Prolonged wound sepsis, as indicated by delayed healing, favours the subsequent onset of epilepsy both in cases in which the dura has been penetrated and in those in which the integrity of the dura has been preserved.

Epilepsy is more common after wounds affecting the sensorimotor cortex than after wounds of the polar regions of the cerebral hemisphere.

The presence or absence of concussion (immediate unconsciousness) after gunshot wound does not influence the subsequent liability to epilepsy.

The first fit may occur within a few hours after injury or may be delayed at least as long as twenty years. Epilepsy begins more often in the first two weeks, and thereafter the liability to develop epilepsy progressively diminishes.

In 30 of the 96 cases in which the course of the epilepsy is known fits ceased some years before the patient was last examined. This subsidence of epilepsy occurred most often in cases in which fits began in the first fortnight after injury, less frequently when fits began within the first two years, and never when the first fit occurred more than two years after the injury.

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RECENT MORTALITY FROM BRONCHITIS IN LONDON

BY

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Until the Registrar-General's Annual Statistical Review appears there is no information as to the main causes of death throughout the whole country in any period of time. Such records were last published for the year 1938, but figures are given for the administrative county of London under "short list" headings in the weekly returns, which have continued to be published since the outbreak of war. It is possible, therefore, to compare the experience of the years 1939 and 1940 with that of previous years for this area. The fifty-two weeks covered by the weekly returns do not coincide exactly with calendar years, but the slight error in taking the sum of the figures contained in them as a year's experience is unimportant. When this is done the very great increase in the number of deaths classed in 1940 as being due to bronchitis immediately hits the eye. Stocks (1940) has shown that the greatest single cause contributing to a general excess of deaths at ages over 45 in London between January 7 and February 17, 1940, was bronchitis. During this short period deaths from all causes exceeded the number expected on the basis of the same weeks in 1939 by 1,900, or nearly 33%; those from bronchitis were 800 (106%) in excess. With all the information of the Registrar-General's office at his disposal he was in a position to eliminate the several fallacies of comparison which will be discussed later, and the great increase in mortality from bronchitis he reveals must be accepted as real. The period of time was, however, very short, and a lesser but substantial excess in the deaths from some other causes, such as influenza, pneumonia, and

heart diseases, which he demonstrated then would probably not have been sustained if the figures for a longer period had been examined by the same methods. He drew attention to the fact that these rises coincided with the exceptionally cold spell of weather in January and February. The point is important, for any change of mortality which is contemporaneous with the war is apt to be regarded as one of its results. The experience of the whole year therefore deserves as careful examination as possible.

Statistical Discontinuities

At the outset we are faced with certain difficulties. We know that the population of the administrative county of London has been falling steadily for some time. Between 1921 and 1931 it fell from 4,484,523 to 4,396,821—i.e., by nearly 2%. The mid-year estimate for 1938 was 4,062,800, representing a rapid decline of more than 8% during the seven years since 1931. So long as comparisons of death rates, not merely of deaths, are made this fall does not matter. In 1939 the population was estimated at 4,013,400, but this figure was adjusted for death-rate purposes to 3,780,700 in order to allow for evacuation movements and the exclusion from the death returns of non-civilian deaths since the outbreak of war (L.C.C. Report, 1939). Estimates for 1940 have not yet been published and are beyond the competence of anyone without access to official records, but it would not be unreasonable to suppose that the deaths in 1940 occurred among a population not exceeding, on the average, three and a half millions. If this is so we should expect a reduction in the number of deaths from all causes, as compared with the average of the previous ten years, of at least 16%, in the absence of factors inhibiting such a decline. Further, since the outbreak of war deaths have been assigned to the place of occurrence and not to residence. This may seriously affect comparability. In the circumstances of 1940 it would probably reduce the recorded deaths from natural causes in London. A still more serious interference with continuity is the change made by the Registrar-General in the method of classifying causes of death since the beginning of 1940. Whereas formerly the selection of one cause for the purpose of classification from more than one stated in a death certificate was made according to arbitrary rules, it is now determined so far as is possible by the order of preference indicated by the certifying practitioner. It is easy to see that this change (which was bound to come sooner or later) gravely affects comparison with the statistics of previous years. The adoption at the same time of the 1938 revision of the International List of Causes of Death is less likely to affect the comparability of figures relating to those causes with which this paper is concerned. It is, at least, clear that, for the present, the large number of deaths from bronchitis in 1940 has to be examined without any attempt to express it as a death rate, and that we must make sure that it is not an artificial result of changes in statistical procedure.

In a normal year nearly 90% of the deaths classed as due to bronchitis in London occur at ages over 45. It is therefore a cause mainly affecting those who have passed middle age, and it rapidly increases in old age. In 1939 92% were over 45, and in 1940 the proportion rose to 95%. The reasons for this rise may be disregarded for our present purpose. The point is that we are considering for 1940 a condition affecting the usual elderly age group of the population. It kills especially those whose cardiovascular and renal systems, as well as the respiratory, are degenerating. When death occurs it must often be hard

for the practitioner to decide whether the most important cause is respiratory or cardiovascular or even, on occasions, renal. He may mention one or more of these systems in his certificate. In the past the Registrar-General of England and Wales has placed bronchitis very low in the order of preference. He chose a definite cardiovascular against any respiratory cause except lobar pneumonia (and, of course, influenza) if both were stated on one certificate, but a comparison recently made by the United States Government of the classification of the same group of certified deaths by the statistical departments of several countries showed that this policy was not so much favoured in some of them (Bureau of Census, Washington: Vital Statistics). Within our own country the preferences of medical practitioners differ from those shown by the Registrar-General in the past, and they also change with advancing knowledge, or, it may be, with medical fashion. Fashion, of course, has not suddenly changed in 1940. From year to year the Registrar-General has shown how bronchitis and old age have declined as assigned causes of death over 70 years of age, their place having been taken largely by heart diseases through increasing use of the terms "myocarditis" and "myocardial degeneration." A death ascribed to "bronchitis and myocardial degeneration" has hitherto been classed under the latter heading, whereas it is probable that if practitioners had been restricted to one single cause many would have preferred "bronchitis." The growth in the proportion of certificates showing such multiple causes no doubt accounts for much of the recorded fall in death from bronchitis and the rise of heart disease. The effect of following the practitioner's choice instead of the statistician's is revealed in the Annual Statistical Review for 1937 (Registrar-General's Review, 1937). It is shown for the records of 1936 and 1937 that a change from the arbitrary rules to acceptance of the certifier's choice would have reduced the deaths throughout England and Wales classed to heart diseases by about 28,000, or 22%, and increased bronchitis by 15,000 to 16,000, or 86 to 89%. Here, then, is a very great discrepancy, especially in the recorded mortality of bronchitis, which must vitiate all comparisons between 1940 and previous years until the figures are published by the Registrar-General in comparable form. On the other hand, nephritis would have been increased by only 1% under the new system.

Comparison with Previous Years

It is necessary to keep these facts in mind when examining the London statistics for 1940. For reasons already given it is not practicable to compare the death rates with those of previous years; but the actual deaths classified to certain causes are shown here in tabular form, their

relation to those of previous periods being brought out in the second half of the accompanying table. In addition to the average for the ten years 1930 to 1939 (inclusive), the year 1929 has been shown separately because influenza was unusually prevalent then, a fact which has a bearing on the number of deaths classed to bronchitis.

For obvious reasons deaths from violence other than suicide are not included in the deaths from all causes for each period stated in the tabulation. The total number of deaths from all other causes has fallen by less than 9% as compared with 1930-9. As already indicated a greater fall might have been expected from the reduction of population, although old folks, who contribute heavily to the deaths, probably have not left London in such a high proportion as younger people. On the other hand, the deaths in 1940 were 27% lower than in 1929, a fact which, taken in conjunction with the very great difference in influenza certifications in these two years, confirms the common observation that no serious epidemic of this disease occurred in 1940. All respiratory causes taken together (including influenza) have risen, but to nothing like the level of 1929. In this group, however, bronchitis alone accounted for even more deaths than in 1929, the deaths from this cause far exceeding those from pneumonia for the first time in any of the years under consideration, and being nearly two and a half times the average of the previous ten years. The fall in pneumonia deaths was a little greater than might have been expected, and when this is viewed along with a considerable increase in the deaths classed to "other respiratory causes" as well as to bronchitis, it may be suspected that there has been an artificial inflation in these latter categories at the expense of pneumonia. The Registrar-General's inquiry indicated that the new system might lead to a very slight increase of recorded pneumonia, and the absence of epidemic influenza may have been in itself sufficient to account for the relatively low figure for pneumonia, but the influence of sulphonamide therapy has also to be kept in mind.

When we turn to the cardiovascular group a marked discrepancy is observed between the behaviour of deaths from cerebral vascular lesions (cerebral haemorrhage, apoplexy, etc.) and other cardiovascular causes. The sharp rise in the former is possibly statistical rather than real, although there was no indication from the Registrar-General's inquiry that this might be expected. The stress of these times may be a partial explanation. It is better, however, to take the two groups of causes together. There is less of a drop (2%) in the deaths from all cardiovascular causes than might have been expected from the fall of the population and the change of method in classification. The smallness of the decline may be due to the same reason as the rise in bronchitis. It is probable that, if the old

Table showing Mortality in London (Administrative County)

	Deaths from Certain Causes, 1929, 1930-9, and 1940*			Deaths in 1929 and 1940 compared with the Mean Annual Number of Deaths in 1930-9 taken as 1,000		
	Annual Mean			Annual Mean		
	1929	1930-9	1940	1929	1930-9	1940
All causes, less violence other than suicide	60,873	48,805	44,548	1,247	1,000	913
Influenza	3,118	908	537	3,433	1,000	591
Bronchitis	4,272	1,915	4,675	2,231	1,000	2,441
Pneumonia (all forms)	5,883	3,426	2,784	1,717	1,000	813
Other respiratory causes	879	515	755	1,705	1,000	1,465
Total influenza and respiratory	14,152	6,764	8,751	2,092	1,000	1,294
Cerebral vascular lesions	2,179	1,896	3,069	1,149	1,000	1,618
Other cardiovascular causes	15,273	15,554	14,064	982	1,000	904
Total cardiovascular	17,452	17,450	17,133	1,000	1,000	982
Nephritis	1,820	1,518	1,043	1,199	1,000	687

* Figures for 1939 and 1940 are the sum of the weekly returns, which do not coincide exactly with calendar years.

system of selection for classification had persisted, still more deaths would have appeared in the circulatory group and fewer as bronchitis, but that both would have shown an increase. Nephritis has declined substantially as compared with the average of the previous ten years; but this is part of a steady and quite rapid process over the years, and the figure for 1940 actually exceeded that for 1939 in spite of the fall of population. There is thus no evidence that bronchitis has borrowed materially from nephritis. This, like the other degenerative causes, may really have increased in 1940. The same comment applies to "old age,"* which has been figuring less and less in London statistics, but which nevertheless accounted for 226 more deaths in 1940 than in 1939. For purposes of classification it is still ignored as a cause if it is associated with any definite disease. The only other large category which showed a substantial decline was "other specified causes" (from 1,731 in 1939 to 1,229 in 1940, a difference of 502), but it is doubtful whether many of these would find their way to bronchitis by a change in the system of classification.

Discussion

The general conclusion from these considerations is that a large part of the increase of the deaths ascribed to bronchitis in the weekly returns for London in 1940 was fictitious, but that part of it was genuine. This part could not be attributed to influenza. It was associated with an increase, or less than the expected decrease, of certain other causes of death common among the elderly. Was it a result of war conditions?

The mortality from bronchitis, like other respiratory causes, and indeed like nearly all causes of death, has a definite seasonal distribution. Between 1921 and 1925 the average maximum for the whole country was in February and the minimum in August (Registrar-General's Review, 1925). In the chart shown here the average weekly number

London (Administrative County): average weekly recorded number of deaths over 45 years of age from bronchitis, in four-week periods, from November, 1933, to March, 1941.

of deaths over 45 years of age from bronchitis in London is given in periods of four weeks from November, 1933, to March, 1941. The comparison before and after the beginning of 1940 is valid, of course, only for seasonal occurrence and not in relation to its magnitude. It will be seen that the peak most often occurred in the first four weeks. In this respect 1940 conformed to type. In so far as there was a real increase in mortality from bronchitis,

most of it was in the beginning of the year, before the people began to resort to shelters. The most notable feature of this season was the rigour of the weather. Unfortunately, meteorological records have not yet been published, but the weather in December, January, and February is known to have been exceptionally severe. Russell (1924, 1926) has drawn attention to the dominating effect of atmospheric temperature on respiratory mortality even in the absence of fog. The bitter weather at the beginning of 1940 was in itself probably enough to account for any increase in deaths from bronchitis and other causes among old people. If towards the end of the year shelter-life and exposure had any effect it was apparently not great, when the artificiality of much of the apparent increase is kept in mind. In 1941 the cold spell, severe but rather less so than in 1940, came later in the year, and the peak of bronchitis deaths was delayed till the second four weeks, when it was quite pronounced. It is, of course, possible that in both these seasons the effect of the black-out exaggerated the influence of the ill ventilation which always accompanies cold weather and favours respiratory infection; but the conclusion seems reasonable that the real part of the increase in mortality from bronchitis and other causes among old folks was mainly attributable to exceptional weather conditions and not to circumstances arising from war.

Summary

There was a great increase of recorded mortality from bronchitis in London in 1940, affecting the elderly.

A large part of it was an artificial result of a change in the system of selecting one cause for classification from more than one cause stated in death certificates.

In so far as it was real it occurred mainly at the beginning of the year, as usual.

It was not due to an epidemic of influenza.

It occurred, probably along with an excess over the expected number of deaths of old people from other causes, during one of the most severe spells of weather this country has experienced, and should not be regarded as having been due to war conditions.

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The Royal New Zealand Society for the Health of Women and Children, which was founded by the late Sir Truby King, gives in its latest annual report some of the vital statistics of the Dominion. The birth rate in 1939 (excluding Maoris) was 18.73 per 1,000, the highest recorded since 1930. The maternal mortality rate, excluding septic abortion, was 2.95, and the infantile mortality rate 31.14 per 1,000 births, almost the lowest ever recorded. The death rate during the first month of life was 21.8, an improvement on the figure for recent years. The names and addresses of all infants who died during the year were obtained from the Registrar, and the Plunket nurses employed by the society investigated every case. An inquiry has also been made into the extent and duration of breast-feeding in New Zealand and the causes of early weaning, the outstanding one being failure of the milk supply of the mother. During the year further efforts have been made by the Plunket nurses to extend their pre-school work, and a ready response has been made by the parents. The society has six infants' hospitals in various parts of New Zealand, and the 138 Plunket nurses in its service saw 22,000 new cases during the most recent year, and paid 170,000 visits to homes.

* Figures of old age are not included in the table because this heading did not appear in the short list till 1931.