

Our grandmothers found old-fashioned yellow soaps best for their purposes but more and more the modern housekeeper leans toward white laundry soap for her ordinary washing uses. This is explained by the disappearance of the old-fashioned rain barrel and cistern and the growing use of hard water from the deep well supply of city mains. Hard water requires the addition of more alkaline constituents and the substitution of coconut oil for the rosin found in soft-water soaps.

To make a fair test of the cleaning ability of the different soaps, standards for dirt are likewise being set up in the Government laundry. Most hardworking housekeepers know to their sorrow that the most innocent looking spots of dirt sometimes prove terrifically stubborn. Carbon black, umber, and various oil combinations are being tried out as fairly representative and stubborn specimens of dirt.

After it has been discovered what soaps are best for a given cleaning job, the question still remains for the laundry chemist: What makes the soap clean well and what should a good soap contain?

By strict definition, all metallic salts of fatty acids are soaps but, as a matter of fact, only the fatty-acid salts of alkali metals are soluble in water and hence practical for ordinary cleaning. To a less extent rosin acids are used.

Soap is practically never used in its pure state, as various "builders" are added to adapt it to special uses. Sodium carbonate, borate, silicate, and

phosphate are added to make the soap harder and more effective in hard water. Clay, sand, volcanic ash, infusorial earth, pumice and starch in soap serve to scrape and wear the dirt away like good-mannered sandpaper.

To the point which these "builders" serve the purpose for which they are added, they enhance the value of the soap. Sometimes, however, the soap manufacturer is tempted to use an excess of the "builder" to increase the bulk of his product without increasing the cost. And it often happens as the unreliable manufacturer hopes, that the housewife is deceived into believing that she has found a bargain when she gets a large piece of soap for her money, though she is in reality paying dear for clay and starch.

Protecting wholesale soap buyers against such deceptions, the Government has formulated a set of standards for various kinds of soap, including white floating soap, liquid soap, soap powder, grit cake soap, automatic soap, chip soap, ordinary laundry soap, scouring compounds and hand grit soap. This enables the buyer to ask for soap conforming to certain minimum specifications and adapted to his needs and provides a test whereby he can readily determine whether he is being supplied in accordance with contract.

The cleaning ability of a soap is only one of its qualities measured in the tests. The shrinking effect of a given soap and its effect on dyestuffs are other factors that go into the ultimate rating.

*Science News Letter, March 7, 1931*

#### CHEMISTRY

## Radium Rays Three Times More Effective than X-Rays

**T**HOUGH radium rays and X-rays cause reddening of the skin to nearly the same extent, the radium is about three times more effective in producing certain other biological effects.

This is the conclusion announced to the Optical Society of America by Dr. G. Failla and P. S. Henshaw of the New York Memorial Hospital.

The work has required the development of an apparatus which would measure equivalent, comparable doses of the two radiations. It was found that 500 roentgen units of radium gamma rays produced the same reddening

of the patient's skin as 600 roentgens of filtered X-rays.

Other experiments were made on wheat seedlings. In both cases the effect of the radiation is shown as a stunting of the shoots and roots. Three times as much X-radiation was required in this case to produce equal effects. Hence it may be desirable to use higher voltages with X-rays for medical purposes.

Dr. Failla emphasized the fact that the suitability of a certain type of rays for a given tumor must always be taken into account.

*Science News Letter, March 7, 1931*

#### PALEONTOLOGY

## New Dinosaur Species Described in Washington

**T**WO NEW species of dinosaurs have made their bow to scientific society in Washington, with the publication of their description in the Proceedings of the U. S. National Museum by Dr. Charles W. Gilmore, paleontologist.

The fossil remains of these ancient reptiles were discovered on the Blackfoot Indian reservation in Montana. The bones were brought to Washington for preparation and examination.

One of the dinosaurs, *Paleoscinus rugosidens* by name, was a medium-sized monster with a skull about a foot and a half long. It had a well-developed armor of bony plates on its back in the region of its hips, and was ornamented with numerous formidable spines. The other species, *Styracosaurus ovatus*, resembled the well-known Triceratops, or three-horned dinosaur, though it is not known how many horns it had. Its outstanding characteristic was an array of radiating spines projecting from the edge of the bony frill that protected the animal's neck.

*Science News Letter, March 7, 1931*

#### ICHTHYOLOGY

## Fish Shoots Insects With Drop of Water

**A** FISH that shoots its insect prey with a drop of water is among the ichthyological incredibilities definitely assured as scientific facts by Dr. Hugh M. Smith, former United States Fish Commissioner, who recently returned to Washington from Bangkok, where he is adviser in fisheries to the Siamese Government. So accurately can the little fish hurl its liquid projectile that on at least two occasions Dr. Smith has seen lighted cigarettes extinguished in the mouths of smokers on a veranda a couple of yards above the surface of the pond where the fish were swimming.

When the shooting fish sights an insect that it considers a likely candidate for dinner, it quietly pokes its eyes and the tip of its snout above water, holding its body at an angle of about forty-five degrees. It opens its wide mouth just the slightest crack in the middle, like a veteran terbakker-chawer from the Ozarks, and at the same instant suddenly squeezes its gill-covers. The speeding drop of water that shoots forth seldom fails to bring down its mark. Dr.

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

**A**N 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

**E**LEVEN 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*

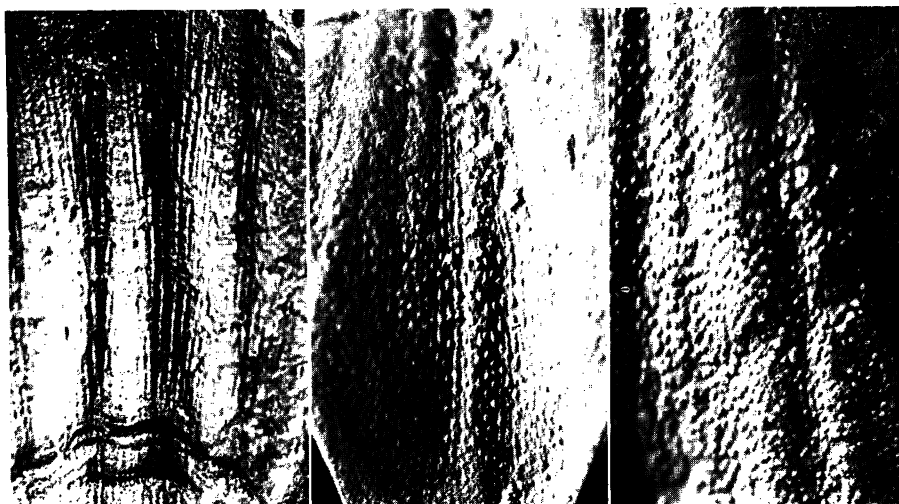
EVOLUTION

## Evolution Depends on "Health Level"

**T**HE 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 ornamentalations of their shells.