GEODETIC DETERMINATIONS

Determinations similar to those noted above will provide data about the oblateness of the earth, that is, the bulging at the Equator. This will yield a better picture of the shape of the earth, which is presently not known accurately enough. At the same time, synchronized observations of the satellite may permit improvements in determinations of longitude and latitude. These observations would significantly supplement the observations that are planned in the IGY longitude and latitude program, involving synchronized observations of the moon.

TEMPERATURES

Measurements of temperatures within the satellite and at its surface will be made. This is of interest primarily in terms of the operating environment within which instruments must function. The heat within the satellite is derived largely from solar radiation, some from the power supplies, some from thermal radiation emitted by the earth, and a very small amount from friction.

PRESSURES

The satellite shell will be airtight and it will contain an inert gas. Pressure gages will be used to measure pressures during the satellite's life in order to check on leakages and in connection with possible meteoritic effects. (See below.)

METEORITIC PARTICLES

Small meteoritic particles, a few thousandths of an inch in diameter, are constantly impinging upon the earth's atmosphere. Although they doubtless enter with great speed, impacts with molecules of air soon slow them down, and then they drift to the ground. Estimates as to the quantity reaching the earth's surface vary, some reaching as high as 1,000 tons per day for the whole earth. These micrometeorites, as they are called, are believed to contribute a measurable, though small, amount to ionizing the atmosphere in the E region. With the use of simple impact detectors these micrometeorites can be observed. Moreover, measurements of pressure within the satellite will reveal meteorite penetration and some information on size.

ULTRAVIOLET RADIATION

Much of the radiation from the sun is masked from the earth by the atmosphere, largely through absorption. This is particularly true of the extreme ultraviolet radiations in the Lyman-alpha region, 1,216 angstroms (1 angstrom equals one-hundredth of one-millionth of a centimeter or about 0.004 millionths of an inch). The satellite offers an opportunity to observe this radiation on a long-term basis and thereby to determine the influence of solar flares on its emission from the sun. It may be possible simultaneously to make similar observations from some direction other than that to the sun. By correlating the intensities observed directly from the sun with those observed off at an angle, it should be possible to estimate the average density in space of hydrogen atoms and ions.