the normal and the total death-rate 1.8 times the normal of the which may be reached without a man being suspicious of any age in question.

In New Zealand life is generally less hard than in the countries of the Old World, and when a miner in this colony feels that he has "miner's complaint" he ceases to go underground. By dint of help from his relatives and friends, and with a little work from public bodies-who always look with a pitying eye upon such a one-he manages somehow to "rub along." He feels no obligation to report himself as suffering from an infectious disorder (5), and is not, as a rule, confined to his bed till the last bout. (This, however, may last two years; but, whether his end be swift or lingering, his sufferings are usually considerable). Often he contracts some other pulmonary complaint, which appears as "cause of death" in the returns of the Registrar-General (6).

The only statistics relating to New Zealand which the writer has encountered appear in a report by Dr. Makgill on phthisis in Reefton, Inangahua County, which says, "We see that at Reefton there is after the age of thirty an increase in the number of cases of consumption among males, whereas among females in Reefton, and among both sexes over the whole of New Zealand, there is a marked drop after that age." He gives the following table :--

	Whole of New Zealand.			Reefton.	
Age.		Males.	Females.	Males.	Females.
0-10		0.5	0.7	0	0
10-30		25.0	28.6	31.2	40.0
30-50		16.6	18.5	34.7	25.6
50 and	over	3.5	2.4	19.2	16.7

That the disease is prevalent among quartz-miners in New Zealand no one living in a mining district has any doubt. There is no need for the colony to set up a Commission; the subject has already a bibliography of its own. All that is necessary is to decide which of the many devices on the market is the best, taking everything into consideration, and to compel its installation. The South African Commission of 1903 awarded the first prize of £500 to the Britten's atomizer, and the second prize of £250 to the Leyner waterdrill. The latter deals only with the prevention of dust during drilling operations, and does not affect its production during blasting.

The General Health of the Quartz-miner.

Quartz-miners appear to tire easily, both mentally and physically. Public movements in mining districts flourish a little while and then die out. The practical miners attending the schools of mines are the least assiduous at their studies. Miners, as a rule, are not inclined to athletic exercises. On returning home from their work they are generally less ready for domestic chores than other members of the working-class. Unless called out by business or social engagements, they usually sit about till bed-time in They often complain of headache their digging-clothes. and palpitation. Generally, they are pale, and move slowly; but a week's holiday improves them marvellously. They soon revert, however, to their former condition.

All these points are doubtless very trivial; but when it is remembered that these men possess, in common with their fellow-citizens, an energetic and sturdy ancestry, there are surely grounds for assuming the possibility of some serious physical disturbance. The paleness might, of course, be attributed to the fact that the miner's work is away from sunlight, and his proneness to fatigue, his headache, etc., be due to gaseous poisoning. It seems to be generally agreed among writers on the subject (7) that more or less carbon-monoxide is always produced during the explosion of nitro-glycerine compounds. When the detonator is small in proportion to the charge, when the ground is wet, or when from any other cause detonation is imperfect, the quantity may be considerable. Some writers consider that varying quantities are produced during the compression of air in presence of oil. As little as 0.05 per cent. in the atmosphere will, in time, produce most unpleasant symptoms. They are: "First, fullness in the head, throbbing in the temples, and palpitation; second, tendency to stagger, indistinctness of vision and hearing, and giddiness. . . . These are more marked when exerting "+ This is with a 30-per-cent. saturation of the blood-a stage

external influence being at work.

The presence of an appreciable quantity of arsenic in the dust suspended in the atmosphere-arsenic derived from the disintegration of nodules of mispickel in the ore-would certainly produce most of the above symptoms; but in all cases of arsenical poisoning paralysis supervenes, and this condition is rarely encountered amongst quartz-miners.

On the other hand, in view of what has occurred in coalmines at Westphalia and elsewhere, and in tin-mines at Dolcoath, Cornwall (8), there is a distinct possibility that ankylostomiasis (miners' anæmia) may be found in the quartz-mining districts of New Zealand.

The truth of the matter can only be elicited by special investigations, but these need be neither expensive nor complicated.

The following is put forward tentatively as a method of carrying out the necessary tests: A qualified medical man appointed by the Minister-a specialist is not indicatedwould meet the shift coming out of the mine, and would select a few of the men showing most marked signs of fatigue From each of these a few drops of blood would be taken and placed in labelled tubes. Twenty cubic millimetres would be drawn from each sample and diluted to a hundred times its volume with water, a hæmacytometer being employed to insure exact measurement. The samples would then be compared against an equally diluted quantity of blood drawn from a person above suspicion as regards carbon-monoxide If the blood of the miner contained HbCO (carpoisoning. boxyhæmoglobin), even to the extent of 18 per cent. saturation-i.e., considerably less than would be required to make the subject conscious of more than a slight lassitude-it would have a readily recognisable pink tinge. The presence of HbCO in the blood of any individual would conclusively prove the mine-air to be contaminated with carbon-monoxide, although a negative result would not be so conclusive a proof of the contrary. If HbCO was detected, the necessary alterations should be made in the ventilation arrangements, and the test repeated at the end of, say, a fortnight. drop of blood from the sample would be treated with eosin (a coal-tar product) and examined under the microscope, the colored corpuscles being counted by means of a special slide. An increase of the eosinophite variety of leucocytes is generally found in ankylostomiasis, but it is not an infallible proof of the presence of the disease (9). The test might then be repeated without the addition of eosin. Any considerable diminution in the number of red corpuscles-if intelligently interpreted-would establish the existence from some cause of anæmia. Anæmia having been detected, it would remain to determine its immediate cause. Malnutrition would certainly not be to blame, for miners receive a wage sufficient to insure them a proper supply of food. Tests must therefore be made on the fæces of selected cases, any infected persons isolated, and the working of the mine stopped until a simple but effective disinfection has been carried out.

During the period of isolation of the suspects in Westphalia it was the custom of the proprietary to pay in full the wages of the men thus prevented from following their employment. No suggestion is made in this essay with regard to this particular point.

It will be best for the regulation of underground latrines to be left to mutual agreement between employers and miners. In any case the faithful carrying-out of regulations rests with them. If the collective opinion of the mining community is against certain practices, then such practices will cease; but if neither party realises the importance of the matter, then all the regulations in the world will fail to prevent continuance.

(3) Report of the West Australian Commission on Venti-on. Vide "New Zealand Mines Record," April, 1905. lation.

Amount varies inversely with pressure carried.
(4) Dr. J. S. Haldane, M.D., F.R.S., Mr. J. S. Martin,
H.M. Inspector of Mines, South-western Division of England;
and Mr. R. A. Thomas, Manager, Dolcoath Mine, Cornwall.
+Authorities differ, but the majority consider silicosis
contagious, claiming that the sputa carry germs capable of propagation in another host.

See additional footnote next issue.