



Photograph of 1932 Eclipse by University of Michigan Observatory

### CORONIUM IS DEAD, LONG LIVE OXYGEN!

Latest astronomical researches show that coronium, the hypothetical element that scientists for over 60 years have considered the source of most of the light of sun's corona, is merely familiar oxygen in a highly excited state.

ASTRONOMY-CHEMISTRY

# Mysterious Sun Element Found To be Highly Excited Oxygen

Proper Identification of Substance Called Coronium Since 1869 Accomplished by Careful Matching of Spectral Lines

**T**HE MYSTERIOUS and hypothetical element coronium, to which for years the major part of the radiation from the sun's halo or corona has been attributed, turns out to be the common element oxygen.

In 1869 when a solar eclipse path crossed the United States green lines in the spectrum of the sun's outer envelope caused astronomers to assume an unknown element and name it after the sun's corona. The corona is visible only during the few minutes of total solar eclipse.

Now Dr. D. H. Menzel of Harvard Observatory and Dr. J. C. Boyce of the Massachusetts Institute of Technology have made the first important step in unravelling this astronomical mystery that has existed since the first observa-

tions of the coronal spectrum more than sixty years ago.

Their analysis identifies three of the five strongest coronal lines with neutral oxygen atoms in the high solar atmosphere. These atoms are in very peculiar states of excitation.

Thus the life-supporting gas in the earth's atmosphere promises to explain another of the mysteries of the heavens. For oxygen has heretofore been shown to be the cause of light from far-off nebulae and from the aurora or northern lights of the earth's atmosphere.

"The light of the gaseous nebulae was long attributed to the hypothetical element nebulium," Dr. Harlow Shapley, director of Harvard Observatory, explained in commenting on the coron-

ium-oxygen identification. "A few years ago the nebulium mystery was solved by finding that highly ionized oxygen and nitrogen were largely responsible for the radiation. Also in recent years the mysterious light of the aurora has been assigned to oxygen."

Careful checking of the "flags" that are flown by the elements in spectrum photographs made possible this latest discovery. These "flags" are lines that appear when light is dispersed by a prism. Bright lines or bands of light, beautifully colored, are caused by the radiation given off by various chemical elements heated to incandescence. Sunlight, which forms the rainbow of a showery day or the rainbow of the physicist's spectroscope, contains a wide array of light from numerous elements. By matching the spectral lines of light from the sun, stars and other otherwise inaccessible sources with those from known elements, scientists have been able to prove the existence of various earthly substances in other parts of the universe. Helium, which is now rated as a useful and fairly available elemental gas, was discovered in the sun's chromosphere during the eclipse of 1868 as a bright yellow line. Not until 1895 was it discovered here on earth chemically.

In a similar way the hypothetical element coronium came into existence because coronal spectral lines were found that could not be linked to any known element. As more and more of the ninety-odd chemical elements were discovered and studied without being proved to be coronium, scientists began to feel confident that coronium was a common element in masquerade. Drs. Menzel and Boyce have now produced the first definite evidence.

The solution of the mystery of coronal radiation was assisted greatly by the recent discovery at Mt. Wilson Observatory that the new star Nova Ophiuchi also shows coronal lines at one stage of its explosive outburst. The investigators used corona spectrum photographs obtained at the 1932 eclipse which was successfully observed by the Harvard Observatory party.

It is probable that after this important start made by Drs. Menzel and Boyce the other coronal lines will soon be interpreted.

The Harvard Observatory announcement states that Drs. Menzel and Boyce find that the frequency difference between two coronal lines (wavelength 6374 and wavelength 3454) agrees with the difference between two known

high energy states of the neutral oxygen atom. This suggests that the lines are produced by combinations with a higher energy state. Calculation shows, the announcement states, that the oxygen atom should possess energy states of about this value. A theoretical extension of the data predicts that a line should be found at approximately the wavelength of a third prominent coronal line (wavelength 3987).

"The validity of assignment of these lines to neutral oxygen," Drs. Menzel and Boyce state, "is supported by the following facts:

"The similar appearance of the three lines on objective prism coronal spectrograms.

"The fundamental character of the states involved despite the highness of their energies.

"Their relation to the metastable states of ionized oxygen from which they may arise by electron capture.

"The production in the laboratories by Dr. Hopfield of line wavelength 6374 under conditions favorable to the excitation of oxygen metastable states.

"Opposed to the identification stands the failure of triplet lines to appear but this may possibly be attributed to the mechanism of excitation since high velocity electrons are more likely to be caught in single states."

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#### PHYSIOLOGY

### Girls Sleep More Soundly Than Boys of Same Age

**G**IRLS are sounder sleepers than boys, Dr. Glenville Giddings, assistant professor of medicine at Emory University, Atlanta, has discovered. This observation was made in the course of studies to determine the effects of food and beverages on children's sleep. The girls in the group of 24 children between nine and fourteen years who were studied not only slept more quietly but went to sleep more quickly than the boys.

The results of the investigations bore out the theory that a drink of warm milk just at bedtime induces quieter sleep. This apparently is due to the facts that milk is an easily digested and assimilable food and that the temperature at which it was drunk was just about the same as the temperature of the body. The children were much more restless when they had eaten a heavy meal than when they had had a light supper.

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#### ANTHROPOLOGY

## Pithecanthropus Had 'Modern' Contemporary, Briton Claims

**D**ISCOVERY of a jaw belonging to an ancestor of the present-day human species was reported at a session of the Anthropological Institute in London by Dr. L. S. B. Leakey.

The discovery, if accepted according to Dr. Leakey's interpretation, would mean that human history and evolution are pushed back into a much more distant past than anthropologists have assigned to man.

Dr. Leakey, whose excavations in East Africa have been a subject of much scientific discussion, announced that the new-found jaw represents a new species, which he called *Homo kanamensis*, in honor of Kanam in East Africa where the jaw was unearthed. The evidence of a new species is based on radiological examination of the jaw. This X-ray test, it was said, showed distinguishing features in the roots of the teeth, marking an evolutionary trend towards *Homo sapiens*, the species to which all modern races of men belong.

The man represented by these skeletal remains lived in the Lower Pleistocene age, it was declared, which would give this early species an antiquity of about half a million years. He would thus be a contemporary of *Pithecanthropus erectus*, Dr. Leakey declared. *Pithecanthropus*, so-called ape-man of Java, is a far more primitive type, and has long been rated as the most venerable proto-man ever found on earth. The new discovery would imply that a much higher type of man, and a direct ancestor of the species of man that survived into modern times, lived on earth at an ancient date.

The jaw found at Kanam shows a development of chin and arrangement of teeth that are similar to *Homo sapiens*, it was reported.

Another skull from East Africa, the Kanjera skull, was declared by Dr. Leakey to be Middle Pleistocene in antiquity and to represent a generalized primitive type of *Homo sapiens*. The shape of the femur or thigh bone shows that this man walked erect, he said. Development of a culture using hand axes of stone can be traced in East Africa, Dr. Leakey said.

Commenting on the reported discov-

ery, Dr. Ales Hrdlicka, well-known anthropologist of the Smithsonian Institution, declared that such a conclusion cannot be reached without ample evidence.

"The whole matter involves problems so great and so numerous relating to human history and evolution that a very thorough independent corroboration of the finds is called for. No opinion as to the meaning of a discovery can take the place of scientific fact.

"There is a theory gaining popularity in Europe to provide *Homo sapiens* with a long antiquity. A young German anthropologist who excavated in East Africa has already written a book on the great antiquity of *Homo sapiens*. Man is apparently about to be rescued from a history which would show his upward climb. He is to be shown as springing fully developed in mind and body into an existence beginning a half million or more years ago. It is a dismal picture, for it means that the human species has made no progress in so long a time and hence has but little, if any, prospect of making any in the future.

"So far, however, the evidence that would convince critical science on these points can hardly be said to have been furnished."

*Science News Letter, November 4, 1933*

#### ARCHAEOLOGY

### Museum Publishes Roman House Model

**A** NEW IDEA in educating the public has been evolved at the University of Pennsylvania Museum. A publication just issued consists of plans, materials, and directions for assembling and furnishing in miniature a complete Roman house such as the well-to-do Pompeians lived in before Vesuvius buried their lovely city. Instead of going to the museum to gaze at a model and wonder over the life of a Roman family, the individual can now put himself in the place of a Pompeian home maker, taking a personal hand in the building and decorating of the home.