Results

The recommendation of this method is based on a controlled study of 130 laymen and doctors, who performed various methods of artificial respiration on 10 anesthetized and curarized adult volunteers (weighing 130–210 pounds) and 10 apneic patients. Tidal volumes greater than 1,500 ml. could be moved in all subjects with the mouth-to-mouth and the mouth-to-airway techniques, while the Holger-Nielsen and the Silvester methods did not move more than deadspace air in 50 per cent of the volunteers whose tracheas were not intubated.

With the mouth-to-airway technique, breaths of approximately 1,000 ml. each, at a rate of approximately 12 per minute, could be maintained by untrained laymen for periods up to 30 minutes without fatigue or dizziness of the rescuer. The victim's alveolar pCO_2 could be maintained below normal, and the arterial hemoglobin, 100 per cent saturated with oxygen. Those untrained rescuers who failed to ventilate the "victim" adequately with the mouth-to-mouth technique were successful with the mouth-to-airway method.

The advantages of the mouth-to-airway technique over the direct mouth-to-mouth technique are: (1) More acceptable and pleasant for the operator, (2) better pulmonary ventilation, (3) less fatigue of the rescuer, (4) less gastric distension of the victim, and (5) fewer failures, because maintenance of a patent upper airway is easier.

This airway can be carried in the pocket, particularly when it is made of rubber or plastic. Captain Martin McMahon of the Baltimore Fire Department Ambulance Service, who was Dr. Safar's associate in developing this technique, his "firefighters," and doctors at the Baltimore City Hospitals are using this airway at the present time.

Dr. Safar credits Drs. A. Lamont and J. Elam for their suggestions in the development of this airway.

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ANEROID MANOMETER FOR ARTERIAL BLOOD PRESSURE

Dr. John Severinghaus, Iowa City, Iowa, suggests connecting an aneroid manometer to an arterial catheter for continuous indication of mean pressure, and his comments follow.

It is occasionally desirable to connect an intra-arterial catheter to some device for continuous indication of the blood pressure, as for example in hypothermia or induced hypotension when cuff pressure may be difficult to obtain. The formerly popular mercury manometer is rarely used in man, but has many advantages. The usual method, at present, includes a strain gauge transducer, its amplifier and recorder, calibration equipment and an operator. This is necessary if either systolic and diastolic pressure must be known or a permanent continuous record is needed. But for continuous indication of mean pressure, a much simpler method is available. An aneroid manometer, filled with fluid and mounted at heart level, may be directly connected to an arterial catheter. Since the manometer cannot be easily sterilized, a membrane must be interposed between it and the catheter. As illustrated, this membrane may be constructed of 3/8-inch Penrose latex tubing tied over rubber stoppers with stainless steel suture. The upper stopper fits snugly into a 5 ml.-syringe barrel and has a hole fitting the manometer nipple. The lower stopper, about 1/4-inch long, should slide freely in the barrel. If facilities are available, a membrane with a closed bottom could be molded from liquid latex over a 3/8-inch test tube. All air must be eliminated from the manometer and membrane to keep the system compliance low and prevent blood from entering the catheter with each pulse. Bubbles are removed by pumping liquid into the manometer from a syringe attached with a short rubber tubing. When completely liquid filled, the compliance of the usual aneroid manometer is less than 0.2 ml. per 100 mm. of mercury. Ethylene glycol is a satisfactory

Aneroid manometer with attached membrane, liquid filled, to be attached to intra-arterial catheter for continuous indication of mean pressure.

fluid which will neither rust the manometer nor rot the rubber. At zero pressure the membrane must be partly collapsed to avoid its introducing pressure. The outside is cleaned and left in sterilizing solution. Before use the membrane is rinsed with sterile heparin-saline solution (10 mg. per 100 ml.) and a sterile syringe barrel filled with solution fitted over it. The three-way stop cock permits the catheter to be flushed periodically.

CONDUCTIVE OPERATING SHOES

Dr. Ralph T. Streeter of Dayton, Ohio, believes that special shoes with conductive soles constitute a considerable expense for the surgeon who may be required to have a pair at each of several hospitals, and although devices which attach to ordinary shoes are inexpensive they have shortcomings. Conductive tape wears out, and aluminum strips from infusion bottles sometimes tear stockings and may catch on table legs. He believes the following device for conductive shoes eliminates the shortcomings of previous methods. It can be permanently inserted in a few minutes with a drill and soldering iron.

The device is a conductive nonferrous core running through the heel of the shoe and a conductive heel plate inside the shoe itself. The necessary materials are: 2 lead screw anchors (⅜-inch or larger) which can be obtained at any hardware store, 2 pieces of heavy (.006 to .010 gauge) aluminum foil such as is used in frozen food containers, and plumber's or tinker's solder.