EUROPEAN-AMERICAN

This animal at the Leningrad Zoological Garden is a hybrid of European bison, or wisent, and American bison.

PHYSICS—PHYSIOLOGY

X-Ray Pictures Show How Opera Singer Produces Tones

X-RAY PICTURES of the throat of Madame Lucrezia Bori, famous soprano of the Metropolitan Opera Company, have given scientists new knowledge of the cause of differences in voice quality, it appears from a study conducted by G. Oscar Russell of Ohio State University and reported by the Carnegie Institution of Washington.

The X-ray photographs were made with synchronized sound record accompaniment while Mme. Bori sang an aria covering a wide range of pitches, voice qualities and vowels. She was even prevailed upon to produce one bad, strident, tight tone, so that the scientists would have a record of the way the vocal organs act in bad singing as well as in good.

The pictures were made with X-ray apparatus especially devised so as to avoid any impediment to the artist's ease and freedom in singing, thus insuring the production of her natural tones. The exposure time of the X-ray plate was reduced to 1/120 of a second, so as to make it unnecessary for the artist to sing stultified, long notes merely to get a sufficient exposure.

The study showed, among other things, that in the case of this one famous voice, at least, the soft palate opening into the nasal passages remains closed under practically all circumstances. Nasal resonance is not made use of except for the relatively small amount of sound energy which could be transmitted through the walls themselves.

The X-rays of Mme. Bori also showed that the larynx does not necessarily always rise on all high pitches and fall on low pitches. Furthermore, the larynx does not remain constantly anchored to the spinal column by the powerful constrictor muscles but shifts its position quite constantly. The purpose of such shifts has not yet been discovered.

The study showed that the pharynx is usually distended on the vowl "i" regardless of pitch, and that the epiglottis or areas in the neighborhood of its tip regularly constrict, or in other words the back of the tongue regularly "gets into the throat" in order to produce a clear vowel "a" (ah).

When Mme. Bori produced the one bad tight tone, the pharyngeal cavity was more distended than usual but the interior larynx was obviously very constricted.

Science News Letter, December 30, 1933

Papier-maché can now be produced from cornstalks.

ZOOLOGY

Bison Blood Being Bred Out of Wisent Hybrids

EFFORTS are being made to build up a supplementary herd of wisent, or European bison, almost exterminated as a result of the World War, by an interesting technique called *Verdrängungszucht,* or "suppression breeding." Surplus wisent bulls have been bred to American bison cows. Only female calves are kept, and these are bred back to wisent sires, each generation thus getting rid of half the remaining bison blood, until finally a stock of practically pure wisent will remain. This experiment is being carried on at the reserve at Springe, in Germany, but it is expected that the herd will soon be transferred to roomier pastures in Brandenburg.

In the meantime, the stock of pure-blooded wisent is being kept carefully separated from the cross-breeds. Every effort is being made to increase the number of these interesting animals. If both breeding programs are successful, there will eventually be two distinct groups of wisent in Germany: the pure-bred European stock, and a stock of mixed ancestry with a minimum of American bison blood surviving in it.

The State of Prussia has recently purchased three pure-blood wisent cows and one pure-blooded bull from the estate of the late Count Arnim-Boitzenburg. These will be added to the herd already in possession of Prussia.

Science News Letter, December 30, 1933

ASTRONOMY

Aluminum Captures Invisible Starlight

THE usual mirrors for stars that astronomers use in their reflecting telescopes consist of glass coated with silver. While these conventional stellar looking-glasses have allowed an astounding exploration of the heavens, they are "blind" to extreme ultraviolet radiation beyond 3300 Angstrom units in the spectrum, a point that is about as far beyond the visible violet as violet is beyond the blue light of the rainbow.

With the idea of reflecting this extreme ultraviolet to as short a wavelength of light as can get to earth through the ozone of the stratosphere, there have been made at Cornell University mirror coatings of chromium and aluminum. These metals reflect the ex-