

The Fatal Current

C. O. BRAINARD, WAOJBU

STRANGE as it may seem, most fatal electric shocks happen to people who should know better. Here are some electro-medical facts that should make you think twice before taking the last chance.

IT'S THE CURRENT THAT KILLS

Offhand, it would seem that a shock of 10,000 volts would be more deadly than 100 volts. But this is not so. Individuals have been electrocuted by appliances using ordinary house currents of 110 volts and by electrical apparatus in industry using as little as 42 volts direct current. The real measure of a shock's intensity lies in the amount of current forced through the body, and not the voltage. Any electrical device used on house wiring can, under certain conditions, transmit a fatal current.

While any amount of current over 10 Ma. is capable of producing painful to severe shock, currents between 100 and 200 Ma. are absolutely lethal. There is no known medical procedure that will revive the victim.

Currents above 200 Ma., while producing severe burns and unconsciousness, do not usually cause death if the victim is given immediate attention. Resuscitation, consisting of artificial respiration, will usually revive the victim.

From a practical viewpoint, after a person is knocked out by an electric shock, it is impossible to tell how much current has passed through the vital organs of his body. Artificial respiration must be applied immediately if breathing has stopped.

THE PHYSIOLOGICAL EFFECTS OF ELECTRIC SHOCK

Voltage is not a consideration in the physiological effects of various current densities. Although it takes a voltage to make the current flow, the amount of shock-current will vary, depending on the body resistance between the points of contact.

Shock is relatively more severe as the current rises. At values as low as 30 Ma., breathing becomes laboured, finally ceasing completely even at values below 75 Ma.

As the current approaches 100 Ma., ventricular fibrillation of the heart occurs (an unco-ordinated twitching of the walls of the heart's ventricles). There's no worldly help for the victim.

Above 200 Ma., muscular contractions are so severe that the heart is forcibly clamped during the shock. This clamping protects the heart from going into ventricular fibrillation, and the victim's chances for survival are good.

DANGER—LOW VOLTAGE

It is common knowledge that the victims of high-voltage shock usually respond to artificial respiration more readily than the victims of low-voltage shock. The reason may be the merciful clamping of the heart, due to the high current densities associated with high voltages. However, lest these details be misinterpreted, the only reasonable conclusion that can be drawn is that 75 volts are just as lethal as 750 volts.

The actual resistance of the body varies, depending upon the points of contact and the skin condition (moist or dry). Between the ears, for example, the internal resistance (less than skin resistance) is only 100 ohms, while from hand to foot it is closer to 500 ohms. The skin resistance may vary from 1000 ohms for wet skin to more than 500,000 ohms for dry skin.

GENERAL SAFETY PRECAUTIONS FOR YOU

When working around electrical equipment, move slowly. Make sure your feet are firmly placed for good balance. Don't lunge after falling tools. Kill all power and ground all high voltage points before touching wiring. Make sure that power cannot be acci-

dentally restored. Do not work on ungrounded equipment.

Don't examine live equipment when physically or mentally fatigued. Keep one hand in your pocket while investigating live electrical equipment. Above all, do not touch electrical equipment while standing on metal floors, damp concrete, or other well-grounded surfaces. Do not handle electrical equipment while wearing damp clothing (particularly wet shoes) or while skin surfaces are damp.

Remember, the more you know about electrical equipment, the more heedless you're apt to become. Don't take unnecessary risk.

WHAT TO DO FOR VICTIMS

Cut voltage and/or remove victim from contact as quickly as possible, but without endangering your own safety. Use a length of dry wood, rope, blanket, etc., to pry or pull the victim loose. Don't waste valuable time looking for the power switch. The resistance of the victim's contact decreases with time. The fatal 100 to 200 Ma. level may be reached if action is delayed.

If the victim is unconscious and has stopped breathing, start artificial respiration at once. Do not stop resuscitation until medical authority pronounces the victim beyond help. It may take as long as eight hours to revive the patient. There may be no pulse, and a condition similar to rigor mortis may be present; however, these are manifestations of shock and are not an indication that the victim has died.



9th Brunswick Scout Troop, Donald Street, Brunswick (Vic.) during the Jamboree-on-the-Air on 16th and 17th October. Left to right: Alan Weshwood, Jan Sardi, Jeffrey Patterson, Brian Patterson, Michael McDonald, David Fellow. Front: Dawn Westwood (L.C.M.) and George Robertson (VK3WJ).