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LIGHTNING SHOCK

A DIRECT HIT by a lightning flash or a high-voltage electric current is almost invariably fatal. Massive holes and tears are found in the body, especially in the brain and blood vessels. But most people apparently struck by lightning seem to suffer no more than freakish damage to parts of their clothes and body. This is because the current tends to take the pathway of lowest resistance; it leaps from one low resistance conductor to another, so that down this pathway all the energy is dissipated, leaving organs a few centimetres away unharmed. The main resistance offered by the body is in the dry skin, and that is why household electric currents are so much more dangerous to the wet body. Surprisingly, the pathways followed by such currents as do traverse the body are not yet finally settled. It is thought that the energy goes mainly along blood vessels or nerves and it is considered that the whole body is a low resistance, structureless gel, so that there is a steady potential drop along the shortest line between the points of entry and exit of the current, with uniform potential fields around. When the current passes from one hand to the other it traverses the lower cervical spinal cord, which may explain why the results of this accident often took like transverse myelitis or even disseminated sclerosis. Whatever the pathways taken, it is the nervous system that always seems to bear the brunt of the current, though experimentally large currents can make the heart stop or fibrillate. A condition of profound "shock" with apparent suppression of all nervous activity may last one or two hours after a heavy electrical shock, yet the persons still recover without apparent sequelæ.

The changes seen in the body after an electric shock depend in the first place and most importantly on the physical characteristics of the current applied, especially on voltage. Of secondary importance is the pathway of the current—its points of entry and exit—and how great a potential gradient is produced inside the body once the high resistance of the skin has been broken down. The brain seems to be the most sensitive organ, but its functions are more often temporarily suspended than destroyed or permanently modified. For this reason it has always been recommended that prolonged artificial respiration be given to those apparently dead from electric shock or lightning. However, a careful physical examination is also necessary, since other potentially fatal lesions such as skull fractures may result from the patient being hurled on to the ground or on to other hard objects by the force of the current. (*B.M.J.*, Nov. 16, 1957.)