TYPHOID IN HOBART AND MELBOURNE, AND THE INFLUENCE OF DRAINAGE ON ITS PREVALENCE.

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At the meeting of the Intercolonial Medical Congress at Melbourne, in 1889, the subject of typhoid was largely considered, and was adopted as the matter of discussion at one of the general meetings. At the end of that discussion a series of resolutions were proposed and carried unanimously. The first affirmed: "That the prevalence of typhoid is owing mainly to insanitary conditions, and above all to contaminated water supply, defective drainage, and improper disposal of night soil." By the second it was declared: "That while there is reason to believe that the sources of the water supply of Melbourne are carefully guarded, it is certain that, as regards drainage and night soil disposal the arrangements are very unsatisfactory, and to these defects must be ascribed in great measure the excessive prevalence of typhoid fever year after year." By the third it was affirmed: "That in the opinion of this Congress, it is the imperative duty of the Government to take immediate steps for bringing about an improvement in the sanitary condition of Melbourne, and specifically for the construction of a proper system of underground drainage, which shall include the removal of night soil by water carriage."

Though these resolutions had properly enough special application to Melbourne, the affirmations were equally true of other places where conditions at all similar prevailed. The late Dr. Richard Bright, who took part in the discussion, and seconded the last of the resolutions, declared in a very positive way his belief that the excessive prevalence of typhoid in Hobart, in the years just preceding the meeting of the Congress, was greatly owing to the pan system.

The resolutions took the shape they did very largely to strengthen the hands of the medical profession in Melbourne in their struggle for sanitary reform. It may be assumed that their unanimous adoption and vigorous wording had the effect intended, since the Government soon after engaged the services of an eminent London engineer to report on the best method for carrying out a scheme of underground drainage In 1890 that report was received, and a Metropolitan Board of Works constituted, with control of water supply and drainage. With some modifications the proposed plans were adopted, though for several years progress seemed to be slow.

About five years ago house connections began to be made, and now (August, 1902) 48,000 buildings out of about 100,000

have been connected with the sewers, and the pan system abolished, so far at least as concerns these places. Of course very much remains to be done, and as was proper, the central and more populous districts, and the suburbs on the line of the outfall drain, were the first to benefit. Clearly the full advantages from the point of view of sanitation are far from being attained, but it may be possible to show that they are considerable.

It might have been expected that an enlightened self-interest would have led the citizens of Hobart, as a place of summer resort, to realise the enormous benefits any such place must derive from a good sanitary reputation. And there is nothing more likely than a fear of typhoid to check the influx of visitors. Without throwing doubt at all on the attractions of Hobart, both as a beauty spot and a good health resort, it must be admitted that, up till quite recent times, it shared the evil fame of Melbourne as a hot-bed of fever. And a comparison of the mortality returns brings out some striking points of similarity between the two cities. Taking the period since 1890, such a comparison brings out the very striking fact that the specially fatal years in both places were 1890-91 and 1898, and the year between these, showing the lowest typhoid mortality was also the same, viz., 1893.

The concomitant variations are much too striking to admit of explanation by the easy way of "accidental coincidence." They strongly confirm the opinion, which I have long held and frequently expressed, that general conditions of the meteorological kind have much to do in determining the fluctuations of typhoid prevalence in particular localities from year to year. I must admit further that my endeavours to fix the exact nature of these meteorological, so-called cosmic, conditions have been attended with rather a scant measure of success (*v.* Proceedings of the Australasian Association for the Advancement of Science, Vol. II., Melbourne, 1890, and *Australian Medical Journal*, March, 1890). And, indeed, looking at the enormous fluctuations in the typhoid mortality, year by year and in almost a parallel way, in the two cities, it might seem as if they had been left at the mercy of these general conditions up till quite recent times.

But knowledge has grown, and from application of that knowledge improvements of many kinds have resulted. And just as the fatality from consumption was steadily becoming less in most countries, independently of any recognition of its infectious character, and without much in the way of special precautions, so with typhoid the death rate has been undergoing diminution, even though certain essential improvements may not have been adopted.

In a paper read before the Royal Society of Tasmania by Dr Gregory Sprott in August, 1898, the argument in favour

of the adoption of a proper drainage scheme was put in a very forcible manner. At that time both Hobart and Melbourne showed very unfavourably in the comparison of mortality rates, not only with European conditions, but even with Sydney. Since then there has been a great change for the better, and for several years it has been a pleasure to me to be able to point out that the deaths from typhoid in Melbourne had at last been reduced to such an extent that the mortality compared favourably with that of the great English towns. And comparatively low as the rate now is, there is every reason to hope, from analogy of what has happened elsewhere, and notably in some of the German cities, that the lowest point has not yet been reached.

In presenting, in tabular form, the death rates from typhoid for a series of years, in Hobart and Melbourne, it is not necessary to go further back than 1890, as by the help of these figures we can make comparison of periods for which reliable census figures of population are available. Calculations based on estimates are apt at times to be fallacious, and especially in our case, where census periods are as long as ten years apart.

The following table gives a comparison of the rate of mortality from typhoid, in Hobart and in Melbourne, for the 12 years 1890-1901 :—

PER 10,000 OF POPULATION.

	Hobart.	Melbourne.
1890	5·1	8·5
1891	16·7	3·9
1892	5·7	3·2
1893	2·5	2·6
1894	4·8	3·5
1895	5·8	3.2
1896	4·	3·3
1897	3·4	2·6
1898	8·1	4·7
1899	1·6 (? 2·)	2·9
1900	1 6 (? 2·)	1·9
1901	2·	1·4

The rates for Hobart are taken from the reports of the health officer, and as regards at least the years 1899, 1900, they almost certainly require correction, since the population had been overestimated by almost 6000,implying an addition to the rate of about one-fourth, and making it more probably 2· than 1·6, as given in the table. On the other hand the census returns showed that the estimates of population for Melbourne had been a close approximation to the true numbers. On analysing the figures given, the first thing at once noticeable is the great decline in the mortality rate in both cities, in the three last years of the period. Another is that the fluctuations from year to year are much greater in

Hobart than in Melbourne, owing of course to the smallness of the population not allowing of a correct average being easily got. But it has further to be noted, that with all the fluctuations the rate for Hobart has never come so low as that which has been found in Melbourne for the last two years, and notably in 1901. It is manifest from the fact that the mortality has been so much below the average in both places, that general conditions have on the whole been favourable during the last three years. The improvement in the typhoid mortality rate has doubtless been in great measure owing to advances in sanitation, better guarding of milk and water supplies, better cleansing of streets, lanes, and house surroundings, more care in the disinfection and ultimate disposal of night soil, and possibly other things not so obvious. But things being equal in all these respects, it might fairly have been expected that in Hobart the swing of the pendulum would have been more distinct with the small population than in Melbourne with the large. It might have been expected that, in one or other of these favourable years, the rate would by chance have fallen lower than in Melbourne, just as it was lower in 1893, than in any of the earlier years of the period, and far higher in 1891 and 1898 than at any time in the period. Many conditions being the same in both places, it seems as if there had been something at work in Melbourne of a special kind, not operative in the Tasmanian capital. It is not easy to think of anything greatly different in the two places but the drainage system adopted in the one and not in the other. Things being equal the mortality ought to be lower in Hobart, with its excellent undulating site, and its comparatively small and scattered population.

It is worth making a further comparison, viz., between Melbourne and the rest of the State of Victoria, to see whether it favours this view :—

Per 1,000 of Population.

	Melbourne.	Rest of Victoria.
1890	8·5	3·2
1891	3·9	2·5
1892	3·2	2·2
1893	2·6	1·9
1894	3·5	3·
1895	3·2	1·9
1896	3·3	2·3
1897	2·6	2·
1898	4·7	4·7
1899	2·9	2·9
1900	1·9	2·
1901	1·4	1·78

Here we have in some respects the same thing seen as in the previous table. With a large population, scattered over a large area, the fluctuations of course are not nearly so great as those shown for Hobart. But what is also apparent is that, while on the whole the mortality has been lower in Extra Metropolitan Victoria than in the Metropolis, this has now ceased to be the case. Something has happened in the last two or three years in Melbourne to make the rate lower than in the rest of the State, though the same thing had never happened in any other year of the period.

To the casual observer the differences just pointed out may seem trifling, but in a place like Melbourne, with a population of about half a million, a lowering of a death rate by even 1 in 10,000 of population represents 50 lives saved annually, and these in turn may represent about 500 fewer cases of typhoid. The value of 50 lives of persons in the prime of life, as most typhoid patients are, and the cost of 500 cases of tedious illness, are not matters which can be dismissed as trifles. By themselves, in fact, they make in their saving a considerable offset against the expense of sewerage. And when, to these savings, there is added the comfort, almost the luxury, of living in a sewered house, as compared with another in which the night pan is ever apt to reveal its offensive presence, and where foul water of every kind has to trickle along from house drains to right-of-way and street, it may well be a question whether the offset is not a full one. It will be for the people of Hobart, who have much to gain in the reputation of their city as a health resort, in addition to the savings and gains just mentioned, to decide whether it is not a grievous mistake to allow present conditions to continue longer than is absolutely necessary. I do not wish to refer specifically to other sanitary defects which reveal themselves easily to the trained, perhaps even to the untrained, observer. Many of them would disappear with the completion of a proper system of drainage. With these improvements accomplished, Hobart should be second to no other place in the Australian Commonwealth as a health resort; and it is hardly stretching prophecy too far to express the conviction that, among the benefits obtained, there would be complete, or almost complete, immunity from outbreaks of typhoid.