papers on the subject, but which leave one undecided on a point which is worth clearing up.

These samples were taken from different mines. The shallow ones are the first on the list. The general effect will be seen in the almost uniform increase of the carbonic acid as the distance from the bottom of the downcast increases. In shallow pits the air at the bottom of the downcast is very good indeed, but in the deep pits I never found a sample as good as in a shallow one, as was to be expected. The oxydisable matter varies, but there are so many substances which act on the permanganate, that the effect must be variable. The micro-organisms do not seem to follow any fixed rule, as in one case very bad samples as regards CO_2 there were none, and the next time I made an examination of the same air I got about twenty bacterial points per litre. Stagnation of air and high temperature are favorable to their growth, but the presence of horses or men is more so.

Of the special forms of microbes obtained the following are some noted, with location in which they were collected:

A. Sample made at upcast shaft, very foul air. The slides were mainly torulæ, mycelial filaments, bacilli subtiles and some cocci. Number of colonies, 26.

E. Stables in upcast, air very bad. Moulds 10, bacteria 110.
Slides: bacilli, torulæ and micrococci.
Cultivations: 1. Orange yellow in jelly.
2. Pure white.
3. " "
4. Yellow sh.

G. Sample taken 1,000 yards from downcast. No work going on. Fans stopped.
In 6 slides there were mostly bacilli. 6 colonies in tubes.

A. Sample made in *cul-de-sac* 1,000 yards from downcast. Moulds 4, bacteria 24.
Slides: nearly all micrococci.
Cultivations: 1. Pearly white growth on surface forming a ring round a central growth.
2. Delicate pink in jelly.
3. Liquefying.

The general condition of the parish is not at all favorable to a low mortality from phthisis, the soil being stiff clay, as a rule, and very wet, marshy in many places and liable to be swept by cold winds, there being very little shelter either from trees or hills. The housing is also indifferent, and overcrowding prevails to a considerable extent. Those conditions might be expected to lead to a higher death-rate from phthisis, even without the influence of occupation.

It will be at once seen that city rates exceed very much the death-rates from phthisis in an almost purely mining district. Although we have thus a low mortality from phthisis, of course it might be that the effect of occupation might show itself in increased deaths from other causes. A reference to other tables will show that for the same periods as already given, the mortality from all causes given in the mean was 15.79 per 1,000 living, and this, of course, is a tolerably low mortality.

General Considerations and Conclusions.—From comparisons of state of air in coal mines with that in one-room houses, schools naturally ventilated, and manufactories, it will be admitted that it is wonderfully good. The problem of mine ventilation is a difficult one, but by the use of fans it has been solved to a certain and large extent. It would not be easy, if possible, to ensure that the air of mines would be as pure as the air above ground, as so many causes are co-operating to vitiate mine air—respiration and excretions of men and horses; combustion of powder, oil and tallow; the exudation of gases peculiar to the various minerals met with in mines; and the decomposition of wood. To keep the products of all these in moderation a large and ever-moving volume of air must pass in and out of the mine. The sectional area of the air shaft would have to be much larger than present uses demand if the impurities were to be reduced to the quantity found in pure air, but the present system might, in my mind, be much improved by attention to some points which have struck me in the present inquiry, and which I now venture to suggest to those concerned.

Twenty years ago air was very bad in mines, ventilation was almost unknown, and the hours were very long. Nowadays the air is generally good; ventilation is efficiently carried on, and hours of work are short. The miner works hard whilst at his work, but he has short hours and many holidays. In the tables of statistics I have shown that phthisis, contrary to general opinion, is not a common disease amongst miners; and my own every-