ASTRONOMY

New Star Bursts Forth In Constellation of the Eagle

Aquila, Setting For Famous 1918 Nova, Scene of New Eighth Magnitude Star High in Southwest Near Altair

A NEW star or nova has burst forth in the constellation of Aquila, the Eagle, the International Astronomical Union's central bureau at the University of Copenhagen has been informed by Nils Tamm at the Kvistaberg Private Observatory in Bro, Sweden.

The new Nova Aquilae is now of the eighth magnitude and not visible to the naked eye. News of its discovery was cabled to observatories of the world.

The brightening of this star takes on added interest because the most famous nova of this century, Nova Aquilae of 1918, was in the same constellation.

The nova is high in the southwestern evening heavens, not far from Altair, seventh brightest star seen from this part of the earth.

The brightening of a star signals a gigantic outburst which if it had occurred to the sun would have immediately wiped out the earth and other planets. One or more expanding shells of gas rush away from a nova at immense speeds. Nova Lacertae rose in June of this year to be as bright as the Pole Star, and Nova Herculis discovered in December, 1934, was even brighter (See *SNL*, Dec. 29, 1934, and June 27, 1936).

The nova in Aquila was photographed on the night of September 20 by Harvard Observatory, and evidence that the star is expanding was discovered. On photographic plates, Nova Aquilae was of the twelfth magnitude on June 22, about tenth magnitude on July 22 and about ninth magnitude on Aug. 17.

Science News Letter, October 3, 1936

ASTRONOMY

New Comet Discovered In South Africa

A NEW comet was discovered in the constellation of Aquarius in the southern evening sky on Sept. 20 at the Union Observatory, Johannesburg, South Africa, by Dr. Cyril Jackson.

It is faint and diffuse with no nucleus. Astronomers rate it as twelfth magnitude. News of its discovery was cabled to observatories by the International Astronomical Union's bureau at the University of Copenhagen.

Whether Jackson comet will grow brighter can be determined only when more and later observations are made so that an orbit can be computed.

The astronomical position of the new comet is approximately right ascension 23 hours and south declination 12 degrees 47 minutes.

Science News Letter, October 3, 1936

ASTRONOMY

First Photographs Taken On Mount Palomar

TO Dr. Fritz Zwicky, associate professor of theoretical physics at California Institute of Technology, goes the distinction of making the first astronomical photographs at the Astrophysical Observatory, the future home of the great 200-inch telescope.

Working with a Schmidt-type camera, a small auxiliary observing unit for the future world's largest astronomical eye, Dr. Zwicky is taking focus photographs of the sky to be used in adjusting the mechanisms of the larger instruments yet to be installed. A month will be required for this work.

A battery of trucks has started to haul from Los Angeles the 500 tons of steel for the side walls of the 200-inch dome. First ten loads of the six trucks and five trailers will be equipment for swinging the steel into place.

So steep is the road up the mountain that the filled trailers are left at the foot while the trucks go up alone. When empty, they return and haul up the trailers.

Grinding of the great 200-inch disk has been started at California Institute of Technology in Pasadena. Three months will be required to give it a flat surface, first. Then the disk will be turned over and another six months spent in grinding the back. Only then will the long, delicate and tedious job of grinding the face to the proper curvature be undertaken.

Science News Letter, October 3, 1936

FROM SILVER DUST

Tiny particles you cannot see produce this visible picture. The enlargements on the facing page show you how it is done.

PHOTOGRAPHY

Silver You Cannot See Makes Images You Can

EVERY time you take a snapshot on your camera at home billions of things happen. Why? Because billions of tiny crystals of light-sensitive silver bromide on the gelatin surface of the film in your camera change when the light strikes them. Those little crystals are embedded in a gelatin layer, like fruit in some of the popular gelatin desserts on the family table.

Developing the film, as it is called, changes the particles struck by the light rays into black metallic silver. It is the gradation from pure black, through the various shades of grays to pure white which produces the shade tones of the final printed picture.

Take a microscope, however, and go into the Lilliputian land of the silver grains you cannot see but which make the images that you can, and there you will find that truly the myriad host of particles is present.

The accompanying pictures, showing successive enlargement and magnification which prove the truth of this statement, are from scientists of the Eastman Kodak Company. The first picture (shown above) shows the young lady as you normally see her on a photographic print, except that the picture is taken from a positive motion picture film. In the second view she takes on something of her photographic granular structure which seems like a good case of freckles in the summer time.

But keep watching her left eye as in the third picture. Yes, the shadow of the eyebrows and the iris of the eye itself are really made of the black grains of silver.

The tiny white highlight on the eye is bright because only a few grains of silver-bromide crystals at that point changed to silver in the developing. Dark regions exist where more crystals changed.

Just as you watched the eye in picture three, concentrate on the eye highlight in the last picture. There it is. The bright area in the center of the picture and the multitude of silver grains all around it are now completely apparent. Instead of a photograph you might well think you are looking at a sprinkling of coal dust instead.

Actually, of course, one could obtain the whole original picture by the super-task of laying down at just the right place tiny microscopic specks of dust; many of them where you wanted black and few for white areas. The job is naturally almost a physical impossibility yet one brief exposure to light for only a fraction of a second accomplishes the same thing. How big are the silver-bromide particles that do this super-human job? Some of them are so small that only the most powerful microscopes will show them. Others loom large under a microscope and may be as big as one six-thousandth of an inch across!

For some of the extra fast super-sensitive films for use in the new candid camera, the grain size is still smaller so that more enlargement will be permissible before the grain structure is noticeable.

In positive film for projecting motion pictures where the enlargement is even greater the grain size is much less than one twenty-thousandth of an inch.

Anywhere from half a billion to five billion particles are embedded in the gelatin on a square inch of surface.

Science News Letter, October 3, 1936

CHEMISTRY

Through Special Technique Enzyme Is Viewed at Work

Action of Catalase Is Observed for First Time and Confirmation Obtained That It Actually Enters Reactions

FOR THE first time in the history of physiological chemistry, an enzyme, one of those chemical substances important in the processes of digestion and fermentation, has actually been observed at work, and experimental proof has been provided for the theory that enzymes enter into chemical reactions, as well as stimulate them. This has been accomplished by Dr. Kurt G. Stern, Visiting Lecturer in Physiological Chemistry at Yale University, who, by a special technique that seems equivalent to slow motion photography, caught the enzyme at its lightning-swift work.

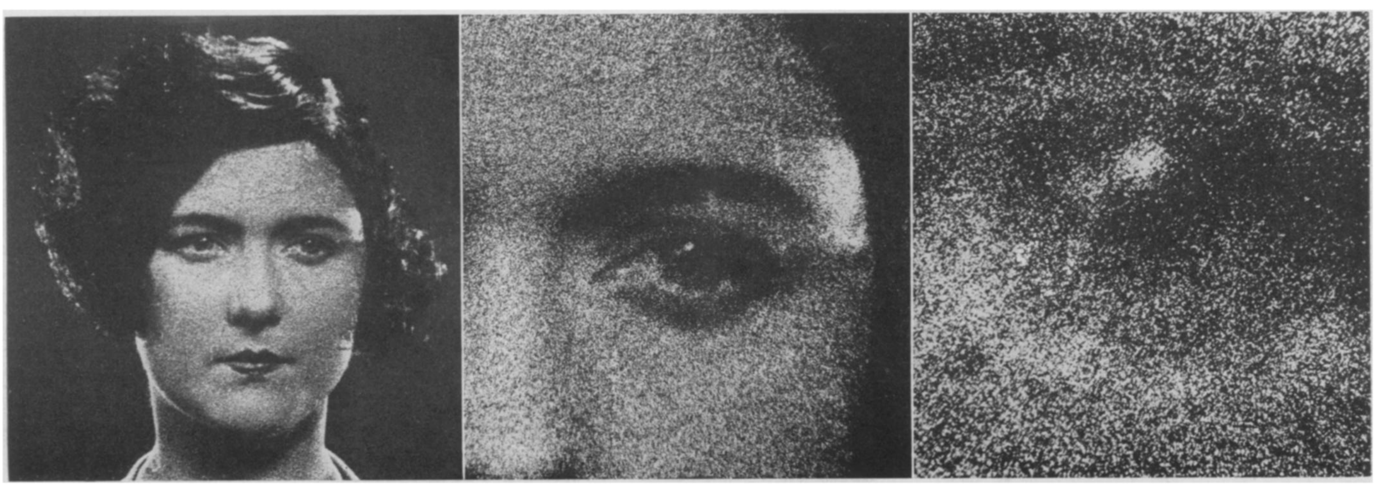
Used Colored Enzyme

The enzyme which opened the door for scientists to a new approach in the study of digestion was catalase, selected because it is the only colored enzyme found in sufficient quantities for experimental purposes and therefore amenable to spectroscopic study. Other enzymes are either colorless or found in minute quantities, but catalase is found in all living cells. The liver cells are especially rich in the substance.

Dr. Stern's first research work on this enzyme was to isolate it and determine its constitution. It was known that it is composed of a colorless protein and a pigment which gives it its color. This pigment, separated from the protein, was purified to a crystalline form and found to be identical with the pigment, or hemin group, of the blood which gets its color from hemoglobin. He was able to transform this enzyme into hemoglobin, by merely exchanging the protein of the enzyme for the globin or protein of the blood pigment, thereby showing the identity of the two hemins.

The exact function of catalase has not been determined, and until recently it was generally assumed that its only function was to break down hydrogen peroxide into water and gaseous oxygen. Since hydrogen peroxide could not be found in the tissues of higher animals and plants, Dr. Stern looked for other substances which might be attacked by this enzyme and thereby provide a clue to its real function. He found that a substance derived from hydrogen peroxide, monoethyl hydrogen peroxide, is also attacked by the enzyme but is broken down much more slowly than the simple hydrogen peroxide.

Monoethyl hydrogen peroxide, when attacked by catalase, does not yield a gaseous product but breaks down into acetaldehyde and (*Turn to page* 222)



LITTLE GRAINS

Like fruit in the gelatin dessert, microscopic specks of light sensitive metal imbedded in the gelatin layer of film make possible the light and shade of the photograph. From left to right are successive stages of enlargement of the view shown on the facing page.