entry into the services of Government and Local Authorities would be a good opportunity to augment regular medical examination by X-Rays, as a safeguard to the individual and also to fellow-workers. The early discovery of active disease may not only mean recovery for the patient in a shorter space of time, but safety for others in contact.

5. Boys and girls in secondary schools, technical schools, colleges and universities are at a period of life where physical and mental strain is great, and the risk of tuberculosis serious. The disease at these age periods shows a tendency to increase. Regular X-Ray examinations are advisable, and the Association appeals to doctors responsible for the health of such institutions to encourage their wider use. This aspect of the problem is dealt with in the first comprehensive resolution of the Trades Union Congress, quoted above.

6. Under the Factory Acts, the Examining Surgeon examines young people who enter into industry under the age of 16. We believe the authorities should take into consideration the expediency of including X-Ray examinations at this stage, as is recommended by the second Trades Union Congress resolution.

7. Finally, there are the commercial firms with large staffs in their offices and factories. The majority of such employment is not pensionable, and the workers do not come under any regular scheme of medical examination, except National Health Insurance. Some employers arrange for medical inpections, including X-Rays, and we believe that this practice, carried out with the active co-operation of the workers, has been successful, and far from arousing antagonism, has met with approval.

8. Tuberculosis is an old and dangerous enemy. It lies in wait particularly for the young adult, whose services today and after the war must be of supreme value to the nation. Moreover, tuberculosis always increases in war-time, and measures must be taken now if the increase that we may expect in the near future is to be stemmed.

Our existing Tuberculosis Services can normally deal with cases of the disease which are sent to them. These Services in this country have grown up almost entirely since the last war. They deal with those who have symptoms of disease, or who feel ill. But a new advance in the detection and Prevention of Tuberculosis is now needed. This means finding cases in whom the disease has started, but not yet caused the patient to feel ill. Often nothing may be necessary other than careful watching : in some, short treatment is required, but in all cases there is a better hope of eradicating the disease. X-Rays used wisely by competent physicians constitute a very important advance.

9. In this country Government proceeds by consent, and anything savouring of compulsory examination would be foreign to our traditions, and would fail at the first attempt. The National Association believes that public opinion can be educated to recognise the needs of the situation, and appeals to the workers, employers, doctors and other responsible authorities to consider the facts of tuberculosis as an enemy of youth, and a menace to our National Health in war-time. A valuable weapon is in our hand—the increased use of X-Rays among all sections of the community, whether they feel ill or not, particularly in the young adults.

10. More careful application will have to be given by the Government and Local Authorities to the provision of economic security for the tuberculous family, as part of a national scheme of social welfare and rehabilitation. This will have influence on the willingness of tuberculous persons to accept early treatment.

11. There is reason to believe that the X-Ray manufacturers will shortly be ready to provide apparatus as soon as they receive orders.

Dr. Fitzpatrick has contributed the following commentary on the Memorandum :

Symptomless is a term which is especially apt in its application to tuberculosis. That consumption may begin and progress to a stage which leaves no reasonable hope of arrest without causing pain, cough, weakness or wasting is now beyond dispute. It is this insidiousness

which makes tuberculosis of all diseases the most treacherous. The child with a chronically enlarged knee joint may go round for months with little more discomfort than an inability to fully bend it, but there may be no pain. One day the child will have to stay in bed. It will then be too late to restore normal function to the joint. The best that can be hoped for is a stiff knee. This is symptomless tuberculosis of a joint. Here, however, there is at least a swelling to indicate to parents that all is not well. Adults, in a great many cases, get no such warning.

The following two cases under our own observation are illustrative :—

No. 1.—A man, after four years apprenticeship, had to undergo a medical examination before receiving a permanent post. The doctor making the examination asked for an X-Ray film of the lungs. Both lungs were affected with tuberculosis and it was not possible to find the disease by methods of examination which did not include the X-Ray. This man during the whole time of his apprenticeship had not one day's illness. It is satisfactory to record that, after a term in Sanatorium, the X-Ray showed that a marked improvement had taken place and he resumed his employment. Now two years afterwards he enjoys normal health.

No. 2.—A man, who had lived for some years in the city, decided to take up farming. Because two members of his family had died of consumption he thought it would be wise to have himself medically examined. Both his lungs were affected with Tuberculosis. Yet he felt in normal health.

It has been stated that people die from tuberculosis because they do not consult their doctors in time. Two significant facts, which have a bearing on this problem, became apparent from the examinations of those who suffer from Pulmonary Tuberculosis and an enquiry into their past medical history. Firstly a very great majority had such extensive disease that very little hope could be given of its complete arrest no matter what treatment could be given. Secondly up to the time of present illness upwards of half of those hopeless cases did not have any illness which compelled them to go to bed during the previous eighteen months. Some admitted to feeling out of sorts at times, some of them to an occasional cough but they did not feel ill enough to go to bed or call to a doctor. There was no urgent illness. The disease up to the time it became fulminant might be described almost as symptomless—without warning. Consumption has been described as a slow wasting disease. It is only in the later stages very often that wasting takes place. I don't think we ever realised fully how slow it may be—months may pass by with the disease gradually spreading all the time, the sufferer if he complains at all is accustoming himself to work under conditions of health slightly below normal.

There are few types of employment, apart from labour, which call for sustained physical effort. A factory day may be a long day but the work is not usually laborious. It is just such conditions as these which favour the symptomless advance of tuberculous lesions in the lung when once they begin. The sufferer is not unwell enough to cease work and not well enough without help to arrest his disease.

Many health surveys have been done on healthy groups of individuals. Always some were discovered with active turberculous lung lesions.

There is another side to this question of symptomless pulmonary tuberculosis. Tuberculosis is notoriously infectious. Only people who have been working or living with those suffering from the disease become affected. The symptomless cases while they remain undiscovered must constitute the reservoir of infection. These cases rather than those that come under treatment are the menace.

The National Association for the Prevention of Tuberculosis, acknowledged leaders of thought in these matters, has been for long alive to the danger both to the individual and communtiy of these undiscovered cases. The circulation of their phamplet is a step to awaken in the profession and the public an awareness of a danger which is a cause of great suffering to the individual and great loss to the community. Much of this can be eliminated by approaching the problem on the lines suggested in the pamphlet.

The routine adminstrative work of the Tuberculosis Dispensary is summarised in the following paragraphs.

The number of new patients examined at the Tuberculosis Dispensary during the year amounted to 251, of whom 116 were adults and 135 children. 68 of the adults and 9 of the children were found to be suffering from tuberculosis in one form or another and appropriate treatment was afforded.

As in former years the new cases dealth with at the Tuberculosis Dispensary who presented signs of advanced disease was disproportionately high. 51 per cent. of such were found to be in Stage III. and 46 per cent. in Stage II. ; in other words, no less than 97 per cent. of the new cases were suffering from definitely established disease recognisable by ordinary clinical methods. These figures are similar to those of former years and must be regarded with considerable dissatisfaction, as little or nothing can be done in regard to the treatment of such advanced cases apart from palliative methods. The main factor in the production of this state of affairs appears to be the failure of patients to seek treatment sufficiently early.

Table 32.—Showing the proportion of early, moderately advanced and advanced cases attending the Tuberculosis Clinic for the first time (1930 to 1941).

TYPE	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
Stage I. ... (Early)	15%	8%	9%	6%	14%	13%	6%	9%	5%	8%	6%	3%
Stage II. ... (Moderately Advanced	36%	50%	38%	39%	28%	30%	43%	38%	33%	32%	44%	46%
Stage III. ... (Advanced)	49%	42%	53%	55%	58%	57%	51%	53%	62%	60%	50%	51%

The number of cases admitted to sanatorium during the year was as follows :—

		Males	Females	Total
Insured ...	...	22	15	37
Uninsured	...	6	8	14
Children ...	...	1	—	1
Total	...	29	23	52

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

		Males	Females	Total
Insured ...	...	19	14	33
Uninsured	...	7	7	14
Children ...	...	1	—	1
Total	...	27	21	48

Advanced cases who are not likely to derive benefit from sanatorium treatment 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 ...	...	15	3	18
Uninsured	...	11	14	25
Total	...	26	17	43

The following cases died or were discharged from the Insititution :

		Males	Females	Total
Insured ...	...	16	1	17
Uninsured	...	9	11	20
Total	...	25	12	37

Two female children were admitted to Cappagh Open-air Hospital, Dublin. During the same period two 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 a hospital could also serve as a convalescent home for delicate and pre-tuberculosis children for which there is also a great need.

SPUTUM EXAMINATIONS.

Examinations of specimens of sputum is carried out in the laboratory attached to the Tuberculosis Clinic. 276 such specimens were examined during the past year, of which 68 were found to contain tubercle bacilli while 208 were negative. Of the 276 specimens examined 112 were submitted by medical practitioners. The following table shows the number of specimens exmined, and the results obtained during the past nine years.

Year	Total	Positive	Negative
1931	375	90	285
1932	440	94	346
1933	502	118	384
1934	519	121	398
1935	512	94	418
1936	467	93	374
1937	511	73	438
1938	336	49	287
1939	228	51	177
1940	336	88	248
1941	276	68	208
Totals ...	4502	939	3563

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. Forty-five flasks were issued during the year.

The number of notifications received during the year was 173. Prior to 1930 such notifications were for the period from the 1st April to 31st March following. Notifications for previous years were as follows—

1925–26	 110	1934	... 112
1926–27	 108	1935	 154
1927–28	 73	1936	 154
1928–29	 116	1937	 166
1929–30	 179	1938	 147
1930 (April–Dec.)	... 133	1939	 128
1931	 196	1940	 114
1932	 136	1941	 173
1933	 164		

In the following table notifications, from the year 1930, have been analysed as to age and sex distribution.

Table 33.—Notifications of Tuberculosis distributed according to Sex and Age.

Year	Total	Sex	All Ages	Under 5 yrs	5–15	15–45	45–60	60 and up
1930	133	M	77	4	11	50	11	1
		F	56	5	11	37	2	1
1931	196	M	114	9	24	64	15	2
		F	82	7	19	53	3	—
1932	136	M	71	5	11	42	11	2
		F	65	1	6	48	7	3
1933	159	M	89	5	10	59	14	1
		F	70	5	8	48	8	1
1934	112	M	43	1	6	26	9	1
		F	69	4	10	41	9	5
1935	154	M	83	7	14	43	14	5
		F	71	5	15	40	7	4
1936	154	M	76	9	10	33	16	8
		F	78	3	12	55	6	2
1937	166	M	91	5	10	47	25	4
		F	75	2	10	52	5	6
1938	147	M	78	4	6	52	15	1
		F	69	4	10	49	5	1
1939	128	M	60	5	9	33	10	3
		F	68	3	3	54	6	2
1940	114	M	56	1	6	35	14	—
		F	58	5	4	41	6	2
1941	173	M	90	8	13	48	19	2
		F	83	8	14	51	7	3

The number of home visits made by the Tuberculosis Nurse was 563.

X-RAY EXAMINATION.

One Hundred and Thirty X-Ray examinations were carried out during the year. This form of examination is utilised for the most part in connection with cases presenting doubtful diagnostic features. All cases of bone and joint disease are subjected to X-Ray examination as routine. The method is also availed of very largely in connection with artificial pneumothorax treatment not only for the purpose of estimating, in the first instance, whether cases are suitable or not but, at a later stage to judge the progress which they are making.

ARTIFICIAL PNEUMOTHORAX.

Six new cases received artificial pneumothorax treatment during the year. These cases had their induction carried out at Heatherside Sanatorium by the R.M.S. Ten cases are having refills and management at the Tuberculosis Clinic. Routine X-Ray examinations are made at the North Infirmary by arrangement with Dr. J. Fielding, Radiologist. The number of cases treated during the year was fourteen. 256 refills were given and 38 X-Ray examinations were made in connection with the treatment.

INSTITUTIONAL TREATMENT.

In the tables which follow statistical details are given of the various institutions which have been utilised for the treatment of our cases during the past year. Early and moderately early cases of pulmonary disease have, almost all, been referred to the Cork Sanatorum at Heatherside.

HEATHERSIDE SANATORIUM.

The Sanatorium, which has 110 beds for the treatment of early or moderately early cases of pulmonary tuberculosis, is situated at the foot of the southern slopes of the Ballyhoura Hills. The grounds are approximately 140 acres in extent and of the light loam type of surface. They are nicely wooded with pine trees. Very suitable and pleasant walks are thus available for the use of patients and no doubt play a considerable part in helping to dispel that introspection, to which the tuberculous patient is naturally enough rather prone. The Sanatorium is intended primarily for the benefit of patients from Cork City and Cork County but cases are also admitted from neighbouring counties. On admission, all cases are fully investigated, including examination by means of X-Ray and fluroscopic screen.

The treatment carried out is similar to that practised in all modern Sanatoria, the basis of which is rest, " grading " and graduated exercise. Collapse therapy in the form of Artificial Pneumothorax controlled by X-Ray and fluroscopic screen is carried out and for cases complicated by tubercular adenitis or lupus Ultra Violet Light Therapy is employed.

Sanatorium regime and treatment will cure pulmonary tuberculosis if the patient submits to it in the early stages of the disease. In a somewhat more advanced state the disease can be rendered quiescent, while still more advanced cases can be improved according to the extent of the disease. The type of cases presenting themselves for treatment at the Sanatorium suggests that a considerable proportion of patients postpone consulting a doctor until the urgency of their symptoms compels them to do so, and thus valuable time is lost.

Another function performed by the Sanatorium is that of teaching the tuberculosis person the mode of life he should follow subsequent to his discharge and thus minimise the risk of recrudescences. He also learns the precautions that are necessary for him to take to avoid the spread of infection to other members of his family and the public.

Table 34.—Showing particulars of patients who received sanatorium treatment during the year.

	Under treatment on 1st. Jan. 1941	New cases admitted during the year	Cases discharged during the year	Under treatment on 31st. Dec. 1941	No. of Cases treated during the year
Insured Males ...	5	20	19	6	25
,, Females ...	2	15	14	3	17
Uninsured Males ...	2	6	7	1	8
,, Females	1	8	7	2	9
Ex-Service men ...	—	2	—	2	2
Male Children ...	—	1	1	—	1
Female Children ...	—	—	—	—	—
Totals ...	10	52	48	14	62

Table 35.—Particulars of cases treated at Cork District Hospital.

	Under treatment on 1st. Jan. 1941	New cases admitted during the year	Cases discharged during the year	Under treatment on 31st. Dec., 1941	No. of Cases treated during the year
Male Adults ...	7	25	28	4	32
Female Adults ...	2	9	7	4	11
Male Children ...	3	8	7	4	11
Female Children ...	2	2	3	1	4
Totals ...	14	44	45	13	58

Table 36.—Particulars of patients treated in St. Patrick's Hospital during 1941.

	Under treatment on 1st. Jan. 1941	New cases admitted during the year	Cases discharged during the year	Under treatment on 31st. Dec. 1941	No. of Cases treated during the year
Insured Males ...	7	12	15	4	19
,, Females ...	—	3	1	2	3
Uninsured Males ...	5	11	9	7	16
,, Females ...	1	14	11	4	15
Ex-Servicemen ...	—	3	1	2	3
Male Children ...	—	2	1	1	2
Female children	—	1	—	1	1
Totals ...	13	46	38	21	59

Table 37.—Particulars of cases treated in the North Infirmary during 1941.

	Under treatment on 1st. Jan., 1941	New cases admitted during the year	Cases discharged during the year	Under treatment on 31st. Dec., 1941	No. of Cases treated during the year
Male children ...	—	2	2	—	2
,, adults ...	1	1	2	—	2
Female children ...	—	2	2	—	2
,, adults ...	—	1	1	—	1
Totals ...	1	6	7	—	7

Table 38.—Particulars of cases treated in the South Infirmary during 1941.

	Under treatment on 1st Jan., 1941	New cases admitted during the year	Cases discharged during the year	Under treatment on 31st Dec., 1941	No. of Cases treated during the year
Male children ...	1	2	3	—	3
,, adults ...	—	3	2	1	3
Female children ...	—	7	7	—	7
,, adults ...	—	1	1	—	1
Totals ...	1	13	13	1	14

Table 39.—Particulars of cases treated in St. Mary's Open-Air Hospital Cappagh, Co. Dublin.

	Under treatment on 1st Jan., 1941	New cases admitted during the year	Cases discharged during the year	Under treatment on 31st Dec., 1941	No. of Cases treated during the year
Female children ...	3	2	2	3	5
Male children ...	--	—	—	—	—
Tota's ...	3	2	2	3	5

Table 40.—Particulars of cases treated at St. Joseph's Hospital, Mount Desert, during 1941.

	Under treatment on 1st Jan., 1941	New cases admitted during the year	Cases discharged during the year	Under treatment on 31st Dec., 1941	No. of Cases treated during the year
Insured Males ...	4	18	14	8	22
,, Females ...	4	10	8	6	14
Uninsured Males ...	—	5	3	2	5
,, Females ...	4	13	16	1	17
Male children ...	—	1	1	—	1
Female children ...	—	—	—	—	—
Totals ...	12	47	42	17	59

Table 41.—Particulars of cases treated at Coole Open-Air Hospital, Co. Westmeath.

	Under treatment on 1st Jan., 1941	New cases admitted during the year	Cases discharged during the year	Under treatment on 31st Dec., 1941	No. of Cases treated during the year
Male children ...	4	2	2	4	6
Total ...	4	2	2	4	6

Table 42.—Return of number of patients treated under the Tuberculosis Scheme, during the year ended 31st December, 1941.

	Pulmonary Tuberculosis			Non-Pulmonary Tuberculosis			Total
	Children under 15 years	Other Persons		Childern under 15 years	Other Persons		
		Males	Females		Males	Females	
1.—*Insured Patients:*							
(i) No. remaining under treatment (a) On 1st Jan., 1941 ...	—	75	24	—	1	1	101
(b) On 31 Dec., 1941 ...	—	65	34	—	4	3	106
(ii) No. of new patients treated during year ...	—	36	22	—	3	1	62
(iii) No. of cases under observation at close of year 1941 ...	—	2	2	—	—	—	4
2.—*Other Patients:*							
(i) No remaining under treatment (a) On 1st Jan., 1941 ...	2	32	46	48	7	7	142
(b) on 31st Dec., 1941 ...	1	31	42	48	2	8	132
(ii) No. of new patients treated during year ...	1	18	29	36	2	3	89
(iii) No o cases under observation at close of year 1941 ...	1	1	2	5	1	—	10

Section V.

Maternity and Child Welfare.

(A) INFANT MORTALITY.

The number of deaths of infants under one year of age amounted to 142, which is equivalent to an infant mortality rate of 85 per 1,000 live births. The corresponding figures last year were 153 and 92 per 1,000 respectively. The principal contributory causes were as follows :—

Premature birth and congenital debility ...	50	
Diarrhoea and enteritis	33	
Marasmus	13	(6)
Convulsions	11	
Broncho-pneumonia	16	

As in former years the main single factor in infant mortality has been the combination of conditions embraced under the title premature birth and congenital debility. This factor remains more or less stationery. There has been a slight reduction in the number of deaths from Diarrhoea, the main cause of which has, undoubtedly, been the substitution of bottle-feeding for breast-feeding.

In previous reports I have deplored the general decline in breast-feeding, which has been taking place for a number of years past and have drawn attention to the uncontrovertible facts which have come to light from our investigations as to the association of gastro-enteritis and high infant mortality with artificial feeding. It has been clearly established that in the vast majority of cases the prime cause of such conditions is artificial feeding, the secondary factors being lack of cleanliness and hygiene in the home as well as unhygienic methods of milk production. The only safe method of feeding infants and the only one independent of weather conditions and parental ignorance is that devised by nature. This question has been further dealt with in the section devoted to infectious disease under the subject of epidemic diarrhoea.

Table 43.—Infant Mortality, Cork City, Éire, and England and Wales from 1881 to 1941.

Year	Cork	Éire	E. & W.	Year	Cork	Éire	E. & W.
1881	124	89.4		1912	107	82.1	95
1882	127	94.9	139	1913	136	93.1	108
1883	109	95.0		1914	119	81.0	105
1884	110	91.9		1915	132	85.2	110
1885	120	91.3		1916	105	81.3	91
1886	110	93.9	145	1917	108	84.0	96
1887	123	93.6		1918	118	80.2	97
1888	139	96.0	136	1919	100	84.4	89
1889	125	92.0	144	1920	79	77.5	80
1890	106	91.6	151	1921	76	72.6	83
1891	138	91.4	149	1922	93	68.9	77
1892	150	99.9	148	1923	66	66.4	69
1893	132	99.8	159	1924	87	71.6	75
1894	150	97.4	137	1925	74	67.9	75
1895	131	98.0	161	1926	130	74.4	70
1896	106	91.0	148	1927	87	70.8	70
1897	152	104.0	156	1928	76	67.9	65
1898	131	105.2	160	1929	81	70.4	74
1899	133	103.2	163	1930	77	68	60
1900	120	105.3	154	1931	71	69	66
1901	139	95.5	151	1932	89	71	65
1902	127	95.2	133	1933	89	65	64
1903	112	92.2	132	1934	72	63	59
1904	118	95.8	145	1935	84	67	57
1905	131	90.2	128	1936	80	74	59
1906	133	88.0	132	1937	103	73	58
1907	139	88.5	118	1938	75	66	53
1908	134	91.2	120	1939	73	65	—
1909	125	87.3	109	1940	92	66	—
1910	96	89.1	105	1941	85	73	—
1911	139	91.3	130				

In Table 44 is set out a comparative statement of infant mortality in Cork, Dublin, Belfast, Limerick and Waterford from 1920 to 1941.

Table 44.—Infant mortality in Cork and other Irish Cities from 1920 to 1941 inclusive.

Year	Cork	Dublin*	Belfast†	Limerick*	Waterford*
1920 ...	79	152	132	109	96
1921 ...	76	143	115	113	102
1922 ...	93	120	94	108	94
1923 ...	66	117	101	128	78
1924 ...	87	119	107	90	93
1925 ...	74	117	104	91	106
1926 ...	130	127	112	146	114
1927 ...	87	123	101	102	83
1928 ...	76	102	103	117	105
1929 ...	81	106	112	118	110
1930 ...	77	97	78	114	91
1931 ...	71	94	90	120	92
1932 ...	89	100	111	91	132
1933 ...	89	83	102	126	103
1934 ...	72	80	80	76	92
1935 ...	84	94	112	106	126
1936 ...	80	114	102	95	90
1937 ...	102	102	94	68	97
1938 ...	75	96	96	70	99
1939 ...	73	90	86	59	73
1940 ...	95	91	122	70	111
1941 ...	85	118	91	95	88

* Figures for current year obtained from Annual Summary of Registrar-General. Those for previous years have been corrected from figures in the Annual Reports of the Registrar-General for the appropriate years.

† Figures obtained from Superintendent Medical Officer of Health.

Neo-natal Mortality. The role of neo-natal mortality (i.e., deaths of infants under one month old) in the following production of infant mortality is shewn in the following table.

Table 45.—Deaths of infants *under one month* in Cork City and the ratio of same to the total number of infant deaths (i.e., under one year), together with the comparative figures for the whole country.

Year	Cork City		Éire. Relation of deaths under one month to all infant deaths
	Deaths under one month	Proportion to all infant deaths	
1931	41	30.1 per cent	38.4 per cent.
1932	47	29.6 ,, ,,	35.9 ,, ,,
1933	56	33.3 ,, ,,	39.7 ,, ,,
1934	43	29.9 ,, ,,	38.7 ,, ,,
1935	39	26.2 ,, ,,	39.9 ,, ,,
1936	56	36.8 ,, ,,	40.5 ,, ,,
1937	58	31.4 ,, ,,	41.7 ,, ,,
1938	34	27.2 ,, ,,	42.4 ,, ,,
1939	47	39.8 ,, ,,	44.1 ,, ,,
1940	45	29.4 ,, ,,	42.0 ,, ,,
1941	52	30.9 ,, ,,	——

The causes of deaths of infants under one month were as follows :—

Prematurity, Congenital Debility and Malformations	39
Convulsions	5
Diarrhoea	2
Broncho-pneumonia	1
Marasmus/Convulsions	1
Jaundice/Convulsions	1
Hemiplegia (forceps)	1
Violence	1
Cause not determinable	1
	52

Table 46.—Cork City—Deaths of Infants under one year from conditions which constitute the principal causes of Infant Mortality.

Year	Number of Births Registered	DEATHS OF INFANTS UNDER ONE YEAR FROM															
		Congenital Debility	Rate per 1000 Births	Prematurity	Rate per 1000 Births	Diarrhoea and Enteritis	Rate per 1000 Births	Pneumonia	Rate per 1000 Births	Convulsions	Rate per 1000 Births	Congenital Malformations	Rate per 1000 Births	Bronchitis	Rate per 1000 Births	Whooping Cough	Rate per 1000 Births
1931	1,963	18	9.17	20	10.19	28	14.26	8	4.08	16	8.15	9	4.58	5	2.55	3	1.53
1932	1,820	28	15.38	13	7.14	39	21.43	13	7.14	19	10.44	6	3.30	8	4.40	8	4.40
1933	1,884	19	10.08	27	14.33	38	20.17	17	9.02	13	6.90	7	3.72	13	6.90	2	1.06
1934	1,846	17	9.21	24	13.00	32	17.33	12	6.50	9	4.88	6	3.25	8	4.33	8	4.33
1935	1,915	18	9.40	19	9.92	50	26.11	23	12.01	6	3.13	5	2.61	5	2.61	—	—
1936	1,913	12	6.27	28	14.64	36	18.82	27	14.11	10	5.23	5	2.61	6	3.14	—	—
1937	1,799	18	10.01	13	16.68	45	25.01	27	15.01	18	10.01	7	3.89	4	2.22	5	2.78
1938	1,761	13	7.38	19	10.79	31	17.60	21	11.93	9	5.11	7	3.98	3	1.70	3	1.70
1939	1,632	24	14.17	16	9.80	34	20.83	9	5.51	10	6.13	8	4.90	3	1.84	2	1.23
1940	1,670	17	10.18	25	14.97	45	26.95	15	8.98	8	4.79	4	2.40	5	2.99	—	—
1941	1,680	15	8.93	25	14.88	33	19.65	16	9.52	11	6.55	10	5.95	6	3.57	1	0.59

Table 47.—Éire. Principal causes of Infant Deaths (ratio per 1,000 Births). The corresponding figures for Cork City are shewn in Table 46.

Year	Congenital Debility	Prematurity	Diarrhoea and enteritis	Pneumonia	Convulsions	Congenital Malformations	Bronchitis	Whooping Cough
1931	16.00	8.58	8.27	7.72	6.78	3.38	3.17	1.16
1932	16.46	8.53	9.33	8.44	6.54	3.40	3.96	2.60
1933	14.38	9.59	8.92	6.99	5.61	3.59	2.79	2.54
1934	13.78	8.05	7.50	6.72	5.41	3.54	3.26	2.97
1935	14.19	9.76	10.65	8.08	4.50	3.90	3.40	1.05
1936	14.44	11.31	10.38	8.96	5.32	4.44	2.96	2.20
1937	13.65	12.16	9.95	8.34	4.99	4.39	2.92	2.46
1938	12.79	10.96	9.12	8.43	4.43	4.38	2.71	1.74
1939	12.68	11.02	9.33	7.67	4.48	4.82	2.35	1.37
1940	13.25	10.67	9.67	7.70	3.55	4.59	2.62	1.77

The figures for 1941 are not yet available.

(B) NOTIFICATIONS 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.

The general procedure in connection with the notification of births was outlined in my Report for the year 1932. The total number of such notifications received in 1939 amounted to 1,711. The number of births *registered* during the same period, according to the Annual Summary of the Registrar-General was 1,559.

(C) MATERNAL MORTALITY.

There were 4 deaths under this heading during the year.

The ante-natal clinic is held on Wednesday mornings. Routine urine examinations and blood-pressure readings are made and pelvimetry is carried out in cases of primiparae. Cases where it is expected that confinement will not be normal are referred to hospital. The provision of milk at reduced rates to expectant mothers has helped the attendances and serves in general to popularise ante-natal supervision as well as providing an addition to the dietary of the expectant mother of considerable value to the growing foetus.

Table 48.—The number of deaths of women directly attributable to or associated with pregnancy or childbirth during each of the years 1924–41, 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 or 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 1000 Births	No.	Rate per 1000 Births	No.	Rate per 1000 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	—	—	8	4.10
1932...	1	0.55	8	4.28	9	4.95	—	—	9	4.95
1933...	1	0.54	8	4.32	9	4.85	1	0.54	10	5.40
1934...	5	2.60	2	0.52	7	3.60	—	—	7	3.60
1935...	1	0.51	5	2.56	6	3.08	—	—	6	3.08
1936...	1	0.52	4	2.08	5	2.60	—	—	5	2.60
1937...	—	—	—	—	—	—	—	—	—	—
1938...	—	—	6	3.51	6	3.51	—	—	6	3.51
1939...	1	0.58	3	1.75	4	2.3	—	—	4	2.3
1940...	—	—	8	4.6	8	4.6	—	—	8	4.6
1941...	—	—	5	2.9	5	2.9	—	—	5	2.9

In Table 49 (opposite) is set out the comparative maternal mortality for Cork, Dublin, Belfast, Limerick and Waterford County Boroughs, and for the whole country.

Table 49.—Maternal Mortality in different areas from 1920 to 1941 inclusive.

Year	Whole Country		Cork City		City of Dublin		Belfast		Limerick County Borough		Waterford County Borough	
	No. of deaths	Rate per 1000 births	No. of deaths	Rate per 1000 births	No. of deaths	Rate per 1000 births	No. of deaths	Rate per 1000 births	No. of deaths	Rate per 1000 births	No. of deaths	Rate per 1000 births
1920 ...	326	4.8	13	5.8	55	6.0	95	7.7	3	2.9	2	2.7
1921 ...	336	5.5	8	4.0	53	6.5	53	4.7	1	1.0	3	5.1
1922 ...	370	6.3	7	3.6	61	7.1	55	5.1	12	11.8	—	—
1923 ...	328	5.3	4	1.9	46	5.5	58	5.3	16	5.6	3	4.9
1924 ...	330	5.2	12	6.1	46	5.0	46	4.4	1	0.9	4	5.9
1925 ...	312	5.0	11	5.6	42	4.9	29	2.8	3	2.8	4	6.4
1926 ...	329	5.4	11	6.1	31	3.5	57	5.5	5	4.8	—	—
1927 ...	291	4.8	11	6.0	23	2.8	36	3.7	5	4.8	3	4.7
1928 ...	318	5.4	13	7.1	31	3.5	43	4.6	5	4.5	2	3.0
1929 ...	283	4.9	4	2.2	30	3.4	43	4.8	7	6.2	1	1.6
1930 ...	294	5.0	4	1.8	43	4.1	44	4.6	4	3.7	3	4.6
1931 ...	272	4.7	8	4.1	29	2.1	54	5.7	4	3.5	3	4.5
1932 ...	235	4.9	9	4.9	33	3.1	49	5.5	8	4.0	6	8.6
1933 ...	255	4.4	10	5.4	22	2.1	42	5.2	7	7.1	2	2.8
1934 ...	304	5.2	7	3.6	41	3.7	57	6.3	2	1.9	—	—
1935 ...	272	4.6	6	3.0	38	3.3	54	6.0	6	5.5	4	4.0
1936 ...	273	4.7	5	2.6	42	3.5	57	6.2	2	2.0	3	4.5
1937 ...	204	3.39	—	—	33	2.8	56	6.1	3	2.9	4	5.8
1938 ...	204	3.6	6	3.5	29	2.5	48	5.2	4	4.0	3	4.8
1939 ...	150	2.7	4	2.3	23	2.0	—	4.4	1	1.0	1	1.6
1940 ...	227	4.01	8	4.6	21	1.9	37	4.2	3	3.0	7	10.3
1941 ...	146	2.6	5	2.9	17	1.5	31	3.6	2	2.1	1	1.6

The above figures were obtained from the Annual Reports of the Registrar-General with the exception of those for the year 1941 (which were taken from the Annual Summary for that year) and those for Belfast, from 1922 onwards, which were kindly supplied by Dr. C. S. Thompson, Superintendent Medical Officer of Health. All figures include deaths from sepsis arising from abortion and miscarriage.

(D) SUPERVISION OF MIDWIVES.

1. Number of Midwives in Practice :—	
Certificate of C.M.B.	53
Other recognised certificates	26
Total	79
2. Number of Midwives according to type of practice :—	
Attached to public institutions	6
Conducting only private maternity or nursing homes	11
Dealing with less than five cases per year ...	12
Monthly nurses	20
Others	28
Total	77
3. Number of visits of inspection of midwives	264
4. Disinfection of appliances	2
5. Reasons for summoning Medical help :—	
Abnormal presentation	28
Obstructed and delayed Labour	39
Post partum haemorrhage	10
Ante partum haemorrhage	8
Rise of Temperature	5
Thrombosis	2
Retained and adherent placenta	4
Ruptured perineum	14
6. Notifications of still births	67
7. Notifications of artificial feeding	120
8. Notifications of having laid-out dead bodies ...	2
9. Suspensions for twenty-four hours on account of contact with cases of infectious disease	3
10. Notifications of liability to be a source of infection ...	3
11. Notifications of deaths	45

Four cases of puerperal fever were notified during the year. These cases are reviewed under the section for infectious diseases, and it is unnecessary to refer to them further here.

It was unnecessary to undertake any legal proceedings against midwives during the year.

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

The following is 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	2567
(b) Old Cases	3864
Attendances of Mothers with Children ...	9659
Cases seen by the Medical Officer :—	
(A) Under one year	
(1) New Cases	1240
(2) Old Cases	2456
(B) One to two years	
(1) New Cases	762
(2) Old Cases	839
(C) Two to five years	
(1) New Cases	500
(2) Old Cases	368
(D) Expectant Mothers	
(1) New Cases	482
(2) Old Cases	498

Analysis of cases dealt with by the Medical Officer :—

Consultations on infant feeding	1059
Diseases of respiratory system	295
,, new born ...	5
,, reproductive system	4
,, urinary system ...	14
,, nervous system ...	3
,, circulatory system ...	2
,, alimentary system ...	613
,, skin	247
,, ears	69
,, eyes	47
Exanthemata	63
Mental defects	2
Congenital defects ...	3
Orthopoedic defects ...	7
Rickets	2
Avitaminosis	67
Number of cases dealth with ...	2502
Number of attendances ...	6165

Ante-natal work—

Number of cases dealt with ...	482
Number of attendances	980

Return of Health Visitors' work—

(A) Under one year		
(1) Primary visits	...	1591
(2) Secondary visits	...	3533
(B) One to two years		
(1) Primary visits	...	1241
(2) Secondary visits	...	1346
(C) Two to five years		
(1) Primary visits	...	892
(2) Secondary visits	...	2694
(D) Expectant Mothers		
(1) Primary visits	...	800
(2) Secondary visits	...	595

The attendances at the clinic continue to steadily increase and are now assuming embarassing proportions, calling for all the energy and tact of the nurses and voluntary workers to deal with them, and in this connection we will have to consider the establishment of outlying centres in the near future to deal with the growing districts now springing up on the outskirts of the City.

The following cases were dealt with at the artificial sunlight clinic during the year :—

Avitaminosis	67
Debility	—
Rickets	2
Non-Pulmonary Tuberculosis ...	—
Anaemia	—
Number of cases treated	69
Number of Exposures	739

Section—VI. Control of Food Supplies

The following report has been contributed by Mr. S. R. J. Cussen, Chief Veterinary Officer :—

(A) SUPERVISION OF MILK.

511 samples of milk were examined in our laboratory during the year. These samples may be roughly divided into two groups :

1. Detailed bacteriological examination	...	274 samples
2. Dirt test only	...	237 ,,
Total ...	...	511

1. The first group *i. e.*, those submitted to full examination comprised samples collected as follows (according to designation) with the addition of 10 samples of pasteurised milk.

Highest Grade ...	...	20
Standard ...	...	31
New Milk ...	...	203
Pasteurised ...	...	10
*Pre-pasteurised ...	...	10
Total	...	274

The following tests were applied to these samples :—

(a) Sedimentation Test.

The procedure was identical with that outlined in previous reports and the results obtained in the various grades were :—

	Highest Grade	Standard	New Milk	Pasteurised
Very Clean ...	8	13	120	—
Clean	12	18	162	—
Fairly Clean ...	1	—	82	10
Dirty	—	—	59	—
Very Dirty ...	—	—	17	—
	20	31	440	10

(*Note*—Col. 3, new Milk, comprises *all* samples submitted to the sedimentation test. This includes samples of ordinary market milk which were submitted to this test *only* as well as samples submitted to full bacteriological examination. Hence the discrepancy between the total for this column and the group above).

* The term *pre-pasteurised* denotes raw milk that has been collected at a pasteurising station and which is intended for pasteurisation.

The Sediment (or Dirt) test is a simple and reasonably reliable one. It does not pretend to absolute scientific accuracy, but as a rough and ready index of general trends in the direction of cleanliness it maintains its position in the armamentarium of the dairy bacteriologist. Since its chief value is that of an indicator of general tendencies the results obtained over a number of years are set out below. Examination of the next two tables will show that there appears to be a definite improvement in the matter of general cleanliness.

Table 50.—Ordinary Market Milk—Result of Dirt Test.

Year	No. of Samples	Very Clean	Clean	Fairly Clean	Dirty	Very Dirty
1930	412	8	72	118	156	58
1931	408	23	61	82	139	103
1932	630	4	27	108	265	226
1933	485	3	27	105	221	129
1934	339	—	19	51	148	121
1935	223	—	7	21	103	92
1936	227	3	21	43	106	54
1937	206	5	31	80	70	20
1938	174	3	36	83	49	3
1939	714	61	184	224	193	52
1940	736	163	251	176	115	31
1941	440	120	162	82	59	17
Totals	4994	393	898	1173	1624	906

In order to test the general tendency in regard to cleanliness the last two columns of this table have been taken and further analysed. The results are shown in the next table.

Table 51.—Ordinary Market Milk—Proportion of Samples classified as "Dirty" 1930–1941.

Year	No. of Samples	Dirty	Proportion
1930	412	214	51.9 per cent.
1931	408	242	59.3 ,,
1932	630	491	77.9 ,,
1933	485	350	72.2 ,,
1934	339	269	79.3 ,,
1935	223	195	87.4 ,,
1936	227	160	70.9 ,,
1937	206	90	43·6 ,,
1938	174	52	29.8 ,,
1939	714	245	33.9 ,,
1940	736	146	19.8 ,,
1941	440	76	17.2 ,,

(b) **Microscopic Test.**

254 samples were submitted to routine microscopic examination. Acid-fast organisms were detected in none of those samples, streptococci were present in 8 and pus cells in 3, and blood in 5. In 246 instances the samples were free from suspicious organisms.

(c) **Bacteria of Faecal Origin.**

Determination of organisms of this character has been a routine for a number of years. Included in this group is B. Coli, the presence of which may be regarded as proving carelessness in the production and handling of milk. A full account of the test has been given in previous reports. The findings for the year were as follows :—

Table 52.—Results of Tests for presence of B. Coli in Milk.

Designation	No. of Samples Examined	B. Coli Present	Proportion Free from B. Coli
Highest Grade ...	20	1	95.0 per cent.
Standard ...	31	5	83.8 ,,
Ordinary Market Milk ...	203	3	98.5 ,,

(d) **Pathogenic Bacteria.**

Under this heading our principal concern is the presence of the *tubercle bacillus* in milk. Other organisms (*e.g.*, streptococci) are also concerned in a minor role and have been alluded to under the heading of microscopic examination. The biological test (involving the use of guinea pigs) is the only reliable test for tubercle bacillus and the results obtained over a number of years are set out in columnar form as follows :—

Table 53.—Tubercle Bacilli in Milk—Results of Biological Tests.

Year	No. of Tests	Positive	Proportion Positive
1931	2	—	—
1932	14	1	7.1 per cent.
1933	63	—	—
1934	10	—	—
1935	25	4	16.0 ,,
1936	201	13	6.4 ,,
1937	23	—	—
1938	90	7	7.7 ,,
1939	71	5	7.0 ,,
1940	94	4	4.2 ,,
1941	96	4	4.1 ,,
Total	689	38	5.5 ,,

The figures for individual years are, on the whole, on the small side so far as reliable information is concerned. The sum total, however, of some 700 tests yielding an approximate proportion of 5.5 per cent. positive may be regarded as a fairly accurate index of the amount of tubercle infection in the local milk supply. This is one aspect of the milk problem which recent legislation has done nothing to solve.

(e) **The Reductase Test.**

The modified method of Wilson has been used. As in the case of other tests mentioned, this method has been fully described in previous reports. Briefly, by means of a colour index which takes into account the rate of decolourisation of a standard solution of methylene blue added to given quantities of milk maintained at a standard temperature, the bacterial content (in numbers) can be estimated. The results obtained are set out below and in order to assist in the interpretation of these results it seems desirable to specify the values attached to the various grades :

Grade I	...	Less than 500,000 bacteria per c.c.
Grade II	...	500,000 to 4 million bacteria per c.c.
Grade III	...	4 million to 20 million bacteria per c.c.
Grade IV	...	Over 20 million per c.c.

Particulars of the various samples and the results obtained are set out below :

(a) Highest Grade Milk—		
Grade I	...	16
Grade II	...	3
Grade III	...	1
Grade IV	...	0
		20
(b) Standard Milk—		
Grade I	...	22
Grade II	...	5
Grade III	...	3
Grade IV	...	1
		31
(c) Ordinary Milk—		
Grade I	...	170
Grade II	...	49
Grade III	...	7
Grade IV	...	3
		229

For *pasteurised* milk and *pre-pasteurised** milk plating on nutrient media with direct colony counts was substituted for the Reductase test and by this method the following results were obtained :

Pasteurised		Pre-pastuerised*	
Sample Number	Bacteria per c.c.	Sample Number	Bacteria per c.c.
1	43,000	1	1,400,000
2	52,000	2	500,000
3	80,000	3	142,000
4	15,000	4	480,000
5	73,000	5	1,280,000
6	28,000	6	490,000
7	43,000	7	9,600,000
8	24,000	8	231,000
9	62,000	9	480,000
10	43,000	10	160,000

*See footnote on page 87.

Bacteriological Examinations.

(a) 133 samples were submitted to the Chief Veterinary Officer by the County M.O.H. of milk collected in creameries in the County Area. Collection and examination was at the instance of the Local Government Department.

(b) On behalf of the Department 71 samples of Designated Milk were collected in the urban area and examined in our Laboratory.

Prosecutions.

(A) MILK AND DAIRIES ACT, 1935.

24 persons were prosecuted for non-observance of the above Act.

15 convictions were obtained and fines amounting to £19 11s. 6d. imposed. 7 cases were marked proved and 1 was dismissed, and one was withdrawn on payment of costs.

With reference to the successful prosecutions—

6 summonses were brought under Section 24
10 ,, ,, ,, ,, 59
8 ,, ,, ,, ,, 60

Section 24.—Relates to the prohibition of the sale of milk by unregistered dairymen or on unregistered premises.

Section 59.—Relates to the prohibition of the sale of dirty milk.

Section 60.—Relates to the sale of milk in public places and prescribes for the conspicuous inscription of the dairyman's name and address on the vehicle, car or receptacle and the words *Bainne ar díol Machtar ar díol* or *Bláthach ar díol.*

Table 54.—Showing detailed results of proceedings against persons for infringements of the *Milk and Dairies Act*, 1935.

Prosecution under Section	Fines Imposed	Prosecution under Sestion	Fines Imposed
59 ...	5/- and Costs	24 ...	7/6 and Costs
24 ...	5/- ,,	24 ...	Proved
59 ...	5/- ,,	60 ...	Proved
59 ...	10/- ,,	59 ...	5/- and Costs
60 ...	2/6 ,,	60 ...	Proved
24 ...	7/6 ,,	60	Proved
60 ...	5/- ,,	60 ...	7/6 and Costs
59 ...	Dismiss	60 ...	2/6 ,,
24 ...	7/6 and Costs	60 ...	10/- ,,
24 ...	Proved	59 ...	7/6 ,,
59 ...	10/- and Costs	59 ...	Proved
59 ...	2/6 ,,	59	Withdrawn on Costs

(B) THE MILK AND DAIRIES REGULATIONS, 1936 and THE MILK AND DAIRIES (BACTERIOLOGICAL EXAMINATION) REGULATIONS, 1936.

47 persons were prosecuted for non-observance of the above Regulations. 28 convictions were obtained and fines amounting to £7 8s. 6d. imposed. 15 cases were marked proved, 1 withdrawn and 3 dismissed.

With reference to the successful prosecutions, particulars are appended herewith of the enactments concerned with the summonses which were undertaken—

(a) The Milk and Dairies Regulations, 1936

4	under article	8	(2)
1	,,	20	
3	,,	21	
3	,,	22	(3)
11	,,	22	(5)
1	,,	22	(6)
6	,,	27	
6	,,	28	
1	,,	22	(9)
4	,,	40	
2	,,	41	(4)
3	,,	42	(1)
1	,,	42	(2)
1	,,	43	(1)

Article 8 (2) of the Milk and Dairies Regulations prescribes " a dairyman shall not permit any person in his employment to commit an offence, whether by act or omission against these regulations and shall take all reasonable steps to prevent the commission of such an offence by such person."

Article 20 relates to the cleansing of yards and passages adjacent to cowsheds.

Article 21 relates to the cleansing of milk Stores, Milk Shops and appliances.

Article 22 (3) relates to the cleansing of Vessels and appliances.

Article 22 (5) relates to the storing of Vessels and appliances.

Article 22 (6) relates to the use of paper, cloth and absorbent substances.

Article 27 relates to the prevention of contamination by dust, dirt or flies.

Article 28 relates to the cleanliness of persons having access to milk.

Article 29 (2) Prescribes that the hair on the quarters, the flanks, the tail, and portions adjacent to the udder shall be kept cut short.

Article 40 relates to vehicles used for conveyance of milk.

Article 41 (4) relates to the filling and sealing of sale containers, and the marking on such of the name and address of the producer together with the date of production.

Article 42 (1) Prescribes that every sale container be provided with a tap.

Article 42 (2) relates to the taking of milk from a sale container other than by means of the tap.

Article 43 (1) Prescribes that no unauthorised person shall open any closed receptacle containing milk in any place which is not part of a registered dairy.

Table 55.—Detailed results of proceedings against persons for infringements of the *Milk and Dairies Regulations*, 1936.

Prosecution under Article	Fines Imposed	Prosecution under Article	Fines Imposed
42 ...	Proved	22 (5) ...	2/6 and Costs
22 (3) ...	Proved	22 (5) ...	Proved
22 (6) ...	7/6 and costs	22 (5) ...	,,
43 (1) ...	5/- ,,	22 (5) ...	5/- and costs
8 (2) ...	Dismissed	40 ...	15/- ,,
22 (3) ...	2/6 and costs	27 ...	Proved
8 (2) ...	2/6 ,,	22 (5) ...	,,
28 ...	Withdrawen on costs	22 (5) ...	,,
8 (2) ...	Proved	28 ...	5/- and costs
42 (2) ...	3/6 and costs	28 ...	5/- ,,
42 (1) ...	Proved	8 (2) ...	Dismiss
27 ...	2/6 and Costs	28 ...	5/- and Costs
22 (5) ...	Dismiss	40 ...	7/6 ,,
22 (3) ...	10/- and Costs	40 ...	7/6 ,,
27 (2) ...	2/6 ,,	22 (5) ...	Proved
20 ...	5/- ,,	41 (4) ...	Proved
29 (2) ...	Proved	21 ...	5/- and Costs
28 ...	10/- and Costs	22 (5) ...	Proved
41 (4) ...	3/6 ,,	27 ...	Proved
27 ...	3/6 ,,	21 ...	5/- and Costs
21 ...	3/6 ,,	22 (5) ...	Proved
27 ...	5/- ,,	28 ...	5/- and Costs
22 (5) ...	3/6 ,,	40 ...	7/6 ,,
42 ...	3/6 ,,	— ...	—

NOTICES SERVED.

The number of notices sent out under the Milk and Dairies Act and Regulations was 120.

B. MEAT INSPECTION.

1. **Meat Inspection Depot**—5,445 bovine carcases were examined. Of this number 1678 (30.8 per cent.) were found to be affected with varying degrees of tuberculosis. It was found necessary that 38 such carcases (0.69 per cent.) should be totally condemned as unfit for consumption, while 1,645 (30.2 per cent.) were partially condemned. In addition to the 5,445 bovine carcases above referred to, 685 sheep carcases were also examined at the Depot and all were found free from disease. 650 veal carcases were also examined and of this number 4 were totally and 31 partially condemned as being affected with tuberculosis. For diseases other than tuberculosis 6 bovine carcases (0.11 per cent.) were wholly condemned and 11 partially (0.20 per cent). For similar reasons 3 veal carcases (0.20 per cent.) were wholly condemned.

Table 56.—The amount (by weight) of meat examined and condemned at the Depot was as follows :—

Variety		Tuberculosis		Other Diseases	
	Quantity Examined	Quantity Condemned	Proportion	Quantity Condemned	Proportion
	lbs.	lbs.		lbs.	
Beef ...	2,721,000	20,038	0.73%	3,530	0.12%
Mutton ...	47,950	—	—	—	—
Veal ...	130,400	470	0.36%	84	0.06%

The amount of offals condemned at the Depot for Tuberculosis and other conditions was as follows :—

Part	Tuberculosis	Other Diseases	Total
Lungs	2,202	122	2,324
Hearts	1,028	84	1,112
Livers	637	1,448	2,085
Kidneys	87	—	87
Heads and Tongues ...	1,062	10	1,072
Total ...	5,016	1,664	6,680

Meat seized in shops and voluntarily surrendered during the year :—

	Seized	Surrendered
Beef	884 lbs.	153,777 lbs.
Pork	350 ,,	97,156 ,,
Poultry ...	11 ,,	—
Bacon	55 ,,	129 ,,
Veal	—	878 ,,
Fish	—	203 ,,
Fruit ...	—	157 ,,

2. Bacon Factories and Slaughterhouses.

Table 57.—**Tuberculosis.** The following are particulars of animals killed in local *slaughterhouses* and the incidence of tuberculosis therein.

Species	Number	Affected	Totally Condemned	Partially Condemned
Cattle ...	4,559	1,479 (32.4%)	55 (1.2%)	1,424 (31.2%)
Sheep ...	9,521	—	—	—
Pigs ...	1,179	87 (7.3%)	2 (0.17%)	85 (7.2%)

Particulars of animals slaughtered in bacon factories and reserved for local consumption were supplied to us by the Veterinary Inspectors of the Department of Agriculture. The number of carcases was 4,862, of which 1,839 (37.8%) were found to be affected with tuberculosis. 62 of these (1.2%) were totally condemned and 1,773 (36.4%) partially condemned.

Table 58.—**Diseases other than Tuberculosis.** Particulars of incidence found in *slaughterhouse* killings :—

Species	Number	Affected	Totally Condemned	Partially Condemned
Cattle ...	4,559	29 (0.63%)	22 (0.48%)	7 (0.15%)
Sheep ...	9,521	—	—	—
Pigs ...	1,179	1 (–)	1 (–)	—

For *Bacon Factories* the figures were 10 out of 4,826 (0.20%) affected, of which two carcases were totally rejected and the remaining 8 partially condemned.

31,920 lbs. beef meat (representing 1.4% of the quantity examined) were condemned in *slaughterhouses* on account of tuberculous infection, while 10,293 lbs. (0.45%) were condemned for other conditions. Of pork 1,361 lbs. (0.77%) were condemned on account of tuberculosis and 385 lbs. (0.21%) for diseases other than tuberculosis.—In *bacon factories* 75,343 lbs. (4.4%) were condemned for tuberculosis, less than 0.04% being condemned for other disease conditions.

Table 59.—Inspections carried out in *slaughter-houses* by our veterinary staff were as follows :—

Species	Carcases Examined	Condemned		
		Wholly	Partially	Meat & Offals
Cattle ...	4,559	77	1,431	82,109 lbs.
Sheep ...	9,521	—	—	—
Pigs ...	1,179	3	90	2,556 ,,

PROSECUTIONS.

Particulars	Fine	Particulars	Fine
Unsound Meat ...	5/- and costs	Unsound Meat ...	7/6 and Costs
Tuberculosis Beef ...	5/- ,,	do. ...	50/- ,,
do. ...	15/- ,,	Tuberculosis Beef ...	Proved
do. ...	20/- ,,	do. ...	7/6 and costs
Unsound Meat ...	Dismissed	do. ...	7/6 ,,
Tuberculosis Beef ...	7/6 and costs	do. ...	Withdrawn with costs
do. ...	7/6 ,,	do. ...	do.
do. ...	7/6 ,,	Tainted Hams ...	5/- and costs
do. ...	Proved	Tuberculosis Beef ...	5/- ,,
Unsound Fowls ...	40/- and costs		

THE SLAUGHTER OF ANIMALS ACT, 1935.

The provisions of this Act were outlined in the 1937 Annual Report, it is not proposed to make further reference to them here.

The provisions of the Act are observed in a reasonable way by occupiers of slaughterhouses and slaughtermen. The humane slaughter instrument, as approved by the Department, is used in all slaughterhouses within the Borough.

During the period under review there were 3 prosecutions under the Act :—

(a) Section 15—Failure to use an approved instrument.

(b) Section 18—Registered occupier of a slaughterhouse permitting an offence under the Act to be committed on his premises.

(c) Section 19—Slaughtering without being the holder of a licence for the time being in force.

Fines amounting to 18/6 and costs were imposed in these 3 cases, which brings the total amount of persons convicted under the Act since its inception to 26, and the total amount of fines to £7 13s. 6d.

There are at present 38 persons licensed to use the humane slaughter instrument.

The number of premises within the Cork Urban Sanitary District where meat and meat products are prepared for human consumption is as follows :—

Slaughter Houses.

Licensed (under Public Health Act, 1878)	20
Registered (being in use before the 1878 Act) ...	1
Registered (Under the Fresh Meat Act)	1

Bacon Factories :—

Where Pigs are slaughtered for Production of Bacon ...	4
Where Pigs are slaughtered for Bacon and Pork ...	4
Where Cattle and Sheep are slaughtered in addition to pigs for Bacon and Pork	4
Sausage Factories	15
Triperies	9

Number of inspections made of premises where meat is prepared and sold :—

Slaughter Houses	2,726
Sausage Factories	501
Triperies	965
Meat Markets	767
Butcher Shops	1,796
Pork Shops	214

In addition to the above the following inspections were made of provision shops, fish shops, fruit shops and hawkers stands :—

Provision Shops	818
Fish Shops	207
Fruit Shops	362
Hawker's Stands	1,015

The number of Notices served to abate nuisances and remedy defects in Slaughterhouses and Triperies—22.

(C) FOOD AND DRUGS ACTS.

MILK.

Appended herewith is the Report of the City Analyst (Mr. D. J. O'Sullivan, M.Sc., F.I.C.)

Table 60.—Showing the number of samples of Milk submitted for Analysis during the year and the results thereof.

Quarter ended	No. of Samples	Genuine	Adulterated
March 31st, 1941 ...	142	132	10
June 30th, 1941 ...	140	119	21
Sept. 30th, 1941 ...	153	147	6
Dec. 31st, 1941 ...	155	152	3
Totals ...	590	550	40

Table 61.—Showing results of proceedings against vendors of adulterated samples and fines imposed.

Extent and form of Adulteration			Fines Imposed	
			Fines	Costs
Deficient in Milk Fat	10%	... ...	5/–	15/8
,, ,,	6%	... ...	—	—
,, ,,	23%	... ...	—	—
,, ,,	13%	... ...	7/6	15/9
,, ,,	8%	... ...	5/–	15/9
,, ,,	8%	... ...	5/–	17/9
,, ,,	6%	... ...	—	—
,, ,,	5%	... ...	5/–	17/9
,, ,,	9%	... ...	2/6	15/9
,, ,,	10%	... ...	10/–	15/9
,, ,,	16%	... ...	—	—
,, ,,	13%	... ...	5/–	15/8
,, ,,	6%	... ...	3/6	15/8
,, ,,	11%	... ...	—	—
,, ,,	13%	... ...	—	—
,, ,,	6%	... ...	5/–	15/8
,, ,,	25%	... ...	5/–	15/8
,, ,,	8%	... ...	5/–	15/8
,, ,,	31%	... ...	10/–	16/6
,, ,,	21%	... ...	7/6	15/8
,, ,,	6%	... ...	2/6	15/8
,, ,,	8%	... ...	5/–	15/8
,, ,,	6%	... ...	2/6	15/8

BUTTER.

Table 62.—Showing number of Samples of Butter submitted for analysis during the year and the results thereof.

Quarter ended	No. of Samples	Genuine	Adulterated
March 31st, 1941 ...	20	19	1
June 30th, 1941 ...	35	34	1
Sept. 30th, 1941 ...	39	38	1
Dec. 31st 1941 ...	28	23	5
Totals ...	122	114	8

Table 63.—Showing results of proceedings against vendors of adulterated samples and fines imposed.

Extent and form of Adulteration			Fines	Costs
Butter + 1.0% excess water	...	...	2/6	17/1
Butter + 1.8% excess water	...	...	—	—
Butter + 4.3% excess water	...	...	5/–	16/10
Butter + 1.7% excess water	...	...	2/6	16/11
Butter +10.8% excess water	...	...	7/6	16/11
Butter + 1.1% excess water		...	5/–	16/11

MARGARINE.

Table 64.—Showing the number of samples of Margarine submitted for analysis during the year and the results thereof.

Quarter ended	No. of Samples	Genuine	Adulterated
March 31st, 1941 ...	12	12	—
June 30th, 1941 ...	17	16	1
Sept. 30th, 1941 ...	10	10	—
Dec. 31st, 1941 ...	—	—	—
Totals ...	39	38	1

SPIRITS.

Table 65.—Showing the number of samples of Spirits submitted for analysis during the year and the results thereof.

Quarter ended	No. of Samples	Genuine	Adulterated
March 31st, 1941 ...	4	4	—
June 30th, 1941 ...	1	1	—
Sept. 30th, 1941 ...	6	5	1
Dec. 31st, 1941 ...	12	10	2
Totals ...	23	20	3

Table 66.—Showing the number of miscellaneous samples submitted for analysis during the year and the results thereof.

Quarter ended	No. of Samples	Genuine	Adulterated
March 31st, 1941	111	111	—
June 30th, 1941 ...	100	100	—
Sept. 30th, 1941 ...	83	81	2
Dec., 31st 1941 ...	103	102	1
Totals ...	407	404	3

Table 67.—Showing details in regard to miscellaneous samples examined during the year.

Miscellaneous	Mar. 31st	June 31st	Sept. 30th	Dec. 30th
Black Pudding ...	2	4	2	5
Drugs	8	6	8	4
Sugar	5	7	3	—
Rice	8	2	1	1
Confectionery... ...	1	10	4	18
Cheese	9	7	10	11
Cream	2	3	—	2
Jam	7	9	11	9
Cocoa	7	2	—	—
Tea	2	—	—	—
Vinegar	3	2	3	5
Pepper	—	1	—	—
Sausages	8	5	4	4
Tinned Fish	2	—	—	2
Fish Paste	1	1	—	2
Flour	6	6	3	3
Cream of Tarter ...	1	—	—	—
Baking Powder ...	1	—	—	—
Beer	4	3	4	9
Dripping	3	1	4	4
Sauce	3	1	1	2
Salt	1	—	—	—
Lard	—	2	2	1
Bread-Soda	4	—	1	—
Wine	—	2	2	2
Cider	1	1	—	—
Coffee	1	—	2	2
Custard Powder ...	1	1	1	—
Mineral Waters ...	1	1	2	2
Jelly	—	—	1	3
Herbs	—	—	1	—
Mustard	—	—	—	—
Cornflour	1	—	—	—
Suet	1	1	—	1
Bovril	1	—	—	—
Meat Paste	1	2	1	—
Margarine	12	17	10	—
Bread	2	3	1	4
Oatmeal	—	3	—	—
Pearl Barley	—	2	—	1
White Pudding ...	—	1	—	—
Meat Cubes	—	1	—	—
Pea Flour	—	1	—	—
Bisto	—	1	—	—
Salad Cream	—	1	—	—
Tapioca	—	—	1	—
Cooked Meat ...	—	—	—	2
Dried Fruit	—	—	—	4
Soup	1	—	—	—
Total ...	111	110	83	103

REMARKS.

The number of adulterated samples amounted to about 5% of the total. This is about the usual proportion.

The following points of interest arose :—

Milk—The Milk (Percentage of Milk Fat and Milk Solids) (No. 2) Regulations, 1936 simply specify a minimum for milk-solids-other than-milk-fat and do not, as formerly, raise a presumption of the presence of added water in case of deficiency. The proof of the presence of added water is, therefore, for the prosecution in any given case. Scientifically, this proof depends on the determination of the disturbance of the freezing point of the milk. In a particular instance this disturbance was determined, offered to the Court as evidence extraneous to the Regulations, and accepted.

Margarine—The limit of 16% of water fixed in the Butter and Margarine Act, section 4, is in the opinion of the City Solicitor, sufficiently qualified by the wording of the Section to be inapplicable to retail sales.

Coffee Substitutes—These consisted uniformly of products of barley, roasted and ground.

Sausages—On the written request of the Military Authorities samples were taken in course of delivery by a contractor who had accepted a specification. For less than the specified amount of meat a certificate was issued, but the City Solicitor gave his opinion that proceedings under the Sale of Food and Drugs Acts were not feasible. Nevertheless, the Garda Authorities insisted on a prosecution and the contractor was convicted and fined.
In a second similar case proceedings were at first instituted and then withdrawn.

Section VII.—Water Supply.

BACTERIOLOGICAL EXAMINATIONS.

In the report for 1931 I outlined the procedure adopted in connection with the examination of the supply at the bacteriological laboratories of University College, Cork, by Prof. W. J. O'Donovan. In the year 1928 Dr. O'Donovan undertook a detailed and systematic examination in which a very large number of samples were studied. Our subsequent procedure has been based on his findings of that year and his recommendations have resulted in a supply of a consistently high degree of purity. In 1941, as in former years, samples were collected and examined on five days during each week. The procedure included an estimate of the number of bacteria growing at 37° C. in 24 hours. The total number of samples examined amounted to 266. The average number of bacteria in 1 c.c. was 3.74 and the number of samples sterile in 1 c.c. was 87.

Such routine examination of water supplies is of great importance as it affords an adequate check on the efficacy of purification methods and directs attention at once to any possibility of danger arising. The results achieved are not, perhaps, dramatic, but none the less they take their place in the ranks of achievement in the field of preventive medicine. An examination of our statistical tables for typhoid fever reveals at once the improvement which has taken place since the installation of adequate plant for dealing with purification of our supply. Water-borne disease has entirely disappeared and such cases of typhoid as have arisen have been definitely proved not to be attributable to the water. Considering the vital importance of water to the existence of the community, the sense of security arising from a supply of known purity is very great indeed, and in this respect it may be said that the funds invested in the erection of the new plant are not only a very sane form of insurance but also a valuable investment.

The routine procedure in connection with these examinations is that samples are collected by the staff of the Public Health Department in special sterilised bottles. These samples are transmitted to the Laboratory for examination. A report is sent daily to the Medical Officer of Health who, in turn, sends a copy to the Water Engineer. In the event of an unsatisfactory sample coming to light in the laboratory the subsequent cycle of events is speeded up by telephonic communications between the various departments pending receipt of a subsequent formal report. In this manner there is exercised a triple check in the purification and distribution of the supply.

In the following tables are summarised the results of the various examinations carried out during the year (and previous years) at the Bacteriological Laboratories, U.C.C., by Prof. O'Donovan and his staff.

Table 68.—Summary of results of routine examinations of water

Total Routine Samples of Tap Water	Bacillus Coli Test					Average daily No. of Bacteria per c.c.	No. of Samples sterile in 1 c.c.
	100 c.c's —ive	100 c.c's +ive	50 c.c's +ive	10 c.c's +ive	1 c.c's +ive		
266	245	10	8	1	2	3.74	87

As stated above, the examinations carried out during the year included an estimation of the numbers of bacteria growing at 37° C. in 24 hours. The findings are set out in the following table and compared with those of 1932 (in which year the figures were first computed) and following years.

Table 69.—Average number of bacteria per cubic centimetre growing at 37° C. from daily sample for each month.

Month	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
January ...	14.0	1.8	1.1	2.9	1.2	4.1	1.8	1.7	1.8	2.2
February...	0.8	1.0	1.6	2.7	1.2	2.8	2.2	1.4	5.3	0.7
March ...	1.6	1.1	1.3	1.6	0.9	1.4	1.9	2.9	1.8	2.8
April ...	4.6	1.5	1.4	1.0	1.6	1.2	1.5	2.6	1.0	1.6
May ...	4.5	1.8	3.4	2.7	1.9	0.7	0.9	1.7	1.3	10.1
June ...	5.4	4.1	21.2	2.1	1.9	0.2	1.4	21.5	4.4	7.3
July ...	44.1	19.2	18.4	2.9	5.0	3.7	2.0	6.6	11.8	4.6
August ...	20.3	14.6	7.4	5.2	1.8	1.0	1.4	6.7	4.2	4.1
September	2.2	2.7	1.7	8.9	3.4	2.8	2.2	3.0	4.5	1.4
October ...	4.6	2.1	4.0	7.9	1.4	6.4	2.0	30.8	4.5	1.6
November	4.7	1.3	4.2	4.4	2.7	2.8	2.6	9.4	4.5	7.2
December	2.2	3.9	4.0	1.2	3.9	5.4	2.2	3.5	2.8	1.4

Table 70.—Comparative results of examinations of tap water made during each of the years from 1928 to 1941.

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 (5.6%)	13 (4.5%)	10 (3.7%)
1931	260	242 (93.0%)	9 (3.5%)	9 (3.5%)	— —	— —
1932	260	245 (94.2%)	3 (1.2%)	12 (4.6%)	— —	— —
1933	253	244 (96.4%)	4 (1.6%)	4 (1.6%)	1 (0.4%)	— —
1934	261	249 (95.4%)	4 (1.5%)	6 (2.3%)	2 (0.8%)	— —
1935	252	235 (93.2%)	3 (1.2%)	7 (2.8%)	5 (2%)	2 (0.8%)
1936	252	244 (96.8%)	2 (0.8%)	5 (2%)	1 (0.4%)	— —
1937	253	235 (92.9%)	11 (4.3%)	6 (2.4%)	0 —	1 (0.4%)
1938	254	251 (98.8%)	1 (0.4%)	0 —	1 (0.4%)	1 (0.4%)
1939	259	254 (98.0%)	1 (0.4%)	3 (1.2%)	1 (0.4%)	— —
1940	261	244 (92.7%)	2 (0.8%)	10 (3.8%)	5 (1.9%)	2 (0.8%)
1941	266	245 (92.1%)	10 (3.7%)	8 (3%)	1 (0.4%)	2 (0.8%)

The bacteriological results indicate that a high degree of purity was maintained during the year, indicating a corresponding degree of efficiency in the purification plant.

Table 71.—Showing average consumption of Water per Head, per Day (in gallons).

Month	1934	1935	1936	1937	1938	1939	1940	1941
January ...	39.6	38.5	47.6	42.7	41.5	45.6	44.7	38.5
February ...	40.0	40.2	44.1	43.1	40.3	40.9	43.1	39.1
March ...	39.1	40.1	44.0	41.8	39.5	39.9	39.8	39.2
April ...	39.9	41.2	44.4	41.6	41.4	40.1	39.3	37.9
May ...	39.2	41.2	46.5	45.1	40.5	40.0	40.2	38.9
June ...	42.1	43.6	47.1	45.9	40.5	44.2	44.0	40.8
July ...	42.8	46.8	47.1	45.9	40.9	42.8	44.9	43.1
August ...	40.6	48.1	46.4	46.3	39.8	41.6	42.6	42.6
September ...	41.4	46.5	44.5	45.7	41.3	41.8	41.9	42.0
October ...	38.6	43.5	44.8	45.0	40.6	39.5	38.6	40.4
November ...	39.0	43.4	44.1	43.1	39.7	37.5	36.7	38.8
December ...	40.2	35.2	43.8	42.7	41.8	37.2	39.3	37.5

Section VIII.—Sanitary Department.

Table 72—Return of work performed by Sanitary Inspectors during 1941 :—

District	INSPECTION OF											SERVED	
	Houses and Yards	Tenement Houses	Tenement Rooms	Infected Dwellings	Common Lodging Houses	Milk Shops	Bakeries	Work Shops	Slaughter Houses	Factories	Out-workers	Justices Orders	Notices to abate nuisance
No 1 ...	7147	285	859	44	—	84	1	46	—	—	—	—	292
No. 2 ...	6796	2828	197	28	23	—	11	87	5	—	—	3	434
No. 4 ...	9357	1174	10096	49	155	424	72	717	174	—	—	3	196
No. 5 ...	5117	1545	6950	36	—	12	—	—	3	—	—	—	41
No. 6 ...	3668	1666	2573	53	23	12	2	68	5	—	—	15	571
No. 7 ...	10552	2634	1795	57	96	244	4	229	52	—	—	6	500
Female Inspector	—	—	—	—	—	—	277	2609	—	1162	394	—	10
Totals ...	42637	10132	22470	267	297	776	367	3756	239	1162	394	27	2044

District No. 3 is divided for purposes of supervision between Districts No. 2 and 4.

The number of inspections carried out by the Corporation Drain Tester was 4,031

Table 73.—Summary of Inspections, etc.

	No. of Inspections
Houses, yards, etc.	42,637
Tenement Houses	10,132
Tenement Rooms	22,470
Infected Dwellings	267
Common Lodging Houses	297
Bakeries	367
Workshops	3,756
Outworkers	394
Factories	1,162
Milk Shops	776
Slaughter Houses	239
Drains and W.C.'s Tested	4,031
Number of Notices to abate nuisances	2,044
Number of Justices' Orders	27
Amount of fines imposed in respect of same	£1 3 6

Table 74.—Return of Work carried out by **Veterinary Staff** during the year :—

Slaughter Houses	2,487
Butcher Shops	2,228
Tripe Houses	965
Meat Markets	767
Milk Shops	1,272
Milk Vans	1, 367
Cowsheds	86
Sausage Factories	501
Hawkers' Stands	1,015
Provision Shops	818
Pork Shops	216
Fish Shops	207
Fruit Shops	362
Cold Stores	32
No of Prosecutions Amount of Fines imposed }	See Section VI., Prosecutions

SHOPS (CONDITIONS OF EMPLOYMENT) ACT, 1938.

In the following tables are set out particulars of the work done by the Shops Inspector during the year.

Table 75.—Number of Inspections.

First Inspections	1,328
Subsequent Inspections	974
Total	2,302

Table 76.—Particulars of Defects Found.

Insufficient Ventilation	10
Insufficient Heating	26
No Heating Provided	7
No Seating Accommodation ...	2
Insufficient Sanitary Accommodation	10
No Sanitary Accommodation ...	11
No Accommodation for same ...	5
No Washing Accommodation ...	5
Total	76

Exemption Orders served (re Sanitary Accommodation) ...	1
Works Notices served	8

Section IX.—Housing

Houses erected and let	3054
Houses erected and bought out	77
Houses erected and still repaying mortgage	223
Houses in process of erection	Nil

Assistance to private persons and Public Utility Societies :—

(a) Under Section 6 of the Housing Acts, 1925–28...	£4,685	0	0
(b) Under the Housing Acts	£10,405	0	0

Assistance under Small Dwellings Acquisition Acts :—

(a) To houses built by Public Utility Societies ...	£103,125	0	0
(b) To houses built by Private Individuals ...	£58,347	10	0

Amount expended by Corporation on Working Class Dwellings, £1,041,000 0s. 0d.

A Scheme of 210 houses has been completed at the Greenmount Site. 186 houses have been let to persons whose accommodation has been the subject of operations under Sec. 23 Housing Act, 1931, and 24 houses were let to occupants of unsuitable accommodation.

The following table, shows the number and rents of the various houses built by the Corporation to date :—

Location	No. of Houses	Year Built	Weekly Rents (Including Rates)
Madden's Buildings ...	76	1886	4/4 to 6/6
Ryan's ,, ...	16	1888	2/4 to 5/-
Horgan's ,, ...	126	1891	2/8 to 6/5
Roche's ,, ...	128	1892	2/11 to 6/8
Corporation ,, ...	33	1900	5/-
Sutton's ,, ...	46	1905	5/9 to 6/7
Kelleher's ,, ...	50	1906	5/7 to 7/5
Barrett's ,, ...	89	1906	4/3 to 6/7
MacCurtain Villas ...	76	1922	11/4 to 11/10
McSwiney ,, ...	40	1923	11/-
French's ,, ...	30	1923	10/- and 10/6
Capwell	148	1928 *	8/6, 10/6 and 14/-
Turner's Cross	152	1930 *	8/-, 10/- and 13/-
Turner's Cross Extension ...	168	1932	11/6 and 12/6
Gurranabraher 1 ...	252	1934 †	2/6 to 8/-
,, 2 ...	25	1935	2/6 to 8/-
,, 3 ...	83	1935	8/6
,, 4 ...	78	1936 †	2/6 to 8/6
,, 5 ...	82	1936 †	3/6 to 9/6
Commons Road 1 ...	48	1936	9/6, 10/6 and 13/6
,, 2 ...	122	1936 †	3/6 to 9/6
,, 3 ...	64	1937 †	3/6 to 12/6
,, 4 ...	42	1937	10/6 and 12/6
Greenmount 1	86	1936 †	3/- to 8/-
Baker's Lane 1	178	1938	12/6 and 15/-
,, 2 ...	88	1938 †	3/6 to 12/6
,, 3 ...	34	1940/1†	3/6 to 18/-
,, 4 ...	208	1940/1†	3/6 to 18/-
Farranferris 1	113	1939 †	3/6 to 18/-
,, 2 ...	93	1939 †	3/6 to 18/-
Assumption Road ...	70	1941	16/-
Greenmount 1	186	1941/2†	3/6 to 18/-
,, 2	24	1941/2†	3/6 to 18/-
Total ...	3054		*Exclusive of Rates. †Differential Rents

Following representations under the 1931 Act to the City Manager by the Medical Officer of Health, Closing or Demolition Orders were obtained on the following houses :—

Abbey Street, 25, 26, 27.
Bandon Road, 104, 105, 116.
Crosses Green, 1, 11.
Donoughmore Place, 1. 2. 3. 4. 5, 6, 7, 8, 9, 10, 11, 12.
Evergreen Road, 114.
Evergreen Street, 45, 46, 53a, 68, 69.
Farrissey's Alley, 1, 2.
Fuller's Lane, 1, 4, 7, 9, 10, 11, 12, 13, 14, 15, 16, 19, 20, 21, 22.
Gillahugh Cottages, 17, 18, 19.
Grattan Street, 54, 55.
Griffin's Place, 2.
Gunpowder Lane, 17.
Henry Street, 10, 11.
High Street, 41.
Kitling's Lane, 1.
Lane's Villas, 1, 2.
Malachy's Lane, 1, 2, 3, 4, 5, 9, 10, 14, 15, 16, 17, 18, 19, 20, 21, 23.
Margaret Place, 8, 9, 10, 11, 12.
Margaret Street 7, 8, 9, 10.
Mary Street, 16.
Millerd Street, 23.
Murphy's Gardens, 7.
Old Weighhouse Lane, 20, 21.
Peter Street, 22.
Red Abbey Place, 10, 11.
Reed's Square, 32.
Rochford's Lane, 18, 19.
St. Finnbarr's Road, 34, 36, 37, 38, 39, 40, 41.
Sober Lane, 1. 2.
Stephen Street, 31.
Sullivan's Quay, 25.
Tower Street, 46, 47.

Table 77.—Showing the number of houses built since 1934 and the number of families rehoused and the effect on the population of the City:—

Location	Number of Houses	City Area		County Area	
		Families	Persons	Families	Persons
Gurranabraher ...	520	516	2923	4	22
Commons Road ...	276	10	79	266	1643
Greenmount ...	86	86	430	—	—
Baker's Lane	508	307	1850	201	1210
Farranferris ...	206	—	—	206	1123
Greenmount ...	210	210	1250	—	—
Assumption Road ...	70	70	300	—	—
Totals ...	1876	1199	6832	677	3998

Section X.—Port Sanitary Administration

Constitution of the Port Sanitary Authority.

The port was constituted a port sanitary district by the Local Government Board (Ireland) on 27th April, 1903. The Authority consists of twenty members chosen by the respective riparian authorities who elect representatives to the joint board as follows :—

By the Lord Mayor, Aldermen and Councillors of the County Borough of Cork	12
By the South Cork Board of Public Health ...	5
By the Urban District of Cobh	2
By the Urban District of Passage West ...	1

The South Cork Board of Public Health was substituted for the Cork County Board of Public Health as a constituent Authority by the Local Government and Public Health Provisional Order Confirmation Act, 1937, as from 1st April, 1937, on which date the provisions contained in the Order came into operation.

Apportionment of Expenses.

Cork County Borough contributes ...	62½ per cent. of the total
South Cork Board of Public Health ...	25 ,,
Cobh Urban District Council	10 ,,
Passage West Urban District Council ...	2½ ,,

Limits of Jurisdiction.

These are defined in Act 18 of the Cork Port Sanitary Order No. 3 as follows :—"The jurisdiction of the said Port Sanitary Authority shall extend to the whole of that part of the customs port of Cork that lies between Power Head and Cork Head in the County of Cork, together with the waters of the said port of Cork within such limits and all docks, basins, harbours, creeks, rivers, channels, bays and streams within the aforesaid limits and the places for the time being appointed as the customs boarding station or stations for such part of the said port and the places for the time being appointed for the mooring or anchoring of ships for such part of the said port under any regulations for the prevention of the spread of diseases issued under the authority of the statutes in that behalf."

Quarantine Anchorage.

Anchorage for vessels with cases of infectious disease on board is between the town of Cobh and the Spit buoy.

Cuskinny Intercepting Hospital.

The intercepting hospital is situated about two miles east of the town of Cobh and about half-a-mile from Cuskinny Strand on the northern shore of the harbour. The hospital was built in the year 1880 by the old Cork Board of Guardians and was acquired by the Port Sanitary Authority in the year 1902 from the Commissioners of Public Works (Ireland) and since has been kept in good repair and condition. During the past year minor repair work was carried out. The function of the hospital is to deal with the more serious types of infectious disease (e.g., small pox, plague, cholera, typhus, etc.) should any such cases arrive in the port necessitating hospital treatment or isolation. Infected vessels would moor at the quarantine anchorage; the patient being removed by motor launch and landed at Cuskinny Strand or some suitable slipway and transferred to the Authorities' ambulance for transport to the hospital. In point of fact it is many years since the hospital was called upon to deal with any cases and the likelihood of such cases arising in the future is not very great. The greatly increased speed of modern sea transport, together with the precautions taken at all sea ports throughout the world in regard to the prevention of infectious disease has greatly reduced the risk of such diseases being introduced to this port. While, however, any such risk exists, the hospital will have to be maintained unless adequate alternative measures are adopted for dealing with cases. Although no case has been admitted since 1918, arrangements can be put on foot for dealing with possible admissions at a moment's notice as it has been the policy to maintain the hospital on this basis. The caretaker has fulfilled her duties in this respect in a praiseworthy manner.

Procedure for granting Pratique.

Deepladen vessels arriving in the lower harbour and bound for Cork may be detained there for tide. Such vessels are boarded by an officer of the Customs and Excise, who puts the usual questions to the master in regard to the prevalence of illness on board and especially in relation to cholera, plague and yellow fever or as to the prevalence of same at any ports of call en route. If the answers are in the *negative*, free pratique is granted and the vessels allowed to proceed to her moorings. If any answers are in the affirmative, pratique is not granted until the vessel has been visited by the Port Medical Officer. Vessels of light draught able to proceed to the City at any state of the tide are hailed while passing Cobh and if the answers are satisfactory are allowed to proceed to Cork where they are boarded by the Customs Officer and the usual questions are put. In addition, instructions have been sent to all shipping agents for companies using the port of Cork that masters of vessels approaching the port with cases of infectious disease on board are to notify the Authority by wireless.

Measures against Rodents.

All vessels from foreign ports are boarded immediately on arrival by the Port Sanitary Officer who, after satisfying himself as the documents relative to health and deratisation certificates proceeds to the examination of the vessel in regard to rat infestation, particular attention being paid to cargo surfaces as soon as the holds have been opened up. The various cargo compartments are searched for sick or dead rats,

which, if found, are submitted at once for bacteriological examination So far a positive result has not been obtained, but such a result would necessitate suspension of discharge of cargo. In addition, traps are laid in various parts of the ship and rats caught are submitted to examnation. Precautions adopted to prevent migration of rodents ashore. comprise the placing of rat guards on all mooring ropes and wires of all except cross-channel vessels. In addition, grain boats from the Argentine have to keep their gangways lime-washed daily and well lighted at night whilst alongside the quays.

The following measures would be adopted in this port in the event of a vessel being found effected with human or rodent plague to prevent egress from ship to shore :—

(1) Vessel would be breasted off at least six feet from the quayside by placing wood floats between it and the quay wall.

(2) Besides the adjusting of rat guards, moorings would be parcelled with old canvas on shore side of rat guards and same smeared with Stockholm tar.

(3) Gangway would be required to be lifted from sunset to sunrise.

(4) Intensive trapping and examination of rodents caught in the immediate neighbourhood of the ship's berth.

Of all diseases liable to be introduced by shipping, *plague* is without doubt the most to be feared, hence the necessity for the stringent precautions in regard to its prevention. Several of the ports from which shipping arrives in Cork are situated in countries in which plague is endemic, even though the ports themselves may not actually be infected at the time of departure. There is, however, the ever present danger of the importation of *plague infected rats* from such ports and it is in consequence of this danger that so much importance is attached to the systematic trapping and examination of rats taken on vessels coming into this port. As there is always a certain amount of migration of rats from ships to the shore while vessels are tied up at their moorings it is also necessary to maintain a constant sampling and examination of the shore rats taken in warehouses adjacent to the quays. It will be noted from the appropriate tables that of 119 rats taken during the past year, 28 were submitted to post-mortem examination and that all gave negative results. In the previous year 146 were trapped, of which 66 were examined, also with negative results. The rats are examined in the first instance by the Inspector, under the supervision of the Chief Veterinary Officer. In the event of a suspicious finding, the carcase would be referred to the Bacteriological Department of University College for a further examination.

The fact that so many rats have been examined and found negative is not by any means an indication for relaxation in the measures which have been adopted in connection with their reduction and the prevention of plague. One infected rat coming ashore might be the cause of an outbreak among the shore population and from time to time we are reminded of this ever present danger by the discovery of plague infected rats in other ports. Plague is rarely transferred from one human being to the other, such transfer requires an intermediary and the agent is

almost always the rat flea. It is only when an epizootic breaks out among the rats and large numbers die that the infecting flea seeks a new host and may transfer his attention to human beings. In countries where the disease is endemic, outbreaks among human beings are always heralded by excessive mortality among rats. Excessive rat mortality on board ship is a very suspicious sign of plague infection and masters are bound to notify any such happening at the port of arrvial. Plague is such a deadly disease that no relaxation in preventive measures can be tolerated and for this reason it is necessary to keep up a constant watch over vessels arriving from foreign parts and for systematic examination and extermination of rats.

Water Supply.

Drinking and boiler water is obtained directly from the public supply. There are upwards of 80 such hydrants available in this port. As mentioned in the section dealing specifically with the supply to the City, the water is subjected to systematic sampling and bacteriological examination throughout the year. 266 samples were examined during. the year and the results indicated that the water was of first-class quality Of this number, 21 were taken direct from hydrants at the quayside.

Sanitation of Coasting Vessels.

I am able to report a definite improvement in the sanitary arrangements on board the majority of the vessels using this port. This improvement is, in my opinion, entirely due to the assiduity of your officer, Mr. Kieran, in following the cases of defects which have come to his notice. Notwithstanding the relaxation which has had to be admitted as a consequence of hostilities, it is satisfactory to note that a very fair standard of cleanliness has been maintained on board the majority of the vessels. A large number of coasters are now being pressed into service which had not previously visited this port and an effort is being made to ensure that reasonable standards are maintained on these also.

Measures against Rodents Ashore.

During the year intensified measures against rodents in the mills and stores abutting the quays have resulted in further minimising the danger of the introduction of rodent plague into the port. The majority of the premises around the port have signed yearly contracts with a Dublin firm, who specialise in the destruction of rodents, whilst those who have no such contract, themselves, lay down poison from time to time. The effects of this poisoning campaign cannot be determined in numbers, but if 25 per cent. of the treatments are effective, it will prevent a recurrence of the heavy rodent infestation discovered around the quays in 1937. The contract with these specialists in rodent destruction calls for a poison treatment of the stores and mills every three weeks, and in the event of reinvasions, further baits are laid down between the periodical treatments. Trapping for specimen rodents is routine, and the same procedure for the bacteriological examination is still in operation namely: a preliminary examination by the Port Medical Officer or the Chief Veterinary Officer, and if found necessary a further examination of the specimen by the bacteriological department of the University College, Cork.

During the year 78 rodents have been trapped ashore and 20 post mortem examinations held, all of which proved negative.

Rat Proofing Ashore.

It must be realised that the proofing of some of the old premises abutting the quays has not proved very successful in one or two cases on account of the apparent honeycombed condition of the limestone supporting walls which are from three to four feet in thickness and the ease with which these pests can burrow through these walls when the old runs have been cement proofed. The hollow sound of some of the old stone flagged floors give rise to the belief that the soft ground beneath must be similarly burrowed, and it appears in one instance that runs underneath the floors extend inwards for a distance of at least 60 feet before breaking the surface through soft ground at the rear. With such conditions prevailing, rat proofing would have to be undertaken on a large scale, and it is even doubtful then, whether these premises would be efficiently proofed on account of their structure.

Badly fitting doors, unprotected skylights, etc., contribute in a minor degree to the continual infestation of this type of premises, but the huge quantities of grain in sacks lying for long periods are the main attraction for rodents, as they provide for these pests nesting places which are very difficult to detect, for the rodent, ever suspicious, builds breeding places as high as five sacks high from the ground and as far into the centre as it is possible to get. As it is impossible therefore to spread bait close around this breeding area, the only means left is to surround these large sacks of grain with poison baits and to try and drop as many as possible from the top through the tiers of sacks towards the centre, and to abundantly distribute baits around the sources of their water supply. A few excellent methods of rat proofing stores intended for the storage of sacks have been noticed, these consist of a wired-in cage arrangement with either one or two doors, but unfortunately the most important point in preventing rodents gaining access to the roofs for water have been overlooked when building this framework and consequently its effectiveness has been considerably reduced, doors not being fitted with self closing springs remain open during the working day and stray rodents find no difficulty in gaining admittance. The defects in these structures have been pointed out to the charge hands from time to time, but I regret to say no serious effort has been made to have them remedied. Mill managers and managers of grain stores have been satisfied with the results of the poisoning campaign as it has saved them money and at the same time lightened the burdens of those who administer Public Health in the Port Sanitary area.

Table 78.—Return of Shipping entering the Port since 1928.

Year	Number of Arrivals			Tonnage		
	Foreign	Coastwise	Totals	Foreign	Coastwise	Totals
1928	442	1,492	1,934	261,612	488,158	749,770
1929	260	1,567	1,827	283,759	525,231	808,990
1930	297	1,636	1,933	364,650	617,783	982,433
1931	272	1,566	1,838	345,430	647,327	992,757
1932	315	1,375	1,690	352,459	602,509	954,968
1933	399	893	1,292	371,757	462,047	833,804
1934	404	817	1,221	407,188	463,169	870,357
1935	285	1,015	1,300	323,631	525,062	848,693
1936	249	1,053	1,302	277,779	583,922	861,701
1937	250	1,098	1,348	300,730	594,396	895,126
1938	239	1,084	1,323	280,403	598,114	878,517
1939	202	1,074	1,276	274,660	521,801	796,461
1940	116	1,053	1,169	174,087	373,841	547,928
1941	—	522	522	Nil	203,976	203,976

Table 79.—Summary of Inspections and Defects.

Description	Number of Arrivals	Tonnage of Arrivals	Number Inspected	Number Defective	No. of Defects Remedied
Foreign Steamers	Nil	Nil	Nil	Nil	Nil
Coastwise Motor	522	203,976	474	131	119
Total	522	203,976	474	131	119

Table 80.—Return of Vessels entering the Port which were dealt with by the Department each month during 1941.

Month	Foreign	Coastwise	Total
January ...	—	48	48
February ...	—	34	34
March ...	—	45	45
April ...	—	36	36
May ...	—	49	49
June ...	—	47	47
July ...	—	44	44
August ...	—	46	46
September ...	—	42	42
October ...	—	35	35
November ...	—	25	25
December ...	—	23	23
Totals ...	Nil	474	474

Table 81.—Return of Imports and Exports, 1929/41.

Year	Imports (tons)	Exports (tons)
1929	815,347	86,246
1930	906,340	120,610
1931	861,782	85,704
1932	890,377	104,884
1933	710,149	89,319
1934	784,174	66,606
1935	743,939	63,219
1936	788,545	73,673
1937	829,704	78,530
1938	802,238	65,147
1939	900,644	105,659
1940	734,888	74,517
1941	262,222	37,448

Table 82—Sanitary defects and nuisances dealt with during 1941.

Dirty Focsles	76
Dirty Store Rooms	10
Accumulation of Offensive Rubbish	1
Damp Quarters	9
Leaky Deckheads	15
Defective Port Frames and Discs	28
Defective Ventilators	7
Defective Flooring Boards and Decks	2
Defective Lockers...	14
Defective Hawse Pipes	4
Defective Spurling Pipes	1
Defective W. C. Fittings	18
Defective Bogie and Galley Stoves	8
Defective Washbasins	3
Defective Waste Pipes	3
Defective Doors	4
Defective Shellplating in Focsles	2
Defective Washing Trough	1
Defective Bunks	2
Total	198
Verbal Notices Given	102
Memos. left on Board	39
Statutory Notices Served	1
Total	142

A total of 1,051 inspections of vessels was carried out during the year.

TABLE 83—RATS TRAPPED ASHORE.

Month	No.	Mus Decumans	Mus Alexandrinus	Mus Rattus	Species Unknown	No. of P.M. Exam.*
Jan. ...	6	5	—	1	—	1
Feb.	6	—	6	—	—	1
March ...	10	1	8	1	—	5
April ...	5	1	4	—	—	3
May ...	8	7	1	—	—	2
June ...	7	3	4	—	—	3
July ...	10	3	7	—	—	1
August	9	5	—	—	4	1
Sept.	6	1	5	—	—	1
Oct. ...	5	2	3	—	—	1
Nov. ...	6	3	3	—	—	1
Dec. ...	—	—	—	—	—	—
Total ...	78	31	41	2	4	20

* All P.M. Examinations proved Negative.

TABLE 84—RATS TRAPPED ON VESSELS

Month	No.	Mus Decumans	Mus Alexandrinus	Mus Rattus	Species Unknown	No. of P.M. Exam*
January	7	2	2	3	—	3
Feb. ...	—	—	—	—	—	—
March	—	—	—	—	—	—
April	—	—	—	—	—	—
May ...	34	10	3	17	4	5
June ...	—	—	—	—	—	—
July ...	—	—	—	—	—	—
August	—	—	—	—	—	—
Sept. ...	—	—	—	—	—	—
October	—	—	—	—	—	—
Nov. ...	—	—	—	—	—	—
Dec. ...	—	—	—	—	—	—
Totals	41	12	5	20	4	8

* All P.M. Examinations proved negative.

Section XI—Meteorology.

I am indebted to Prof. H. N. Walsh, University College, for the following particulars concerning the weather conditions during the year, and more especially for the trouble which he has gone to to bring up to date the Tables which follow.

Table 85.—Rain fall in inches for each quarter and for each year, 1901–1941.

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	1.14	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
1932	8.54	8.11	7.31	13.62	37.58
1933	8.61	8.74	5.22	6.47	29.04
1934	9.66	7.13	11.49	13.75	42.03
1935	5.33	9.33	9.98	10.97	35.61
1936	16.77	4.51	9.13	9.88	40.29
1937	19.67	6.12	7.90	8.52	42.21
1938	9.22	7.38	7.99	15.14	39.73
1939	13.01	4.94	7.43	16.53	41.91
1940	14.74	6.64	3.80	17.96	43.14
1941	12.82	5.47	5.73	14.40	38.42

The mean temperature for 1941 was 49.9° F. The warmest day was June 28th with a maximum shade temperature of 79° F. The warmest night was June 29th with a minimum shade temperature of 62° F. The coldest night was January 3rd with a minimum shade temperature of 23° F.

Table 87—Temperature at Cork (in the Shade) for 58 years ending 1941.

YEAR	January			February			March			April			May			June			July			August			September			October			November			December			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	Max.	Min.	Mean	
	Degrees			Degrees			Degrees			Degrees			Degrees			Degrees			Degrees			Degrees			Degrees			Degrees			Degrees			Degrees			
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	73	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	58.4	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	70	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	34	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	57.4	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	69	49	53.5	78	41	58.6	68	43	57.0	68	38	57.0	60	28	45.9	52	29	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	28	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	63	36	51.2	66	32	52.9	74	44	55.7	61	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	23	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	36	40.8	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	57	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	75	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
1932	56	27	45.6	51	29	41.0	57	25	43.1	58	33	45.5	67	33	51.5	76	39	59.4	75	47	60.5	78	44	63.1	72	34	55.4	66	30	48.3	58	30	46.5	53	31	44.4	50.4
1933	56	23	39.1	58	24	41.7	60	33	46.3	61	30	49.2	68	41	54.4	72	47	60	82	47	63.7	81	45	62.6	78	35	60.1	67	34	51.0	58	25	43.4	51	26	40.4	51.0
1934	56	27	42.5	53	26	39.5	58	30	44.0	63	30	41.5	70	33	51.5	76	38	57.0	82	50	6.0	71	38	54.5	72	38	55.0	63	33	48.0	55	29	42.0	55	33	44.0	48.3
1935	55	26	40.5	57	24	40.5	59	27	43.0	67	34	50.5	70	30	50.0	75	48	61.5	76	44	60.0	76	41	58.5	70	40	55.0	65	55	50.5	55	24	39.5	52	19	35.5	48.7
1936	54	29	41.5	53	30	41.5	58	30	44.0	60	30	45.0	73	35	54.0	75	39	57.0	70	44	57.0	80	44	62.0	72	34	53.0	65	34	49.5	57	27	42.0	55	27	41.0	48.9
1937	58	26	42.0	57	30	43.5	54	25	39.5	66	37	51.5	72	30	51.0	71	43	57.0	77	45	61.0	77	45	61.0	70	40	55.0	65	29	47.0	56	25	40.5	54	24	39.0	49.0
1938	49	4	37	43.3	49	38	43.7	55	43	49.0	58	37	47.8	59	45	52.0	64	50	57.1	65	51	58.2	67	53	60.1	64	49	57.0	58	45	51.4	54	42	48.4	48	32	40.0	50.6
1939	46	36	41.4	55	40	47.9	51	37	44.5	56	41	48.5	63	46	54.7	68	48	58.6	65	52	59.3	69	54	62.0	64	51	58.1	56	39	48.1	54	43	48.8	64	35	40.8	51.0
1940	54	22	38.0	57	24	40.5	59	27	43.0	63	30	48.5	70	37	53.5	80	42	61.0	74	45	59.5	78	42	55.0	79	36	57.5	62	27	44.5	60	27	48.5	55	25	40.0	49.1
1941	51	23	37.0	58	25	42.5	59	28	43.5	62	31	46.5	66	30	48	79	45	62	73	42	57.5	78	44	61	75	42	58.5	66	32	49.0	56	28	42.0	55	35	45	49.3

Table 88. Showing Monthly Rainfall in Cork for 64 years ending 1941.

Month	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Jan. ...	2.28	6.32	1.76	1.39	3.91	6.43	6.18	4.60	3.40	4.88	5.42	2.82	6.60	2.30	3.35	5.98
Feb. ...	2.80	4.77	4.78	5.46	4.86	6.88	7.35	8.48	3.76	1.60	0.41	2.42	3.16	0.53	4.14	3.96
March ...	0.95	1.23	3.28	5.20	2.60	3.78	5.46	2.75	5.91	2.18	3.14	1.35	4.55	1.51	1.24	0.26
April ...	4.55	3.70	2.84	1.64	5.05	2.66	1.94	4.30	2.43	1.13	1.78	4.55	1.57	2.44	0.88	1.54
May ...	4.84	1.85	0.90	1.76	2.31	1.35	1.60	3.05	2.40	1.06	3.46	4.57	3.93	2.65	2.74	2.01
June ...	6.74	8.27	1.93	4.79	3.36	2.30	0.79	1.42	1.32	0.30	4.23	1.78	2.86	3.45	2.78	1.66
July ...	1.25	4.24	1.68	1.85	4.90	3.50	2.75	1.52	5.60	1.43	5.36	4.83	2.26	1.55	3.16	1.79
August ...	3.06	2.84	1.07	4.95	3.20	4.17	0.95	4.07	2.78	2.9	3.38	1.11	2.28	3.99	7.75	5.42
Sept. ...	2.42	3.25	1.80	2.38	2.65	5.07	2.40	5.42	3.93	2.45	0.98	3.87	2.09	3.12	3.64	1.34
Oct. ...	2.97	0.59	2.49	3.99	4.50	2.85	1.72	2.14	6.15	2.75	2.98	3.87	1.40	4.79	3.27	2.55
Nov. ...	1.88	0.65	3.24	6.95	4.67	4.03	3.50	3.21	2.42	2.55	7.31	2.55	4.94	4.26	8.18	2.11
Dec. ...	2.24	1.76	3.13	5.50	4.87	1.06	3.84	2.06	4.77	3.22	7.40	3.53	3.92	6.27	3.94	5.29
Total ...	37.98	41.43	30.74	45.86	45.98	42.18	37.85	40.81	44.76	26.45	48.13	34.06	39.16	39.10	44.94	33.93
No. of Raindays	190	232	170	220	215	222	205	185	252	159	195	159	203	196	193	170

Month	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Jan. ...	6.15	5.75	1.14	3.27	2.51	4.53	3.55	5.68	1.86	8.36	5.81	3.59	3.88	1.27	2.83	1.80
Feb. ...	2.23	2.56	1.90	2.67	1.53	5.28	6.16	1.79	6.22	3.45	5.99	1.60	3.35	1.98	2.31	2.25
March ...	1.84	3.19	2.98	6.29	0.63	1.82	0.78	3.52	1.77	5.26	2.56	7.49	1.25	0.93	3.38	2.77
April ...	6.55	2.95	0.48	5.30	3.71	3.66	3.68	4.42	3.22	2.41	2.62	3.44	1.40	2.70	1.47	4.78
May ...	0.88	0.77	0.16	1.03	2.38	3.04	2.65	1.88	2.00	2.49	2.23	0.86	3.26	3.06	2.82	1.02
June ...	2.10	3.33	2.16	3.08	2.02	1.37	4.26	1.58	3.13	3.95	2.14	2.52	1.66	3.39	1.20	2.79
July ...	1.90	3.64	4.71	0.94	1.26	1.85	1.64	5.62	2.71	5.85	4.25	1.16	3.02	2.44	1.72	0.53
August ...	2.63	4.60	1.45	4.52	6.20	2.71	3.04	2.31	3.43	4.40	2.49	6.33	1.69	2.34	2.63	0.42
Sept. ...	1.40	1.30	3.46	2.42	3.06	1.13	0.81	8.32	1.95	4.22	4.02	1.41	0.89	1.15	4.04	0.46
Oct. ...	6.29	2.07	3.25	5.07	7.73	1.7	5.88	2.59	1.22	6.14	2.85	1.05	4.34	5.40	2.88	4.18
Nov. ...	5.30	7.88	1.63	5.30	3.05	3.36	5.03	1.79	9.33	1.76	1.55	4.81	3.01	4.88	2.03	0.47
Dec. ...	3.08	10.93	6.96	4.35	3.44	15.11	6.52	5.44	3.37	4.90	3.01	6.34	1.91	6.64	3.68	4.26
Total ...	40.31	49.68	32.22	44.89	35.64	45.91	49.3	49.12	40.51	53.11	39.93	41.40	30.96	35.86	31.54	28.18
No. of Raindays	158	194	179	221	192	182	224	191	187	238	214	182	186	194	207	164

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Jan. ...	3.07	0.80	5.03	7.40	1.93	3.46	2.04	3.97	4.94	4.64	5.96	2.37	6.46	1.92	8.04	3.66
Feb. ...	5.61	1.82	4.76	2.30	6.46	7.44	4.30	3.65	6.12	3.66	1.67	2.16	4.42	4.53	2.97	4.42
March ...	2.60	1.29	3.69	4.00	5.35	0.72	2.34	0.325	3.69	2.46	4.14	2.91	2.22	3.96	1.31	0.22
April ...	1.88	1.77	0.54	3.39	1.37	1.59	3.25	3.12	1.73	3.30	5.54	0.54	2.98	4.29	2.44	3.32
May ...	1.84	1.48	1.30	4.57	1.40	2.52	2.91	4.045	2.75	5.18	3.36	3.46	1.67	0.90	3.62	4.35
June ...	3.44	2.86	5.17	2.09	0.88	2.16	3.03	2.77	1.11	0.43	3.22	0.02	0.80	0.16	3.79	0.63
July ...	2.14	2.03	5.06	0.20	3.00	3.22	2.48	3.57	4.43	1.49	3.96	3.77	3.21	2.37	3.46	2.77
August ...	4.73	2.99	3.21	2.27	3.78	2.22	3.76	6.54	2.03	3.13	2.18	3.59	3.91	5.34	2.15	3.03
Sept. ...	1.35	2.56	1.04	5.27	3.07	1.82	1.12	3.29	0.41	2.15	2.66	1.35	3.65	2.96	5.86	2.63
Oct. ...	4.37	3.98	2.52	6.61	1.51	5.64	9.13	3.51	3.39	0.51	3.86	2.90	1.06	4.48	4.22	3.31
Nov. ...	4.63	4.19	1.37	4.45	2.96	3.48	9.04	3.06	3.22	1.90	4.16	5.16	1.83	3.65	5.96	2.48
Dec. ...	4.33	4.84	3.16	1.41	10.73	8.26	2.94	2.66	7.12	4.36	5.12	1.84	4.36	2.27	7.48	4.13
Total ...	40.39	34.55	36.88	44.10	42.62	42.83	46.30	32.33	47.44	31.43	46.01	28.87	37.25	41.06	51.56	41.13
No. of Raindays	240	209	244	211	213	198	211	182	219	189	217	178	203	214	225	197

Month	1926	1927	1928	1929	19[illegible]	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Jan. ...	9.16	4.75	5.39	2.23	7.[illegible]	5.16	3.06	4.67	0.84	7.51	9.64	4.59	5.70	6.08	6.83
Feb. ...	4.74	2.66	3.42	8.16	1.[illegible]	0.37	2.25	0.32	2.95	6.03	4.66	3.11	4.38	7.93	4.02
March ...	1.50	4.79	7.33	0.89	6.[illegible]	3.24	2.74	4.87	1.54	3.23	5.09	1.52	2.93	2.73	3.99
April ...	3.04	1.21	5.66	1.40	2.[illegible]	2.48	2.58	3.52	3.31	1.18	3.50	0.10	2.08	3.51	3.42
May ...	2.47	2.38	2.60	4.01	1.[illegible]	4.24	4.37	1.98	0.71	1.36	1.96	4.48	2.38	2.23	2.34
June ...	2.28	2.57	1.60	1.21	2.[illegible]	3.89	1.09	1.63	5.31	1.55	0.68	2.80	1.78	0.94	3.71
July ...	1.67	4.35	1.01	4.29	7.[illegible]	2.47	2.46	2.20	0.50	5.67	3.21	3.97	6.20	2.39	2.33
August ...	2.59	3.08	3.04	2.16	3.[illegible]	2.24	1.64	3.31	2.66	0.56	1.68	1.85	1.56	0.22	2.06
Sept. ...	0.51	3.62	2.26	0.82	6.[illegible]	2.36	1.58	5.98	6.80	2.88	3.01	2.37	1.65	1.29	1.34
Oct. ...	2.87	3.48	4.61	3.22	3.[illegible]	3.79	2.09	3.50	2.10	1.53	2.48	4.84	6.53	7.29	2.41
Nov. ...	6.20	4.15	3.33	6.10	3.[illegible]	1.06	2.72	1.33	4.56	3.66	1.57	3.95	9.00	6.53	9.41
Dec. ...	0.18	4.43	5.61	10.79	3.[illegible]	8.17	1.66	8.92	4.29	4.89	2.47	4.35	3.00	4.24	1.98
Total ...	37.84	45.87	55.66	46.1[illegible]	[illegible]	7.58	29.04	42.10	35.63	40.29	42.21	39.73	41.91	43.14	38.42
No. of Raindays	209	220	231	198	19[illegible]	205	173	223	156	196	197	207	200	194	188

Greatest Month's rainfall 13.72 inches in December, 1889. Least month's rainfall 0.02 in June 1921.

Greatest number of consecutive days with rain was 21, ending February 12th, 1918. Greatest number of days without rain (absolute drought) was 26, ending July 3rd, 1887.

SUNSHINE.

The total number of hours of bright sunshine received in 1930 was 1,478.1 ; in 1931 the amount was 1,313.8 ; in 1932 the amount was 1,282.5 ; in 1933 the amount was 1,465.8 hours ; in 1934 the amount was 1,480.1 hours ; in 1935, 1,442.0 hours ; in 1936, 1,357.5 hours ; in 1937, 1,259.4 hours ; in 1938, 1,350.9 hours ; in 1939, 1,393.1 hours ; in 1940, 1,493.9 hours, and in 1941, 1246.5 hours.

Table 86.—Mean Temperature (°F.) for each quarter and for each year from 1901 to 1940, inclusive.

Year	I.	II.	III.	IV.	For whole year
	°	°	°	°	°
1901	37.5	50.4	57.2	41.9	46.8
1902	40.4	48.1	55.3	43.3	46.5
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
1932	43.2	52.1	59.7	46.4	50.4
1933	42.3	54.5	62.1	44.9	51.0
1934	42.4	52.8	59.8	47.6	50.6
1935	44.1	52.7	59.4	44.2	50.1
1936	42.8	52.6	59.9	47.1	50.5
1937	42.6	53.8	59.2	44.9	50.1
1938	45.3	52.3	58.4	46.6	50.6
1939	44.6	53.9	59.8	45.9	51.0
1940	43.2	55.6	58.9	45.4	50.8
1941	40.4	51.8	60.0	47.5	49.9

BAROMETER.

The mean reading for 1941 was 30.03 inches ; the highest was 30.73 inches on the 2nd December. The lowest was 28.60 inches on the 20th January (Observations made at 9 a.m. G.M.T. only).

Appendix I.

OPERATION OF THE SCHEME FOR THE TREATMENT OF VENEREAL DISEASE.

Record of Work Done in the V.D. Treatment Centre.

	Cork City		Cork County		Other Districts		Total		Total Male and Female Cases
	M.	F.	M.	F.	M.	F.	M.	F.	
New Cases (1st time)									
Syphilis	5	11	4	5	–	–	9	16	25
Soft Chancre ...	6	–	–	–	–	–	6	–	6
Gonorrhoea ...	26	8	6	–	2	–	34	8	42
Not V.D. ...	38	5	23	2	–	–	61	7	68
Total ...	75	24	33	7	2	–	110	31	141
Total Attendances :—									
Syphilis	320	280	129	73	5	45	454	398	852
Soft Choea ...	27	–	–	–	–	–	27	–	27
Gonorrh. ...	236	84	68	18	8	–	312	102	414
Not V.D ...	63	26	30	6	–	–	93	32	125
Total ...	646	390	227	97	13	45	886	532	1418
Cured :—									
Syphilis	2	4	–	–	–	–	2	4	6
Soft Chancre ...	6	–	–	–	–	–	6	–	6
Gonorrhoea ...	29	2	–	–	–	–	29	2	31
Not V.D. ...	–	1	–	–	–	–	–	1	1
Total ...	37	7	–	–	–	–	37	7	44
Pathological Exams. :—									
Wassermanns ...	27	22	16	6	–	–	43	28	71
Gonococci ...	51	14	13	1	1	–	65	15	80
Dark Ground ...	2	–	1	–	–	–	3	–	3
Total ...	80	36	30	7	1	–	111	43	154
Therapy :—									
Stabilarsan or other Arsenicals ...	124	182	48	44	3	17	175	243	418
Bismuth Preparations	167	40	74	17	2	–	243	57	300
Irrigations ...	–	–	–	–	–	–	–	–	–
Douches	–	5	–	–	–	–	–	5	5
Mercury and Iodides	18	–	2	–	–	–	20	–	20
Vaccines, M. & B. 693	230	50	60	14	6	–	296	64	360
Total ...	539	277	184	75	11	17	734	369	1103

Appendix II.

OPERATION OF THE COUNTY BOROUGH SCHEME FOR THE WELFARE OF THE BLIND.

The following are the terms of the Scheme drafted for this purpose and now in operation within the Borough :—

In this scheme the term " Blind Person" shall mean any inhabitant of the County Borough who is so blind as to be either unable to perform any work for which eyesight is essential, or unable to continue his or her ordinary occupation ; the term " The Corporation " shall mean the Lord Mayor, Aldermen and Burgesses of the County Borough of Cork, acting by the City Manager ; the term " The Minister " shall mean the Minister for Local Government and Public Health.

2. The Corporation will establish and maintain a Register in which shall be entered the name and address, age, sex, religion and other necessary particulars of every blind person who shall produce a certificate from a recognised Ophthalmic Surgeon that the acuity of vision of such person (refractive error being corrected) is below 1/20th normal (3/60th Snellen), or that such person is so blind as to be unable to continue his or her ordinary occupation. Any person between the ages of 30 and 70 may, however, be registered without producing such certificate on furnishing evidence of being in receipt of a pension in pursuance of Section 6 of the Old Age Pensions Act, 1932. The Register shall be kept written up-to-date, and shall be revised annually in the month of January. The Corporation shall be empowered to pay reasonable fees to Ophthalmic Surgeons for certifying in cases of necessitous persons.

3. Arrangements will be made by the Corporation with the Authorities of one or more of the Institutions for the Blind mentioned in the Schedule hereto on such terms as may be approved by the Minister for the following purposes :—

(a) the education or industrial training of suitable blind persons between the ages of five years and thirty years ;

(b) the employment in workshops for the Blind of blind persons suitable for such employment, their maintenance in a Hostel, and the augmentation of their wages ;

(c) the maintenance in Homes of blind persons who, owing to age or infirmity, are incapable of work.

4. The Corporation may in cases of unemployed and necessitous blind persons ineligible for education or industrial training under Article 3 (a) of this Scheme and living in their own homes or in lodgings, grant assistance to such persons in accordance with the following scale :—

Classification of Blind Persons	Amount of weekly allowance
(a) Blind person over 15 years and under 30 years of age	12s. 6d.
(b) Blind person 30 years of age and upwards ...	6s. 0d. (with pension)
(c) Married man under 30 years of age with wife dependent on him	19s. 0d.
(d) Married man 30 years of age and upwards with wife dependent on him	12s. 0d. (with pension)
(e) Additional allowance for each child	2s. 6d.

In considering the grant of allowances on this scale to the classes of blind persons at (a) and (c) above, the Corporation will not take into account casual earnings of any such person where they are satisfied that such earnings do not exceed six shillings per week.

5. Nothing in this Scheme is to be construed as giving blind persons irrespective of their means or conduct, a right absolute to assistance. The Corporation will not grant an allowance under Article 4 above to any blind person under 30 years of age who is capable of instruction and who declines without a satisfactory reason to take advantage of the facilities for education, training or employment under the Scheme, or who is by conduct or otherwise deemed unsuitable for assistance. No habitual mendicant shall be granted an allowance under the Scheme unless the practice of mendicancy is discontinued. No person shall be eligible to receive assistance under this Scheme who shall not have been resident within the County Borough for two years previous to date of application for assistance.

6. The Corporation may incur such expenditure in the execution of this Scheme as the Minister may from time to time approve.

7. This Scheme shall come into operation on the 1st October, 1932, and shall continue for a period of three years, but may during the period with the consent of the Minister be modified, extended or revoked by the Corporation, and with the like consent may be continued for such further time as may be deemed necessary. Any question, dispute or difference arising in connection with the interpretation of this Scheme shall be determined by the Minister whose decision shall be final.

SCHEDULE.

Institutions for the Blind Approved by the Minister	Class of Blind Persons Received
1. St. Mary's Institution for Female Blind, Merrion, County Dublin	Females, also boys up to 7 years of age
2. St. Joseph's Asylum for Male Blind, Drumcondra, Dublin	Males
3. Richmond National Institution for Industrious Blind, 41, Upper O'Connell Street, Dublin	Males
4. Cork County and City Asylum for the Blind, Infirmary Road, Cork	Males and Females

The number of persons receiving weekly allowances in their own homes from the Corporation during the year was 219, and the disbursements under the heading amounted to £3,897 1s. 0d. 34 applications were received for allowances. Other disbursements amounted to £79 12s. 9d. (examinations, grant to National Council and other expenses). In addition to the above-mentioned cases there were 25 cases maintained in Institutions by direct grants from the Corporation, viz. :—Cork Blind Asylum (7 males and 5 females) ; St. Mary's, Merrion (12 females) ; and Richmond National Institution (1 male). The total cost of the maintenance amounting to £495 13s. 9d.

The following note is contributed by the Hon. Secretary of the local branch of the National Council for the Blind of Ireland.

Home Teaching for the Blind.

Under the National Council for the Blind, this very essential service has been inaugurated in Cork City, to which the Corporation has granted a small annual contribution towards the expenses incurred by employing trained and qualified Home Visitors and Teachers.

The work of the Home Visitor is varied and broad, embracing social as well as mental instruction. She must help the blind to become active members in their homes, teach them to read embossed type, various handicrafts, such as knitting and rugmaking, and to bring an interest and hope into their otherwise hopeless lives.

The Home Visitor can help to prevent blindness in children, who often, through parental ignorance and negligence, or want of interest, lose their sight, which under proper care and supervision can be cured by seeing that they are provided with glasses where necessary and sent for treatment. She also gives her assistance and advice over pension applications, appeals and better accommodation.

Wireless sets are distributed on loan where most required, entertainments organised and free seats at musical shows secured.

Voluntary visitors also give their services to read and spend some time talking to the lonely blind, who greatly appreciate these visits.

Classes are held weekly for instruction in basket making, chair-caning and other forms of handicraft. The finished articles are presented for sale only if up to standard—no inferior goods labelled " Made by the Blind " are passed for sale. Efficiency is the definite aim.

The Home Teacher becomes a real friend of the Blind, who turn to her in all their difficulties, knowing that they will obtain help and encouragement to become as useful and important as their sighted brothers and sisters.

Suitable cases are urged to enter institutions for the blind and arrangements made for this purpose.

The Home Teacher has office hours daily where any blind or defective sighted person can get in touch with her and make enquiries. Over the Home Visitor is an Executive Council who meet monthly, receive the reports of the Home Visitor, deal with various cases, arrange the financial side of the work and follow closely and with interest the progress which is being made.

The following is a resume of the work done by the Home Visitors of the National Council for the Blind.

Number of City cases on Register on 31st December, 1941 ...	404
Visits paid to the blind	1,800
Visits paid on behalf of the blind	215
Interviews at the Office, City Hall	790
Number of Braile Readers	19
Number of Moon Readers	3
Number attending Men's Handicraft Class	9
Number attending Women's Handicraft Class	8
Number of Home Workers whose work is of saleable standard	35
Number sent to Convalescent Home	3
Number helped to obtain spectacles and artificial eyes ...	5
Number given coal and Christmas Gifts	30
Number given clothing	49
Number given help over Dentures	1
Number given nourishment and relief during illness ...	25
Number given Wireless Sets on Loan	84

REPORT ON DIETARY NEEDS. *

The problem of the adequate nutrition of the working-class population has been very prominent for a great many years. Interest in this question was greatly stimulated by the investigations of Dr. G. C. McGonigle, Medical Officer of Health for Stockton-on-Tees, who was one of the first to appreciate the importance of obtaining precise information about the critical range of income levels below which the poorer families were obliged to restrict expenditure on " protective " foods, such as milk, fruit and vegetables. In 1927 an " unhealthy " area in Stockton was demolished and 710 poor inhabitants (many of them unemployed) were transferred to a new housing estate. It came as a great surprise when during the next five years it was found that there was a rising death rate among this population. For five years before they were moved the mean rate in the " unhealthy " area had been 18.75 per 1,000 ; a figure appreciably higher than that for the Borough as a whole, which was 13.96. In the new and supposedly healthy surroundings it averaged 26.71 during the next five years. The matter was examined closely and detailed inquiries were made into incomes, expenditure, habits of life and any other factors that may have played a part. It was found that these people had for years being living in the danger zone of dietary insufficiency, not in respect of energy-producing food, but of the protective foodstuffs. The move to the new surroundings had

involved them in an appreciable amount of additional expense, mainly in the form of larger rents, which had been just sufficient to reduce their purchases of the more nutritious foods. They had fallen back on the cheaper forms of energy such as white bread. In consequence their health was impaired and their resistance to disease enfeebled. One of the most striking features of this unpremeditated experiment in human nutrition was the rapidity with which the influence of the change of diet was felt.

The findings in Stockton-on-Tees and enquiries made in other localities gave a great stimulus to the study of nutrition. In 1931 the British Ministry of Health established an Advisory Committee on Nutrition to examine this question. In 1928 the League of Nations had set up a Committee to investigate nutrition and their report appeared in the Quarterly Bulletin Vol. II, 1933. In 1932, Dr. C. P. Crowden published in the Lancet an article on minimum cost of Physiologically Adequate Diets for Working Class Families which has been the basis of a great deal of the subsequent work. In 1933 the British Medical Association undertook a study of the problem.

Up to that time the study of diet in relation to disease had been actively pursued by medical scientists for many years but relatively little information of immediate practical value was available for the guidance of the mother faced with the weekly, or daily, problem of not only satisfying hunger but ensuring that the members of her family were so fed that they were capable of maintaining resistance to disease. It was essential to make use of available scientific data and proved experience in an attempt to define not only the physiological requirements of individuals for food in general but to name foodstuffs as they are actually purchased by the housewife and to select those which would not only meet the needs of the body, but yield the highest nutritional value for the minimum outlay. In order to meet the need for an authoritative statement on the conversion of available knowledge on nutrition into definite suggestions capable of practical application the British Medical Association established a special Committee. The report of this Committee which was published in 1933 has been generally accepted as a full and comprehensive answer to the various problems encountered, so far as they are capable of an answer. The terms of reference of this Committee were :

> " To determine the minimum weekly expenditure on foodstuffs which must be incurred by families of varying size if health and working capacity are to be maintained, and to construct specimen diets."

(It will be borne in mind that the prices appended to the tables which follow relate to figures prevailing in England before the outbreak of war and therefore have no relation to present prices. These figures would need to be corrected either by reference to the Cost of Living Index or by specific enquiry into current prices for the commodities named).

* The dietary scales in this report are taken from the Report of Committee on Nutrition (British Medical Association), 1933 ; the text of which has also been freely drawn upon.

Certain terms of a more or less technical character must, of necessity, be used and it may be well to define these at this stage and to allude to certain other matters before setting out the details which make up the various suggested dietaries. It is, for example, now customary to refer to "man-values" in assessing the nutritional value of diets and in estimating their cost it is necessary to calculate the "man-value" of the family or group under consideration. It is obvious that a man requires a greater quantity of food per day than a child of, say, 5 years old. The difficulty lies in determining the ratio between growing children of various ages and that of an adult male. Any figures agreed upon must, of necessity, be approximations. In the case of an adult male large variations of food intake occur according to his size and muscular output. It is obvious for example that a small man pursuing a sedentary occupation will not require as much food as a big man working as, say, a navvy. When making calculations for any one individual, or family, these difficulties must be taken into account and allowances made for gross variations from the normal average man. The "normal" adult male of average stature is taken as unity in scales which purport to show the "man-value" of various ages. The age, size and occupation of the individual markedly influence the need for calories.

The energy value of food is usually expressed as the number of "calories" yielded by each gram of food. The calorie is the unit measurement of heat and the food-calorie is the amount of heat required to raise 1 litre of water 1°C. The calorie value of food varies according to its nature. Thus 1 gram of protein yields 4.1, 1 gram of fat 9.3 and 1 gram of carbo-hydrate 4.1 calories. By means of these figures it is possible to assess the energy values of a diet composed of various foodstuffs. So far as energy requirements are concerned an intake of food to yield 3,000 calories per day is generally accepted as being sufficient for the needs of an average man undertaking a moderate amount of muscular work. This will require to be increased if there is a heavy output of muscular energy and the B.M.A. Committee was of the opinion that 3,400 calories in the food as purchased was a safe figure for a man of average stature leading a healthy life with moderate muscular exertion and it will be noted that their tables are drawn up on this basis.

It is obvious that a child requires fewer calories per day than a man and that the quantity requisite will vary with the age of the child. Many scales have been suggested from time to time, the calorie-requirements at the different ages being expressed as fractional values of the requirements of the adult male, that is, man-value unity. The Scale drawn up by Cathcart and Murray is the one which has been generally adopted and is as shown :

Table I.—Man-values at Ages.

Ages	Man Value	Calories
Adult Male	1.00	3,400
,, Female	0.83	2,840
Child—1 and under 2 years	0.30	1,020
,, 2 ,, ,, 3 ,,	0.40	1,360
,, 3 ,, ,, 6 ,,	0.50	1.700
,, 6 ,, ,, 8 ,,	0.60	2,040
,, 8 ,, ,, 10 ,,	0.70	2,380
,, 10 ,, ,, 12 ,,	0.80	2,720
,, 12 ,, ,, 14 ,,	0.90	3,060

A boy over 14 years is taken as to need the same number of calories as an adult man and for a girl of the same age the requirements are those of an adult woman. From this table it is easy to calculate the total "man-value" (and the calorie requirements) of a family. For instance, a family consisting of husband, wife and four children, aged 13, 10, 7 and 4 years, has a total man-value of 4.63 and requires 4.63 man rations of calories per day.

The energy value of a diet constitutes but one of several factors which go to make up an adequate diet. In addition to its energy value a diet, in order to maintain health, should be made up of proteins, fats and carbohydrates in certain proportions as well as a sufficiency of vitamins and mineral salts.

It is generally agreed that 10 to 15 per cent. of the daily calorie requirements should be provided by proteins. Any less proportion of protein in the diet would be insufficient for growth and tissue repair. It is further agreed that at least half of the daily protein should be of animal origin. It would be possible to supply the whole of the protein-requirement from vegetable sources but vegetable proteins are regarded as being incomplete and lacking in some elements essential to human nutrition. Proteins of animal origin—milk, cheese, eggs, meat, fish, etc., are believed to have a higher nutritional value than those from vegetable sources—peas, beans, potatoes, etc. It is customary, therefore, to designate animal protein as *first-class* protein and that from a vegetable source as *second-class*. 100 grams of protein per day will provide approximately 12 per cent. of the total 3,400 calories required, and it is agreed that half of this amount should be in the form of first-class protein. This represents half the daily intake of protein. The other half can be of vegetable origin.

One hundred grams of fat per day is usually accepted as an adequate amount. This will yield 930 calories towards the daily requirement of 3,400. Fats may be of vegetable origin (e.g. margarine) or of animal origin (butter, meat, fat, etc.). For reasons which will be discussed subsequently, as much fat as possible should be derived from certain animal sources.

The group of foods described under the generic term of carbohydrates supply the body with starch and sugar. Potatoes, flour, rice and cereals generally are characteristic of this class of foodstuff. Carbohydrates if resolved into their constituent elements would be found to be made up of carbon, oxygen and hydrogen, the oxygen and hydrogen being present in the exact proportion necessary to form water. Fats, also, are made up of carbon, oxygen and hydrogen but in this case the proportion of the latter two elements is not that from which water could be formed. Carbohydrates and fats are the great suppliers of heat and energy. It will have been noted that the amount of heat yielded from unit quantity of fat is much greater than that from the same amount of carbohydrate, but the latter is by far the cheapest source of energy and mainly for this reason 500 grams are provided for in the daily ration to bring the total of calories up to 3,400 per day. The requirements of these three constituents of the diet may therefore be set out in tabular form.

Table II.—Daily amounts of the Proximate Principles necessary for an Adult Male (With calories provided thereby).

Source	Amount	Proportion of Total Calories	Number of Calories
First-Class Protein ...	50 grms.	6%	205
Second-Class Protein ...	50 ,,	6%	205
Fat ...	100 ,,	27%	930
Carbohydrate ...	500 ,,	61%	2050
Totals ...	700 grms.	100%	3390

(Note—28.4 grams=1 ounce).

The amounts of protein, fat and carbohydrate given in this table are now universally accepted as being sufficient to provide the necessary amount of energy for a normal man carrying on a moderate amount of muscular work. Experiment, however, has shown that the provision of these substances in the specified amounts is in itself not sufficient to maintain health. As much care must be exercised in regard to the *quality* of the food as is given to the *quantity*. Certain elements or substances must be present in the food if health or even life is to be maintained or, in the case of children, if normal growth is to be attained. This bring us to the consideration of the vitamins and mineral salts.

It is not necessary now to go into detail in regard to the vitamins except to remark that it is hardly possible to over-emphasise their importance in nutrition. There is growing evidence that a large range of debilitating illnesses (some of which may proceed to stages necessitating operative treatment) are due to deficiency of vitamins in the diet brought about by modern devitalising methods of manufacture, and the substitution of processed food for the natural article. The vitamins have been separated into several well-defined groups (indicated by letters of the alphabet) each group having specific functions in the prevention of disease or the promotion of growth. It is interesting to note that all these substances are present in nature and that their absence from food results only from tampering with it. There is no readily available method so far of assessing the quantitative needs of the body for the various vitamins or of accurately estimating the vitamin content of the diet. It is possible, however, to state in general terms whether any particular article of diet does or does not provide the particular vitamins. The best possible safeguard against a shortage of any one or more of the vitamins is to insist on as great a variety of foodstuffs in the diet as possible and the invariable inclusion in it of dairy produce and fresh fruit and green vegetables. There are now some readily available sources of information which set out the values of various kinds of food not only in regard to energy provision but also in regard to vitamin content. These will be appended. If there is any doubt as to the sufficiency of vitamins it is advisable to include in the diet (especially in the case of children) a few teaspoons of a reputable brand of cod-liver oil. By this means an adequate supply of vitamins A and D can be assured. In connection with this matter the B.M.A. Report says :

> " A word of caution is necessary here, for it will be far better for the housewife to spend money on good wholesome vitamin-containing foodstuffs than to buy costly preparations of the concentrated vitamin-containing products."

Many of the vitamins are now available in synthetic form and in the present war emergency this may be regarded as a good thing in view of the possibility of a scarcity of some of the natural forms. The advocacy of such preparations should be regarded solely as a war emergency however since they cannot be expected to replace the natural vitamins. Concerning this subject Professor Cathcart remarks : " One thing, I think, is certain, and that is that it is best to ingest our supply of vitamins in the form nature provides." The subject of the vitamins is stressed because they are of such vital importance in the maintenance of health.

For normal growth and healthy functioning the body requires also an adequate supply of minerals of which calcium, phosphorus, iron, iodine and chlorine are the most important. Shortage of calcium, phosphorus and iron is common. Such deficiency has been accompanied by various diseases, including rickets and other defects in the bones and teeth, anaemia and general debility and occasionally goitre (lack of iodine). In general terms it may be said that the chief cause of mineral deficiency is the lack of a sufficient amount of milk in the diet and the substitution of white bread for wholemeal bread. Stone-ground wholemeal flour is rich not only in calcium, phosphorus and iron but also in vitamins A and B. In comparison white flour contains only half the amount of calcium and phosphorus, one-third the amount of iron, one-sixth to one-tenth the amount of vitamin B and no vitamin A. The importance of such knowledge is inestimable when it comes to the question of providing dietaries for those of limited purchasing power. Bread is the main source of energy for the poor and since wholemeal bread is so patently and so obviously a better source of minerals and vitamins than white bread it is obvious that it should be prescribed in every instance.

The dietary tables which follow are those drawn up by the British Medical Association. The Report refers to the difficulties experienced in constructing dietaries which will conform to the accepted criteria. Unless due care is exercised some one or other constituent may be found to be missing or out of proportion. The difficulty is increased when, as was the case there, it is necessary to work to minimum costs. It was found by consideration of budgets obtained from working-class families that the average housewife, with no expert knowledge of calories or proteins, did, in fact, purchase by rule of thumb methods foodstuffs which broadly approximate to dietaries which physiologists regard as satisfactory. This is subject to the purchasing powers being adequate to the needs of the family. It has been found that when money is short she buys a smaller proportion of expensive proteins and fats (such as butter) and a higher proportion off cheap carbohydrates—usually bread and, according to season, potatoes. Speaking in general terms, the dietetic value of the foodstuffs purchased is more or less directly proportional to the amount of money available for their purchase. In cases in which money is short deficiencies are most likely to occur in first-class proteins and in the minerals and vitamins ; due to scanty purchase of dairy produce and green vegetables. The general consensus of opinion upon the value of milk as a food for young children is so strong that it should be included in every case in the diet of children in order to maintain health and normal growth. The Committee emphasized the importance of this foodstuff and in compiling diets for children between the ages of 1 and 5 allowed 1 pint of milk as the basal primary requirement, the full diet being based on this requirement. For children between 5 and 10 years, half a pint of milk has been used as the base.

With regard to costs, it was difficult to decide what to do in this matter, whether to omit this column altogether leaving it open to anyone who desired to do so to calculate present costs from the prices prevailing in any given locality or to insert the prices given in the Report which were those prevailing in Great Britain when it was drawn up (1933). Costs have been so disturbed since the war that these amounts are now more or less meaningless but, nevertheless, they have been allowed to remain. They may be regarded as an interesting means of comparing prices nine years ago with those current now. To correct these prices for current prices in this area would be a very big undertaking involving enquiry into dietary habits, foods utilised, wages, expenditure and outgoings generally. Given adequate facilities there is, of course, no reason why it could not be done but it is not within the scope of the present report which is to recommend " a dietary scale of wholesome cheap food for the information of the public " and since this very matter has been so admirably dealt with by the B.M.A. Committee I have relied very largely on their recommendations. The matter of present local costs, if deemed necessary of investigation, should be the subject of a separate enquiry. The prices given for beef, mutton and liver were those current at the time for frozen imported products ; further allowance has to be made for this factor.

TABLE I.—Bare Ration. No Variety. Man-Value 1.

Item	Quantity	Price B.M.A. Mean(1933)	Protein (grams)	Fat (grams)	Carbo-hydrate (grams)	Calories
		s. d.				
Corned Beef	1 lb.	6	119.2	84.8	—	1,278
Cheese ...	2 lb.	1 1	233.2	317.6	28.2	4,022
Margarine	¾ lb.	3	0.7	288.5	—	2,684
Flour or	7 lb.	—	320.6	51.1	2,397.5	11,620
Bread ...	11¼ lb.	1 7¾	(367.9)	(10.1)	(2,454.8)	(11,666)
Sugar ...	1¾ lb.	4	—	—	793.9	3,255
Potatoes	3½ lb.	2½	30.1	0.4	287.4	1,306
Tea ...	¼ lb.	3	—	—	—	—
Fresh Fruit and green vegetables	—	7	—	—	—	100
Total Weekly quantities	—	4.10¼	703.8	743.4	3,506.9	24,265

Total first-class protein—352.4 grams.
Daily first-class protein—50.3 grams.
Cost per man per week (B.M.A. mean)—58.25 pence.

This diet provides adequate protein, fat and carbohydrate for one man. Though adequate in its principal constituents, it may be deficient in vitamins and minerals. Its principal defect is the lack of variety. Such a diet might be acceptable for a period of a week or thereabouts but with longer use would rapidly become nauseous. In order to avoid the repugnance which such a limited diet would create it is necessary to increase the number of constituents in order to obtain greater variety and with this end in view the next table was drawn up.

TABLE II.—Suggested Adult Ration, based on 50 grams First-Class Protein. Giving ¼ pint Milk. Man-value 1.

Item	Quantity	Price B.M.A. Mean (1933)	Protein (grams)	Fat (grams)	Carbo-hydrate (grams)	Calories
		s. d.				
Beef ...	1 lb.	6	85.3	83.5	—	1,126
Minced Meat	½ lb.	2½	42.7	41.8	—	563
Bacon ...	½ lb.	3	23.3	122.9	—	1,239
Corned Beef ...	½ lb.	3	59.6	42.4	—	639
Liver (ox) ...	¼ lb.	1¾	22.6	3.6	5.0	147
Eggs ...	2 oz.	1	6.3	5.7	0.8	82
Cheese ...	½ lb.	3¼	58.3	79.4	7.0	1,005
Milk ...	1¾ pts.	5	32.7	35.7	47.6	661
Fish (Cod) ...	¼ lb.	1¼	16.6	0.1	—	69
Butter ...	¼ lb.	2½	0.2	94.1	—	876
Suet ...	1 oz.	¼	0.3	26.4	—	247
Lard ...	¼ lb.	1½	—	113.4	—	1,055
Flour or ...	4½ lb.	—	206.1	32.8	1,541.2	7,470
Bread ...	7¼ lb.	1 0½	(237.0)	(6.5)	(1,581.9)	(7,518)
Sugar ...	1 lb.	2¼	—	—	453.6	1,860
Jam ...	¾ lb.	3¼	1.1	—	236.1	972
Potatoes ...	5 lb.	3¾	43.0	0.5	410.5	1,865
Peas (dried) ...	¼ lb.	1	23.1	0.7	64.7	367
Tea ...	¼ lb.	3	—	—	—	—
Oatmeal ...	½ lb.	1¼	27.0	19.5	158.7	943
Rice ...	¼ lb.	¾	6.7	0.5	91.1	405
Syrup (treacle)	½ lb.	2	0.7	—	173.3	714
Cabbage ...	1 lb.	1	3.2	0.2	17.7	88
Beans (butter)	¼ lb.	¾	21.1	0.8	70.5	383
Barley ...	½ lb.	1	15.8	1.8	181.2	825
Fresh Fruit and green vegetables	—	7	—	—	—	100
Total weekly quantities ...	—	5.10½	695.7	705.8	3,459.0	23,701
Daily quantities per man ...	—	—	99.4	100.8	494.8	3,386

Total first-class protein—347.6 grams.
Daily first-class protein—79.7 grams.
Cost per man per week (B.M.A. mean)—70.5 pence.

Twenty-five items of food are included in this diet as compared with eight in No. 1. The amounts of proteins, fats and carbohydrates are approximately the same as in Diet No. 1 but they are obtained from more varied sources. The amounts of vitamins and minerals should be adequate. This is a more palatable diet and should be much less monotonous after prolonged use but, of course, the cost is higher. The B.M.A. Report describes it as a typical diet such as is commonly used by the working classes in receipt of adequate wages. In cases where the income is from whatever reason diminished to a level which renders 5/- per week per " man " difficult, saving is effected by reducing the quantities purchased for the first fourteen items of the list. The result is to diminish the amounts of first-class proteins and animal fats. Such reductions seriously depreciate the value of the diet.

As already remarked the requirements of children vary according to age and physical development. A number of tables have been drawn up similar to those already given in which the needs of the various groups are set out. It may be said that given the requirements for an adult man, one should be able to work out those for children. This may be so and in order to reduce the amount of such tabular matter I have drawn up a composite table showing the amounts prescribed for the various ages and the approximate cost of same as estimated by the B.M.A in England and Wales in 1932. This table may be of use to those who are sufficiently interested in the matter to want to know what these requirements are, how thy compare whith those of the adult and, from the practical point of view, how such needs are to be met by actual purchase. These figures are shewn in Table III.

TABLE III.—Weekly requirements at various age-groups.

Item	1 to 2 yrs.		2 to 3 yrs.		3 to 6 yrs.		6 to 8 yrs.		8 to 10 yrs.	
	Amt.	Calories	Amt.	Calories	Amt.	Calories	Amt.	Calories	Amt.	Calories
Minced Meat	¼ lb.	282	¼ lb.	282			¼ lb.	282	½ lb.	563
Cheese ...	¼ lb.	503	—	—	—	—	¼ lb.	503	½ lb.	1005
Milk ...	7 pts.	2646	7 pts.	2646	7 pts.	2646	3½ pts.	1323	3½ pts.	1323
Fish ...	¼ lb.	183	—	—	—	—	—	—	—	—
Butter ...	⅛ lb.	438	¼ lb.	876	¼ lb.	876	¼ lb.	876	¼ lb.	876
Flour or ...	1 lb.	1660	1½ lb.	2490	2½ lb.	4150	3½ lb.	5810	3½ lb.	5810
Bread ...	1½ lb.	(1550)	2½ lb.	(2593)	4 lb.	(4148)	5½ lb.	(5704)	5½ lb.	(5704)
Sugar ...	⅛ lb.	233	1 lb.	1860	1 lb.	1860	1 lb.	1860	1 lb.	1860
Potatoes ...	1 lb.	373	1 lb.	373	1 lb.	373	2½ lb.	933	2 lb.	746
Tomatoes ...	½ lb. (tin)	51	—	—	—	—	—	—	—	—
Carrot ...	½ lb.	103	1 lb.	205	—	—	—	—	1 lb.	205
Turnip ...	½ lb.	54	—	—	—	—	—	—	—	—
Oatmeal ...	¼ lb.	472	¼ lb.	472	¼ lb.	472	¼ lb.	472	¼ lb.	472
Cabbage ...	½ lb.	44	½ lb.	44	—	—	—	—	½ lb.	44
Liver ...	—	—	¼ lb.	147	—	—	¼ lb.	147	—	—
Semolina ...	—	—	¼ lb.	415	—	—	—	—	—	—
Bacon ...	—	—	—	—	¼ lb.	620	¼ lb.	620	¼ lb.	620
Corned Beef	—	—	—	—	¼ lb.	320	¼ lb.	320	¼ lb.	320
Peas (dried)	—	—	—	—	¼ lb.	367	—	—	¼ lb.	367
Beans (Haricot) ...	—	—	—	—	¼ lb.	388	—	—	—	—
Beef ...	—	—	—	—	—	—	¼ lb.	282	¼ lb.	282
Cocoa ...	—	—	—	—	—	—	¼ lb.	554	¼ lb.	554
Kipper (Herring) ...	—	—	—	—	—	—	—	—	¼ lb.	183
Dripping ...	—	—	—	—	—	—	—	—	⅛ lb.	527
Jam ...	—	—	—	—	—	—	—	—	¼ lb.	324
Figs ...	—	—	—	—	—	—	—	—	¼ lb.	277
Barley ...	—	—	—	—	—	—	—	—	¼ lb.	413
Fruit & Green Vegetables	—	100	—	40	—	50	—	50	—	50
WeeklyAmts.	—	7042	—	9850	—	12122	—	13982	—	16821
Daily Amts.	—	1006	—	1407	—	1732	—	1997	—	2403
Man Value ...	0.3		0.4		0.5		0.6		0.7	
First-Class Protein ...	197.5 grms.		175 grams.		176.2 grms.		201.5 grms.		245.4 grms.	

So far we have considered the needs of the individual adult man and those of the growing child at various ages, without attempting to cater for family groups. These interests, too, have been considered in the Report and diets for various sized families of varying age-constitution have been drawn up. From our point of view the chief feature is that they cater for what would, in this country, be regarded as small families. The biggest does not exceed man, wife and three children. This may may be said to be definitely smaller than the average Irish family; nevertheless the diets recommended are of interest in shewing how money may be expended so as to extend the range of purchases and introduce variety into the family diet.

TABLE IV. —Diet for Man, Wife and Three Children, aged 6 to 8 years, 10 to 12 years and 12 to 14 years : Man-value 4.13.

Item	Quantity	Price B.M.A. Mean (1933)	Protein (Grams)	Fat (Grms.)	Carbo-hydrate (Grams)	Calories
		s. d.				
Beef ...	3 lb.	1 6	255.9	250.5	—	3,378
Mutton ...	2 lb.	10	100.8	338.4	—	3,560
Minced Meat ...	1 lb.	5	85.3	83.5	—	1,126
Bacon ...	1 lb.	6	46.7	245.8	—	2,478
Corned Beef ...	2 lb.	1 0	230.4	169.6	—	2,556
Cheese ...	3 lb.	1 7½	349.8	476.4	42.3	6,033
Milk ...	14 pts.	3 2½	261.8	285.6	380.8	5,292
Kipper ...	1¼ lb.	6½	80.0	63.0	—	913
Butter ...	½ lb.	5	0.4	188.2	—	1,751
Suet ...	¼ lb.	1½	1.3	105.8	—	989
Lard (dripping)	½ lb.	3	—	226.8	—	2,109
Margarine ...	½ lb.	2	0.4	192.3	—	1,789
Flour or ...	24½ lb.	—	1,122.1	178.8	8,391.2	40,670
Bread ...	39½ lb.	5 8¾	(1,283.5)	(35.3)	(8,564.4)	(40,702)
Sugar ...	6½ lb.	1 2¾	—	—	2,948.4	12,090
Jam ...	1 lb.	4½	1.4	—	314.8	1,296
Potatoes ...	10½ lb.	7½	90.3	1.1	862.1	3,917
Peas (split) ...	1 lb.	1½	92.1	3.2	285.8	1,579
Tea ...	½ lb.	6	—	—	—	—
Oatmeal (med.)	½ lb.	1¼	27.0	19.5	158.7	943
Rice ...	1 lb.	2½	26.8	1.8	364.2	1,620
Treacle ...	¾ lb.	3¼	5.5	—	203.8	858
Beans (Butter)	½ lb.	1½	42.2	1.6	141.0	766
Barley ...	1 lb.	2	31.7	3.6	362.4	1,650
Fresh Fruit and Green Veges. ...	—	2 6	—	—	—	500
Total weekly quantities ...	—	22 6½	2,859.9	2,835.5	14,455.5	97,863
Daily quantities per man ...	—	—	98.9	98.1	500.0	3,385

Total First-class protein—1,420.4 grams.
Daily first-class protein per man—49.1 grams
Cost of food per man per week (B.M.A. Mean)—65.5 pence.
Minimum weekly cost of family food—22s. 6½d.

It is hardly necessary to stress once again that the prices given were those prevailing in Great Britain in 1932 and bear no relation to present day prices. It would be necessary also, in comparing these with contemporary prices, to bear in mind that allowance would have to be made for local conditions and tastes. For instance in this area there is a very large consumption of fresh pork products of the local bacon factories which obtain a very ready sale in many parts of the city and which, in the light of modern knowledge, contribute very materially towards the nutrition of a considerable part of the population. These various cuts sell at comparatively cheap rates and it will be noted that they do not appear at all in the B.M.A. Dietaries. Other local predilictions too would have to be taken into account as well as such factors as rents, prevailing prices of essential commodities and so on. It will be appreciated that all these variable factors make it very difficult to indicate in a report such as this the full requirements of a large urban community. The dietaries drawn-up by the B.M.A., however, indicate the essential needs and it should not be beyond the wit of our housewives to make their own allowances for some of the articles recommended.

Having indicated these essential needs and having discussed the nutritional value of the various foodstuffs the question arises as to whether it is possible to translate all the recommendations into terms which can be understood and appreciated by the average housewife. Comparatively few persons are interested in foodstuffs in terms of calories and co-efficients. From this point of view it would appear that the B.M.A. overlooked the cook, but since the publication of their report iu 1933 this matter has been remedied and the publication in 1935 of a booklet entitled *Family Meals and Catering* followed by a later edition under the title of *The Doctor's Cookery Book* put in a practical form the recommendations of the dietetic experts. With the help of experts from the Board of Education and facilities from the National Training College of Domestic Science in London the diets were revised and the foodstuffs listed in the last diet given above were converted into palatable and attractive dishes for the main meals of each day of the week. In order to introduce variety, the scope of this practical investigation was extended to cover three weeks menus. As an index of the usefulness of these publications it may be mentioned that over 300,000 copies have been disposed of to the public. It is doubtful now, of course, whether any are available but there are many other excellent little books offering to the public catering especially for those problems created by war conditions which have made some of the articles already mentioned difficult, if not impossible, to obtain. Some of these have been published in this country and should be freely obtainable, others have been imported. Among the latter which may be especially recommended at the present time is the Penguin volume entitled *Food—The Deciding Factor*. Retailing at a very modest sum this little book gives a most useful summary of present knowledge concerning the nutritional value of foodstuffs as well as practical recipes covering a wide range of articles available under war conditions.

In addition, there is the excellent pamphlet produced by Prof E. J. Sheehy and Miss K. O'Sullivan in Dublin entitled *Food and Dietetics* (Price 3d.). This book is undoubtedly one of the best of its kind ever published. The language is clear and simple and can be understood by anyone, there is a marked absence of technical terms and the views expressed are very sound.

That there will be a still further restriction in the range of foodstuffs to which we have been accustomed is, I think, quite clear but there is so far, at any rate, no cause for alarm if due consideration is paid to the prevention of waste and to the proper selection of foods. In this connection it is pertinent to refer again to the experience of Denmark during the war of 1914–18. From 1917 onwards the blockade prevented imports of animal feeding-stuffs and forced the Danes to kill off four-fifths of their pigs and one-third of their cows. The wheat bran and germ normally fed to the animals were reserved for human consumption, and the dairy produce normally exported was added to the human diet, so that the population was living mainly on dairy produce, coarse wholemeal bread made from wheat and rye, barley porridge and potatoes. This diet differed from the pre-war diet of the Danes in that the meat protein was largely replaced by protein from dairy produce. This change in the source of protein was accompanied by a drop of 17 per cent. in the mortality for the whole country down to 10.4 per thousand, the lowest ever known in any country. The lesson from this experience is obvious.

The tables given above are based on the necessity for presenting certain specific articles of food calculated to yield the necessary amount of energy and to afford protection against disease. Naturally there must be a rather strict limitation in the number of items so presented. At the same time it seems appropriate that a general indication should be given of the kinds of food which are best calculated to subserve this purpose without dealing with the actual quantities required. The recommendations of Sir Robert McCarrison, in this respect, were appended to my Annual Report for 1939. It is appropriate that they should be referred to again here. So far as I know they have never been questioned.

1. Whole or lightly-milled cereal grains. Whole wheat flour and the bread made from it (containing the germ of wheat and a proportion of the outer skin), ryebread, oatmeal and semolina.
2. Milk and milk products—cheese, butter, skimmed milk, curds, buttermilk.
3. Pulses—peas, beans and lentils.
4. Fresh green leaf vegetables, such as spinach, lettuce, watercress, cabbage, parsley, turnip tops and young dandelion leaves.
5. Root vegetables, particularly potatoes, carrots and onions.
6. Fruit, both fresh and sun-dried.
7. Egg.
8. Meat (including glandular organ such as liver), fowl and fish (particularly the herring).

This is the list which has been presented by one of the foremost experts on nutrition as being sufficient to maintain a " vigorous, hardy and healthy " existence. All the items have been produced in abundance in this country. A reference to the B.M.A. lists will show that some of the foodstuffs named are now very difficult to obtain. Such articles as rice, sago, tapioca and cocoa may be specified. In addition there

are many other commodities such as currants, raisins, figs, oranges, lemons, bananas, prunes, etc., which have been used largely in our daily dietary and which are now practically unobtainable. It is obvious, therefore, that we are going to be thrown more and more upon the natural resources of our own country. Many of these items which we have been accustomed to look upon as necessities must needs now be regarded as luxuries. One of the principal deficiencies likely to arise as a result of war conditions is a shortage of fats. This was particularly evident in Central Europe during the closing stages of the last war and caused serious ill-health among the child population especially. In one respect it was not an unmixed evil, for it led to an intensive study of nutrition in the post-war years, one of the chief fruits of which has been our present knowledge of the vitamins. In this connection it is desirable to draw attention to one of the items included in McCarrisson's lists. We do not appear to have fully appreciated the value of the herring as an article of food. The body fat of this fish, according to experts, contains the whole of the daily requirements of Vitamin D in $\frac{1}{4}$ to $\frac{1}{2}$ oz. The flesh of the herring is a most valuable article of diet and an attempt should be made to supply it in greater abundance to the people of this country.

The most valuable source of fat remains, however, dairy produce since, in addition to vitamin D, it also provides vitamin A and valuable mineral salts. It is most unfortunate that in this country the manufacture of cheese has been so neglected. Cheese is the ideal form of preserved milk and every effort should be made to produce more so as to build up a reserve for use during the periods when liquid milk is scarce. In ordinary circumstances I would not be prepared to advocate the extended use of dried milk for this purpose but in the position with which we are now faced this commodity must also be regarded as a very useful addition to our emergency rations, if they have to be resorted to. It is perfectly clear that for the purpose of maintaining health milk and milk products stand pro-eminent. All the experts are agreed on that. It is unfortunate, however, that they rank amongst the highest priced foods and it is most desirable that something further should be done to make them more available to the poorer sections of the populace. A far-seeing policy in this respect is bound to react to the benefit of the whole community as it is a mere truism to remark that money is better spent in preventing disease than in curing it. In my Annual Report for 1939 (already referred to) I threw out a suggestion as to one means by which dairy produce might possibly be made cheaper. This suggestion, admittedly, does not appear to have attracted any attention whatever nor, on the other hand, so far as I am aware, has it excited hostile criticism. In view of the position with which we are now faced it may perhaps receive consideration.

In conclusion I would desire to say a few words on the subject of bread which, as you know, is of such importance in the diet of the poor. My views on this matter are, I think, fairly well known so I need not labour the point further than remarking that all the accumulated evidence points to the superiority of wholemeal flour over white flour from the nutritional view point. It is necessary, however, to emphasise that the bread which is generally on offer to the public today is not wholemeal

bread but what may reasonably be termed re-constituted white bread from which the most valuable ingredient of the wheat berry is still missing—the germ.* At the moment, for some unknown reason, there is a great scarcity of both wholemeal flour and bread. A great many people have quite an unconquerable aversion to the ordinary bread and we have the situation that those who can afford it are paying exorbitant prices for the white flour which has been making its way into the country. I do not wish to be taken as meaning that re-constituted flour is inferior to white flour. It is perfectly clear, from the nutritional point of view, that it is far better since it contains many nutritive elements which are lacking in white flour. Admittedly, however, it has certain definite bad points, it does not bake so well and stales very quickly, the latter feature being one which has contributed materially to its unpopularity. In this connection I desire to draw attention to the work of Mr. S. Anthony, Principal of the Dublin Bakery School, who has shown that this tendency to stale is largely due to the increased percentage of bran. Bran appears to have the property of absorbing water very rapidly but it loses it just as readily. Mr. Anthony suggests that the addition of gelatinised starch in some form will help to overcome this fault and claims that by adding a small proportion of mashed potato this difficulty can be surmounted, with the production of a good open loaf which will keep moist for days. I am not in a position to state whether this is so or not, but understand that such a loaf has been produced in the Dublin School. It is up to the bakers to prove or disprove the claim.

While it may be conceded that there are substantial grounds for complaint against the reconstituted loaf two things should be kept in mind : first that the great bulk of the people do not seem to have been prejudicially effected in any way by it (many claim very material benefit from it) and secondly we must remember that the position in regard to food supply is very serious. The recent pronouncement of the Minister of Agriculture makes it clear that this position is now definitely worse than it was in December last when he made his announcement of the increased extraction of flour.

There is now a markedly increased demand for wholemeal flour which, baked at home, many people find far more palatable than ordinary bread. This increased demand has naturally led to a shortage which, it appears, has been somewhat accentuated by the decreased quota allowed to the millers. Since the public is now compelled to use flour of high extraction it is not unreasonable to expect that the best quality of this class (which is wholemeal) should be available in sufficient quantity, more especially as this happens also to be the most economical. As a corollary it follows that, in order to meet the increased demand which now exists for it, there should, if necessary, be an increased quota allowed to those millers who have concentrated on the manufacture of wholemeal flour.

* Note—This statement was correct at the time of writing this report Since then a furthur Order has been made which has had the effect of ensuring that all flour milled is now whole-meal (i.e. 100 per cent. extraction.

THE PLACE OF MILK IN NUTRITION.

(A Paper read at the Annual Congress, Irish Dairy Shorthorn Society, at Mallow, January, 1941).

Of the importance of milk in the regular diet of the people there can be no doubt. In the light of modern knowledge it must be regarded as the keystone of the arch of nutrition. Taking into consideration the nature and composition of milk this is not to be wondered at, for here we have a foodstuff in which practically all the elements essential for the maintenance of health are presented in a form which renders them ideal from the nutritive point of view. The fat holds in solution two very important vitamins concerned with the promotion of growth and the maintenance of health ; the protein supplies material for the replacement of broken-down tissues and also provides the necessary material for rapidly growing cells in the young. This protein falls into the group which is now called first-class or protein of high biological value because it is assimilated with great readiness by the body tissues. Carbohydrate supplies heat and energy and lastly the mineral salts, calcium and phosphorus which are of such fundamental importance in the development of the teeth and bony structures of the body and are present in abundance and in the form best suited for absorbtion by the growing body.

It is, of course, in the nutrition of the infant and growing child that milk is of prime importance but it is now known that even for the adult the inclusion of milk in the ordinary diet is a matter of considerable import so far as the maintenance of health is concerned. This point will be discussed later, for the time being we are concerned with the importance of milk for the growing child. There is universal agreement on this point and it might be argued that the matter is therefore removed from the plane of discussion. But popular opinion cannot always be trusted and indeed, in the matter of diet, it has often been grossly at fault. The scientific mind is not satisfied with anything less than experimental proof and it is therefore a matter of considerable interest to be able to refer to an experiment in which all the stages were carefully controlled and which in its end-result showed in a remarkable way the value of milk in the development of a growing child.

This investigation was carried out in 1926 by Dr. Corry Mann on behalf of the Medical Research Council. The subjects were boys living in an institution where the food had long been regarded as ample, that is to say, the calories yielded by the various constituents were in amount equal to these which were recognised as being sufficient for the needs of the boys. In actual fact however it was found that the amount of first-class protein was less than it should have been. The average rate of growth of these boys had been 1.8 inches per year and their increase in weight 3.8 pounds. The amount of animal protein in the diet was raised by the addition of a daily ration of casein (which is the highly digestible and nutritious protein of milk). On theoretical grounds one would have been justified in assuming that this addition would have produced a definite improvement in the nutrition of the boys, but the result was quite inconclusive. The average response

was 4 lbs. in weight and 1.75 inches in height. The difference is not significant. The first impression from this result might be that the boys were already receiving sufficient protein in their diet. Other tests, however, in the same experiment showed that the basic diet was deficient in vitamins and other accessory substances. Until these were supplied it was impossible for them to make full use of the additional protein.

Quite a different result followed the addition of a pint of milk a day to the boys food. This amount provides actually about the same quantity of casein which had been given to the boys in the first group. The boys in the " milk group " made a surprisingly big gain in weight which averaged 7 lbs. (as against 3.8 lbs in the non-milk group and grew no less than 2.6 inches during the twelve months (the average for the non-milk group being 1.8 inches.)

The investigations did not stop with these two groups. Other groups of boys were given butter, margarine, watercress or extra sugar as supplements to the basic diet. The only one among these latter groups which showed an improvement approaching the response of the " milk-group " was that which received butter as a supplement.

The interpretation of these results is clear. If the subnormal growth of the boys on the basic diet had been due to lack of animal protein the rate would *not* have been increased when butter was added, because butter contains no protein. Furthermore, the effect of the butter could not have been due to the fact that it supplied extra *fat*, because the same amount of margarine did not produce anything like the same beneficial effect. The major part of this excellent effect of the extra milk was due to its *vitamins* and, especially, to those associated with the fatty parts. This experiment shows us in a very striking way the fundamental importance of the vitamins. In their absence the body tissues are unable to benefit from the application of the other nutritive elements in food. In passing it may be remarked that the boys receiving the extra milk ration were, as a group characterised by abounding vitality and high spirits so much so that their teachers found them much more difficult to control than the other groups.

There is one simple test for malnourishment which can be applied in every case and which seldom, or never, fails ; improve the diet and watch the result. In this case the diet had long been regarded as ample, but Dr. Corry Mann demonstrated its inadequacy. A pint of milk a day increased the average height of the boys by nearly one inch and their weight by over three pounds. Even more important was the improvement in physical vigour and mental alertness. There could be no question these boys who had always been regarded as adequately nourished had, in fact, been undernourished before the supplement of milk was given and it was the administration of the milk alone which uncovered this fact.

It was the striking result of this investigation which finally convinced the experts that milk has a special value in the diet of young growing children which cannot be measured in terms of proteins, fats and calories and it was the foundation on which has been built the great national schemes for providing extra milk for school children.

I have already alluded to the importance of milk in the diet of the adult and in this connection there is one aspect of the case I would especially refer to, because it relates to a condition which, if not so prevalent now as in former times, is sufficiently so to merit serious consideration. In his very interesting historical work on food habits Prof. Drummond tells us that stones in the bladder and urinary tract were very common in England and other countries centuries ago. Significantly enough this was at a time when milk was held in general disfavour as a food, except in the case of very young children. The trouble was most usually ascribed to gluttony and luxurious living. The cause of stone (or calculi) in the urinary tract is still under investigation but certain very important facts have been brought to light within recent times. The experimental work of Osborne and Mendel in America, McCarrisson in India, and of a group of Dutch scientists in the University of Amsterdam, leave no doubt that faulty diets may produce calculi in animals. The dietary defects which seem to be concerned are a deficiency in vitamin A and an abnormally high intake of lime. When the diet is adjusted by increasing the amount of vitamin A or in some cases adding phosphate (both of which are provided in milk) the incidence of stone is greatly reduced. Milk stands out pre-eminently as the best preventive food and Drummond goes so far as to say that it seems to be impossible to obtain conditions under which stone will form in the urinary tract if milk forms a reasonable part of the diet.

The primary defect in this case appears to be the deficiency in vitamin A. Chronic shortage of this constituent in the diet causes degenerative changes in the lining membrane of the urinary tract. Minute plaques of calcified matter are formed on the affected part which tend to break off and to be carried into the ureters and bladder. These detached fragments form nuclei for the deposition of urinary salts, and such deposition occurs with the gradual growth of the stone if the diet is rich in lime. One of the most important functions of vitamin A is to preserve a healthy condition of all the lining membranes of the body and in the absence of the vitamin there is a very marked tendency toward the development of inflammatory conditions, not only of the urinary tract but in all parts of the body in which mucuos surfaces are found. This is a fact which illustrates the necessity for an adequate daily amount for every person of some substance providing vitamin A and milk appears to be the ideal vehicle to present it—for the adult at any rate.

Studies in human diets reveal interesting points in connection with the incidence of stone. The African negro rarely suffers from it. Dr. Vermoolen traced only one case in over a million hospital admissions, whereas the white population of South Africa showed an incidence of 1 in 460 admissions. The negro diets were found to be rich in vitamin A and relatively poor in calcium, whereas the food of the white people was often rather deficient in A and usually richer in calcium. The problem of the part played by dietary factors has not been solved, but the trend of modern research is to attach primary importance to vitamin A.

I have already referred to two mineral salts, calcium and phosphorus, which are vital to the development of bone and tooth and which are abundantly provided by milk. In this connection it is necessary now to say something about the other important accessory food factor found in milk—vitamin D. In the absence of this vitamin it would not matter in the least how much calcium and phosphorus you supplied to the child, he simply could not absorb the minerals and would eventually develop rickets. It is a very significant fact that milk presents not only the two salts necessary for the formation of bone, but also the vitamin without which they are useless and in this coincidence of materials we see another example of the wisdom of nature in its provision for the welfare of its creatures.

We know now that vitamin D is essential for the formation of healthy bone and that, in conjunction with vitamin A and the presence of adequate supplies of calcium and phosphorus it will ensure healthy growth and development. There is another interesting sidelight on the functions of this vitamin to which I would desire to direct your attention. It relates to an investigation carried out by Dr. G. E. Friend the medical officer of Christ's Hospital School. In the summer of 1917 in response to an appeal from the Government there was a voluntary restriction of the amount of bread eaten. This was followed by the substitution of margarine for butter. The replacement of butter with margarine had one very curious result, although at the time the relationship was not suspected : there was a surprising increase in the number of fractured bones. Another curious observation was made later when it was found that the unusual fragility of the boys' limbs seemed to persist after the beginning of 1919 when the school was again able to provide an ordinary diet.

About this time Mellanby had published his important work on rickets and Dr. Friend suspected that a vitamin deficiency might be responsible and it occurred to him that although the boys were getting what was practically a pre-war diet, the school authorities had not restored butter to the menu. On his suggestion the supply of margarine was stopped and replaced by butter and almost at once the incidence of broken bones returned to its usual level. Commenting on this Prof. Drummond remarks that " it would be difficult to find a more striking illustration of the influence of mild vitamin deficiency, which was detected only because the diet and physical condition of the community were under such close observation." Butter is of course the fatty part of milk which holds the two vitamins in solution and there is no doubt that if a suitable ration of milk had been supplied instead of the butter, the result would have been the same. One of the conclusions, therefore, which can be drawn from this observation is that, in addition to providing for the optimum growth and development of bone, an adequate supply of milk is necessary to formation of hard, resistant bony tissue. This leads us to the further conclusion that milk is a very desirable food for all members of the community if the bony skeleton is to be made as fit as possible to withstand the shocks to which it will almost inevitably be subjected during the life-time of the individual.

A classical example of the far-reaching effects of slight vitamin deficiency occurred in Denmark during the last war. At that time such high prices were being received for butter in the export market that all available supplies were sent abroad and the commodity almostdisappeared from the home market. The result was that the people were subjected to a deprivation of vitamin A with the consequence that there was a widespread outbreak of a serious eye disease which is called xerophthalmia. In some cases this proceeded to actual blindness. All except the advanced cases improved rapidly when butter or codliver oil were administered. Xerophthalmia had, of course, been known from ancient times but it was only the study of this outbreak which led to the first convincing proof that the disease was caused by vitamin A deficiency.

We hear much nowadays of night blindness. This has been a common disorder for centuries in the East, where the natives live on a diet of cereals of low vitamin A content. Numbers of Newfoundland fishermen migrate every summer from their home fishing grounds to those of the Labrador coast, where the fish are large and plentiful. For two or three months they live on white flour and fish so that by the end of the season many of them are in a state of vitamin A deficiency and "night-blindness" is well-known to them. When the fishermen finds that on coming into a dimly lit hut from outside he stumbles and is unable to see properly, he at once cooks and eats a cod's liver, knowing that his sight will be normal the next day. Cod liver oil is, as most people know, one of the richest sources of vitamin A (as well as vitamin D) and it is interesting to know that both in milk and cod liver oil the ultimate source of the vitamins is the beneficent rays of the sun.

It is quite clear, I think, from what has been said that the provision of more milk would be of very pronounced benefit to the health of the community, both children and adults. In the case of adults this benefit would be manifested in improved nutrition and resistance to disease. In the case of children both these factors would be in evidence and we would also expect a very marked acceleration in growth, improved dentition and much more buoyant health generally. No doubt too, in the light of ascertained fact, one is justified in claiming that there would be a definite increase in height and an all round improvement in the physique of the community if more milk was consumed. This would apply particularly to the urban population which has been much stinted in the use of this invaluable commodity and which, in consequence, presents a physique much inferior to that of the average countryman.

The particular branch of medical work with which I have been brought into contact is concerned with the prevention of illness and in it one is confronted with a large and growing volume of evidence pointing towards the nutritional origin of disease. I have indicated some of them ; there are a great many more in which the relationship has been clearly established. Anyone who is conversant with mortality-tables is well aware of the fact that of all the causes of death heart disease ranks foremost and also that it is a prime cause of crippling during lifetime. In tracing the causes of heart disease rheumatic conditions predominate and in a very great many cases these conditions can be traced back to

childhood and adolescence. The manifestations of juvenile rheumatism are often very obscure indeed, so much so that usually they are missed altogether and it is often not until heart disease has actually occurred that the unfortunate sufferers are found. A great deal of work has been done in connection with the cause of rheumatism and of these, it is now clear, that malnutrition is the most important—the lack of a sufficiency of good wholesome food. In regard to prevention, I know of no authoritive work in which milk does not receive first place, a fact which indicates its pre-eminence in the nutritional sphere.

There are, of course, many other disease conditions to which one could refer, in the causation of which it would seem that faulty dietetic habits play a prime part, but there is not time now to discuss them in detail. It is important however to emphasise the fact that they are not always due to insufficiency of food, but rather to insufficiency of the right kind of food. I have stressed the importance of milk but it is obvious, of course, that milk alone would scarcely suffice to maintain nutrition. A diet must be whole and balanced. Sir Robert McCarrisson (one of the most eminent authorities on the subject) has indicated the regimen which he considers necessary and sufficient for the maintenance of health. Milk, wholemeal bread, pulses, salads, root vegetables, such as potatoes, carrots and onions (especially those which can be eaten raw), milk products, fruit, egg and meat. You will note that there is an absence from this list of prepared and proprietary foods, that the constituents are simple in character and that they are prescribed in the form that nature presents them to us.

I would like to refer to what has been termed the " Oslo breakfast " About the year 1932 Professor Carl Schiötz carried out an interesting experiment in a school in Oslo. Instead of a hot meal given at mid-day, the children were given a breakfast of foods selected primarily with the object of making good all the deficiencies of the home diet. There were rolls of wholemeal bread to supply the vitamin B, and mineral salts lacking in the white bread at home. The deficiency of meat (animal protein) was made good by a hunk of cheese and a glass of milk, which also supplied minerals and vitamins. Protection against mild scurvy was given by a daily allowance of half an apple or orange, a lettuce salad or a raw carrot depending on prevailing prices. In addition there was a good sized pat of butter to add more of the vitamins A. and D. The experiment proved an unqualified success, so much so that a similar type of meal was adopted in almost every school in Norway. Both the development of the children and their general health were found to be better than when a hot meal of meat and cooked vegetables was provided. There was an extensive adoption of this meal in European countries before the outbreak of the war.

I think I have said enough to justify the adoption of a more widespread use of milk. The problem lies in implementing the recommendation and presumably, the chief obstacle is the cost. We are dealing, however, with what is not only a humanitarian principle but on which involves the physical well-being of a whole nation and in such a matter the question of cost should not be allowed to stand in the way. We are prepared to spend millions in the cure of established disease but by some

extraordinary perversity of nature we stint a few pounds for its prevention. In the light of accumulated scientific knowledge, this is an attitude of mind which can no longer be tolerated. In connection with this matter Professor Drummond remarks: "Questions of expense are altogether beside the point. The physical disabilities and ill-health of later life which are the legacy of malnutrition in childhood cost the nation millions more than would the provision of free supplies of protective foods in the early years. Even looked at from the cold, materialistic point of view, money so expended is not charity, it is a profitable form of national insurance." Everyone with a knowledge of the problems of nutrition and health will sympathise with this attitude. If we cannot yet supply each of our poor school children with an "Oslo" breakfast, then, at any rate let him be provided at least with a pint of milk a day, because of all the good foods which we have at our disposal good milk ranks first and foremost.

THE UTILIZATION OF TOWN WASTES.

(Paper read before the Munster Agricultural Society, 15th November, 1941)

That celebrated American Agriculturist, the late Dr. F. H. King, in his book, "Farmers of Forty Centuries" computed that the people of the United States and of Europe were pouring into the sea, lakes and rivers some 3,000 tons of nitrogen, 1,300 tons of potassium and 900 tons of phosphorus each year for every million of the adult population—and this waste was esteemed one of the great achievements of our civilization. He was referring to human excreta only and did not take into consideration the waste of organic refuse which resulted from unscientific disposal. The same waste is going on to day only on an exaggerated scale in every town and city in the country and I propose to address myself to the problem of its utilisation in order to see if there is a possibility of returning any of it to the soil from which it has all come; and to discuss the form in which it should be returned.

I need not labour the point of the necessity for exploring every possible source of fertilising material. The pronouncements of the Minister of Agriculture, in the first instance as to the bread position and his more recent one concerning artificial fertilizers make it abundantly clear that we are face to face with a crisis of the first magnitude. So far as the utilization of town wastes is concerned the problem may be divided into two parts; the first relates to the disposal of sewage, the second to the disposal of house refuse. For our immediate concern the latter is by far the more important for no one can envisage any possible method by which human excreta can, under our present system, be made immediately available for fertilizing purposes.

I am, of course, referring only to town wastes now and do not wish to be taken as holding that human waste cannot be turned to account in rural areas. It can and should be. It is not necessary to go into the various methods which have been adopted for the disposal of garbage or town refuse. The method in use here is that of uncontrolled tipping

in which the refuse cars run up to the tip face and discharge their contents indiscriminately over the site of the tip. This method has nothing to recommend it except cheapness. It is both unsightly and unhygienic. It encourages rats and flies and gives rise to unpleasant smells, fouls watercourses and generally makes life unbearable for those who have to live near the tip.

The materials dumped comprise the whole heterogenous range of things that find their way into the refuse bins of our city. Very unpromising material indeed from the agricultural aspect ; but in point of fact this material has been held in high esteem for generations by the market gardeners who used to flourish in the outer portions of the city There is no doubt whatever I think, that this material, crude and rough as it is, must have a high fertilising value. How else can we account for the continued fertility of the market garden with its intensive system of continuous cropping The main source of this manure has been two dumps, one on the northern side of the city and the other on the south side—the latter is mainly drawn upon by market gardeners and the former by local farmers. A large proportion of the manure is composed of horse-droppings collected from street sweepings. You will realise that there can be no urine in it. That the refuse is decomposed under very unfavourable and haphazard conditions is apparent from the foul smell which it gives off when disturbed but, even so, when dug into and incorporated with the soil it seems to have great potentials of fertility as evidenced by the results obtained.

We have, therefore, first hand evidence that this very crude, uncontrolled refuse is a valuable potential source of fertiliser. Is it possible to increase its value as manure and, at the same time, dispose of it in such a way as to give rise to no offence whatever ? This fortunately is so. In the system of controlled tipping when the refuse is dumped the materials are so arranged that refractories are placed underneath and covered with an even layer of inorganic material (ashes, etc.), over this a layer of organic, decomposable matter which is finally covered with a layer of earth. Rapid decomposition takes place in the middle layer with the generation of a considerable degree of heat (which is sufficient to kill off ordinary harmful bacteria) and eventually this layer becomes converted into a fine spongy mass of humus in which is incorporated the nutritional elements of which the material was composed. This humus has been found to possess a high fertilising value and plants, grasses and trees grow very freely on tips so constructed. Controlled tipping is now standard practice in many English cities and the humus from such tips is a valuable source of fertiliser for the supplementing of farm manure.

In other areas the refuse is sorted out and after removal of tins and other large articles it is fed to pulverisers which reduce the bulk and provide a uniform material to spread on land. This material has been found especially valuable for incorporation with ordinary farm manure. As evidence of this it may be mentioned that the sale of such pulverised refuse from the Borough of Southwark increased from 8,000 tons in 1933 to 17,000 tons in 1938 and that during this period the income from

sales increased from £600 to over £2,700. This pulverised town refuse has been used very successfully by Sir Bernard Greenwell on his farm at Marden Park in Surrey, using one part of dung to three parts of town waste.

Although neither of these two methods has been adopted in this locality, I draw attention to them because I feel that they are deserving of the most serious consideration, no matter from what angle we look at them—that of the individual anxious to dispose of his wastes in the most hygienic way possible or that of the farmer anxious to increase his stocks of fertiliser. If it can be shown (as I think it can) that both views coincide then I think the case for a revision of our present methods of refuse disposal is a very strong one and mere costings should not be allowed to stand in the way.

Admittedly the contents of our refuse tips are not up to the standard of those obtainable from controlled tips or to the material coming from the pulverising plants but, I think, I have already shown that, such as they are, they are quite valuable and contain within themselves great potentialities if properly treated by the farmer when taken away from the tip. You have recently heard from Mr. Clarke his experiences of comporting farm manure and farm wastes generally. I was deeply interested in that discussion because it is one with which I have been in contact for a good many years—the biological processes underlying the disposal of all waste products by natural means. A study of these processes shows us the extraordinary provisions of nature to bring about the resolution of all dead organic matter so as to provide for the nutrition of the future living generations. This involves the law of return. Theoretically, at any rate, it should be sufficient for the maintenance of soil fertility to return to it everything that has been taken from it—that is obviously nature's method and in arranging for the return the whole process is carried out so that little or no offence is created. It is interesting to note that it was only when this method became more fully understood that the first real advance in sewage disposal took place. At the moment however we are concerned only with the problem of the reduction of town wastes to a suitable form for incorporation with the soil for the increase of its productivity. I suggest that this involves its treatment so that it contains the maximum amount of available plant food at the time of application. This is best achieved by composting.

You will recall that I have already mentioned that the material used by market gardeners is generally of an offensive character. This indicates that decomposition has taken place under unfavourable conditions—probably too much moisture and too little air. I suggest therefore that in dealing with this material the careful farmer will follow the method advocated by Sir Albert Howard and recently outlined to you by Mr. Clarke, the keynote of which appears to be the proper regulation of moisture and ample provision for aeration by turning and ventilation, bearing in mind that his labours are only supplementary to those of the uncountable millions for bacteria that are working for him in his compest heap.

I think it is reasonable to assume that town refuse is more valuable as fertiliser now than it has ever been on account of the greatly increased consumption of timber for fuel. Under present conditions this valuable potash is, I suppose, being simply leached out of our refuse tips. And what about phosphorus? Is any widespread effort being made to collect and crush bones for application to the soil or to enhance the value of our compost heaps? Ammonia is, of course, the weak link of the town waste because all of it is being washed down the drains with the potash and phosphorus of human origin. It is up to the farmer to take steps to conserve his own supplies. It is painful to contemplate the waste, in this respect, which takes place from the average manure heap.

I have endeavoured to put before you briefly some aspects of this problem as they have appealed to me. For my part I feel that, so far as the town end of it is concerned, we should take a long view and envisage a regular system of composting of town refuse at the dump. This should be carried out in conjunction with sewage disposal. In connection with the latter it is of great interest to note that the latest and most promising development actually involves this concept. In sewage treatment plants the greatest problem has been the disposal of the sludge, this has now been overcome by incorporating it with town refuse and considerably increasing the manurial value of the latter. The system employed is merely the application of the principles laid down by Howard and it will be realised that the nitrogen, potash and phosphorus added to the composted refuse not only enhance the manurial value of the latter but greatly accelerate the process of breaking down by providing the bacteria with ample sources of energy and food.

Already experimental work is being carried out at one of our tips. Some of those who draw away the material are, I understand, applying it direct to the land. This, I feel, must be bad practice for it cannot be sufficiently broken down and some of the energy of the soil bacteria must be dissipated in converting this crude material into simpler products before it can become available as plant food. That process is much better carried on beforehand in the compost heap. In the nitrogen cycle we know that protein material is broken down into simpler and simpler substances until eventually ammonia is produced. This ammonia is then built up first into nitrites and then nitrates which are available for plant use. The action is entirely carried on by bacteria and the process is referred to as mineralisation. Potash and phosphorus cycles too take place and the final result is food material ready for absorbtion by the plant rootlets for re-conversion into protein and carbohydrate by the plant in the presence of sunlight.

It is obviously best that the preliminary process, that of breaking-down, should be carried out before the material is applied to the land and hence the value of thorough composting. In addition to providing plant food ready-made as it were, the compost heap provides another most valuable alley to the cultivator—humus. So far as I know no one has ever succeeding in determining what exactly humus is, obviously it is of immensely complicated structure. The bodies of dead organisms and the residues of living matter deposited on or within the soil form the material known as soil organic matter. Theoretically it comprises only the dead residues of organisms and the products of their decomposition but in practice it is impossible to separate this material from living organisms. This matter includes the dead roots, leaves, fruits and stems

of plants ; carcases of insects, worms and animals ; live and dead bacteria, fungi and protozoa ; and newly synthesised substance of active bacteria. Soil humus represents a stage in the decomposition of soil organic matter.

It must not be regarded as a mechanical accumulation of inert material. It represents a stage of an endless exchange between living matter and the mineral kingdom. The gradual mineralisation of humus liberates continuously a certain amount of simple mineral compounds available for consumption by growing plants. It is therefore a store-room of the mineral plant nutrients and a regulator of their supply to the growing crop. Its significance in the soil is not limited to these two functions. It also modifies the physical and mechanical properties of the soil such as structure, colour, consistency and moisture holding capacity. The formation of the granular structure most favourable for the development of crop plants is governed by humus content. The relationship between the amount of humus, the supply of nutrients and the rate of weathering in the soil illustrates the intimate union between the various components of the soil and emphasizes the fact that maintenance of humus must be an essential part of the entire system man follows in using the soil.

I have adverted to the subject of humus because it seems to me to provide the clue to the question of the success of town refuse as a fertiliser in actual practice. By providing an adequate supply of humus it unlocks from itself and the soil a store of minerals nutrients which would otherwise be unavailable and by holding up excessive moisture it prevents these minerals being washed into the deeper layers of the earth. The older market gardeners in this area may not have known about humus, but they knew by experience that the application of town refuse to their land gave good results. There seems to be no reason why the farmers should not profit by their experience. In any case at this juncture it is necessary to conserve every scrap of material which might conceivably be utilised in increasing the productivity of the soil and, for my part, I feel that it should be obligatory on every urban area in the country to take the necessary measures to meet this emergency by the proper conservation treatment and disposal of its wastes.

Note :—Since this paper was written one has been impressed by the references which appear continually in the press to complaints of the lack of artificial fertilisers. These complaints appear to be voiced in all parts of the country. Yet, apart from two small groups of farmers in the northern and southern boundaries of this city, no concerted effort seems to have been made to utilise town wastes in supplementing farmyard manure. It would be much better if some of the effort expended in voicing irremediable grievances of this character were spent in utilising all available material to conserve and increase soil fertility. In some districts, more remote from the city than the liberties it may be noted that the farmers are removing the sod from the roadsides and are incorporating it with the soil in their fields. This is sound practice and exemplifies constructive self-help. The question of soil fertility doe-not concern the agricultural community alone but is one of equal impors tance to the urban population for it involves the maintenance of the food supply of the whole people. From this point of view there seems to be no doubt that the utilisation of town wastes all over the country is a vital necessity at the present juncture and one that should be tackled on a nation-wide scale. Vested or sectional interests should not be allowed to stand in the way.

RATS AND MICE.

(Report made at request of Corporation).

In order to obtain some idea of the magnitude of the problem concerned with the elimination of rats (and mice) it is first necessary to survey briefly the habits of these pests as well as some of the biological facts concerning them. There are two types of rat in this country—the brown (or Norwegian) and the black rat. The latter is now mainly found in coastal cities. having been driven out of the rest of the country by the more vigorous brown rat which can establish itself in the open, in fields, hedge-rows and banks, especially along watercourses and in refuse dumps ; in towns it is found in sewers and drains and generally enters a building through a defective drain. Rats emerge from sewers into vacant sites where houses have been demolished and also through the open ends of house drains (all such open drains should be effectively sealed off). Heaps of builders' refuse on the sites of demolished houses and collections of lumber in yards, outhouses and cellers form attractive nesting places for them. Rats sleep by day and at dusk come out for food and water. Both in the open and in buildings they make well marked tracks between their nests and sources of food supply (in dealing with them it is very important to locate such tracks). In buildings these tracks lie along skirting boards or pipe casings. They avoid crossing open floors or spaces ; the dirty marks of their feet make the track show up and the sides of the holes through which they pass become greasy. The dejecta are seen along the course of the track.

Rats begin to breed when between three and four months old ; five to six litters are born in a year. The normal period of gestation is 21 days. It is assumed that in the estimated rat population of 40 millions in Great Britain in 1918 there were 10 million breeding pairs and, allowing for casualties, it was estimated that at the end of twelve months there would be 41 million pairs, or double the original population. Although we have no exact knowledge of actual birth and survival rates such estimates show the extent of the problem of lessening the number of rats ; the rate of reproduction is such that the extermination of rats is impossible.

Measures against rats are useless unless they are thoroughly organised and continuously carried out. The necessity for such measures is at once apparent when we consider the diseases transmitted by them and the damage which they inflct on foodstuffs, wearing apparel and the structure of buildings. They are potential agencies for the spread of spirochetal jaundice (Weil's disease) and trichiniasis (an affection of pork transmissable to man). The former disease has undoubtedly increased within recent years in this country and has been associated with the increased cultivation of sugar beet. They give rise to rat-bite fever and by contaminating food rats may be responsible for some of the cases of food poisoning. An eminent continental authority (Professor Bang) is convinced that they play a considerable part in the spread of foot and mouth disease. They are also responsible for the spread of bubonic plague.

This formidable list emphasizes the importance of repressive measures but any such measures must of necessity be useless unless carried out on a very wide scale. It is of no use for individual persons or even individual municipalities taking up such measures—at the best they would merely suffice to drive the rat population into neighbouring regions where conditions were more favourable, there to await immigration back to their old haunts when the efforts had been relaxed. It has been established that at the end of winter the overflow population of rats emigrates from towns into the country, where nature provides the necessary food supply. There is a return to the towns in the autumn when the food supply in the countryside begins to fail. This emigration has an important bearing on repressive measures. Such measures should be especially intensive during the month of November (but should, of course, be kept up throughout the year). In many towns it has consequently become the practice to hold a special "Rat week" early in November, but, as suggested above, such efforts are largely negatived by the apathy and indifference of neighbouring authorities. To be really effective such measures should be organised on a nation-wide scale.

The chief methods used to destroy rats are hunting, traps, the use of poisonous gases and of poisons. Hunting is the method largely employed by 'professional' rat-catchers. The recent circular from the Department of Local Government and Public Health indicated a method that has been found effective in connection with harvesting operations but so far as we are concerned reliance would have to be placed mainly on trapping and poisoning. Certain poisons were referred to in the circular of which red squills is undoubtedly the best. Unfortunately this material is practically unobtainable now. One great advantage of this poison is that it is slow acting, it takes upwards of five hours to kill a rat; after taking the poison the sick animal comes out into the open to get air and water and does not die in its haunt and give rise to smell. The lethal dose for a rat is very small ($\frac{1}{4}$ to $\frac{1}{2}$ grain). For poultry the dose is 20–30 times greater and no other domestic animal has been killed by red squills. The other poisons referred to in the circular have been published in the press and need not be referred to especially here (barium carbonate is the most usual). With regard to trapping, which is the best and safest so far as individuals are concerned, it is important that the traps should be laid along the runs frequented by the rats and that the baits used should be of a different type from the food the rats usually obtain and that a change of bait is sure to be of value. For example, in fish shops meat, cheese and bread should be used; in grain stores, warehouses or restaurants, bloaters, red-herrings or cheese are effective. It is necessary to ring the changes and it should be remembered that rats exhibit an extraordinary degree of cunning in avoiding danger. It has, in fact, been stated that traps should first be placed unset and unbaited along the runs to allow the rats to become accustomed to them.

More important than the trapping of rats is the adoption of measures to discourage their presence and chief among these is the precaution of restricting their available food supply to the lowest possible minimum. This applies not only to food but also to water. They will not remain in places where food is not easily procured. To prevent rats already on

premises getting food or water, all food stored overnight should be kept on unclimable surfaces such as counters with marble or similar sides or in rat-proof receptacles (e.g. metal lined drawers) or in rat proof larders or store-rooms. Where meals are consumed on premises every particle of food, even the crumbs, should be swept up each evening and removed. Any refuse stored in kitchens should be kept in metal bins with tightly fitting covers. Rats should not be allowed to gain access to water or other suitable drink. Any receptacle containing water which cannot be done away with, should be properly covered.

These are the methods to be adopted in the case of individual establishments—either of a business or private character and there is no doubt that if strictly adhered to on such premises they will have the effect of greatly reducing the attention of rats. They are referred to because the Departmental circular states that " as far as County Boroughs are concerned, steps should be taken forthwith to urge on the occupiers of premises the necessity for the destruction of rats and mice infesting any portion of their premises." The keynote of prevention in this instance is to remove all food supplies.

It may be of interest to refer to the results of concerted action which have been achieved by a group of manufacturers in the city. Some years ago a meeting of representatives of the milling industry was held under the auspices of the Port Sanitary Authority, as a result of which a contract was entered into with a firm specialising in rat eradication. There is no doubt that the results achieved have been very impressive ; all the firms concerned have testified to the marked reduction of rats on their premises (with corresponding economy of stores and accessories) and, perhaps, the chief witness to the efficacy of the method is that the contract has been renewed each year. A similar report has been received from the Cork Mental Hospital. This building was at one time badly infested with rats. Now, as a result of the attention of this firm, it has become almost rid of the pests. Mr. Kenny informed me that their real trouble now was to prevent the re-invasion of the premises from the outside. This is the experience too of the millers and it illustrates the point I have already made of the necessity for widespread action if any real impression is to be made. Anything short of this will be largely wasted effort. The methods which have been outlined will, no doubt, tend to keep individual premises free but they will do nothing towards effecting a real reduction in the rat population.

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