

Stormy weather on Mars

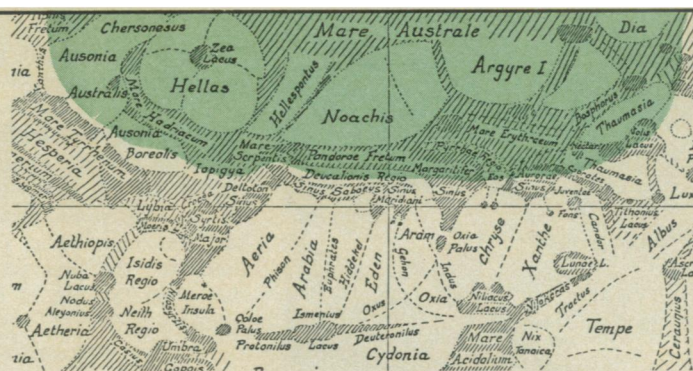
Much of the surface of the planet Mars appears to be dry as dust. From time to time the dust gets into the atmosphere and forms yellow clouds. Such a storm is happening now, and astronomers all over the world are watching its progress.

According to Charles F. Capen of the Lowell Observatory at Flagstaff, Ariz., the first clouds began to appear on Sept. 23. "We caught it five days after it started," says Steve Larson of the Lunar and Planetary Laboratory of the University of Arizona at Tucson. "Well defined clouds were confined to the southern hemisphere from near the equator to 70 degrees south. There was a general haze over the whole planet."

From the Cerro Tololo Interamerican Observatory in Chile, P. B. Boyce reports that "spectral reflectivity of the clouds from photoelectric area scanning does not differ greatly from that of normal Martian desert areas, suggesting a widespread dust storm activity similar to that in

Areas of dust storms (tinted) in the southern hemisphere of Mars.

Menzel, Whipple, de Vaucouleurs: Survey of the Universe. ©1970. Reprinted by permission of Prentice-Hall Inc.



1956, as predicted by Capen and others."

By Sept. 29, Capen reports, the clouds extended over 200 degrees of Martian longitude from the feature called Ausonia to the one called Thaumasia. Lately it appears to be edging into the northern hemisphere.

Clouds of this kind have occurred in the past. The most spectacular recent display was in 1956. Various observers refer to a memorable one in 1909. "We used to think they were rather rare," says Capen, but a search of observers' reports found numerous instances going back to

1877. It was somewhat difficult, he says, because the phenomenon is described in various ways, but terms like yellowish or golden were used by everybody.

"Though yellow clouds have been recorded in all Martian seasons," Capen wrote in the February SKY AND TELESCOPE, the largest outbreaks seem to occur during Martian perihelic apparitions. . . . This has led to a model that relates the formation of the clouds to solar heating of the surface and atmosphere. On that basis Capen predicted the next outbreak would occur in September.

Probing the New Kingdom pharaohs with X-rays

Unfortunately for modern students of ancient Egypt, the tombs of the royal pharaohs were robbed both in ancient and modern times. Mummies were destroyed and archaeologically significant artifacts stolen. To protect these relics the Egyptian Government, in the late 1800's transported many of them to the National Museum in Cairo. Among them were a group of pharaohs of the New Kingdom period of ancient Egyptian history (1600 B.C. to 1000 B.C.). There they were studied by archaeologists in the latter part of the 19th and the early 20th centuries. The most recent intensive study was published by anatomist and Egyptologist G. Elliot Smith in 1912. In his publication he called for the use of X-rays to study this group of mummies. Radiographic analysis, however, was not used on these particular mummies until a University of Michigan orthodontic group obtained permission to study the skull and facial bones in 1969, and proposed a more extensive radiographic study of the mummies in their entirety. This was carried out in December 1970.

The 29 mummies of pharaohs and queens were examined without disturbing their present positions in open top wooden boxes after protective glass covers were removed. Portable X-ray equipment was used. Particular attention was paid to roentgen evidence of age, developmental variants, morpho-



Univ. of Michigan Medical Center
Whitehouse with X-ray of Tutmose I.

logic variation, demonstrable disease and items on or within the bodies.

X-ray studies have been made in the past of mummies at such institutions as the Field Museum in Chicago and the British Museum. But never had these most important pharaohs in Cairo been so examined. The Egyptians probably feared damage, says Walter M. Whitehouse, chairman of the department of radiology at the University of Michigan,

but the study was long overdue.

Whitehouse presented preliminary findings of the radiological study last week in Boston at the meeting of the American Roentgen Ray Society. Among other things, the researchers identified a variety of medical ailments that afflicted the ancient Egyptians. They found evidence of rheumatoid inflammation of the vertebrae on Amenophis II, ruler of Egypt from 1436 to 1413 B.C. The mummy of Tutmose I (ruler from 1528 to 1510 B.C.) showed thick cartilage of the knees that suggests pseudogout. The mummy of Merenptah showed evidence of hardening of the arteries. Sekenenre Ta'o had a crooked spine and dislocated vertebrae. And Siptah had signs of polio.

Other types of information were also gained. Seti I, thought to have ruled from 1309 to 1291 B.C., showed more Asiatic features than his predecessors. The mummy of Queen Nodjme had artificial eyes, eyebrows and a wig. Her mouth was stuffed to make the cheeks appear rounded, and a large scarab and four mythical figures were inserted into body cavities to accompany the replaced viscera. Another queen, Makare, was buried with what was thought to be her mummified infant. But radiography of the object confirmed its identification as a mummified adolescent baboon.

The complete findings of the University of Michigan team will be published in book form next year. Whitehouse says prompt radiography of similar specimens discovered in the future will aid in their evaluation. □