

PSYCHOLOGY-ENGINEERING

Driver's Own Reflex Act Throws Car "Out of Control"

Sudden Jolting Makes Anyone Stiffen Arms and Press With Feet; Safety Pedal is Recommended as Remedy

A NEW auto appliance to prevent ten per cent. of all serious automobile accidents such as that which took the life of Belgium's young queen was described by Dr. Yandell Henderson, Yale University professor of applied physiology, in a report to the National Academy of Sciences.

The device would prevent the type of accident now explained by the phrase "the car got out of control." In these accidents it is not the car but the driver that gets out of control, Prof. Henderson said. A self-preserving reflex action of the human body that "could not be eradicated in a million years" is what makes motor cars in perfect condition suddenly "get out of control."

The reflex action is a "self-righting reflex," much like that which causes a cat, no matter how it is dropped, to twist around and land on its feet. It occurs in all animals. Even a new-born baby has it. No training can eradicate it. It is a righting reaction to recover balance and regain support of the body. In the driver of a motor car, it may be brought into play by a jolt or by a start such as any driver may experience when he sees a child run into the street ahead of his car.

"Freezes" on Wheel

"When it occurs in the driver of a car," Prof. Henderson explained, "the impulse that dominates him is to steady himself in his seat. He grasps the wheel with his whole strength, his arms stiffen, and he is as likely to steer off the road as along it. Simultaneously and as part of the same nervous and muscular complex, he performs another act so instinctive that in many cases he is entirely unconscious of it. His legs are forcibly extended and his feet are pressed down hard.

"Any motorist, no matter how experienced, who is suddenly and severely jolted, instantly reacts to steady himself in his seat; and in so doing he presses his foot down hard on the accelerator pedal."

The result is that the car tears along at its highest speed, "out of control,"

until it runs into a tree, wall, over a ditch or overturns.

The remedy Prof. Henderson suggests is a safety pedal for the left foot at the spot where this foot normally rests when not on the clutch. Heavy pressure on this pedal, which would occur with the same reflex that drives the right foot down hard on the accelerator, should either counteract the pressure of the right foot on the accelerator and allow the throttle to close, or it should turn another butterfly valve in the carburetor and shut off the power.

This safety pedal would work because one of the characteristic and reliable features of the thrust of the legs in the self-righting reflex is that the two legs are always pushed forward and

downward together, Prof. Henderson explained.

By way of accustoming the motorist to the safety pedal, Prof. Henderson suggests that moderate pressure on it might be allowed to blow the horn.

Prof. Henderson described many accidents of the "car out of control" type which showed how the motorist himself was out of control due to this reflex.

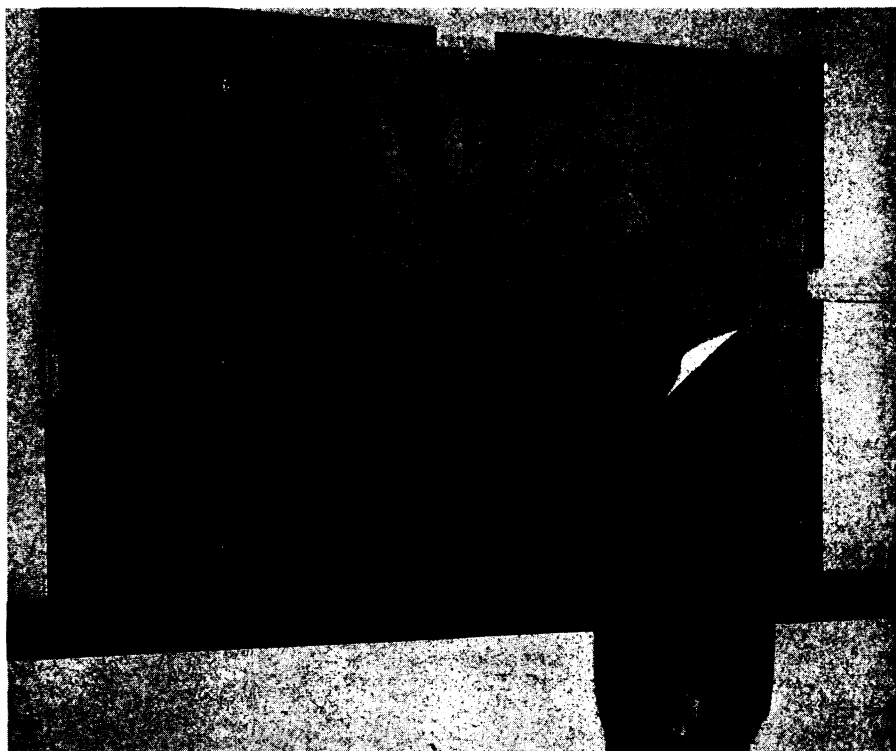
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MEDICINE

Take Step Toward Better Spotted Fever Vaccine

THE FIRST step toward a simpler, cheaper and safer method of making a vaccine to protect against Rocky Mountain spotted fever seems to have been taken by U. S. Public Health Service scientists at the National Institute of Health.

Federal disease fighters at their Hamilton, Mont., laboratory have for some time been producing an effective vaccine for this usually fatal disease. This vaccine is made from infected ticks, the insects that transmit the disease. Production of the vaccine is difficult, costly and dangerous. Two of the men working



TIME ROUND THE WORLD

The U. S. Naval Observatory in Washington has just put into operation its new world time "wheel." Based on the measurement of time by the rotation of the earth, it is possible to set the wheel for a given hour at any part of the world and find out what time it is at any other part. Capt. Julius Hellweg, director of the Naval Observatory, is shown above adjusting the wheel.

with the vaccine at Hamilton lost their lives and a number have been seriously ill as a result of infection picked up in the course of their work with the spotted fever ticks.

The latest advance has been made by Dr. R. E. Dyer and Ida A. Bengtson, senior bacteriologist of the federal health service. These two have succeeded in growing the Rocky Mountain spotted fever virus on chick embryos. The latter substance is being used increasingly for cultivation of viruses and is now being used for the production of vaccine for smallpox.

Since the Rocky Mountain spotted fever virus can be grown and kept alive apparently indefinitely on chick embryo, it may be possible to prepare the protective vaccine directly from it. This

would eliminate the expense of keeping animals on which to grow the ticks and also the danger of an infected tick's escaping and biting either a laboratory worker or some other unsuspecting person in the neighborhood.

Because of the cost and difficulty of preparing the tick vaccine, the federal health service has never been able to supply all the vaccine wanted by ranchers, hunters and others exposed to the Rocky Mountain spotted fever ticks. The situation has become more acute since the discovery that ticks on the eastern seaboard and in other widely separated parts of the country are infected with the virus of this disease which is thus no longer confined to a small, sparsely populated area of the Far West.

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PHYSICS

Cosmic Rays Show Earth's Magnetic Field is Lopsided

DISCOVERY that the magnetic field of the earth is lopsided was announced by Dr. R. A. Millikan of the California Institute of Technology, before the meeting of the National Academy of Sciences. Dr. Millikan's wholly unexpected discovery comes as a result of studies on cosmic rays.

In attempting to discover the nature and distribution of cosmic rays, Dr. Millikan has changed the idea of the still-mysterious aura of magnetism that surrounds the earth.

He finds that the magnetic field extends into space to at least ten thousand miles from the earth's surface—far beyond the limits of the atmosphere.

The magnetic intensity is stronger on the side of the earth opposite to America. This is demonstrated by the fact that there is greater effect on the cosmic ray intensity, from the North Magnetic Pole to the Equator, in the region of India than there is in comparable latitudes in America.

Dr. Millikan's discovery has been discussed with the scientists who have studied magnetism during the past thirty-five years at the Department of Terrestrial Magnetism of the Carnegie Institution of Washington.

A comparison of magnetic variations on the surface of the globe with those high above the earth, as determined by cosmic ray intensities, shows that the variations of magnetism on the earth extend outward many thousands of

miles. Dr. Millikan's results on terrestrial magnetism were obtained on the surface of the earth, and the extension of these results out into space was made by the use of simple laws of magnetism which govern such things as the running of an electric motor.

For the past hundred years, ever since the time of Karl Gauss, it has been assumed that the intensity of the earth's magnetic field was essentially uniform—a conclusion which is now revised by Dr. Millikan.

Science News Letter, November 30, 1935

ENGINEERING

Giant Salt Container Holds Twenty-Five Tons

THE COVER of this week's SCIENCE NEWS LETTER shows a new 25-ton salt evaporator just completed for one of the largest salt manufacturers. Within it a bronze propeller stirs up wet salt and circulates it through more than 800 tubes where the water is distilled off.

The Lincoln Electric Co., which supplied the picture, states that the apparatus is fifty feet high and twelve feet in diameter at its largest point. Arc weld construction was used throughout.

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A new kind of popcorn in Mexico is said to pop to extra-fat limits, and is believed to be the descendant of an old Indian grain variety.

PHYSIOLOGY

Dieting Improves Health Of Over-Fat Children

OVERWEIGHT or obesity is so often associated with "middle-age spread" and "corporation front" that its occurrence in children is apt to be ignored. It is so easy to say, "Oh, my people are all fat like that," and to attribute to the ductless glands the blame for such overweight.

Just as often the family eating habits are at fault. That such is the case is well shown by a report of Drs. Hannah Mulier and Helen Topper of the Pediatric Service of Mt. Sinai Hospital, N. Y., who gave "slimming" treatment to 25 overweight boys and girls not only without harm but with marked improvement in general health as well as in weight.

To do this required careful adaptation of the diet to fill the needs of the child. Not only must the diet furnish enough energy for the internal needs of the body organs and glands, but also for growth and for the child's activities. It must also be low enough to force the body to consume some of its own excess fat.

These doctors therefore gave relatively large amounts of protein foods, such as meat, eggs and cheese, to insure continued normal growth; with but small amounts of sugars and starches, and larger amounts than customary of the bulky foods, such as vegetables and fruits.

Too Much Rich Food

All of the children treated had a history of over-feeding with rich foods, fats, sweets and pastries, and of high water and milk intake. Since some of the overweight of obesity is due to the retention of water by the body tissues, especially when a high carbohydrate diet is eaten, fluids were limited to 15 or 20 ounces daily, and salt not to exceed 15 grains, because it, too, is concerned with water storage in the body.

Increased participation in outdoor sports, swimming, walking, tennis, was gradually encouraged, and the results were well worth the effort taken. Not only did the children lose some of their excess fat, averaging three-quarters of a pound loss per week, but they continued to make more than the normal gain in height for children of their age, 5 to 14 years. They lost their passion for excessive food, became much more interested in work and school study and outside activities, and manifested an increased sense of well-being and alertness. In addition, some of them who