

## GENERAL SCIENCE

# Scientist Refused Passport

University of Rochester physicist is denied passport for a trip to India to study cosmic rays. State Department says trip contrary to best interests of the country.

► THE State Department has denied a passport to Dr. Bernard Peters, University of Rochester physicist, to go to India to do basic research on cosmic rays.

Mrs. Ruth Shipley, head of the passport division of the State Department, stated that the action was taken because Dr. Peters' trip to India would be "contrary to the best interests of this government." Dr. Peters worked for the atomic bomb project during the war and, a year and a half ago, was a witness before the House Un-American Activities Committee. At that time he declared under oath that he was not and never had been a member of the German or American or any communist party.

Dr. Alan Valentine, president of the University of Rochester, backed up Dr. Peters. After saying that he had conducted a personal investigation "at high government levels" into the Peters case, Dr. Valentine declared: "From that investigation nothing has emerged which in my opinion should impair our confidence in Dr. Peters as a scientist, a professor or an American citizen. He continues a member of the university faculty in full good standing."

Dr. Peters, who was sent to the Dachau concentration camp early in the Hitler regime and came to this country after he escaped, is known by his fellow physicists as a brilliant specialist in cosmic rays. He had been invited to go to India on a six-week cosmic ray project by the Tata Institute of India. Cosmic rays come into our world from somewhere in the universe and, in the study of these rays, scientists can gain more knowledge of what our universe is like.

Other physicists were looking forward eagerly to the results of Dr. Peters' six-week trip to India to give them another important link in our knowledge. The Office of Naval Research, with which the University of Rochester has the contract under which Dr. Peters would have gone to India, had already shipped \$12,000 worth of equipment for the project.

India was chosen because the earth's magnetic field affects the composition of cosmic rays striking various parts of the earth. In the latitude of India can be found the kind of cosmic rays Dr. Peters wanted to study.

Dr. Valentine declared that "all of the work he would have done in India is of an open and wholly non-secret nature."

University officials are known to be determined not to send any other physicist in Dr. Peters' place, preferring to abandon the contract for this particular project.

In a letter to Secretary of State Dean

Acheson after his application was turned down, Dr. Peters wrote:

"I have been completely unsuccessful in learning the nature of the charges which in the opinion of the government justified the treatment which I have been accorded. Both my own efforts in this direction and those undertaken by the administration of this University have been entirely fruitless."

"Of all the problems which the ambiguous attitude of the government has created," he wrote Secretary Acheson, "I consider the effect on my children to be the most serious one. They have been growing up in an atmosphere of secret dossiers, tapped telephones and incredible slanders against their family without any means of combatting them."

Dr. Valentine concluded his statement by saying: "The atmosphere and procedures in these matters in Washington are at present peculiar. But we note that a man's reputation and career have been greatly threatened and perhaps even ruined without his being given an opportunity to hear the grounds for such action, to identify and face his accusers and to offer his defense. It was my impression that our government

protected its citizens against such practice. In this case the citizen appears to need protection from his own government.

"Consequently we do not regard this case as closed, and we shall continue to inquire as best we can into the status of Dr. Peters and the status of American justice."

Dr. Peters stated he would make re-application to the State Department in September.

"At that time of the year," he explained, "the cosmic rays to be found near the magnetic equator will be the kind I want to study."

However, a State Department spokesman said any new application Dr. Peters makes will be considered and a passport will be granted if he can show that it would not be contrary to the best interests of this government.

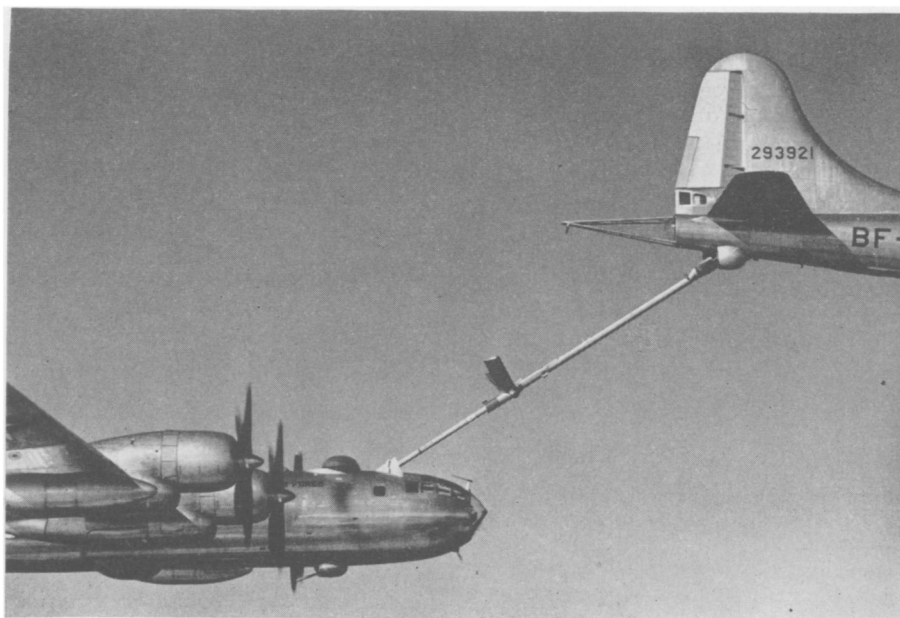
Dr. Peters said that he also wanted to re-apply because that action might provide an opportunity to clear up what he considers to be a blot upon his reputation. He said that he would be willing to answer any questions the State Department cared to put to him.

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## AERONAUTICS

## Details of In-flight Refueling System Revealed

► WRAPS on the Boeing-developed device to feed fuel from a flying tank plane to another plane in the air were removed in Seattle, Wash., at least in part. It is a development that will greatly increase the



**GAS STATION IN THE CLOUDS**—The B-29 tanker aircraft, above and to right, is pumping aviation gasoline at high speed to a new Boeing B-50D Superfortress medium bomber through the Flying Boom. Small surfaces known as "ruddevators" control the boom from side to side and up and down and may be operated in all kinds of weather.

range of war planes by assuring a dependable in-flight aircraft refueling system.

This so-called Flying Boom for refueling was announced by the Air Force, for which it was developed, some six months ago. Details were omitted. It was developed to eliminate as far as possible some of the difficulties of earlier methods of refueling in which gravity was relied upon to bring the aviation fuel from a tanker plane to receiver through a flexible hose.

In this system the feeder pipe is rigid, and the fuel is transferred by pressure. Refueling time is greatly shortened. The boom makes it possible to refuel in flight with greater speed and at higher altitudes than previously was possible.

#### ASTRONOMY

## Tenth Planet Predicted

➤ A TENTH planet, even farther from the earth than Pluto, is now being predicted by Dr. Karl Schutte of Munich, Germany.

Its discovery, if made on the basis of Dr. Schutte's prediction, will be "unique," a Harvard astronomer states.

Dr. Schutte finds a trans-Plutonian planet necessary to account for a new family of comets. He has been studying the distributions of the comets, orbits, or paths.

It would be a Herculean job for astronomers to prove the existence of the proposed planet. The planet would be extremely faint and would move very slowly.

Pluto, the ninth planet of our system whose discovery was announced in 1930, has a magnitude of 15.5 photographically and 14.7 visually. The new planet would be even fainter than Pluto.

Dr. Schutte reports his findings in the German popular astronomical journal, *STERNENWELT*. Commenting on the prediction in *SKY AND TELESCOPE*, Dr. Dorrit Hoffleit of Harvard College Observatory states: "Unique in the history of astronomy would be the discovery of a planet predicted from the observations of comets."

The new planet predicted by Dr. Schutte would be at the distance of approximately 77 astronomical units from the earth. An astronomical unit is the mean distance between the earth and the sun, a little more than 93,000,000 miles. Therefore, the distance of the suspected planet would be 93,000,000 miles times 77, or 7,161,000,000 miles.

Dr. Schutte had been examining the distributions of all of the orbits of comets with periods of less than 80 years. These paths have been figured quite exactly by astronomers.

He found that, with the single exception of comet Encke, all of these comets appeared to belong to discrete "families" of the planets that are farthest from the earth.

In the refueling process, the tanker plane flies above and a little to the front of the plane to receive the fuel. The boom is telescoped down and out from beneath the tanker and is inserted atop the nose of the receiver.

Control of the fueling tube is possible through the use of small vee-shaped surfaces, known as "ruddevators," which govern movements of the fueling boom.

A crewman of the tanker plane, in a rear turret in the position occupied by the tail guns of combat planes, operates the ruddevator controls and places the fueling tube nozzle into the socket on the receiving plane.

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Jupiter has the largest family with 53 known comets as members. Saturn has 6, Uranus 3 and Neptune 8 comets in their respective families. The aphelion distances of these comets average about 10% greater than the aphelion distances of the planets that captured them. The point in the path of a heavenly body that is at the greatest distance from the sun is known as aphelion. That which is at the closest distance is known as perihelion.

In the case of Jupiter, Dr. Hoffleit states, it is of particular interest to note that most of the aphelions of the comets are in the same direction as Jupiter's own aphelion. The planet moving more slowly at its aphelion than at perihelion, in accordance with the law of areas, has more time to capture comets as they speed by.

No comets were found with aphelion distances strikingly intermediate between those of the major planets. Turning his attention to comets with longer periods, Dr. Schutte found that they also had an average aphelion distance some 10% greater than the distance of their foster-parent.

The distance of the planet that should capture eight of these comets would be at about 77 astronomical units from the sun. This distance is in excellent agreement with the position that might be predicted for a trans-Plutonian planet from an astronomical rule-of-the-thumb known as Bode's law.

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#### GEOLOGY

## Second Largest Meteor Dug Half-Mile-Wide Crater

➤ AUSTRALIA'S half-mile-wide Wolf Creek Crater was definitely blasted out by a meteor, studies at the Smithsonian Institution show.

The big hole was found in 1947 in the Western Australia wilderness by three American geologists prospecting for oil by plane. The scientists thought at first it was caused by a volcanic explosion.

But analysis of rock fragments found

nearby has shown they came from a giant meteorite, Dr. Edward P. Henderson, associate curator of the Smithsonian, told the Geological Society of Washington.

Wolf Creek Crater is 2,800 feet across at the bottom and 150 feet deep. The meteor that dug it, throwing up a rock rim 100 feet high, is the second largest on record ever to have hit the earth.

The biggest struck in Arizona. Indians named the pit, four-fifths of a mile across and 570 feet deep, Canyon Diablo.

Even bigger meteors may have collided with the earth in early geologic eras, although most are so small they burn themselves out in the atmosphere. But unless the missiles struck in an arid region, the craters would be slowly erased by erosion and other natural forces.

Dr. Henderson studied samples brought back by Dr. Frank Reeves, one of the oil company geologists who spotted Wolf Creek Crater. The Smithsonian mineralogist said the analysis showed 86.3% iron oxides, 4.3% nickel oxide, 1% each of potassium and cobalt oxides, and 7.1% water.

Scientists of Australia's Bureau of Mineral Resources also checked fragments, Dr. Henderson said. They agreed that the ironstone material was typical of meteorites.

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#### MINING

## Separator Gets Rich Iron From Low-Grade Ores

➤ LOW grade iron ore is quickly separated from the crushed rock with which it is mixed by a new improved type magnetic separator revealed in Pittsburgh by Westinghouse Electric Corporation.

The new device operates on a somewhat different magnetic principle than previous separators. It is already under test at Aurora, Minn., extracting iron ore from magnetic taconite. It was developed particularly for this purpose.

The rich iron ore of the famous Mesabi Range is facing exhaustion. When gone, iron ore from that region will have to come from taconite of which there is a plentiful supply. It contains about 25% iron and 75% rock.

The new separator consists of a rotating drum mounted in a pulp box of special design. Stationary magnets within the drum provide the means whereby iron ore is extracted from the taconite.

As the mixture passes beneath the separator's rotating drum, the magnets draw the iron ore to the drum. The movement of the drum carries the ore through a washing zone and then away from the direct pull of the magnets.

The ore nodules produced in the process will be about 64% iron. This is several percent higher than the high-grade ores now used in blast furnaces.

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