

that earth rotates within the orbit. The northernmost part of the orbit would be close to the Arctic Circle, and the southernmost part close to the Antarctic Circle. Thus we would have basically all of the interesting land and sea masses under the swath of the spacecraft that continuously overflies it.

One of the most challenging aspects of this whole operation will be data processing. The computer center on the ground, unless we do it right, can be virtually drowned by the continuous torrent of data coming down from the spacecraft. The spacecraft gets its electrical power from the sun, through solar cells that never wear out. Incidentally, our little Vanguard satellite is still beeping although it went up 9 years ago. So here the question is "What shall we do with all this data?"

Well, much of the data collected is probably not needed, such as that picked up when overflying oceans or cloud-covered areas; or if we have 4 weeks of good weather somewhere in the United States, we don't need any more data of that particular area. Yet there may be other areas where the weather is, on the average, pretty bad and where we can get a good clue to the crop situation only occasionally. These data are important. The most important function of this computer center will be to reject the useless data and select what's really important and process it. This includes distribution to the interested parties. For example, the Department of Agriculture or the Department of State may want to know about crops; the U.S. Geological Survey may want to get data on oil or mineral deposits; and maybe the Navy would like to get some data on oceanography. So dissemination to many, many agencies would be involved.

Another application for improving man's lot on earth is global weather forecasting. The basic technique would be the same. We would look down at the weather from the spacecraft as we have already done with Tiros and Nimbus satellites, and get all the information on the movement of cold fronts, overcasts, and so forth.

Now these early systems, Tiros and Nimbus, certainly real achievements in their own right, may be considered primitive when considered with future possibilities. Tiros and Nimbus use television cameras. But imagine for example, the employment of a technique called cross-beam correlation. With this technique we can measure turbulence layers, including the famous clear air turbulence in the air at various altitudes. Clear-air turbulence is a problem for our high-flying military and commercial jets. And advanced satellite weather forecasting system can also employ ground stations. For example, we could have 100 stations on the ground in various locations, some even in buoys anchored in the oceans, so that whenever the satellite appears on the horizon, the ground station would release a balloon. As the balloon rises through the atmosphere, it would record the temperature, density and humidity, stratification of the atmosphere, and then radio this information up to the passing satellite. The satellite would simply record it. It would code the number of the station and write down what the station records. Then whenever this same satellite overflies a central weather report station in the United States, it would just dump its information collected from all over the world into the central station. The station would feed it to a computer, and the computer