

**Restoring animation in the apparently drowned : report of a committee ;
appendix: Instructions for carrying out the Schäfer Method / by E.A.
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RESTORING ANIMATION IN
THE APPARENTLY DROWNED.

Report of a Committee of the
ROYAL SOCIETY OF MEDICINE
On the best method to be adopted in employing Artificial Respiration
in the case of the Apparently Drowned.

APPENDIX.

Instructions for carrying out the "Schäfer Method," by Professor
E. A. SCHÄFER, F.R.S., &c., Professor of Physiology in the University
of Edinburgh

ROYAL SOCIETY OF MEDICINE
20, HANOVER SQUARE, LONDON, W.
(Temporary address during building)
15, CAVENDISH SQUARE, W.

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REPORT

OF THE

Committee appointed by the Royal Society of Medicine to consider the Request of the Chief Surgeon to the Metropolitan Police that the Society should pronounce as to the best method to be adopted in employing Artificial Respiration in the case of the Apparently Drowned.

THE subject of suspended animation and the best means to be used for recovery from it occupied the attention of the Royal Medical and Chirurgical Society at irregular intervals for many years.

At a General Meeting of the Society on July 23, 1861, it was unanimously decided that Committees for the purpose of investigating questions of scientific medical interest should be from time to time appointed; at the same meeting a Committee consisting of Fellows of the Society for the purpose of investigating the subject of suspended animation and the best methods of restoration from it was formed. The Fellows constituting the Committee were Drs. C. J. B. Williams (Chairman), C. E. Brown-Séquard, G. Harley, W. S. Kirkes, H. Hyde Salter, J. Burdon Sanderson, Mr. W. S. Savory and Dr. E. H. Sieveking (Secretary). It seems probable that the paper of Mr. James Stanley Christian, Medical Officer to the Royal Humane Society, communicated through Dr. Sharpey, and read in 1861, determined this subject being taken up. Mr. Christian's paper is to be found summarized in the third volume of the *Proceedings of the Royal Medical and Chirurgical Society*, and is little more than a record of the work done at the Humane Society's Receiving House on the Serpentine. No details of the methods used are given, but Mr. Christian reports favourably on the Silvester method, stating that as the result of the observation of fifteen cases treated by it the officers of the Society were favourably impressed by the advantages of the Silvester method.

In 1869 a fresh Committee, consisting of Mr. Savory, Dr. J. Burdon Sanderson, Mr. Power, and Mr. Pick, with the Secretary and Mr. Gascoyen, were appointed to investigate Dr. Bain's and Professor Pacini's method of restoring suspended animation; its Report is to be found in vol. liii of the *Transactions* for the year 1870.

In April, 1878, a communication was received by the Society from the Royal Humane Society, and the Committee of 1869 was reappointed with power to add to their number "for the purpose of investigating the subject of suspended animation; the comparative merits of the method used by the Royal Humane Society and that proposed by Dr. Benjamin Howard, of New York, for the recovery of persons apparently drowned." In addition to the members of the 1869 Committee the following Fellows served on it: Drs. Sieveking, G. Harley, Lauder Brunton, Ralfe, John Williams, Curnow, Andrew (*ex-officio*); Sir William Savory declined to serve.

This Committee reported in October, 1879, but the Report does not appear in the Society's *Transactions*. Interest in the subject then appears to have dropped until Dr. Bowles read his paper before the Society in 1889, "On the Resuscitation of the Apparently Drowned." In June of that year the Secretaries, on the suggestion of the President (Sir Edward Sieveking), were requested to communicate with Fellows who might be willing to act on such a Committee. In November of the same year a fresh Committee, consisting of Mr. H. Power, Dr. G. Harley, Mr. Pick, Dr. Klein, and Professor Schäfer, was constituted to investigate the subject afresh; but it was not until the year 1900 that an Interim Report was presented at the Annual General Meeting signed by Professor Schäfer, Mr. Power, Dr. Mott, and Mr. Pick. Three years later the Report of the Committee was read on May 26, and is published separately, together with an appendix by Professor Schäfer, added December, 1903, which was included in vol. lxxxvii of the *Transactions*. In the discussion which followed Dr. Bowles, Dr. Silvester, and Dr. Hewitt, with others, took part.

The Reports of the first and last Committees are by far the most important. The first Committee did much experimental work which falls under two heads: (1) Experiments on living animals; (2) on the dead human body. The experiments on the living animal conclusively showed the important part that the introduction of water or other fluids into the trachea and lungs plays in drowning, and the incorrectness of Sir Benjamin Brodie's opinion—"That the admission of water into the lungs is prevented by a spasm of the muscles

of the glottis cannot, however, be doubted, since we are unable to account for the exclusion of it in any other manner; and a multitude of circumstances prove that these muscles form a sphincter to the windpipe as perfect in its functions as any sphincter in the body."¹

"The difference between apnœa produced by plugging (a trachea) and that by drowning" is summed up on pp. 459, 460, vol. xlv, of the *Transactions* in their Report and need not be transcribed. Experimentation on the dead body was found by this Committee, as by all subsequent ones, to be very unsatisfactory; comparisons between Dr. Silvester's and Dr. Marshall Hall's methods of restoring suspended animation are thus summed up on p. 489 of the Report: "Without expressing an opinion as to the efficacy of the method of Dr. Silvester, as a means of restoring suspended animation in cases of drowning, its claims to be considered as an effectual means of producing an exchange of air similar to that effected by the respiratory movements appear to us to be satisfactorily established."

The Report of the Second Committee (1870), vol. liii, p. 291 of the *Transactions*, is as follows: "They are unanimously of opinion that the method advocated and practised by Dr. Bain is but a modification of the plan usually known as Silvester's, and involves no new principle of action; . . . they are therefore of opinion that in the great majority of cases it is of comparatively little moment which method of manipulation is practised, provided the common principle on which both are founded be fairly carried out."

The Report of the Third Committee on the comparative merits of the methods at present used by the Royal Humane Society and of that proposed by Dr. Benjamin Howard, for the recovery of persons apparently drowned, although printed, was not published in the *Transactions* and was of the nature of an Interim Report. They experimented on only two bodies. Dr. Howard himself conducted his method, whilst two boatmen of the Royal Humane Society employed the method (Silvester's) in the usual manner. The conclusions of the Committee are thus expressed: "The above results of the experiments are important as showing that, with regard to the exchange of air, Dr. Howard's method has no advantages over that now in use, but your Committee cannot consider them as conclusive unless they be confirmed by further experiments on subjects with fairly healthy lungs and chest walls; the difficulty of obtaining such subjects has prevented them from making a final report."

¹ Collected works of Sir B. C. Brodie, i, p. 430 (1865).

The fourth, the last Special Committee on the subject, performed a considerable number of experiments both on man and animals during life as well as on dead bodies, and accurate graphic records of the effect of the experiments on the respiration and blood-pressure in the vessels were obtained. The Committee expressed no direct opinion as to the value of the various methods now in use, Professor Schäfer saying in the discussion that "personally he would prefer to adopt the prone or semi-prone position," and "exert intermittent pressure when attempting to resuscitate the apparently drowned."

The question referred by the Council to your Committee was what answer the Society should return to the request of the Chief Surgeon of the Metropolitan Police. Your Committee decided in the first place to obtain what evidence they could from those who were most frequently in the position of having to attempt resuscitation in the apparently drowned. For this purpose they applied, in the first instance, to the police, and, by the kindness of the Chief Surgeon, an inspector and constable of the Thames Police attended at the first meeting of the Committee and gave evidence. They (the river police) make use at the present time of the Silvester method, and the inspector demonstrated the way in which it is applied on the constable and on some of the members of your Committee.

At the second meeting of the Committee Mr. Henry, Secretary of the Royal Life Saving Society, and its founder, gave evidence. Dr. Hewitt also was good enough to attend the meeting of the Committee and gave much information of the part which, in his opinion, spasm played in asphyxia due to the administration of chloroform, and how far the same condition held good in drowning. Mr. Henry demonstrated the Schäfer method as now taught by his Society, to the exclusion of all others, on Dr. Hill and Mr. Keith.

Major Claughton, representing the Royal Humane Society, and Mr. Horton, Superintendent of the Receiving House on the Serpentine, also attended and gave evidence. At the Receiving House the Silvester method has been in use since 1860. As the cases of drowning in the Serpentine or Long Water are taken at once to the Receiving House, other means, in addition to artificial respiration, are available and can be used, such as warm baths, forceps to hold forward the tongue, smelling-salts, &c.

Of late years, since the establishment of boats during the bathing hours, very few cases have been brought in unconscious, and only four or five cases have required treatment by the Silvester method during the last eight or ten years.

Major Claughton informed the Committee that during the last ten years not less than 500 certificates had been given by the Royal Humane Society for resuscitation from drowning; unfortunately he was not in a position to state the methods used in these cases nor to express an opinion as to how far the means taken may have assisted Nature.

At the third meeting Mr. Edward J. Blackett, Honorary Surgeon to the Royal Humane Society, attended and reported the results of post-mortems he had made upon cases taken from the Serpentine, all of which had been treated by the Silvester method.

In forming an opinion as to the best means to be used for the resuscitation of the apparently drowned, it is necessary to remember that they must be adapted to the circumstances under which drowning usually occurs. In other words, they must be simple, the directions for making use of them incapable of being misunderstood, available under a variety of circumstances, and capable of being carried out by a single person. Your Committee are of opinion that Professor Schäfer's method fulfils these conditions better than the Silvester or Marshall Hall methods. It has also in their opinion other points which render it preferable: (1) The prone position favours the escape of water, and of the mixture of water, mucus, and other secretions through the mouth and nose, which, when present, play so important a part in drowning. (2) A larger amount of air can be made to pass in and out of the chest by pressure and relaxation applied in Professor Schäfer's manner than in either of the others.¹ (3) Upward pressure on the diaphragm is more effectually obtained by it than by the other methods, and exerts more direct pressure on the heart, thus stimulating it to action. (The value of such stimulation of the heart has not, in the opinion of your Committee, received sufficient attention in the older experiments on living animals.) (4) There appears to be less risk of injury to the chest, the liver, and the other abdominal organs, from pressure exerted according to Professor Schäfer's directions than by the Silvester method, which has, in inexperienced hands, led to fracture of ribs, and not improbably to rupture of the liver.

¹ Professor A. Keith, *Lond. Hosp. Gaz.*, June, 1908, xiv, p. 206.

Your Committee are also of opinion that in recommending the Schäfer method attention should be drawn to the desirability, when natural breathing has recommenced, of placing the patient in the semi-prone position on his right side, as pointed out by Dr. Bowles, so that any frothy fluid present should gravitate from the bronchi of the left to those of the right side in order that air may more freely enter the left lung; not a few instances of death being reported in persons placed in the supine position after natural breathing had been restored.

In reply to the questions asked by the Chief Surgeon to the Metropolitan Police, our answer is as follows:—

Question I.—Are the Marshall Hall and Silvester methods still to be recommended as thoroughly efficacious when properly employed?

Question II.—Is the Schäfer method preferable to either, or both?

Answer (to both I and II).—If one method only is to be recommended, we think the Schäfer method is preferable to the two others.

Question III.—(a) Should the Schäfer method be adopted when a single person is available to restore animation?

Answer.—Yes.

(b) If additional help can be secured, should either of the other methods be preferred?

Answer.—No.

In view of the absence of accurate knowledge of the condition of the lungs and other organs of the body in cases in which attempts at resuscitation have been made, your Committee desire to draw attention to the importance of “post-mortem” examinations being performed in all cases of drowning in which unsuccessful attempts at resuscitation have been made.

We also wish to bring to the notice of the Royal Society of Medicine the extremely valuable work that is being done by the Royal Life Saving Society, which is affiliated to between 600 and 700 swimming clubs in Great Britain and Ireland for the purpose of teaching swimming and the rescue of persons from drowning, and to take this opportunity of thanking its Secretary, Mr. Henry, for the assistance he gave us in this inquiry.

In conclusion we would point out that whilst we consider the Schäfer method the best for what may be called first aid in cases of drowning, there may be circumstances which may render other and additional means desirable. Our recommendations are not to be taken as a disapproval of other methods of various kinds applied by those who understand the subject, and who are aware of what each method can specially effect.

W. S. CHURCH, *President.*

F. H. CHAMPNEYS.

J. WARRINGTON HAWARD.

LEONARD HILL.

ARTHUR KEITH.

E. H. STARLING.

ARTHUR LATHAM,

HERBERT S. PENDLEBURY, } *Hon. Secretaries.*

J. Y. W. MACALISTER, *Secretary.*

This Report was presented to and adopted by the Council of the Society on July 29, 1908, and has been officially accepted by the Commissioner of Police for adoption throughout the Metropolitan Police area.

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III.—General.

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APPENDIX

The Schäfer Method for Restoring Animation in the Apparently Drowned.

INSTRUCTIONS

THE movements of artificial breathing should be commenced the moment the patient is removed from the water, and no time should be wasted in removing or loosening clothing.

Immediately after removal from the water, lay the patient face downwards with the arms extended. Turn the face to the side. Kneel astride or on one side of the patient (fig. 1 A, B).

Place the hands on the small of the patient's back, one on each side, with the thumbs parallel and nearly touching (fig. 1).

Bend forward with the arms straight so as to allow the weight of the operator to bear on his wrists and thus make a steady, firm, downward pressure on the lower part of the patient's back (the loins and lowest ribs), as shown in fig. 2. (This part of the operation should occupy the time necessary to count—slowly—*one, two, three.*)

Immediately after making the downward pressure, the operator should swing backwards so as to relax the pressure, but without lifting his hands from the patient's body (fig. 1). (This part of the operation should occupy the time necessary to count—slowly—*one, two.*)

Repeat the forward and backward movements (that is, the pressure and the relaxation of pressure) without any marked pause between the movements. The downward pressure forces the air out of the lungs and the relaxation of pressure causes the air to be drawn in again.

Continue the movements at the rate of about 12 per minute until natural breathing has recommenced.

When natural breathing is fairly begun, cease the movements. Watch the patient closely, and, if natural breathing ceases, repeat the movements as before.

When natural breathing has commenced, the patient should be allowed to lie in a natural position on one side, and treatment for the promotion of warmth and circulation may be proceeded with.

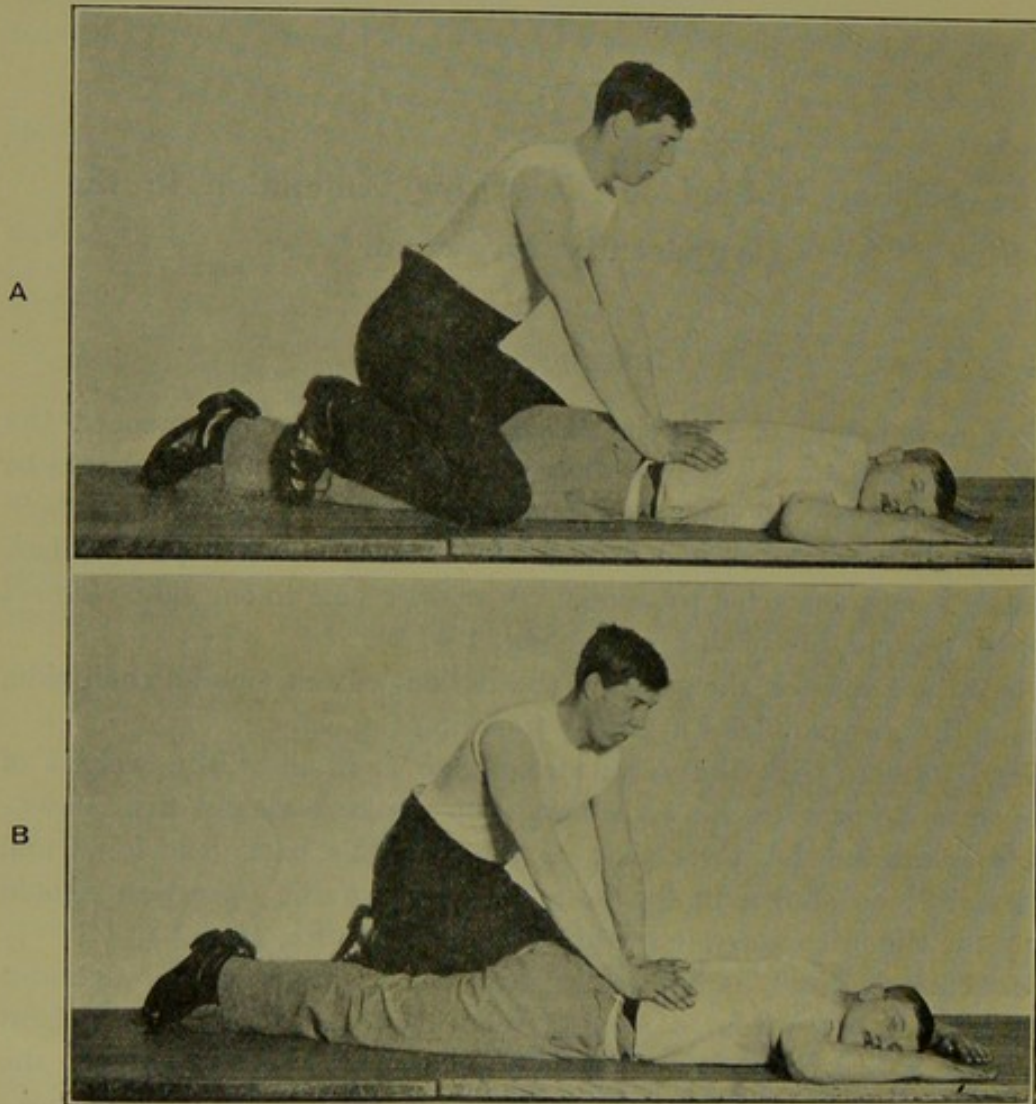


FIG. 1.

The movements of artificial breathing are of the first consequence. If the operator is single-handed, he must attend to these alone until natural breathing is restored. If other assistance is at hand, warm wrung-out flannels, hot bottles, &c., may be applied between the thighs,

and to the armpits and feet; but the movements of artificial breathing must not be interfered with.

After natural breathing is restored, the wet clothing may be removed and a dry covering substituted. This must be done without disturbing the patient, who should be allowed to lie quiet, and watched, for at least an hour, and encouraged to sleep.

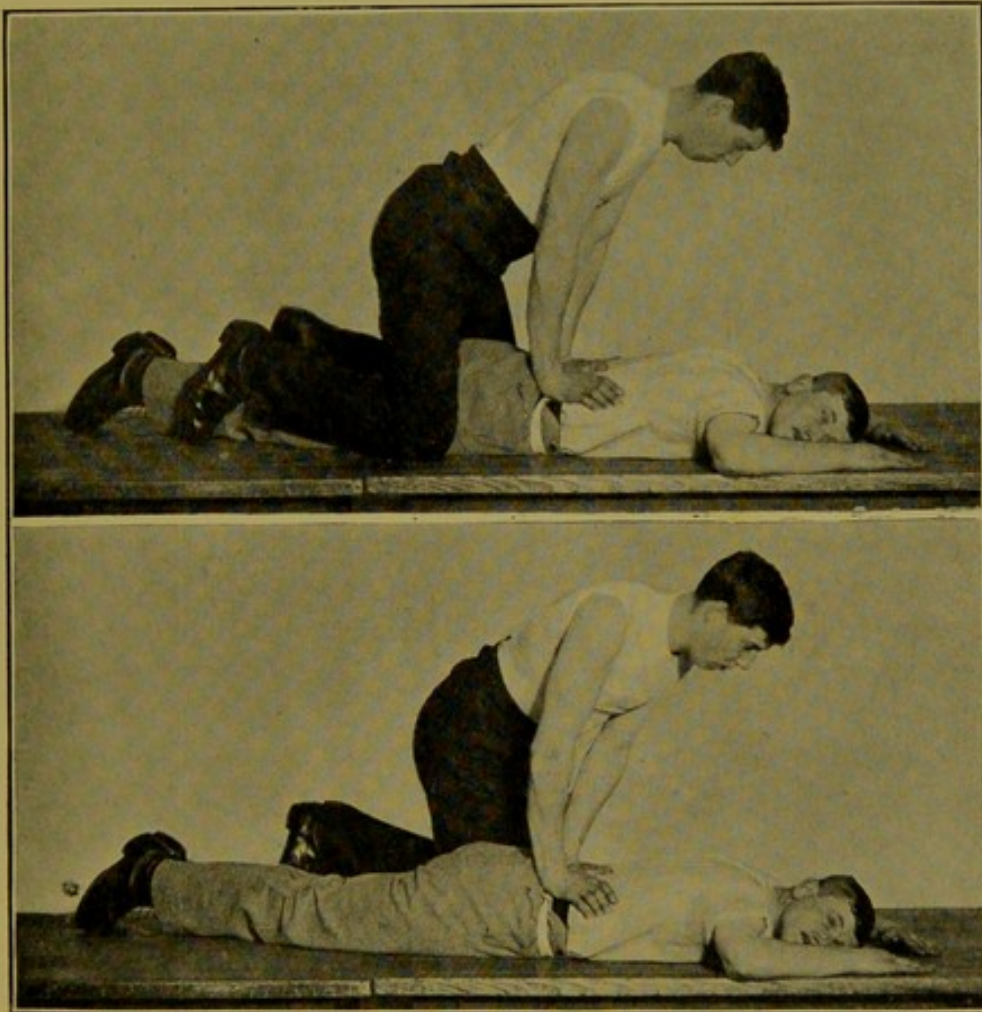


FIG. 2.

The patient should not be allowed to go home until certified by a medical man as fit to be removed.

