**1998-Text 5**

Scattered around the globe are more than 100 small regions of isolated volcanic activity known to geologists as hot spots. ①Unlike most of the world’s volcanoes, they are not always found at the boundaries of the great drifting plates that make up the earth’s surface; on the contrary, many of them lie deep in the interior of a plate. Most of the hot spots move only slowly, and in some cases the movement of the plates past them has left trails of dead volcanoes. The hot spots and their volcanic trails are milestones that mark the passage of the plates.

That the plates are moving is now beyond dispute. Africa and South America, for example, are moving away from each other as new material is injected into the sea floor between them. ②The complementary coastlines and certain geological features that seem to span the ocean are reminders of where the two continents were once joined. ③The relative motion of the plates carrying these continents has been constructed in detail, but the motion of one plate with respect to another cannot readily be translated into motion with respect to the earth’s interior. ④It is not possible to determine whether both continents are moving in opposite directions or whether one continent is stationary and the other is drifting away from it. Hot spots, anchored in the deeper layers of the earth, provide the measuring instruments needed to resolve the question. From an analysis of the hot-spot population it appears that the African plate is stationary and that it has not moved during the past 30 million years.

The significance of hot spots is not confined to their role as a frame of reference. It now appears that they also have an important influence on the geophysical processes that propel the plates across the globe. When a continental plate come to rest over a hot spot, the material rising from deeper layers creates a broad dome. ⑤As the dome grows, it develops deep fissures (cracks); in at least a few cases the continent may break entirely along some of these fissures, so that the hot spot initiates the formation of a new ocean. Thus just as earlier theories have explained the mobility of the continents, so hot spots may explain their mutability (inconstancy).