To learn more about the moon, which will help us to learn more about the earth and the solar system, scientists will need more equipment, including vehicles for moving about and machinery for doing heavy work. The extra people and equipment will require corresponding increases of food, water, oxygen, and fuels. In other words some kind of base or camp will have to be established, and the more interested we get in exploring the moon and using it, perhaps as a better vantage point for further study of the universe, the more traffic will build up in lunar logistics. Large payloads of engineering equipment and supplies will have to be shipped to our lunar bases.

The efficiency of nuclear rockets could be the answer to the increased cost of such operations. At an early phase the use of nuclear rocket upper stages could so increase the load-carrying capability of the Apollo booster, the Saturn V, that more men and supplies could be landed per launch and the landing site restriction could be eliminated. Stay times on the surface could be lengthened to months, and roving vehicles could be made available for more meaningful exploration.

The next logical step to reduce operational costs might be to introduce reusable rocket vehicles for transporting material to earth orbit. Chemically fueled boosters used to carry payloads from earth surface to earth orbit would be designed to reenter the earth's atmosphere and be reused to reduce the cost per pound in orbit, a major factor in the cost of space travel.

At the other end, a reusable chemically fueled shuttle could carry personnel and cargo from lunar orbit to lunar surface. But the intermediate transportation system from earth orbit to lunar orbit is a natural application for nuclear rockets. The economy with which nuclear rockets use propellant would greatly reduce the amount of propellant that would have to be supplied to the lunar ferry. This kind of space-flight operation represents a reusable approach, in contrast to the expendable approach we must use now. Eventually we visualize, as a result of this approach, the equivalent of a lunar ferry service with extensive docking service at earth-orbiting and lunar-orbiting stations (Figure 4).

Another type of space vehicle that requires many uses over an extended service lifetime is one designed for shuttling about between various earth orbits for resupply, inspection, maintenance, and, perhaps, rescue action. Rapid movement in orbit, especially where the plane of the orbit must be changed, requires a great amount of