

Done with that mass technique peculiar to the art of the new Russia, from the crowds waving "bon voyage" to the greatly multiplied crowds cheering the return of Prof. Otto Yuelvitch Schmidt and his band of heroes, the film record produces a feeling that no Hollywood epic can achieve.

When the ice is seen crushing the side of the good ship *Cheliuskin*, when the bow of the ship in swirling snow upends and then sinks in the ice-covered Arctic ocean, 90 miles from land, leaving 104 men, women and children on the ice, when airplanes in the dead of Arctic winter rescue all safely, the audience seated in warmth and comfort nevertheless are eye-witnesses.

Fortunately, there is no attempt to convert into English the few speeches included. Superimposed titles give the essence, the original sound gives the spirit. It serves a real educational pur-

pose to have Americans realize emotionally that Russian and other foreign languages are in everyday use in their countries.

Disaster so frequently makes news. The *Cheliuskin* film is remarkable because it has thrills aplenty although the life loss was only one during the whole expedition, a seaman who went down with the ship.

Even more thrilling to those who appreciate economic and geographical conquest is the broad plan for the opening of the long coastline of the Soviet Arctic to economic development and the opening of the Northeast Passage. Rich resources, lumber, oil, furs and minerals are locked by ice in the Soviet Arctic. The *Cheliuskin* expedition was but an incident in this great development which has made new gains this year.

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the real one but with the new device the position of the mean sun is also shown, by a line of light, and the visitor can see its motion.

There are now eighteen planetaria in Europe, and two in the United States—the Adler Planetarium in Chicago and the Fels Planetarium at The Franklin Institute in Philadelphia. Others are being built in Los Angeles and New York. Neither of the American planetaria is yet equipped with the new attachments.

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PHYSICS

Daily Cosmic Ray Variations Demonstrated

RESULTS of three years of research at the University at Innsbruck, Austria, reveal that there is a daily regular variation in the intensity of the cosmic rays striking the earth. Over 18,000 measurements have been made. The effect has been suspected but until now never proved conclusively.

Dr. Victor F. Hess, working with Drs. R. Steinmaurer and H. Graziadei of the University, will shortly announce to the Vienna Academy of Science that measurements in their cosmic ray meters indicate a daily fluctuation in intensity. The maximum occurs at midday, the minimum between 9 p. m. to 3 a. m. at night.

The cosmic ray station at Innsbruck has been taking cosmic ray measurements continuously since September 1, 1931. Some of the apparatus has never stopped during that time. The station is high in the Tyrol Mountains at an altitude of 2,300 meters above sea level, or well over 7,600 feet. The research program is part of the present worldwide plan to study cosmic rays.

In a preliminary announcement (*Forschungen und Fortschritte, Sept. 1*) Dr. Hess declared:

"It is not to be wondered at that for a shorter series of cosmic ray measurements at lower altitudes the daily change was not noted."

While avoiding a dogmatic assertion that the sun affects cosmic ray intensity, Dr. Hess suggests it would not be surprising if the changes in the magnetic and electric fields surrounding the earth—changing as they do from daytime to night—might alter the part of cosmic rays which is now known to consist of electrical particles.

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ASTRONOMY

See the Meteors in Comfort-- In German Planetarium

THOUGH astronomers may have to wait years before another bright naked-eye comet appears, visitors to the Zeiss planetarium in Jena, Germany, can now see one threading its way through the artificial skies. They can also see a brilliant shower of meteors, or "shooting stars" such as those observed in 1833, in 1866, and early this year from Little America.

The comet machine is a new attachment to the planetarium instrument which projects images of all the stars and planets, visible to the naked eye, on a hemispherical dome above. The comet shown is Donati's, which appeared in 1858, and of which George P. Bond of the Harvard College Observatory made a very complete and accurate series of drawings showing its appearance as it went across the sky. Reproductions of Bond's drawings are used like the separate pictures in a motion picture film, shown successively, and one faded into the next. At the same time, the comet projector turns so that the comet is seen to move through the starry background, from the constellation of Canes Venatici, the hunting dogs, southwards to Scorpius. It requires about five minutes for the comet to run its course, instead of the many weeks that it actually was visible.

The meteor shower projector throws on the dome rapidly moving spots of light, all radiating from a single point, in the same manner as a real one. This is accomplished by a set of rotating circular plates, cut with narrow slits. The method was devised by Dr. Philip Fox, director of the Adler Planetarium in Chicago. When watching it, the meteors seem to appear completely at random, except for the radiation from one point. In a real shower this effect of a radiant is due to the fact that the meteors are moving in parallel paths, and when they enter the earth's atmosphere, to be burned by the friction, their paths seem to converge in the distance, like the tracks of a railroad.

Another new planetarium attachment is a "mean sun projector." The real sun seems to move eastward completely around the sky during the year, but its actual speed varies. As a result, sun dial time is fast at certain parts of the year, and slow at others. Therefore astronomers assume the presence of a "mean sun," which also takes a year to encircle the sky, but moves with uniform speed eastward. Our standard time is based on the passage of this mean sun, sometimes ahead of the real one and sometimes behind.

The planetarium sun moves just like