

ON ARTIFICIAL RESPIRATION WITH OXYGEN.

BY

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SHORTLY after the discovery of oxygen by Priestley in 1774 it was used in many diseases, and at first, like most new remedies, it was said to be exceedingly successful. Further observations, however, showed that it was not so useful as at first supposed. It has continued to be used more or less ever since, but one of the great difficulties has been that of obtaining it in a convenient form for clinical use.

When making experiments with it as a means of

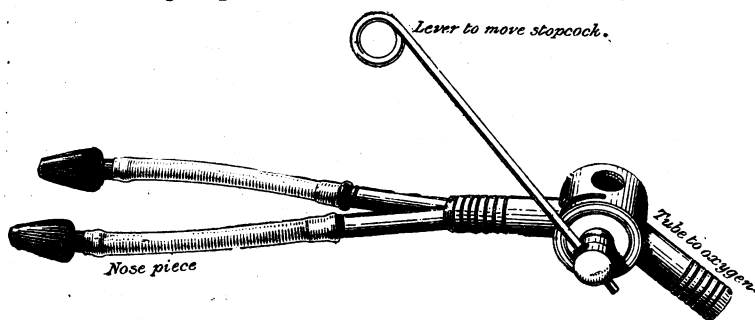


Fig. 1.

preventing death from cobra venom, Sir Joseph Fayrer and I. in 1874, obtained it in a small gasometer, but our supply unfortunately ran out in the middle of one experiment. We then had it in a large gas bag, and this was more successful but was very inconvenient for carriage.

In 1891 Dr. Prickett and I had a case of pneumonia in which we used oxygen compressed in a cylinder, with very gratifying results. The publication of this case¹ appeared to give an impetus to the use of oxygen. Numerous papers on its use appeared shortly afterwards in medical journals, and it has continued to hold its place ever since. In one case of pneumonia which I saw with Dr. John Attlee, as one lung was clearing up the other became consolidated, and it seemed to be simply a race for life to get a sufficient amount of breathing space in the clearing lung before too much of the other became useless. In this case we kept up a continuous inhalation of oxygen day and night from cylinders connected to a funnel, which was suspended a few inches above the patient's nose and mouth. The results here were also very satisfactory; without oxygen the patient must almost certainly have died.

Sometimes patients complain of the oxygen feeling dry or cold. This difficulty can be got over by passing the gas through a Woulfe's bottle containing warm water, and kept from cooling either by hot cloths or by immersion in a basin of hot water. To this, in cases of bronchitis, tincture of benzoin, pine oil, or other expectorants may be added. In cases where a diffuse stimulant is required alcohol or ether or a mixture of both may be put into the Woulfe's bottle or into a Junker's inhaler. In cases of angina pectoris amyl nitrite may be given with oxygen, either by dropping it into a Junker's inhaler with alcohol or by simply putting a drop or two on cotton-wool and placing it in a funnel before the patient's nose. Ethyl iodide may be given in the same manner in asthma.

The effect of oxygen sometimes as a cardiac stimulant is very extraordinary. Some one, I think Sir Douglas Powell, has well said the heart is the organ which first takes toll of the oxygenated blood returned from the lungs, and in a case of cardiac asthma I found the tension in the radial artery, which was only equal to 75 mm. of mercury when the inhalation of oxygen was begun, rose to 150 in the course of ten minutes. When natural respiration has

completely ceased artificial respiration with oxygen may be kept up for some time by simply placing the end of an india-rubber tube passing from the oxygen cylinder into the patient's nostril, at intervals corresponding to the natural respirations, either with or without compression of the other nostril. The force of the gas issuing from the cylinder is sufficient to inflate the lungs, and when the tube is removed from the nostril the gas is again expelled from the chest by the natural resiliency of the chest wall, aided, if necessary, by gentle compression.

I demonstrated an instrument for keeping up artificial respiration with oxygen at the International Medical Congress in Rome, 1894, but the account which appeared in the reports² was not illustrated and attracted very little attention either at the time or afterwards. I think it may therefore be worth while to describe it again with illustrations to show its working. The instrument itself is shown in Fig. 1. It consists of a stopcock of peculiar construction which is connected by an india-rubber tube at one end to the cylinder containing oxygen, and at the other terminates in two nozzles which pass into the nostrils. By moving a short lever the nostrils are alternately put into communication with the oxygen cylinder and with the open air, so that, by moving the lever alternately backwards and forwards, artificial respiration is kept up with the minimum of exertion, so that it might be continued if necessary for hours. Fig. 2

gives a general view of the arrangement of the apparatus with sections of the stopcock at A and B. In A the stopcock is shown with the communication free between the lungs and the air, and the communication with the oxygen cylinder is closed, this being the position in expiration; B shows the position in inspiration when the oxygen streams from the cylinder into the lungs and the opening which communicates with the outer air is closed.

In the illustration the stopcock is represented as being directly connected by tubing with the oxygen cylinder, but in order to prevent the tubing being blown off, or other unpleasant surprises from too great pressure of the oxygen, it is advisable to insert a large distensible bag between the

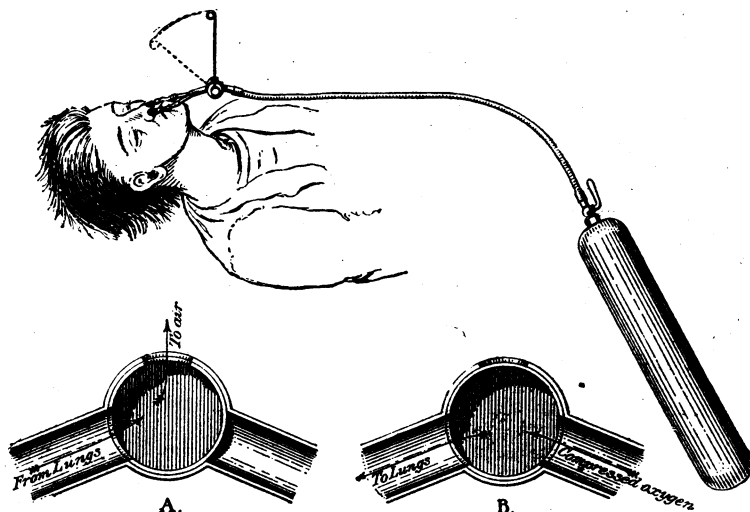


Fig. 2.

stopcock and the cylinder. If necessary it may be weighted by laying books upon it, so as to obtain the pressure required.

REFERENCES.

¹ BRITISH MEDICAL JOURNAL, January 23rd, 1892. ² Atti dell' XI Congresso medico Internazionale, Roma, 29 Marzo - 5 Aprile, 1894.

THE German Roentgen Society will hold its eighth annual meeting this year at Berlin on April 14th. There will be a demonstration on the evening of April 13th. Communications relative to the Congress should be addressed to the secretary of the society, Dr. Immelmann, Berlin W. 35, Lutzowstrasse 72.