MATHEMATICS

Fall, Jump or Push?

Science solves question whether death was suicide or accident. High speed camera used to study falling body. Mathematics and actual experiments used in method.

➤ A MAN falls off a building. Was it accidental or suicide? An answer has been provided by the scientific investigation of Prof. Rufus Oldenburger, mathematician at the Illinois Institute of Technology in Chicago (*Journal of Applied Physics*, July).

If a man merely loses his balance and falls, the body will first describe a circular arc and then follow the course of a parabola. It will strike some distance out from the building. This distance, for a given height of building, varies somewhat with the height of the man, whether he stood erect or crouched, and whether he gave himself some slight impulse after losing his balance.

Dr. Oldenburger investigated all the ways in which a man, of varying proportions, can accidentally fall off a building—first mathematically, then experimentally.

The experiments were made with sticks of small models which were allowed to fall off a ledge in the laboratory. They were photographed with a camera making 15 exposures per second on the same film, so that position and attitude of the model was shown at successive points of the fall.

Characteristic of the accidental fall is that the body turns end over end while falling. This is due to the initial circular motion which occurs after the man has lost his balance and continues until his feet have left the ledge. This turning continues during the fall and cannot be stopped.

On the other hand, if a man merely steps off a ledge, he will fall nearly vertically. If he walks, runs or jumps off a ledge, he will land farther out than if the fall had been accidental. In none of these cases will there be much if any turning.

By the distance out at which the man lands can be calculated the amount of energy he put into his jump. Dr. Oldenburger further backed up his findings by having young track athletes do some jumping for him. He found that the maximum energy which the strongest of them could put into a jump, made after losing balance, was 100 foot-pounds. If then the calculations show that the man's jump exceeded this energy, it is conclusive evidence that the jump was made before losing his balance, and the verdict is suicide.

Science News Letter, September 5, 1942

AGRICULTURE

Contour Plowing Brings Changed Fencing Method

➤ CONTOUR PLOWING, following the natural levels of the land to conserve moisture and check soil erosion, is becoming increasingly popular on American farms. Until now, however, the old straight-line fences of the old square-shaped fields have remained, in many instances interfering with the curved path of the cultivating machinery and increasing the number of troublesome "point rows" found necessary.

Some farmers, the U. S. Department of Agriculture notes, have recently begun to reset their fences, so that field boundaries go with the contour plowlines. This not only abates the "point-row" difficulty, but furnishes a permanent guide to cultivation. Plant growth in the fence row also serves as a further water conserver and soil anchor.

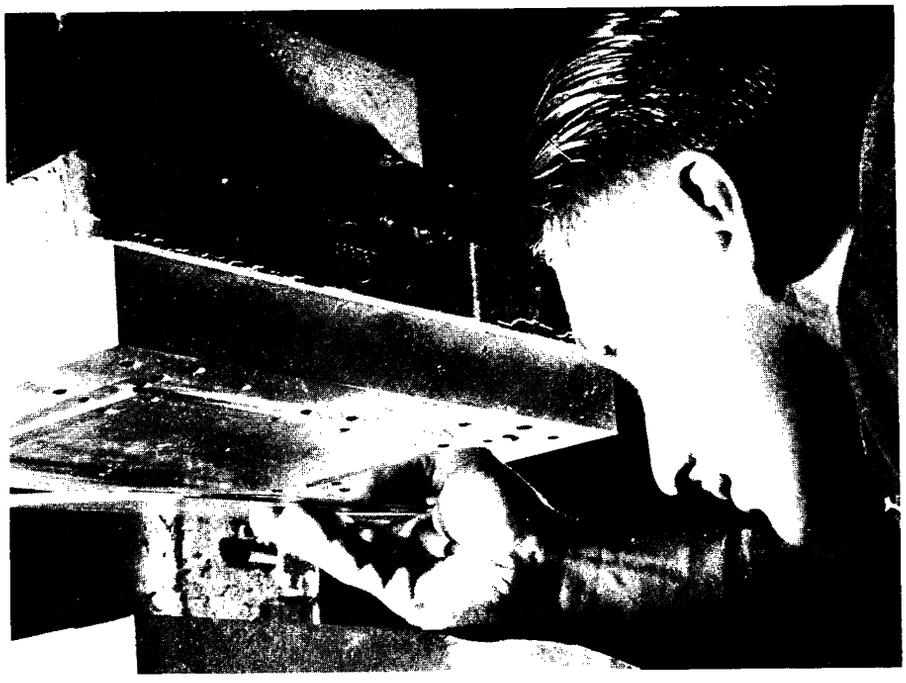
Science News Letter, September 5, 1942

INVENTION

Liquid from Cashew Nuts Makes Varnish Material

➤ CASHEW NUTS, an imported luxury, arrive in shells for which there has been little use. However, the shells contain a liquid that can be converted into good material for varnish and similar uses by means of polymerization, or a chemical welding of its little molecules into bigger ones. A process for doing this has been developed by Solomon Caplan of New York, covered by patent 2,292,611, which is assigned to Harvel Corporation.

Science News Letter, September 5, 1942



***COMPRESSED AIR** blown down through the top of the hydraulic press under 80 pounds pressure, holds the steel plate above the workman's hand in place until the air is automatically turned off. Then the plate drops into the operator's hand. Developed at Westinghouse, the device has nearly doubled the speed of production of air cleaners for arsenals, Navy laboratories and defense factories. Workmen formerly spent much valuable time in prying each plate loose from the bottom bed of the press.*