

Smith states that he has even seen these fish dislodge small lizards with these water bullets.

The range of the shooting fish's projectiles has not yet been accurately determined. Dr. Smith says that he has seen the fish make good scores at a distance of a yard, and has known of cases where the projected drops spattered against the ceilings of verandas three or four times that high. He has a number of these fish in a pond in his yard in Bangkok, on which he expects to make further observations. They are sociable fish, he says, and like the attention of human beings.

Science News Letter, March 7, 1931

CHEMISTRY—AGRICULTURE

Public Gets Benefit Of Poison Gas Patent

AN INTERNATIONAL race for a patent on a poisonous gas has been won by the U. S. Department of Agriculture, and the public will get the benefit.

Two scientists of the Department, Dr. Ruric C. Roark and Dr. Richard T. Cotton, discovered that ethylene oxide is an exceedingly effective destroyer of weevils and other insects that infest stored food products. A well-known German dye company patented the gas for use as a fumigant abroad, and applied for a patent in this country. However, the priority of the American scientists' claim was recognized by the U. S. Patent Office, and their patent has been dedicated to public use.

Science News Letter, March 7, 1931

ASTRONOMY

11,000 Miles Per Second Is New Heavenly Speed Record

Astronomers, Not Believing Nebula Really Travels That Fast, See Explanation in Einstein's Curvature of Space

ELEVEN THOUSAND miles per second is the new record "apparent" velocity reported detected in the red-dened light from a distant "island universe" viewed through the world's largest telescope at Mt. Wilson, Calif.

The faint nebula discovered to seemingly recede from earth at this tremendous speed is so far distant that light traveling six trillion miles a year would need 120 million years to reach earth.

This new research result is declared by Dr. John C. Merriam, president of the Carnegie Institution of Washington, to be "of special interest at this time because of Einstein's visit and the bearing that it will have on his conception of the universe." Dr. Walter S. Adams, director of the Carnegie Institution's Mount Wilson Observatory, reported the discovery to Dr. Merriam who announced it.

Milton L. Humason, in photographing with the great hundred-inch telescope the spectrum of the faintest nebula yet observed, discovered by a fellow astronomer, William H. Christie, learned that its spectrum lines were shifted to the red in such a way that a rushing away at eleven thousand miles a second would be necessary to produce it. This

is sixty per cent. greater than any so-called apparent velocity so far observed.

But astronomers do not actually believe that the far-distant cluster of stars is receding into space at any such tremendous velocity. They see the true explanation in the curvature of space, as postulated by Prof. Albert Einstein, now at Pasadena working with the astronomers who made the discovery. Space, he says, is curved in dimensions higher than the three familiar in everyday experience, just as a ball is curved in three dimensions. Very distant objects like the nebula just discovered give effects of great speed not because they are moving rapidly but because they are so distant that space gets a chance to produce its effects.

Science News Letter, March 7, 1931

EVOLUTION

Evolution Depends on "Health Level"

THE evolution of a species is determined in considerable measure by what might be termed its general health level. The rate at which it develops new features, like the rate at which the individual grows, is largely a measure of the rate of its metabolism.

This is the theory developed in an article in *Science* by Dr. Carroll Lane Fenton of the University of Buffalo. Dr. Fenton was led to his conclusions by studies on a large series of fossil sea-shells, called brachiopods. These, by the simplicity or elaborateness of their markings, indicated at once the evolutionary status and the degree of vigor possessed by the animals that formed them.

In any series of shells, Dr. Fenton found, the animals started out with very simple and austere ideas of exterior decoration. As the millenia rolled by, the markings became more elaborate, reaching a climax indicating full vigor. Then a decline would set in, marked by the development of bizarre decoration schemes (*Turn to page 156*)



YOUTH, MATURITY, OLD AGE

Reading from left to right, three evolutionary ages of a brachiopod line, as traceable in the ornamental patterns of their shells.