FIG. 2.—Heat elimination from the index finger, calculated for 100 ml. finger volume, in cal/100 ml. During the first six minutes the circulation was arrested. Solid line: without vibration; broken line: after vibration.

Results

It was found that the heat elimination during the initial constriction and the cold dilatation was greater after the application of vibration than before; heat elimination was greater than in the opposite (control) finger. This observation was also found when the circulation was arrested during the first six minutes. Figs. 1 and 2 show typical examples of the two experimental series.

In contrast to healthy subjects, three patients suffering from vibratory Raynaud's phenomenon gave a negative response to vibration. Their heat output both in the initial phase and the second phase of the calorimetric examination remained at a very low level.

Comments

It appears from the present study that vibration causes an increase of the internal temperature of the vibrated finger and a change in the reactivity of the blood vessels to cold (increased cold dilatation). It is likely that at the beginning of the exposure to vibration, the finger blood vessels of subjects who are not accustomed to use vibrating tools show a better defence against local

cooling than those with vibratory exposure. The former react with increased cold dilatation, at least immediately after the brief vibration. Subsequently, in those who work regularly with vibrating tools, the cold dilatation decreases and the blood vessels give a negative response to vibration.

It appears from this study that the increased internal temperature of the vibrated finger is a reactive effect; as is shown by the fact that in patients suffering from Raynaud's phenomenon this effect was abolished.

It is possible that vibration stimulates the same mechanism that is responsible for the cold dilatation and that long-term repetitive stimulation causes damage to this mechanism.

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Expired Air Resuscitation in a Contaminated Atmosphere

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Respiratory resuscitation in an atmosphere deficient in oxygen, or heavily contaminated with poisonous substances, is a problem which may occur in some industries, and particularly in the petroleum industry. Manual methods of artificial respiration are unsuitable for obvious reasons. Either the victim has to be removed from the poisonous atmosphere before resuscitation can begin, when it may be too late, or some form of positive pressure breathing apparatus, using oxygen or compressed air, has to be employed. The latter is heavy, or may be limited in its use by the length of pipeline.

In recent years direct expired air resuscitation has been shown to be a satisfactory method of artificial respiration (Safar, Escarraga, and Elam, 1958), and it is known that this can be performed efficiently by an operator who is wearing a modified anti-gas respirator (Lucas and Whitcher, 1958). Men working in contaminated atmospheres wear some form of breathing apparatus, and modifications to a standard, open circuit, compressed air breathing set were therefore effected so that it could be used for expired air resuscitation.

Most respiratory facepieces have a plug in the side which can be used for telephonic communication. A corrugated rubber tube, 1 in. (2.5 cm.) in diameter, is inserted in place of this plug and projects into the

FIG. 1.—Rescue tube in position in respirator facepiece.

FIG. 2.—Inflatable airway and non-return valve at victim's end of rescue tubing.

facepiece so that it can be gripped by the rescuer's mouth (Fig. 1). At the other end of the tubing, which is 6 ft. 6 in. (198 cm.) long, there is a three-way inspiratory-expiratory valve such as is used on any intermittent positive pressure breathing machine. Connected to the inspiratory side of the valve is a rubber pharyngeal airway with a large self-inflatable cuff (Fig. 2). This cuff inflates on inspiration and not only makes a gas-tight seal in the pharynx, but also keeps the airway in position, so allowing the rescuer to give artificial respiration while the victim is being removed from the contaminated atmosphere.

These modifications to the facepiece are inexpensive and do not affect the ordinary use of the apparatus since the tubing need only be fitted when required. The device has been tested on a number of anaesthetized, curarized subjects and has been found to be entirely satisfactory. Fortunately, or unfortunately, it has not yet been used in an emergency.

We are grateful to J. G. Franklin and Sons Ltd., of Dalston, London, who made the inflatable airway. The complete device is now available from Siebe Gorman and Co. Ltd., of Chessington, Surrey.

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Prevention of Occupational Risks

The Third World Congress on The Prevention of Occupational Risks takes place in the Palais de Chaillot, Paris, on May 22 to 27, 1961. It is organized by the National Safety Institute of France in collaboration with the Committee on the Prevention of Occupational Risks of the International Social Security Association (I.S.S.A.) in co-operation with the International Labour Office.

The aim of the Congress is to enable international specialists to discuss various aspects of the prevention of occupational risks and to collect together the latest information on "research and progress towards prevention". This theme will be treated under three headings:

- (1) The present state of research;
- (2) Progress in technical fields;
- (3) Progress in medical and psychological fields.

Three committees will examine these items specifically from the standpoint of the prevention of occupational risks and will discuss the latest measures for security and hygiene, new techniques and principles, and the perfection of systems which have given good results in the past.

Inquiries should be sent to the National Safety Institute, Third World Congress, 9 avenue Montaigne, Paris 8, France.