DRIVER'S DELIGHT—Designed by Dr. Laurence E. Morehouse and his associates at the University of California, Los Angeles, this fatigue-reducing seat cushion is tested by a subject.

TECHNOLOGY

Truck Driver's Cushion Reduces Driving Fatigue

A SELF-ALIGNING seat cushion that reduces foot swelling, leg numbness and other causes of truck driver fatigue has been developed.

It was designed by Dr. Laurence E. Morehouse and his associates in the Human Performance Laboratory of the University of California, Los Angeles, and tested by five drivers of the North American Van Lines on cross-country trips.

Dr. Morehouse, who supervised the truck drivers' testing, said the seat cushion embodies a new and revolutionary concept of seating.

It supports the body's weight on the ischial tuberosities (seat bones) instead of the fleshy, vein-lined thighs, and employs a system of soft springs which, due to the driver's continual change of position, are in constant though barely noticeable motion.

This maintains the massaging or "pumping" actions of muscular movements even though the driver is seated.

"Studies indicate that stoppage of normal circulation and hydrostatic blood pooling from thigh pressure during long periods of driving may be responsible for many driving accidents because of slowed reactions and blackouts," Dr. Morehouse said.

The self-aligning seat cushion, now being produced commercially, is applicable to present truck chassis or frames without disturbing shock absorbent units or seat backs already in use, he noted.

Dr. Morehouse, a professor of physical education and a noted physiologist, specializes in fatigue factors as related to human performance. His research led to the development of the Ripple Sole for shoes.

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MEDICINE

Atomic Tool for Cancer

AN ATOMIC TOOL, the thermal (slow) neutron, is bringing man closer to victory in his fight against cancer.

Neutrons are electrically neutral, high or fast-energy particles that trigger atomic reactors and bombs. Thermal neutrons are developed by passing fast neutrons of 6,000,000 electron volts each through a moderator or nuclear reactor which slows them by cutting down their voltage to .025 electron volts.

Thermal or slow neutrons produced in the special medical reactor at Brookhaven National Laboratory at Upton, L. I., N .Y., are providing a wholly successful therapy in treating experimental tumors in mice.

The therapy also has been significantly effective in treating glioblastoma multiformi, a fatal human brain cancer that has proved unresponsive to X-ray, surgery or other cancer therapy.

Its effectiveness in mice and men gives hope of future success in treating localized, deep-seated cancers that cannot be surgically removed or otherwise treated, Dr. Lee Farr, medical director at the Brookhaven Laboratory and a specialist in nuclear medicine, said in an interview.

Brookhaven's use of slow neutrons in treating cancer is the result of more than ten years of experimental and clinical research under Dr. Farr's direction.

Previous research by others had revealed that thermal neutrons can be captured by atoms such as uranium, lithium and boron. Normally, the total distance traveled by the free thermal neutron is approximately the diameter of a living cell. Its capture both shortens its path and disintegrates the neutron into two heavy particles, alpha and lithium-7, neither of which is radioactive or harmful. This known behavior makes it possible to control the reaction and limit it.

A patient first receives an injection of boron into his blood stream. After half an hour, a cloud of the slowed-down neutrons is passed on to the area treated for a matter of minutes, less than ten. Trapped by the boron, the neutrons pass only halfway through the diseased cells and destroy them.

"They do not appear in any way adversely to affect healthy tissue or blood," Dr. Farr said. "It is a one-shot treatment and for complete effectiveness, the thermal neutrons must penetrate every cell of the diseased area in sufficient numbers and within the specified time."

The small size of mice permits an easy solution to this problem of "penetration in depth and time," as Dr. Farr describes it. By means of thermal neutron therapy, cancers in mice are destroyed at will at Brookhaven without any recurrence of the disease in the normal two- to three-year life span.

The size of man presents a different engineering problem, which has proved more difficult to solve. Thirty-five cancer sufferers with advanced stages of severe malignant brain tumors unresponsive to other treatment were referred to Brookhaven by their physicians for thermal neutron treatment. Most of these were stretcher patients who after the one-shot treatment were able to walk out of the Laboraory and resume normal activities. However, in time, all the human patients succumbed to the tumor, which examination showed had not been completely penetrated by the neutrons in numbers sufficient to destroy all diseased tissue.

This difficult-to-treat human brain cancer was selected for treatment by Dr. Farr and his staff because "it is common enough to afford selective material; the short life expectancy of its victims allow us to know within a year the results of our efforts; and no other treatment is known to be effective.

"While we are far from achieving the success in treating men that we have demonstrated in treating mice, we have been able to provide patients with a substantial period in which he may be both comfortable, active and productive."

Dr. Farr believes the solution is attainable and may require a better designed reactor as well as more research on the physiology of the reaction in the therapy. Currently a medical reactor that meets Dr. Farr's specifications is under design and is expected to be constructed in the next five years.

Meanwhile, the dramatic although limited success in treating and temporarily arresting the deteriorating human brain cancers has encouraged Dr. Farr and his staff to use the thermal neutron therapy in other varieties of cancer suffered by man. Because there is no observable radiation damage from this therapy, it may be used on patients who have not responded with complete success to X-ray therapy.

Cancer patients treated at Brookhaven are referral patients only. It is too early to estimate accurately the effectiveness of the therapy on recently treated patients.

It takes a "team effort" of 150 persons—engineers, technicians and scientists—to give a thermal neutron treatment to a single patient.

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ROCKETS AND MISSILES

Canaveral System To Monitor Missiles

A MISSILE TRAJECTORY measurement system designed to monitor the guidance performance of missiles launched at the Atlantic Missile Range will be developed by the General Electric Company under a $15,500,000 contract with the Air Force. Preliminary planning for the system is now underway for the basic system expected to be completed by 1962. Later on, a more accurate system is planned for operation that will keep the basic system as an integral part. The basic system will be installed near the Air Force Missile Test Center in Cape Canaveral.

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