

MEDICINE

Anesthetic Has War Use

New method of making childbirth painless and safe may prove boon to war wounded. Men might be transported comfortably from battlefield to base hospital.

► THE NEW safe method of making childbirth painless and comfortable, called continuous caudal anesthesia, may prove a great boon to the war wounded, it appears from a report by Dr. James L. Southworth, Dr. Waldo B. Edwards, and Dr. Robert A. Hingson, of the U. S. Public Health Service. (*Annals of Surgery*.)

The new anesthesia has now been used in 255 cases in general surgery with only three failures, the doctors report. The cases included operations for femoral and inguinal hernia; Cesarean delivery of a baby; setting of broken bones, other orthopedic operations and amputations of legs and feet; and surgical treatment of varicose veins. It also shows promise as a method of treating thrombophlebitis in the legs.

"It would seem," the doctors state, "that this method is adaptable for use in the treatment of casualties both in civilian and military practice where it

would be desirable to have a safe, prolonged analgesia (absence of sensibility to pain) during the transportation and the physical and roentgenologic examinations of the injured."

One anesthetist with several trained corpsmen or medical attendants could handle a large number of patients at one time, they point out. It might be possible to give this anesthetic to some of the war wounded on the field and transport them painlessly to a base for treatment, thus perhaps reducing the instances of shock. The method might also be valuable in preventing the delayed shock condition usually referred to as "crush syndrome."

The new anesthetic method consists of continuous injection near the base of the spine of a pain-killing chemical, metycaïne. The drug temporarily blocks the nerve pathways for pain below the level of the umbilicus but does not cause unconsciousness. Its chief disadvantage for surgical operations is the time consumed,

30 to 40 minutes, to give the anesthetic and allow it to become complete. A skilled anesthetist, however, can have the patient ready for certain types of operations in 10 minutes.

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MEDICINE

Killing Virus With Light Depends on Hitting Spot

► DESTRUCTION by ultraviolet light of the virus type of disease germ depends on hitting a certain vital spot or "Achilles heel" of the virus, Dr. Harvey C. Rentschler, director of research at the Westinghouse Lamp Division, declared.

His statement was based on thousands of tests made with the aid of Miss Galina Mouromseff, staff bacteriologist, in which bacteriophage, a virus that destroys bacteria, was subjected to ultraviolet light barrage.

"This ability of ultraviolet to inactivate virus," Dr. Rentschler said, "means that science now has an effective weapon to use in the battle against influenza, infantile paralysis and the common cold among other diseases thought to be caused by virus."

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ENGINEERING

New Welding Method Aids In Upkeep of Railroads

► BY WELDING railroad rails together in thousand-foot lengths through a new technique, then skidding them along the old rails into the famed Moffat Tunnel, over 17,000 feet of old track has been replaced without holding up heavy war traffic for a single moment.

At the east portal of the tunnel, the rails were clamped together in a long line with molding boxes surrounding each of 23 joints.

Rails were heated at the joints to welding temperature. Evenness of heat in rail ends was measured by an instrument called an optical pyrometer.

Then a funnel-shaped crucible with chemicals spewing thermite fire, moved up to heat the welding material to correct temperature, as shown in the photograph. The molten material flowed down through the molding box to fill the crack between rails.

After cooling, the welded joint was radiographed, emanations from radium shining through the metal from the side opposite a camera. When the developed photograph showed a perfect weld, the



SPEED WELDING—This funnel-shaped crucible spewing thermite fire is welding rails for a quick replacement job.

joint was then buffed and smoothed off. Pairs of the completed thousand-foot lengths were then towed into the tunnel. Skilled crews quickly slid aside the old track and installed the new. It took just 51 working hours to lay the track.

The new method was developed by experts of the Denver and Rio Grande Western Railroad in cooperation with the Metals and Thermit Company of New York.

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MEDICINE

Warn Against Heat For Treating Shock

► WARNINGS AGAINST the use of heat for treatment of shock have just been issued by Dr. George E. Burch, assistant professor of medicine at Tulane University, who lectures on the subject to Army doctors studying at the university, and by Dr. K. G. Wakim and Dr. W. D. Gatch, of Indiana University School of Medicine. The last two report experiments on treatment of shock in the *Journal of the American Medical Association*.

First rule for treatment of shock in standard first aid manuals is to apply heat. This is wrong, according to both the Indiana and Tulane doctors. They state emphatically that patients in shock should be kept comfortably warm and protected from cold by wrapping in blankets. However, using hot water bottles or the like, as advised in first aid rules, overheats the patient and will aggravate the shock condition, the doctors warn.

A cold, clammy skin is present in shock. This may be what led to the idea of treating shock by heat. The cold, clammy skin, however, results from the fact that in shock the tiny blood vessels near the surface of the body are constricted. This constriction is a natural defensive mechanism designed to make up for the decrease in blood volume in shock. Applying heat defeats the purpose of the protective mechanism by dilating the blood vessels so that more, instead of less, blood must flow into them.

The Indianapolis doctors treated animals in shock with ice bags and with water bottles of temperatures ranging from room temperature (77 degrees Fahrenheit) to a really hot water bottle of 131 degrees Fahrenheit. Heat and cold greatly shortened the survival time of the animals but those kept at room temperature or near normal body temperature survived longest.

Using heat harms shock patients also: (1) by speeding up chemical reactions

in the body, thus requiring the use of more oxygen and possibly leading to fatal oxygen lack, and (2) by increasing per-

spiration, thereby adding to fluid loss, a condition already present in shock.

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SEISMOLOGY

Mexican Seismograph

American scientists cooperate in arranging new instrument for National Astrophysical Observatory at Tonanzintla. Will study volcanoes.

► EARTHQUAKES and sleeping volcanoes in Mexico will be studied intensively by one of the world's most sensitive seismographs, to be installed in Mexico's National Astrophysical Observatory through the cooperation of American scientists and with the State Government of Puebla, headed by Dr. Gonzales Bautista.

The Mexican Ambassador, Don Francisco Castillo Najera, in Washington, announced the acquisition of the instrument, and Dr. Harlow Shapley and Dr. L. Don Leet of Harvard University announced that arrangements for the shipping and installation of a Benioff vertical-component seismograph, which has recently been thoroughly tested by Daniel Linehan of Weston College, have been concluded by the Committee on Geophysical Research in Harvard University. The instrument was provided by the National Research Council in Washington and was originally intended for use in the studies of local earthquakes. Recent events in Mexico have shown that seismographs of this type, located where they will contribute new information about Mexican earthquakes, will contribute also to knowledge of volcanic activity.

The seismograph will soon be installed at Tonanzintla, just east of the famous towering twin mountains, Popocatepetl and Ixtaccihuatl.

This new seismograph is one of the latest models of a type that has proven itself to be among the world's best. It was developed by scientists at the California Institute of Technology. Some of the earliest investigations with Benioff seismographs were made at Harvard University's Oak Ridge, Mass., station, resulting in the discovery of previously unsuspected minor seismic activity in this area. The great success of Harvard with this instrument has led to its widespread adoption both in this country and also abroad.

The seismograph produces a record of

ground vibrations in the form of lines on photographic paper. It is capable of magnifying ground motions by as much as 250,000 times. At Oak Ridge it records the passing of trains eight miles away as well as earthquakes on the opposite side of the globe.

Mexico is one of the best natural laboratories available for a study of the related problems of earthquakes and volcanoes. There are both active and recently extinct volcanoes and numerous earthquakes. Some of these earthquakes, in fact all that are in the volcanic regions, are unusual in that they occur at distances of around sixty miles below the surface. Just enough information has been accumulated in recent years to cause scientists to be considerably puzzled and extremely curious about the connection between these earthquakes and the volcanoes. This curiosity was sharpened recently by the reported appearance in Mexico of a new volcano in a region where such earthquakes have been occurring over a period of years.

These investigations into the relationship of volcanoes and earthquakes mark an interesting cycle in seismological thought. The earliest theories of the origin of earthquakes held that all earthquakes were caused by volcanoes. Subsequent opinions, based on new facts, held that all earthquakes were caused by crust-distorting forces, and that any relationship to volcanoes is purely coincidental. It now appears that the forces which produce earthquakes in certain areas may also be the cause of volcanic eruptions.

The installation of a high-sensitivity instrument in Puebla will provide an ideal opportunity, one of the few in the world, to study the day-by-day minor manifestations of the forces causing earthquakes and volcanic eruption, contributing perhaps ultimately to the solution of the larger problem of the origin of mountains.

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