

Third Hand Needed for Perfect Photos

Astronomy

Any details of heavenly objects that can be seen with modern astronomical telescopes can also be photographed, but the astronomer really should have three hands to do it with. However, since no race of three-handed astronomers has yet been evolved, he can use his lips in place of the extra appendage, suggests Prof. G. W. Ritchey, American astronomer, who has been working at the Paris Observatory for several years.

In a recent report to the Royal Astronomical Society of Canada, Prof. Ritchey described his recent work, which points the way to astronomical photographs magnified thousands of diameters. He began his work at the University of Chicago's Yerkes Observatory in Wisconsin, and was later connected with the Mt. Wilson Observatory in California, where he made the great 100-inch mirror of the world's largest telescope.

The difficulty in securing satisfactory photographs of fine details on heavenly bodies, like the moon, arises from the fact that we live at the bottom of an ocean of air. Even on top

of the highest mountain, there is a large mass of atmosphere, in continual turbulence, between the telescope and the sky. Even when relatively still, there are changing currents which bend a ray of light from the heavens first one way and then the other.

In the telescope, the motions are greatly magnified. Prof. Ritchey told of his observations of the moon with the 40-inch telescope at the Yerkes Observatory. On nights that were unusually favorable, he observed tiny lunar craters with very high powers. They were very sharply defined and appeared quite still, but when he put in a ring containing cross-hairs, so that a network of fine reference lines appeared in the eyepiece also, he saw that the craters were continually moving in every direction. Without the cross-hairs, the eye unconsciously followed the motions and they appeared still.

Besides the motion, however, the fineness of the detail constantly changed.

"At the best instants," said Prof. Ritchey, "the exquisitely small details come out sharp (*Turn to next page*)

Treasures Among Rubbish

Archæology

Clay tablets bearing writing more than 5400 years old, suggesting the probability of still older tablets yet to be found beneath them, were among the fruits of exploration of a "poor" tomb at Ur, in ancient Mesopotamia. The results have been announced by the University of Pennsylvania, which is conducting its expedition jointly with Oxford University.

The clay tablets, and a quantity of seal-impressed clay jar stoppers which were found with them, are very much older than the tomb at whose bottom they were found. The excavation had led through a "death pit" of the type customarily encountered in connection with a royal or aristocratic burial of the third millennium B. C., where row on row of courtiers and servants were laid out to wait upon their lord in the after-world. But in this particular "death pit" the skeletons were much more poorly clad than is usually the case in such burials, having only a few silver ornaments in place of the gold most frequently found.

Yet this relatively poor burial chamber proved to be one of the richest finds in Ur, from an archaeologist's point of view. For all the graves had been dug into a vast rubbish pit which (*Turn to next page*)

Europe to Save Beaver

Zoology

Beaver, once almost wiped out in the United States, but now becoming re-established through wise protective measures, are now the objects of similar care in certain of the countries of Northern Europe, according to Dr. Theodor G. Ahrens, a well-known naturalist residing in Berlin.

There is a "beaver oasis" between Torgau and Magdeburg on the Elbe. Before the war there were 188 animals in it, but during hostilities it suffered from the inroads of poachers. Now, however, it is returning to normalcy, and it is estimated that there are 150 animals in the colony. In Prussia and Anhalt there is a permanent closed season on beaver. The willows around their streams are not cut, and new ones are planted for their benefit. Human beings are kept out of their preserves as far as possible.

The beaver are receiving protection in Russia also, though during the war and the early days of the revolution the animals here were badly persecuted and the morale of the survivors shaken, making them very restless and prone to migrate. It is hoped that through strict protective measures and the creation of reserves the beaver may in- (*Turn to next page*)

World's Greatest Toothache

Paleontology

Texas has long been famous for the longest horned cattle, for the greatest oil wells, for its wealth of ancient animal life preserved in its extensive Red Beds and now it comes to the front as having produced an example of the greatest toothache known to man or animal.

A. H. Dosser found near Corsicana several molars of the large imperial elephant. This extinct beast stood nearly fourteen feet high at the shoulders. Among the bones was a much twisted, deformed tooth weighing about twenty pounds, which has been interpreted as an impacted lower molar, recalling in all essentials a badly impacted lower human molar.

This mammoth tooth had a hard time trying to come through, and had itself badly twisted as the thirteen thick dental plates which form the tooth had continued to grow, trying to erupt. A few of the enamel plates had succeeded in forming a circular crown, but the eight enamel plates are placed at right angles to the remaining unerupted plates.

Pain would be due to the pressure exerted by the growing tooth trying to come through the bone and gums. If the size of the pain is comparable to the size of the tooth, then great indeed most have been the pain.

This particular elephant was the largest of any of the different kinds of elephants which lived in North America during and for some time after the great Ice Age. The imperial elephant roamed all over the wide stretch of Southern United States, from Florida to Southern California.

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Record for Bird Flight

Ornithology

The longest flight record ever reported to the Biological Survey for a banded bird was that of a fledgling Arctic tern, banded at Turnevick Bay, Labrador, on July 23 of last year by Oliver L. Austin, Jr. This bird was found dead on the beach at Margate, fifteen miles southwest of Port Shepstone, Natal, South Africa, on November 14. This is a remarkable record, not only for the distance covered, but for the time element, as the bird could have been only about three months old. It suggests the possibility that the birds, which are rarely or never seen on the South Atlantic Coast of the United States, may cross the ocean to Europe, and then proceed south.

The Arctic tern is well named, for it nests as far (*Turn to next page*)

Pretty Soft

Natural History

By JAMES J. MONTAGUE, in the *New York Herald-Tribune*.

I know the bluejay's wicked ways:
Throughout the summer time
The wretch devotes long, idle days
To piracy and crime.
If but they hear his raucous cry
The robins take alarm
And swiftly to their nests they fly
To save their babes from harm.

I know the squirrel far too well—
Egg robber that he is,
The jay himself can scarce excel
That evil stealth of his:
And when a sparrow pipes her woes
Or catbird her despair
Above an empty nest, I know
What rascal has been there.

But when the gentler birds have gone
And frozen is the ground
And yonder, out across the lawn,
I hear a pleading sound,
I know the bluejay has come back,
His beady eyes a-shine;
He knows I will not let him lack
The wherewithal to dine.

And when the squirrel cannot find
Among the frozen weeds
The store of nuts that he designed
To serve his winter needs,
He comes and chatters at the stoop
As beggars often do,
And I become his easy dupe;
He gets his dinner, too.

Science News-Letter, March 16, 1929

New Bird Record—Cont'd

north as land has been discovered. It arrives in the Arctic region about June 15 of each year, and leaves about August 15 for its winter home, after its young are full grown. Several months after leaving its summer home this bird is found near the Antarctic continent, which is 11,000 miles from its starting point. It is estimated that at least 150 miles a day are covered on its migration flights, although ornithologists do not yet know its exact routes. Spending its life at opposite ends of the globe, the Arctic tern has more hours of daylight and sunlight than any other animal in the world. In the north the sun never sets during its entire stay, and in the Antarctic regions broad daylight continues throughout its sojourn there.

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A study of the quality of fleece shows that the finest wool on a sheep grows on the cheek or back of the ear.

Perfect Astronomical Photos—Continued

and distinct, often for a duration of two or three tenths of a second, sometimes for six or seven tenths of a second, seldom for a full second. The time between these best instants varies, in general, from one to four seconds. Perhaps the most remarkable effect was that the mind of the observer, keenly intent on noting the exquisitely small details visible at most favorable instants, disregards or even forgets the less favorable moments between. It was only by forcing the attention to observe all of these phenomena that it was realized that the instants of finest definition occupied only one-fourth of the total elapsed time."

It is to take care of this effect that the third hand is needed. By using a very light plateholder that can be moved up or down and right or left very rapidly, the motions of the image can be followed. One hand is required for each direction. In addition a shutter is needed that can stop the exposure during all but the most favorable moments, and Prof. Ritchey suggests that this can most conveniently be operated with the lips.

As adjustments should be made many times a second, Prof. Ritchey

Save Beaver—Cont'd

crease and again become game animals. However, by far the greater number of European beaver live in Norway; their total has been estimated variously as 10,000 to 14,000. Since 1926 they have enjoyed a permanent closed season, except that at the discretion of the Minister of Agriculture a few may be captured from time to time in certain designated districts. The present flourishing state of the beaver in Norway has been build up since 1899, when only a few of the animals were left alive. Norway even has beaver to spare for her neighbors, and Sweden expects to colonize her national parks from Norwegian stock.

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In the Chesapeake Bay region there are more than 200,000 acres of shellfish beds.

Llamas differ from camels in being smaller, having no hump, and having large ears.

A writer on aeronautics in 1786 advised balloon ascents for convalescents, because of the purity of the air and the restfulness of the voyage.

constructed a practice machine, giving the effects artificially. With this he was able to make as many as sixteen adjustments a second. At least an hour a day should be devoted to practice with such a machine by the astronomer, he said.

Using such refinements on a telescope of 1 foot aperture, about the size of the new one recently announced from the California Institute of Technology, it would be possible, he said, to photograph the general form of details on the moon as small as 100 feet in diameter, or on Mars as small as 2.8 miles in diameter. Such a telescope would be able to magnify the stars 24,000 diameters, while 14,500 diameters could be applied to extended objects, like nebulae, the moon and planets.

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Only seven states had more people on farms in 1925 than in 1920.

Scientists are attempting to achieve a weedless farm at the University of California, as an example to farmers of the state.

Treasure Rubbish—Cont'd

sloped down from the walls of the earliest Sumerian settlement to the marsh or river out of which it rose, and the bottom of this particular "death pit" just touched a stratum of rubbish, necessarily much older than itself. In this rubbish were found the inscribed tablets and jar stoppers.

These prove to be among the oldest of written documents, certainly the oldest thus far found at Ur. They date to the same time as certain clay figurines found last year, whose cultural level could not then be determined. They are not so old as the tablets found a short time ago near Kish, bearing an exceedingly archaic form of picture writing, but the fact that they lie at the top of a heap of debris as yet wholly unexplored promises that when the spades go down through it they will probably turn out specimens of writing as old as those of Ur's rival city.

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There were more than 20,000 students in the medical colleges of the United States last year.

Of the old Roman town of London, there remain only 13 fragments of wall and brick work now visible.