

In dressing the wound, the cannula and the packing around it are removed, the trachea cleared and the tube reinserted, packing it around with antiseptic gauze, so that no secretion can pass it, and then the balance of the wound filled nearly full with the same gauze. A separate strip of gauze should be used to plug the œsophagus so that it can be removed from time to time for feeding without disturbing the rest of the dressing.

The wound is allowed to granulate and as cicatrization follows preparations should be made for the introduction of some artificial substitute for the larynx. A very ingenious apparatus is the one devised by Gussenbaur of Prague, a model of which is shown in the "Reference Handbook of the Medical Sciences."

BACTERIOLOGY AND EPIDEMIOLOGY.

Micro-Organisms in Air a Measure of Healthfulness in Tenements and School Rooms.

Although the special work of municipal hygiene is relegated to local boards of health, nevertheless by the provisions of the Public Health Act of 1887, as well as of previous school regulations certain very important duties are laid upon boards of trustees and teachers with regard to contagious diseases. Apart, however, from these special duties, a still greater demand is made upon the teacher in the way of obtaining a special knowledge of the everyday conditions of the school rooms, as they specially affect the health and comfort of both himself and his pupils. In no one point does this become of such vital importance as in the matter of ventilation and heating of school rooms. Before, however, they can seriously engage in this work they must thoroughly realize the dangers which the ordinary conditions of school rooms imply. With a view of aiding in the acquisition of such knowledge, and of supplying to medical health officers who by law are medical inspectors of schools, we propose to give the results of some very remarkable experimental researches on vitiated air recently conducted by Professor Carnelley, of Dundee, and J. S. Haldane, Esq., of Dundee, aided by Dr. Anderson, Medical Health Officer.

The first series of observations was made on the air of buildings. He says, "The fact that an enormously increased mortality prevails amongst persons who spend much of their time crowded to-

gether in ill-ventilated rooms is universally admitted, and recapitulation of the argument be deemed unnecessary." One of the first requisites for success in the endeavor to procure pure air is a knowledge of the nature and amounts of the various impurities present in vitiated air, and their sources. While carbonic acid is easy to estimate in air, it is now well-known that its estimation is in no sense a certain measure of the impurities which are directly or indirectly communicated by human beings to air in other ways than by respiration.

Of the other impurities of vitiated air perhaps most interest attaches in view of recent advances in pathology to the micro-organisms, and especially to the bacteria. It has lately become possible to estimate the latter with relative ease and accuracy, thanks to methods of research introduced by Professor Koch and Dr. Hesse. There are still other impurities, some of which we can detect by the sense of smell. We know little as to their chemical composition, and, if possible, less as to their hygienic significance. They may be roughly set down as "organic matter." They indicate their presence by several chemical reactions, one of these being the bleaching of solutions of permanganate of potash. For the purposes of our research Dr. Carnelley introduced a process dependent on this reaction, by which the relative amounts of the bleaching action in different specimens of air could be rapidly estimated. (Carnelley and Mackie, *Proc. Roy. Soc.*, Vol. XLI., p. 238.)

Our observations on the air of buildings relate chiefly to dwellings and schools in Dundee. The main part of our work consisted in making a large number of simultaneous estimations of carbonic acid, "organic matter," and micro-organisms; but we endeavored in addition to throw what light we could on the sources of each constituent.

THE AIR OF DWELLINGS.

The analyses of the air of dwellings were made during the night, between the hours of one and five in the morning, as we considered that at this time the air would contain about an average amount of the impurities existing in the air during the presence of the inhabitants. We examined the air in sleeping rooms of eighteen of the better class of houses in Dundee, in thirteen two-roomed, and in twenty-nine one-roomed dwellings. The results were as follows:—