



## OVER

*The jumper cleared the bar by three inches—and got credit for it, with a new application of the electric eye for measuring jumps. Developed by General Electric engineers, it was tried out with great success the other day at a Schenectady track meet. Four parallel beams of light, an inch apart, are sent across from one upright to the other, and detected by photoelectric cells. The recording device tells which, if any, of the beams is interrupted by the jumper's body. Actually, no bar is necessary, though it helps the jumper by giving him a mark to aim for.*

## GENERAL SCIENCE

## Soil Erosion More Destructive Than War's Havoc in Africa

### Conservation Practices Begun Years Ago Fallen Into Disuse and Soil Is Eroded Down to Bedrock

**N**ORTH AFRICA and the Near East, scourged for the thousandth time by war, have suffered even more during intervals of peace than from the havoc of actual armed strife. Partly because of war-caused paralysis of civil life, partly from internal disorder and weakness, soil-conserving practices begun by good farmers ages ago have been permitted to fall into disuse, and the impoverished soil has eroded to bedrock, Dr. W. C. Lowdermilk, of the U. S. Soil Conservation Service, stated in an address before the American Association for the Advancement of Science in Durham, N. H.

The world's earliest large-scale civiliza-

tions, in the Tigris-Euphrates and Nile valleys, have had diverse histories, Dr. Lowdermilk pointed out. The history of the land now called Iraq has had marked ups and downs. This is at least partly due to the fact that its agriculture depended on irrigation canals, which were at times permitted to silt up and become useless. For the past thousand years or more, the valley that was once the Garden of Eden has been in a "down" phase of its history, impoverished, underpopulated.

Egypt, on the other hand, has depended on the annual Nile flood for its irrigation, so that its only problems have

been much simpler ones of drainage, to prevent the water table from becoming too high and to eliminate saline deposits from certain spots in the soil.

Apparently the device of terracing sloping fields was first used by the ancient Phoenicians, in the fields on the mainland back of Tyre and Sidon, Dr. Lowdermilk said. As the necessities of the growing city populations pressed ever harder on the means of support, the stone-supported terraces were pushed ever higher up the hills. If the work had to be done at present-day wages the cost would be terrific.

Nevertheless, these ancient terraces have justified their existence. Where they have been well taken care of they are still functioning, after more than 2,000 years of use. Where they have been neglected and allowed to break down, the soil has slid into the valleys and choked the rivers, leaving the bare bones of the rock sticking out of the hillsides.

Dr. Lowdermilk drew a lesson for America from the history of these classic lands. Here, too, there has been neglect and wastefulness in land use, and soil erosion has got started at an alarming rate.

However, the speaker concluded, "this destructive force did not go unheeded. Far-sighted students of land foresaw the dangers of soil erosion. But it was not until experimental studies were begun by which it was possible to measure comparative losses of water and of soil under various types of cropping, slopes and climates, that the magnitude of the menace could be measured.

"On the basis of these researches, a nation-wide program of demonstration projects in erosion control and soil conservation showed the farmer and the technician alike how this enemy of civilization might be controlled. Out of these steps has grown a movement for conservation of land resources which was founded upon the lessons of the past and science of the present.

"Continued progress in this movement of conservation must be founded on the adaptation of the findings of research to problems in land use that become more and more intricate as the demands upon the land increase."

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## Use Renewable Resources

**L**IVE on income, not capital; use renewable resources, rather than exhaust non-renewable ones. Such is the national policy that (*Turn to page 15*)

of bats lasted until 9:30 at night, but long before that the two lingerers gave up their attacks and flew away.

Before dawn, Mr. Stager stationed himself by the cave mouth to watch the return flight of the bats. Again the hawks appeared, and dashed into the cloud of flying mammals to get their breakfasts.

At no time, apparently, did the bats make any attempt to evade the hawks' attacks. The predations of even half-a-dozen hungry birds made no impression whatever on the innumerable hordes, and even their smashing dives into the column made only momentary disturbances.

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was urged by Dr. H. L. Shantz of the U. S. Forest Service.

The nation's resources were divided by Dr. Shantz into two categories, renewable and non-renewable. The latter are of mainly mineral origin. Some, notably the metals, last a long time and can be reworked several times before they vanish out of circulation. Others, especially coal, oil, natural gas and fertilizer deposits like phosphates and potash, are completely expended the first time they are used. Non-renewable also, the speaker pointed out, are species of plants and animals: once exterminated, they can never return.

Renewable resources include water power, plant products, and animal uses of plant products. These come back in cycles; every year in annual crops, over longer periods in forest products, perennially in water power. These are the things that should be used most freely, and should be substituted for non-renewable resources where that can be done, as in use of plastics for metals.

The soil occupies an intermediate position. If it is permitted to waste itself through erosion, it is strictly a non-renewable resource. If it is properly conserved, it moves into the renewable category.

"Plant cover is most important as a source of energy and as a means for holding the soil," stated Dr. Shantz. "When this cover is gone, it becomes almost impossible to hold the soil. It is doubtful if plowlands can endure permanently, but where there is a closed cover of vegetation the soil is permanently safe."

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## Suprenals Affect Heart

**H**EART diseases, of several different types, are due to abnormal functioning of the suprarenal glands, small

bodies above the kidneys that furnish adrenalin and other hormones necessary for normal functioning of the body but harmful in excess, Dr. William Raab of the University of Vermont medical college told the American Association for the Advancement of Science.

In experiments on rats, Dr. Raab found that the heart muscle seems to have a peculiar affinity for adrenalin and its associated hormones. The animals' hearts absorbed more of these adreno-cortical compounds than did other organs. An overdose, above a certain definite concentration, inevitably resulted in death by heart failure.

Experimental data are backed up by clinical results, the speaker claimed. In the too-common and exceedingly painful heart disease, angina pectoris, it was found that physical exercise resulted in excessive discharges of the hormones into the blood stream, and these in turn provoked typical attacks. In a number of cases, where the glands were partially inactivated by X-ray treatment, these abnormal discharges were abolished for many months, with parallel disappearance of the anginal attacks.

Dr. Raab traced similar apparent connections between abnormal discharges from the suprarenal glands and other types of heart disease, including essential hypertension and congestive heart failure. Assay of the heart muscle, in autopsies of patients who had died of heart failure, showed abnormal amounts of the hormones. Usually these were excessive, but in some cases subnormal concentrations were found.

Summarizing his results, Dr. Raab stated: "It can be said that normal functioning of the heart muscle is dependent on the presence of normal amounts of adreno-cortical (AC) hormones in its tissue. Both abnormal increase and diminution of the myocardial AC are likely to bring about heart failure. Intense AC discharges into the blood stream going on over years and decades stimulate, exhaust, and finally damage the myocardial tissue in a similar manner as they stimulate and ultimately damage the muscular walls of the arteries."

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## Insects Lured By Scent

**C**HEMICAL lures may eventually be used as protection for crops, instead of the barrages of poison spray with which plants have to be drenched nowadays. It may become possible to mislead insect pests to lay their eggs in chemically scented traps, instead of on

plants, Dr. V. G. Dethier of John Carroll University suggested.

Dr. Dethier has been experimenting with many kinds of insects and many kinds of chemical compounds found in plants, to get some idea of what induces certain species to lay their eggs on just one or a very few kinds of plants. The cabbage butterfly, which never lays its eggs on anything but the leaves of cabbages and related plants, was attracted by compounds found in just that group of plants. The orange puppy, a troublesome pest of citrus trees, is lured by the scent of two chemicals, citral and methyl-nonyl-ketone. The tent caterpillar has a decided preference for poison in small quantities: it hastened to a bait of hydrocyanic acid and benzaldehyde.

Dr. Dethier demonstrated that insects are guided by their chemical sense by impregnating filter paper with the chemical compounds preferred by various species. Each insect went to the paper scented with its favorite luring odor and proceeded to make a meal of it, despite its lack of other resemblance to leaves and its obvious indigestibility.

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### VETERINARY MEDICINE

## Ticks Suspected Carriers Of Fatal Poultry Disease

**T**ICKS are under indictment for another crime of disease-carrying. This time it is fowl paralysis, a highly fatal disease that wipes out whole flocks of poultry. Researches by J. C. Brown and Prof. J. C. Cross, of Texas College of Arts and Industries, strongly suggest that the carrier is the fowl tick, or "blue bug" as it is familiarly known. (*Science*, May 30.)

It was noticed that chickens in pens infested with "blue bugs" were dying of fowl paralysis at an appalling rate. Thorough cleanup and disinfection of some of the pens was followed by high survival rate. In the infested pens 111 birds out of 120 developed paralysis. In the cleaned-up control pens only one bird out of 126 was stricken.

As a clincher, ticks from an infested hen were ground up and a suspension of their body substance was injected into several chickens. All were attacked by the disease.

Further researches, to find whether there are other possible carriers, are now in progress.

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In China, *cotton* was first grown as a garden plant.