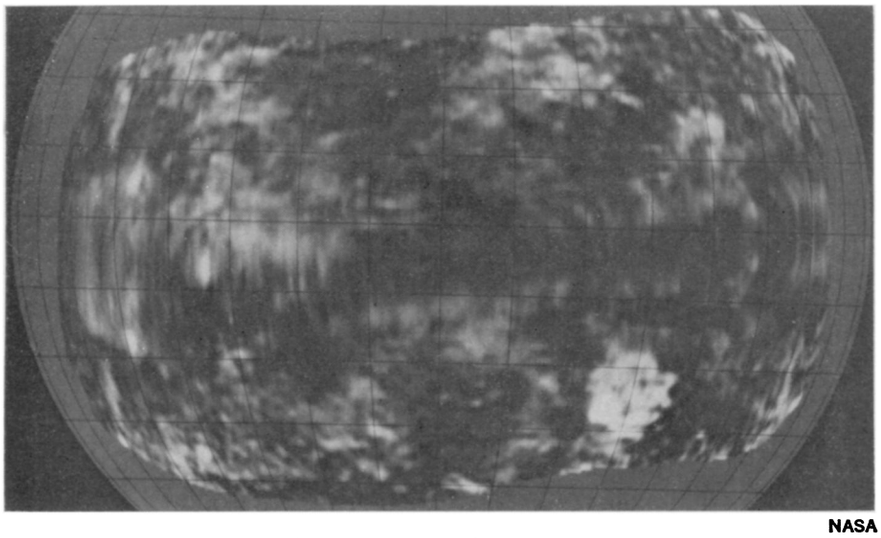
Although long a major voice in the profession, Dr. Morgenthau has never been part of the society's ruling clique, as he calls it. He is not a member of the caucus, but he does agree on the question of relevance in political science research.

"The profession at large," he says, "has made an elaborate effort to avoid the real political problems of American society. They have taken refuge in semantic and methodological exercises." His opponent is Dr. Heinz Eulau of Stanford University.

Concerning the journal, Dr. Morgenthau has negative thoughts. "It's a monumental bore," he says. "Who can read it? Who can understand it?" He expects to make some changes, or at least to separate membership in the society from subscription to the journal. □

RADAR ASTRONOMY

Mapping the veiled planet



NASA

Bright spot in lower right of Venus radar map could indicate mountains.

Except for a few asteroids, Venus is the planet that comes nearest the earth. Nevertheless it is one of the most difficult to study because its surface is hidden by whitish clouds that have never been known to break.

Radio waves can penetrate the clouds, however, and radar beams sent from the earth will strike the surface and come back with information about its roughness or smoothness. But only in the last few years have senders and receivers been strong enough to make attempts at mapping the surface of Venus practical.

The first success was reported two years ago by Dr. Richard M. Goldstein of the Jet Propulsion Laboratory of California Institute of Technology, who used JPL's 210-foot sending and receiving antenna at Goldstone, Calif. (SN: 8/10/68, p. 138). Now Drs. Goldstein and Howard Rumsey Jr., report that observations taken between March and May have yielded a map that covers a much larger area of the planet than the 1968 map. It contains about 100 times as much information as the previous one, according to Dr. Goldstein.

The new map covers an area 120 degrees of Venus longitude by 80 degrees of Venus latitude: about 8,500 miles along the Venus equator and 4,600 miles wide. There are, however, gaps or holes within this area that could not be mapped.

The most striking feature is a large rough spot in the planet's southern hemisphere, which Drs. Goldstein and Rumsey call Alpha. Alpha is roughly 1,000 miles in diameter. Dr. Goldstein believes it is probably a mountain range but adds that it "could be a chain of craters or large areas strewn with boulders."

The map shows a strip through the middle, which Dr. Goldstein calls a runway, where analysis of the radar beam is not as practical as at the edges. He hopes that observations planned for November will increase the definition in the runway. At that time the center of the apparent disk will be 10 degrees north of its position in the spring. That will put the runway in a position where better separation of points and images is possible. The capability of the radar may be improved by then too.

Another November observation will use two receiving antennas as a radar interferometer in an attempt to gain very fine resolution for a small area of the planet, say 10 degrees by 10 degrees. "It's a hard experiment," says Dr. Goldstein. "I don't know if we can pull it off." □

AIR TRANSPORTATION

Toward the year 2,000

In less than 20 years, the air transport industry has seen the bulk of its piston-engine aircraft supplanted by nearly supersonic jet-propelled jumbos. It now awaits new craft capable of flying at three times the speed of sound. Aircraft users and Government planners have consistently underestimated industry growth and the pace of technology. They have also failed to foresee the social and environmental consequences of this growth.

To obtain a better view of the future in this field, the Advanced Transportation Concepts department of McDonnell Douglas Corp. in Long Beach, Calif., sought the opinions of industry professionals on 10 possible developments. The questionnaire went to 304 persons representing different segments of air transportation.

Whether by design or oversight, the query did not address itself to worsening air congestion or to the potential restraining effects on the industry by environmentalists. However, these factors may have been considered by many respondents.

The survey forecasts the first use of exotic materials, such as boron filament (SN: 6/21/69, p. 601) and beryllium, in commercial aircraft by 1985 to 1990. Some 75 percent of those polled expect a nuclear-powered air transport to be in operation by 1995 or 2000.

The former is surprising in the delay anticipated: Boron composite for commercial air frame fabrication and testing was approved by the Federal Aviation Administration in late 1967 and was applied successfully to the leading edges of a C-141 Starlifter the next year. Boron filament also was tested on the Air Force F-111A fighter-bomber and the C-5A Galaxy transport because of its light weight, stiffness and resistance to corrosion.

The contrary is true for dreams of a nuclear-powered aircraft because there is no program for such a development today. The last was terminated during the first year of the Kennedy Administration; the only other remotely similar effort, a nuclear-powered supersonic low-altitude missile (SLAM), suffered a like fate in the Johnson era.

For non-Communist certified and chartered passenger services, the survey predicts passing of the trillion mark for annual revenue passenger-miles between 1990 and 2000. This calls for a marked increase in passenger service because the total for 1969 was only 217 billion, according to the International Civil Aviation Organization. Also, operation of a 1,000-passenger aircraft is expected by 1990 to 1995—a reasonable esti-