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https://www.100test.com/kao_ti2020/125/2021_2022__E8_8B_B1_E8_AF_AD100_E7_c88_125430.htm Passage Thirty-five (Exploration on the Origin of Continents)The origin of continental nuclei has long been a puzzle. Theories advanced so far have generally failed to explain the first step in continent growth, or have been subject to serious objections. It is the purpose of this article to examine the possible role of the impact of large meteorites or asteroids in the production of continental nuclei. Unfortunately, the geological evolution of the Earth ’ s surface has had an obliterating effect on the original composition and structure of the continents to such an extent that further terrestrial investigations have small chance of arriving at an unambiguous answer to the question of continental origin. Paradoxically, clues to the origin and early history of the surface features of the Earth may be found on the Moon and planets, rather than on the Earth, because some of these bodies appear to have had a much less active geological history. As a result, relatively primitive surface features are preserved for study and analysis. In the case of both the Moon and Mars, it is generally concluded from the appearance of their heavily cratered surfaces that they have been subjected to bombardment by large meteoroids during their geological history. Likewise, it would appear a reasonable hypothesis that the Earth has also been subjected to meteoroid bombardment in the past, and that very large bodies struck the Earth early in its geological history.The large crater on the Moon listed by Baldwin has

a diameter of 285 km. However, if we accept the hypotheses of formation of some of the mare basins by impact, the maximum lunar impact crater diameter is probably as large as 650km. Based on a lunar analogy, one might expect several impact craters of at least 500km diameter to have been formed on Earth. By applying Baldwin ’s equation, the depth of such a crater should be about 20km. Baldwin admits that his equation gives excessive depths for large craters so that the actual depth should be somewhat smaller. Based on the measured depth of smaller lunar crater. Baldwin ’s equation gives the depth of the zone of brecciation for such a crater as about 75km. The plasticity of the Earth ’s mantle at the depth makes it impossible to speak of “ bracciation ” in the usual sense. However, local stresses may be temporarily sustained at that depth, as shown by the existence of deep-focus earthquakes. Thus, short-term effects might be expected to a depth of more than 50km in the mantle.Even without knowing the precise effects, there is little doubt that the formation of a 500-km crater would be a major geological event. Numerous authors have considered the geological implications of such an event. Donn et al. have, for example, called on the impact of continent-size bodies of sialic composition to from the original continents. Two major difficulties inherent in this concept are the lack of any known sialic meteorites, and the high probability that the energy of impact would result in a wide dissemination of sialic material, rather than its concentration at the point of impact.Gilvarry, on the other hand, called on meteoroid impact to explain the production of ocean basins. The major difficulties with

this model are that the morphology of most of the ocean basins is not consistent with impact, and that the origin and growth of continents is not adequately explained. We agree with Donn at al. that the impact of large meteorites or asteroids may have caused continent formation, but would rather think in terms of the localized addition of energy to the system, rather than in terms of the addition of actual sialic material.1. A mare basin is [A]. a formula for determining the relationship between the depth and width of craters. [B]. a valley that is filled in when a spatial body has impact with the moon or the earth.[C]. a planetoid (small planet) created when a meteorite, upon striking the moon, breaks off a part of the moon.[D]. a dark spot on the moon, once supposed to be a sea, now a plain.2. The writer does not believe that[A]. an asteroid is larger than a meteorite.[B]. material from space, upon hitting the earth, was eventually distributed.[C]. the earth, at one time, had craters.[D]. ocean were formerly craters.3. The article is primarily concerned with[A]. the origin of continents.[B]. the relationship between astral phenomena and the moon.[C]. differences of opinion among authoritative geologists.[D]. the relationship between asteroids and meteorites.4. Sialic material refers to [A]. the broken rock resulting from the impact of a meteorite against the earth.[B]. material that exists on planets other than the earth.[C]. a composite of rock typical of continental areas of the earth.[D. material that is man-made to simulate materials that existed far back in geological history. 