PHYSICS—CHEMISTRY

Detect Flaws in Rubber

New apparatus uses supersonic waves to locate flaws in rubber tires in same way X-rays are employed to expose flaws in steel.

➤ FLAWS in rubber tires are detected by means of supersonic waves as flaws in steel are exposed by means of X-rays, in an apparatus demonstrated before visitors to the new Goodyear Research Laboratories in Akron, Ohio. Supersonic waves, which are sound waves far above the frequencies audible to human hearing, are transmitted through water against the sides of a tire which is rolled slowly through the trough. A microphone picks up the waves passing through the rubber.

As long as the structure is solid, the waves come through, and the amplified current from the microphone keeps a green lamp lighted. If a flaw breaks the continuity of the waves, the current is switched over and a warning red light is flashed.

Science News Letter, July 3, 1943

New Vulcanizable Plastic

➤ PLIOFLEX, a rubber substitute that can be vulcanized, was announced at the opening of the new laboratories. It is a polyvinal plastic, like many of the rubber-like substances at present on the market, but unlike them is resistant to the softening at high temperatures and stiffening in cold that limit their usefulness.

Tensile strength of the new substance can be increased from 100 to 200 per cent during vulcanization. The process can be carried on with the same machinery now used in vulcanizing rubber, and by very nearly the same procedure, so that extensive retraining of personnel is not needed.

Plioflex is expected to be useful through a very considerable range of applications, from automobile parts to shoe heels and soles, jar rings and impregnated fabrics. It will not appear on the civilian market, however, until after the war.

Science News Letter, July 3, 1943

Device Neutralizes Static

➤ STATIC, that eldest of radio-ruining gremlins, has finally been exorcised, it was announced at the dedicatory exercises. A new device, developed by Goodyear engineers and officially christened the radio static neutralizer, eliminates the disturbing atmospherics caused by lightning flashes and sparks from powerful electrical apparatus, that cause such annoying crashes and sputterings in radio programs and manifest themselves by black spots and streaks on radio-transmitted pictures.

The static neutralizer will be used for the present by the armed forces in improving communications between planes, ships, tanks and ground stations, in bettering the performance of radar, and in securing clearer transmission of military maps and reconnaissance photographs. After the war it will become available for use on civilian radio sets.

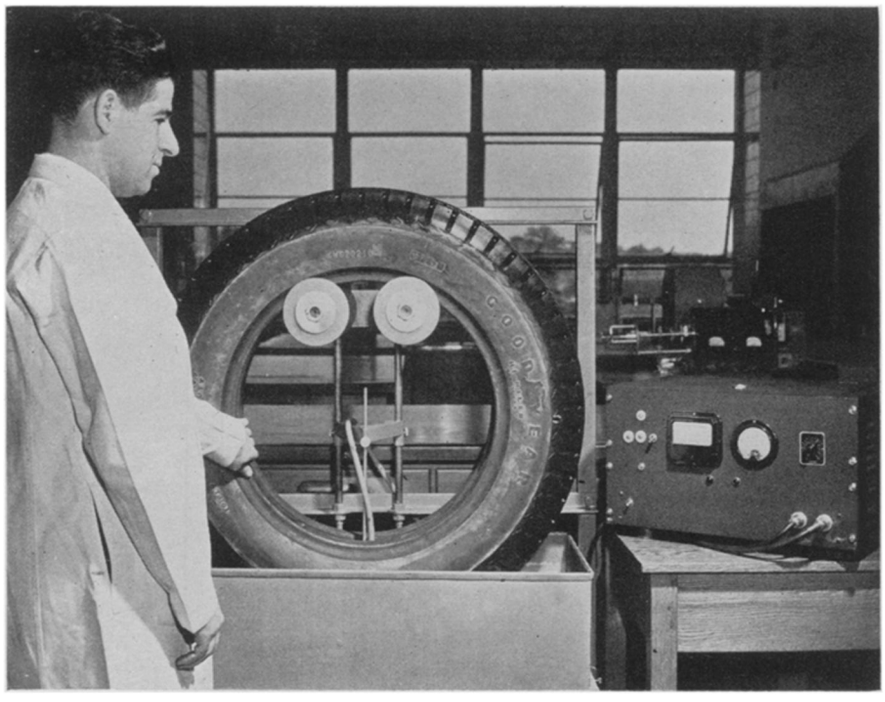
The neutralizer makes use of small electronic tubes, which are automatically adjusted to each radio signal, whether weak or strong. They discriminate between static and the desired signal, and automatically control the amount of static energy that can pass through the radio set. It also gets rid of static on the same frequency as the incoming signal, by means of a circuit that uses the energy of the static to build up an electronic current of opposite sign. This current then neutralizes the static so that it has no effect on the signal.

Science News Letter, July 3, 1943

Replaces Sponge Rubber

➤ ANOTHER CASE where a war necessitated "ersatz" material proves superior to its vanished predecessor was revealed at the dedicatory exercises. The bubbly rubber sponge much used for cushions, insulation and other purposes in pre-war days is now replaced by a new material known as plastic foam, which looks like packed snow and is claimed to be superior to the original rubber product. For one thing, it is lighter than balsa, as well as proof against fire and water, and so is well adapted for use in floats. Production at present is in limited quantities, and all that is being turned out goes into insulation for warplanes.

Science News Letter, July 3, 1943



TESTS TIRES—This new device uses supersonic vibrations, or sound waves, of high frequencies beyond the range of the human ear, to detect defects in automobile tires.

Explosives Need Brisance

➤ HIGH BRISANCE may become as familiar a term in this war as high octane has already become. It is the quality that makes the bazooka's little rocket projectiles so deadly even to the biggest German tanks.

Brisance made its bow to the American non-military public in an interview granted to the press by Maj. Gen. C. M. Barnes, chief of the technical division office of the chief of ordnance, a featured speaker at the dedication of the new Goodyear Research Laboratories.

Brisance is the suddenness with which an explosive acts as contrasted with its total power. Smokeless powder, for example, is powerful, but it is slow in action. Its brisance is low.

The still-secret explosive used in the bazooka's projectiles, on the contrary, has extremely high brisance; so high, indeed, that it only needs to burst outside even the thickest of tank armor to blast a hole in it, shooting white-hot tongues of flame through the opening to set off the tank's own ammunition supply and perhaps also its fuel tanks as well, and reducing the whole business to a fiery wreck. Gen. Barnes saw tanks to which that had happened on a recent tour in North Africa.

Gen. Barnes had high praise for the cooperation of American scientists, technologists and industrial leaders with the Army and Navy in developing new weapons since the beginning of the war crisis. As a single instance that had important effects in the African campaigns, he cited the rubber tank-tread blocks with which American tanks alone are equipped. The steel pins that link the elements of the track together are embedded in rubber so that nowhere does steel rub against steel. The destructive sand of the desert cannot cut these tracks to pieces as they did tracks of Axis tanks. The rubber-footed American weapons could therefore travel fast and far while their "opposite numbers" suffered frequent breakdowns.

Science News Letter, July 3, 1943

Rubber for Post-War Needs

➤ SYNTHETIC RUBBER is now beginning to be turned out in large enough quantities to meet the present emergency, and it is of good enough quality for present purposes, too. But it definitely is not good enough for a peaceful victorious America, and it will be a big job of post-war research to make it good enough.

Such improvement will be one of the undertakings of the new Goodyear Research laboratory, Dr. L. B. Sebrell, manager of research and new products for Goodyear, told the audience of scientists, industrialists and newspapermen gathered for the ceremonies.

In substantial agreement with him was Dr. R. P. Dinsmore, manager of the development department, reviewing progress of the synthetic rubber program to date.

Present-day synthetic rubbers do not have molecules of the same size and shape as natural rubber, which is the basic reason why they fail to come up to the tree product in many respects, Dr. Sebrell pointed out. Studies by X-ray have revealed this much, and further studies, with the more powerful X-ray and electron microscope equipment of the new laboratory are expected to show much more.

One difficulty with the synthetic rubber molecule, Dr. Sebrell mentioned, is its tendency to stick out branches while it is being combined with other molecules. Longer, straighter strings of atoms, forming molecules more like those of natural rubber, may be the ultimate answer.

But even though improvements are desirable and necessary, it is not to be inferred that American synthetic rubber is inferior.

"We believe," the speaker concluded, "that the type of rubber now being used in this country is equal or superior to that developed by any country in the world and that such development may, in time, make us independent so far as the supply of rubber is concerned."

Science News Letter, July 3, 1943

MEDICINE

Skin Grafting With Ice

Refrigeration anesthesia has been successfully used to banish pain when removing skin to be grafted in new place on the body.

➤ SUCCESSFUL USE of refrigeration anesthesia to banish pain during skin grafting operations is reported by Lieut. Harry E. Mock, Jr., of the U. S. Army Medical Corps (*Journal of the American Medical Association,* June 26).

Ice bags are tied or bandaged over the area from which the skin is to be taken. They are left in place for two hours. This chills the skin so thoroughly that it is completely insensitive to pain. The pain-deadened condition lasts for about 20 minutes after the ice bags are removed, giving the surgeon time to remove the skin which is then put in its new place and the wounds bandaged. The procedure is so simple that for small grafts the operation can be carried out in the patient's bed without having to use the operating room.

Only three of 27 patients felt anything with the refrigeration anesthesia. These three complained of a burning sensation when the graft was cut but it was not so acute that any other anesthetic had to be used.

In 23 of the 27 cases successful grafts were obtained. In the four failures, the cause was attributed to error in judgment about the extent of infection and not to the refrigeration anesthesia.

The idea for using ice bags instead of anesthesia to make skin grafting painless came from an observation in amputation cases. Refrigeration was also used in these cases. Some who have been using this method discovered that the pain of the tourniquet which has to be applied before amputation of an extremity was decreased by previously chilling the tissues with ice bags. Lieut. Mock and associates, corroborated this finding and noticed that the ice bags were completely anesthetizing the skin.

Science News Letter, July 3, 1943

ZOOLOGY

Baby Brazilian Tapir Born In D. C. Zoological Park

➤ THERE'S a new Brazilian tapir at the National Zoological park in Washington—a baby, born to a pair brought here from Rio de Janeiro in 1938. It differs strikingly from its parents in coat-color, being covered with spots; but these will disappear as it grows older, leaving it a uniform gray-brown like them.

Director William M. Mann made the new arrival welcome—because it belongs to an herbivorous species. "We're glad to have new animals so long as they're grass-eaters," he commented. "Meat-eaters we're not too keen about nowadays."

Science News Letter, July 3, 1943