

From the great want of space in this issue we are reluctantly compelled to hold most of our editorial matter over, the addition of a report of the Ontario Medical Association more than crowding our columns.

THE BACTERIOLOGICAL EXAMINATION OF WATER—ITS IMPORTANCE.

Water is one of the most convenient mediums for the rapid dissemination of micro-organisms, and this most noticeable in surface water, for it has been demonstrated that a shower of rain diminishes the number of organisms in the air in a most remarkable degree, consequently micro-organisms may thus find their way directly through the air into surface water; also, they may find their way by drainage.

Water proves a medium of great importance; while it contains organic matter putrefactive bacteria flourish. It has also been shown that water bacteria can flourish in distilled water; thus a small quantity of water containing organic matter, such as sewage, may contaminate water for a great distance, and thus prove a ready medium for the cultivation and dissemination of micro-organisms, hence the importance to be attached to proper bacteriological examinations.

Nothing could be more misleading than the quantitative examination, as it is not the number of the organisms but the individual species which may render the water dangerous.

If a sample of the purest water containing, say, 200 germs per cc. be left standing in a warm room for twelve hours you may have instead of 200 germs per cc., 5,000 germs per cc., and the water be just as pure so far as pathogenic organisms are concerned, as the 5,000 will not contain one more species than it did originally with the 200 colonies; thus it can be readily understood that the number of organisms has no relation to the quality of the water.

It has been said by Crookshank that when water does not contain more than 1,000 organisms per cc. that it is fit for drinking purposes, but it must be borne in mind that this 1,000 may contain a number of pathogenic organisms. Whilst, on the other hand, 5,000 colonies in the same water might not contain one single pathogenic organism. It has been proven and unanimously agreed upon

by bacteriologists that no general biological examination of water will give us any reliable information or indicate the fitness or unfitness of water for drinking purposes with any accuracy.

The number of liquifying organisms has indeed been given by some as a more accurate method, but to obtain such information a more rigid examination of the species must be carried out. A much safer rule than that followed in Toronto—which, by the way, is not only misleading but unnecessarily alarming—would be to take the different species of organisms in the water as indicating its purity or impurity, for it would follow that in a considerable number of species there must be several centres from which these are derived, each additional source being in itself an additional source of danger. After examining 400 spring wells and streams, M. Megala concluded that when there were more than 10 species present in any sample the water was unfit for drinking purposes, in only 50 out of the 400 examinations was such a number found, while 160 contained more than 1,000 colonies per cc., 66 of these having over 10,000 per cc., and in 40 over 50,000 per cc. He found in all 28 species and observed that the number of colonies does not in any means correspond with the number of species. He concludes by stating the only perfect and reliable method is to examine each species by itself and to examine carefully any organism that bears the slightest resemblance to any of the pathogenic species. This, in itself, is necessarily a very difficult task, as from each colony drop cultures and tube cultures must be made, and if any fail to grow thus they must be again tried in an atmosphere of hydrogen, and treated as non-erobic organisms, and if any doubt still remains they must be passed through animals and thus all doubt may be removed if Koch rules are carefully followed. The present methods of examinations are tedious and difficult, but are finally eminently satisfactory as compared with the earlier methods of merely counting the colonies.

No town should establish a water-works' system without the question of purity of the supply both chemically and bacteriologically having been established, and its purity thus established, it must be constantly watched to prevent contamination, as in this way infectious diseases are most frequently transmitted.