

which the vapour comes into contact; it encourages suppuration where the ulcerative process has begun, and it tends, therefore, to increase expectoration and cough, and consequently the distress and exhaustion of the patient. The inhalation of hot moist vapour, indeed, is so repugnant to the respiratory tract, that but a small quantity of the medicated material can penetrate sufficiently into the pulmonary tissue to be of use. The immediately subsequent effects are also not unattended with risk, from the exposure of the air-passages to air of a lower temperature after hot inhalation. However beneficial, then, in laryngeal affections (and we are all familiar enough with its value in such), the inhalation of dry powders, or of pulverised fluids in the form of spray, either cold or hot, may be, they cannot be regarded seriously in connection with the treatment of suppurative processes within the lung itself.

It is now more than five years since I became strongly impressed with the important bearings of Lister's teaching on the local treatment of phthisis; and, in working out the idea of antiseptic inhalation, the considerations above referred to, suggested the plan of adopting the principle of the old-fashioned, and now happily almost obsolete, respirator for the purpose—selecting a volatile medium for the antiseptic materials, and employing the breath in the alternate acts of inspiration and expiration, as their vehicle.

The apparatus is extremely simple. It consists of a space for a pledget of tow or cotton-wool, enclosed between the perforated surface of the respirator and an inner perforated plate, which can be raised so as to permit the tow to be saturated with the antiseptic solution. Elastic loops are attached to pass over the ears, and retain it in position. The inhaler may be procured either plain, or of a slightly-smaller size, and covered with black cloth, for wearing out of doors. The pledget of tow, which may be changed once a week or so, should be sprinkled with from ten to twenty drops of the antiseptic solution, from a drop-stoppered phial, twice-a-day at least, according to the extent to which the inhaling may be carried on. Of this the patient is the best judge, and the length of

time and quantity of solution should be regulated by tolerance and effect. The most important times for inhaling are for an hour or so before going to sleep at night, and after the morning expectoration, which leaves the suppurating surface or cavity dry to be acted upon—disinfected, so to speak—by the antiseptic vapour. A great many of my patients have of their own accord come to use the respirator almost continuously day and night, from their experience of its good effects. I attach the utmost importance to the mode in which the respiration is conducted while inhaling. The patient should be carefully instructed to inspire through the mouth alone, and expire through the nose. In this way, the breath is drawn through the saturated tow in the perforated chamber of the inhaler, and passes directly into the lungs laden with the antiseptic materials. Expiring through the nose only, necessarily involves a complete circulation of the medicated air. The breathing should be short at the beginning of inhalation, but gradually deepened, so as to displace and affect the residual air in the more distant portions of the lungs. This form of respiration itself is not only of great use in favouring the circulation of the blood in the lungs, and thus aiding both local and general nutrition through that fluid, but it helps very much the expulsion of the sputa by means of the increased energy and thoroughness of the expiratory acts. Indeed, the great objection to the ordinary respirator lies in the shallowness and rapidity of breathing which it involves, in consequence of which the lungs, being imperfectly expanded and contracted during each act of respiration, become themselves literally fatigued, and the breath is drawn in and forced out so feebly, and at the same time so quickly, that there is not time for it to be dispersed into the fresh air, but it returns each time into the lungs only partially changed. The extremely foetid odour which the apparatus rapidly acquires is sufficient proof of this. One of the patients in the Royal National Hospital here, when I was working out this subject, made a pasteboard respirator for antiseptic inhalation of such a shape as to include the nose; but it was found to have all the objectionable points of the ordinary respira-