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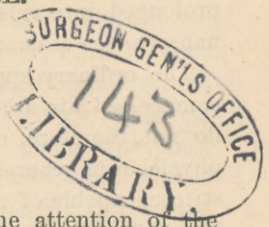
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PHILADELPHIA.

## HYPERDISTENSION OF THE AIR-CELLS AS A THERAPEUTIC MEASURE.

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THE object of this brief paper is to call the attention of the members of the Society to a handy method of forcing compressed air into the lungs in cases where resort to that agent is desirable.

The indications for the use of inspirations of compressed air are both direct and indirect. Direct, when assistance is required in the access of atmospheric air to occluded bronchioles and air-vesicles, or to increase the actual air-pressure in the lungs, so that they can be expanded to an extent greater than can be accomplished by the most powerful voluntary effort of inspiration that the patient may be capable of exerting. Indirect, when the object is to increase the pressure upon the aortic system, augment the amount of blood in the arteries, and thus divert excess of blood in the capillaries and venules, in the relief of congestions and hypersecretions dependent upon accumulations of blood at the peripheral portions of the circulatory system.

The indications against the use of inspirations of compressed air are: existing excess of pressure in the aortic system; atheromatous degeneration of the arteries; congestions of the arterioles in important peripheral organs, as the brain and uterus; and tendencies to hemorrhages, whether interstitial or from mucous outlets.

The direct influence of inspirations of compressed air may be invoked advantageously in instances of inefficient expansion of the lung in early or suspected pulmonary phthisis; in the dyspnoea of spasmodic asthma; chronic bronchitis, pleuritic effusion, and pulmonary emphysema; as well as in other forms of dyspnoea from obstruction; and the hyperstatic stasis that occurs in low febrile conditions, and the like. But the most useful general application that can be made of it is as a mechanical expectorant in the discharge of products of secretion, suppuration, and exfoliation, accumulating in the bronchioles and in the air-cells. Here, often, the aid

of a current of slightly compressed air will quickly dislodge the masses of viscid sputa, and provoke their prompt expulsion by cough. The advantage of a mechanical expectorant which clears the passages directly and immediately, and without unfavorable influence on any of the organs, renders its use preferable, in many instances, to medicinal expectorants which act indirectly and after prolonged intervals, and at the same time have the tendency to nauseate the stomach and impair the appetite for food.

The ordinary apparatuses for administration of inspirations of compressed air are cumbersome, stationary, and expensive. They do not, therefore, commend themselves to the patient, or to the physician in general practice. A convenient and inexpensive substitute, capable of rendering service as an expander of the air-cells in insufficient dilatation, and of acting as a mechanical expectorant in the conditions indicated, was suggested to me, little more than a year ago, by Dr. Gadbury, of Yazoo City, Mississippi, in the rubber bulb and tube such as is supplied with many forms of spray producers. This apparatus, which costs but half a dollar, can be supplied to any patient too poor to purchase it, and will enable the invalid to pump his lungs free of secretion several times a day, or as frequently as may be desired. It is used in the manner following: The patient makes as deep a voluntary inspiration as possible, so as to distend his lungs with air; he then closes his lips upon the tube, compresses his nostrils with one hand, and pumps additional air into his chest by a series of compressions of the bulb; thus hyper-distending his air-cells. When the compression becomes uncomfortable, or the need of an expiratory effort is felt, the process is suspended to allow of the expulsion of the air, and is then resumed; several repetitions being made in succession. In phthisis patients with nummular sputa, large masses are often expectorated immediately or within a few minutes after their disturbance by the column of compressed air; and great relief is experienced until respiration becomes disturbed by reaccumulation, when the same means may be resorted to for their prompt and easy expectoration, without the exhausting effects that often follow spontaneous violent efforts at coughing. A similar result often follows in chronic bronchitis of whatever variety.

The amount of pressure exercised on the volume of air in the tube of this little insufflator would be too great for safety were it not that it is immediately diffused over the large volume of air in the thorax; so that the pressure on the entire mass is diminished. It is well established that a pressure of more than half a pound should not be used in administering inspirations of compressed air,

and that in many instances, even less than half this amount is all that is desirable. Although there is no means of measuring this pressure in this insufflator, a proper amount can be estimated in each case, by noting the effect; and the patient can be cautioned against any attempt at overdoing it in the hope of facilitating its results.

I am at present experimenting with a cheap form of compression pump,—that used in Burgess's mechanical blowpipe, which I have had attached to a reservoir of sufficient capacity, and furnished with a pressure-gauge. As the pump is worked with a pedal, it requires very little exertion, and the eye on the pressure-gauge will guard against any excess. The apparatus can be furnished for ten dollars, which is not beyond the means of any practitioner who may have a strong inclination to use it. In order to gauge the amount of compression, a small steelyard can be attached, or an inexpensive form of valve weighted with as many ounces as may be required to limit the pressure which it may be desirable to use.

I have had the testimony of a number of private and clinical patients as to the relief afforded by the use of the hand-ball compressor, which, if there is any demand for the appliance, should be made rather longer so as to compress a greater volume of air; and I would be very glad if the members of the Society would test its efficacy for themselves upon their own patients.

The therapeutic value of any agent harmlessly capable of clearing the air-cells and smaller bronchi of accumulations, is sufficient to commend it to the consideration of the practitioner as an agent in his management of cases in which such an effect is desirable.

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that is desirable. Although there is no means of measuring the  
pressure in this method, the pressure should be estimated in  
each case by using the effect; and the patient can be cautioned  
against any increase of exertion if in the face of resistance it  
is felt that the pressure is increasing.

I am at present experimenting with a cheap form of sphygmomanometer  
pump—this uses an ordinary mechanical sphygmomanometer which I have  
had attached to a reservoir of sufficient capacity, and furnished with  
a pressure gauge. As the pump is worked with a pedal, it requires  
very little exertion, and the eye on the pressure gauge will give  
against any excess. The sphygmomanometer can be furnished for a dollar,  
which is not beyond the means of any practitioner who may have  
a strong inclination to use it. In order to gauge the amount of  
compression a small sphygmometer can be attached, or an instrument  
form of valve weighed which many others as may be suited to  
that the pressure which it may be desired to use.

I have had the testimony of a number of private and clinical  
patients as to the relief afforded by the use of the hand, half coin  
pressure, which if there is any demand for the apparatus, should be  
made rather larger so as to contain a greater volume of air; and  
I would be very glad if the number of the Society would test the  
effect for some of their own patients.

The beneficial value of any agent, however capable of clear-  
ing the vessels and smaller vessels of accumulation, is sufficient  
to counteract to the vesselization of the periphery as an agent  
in the treatment of cases in which such an effect is desirable.

