

ASTRONOMY

**120-Inch Flat Mirror
Now Being Ground**

TWO skilled California Institute of Technology workmen have started the largest optical job since the 100-inch mirror was completed for the world's largest telescope on Mount Wilson.

Preliminary grinding of the 120-inch pyrex mirror, to be used in testing the final surface of the 200-inch "eye," shortly to be recast at Corning, N. Y., is under way. By spring it is expected the surface of the disk will be ground flat to within a hundred thousandth of an inch of perfection. Preliminary grinding is to continue until bubbles on the surface are removed.

Machinery weighing between 40 and 50 tons is used to prepare the mirror's face for use. It is housed in a huge one-room, cork-lined laboratory building designed to keep a constant temperature which is needed to prevent distortion of the glass.

The grinding tool is fastened to an arm controlled by a series of motors. Each motor gives the tool a different motion over the heavy mirror. One man, at switches, controls these operations. The other watches the progress of the grinding and supplies the necessary amount of carborundum, the grinding substance.

The grinding is done on an NRA week of five days of eight hours each.

Science News Letter, August 25, 1934

PALEONTOLOGY

**National Museum Gets
2,000,000-Year-Old Horses**

OUT IN IDAHO, near the town of Hagerman, Dr. C. Lewis Gazin, paleontologist of the U. S. National Museum, is busy putting bones into plaster-of-Paris casts. They are not all broken bones; many of them are whole. They are not human bones; they are horses'. And the horses have been dead for over two million years.

Dr. Gazin's job of inverse veterinary surgery has already used up half a ton of plaster-of-Paris. The bones thus bandaged, to insure them against breakage, are to be shipped to the U. S. National Museum in Washington where they will form a notable addition to the great collection of horse fossils already obtained from the same site.

This quarry has proved to be a veritable mine for the remains of the extinct horse genus known as *Plesippus*, an animal that roamed the American West during the pliocene geologic period, immediately before the coming of the great Ice Age. *Plesippus* closely resembled the modern horse in size and general appearance but certain details of structure set him apart as a separate genus.

Along with the horse bones, Dr. Gazin has found considerable numbers of bones of other extinct mammals that were the contemporaries of *Plesippus*. These he is also packing for shipment to the Museum.

Science News Letter, August 25, 1934

CHEMISTRY

**Milk Product Glazes Paper
For Fine Printing**

THE HIGHLY polished surface on the paper in the better magazines, which makes possible the beautiful colored pictures and fine printing, comes from—of all things—skimmed milk.

The glazed surface consists of casein pressed into the paper. Casein is obtained from the curd, after the whey has been separated from it.

A new machine which manufactures casein in one continuous process and produces a product rivaling casein imported from abroad is reported to the American Chemical Society by Dr. Richard W. Smith, Jr., of the University of Vermont.

For good printing the casein should have uniform quantities, and when paper manufacturers make fine paper by practically the square mile it is difficult to maintain the uniformity everywhere.

In the new process, developed by F. L. Chappell of Hobart, N. Y., the skimmed milk is separated into the curd and whey continuously and each chemical step taking out the impurities follows the one before it in sequence.

"The finished casein is superior to that made by other methods," Dr. Smith declares. "The whey also obtained contains lactose, inorganic salts and some residual albumin. It is utilized in several ways. It may be evaporated direct to powder to yield a valuable feed for poultry and stock; it may be worked for its lactose content; it may be fermented to yield lactic acid, or, as has been recently proposed, its albuminous constituents may be separated and used."

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IN SCIEN

CHEMISTRY

**Fertility Vitamin E
Absorbs Ultraviolet Rays**

HOPE, long-held, that the fertility vitamin E would absorb light in a distinct, characteristic fashion and thus make possible a positive identification appears to have been achieved by workers at the Dunn Nutritional Laboratory of the University of Cambridge. Reporting to *Nature*, Drs. A. J. P. Martin, T. Moore, Marion Schmidt and F. P. Bowden describe experiments on the spectrum analysis of vitamin E.

By dissolving vitamin E, prepared from wheat seed germs, in alcohol the British workers found that a sharp absorption occurred at the wavelength 2900 Angstroms when they shone light through it. This wavelength is in the invisible ultraviolet region, near the actinic rays which produce sunburn.

The key test in the research was to show that the vitamin E which produced this characteristic absorption really produced a biological effect when given to experimental animals. Such an effect was found, say the investigators, "for the vitamin caused a female rat which had shown characteristic resorption gestation to produce a litter of eight live young."

Science News Letter, August 25, 1934

OCEANOGRAPHY

**Bathysphere Record Set
At 3028 Feet Under Sea**

WILLIAM Beebe and Otis Barton, established a new "low" for personal deep-sea exploration when their bathysphere descended to a depth of 3028 feet beneath the surface of the sea off the shores of Bermuda on Wednesday, Aug. 15.

With this "deep down divin'est" record, exceeding the half-mile dive they had set as their goal, the two men announced themselves as content. They will now make a series of bathysphere descents to shallower levels, to study marine life "at home."

Science News Letter, August 25, 1934

CE FIELDS

ASTRONOMY

Astronomers Search For Comet Seen in Europe

AMERICAN astronomers are on the watch for a faint periodic comet which has been rediscovered in Europe. Harvard College Observatory, the collecting center for astronomical information, was notified of the discovery and, in turn, sent the details to American observatories.

The comet is of the twelfth magnitude, which means that it is much too faint to be seen with the unaided eye or even through a small telescope. It is low in the eastern sky as seen from the United States, somewhat east of the constellation of Pisces.

Science News Letter, August 25, 1934

PHYSICS

Gamma Rays Split Apart Heavy Hydrogen Atoms

GAMMA rays, the same kind of radiation used medically for the treatment of cancer, are now being employed to produce artificial disintegration of atoms of the "heavy" hydrogen isotope, deuterium. The atom breakup achieved throws new light on the composition of the newly discovered "heavyweight" kind of hydrogen.

Prof. James Chadwick and Dr. M. Goldhaber of Cambridge University report to *Nature* that by bombarding diplons (deuterium atoms which have lost an electron and become ionized) with gamma rays having energies of 2,620,000 volts they have produced ordinary lightweight hydrogen atoms, and neutrons.

Diplons are known in America as deuterons. They are much used as particles with which to bombard other substances and so cause disintegration. As ionized atoms of deuterium, diplons have twice the weight of ordinary hydrogen atoms.

Drs. Chadwick and Goldhaber indicate that to break down the diplons into their two constituent parts the bombarding gamma rays must have energies greater than the forces which normally

hold the particles together. This condition is satisfied with gamma rays of 2,620,000 electron-volts energy.

The new discovery is expected to make possible more accurate estimates of how much a neutron weighs, a point on which various investigators differ at the present time.

A neutron is thought by some to be a composite particle consisting of an extremely close union of particles with positive and negative charges so tightly bound that there is no measurable external electric field. It weighs as much as a hydrogen atom but is much more tiny, and hence more penetrating when it strikes some other substance. So piercing is a neutron that it is difficult to distinguish between it and the packets of radiation called photons.

Science News Letter, August 25, 1934

VETERINARY MEDICINE

Animal Hospitals Now Use Modern X-Ray Methods

X-RAY examinations and surgical attention such as are now standard in the treatment of human hospital cases should be available for sick animals also, Dr. Alois Pommer, Viennese veterinarian, told the Twelfth International Veterinary Congress at its New York meeting last week. He added that medical treatment for animals is hindered in many cases by lack of X-ray apparatus and roentgenologists giving their full attention to veterinary work. Vienna's Veterinary College has established a central Roentgen institute, which aids the practitioners in animal surgery, internal medicine and obstetrics.

An increasing use of anesthetics and aseptic surgery has occurred in Great Britain's veterinary work, Sir Frederick Hobday, principal of London's Royal Veterinary College, reported. Animals are being given anesthetics as a customary procedure, chloroform being used on horses, cows and mature dogs, while puppies and cats are usually given ether or mixtures of chloroform and ether. There has been research on comparatively new anesthetics, avertin and nembutol.

In the United States, also, Dr. W. F. Guard of Ohio State's College of Veterinary Medicine reported, there has been marked improvement in the use of anesthetics and surgery. Great advances have been made in the general application of local anesthetics to all species of animals.

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RADIO

Radio Reception Affected by Moon

DOES THE MOON affect radio reception? Do owners of radio sets get stronger signals when the moon is full than when it is waning?

Dr. W. W. Perrett, Moravian missionary stationed at Hopedale, Labrador, has been keeping a log of radio reception on his set since 1925 and finds that the height of the ocean tide indicates times of good and bad reception, especially fading. The ocean tides, of course, are caused by, and follow, the position of the moon.

Despite the fact that Dr. Perrett is very near the "home" of the Aurora Borealis, or Northern Lights, this phenomenon does not markedly influence radio reception at his station.

The correlation between tides and radio was described by Dr. Perrett in a communication to E. F. McDonald, Jr., president of the Zenith Radio Corporation of Chicago.

In believing that the moon exerts a positive effect on radio, Dr. Perrett is supporting results already obtained by such men as Prof. Harlan T. Stetson, astronomer at Perkins Observatory, and Dr. G. W. Kenrick and G. W. Pickard.

Dr. Stetson has found that there is a daily lunar cycle of radio signal strength. The signals have a minimum intensity when the moon is forty-five degrees above the horizon and a maximum when the moon is thirty degrees below the horizon.

Dr. Kenrick and Mr. Pickard have found that there is a monthly variation of radio signal strength with emphasis on a half period, 14.75 days, and a full period of 29.5 days.

Science News Letter, August 25, 1934

SEISMOLOGY

Earthquake Located East Of Philippine Island

THE EARTHQUAKE that was recorded on seismographs all over the world, on Sunday, Aug. 12, had its origin in a deep portion of the ocean east of the Island of Mindanao in the Philippines. The location was determined by the U. S. Coast and Geodetic Survey from information furnished by Georgetown University, Manila and Honolulu observatories. The time of the quake was 6:49 p. m., E. S. T.

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