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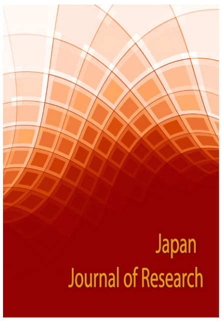

The Cantilever Fracture Model of Planetary Formation in the Solar System and Plate Tectonics of Earth

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Abstract

This paper proposes a cantilever fracture model for the formation of the solar system, which explains the origin of the planets and the Moon, the rotation and revolution of the planets, the tilt of the rotation axis of the Earth and Mars, the abnormal rotation of Venus and the Moon, the formation of the three ancient lands and the Atlantic Ocean, the drift of the Indian and Australian plates, the displacement of the westward and the leaving poles of the continental plates, the origin of the ocean floor expansion and other driving forces, the origin of the Qinghai Tibet Plateau and the Himalayas, orogeny, desert, clay, natural gas, oil, earth magnetic field and lightning.

Introduction

In 1912, German meteorologist Alfred Wegener put forward the "theory of continental drift" and published his book Die Entstehung der Kontentent und Ozeane in 1915, which became one of the most controversial geological works in the first half of the 20th century [1]. His theory of continental drift is based on the existence of a primitive united ancient land. However, many evidences show that the United Ancient Land of Weigner is by no means a primitive continent.

For example, before Wegener, Eduard Suess (1831-1914), the great Austrian geologist, considered the existence of the former supercontinent of Gondwana in the south, Laurentia and Angola in the north and the lost Tethys Ocean between these two regions. Among them, the entire Alpine Himalayan belt formed an asymmetric orogenic system (belt hinterland and foreland), It is composed of large-scale folds generated by compressive (tangential) stress (non vertical or thermal uplift) [2].

It is inferred that Gondwana once existed near the South Pole of the Southern Hemisphere, including Africa, Madagascar, India Pakistan subcontinent, Australia, South America and the Antarctic continent. The age of its existence is controversial. It is generally believed that it is mainly the Paleozoic, but it began to split after the Paleozoic. E. Suess found that Africa, India and other continents have the same geological history and ancient flora, and believed that they were once a unified continent. Therefore, in 1885, he first used the word "Gondwana" in The Face of the Earth. Moraine rocks found in these areas proved that there had been large-scale glacial activity during the Carboniferous Permian. The paleomagnetic data also show that the large ice sheet was mainly distributed near the ancient Antarctic within 60 ° of the ancient south latitude. The dominant flora in the southern continent during the Permian period was the seed fern fern glossopteris, which did not occur in the northern continent. Therefore, Gondwana is a continent with special animal and plant development.

For another example, South African geologist A. L. Du Toit published Our Wandering Continents in 1937. Although he supported Weigner's view on continental drift, he also believed that there were two ancient lands, one was Laurasia (old) land in the north, and the other was Gondwana in the south, separated by the Tethys Sea (ancient Mediterranean).[3]

It is inferred that Laoya Ancient Land once existed in the low and middle latitudes of the Northern Hemisphere, and existed earlier. According to the geological data, several relatively stable platforms have been formed in the Northern Hemisphere during the Proterozoic, such as the North American platform, the Eastern European platform, the Siberian platform and the Chinese platform. In the late or late Early Paleozoic, Northern Europe and North America united to form the Laos-Russia continent. In the middle or late Late Paleozoic, the Ural geosyncline region and the Tianshan Xing'an geosyncline region were all folded and uplifted, leading to the

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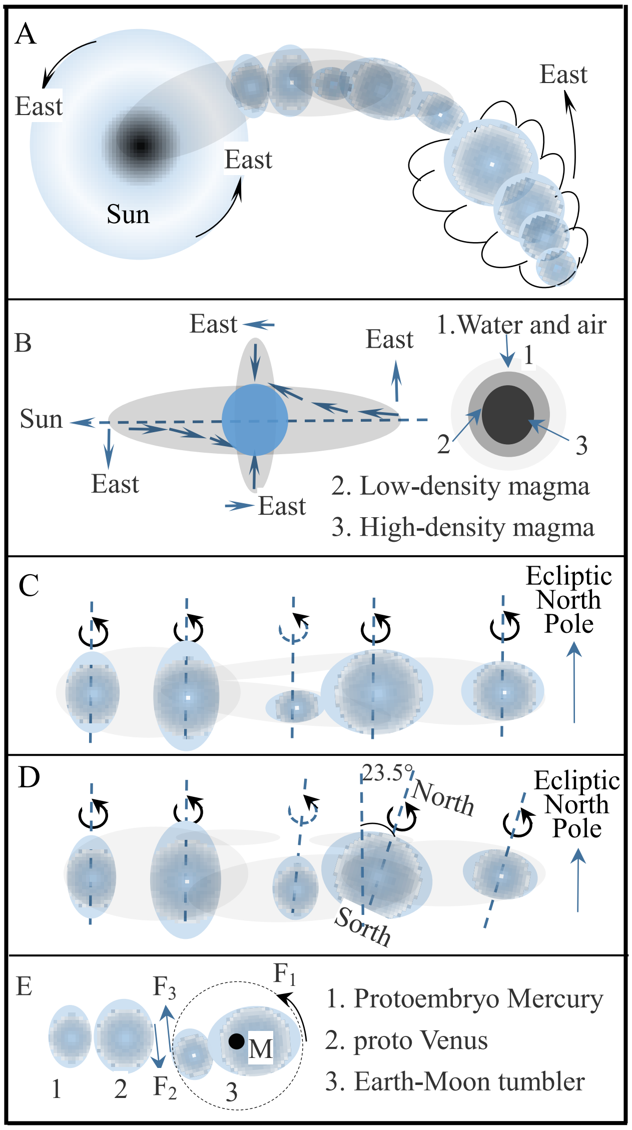

Figure 1. *Schematic Diagram for Planetary Formation in the Solar System. A) The sun ejects mushroom shaped cantilever. B) Generation of planetary rotation. C) The axis of rotation is parallel to the normal of the ecliptic. D) The tilt of the Earth and Mars. E) Influence of Earth Moon tumbler on the rotation of Venus and the Moon.*

connection of the Eastern European platform, the Siberian platform and the Tarim China Korea platform, thus forming the northern continent with unified geological history characteristics in the Northern Hemisphere.

The plate tectonic revolution in geology since the 1950s has led to a comprehensive reassessment and affirmation of the Wegener hypothesis [1]. Although his one-ancient-land hypotheses failed, the plate tectonics theory developed from his continental drift theory explained the movement of continents, which has become the mainstream theory supporting our understanding of the earth.

However, the current human understanding to the Earth is still very superficial. 125 major scientific questions published by Science magazine in 2005. The tenth question is "How does the earth's interior work ? ", pointing out that the source of the earth's power has not yet been solved. China's Discipline Development Strategy — Plate Tectonics and Continental Dynamics, published in 2017, believes that the plate tectonics theory still has three problems since its formation, namely, plate dynamics, plate origin and plate landing. The dynamic mechanism driving plate movement is the most important problem and also an urgent problem to be solved [4] In fact, I think the origin of the plate, that is, the origin of the land, is the most fundamental problem. The cantilever model of the formation of solar system planets that I put forward in recent years [5, 6] can just get the answers to these questions..

Cantilever model about planetary formation

In the early years, due to nuclear reaction, the sun accumulated a lot of energy and light elements to form gas in its interior, such as hydrogen, helium, carbon, nitrogen, oxygen, chlorine, etc. The internal pressure was getting higher and higher. When the pressure exceeded the critical constraint limit of the external gaseous shell, it would erupt along the ecliptic in a certain direction. The temperature and brightness at the nozzle must increase dramatically. If periodic brightness changes could be observed from a distance along the ecliptic plane, it was likely to be considered as a supernova explosion or a new periodic variable star. The ejecta was a gas liquid chaotic magmatic flow, which formed a mushroom shaped cantilever as shown in Fig. 1A). Of course, the ejected magma flow also contained a large number of elements such as calcium, magnesium, sodium, potassium, silicon, aluminum, iron, titanium and a small amount of other heavy elements.

The magma in the cantilever lost the material exchange and renewal with the solar internal nuclear reaction, and formed a specific material with element isotope marks depending on the position on the cantilever. The age of the oldest rocks sampled on the Earth, the Moon and Mars may be related to the formation of the cantilever, but not necessarily the time of solidification of the sample rocks. The cap of the mushroom shaped cantilever developed and broke into Neptune, Uranus, Saturn, Jupiter and other major planets in turn. The lower edge of the cap formed the asteroid belt of the solar system; The stipe of mushroom

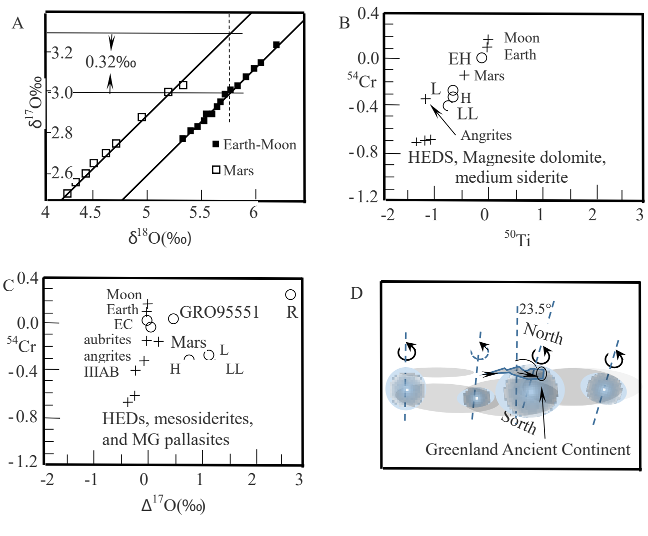

Figure 2. *The determination of stable isotopes A) ^{17}O-^{18}O [6, 7, 8], B) ^{54}Cr-^{50}Ti [8, 9] and C) ^{54}Cr-^{17}O [8, 9] shows that the origin of the Moon is not in the outer solar system, nor between Earth and Mars, but in the perihelion of the Earth. D) It indicates that the frenulum connecting the north pole of proto Earth and the north pole of proto Venus broke and retracted to the proto Earth, generating the oldest Greenland ancient land.*

shaped cantilever developed and broke into Mars, Earth-Moon, Venus and Mercury in turn.

Next, we will mainly discuss the formation of the four inner planets and the Moon, which are rocky and formed by mushroom stalks. The planets and Moons distributed in the cantilever before the fracture are called proto stars. There is no doubt about the order of the cantilever proto planets, but there are two possible arrangements for the position of the proto Moon: one is to place the proto Moon between Earth and Mars; The other is to put the proto Moon between Venus and Earth. This choice involves the highly controversial issue of the origin of the Moon.

Position of the proto Moon in the cantilever

Because the extremely large angular momentum of the Earth-Moon system is difficult to explain, since the middle of last century, a planetary impact model is prevailing for the origin of the Moon. They believed that the Moon comes from a Mars like planet in the outer solar system [7, 8]. But in the 1970s and 1980s, lunar exploration realized the determination of lunar rock samples. It was found that the amazing chemical similarity between the Moon and the Earth rock samples has caused serious challenges to the planetary impact model [8]. The accurate measurement of silicon isotope shows that the composition of the Moon is similar to that of the silicate Earth, but this property is different from Mars, the Vesta (HEDs) and chondrites [11]. From the accurate measurement of oxygen isotope 17O-18O (as shown in Fig. 2A), chromium-titanium isotope (as shown in Fig. 2B) and chromium-oxygen isotope (as shown in Fig. 2C), it can be inferred that the original Moon should have come from the perihelion side of the original Earth rather than the aphelion side.

Therefore, we choose to place the proto Moon between proto Venus and proto Earth in the cantilever, rather than between proto Earth and proto Mars. This choice of the position of the proto Moon in the cantilever unexpectedly led to the solution of many original difficult problems.

Landing of the original Earth's hydrosphere

The original atmosphere contained a large number of light elements that can form gas, such as oxygen, nitrogen, hydrogen, carbon, chlorine, helium, etc. Under the ignition of lava or lightning, oxygen and hydrogen combined to form water, and oxygen combined with carbon to form carbon dioxide and carbon monoxide. Therefore, the original atmosphere was an acid gas dominated by constantly transpiration of water vapor. Due to the density differentiation, the original atmosphere gradually floated to the outermost layer of the cantilever cross-section. Both atmosphere and water are fluids. Fluid on the ground always flows from high to low. The original atmosphere wrapped in the outer layer of the cantilever always flowed from the area with low gravity to the area with high gravity along the surface of the cantilever. This is equivalent to water flowing from high to low. In the stipe portion of the cantilever, proto Earth was the largest potential planet. It generated the greatest gravity, so the primitive atmosphere and water flow continuously converged to the surface of the primordial Earth.

The flow of original gas and water accelerated the cooling and dissolution of magma on the cantilever surface. Assuming that the pressure of the original atmosphere is similar to that of today, when the surface magma cooled below 100 degrees, water began to accumulate on the surface of cantilever segment containing the proto Earth, which meant that the hydrosphere began to fall. Especially near the proto earth, the earliest and shallowest primitive oceans began to appear. The low-density soluble magma composition, or the oxide rock composition containing high calcium, magnesium, sodium, potassium, aluminum and iron, or the aluminosilicate containing soluble metal oxides reacted with water, and the soluble matter was leached to generate strong alkaline seawater. A large number of insoluble residues become clay, such as the Loess Plateau in North China. So the earliest primitive ocean on the ground was strongly alkaline.

The molecular weight of carbon dioxide was the largest in the original atmosphere, and it is usually distributed at the bottom. A large amount of water vapor risen, cooled down to clouds, and fell to rain. When the rain fell, the carbon dioxide was washed and mixed with rainwater and fell into the strong alkaline original sea water. Due to acid rain, most carbon dioxide was dissolved in rainwater in molecular state and brought into the strong alkaline primitive ocean. Carbon dioxide continuously neutralized the strongly alkaline seawater and formed bicarbonate with greater solubility in the upper seawater. Bicarbonate was more easy to diffuse than the carbon dioxide in seawater. Then hard calcium carbonate crystals were rapidly formed on the hot rock surface at the seawater bottom. This reaction is the same as that of forming hard scale at the bottom of the kettle when we boil water. With the thickening of calcium carbonate sedimentary rocks, the content of carbon dioxide in the original atmosphere and the concentration of calcium and magnesium ions in the original ocean decreased continuously. The atmosphere and seawater gradually became neutral, and the first period of rapid calcium carbonate deposition ended. Therefore, the earliest existing calcium carbonate sedimentary rock on the earth should have occurred during the landing of the hydrosphere in the cantilever period, and there was only flat deposition. It can also be inferred that the earliest carbonate rock sedimentary area does not cover all the earth today.

The magma in the gas-liquid chaotic state at the cantilever stage could become the adsorbent of gas, and contains many transition metal ions, which also provided sufficient catalyst for the chemical reaction of gas. The original gas was wrapped in the foam like molten magma and generated high pressure as it cooled. These magma foam were similar to chemical containers. High pressure, catalyst and appropriate high temperature became appropriate chemical reaction conditions, producing a large amount of organic matter. The most common and simplest should be low carbon alkanes, such as methane, ethane and other natural gas. In these early reactions, various amino acids were also synthesized in large quantities. In addition to hydrophilic substances such as amino acids, most of these newly generated organic substances were hydrophobic and oily substances, while foam like magma wrapped or cooled rock powder was either water-soluble or hydrophilic. During the landing of the hydrosphere, the oily organic substances generated were separated from the water phase. They were mixed in the sedimentary layers of minerals, forming so-called fossil fuels such as natural gas, combustible ice and oil in the strata.

Under appropriate conditions, inorganic substances could automatically synthesize organic substances, but inorganic substances could not directly synthesize life automatically. When a variety of large amounts of organic matter and water appeared on the earth, there would be opportunities for biogenesis. It can be speculated that the emergence of organic matter on the earth must be earlier than the emergence of life. Although these early natural gas, combustible ice and oil might contain animal debris, they could not be formed from animal debris. They might be different with the formation mechanism of coal. Dense forests with large numbers of tall trees could exist for a long time and had full opportunities to form coal. However, the living density of animals was far less than that of plants, and the natural storage time of uncorrupted animal remains was also far less than that of plants. Therefore, a large number of dense and tall animal clusters that could form oil reserves could not exist.

Origin of rotation of planets or satellites

As we all know, in the air, two metal balls with different densities can fall from the same height at the same time and land at the same time. The buoyancy of air can be ignored, and the gravity of the earth center plays a leading role. However, buoyancy played an important role in density differentiation in viscous fluids. The newly ejected cantilever was a gas-liquid chaotic state of magma and mixed gas. As the temperature dropped and density differentiated, the cantilever was divided into three layers by density differentiation along the cross section direction of the cantilever, as shown on the right-hand side of Figure 1B. High density magma accumulated to the axis; The low-density magma was squeezed out to the shaft sleeve layer in the middle; Gaseous matter floats up to the outermost layer.

Due to the inhomogeneity of the cantilever material, several large planet particles were formed along the axial direction. In the stipe segment, they were proto Mercury, proto Venus, proto Moon, proto Earth and proto Mars in turn. In viscous liquids, the denser the material, the easier it would sink. The low-density outer magma had lower temperature and higher viscosity. They flowed more slowly and had greater resistance. In the density differentiation, the high density axial magma flow could flow to these proto planets faster than the outer low-density magma flow. The outermost gas also has better mobility. Since the mass of the proto Earth was much greater than that of the proto Moon, most of the dense axial magma near the Moon flowed to the proto Earth, resulting in the proportion of the axial magma contained in the proto Moon being much smaller than that of the proto Earth. Similarly, the proto Moon's proportion of volatile matter easy to flow was also much smaller than that proto Earth's.

The front side of the cantilever rotating around the sun was also the east side, and the rear side was also the west side. As shown on the left hand side of Fig. 1B, when the high-density axial magma gathered to the same protoembryo planet from both the perihelion (a) and the aphelion (c), the axial magma near point (a) would flow away from the sun. In the flow, the radius of revolution would increase. Because of the conservation of angular momentum, the angular velocity of the movement around the sun would decrease. The axial magma from point (a) would flow to the back side (b) of the cantilever, which was also the west side of the cantilever, but it pushed the nucleus of the proto planet to rotate eastward.

The axial magma from the far solar side (c) would flow to the sun direction, the revolution radius decreased, and the angular velocity of its movement around the sun increased. It would flow to the front side (d) of the cantilever along the arrow direction, which was also the east side of the cantilever, and also drove the nucleus of the proto planet to rotate eastward. The magma flow along the axis from both ends to the proto planet would start its rotation. Because both the density of the axial magma and the angular momentum of revolution carried by it was large, its contribution to the rotation was also large.

The magma flow flowing to the protoplanetary along the directions (b) and (d) did not change both the distance to the sun and the common angular momentum, so it did not contribute to the rotation of the protoplanetary core. Only after the protoplanetary core rotates, could it bring the angular momentum of rotation, and then concentrated on the protoplanetary core to accelerate its rotation. However, the magma flow along the directions (b) and (d) to the protoplanetary core could not start its rotation.

It can be seen that the protoplanetary core, which concentrated axial magma for a longer distance along the direction of the cantilever axis, would have a greater angular momentum. Because they was closest to the sun, the cantilevers at proto Mercury and proto Venus might be relatively thick, and the arm segments along the arm axis were relatively short, so the contribution of mass to their rotation was relatively small. Therefore, theoretically, Mercury and Venus could only obtain relatively small rotation speeds. proto Earth and proto Mars had

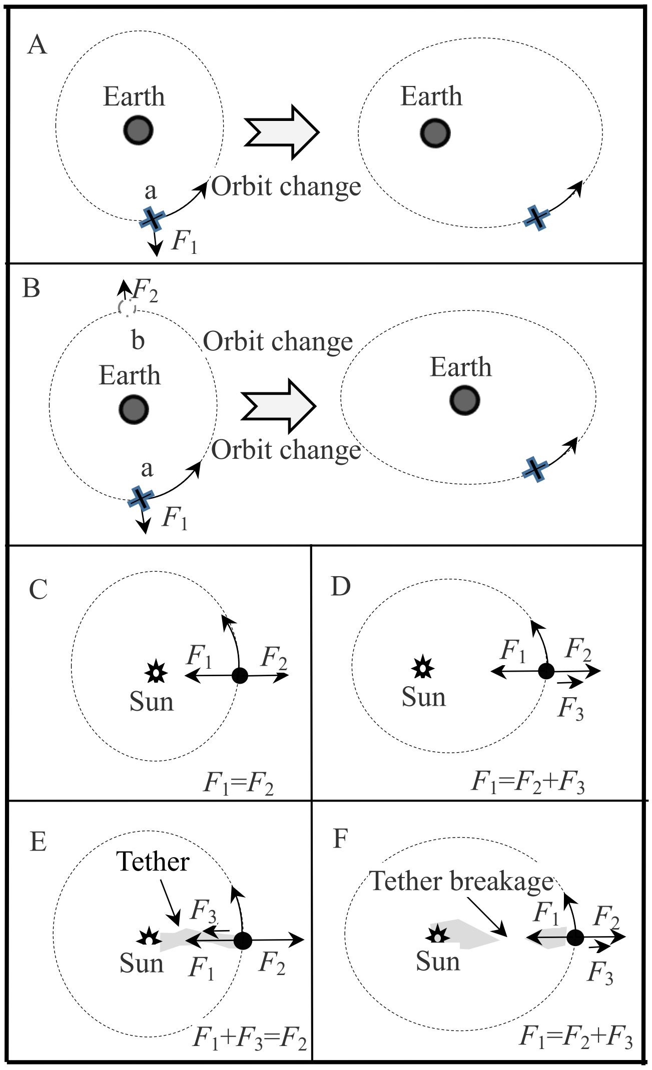

Figure 3. *A) and B), the orbit of an artificial satellite changes after a force is applied; From C) to D), the elliptical orbit of a planet must be affected by the orbit changing force; From E) to F), the orbit changes from round to ellipse due to the fracture of the tether.*

obtained large rotation speed because they had obtained the angular momentum of bidirectional large distance axial high-density magma.

Before the cantilever fracture, the axial magma between each proto planet had broken, and contracted and flowed back to each proto planet core, resulting in the rotation of each proto planet core. As shown in Figure 1C), due to the same principle, at first, the rotation direction of each proto planet core was the same, and they all rotated eastward, and their rotation axes were parallel to the normal of the ecliptic. The rotation of Venus and Moon will be discussed below.

Generation of elliptical orbit

The orbits of all planets and satellites are elliptical, and the parent body must be located at a focus of the elliptical orbits. In the study of "New hydrogen atom model and radiation absorption mechanism "[12], I proposed that the ground state orbit of hydrogen atom is circular, and the orbit becomes elliptical after the electron absorbs photons. However, the nucleus is located at the center of the ellipse, not at a focal point. We can analyze it with the help of orbit change of man-made satellite. By orbit change technology, an artificial satellites can turn elliptical orbits into circular orbits, or turn circular orbits into ellipses. As shown in Figure 3A), if an orbit change operation is only carried out at point a of the circular orbit, that is, a force *F1* is applied outward along the radius of the orbit, the circular orbit will become elliptical, and the earth will be located at a focus of the elliptical orbit. As shown in Fig. 3B, if another force *F2* of the same size is also applied to another symmetrical point b opposite the orbit, an ellipse with greater eccentricity will be obtained, and the earth will be at the center of the ellipse.

By the mechanical analysis of the satellite orbit change, we can draw the following conclusion: the elliptical orbits of planets or satellites in the solar system must have been affected by an orbit change force when they were formed. As shown in Figure 3C), if there is no specific orbit change force, the planets will circle around the sun. Then, the gravitational force received by a planet from the sun is equal to its centrifugal force generated by circular motion, that is, *F1=F2.* As shown in Figure 3D), the planet moves in an elliptical orbit, indicating that its orbit must have changed when it was formed. During the orbit change, it must have been affected by an orbit change force *F3* before it reached the aphelion. So, what kind of force is *F3*?

The cantilever fracture model proposed by me just conforms to the characteristics of force *F3*. As shown in Fig. 3E), a proto planet was connected with other proto planet or the primitive sun by magma tethers in the cantilever. The tethered magma had a large viscous tension *F3*. Before the break, the combined force of the sun's gravity *F1* with *F3* was equal to the centrifugal force *F2* of the planet. Therefore, the proto planet in the cantilever moved in a circle around the sun.

When the tether was broken, as shown in Fig. 3F), *F3* disappeared, and *F2 > F1*. Turn out, the broken proto planet was thrown out, and *F2 - F1 = F3*. The disappearance of *F3* was a process in which the tether was firstly rapidly stretched and finally completely broken. According to Newton's third law, the disappearance of *F3* was equivalent to the increase of *F2*. The increase of *F2* is the same as the orbit change process of the artificial satellite shown in Figure 3A). This mechanical principle shows that all the planets and satellites of the solar system were fractured from the cantilever. So they all had elliptical orbits. Because a rupture process only occurred on one side of its orbit, the sun (or planet) was always at a focus of the elliptical orbit of the planet (or satellite).

The larger *F3*, the greater the eccentricity of the orbit. The size of *F3* depended on the minimum cross-sectional area of a tether and the viscosity of the tether. The viscosity of the tether depended on the composition and temperature of the tether magma. The lower the temperature, the greater the viscosity. In the planets not close to the sun, the temperature at which the tether broke might be a major factor. For example, the orbital eccentricity of Venus, Earth and Mars increased gradually, indicating that their temperatures decreased in turn when their tether broke. Mercury had a very large orbital eccentricity, which might be related to a very large cross sectional area of its tether between the proto Mercury and the primitive sun.

If a proto body in the cantilever was directly fractured, its orbit changed from a circular orbit to a elliptical orbit around the sun, and became a planet. The formation of a planet did not depend on the size of its mass, nor did it depend on the distance from the sun in the cantilever. Even a rock with only a few thousand grams could form an asteroid in the solar system as long as it was directly fractured from the cantilever. The asteroid belt of the solar system might be formed in this way.

Based on the above reasoning, the proto Moon must not have broken down from the cantilever alone. It must have broken off from the cantilever together with the proto Earth as a conjoined proto binary, and then separated with the earth. Therefore, all satellites broke up with the parent planet after the parent planet broke off from the cantilever. Therefore, whether it became a satellite did not depend on its mass. If its mass was similar to that of its parent planet, they could only form a binary planet that rotates around each other, such as the dwarf planet Pluto and its moon Charon.

Four cantilever fracture events and the formation of three ancient lands

By the above analysis, we can speculate that there had been four cantilever breakage events related to Earth and Moon. (1) Earth-Venus Arctic tether breakage; (2) Earth-Mars tether breakage; (3) Tether breakage between an Earth-Moon binary system and Venus; (4) Earth-Moon tether breakage.

Earth-Venus Arctic tether breakage and formation of Greenland ancient land

In rocky planets, the composition of tethered magma between proto Venus, Moon, Earth and Mars, which were close to the Earth, was similar. Proto Venus had a similar radius to the proto Earth and was only smaller than the proto Earth. The radius of the Moon was much smaller than that of the Venus or Earth. As long as the composition on the cross section of the cantilever was uneven, for example, the volatile matter with low viscosity was mainly distributed in the north pole direction, the proto Moon would deviate from the axis of the cantilever to the south pole direction. According to an actual research, as shown in Figure 1C), the proto Moon was indeed inclined to the south side of the cantilever, resulting in a separation of the North Pole of the proto Moon with a branch of the cantilever tether. The separated tether branch directly connected the North Pole of proto Earth and of proto Venus, but no longer connected the proto Moon. The tether branch is called the Earth-Venus Arctic tether. Therefore, the volatile matter of the Moon is significantly lower than that of the Earth and Venus today.

Since the middle part of the Earth-Venus Arctic tether had been separated from the proto Moon, it was easier to cool down and fracture under the cooling of surface flowing water vapor. Therefore, before the rupture of the planetary cantilever, the Earth-Venus Arctic tether broke. Because the fracture of the Earth-Venus Arctic tether belongs to the asymmetric and incomplete, the situation shown in Figure 1D) caused the cores of both the proto Earth and the proto Mars to shift outward (away from the sun) from the North Pole of the rotation axis, and the axis of proto Earth tilted about 23.5 degrees. Since the rotation is gyroscopic, the inclination can be kept up to now.

After fracture, a remnant wing of the Earth-Venus Arctic tether connecting the North Pole of the proto Earth rapidly shrank back to the proto Earth. Fall of the magma of the remnant wing belonged to the movement from the perihelion direction. In the process of falling back, the distance (radius) from the sun increased and the angular velocity decreased, leading to the deviation from the Earth-Venus Arctic line to the back side (west side) of the cantilever. On the one hand, the magma density of these tethers was far less than the axial magma density of the cantilever. On the other hand, the axial magma had already fallen back and been mixed into the high-density core and floor of the proto Earth.

As shown in Fig. 1D), the tether magma could only float on the surface of the upper mantle magma when it landed due to above two reasons. This is similar to a small oil drop on the water. At that time, the magma on the surface of the proto Earth had not solidified or had just solidified for a short time, and the temperature of the falling magma was even lower than that of the magma on the ground. Therefore, the earliest Greenland ancient land on the Earth, which is now Greenland Island, had been formed. Due to the inertial kinetic energy produced during the fall, the ancient land of Greenland continued to drift along the west side of the North Pole of the Proto Earth to the opposite side after landing, that is, from the perihelion side to the aphelion side of the proto Earth. Until it slowly drifted to the root of the Earth-Mars tether on the opposite side and stopped when it was blocked. Of course, there should also be traces of this plate collision in geology.

Earth-Mars tether breakage and formation of northern ancient continent

By the above analysis, an image is clear. The Earth-Mars tether and the Earth-Moon tether were almost independently distributed on both sides of the proto Earth. The former was on the aphelial side, and the latter was on the perihelial side. On the one hand, because of the earlier breakage of the Earth-Venus Arctic tether and the tilt of the Earth axis, as shown in Figure 2D), the Earth-Mars tether deviated to the North Pole of the proto Earth. A northern ancient land was formed after residual wing of the tether fell to the ground during Earth-Mars tether breakage. On the other hand, the Earth-Moon tether deviated to the South Pole of the proto Earth, and then a southern ancient land was formed after the residual wing of the tether fell to the ground. The formation time of the northern ancient land should be earlier than that of the southern ancient land.

For the formation of the northern ancient land, because the axial magma of the Earth-Mars tether had first broken and flowed to the cores of proto Earth and proto Mars respectively, only the axle sleeve magma with low density was left, as shown on the right of Fig. 1B). During the rupture of the Earth-Venus Arctic tether, the violent vibration caused by the tilt of the Earth axis accelerated the differentiation and rupture of the mantle magma of the Earth-Mars tether. The axle sleeve magma was divided into several tether branches, which formed a tubular distribution. After they fell to the ground, they formed several ancient platforms in the northern ancient land, and developed into the North American ancient platform, the European ancient platform and the Asian ancient platform respectively. They still maintained a roughly circular distribution. An ancient ocean was enclosed in the center of the ring. On the one hand, due to the effect of gravity during their landing, they had an inertial tendency to gather toward the center of the circle. On the other hand, due to the fracture and departure of the proto Mars, the northern ancient land had become the farthest end of the cantilever. Under the action of centrifugal force and tidal force, they were also subjected to the force of drift towards the center of the ring. The two factors caused the northern ancient land to converge to the center of the ring, and finally the ancient ocean around the center disappeared.

The tether fracture between Earth-Moon binaries and Venus

The Earth-Moon tether was also a tether tube formed by axle-sleeve magma. According to the composition of the southern ancient continent, we speculate that the tether tube of the Earth-Moon tether was mainly composed of three large tether branches, the South-America-Africa tether branch on the east and north, the Indian tether branch on the southwest and the Australian tether branch on the west. Each tether branch was often divided into several segments to land separately, and the later ones were related to orogeny.

When the Earth-Venus Arctic tether broke, the inclination of rotation axis of Earth and Mars had the greatest impact on the Earth-Moon tether, where the South-America-Africa tether branch was nearest the equator of the proto earth. During or after the Earth-Mars tether broke, the South-America-Africa tether branch first broke, and most of the tether branch connected with the proto Earth fell back to the ground. Because the position of the proto Moon corresponds to the South Pole of the proto Earth, the South-America-Africa tether magma leaned to the northwest in the process of falling, and continued to drift northward after falling. When met the North American and European ancient platforms of the northern ancient land, they merged with each other and the drift stopped roughly. The South American part merged with the edge of the North American ancient platform, and the African part merged with the edge of the European ancient platform. It is speculated that the driving force of their northward drift was small and the time was not long. It is likely that they landed close to the southern edge of the northern ancient land.

Influence of Earth-Moon binary tumbler on the rotation direction of Venus and Moon

The tether must first be pulled by a large centrifugal force before fracture. The Earth-Venus Arctic tether fracture also weakened the proto Moon-Venus tether. As shown in Figure 1E, when the Earth-Mars tether fractured and its tether remnant shrank back to the Proto Earth, it generated an eastward-rotation driving force *F1* to the Proto Earth. *F1* was magnified to *F2* by a leverage of the Earth-Moon binary tumbler. *F2* yanked the proto Venus backward, causing the proto Venus core to reverse. While the Proto Venus also produces a reaction force *F3* to pull the proto Moon. *F3* and the viscous interaction between the proto Earth and the Moon together caused the proto Moon core to lose its rotation. The fracture of proto Moon-Venus tether was accelerated by the effect of *F2* and *F3*.

During this fracture process, a proto Earth-Moon-binary tumbler structure was released from the cantilever. The tumblers rotated around their common center of mass M, so they had a particularly large angular momentum. Because the proto Moon was not broken from the cantilever alone, the Moon did not become a planet, but only a satellite of our Earth.

During the period of the tumbler, the tide force tore out the Atlantic Ocean

The familiar tide is actually a phenomenon of the combined action of buoyancy and centrifugal force [13]. When the rotation axis of a solid sphere is eccentric, the fluid adsorbed on the surface will always flow to the place with the largest radius. The force that makes the fluid flow is tidal force. The Earth tides caused by the Moon today can be divided into backing-Moon tides and facing-Moon tides, the former being greater than the latter. Today's lunar tides revolve around our Earth periodically with the lunar phase, and its impact on the crust is also periodic and relatively small.

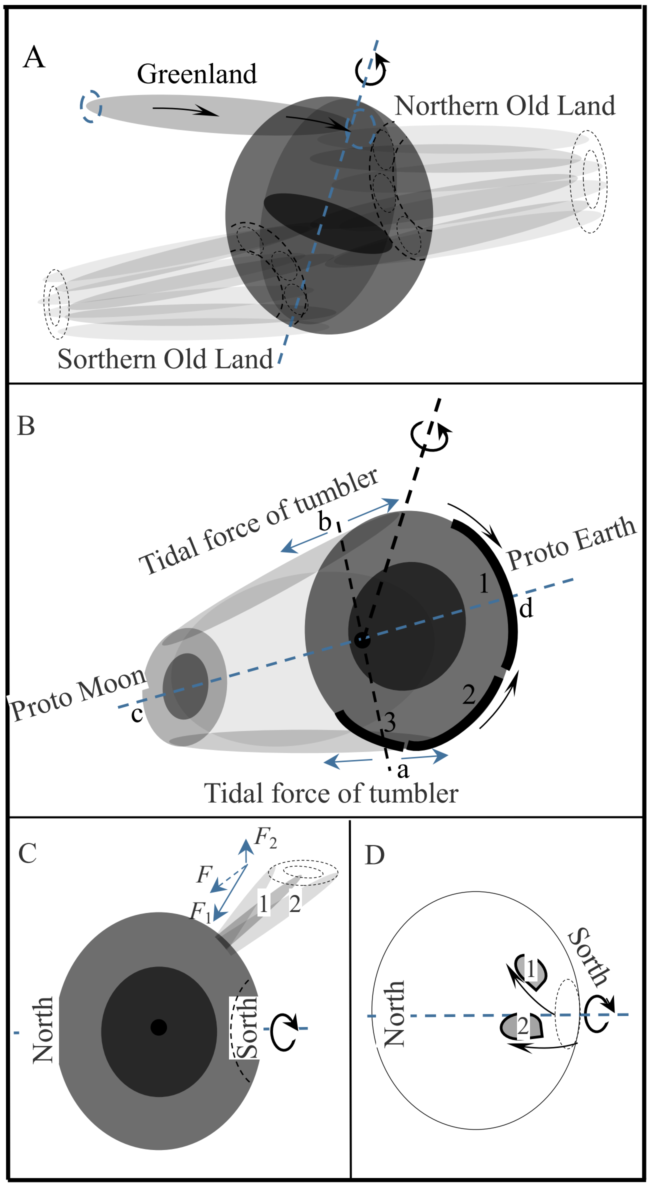

Figure 4. *A) The formation of the three ancient lands; B) Tidal force of the Earth-Moon tumbler teared open at the point a and created Atlantic; C) Tetheres 1 and 2 formed the Australian and Indian plates respectively; D) Inertial drift of Australia and India plates after landing.*

However, during the period of the Earth-Moon-binary tumbler, the proto Earth had not yet obtained a spherical surface with independent rotation, and the tidal force exerted on the tumbler was huge and not spherical symmetric.

In Figure 4-B), the arrow indicates the direction of the huge tidal force generated by the Earth-Moon tumbler. At point a or b, the tidal force was in the opposite direction, producing a huge tearing force. For the Northern Hemisphere, 1, 2 and 3 in the figure represent the ancient Asian plate, the ancient European plate and the ancient North American plate in the northern ancient land, respectively. For the Southern Hemisphere, 3 represents the South America-Africa plate of the Southern Old Land. Point a was located in the middle of the South America-Africa plate of the southern ancient land, which is the middle line of today's South Atlantic Ocean. Point a was located in the interior of the ancient european plate in the northern ancient land. Point b was located in the pacific ocean, and the huge tidal forces tore the pacific ocean wider along the north-south direction at point b.

Because the South America-Africa plate in the ancient land in the south was a new land that had just landed, solid rock crust had just begun to appear or had not yet appeared. It was easily torn apart by the tide force of the tumbler. For the northern ancient land, the landing time was earlier than the south ancient land, its surface solidification and internal binding force had been enhanced, and the tidal force did not tear the ancient European plate, but the crack moved westward, cracking from the edge of the ancient European plate and the ancient North American plate. Further to the north, the Greenland ancient land, located at the crack, also resisted the tear of tidal force and shifted as a whole. Therefore, today the cracks in the South Atlantic and the North Atlantic are not in the same north-south straight line.

Since the mass of the land plate was huge, the tidal force of the tumbler was necessarily huge. When the tether between the proto Moon and the proto Earth was completely fractured, that is, after the separation of the Earth and the Moon, the tumbler disintegrated, and the tidal force of the tumbler disappeared. Therefore, the driving force for tearing up the continent to form the Atlantic Ocean only existed in the tumbler period of the Earth-Moon binary. When the tumbler disintegrated, the Atlantic Ocean might not have formed, or there might only be a crack. But the cracking speed must reach the maximum speed. After that, although the driving force of tearing disappeared, the plate drifted under the action of inertia and its speed gradually decreased. When the ocean floor increased, the ocean floor expansion gradually replaced the original inertial motion until the Atlantic Ocean was finally formed.

Earth-Moon tether fracture and the formation of the southern ancient continent

The diameter and scale of the tether axis sleeve in the southern ancient land were much smaller than those in the northern ancient land. On the one hand, no circular ancient ocean was formed in the center, and on the other hand, various branches of the tether landed at different times. Before the tumbler period, the largest South American-African branch frenulum had landed. The Earth-Moon tether fracture mainly occurred in the Australian branch tether on the west side of the shaft sleeve and the Indian branch tether on the south side. The vertical foot from the center of mass of the tether to the axis of the earth has exceeded the south pole of the proto earth, and the trajectory lines when landing under the gravity cross. As shown in Figure 4C), *F1* represents gravity, *F2* represents centrifugal force, and dotted arrow F represents the resultant force formed by centrifugal force and gravity. The tether falls in the direction of the resultant force. The trajectory lines at the time of falling cross and pull the land at the root tightly together to form an integrated Antarctic continent.

Source of driving force for plate drift

The driving force of ocean floor expansion is actually the drag force of light fluid

The density differentiation of the material in the mantle is roughly globally uniform. The amount of low-density materials produced, such as water, aluminosilicate, etc., floating upward is proportional to the plate area. They continuously rise to the upper layer of the asthenosphere under the solid lithosphere, and we call them light fluid in the asthenosphere [14, 15]. They accumulate and flow from high pressure to low pressure, or from low to high, just opposite the trend of water flow on the ground.

Compared with the continental plate, the oceanic plate has a relatively uniform thickness and a huge area, and generally has the same gradient from the edge to the center, that is, the center is low and the edge is high. Under the oceanic plate, light fluid is constantly produced uniformly in time and space. It flows slowly from the deepest part of the ocean center to the edge. They carry the above oceanic plate and drift towards the land plate. When the ocean floors on both sides of the mid ridge drift in opposite directions, the ocean floor is torn. At the tear fracture, the deep high-density magma upwell to fill the fracture. The cracks become wider and wider, and new ocean floor is constantly generated. This phenomenon is called ocean floor spreading. In fact, the driving force of ocean floor expansion comes from the drag force of light fluid along the bottom of the plate.

Driving force for leaving the poles and moving west

Since the tether between the Earth-Moon binaries was completely broken, the Earth contracted into a roughly spherical shape by its own strong gravity, and began its own independent rotation. Because the mass of the proto Earth was far greater than that of the proto Moon, its rotation direction and speed had not changed much. However, the strong directional tidal force had become a weak periodic tide around the Earth. The strong tidal forces that tore the Atlantic Ocean disappeared. Tide has tidal force not only for sea water, but also for floating land plates. It tends to push the land plate to the equatorial region with the largest rotation radius. This tidal force is also known as a driving force away from the poles. It changed the sea level from a sphere to a fatter ellipsoid in the equatorial zone. The land plate is continuously thickening, and the thickening material comes from the deep mantle. Because of the conservation of angular momentum, the angular velocity of the buoyant material decreases. It causes the slow westward movement of the land plate.

Driving Force of the North by East Drift of the Indian Plate

As shown in Figures 4C) and D), when the Earth-Moon tumbler disintegrated, the Indian branch tether located in the southwest fell in the direction of the combined force of centrifugal force and gravity, and fell to the north outside the Antarctic Circle. Due to inertia, it continued to drift north by east after landing.

We speculate that the Indian plate and the Australian plate have lower temperature, higher magma density and later landing time than the South America-Africa ancient land and the northern ancient land. At the time of landing, an ocean floor plate at the north side of the Indian plate was nearly hardened and formed. Driven by the drift of the Indian plate, it was inserted northward under the plate of the northern ancient land. At that time, the hardened rock layer of the northern ancient land was not thick, and the insertion resistance from the bottom was not large, resulting in the North by East drift of the Indian plate did not stop, but the speed gradually slowed down.

The insertion and advancement of the bottom plate, on the one hand, uplifted and folded the hardened rock layer above, forming a large-scale pushed fold mountain range. On the other hand, it pushed the front unhardened magma further forward, resulting in the uplift of the Qinghai Tibet Plateau and the Loess Plateau [16].

In the process of the Indian plate drifting to the northeast, on the right side, it encountered the ancient land of Southeast Asia with a westward drift trend and today's Yunnan Guizhou Plateau, where a large number of Hengduan Mountains were formed. On the left side, the ancient land of South Asia and the Middle East, which tends to drift to the west, was stretched and twisted, forming several bays.

Although the northeast drift of the Indian plate did not pull apart the Antarctic continent, the ocean floor behind it smoothly entered the south-north ocean floor expansion period. So that the Indian Ocean became larger and deeper. Both the south-north expansion and North by East drift of the northern ocean floor and the westward drift of the African continent, together, produced a north-south trending Great Rift Valley in the east of the African continent. Today, the driving force of the drift of the Indian plate has gradually been replaced by the north-south expansion of the Indian Ocean from the original inertial motion. However, the East African Rift Valley does not have the conditions to generate oceans.

Driving force of east by north drift of Australia plate

As shown in Fig. 4C) and Fig. 4D), the Australian tether (1) located in the west of the tether shaft sleeve fell to the northeast outside the Antarctic Circle in the direction of the resultant force. Due to inertia, after landing, it continued to drift east by north until the location where Australia is today.

The driving force for the formation of the Atlantic once existed in history

As mentioned above, the huge tidal action during the Earth-Moon tumbler period was the original driving force for tearing up the continent to produce the Atlantic Ocean.

Volcanic eruption and earthquake

The drift of the oceanic plate towards the continental plate will inevitably lead to the collision of the plates at the edge. Due to the different structures of the plate edge, the collision can be divided into many geological models. No matter which mode, it has the following common characteristics.

Since all of ancient lands dropped-down from the sky, their density was far less than that of the mantle. Therefore, they all floated above the upper mantle, forming a thick crust with a deep asthenosphere below. Only at the edge of the continental plate could there be a shallow asthenosphere. Therefore, light fluid from both the continental plate and the ocean floor plate flowed from the center of the plate to the edge. Finally, it would converge at the junction of the ocean continent plate. Where the plate bottom was higher, more asthenosphere light fluid could be gathered, and the upper and lower convection of light fluid would melt the solidified rock layer above. Once the upper solid rock layer in local position was completely melted, light fluid would be ejected upward to form a volcanic eruption. After the superfluous light fluid below erupted overall, the volcano would go into dormancy. When the light fluid below gathered too much again, the volcano would erupt again. Therefore, most volcanic eruptions were periodic.

At the plate boundary, there is often no or not enough volcanic eruption of excess light fluid. The mass accumulation of light fluid is easy to cause the rise of local areas or the subsidence of other areas. The subsidence is often accompanied by the fracture and folding of the plate edge, forming a function similar to the water retaining "dam" above the ground, which can block and accumulate the flow of light fluid. When the accumulated light fluid is too much, it can break down the "dam" and flow quickly. This kind of action will inevitably cause the fracture of the above solid rock stratum and cause the earthquake. Therefore, earthquakes also occur periodically in an areas. The Pacific Ocean is the largest, and the asthenosphere light fluid produced under the plate is the largest. Therefore, there are often strong seismic activity zones around the Pacific Ocean [17, 18].

The Indian plate drifted northward and inserted into the bottom of the hardened rock layer of the Qinghai Tibet Plateau, lifting the Qinghai Tibet Plateau upward. The bottom of the Qinghai Tibet Plateau and its surroundings are the areas where light fluid accumulates. In the south, there is the inflow of light fluid under the Indian plate. In the west, north and east, there is also the influx of light fluid under the land plate. When these light fluids flow from the surroundings to the edge of the Qinghai Tibet Plateau, they are often blocked by the "dam" formed by the edge faults. With the increase of light fluid accumulation, when the "dam" was washed down, light fluid suddenly rushed to the Qinghai Tibet Plateau. The upper hardened rock stratum on both sides of the "dam" fractured, causing an earthquake. Therefore, the surrounding areas of the Qinghai Tibet Plateau are seismically active zones. Because the asthenosphere at the bottom of the Qinghai Tibet Plateau is pushed to the bottom of the Loess Plateau in the northeast, earthquakes in the northeast are often farther from the center of the Qinghai Tibet Plateau.

Orogeny, asteroid impact and meteor shower

There have been many orogenies on the earth, and there are also many forms of orogeny. In addition to the volcanic eruption mentioned above, there are several other forms of orogeny.

Interlayer magmatic injection orogeny

The tethers that formed the ancient land were easy to break into multiple segments due to both the uneven distribution of length and the cooling. Therefore, it was often impossible for a tether to fall to the ground all at once. Because the tether magma carried the angular momentum of revolution around the sun during the cantilever period, even if the tether magma was the same, its fall could last for a long time.

In 2015, Xiaohua Chen pointed out that "since the study of orogenic belts started again in the 1970s, people have more and more clearly realized that dynamic metamorphism caused by tectonic lateral pressure far exceeds regional metamorphism. In the past, people believed that metamorphic belts were in situ, but in the study of orogenic belts, it was found that most metamorphic belts experienced long-distance displacement and appeared as nappes. [19]

When the main body of a tether fell to the ground to form an ancient land platform, a layer of calcium carbonate sedimentary rock with a thickness of tens of meters or even hundreds of meters might be formed on the platform surface, or a layer of solid granite layer with a thickness of tens of meters or even more might be formed by cooling. No matter what kind of rock layer was formed, the magma of upper mantle with higher density and high temperature melting was beneath them. In this case, when the residual tail magma flow of the tether fell from the sky to the ground, the impact force generated by the descending acceleration could break through the solidified thin rock layer on the ground, and then spread rapidly on the surface of the high-density mantle magma below. They spread and flowed around, simultaneously jacking up and breaking through the upper solid rock strata. The above solid rock stratum was characterized by fracture, bending and protrusion. The result was mountains like cypress leaves and scales. This was the formation mode of most mountains on land. Because the injected magma was an orogeny formed by spreading and flowing between the upper solid rock layer and the lower high-density magma, we call it "interlayer magma injection orogeny".

Tether landing edge sputtered into island arc

Island arcs can be found at the edges of many lands. When a tether fell to form an ancient land, island arcs were formed in the marginal area of the ancient land due to the sputtering of magma falling. The center of the island arc is where they first landed.

Plate edge collision folding into mountains

Because of the huge mass of the plate, the kinetic energy of plate movement is also huge. The collision at the edge of the plate could compress and folded the existing land mountains, forming a folded mountain range. The Himalayas in the south of the Qinghai Tibet Plateau is a typical folded mountain range.

Asteroid impact to form mountains

Both geological archaeology and lunar landing have found that a large number of asteroid impacts occurred in the early period. The so-called asteroids must be the remnants of those tethers. Most of the remaining fragments of the tether were mistaken for asteroids when they were cooled and fell to the ground. They are brothers to the rocks on the land, and most asteroid impact events are actually brothers coming home. Large fragments fall to the ground to form a crater.

Meteor shower

There are many meteor showers that can be predicted every year, such as the Geminid meteor shower, one of the three major meteor showers in the Northern Hemisphere. The Gemini meteor shower certainly does not come from Gemini. These meteor showers are also remnants of the early tether rupture. Tethers can be divided into Earth-Mars tether and Earth-Moon tether. If the Earth-Moon tether remains, its distribution should be related to the lunar phase. The distribution of meteor showers observed now is related to the position of the Earth's revolution, and should come from on the side of the aphelion. Therefore, most of them should be the remains of the Earth-Mars tether, that is, the remains of the tether fault related to the northern ancient land. There are also several tether branches related to the northern ancient land, and the residues of each may form a meteor shower belt that lasts for many years. Every tether residue is often accompanied by comets or asteroids, so people mistakenly believe that meteor showers are comet or asteroid residues. The isotopic composition of many meteorites found on the earth today is similar to that of samples from Mars. It seems that the cantilever model in this paper has been proved.

Formation of desert and clay layer

If granite lava is poured into water, it will be blasted into sand. When a large area of granitic magma slowly falls into the sea water in turn, a large area of desert will be formed [20]. The desert is certainly not formed by weathering.

The main component of granite is silica. The silico magnesian magma is mainly a mixed lava of silica and magnesium silicate. Because magnesium ions are combined into the rock structure as cations, they have a higher density than granite. The aluminosilicate magma, mainly the mixed lava of silicate and aluminate, usually has a smaller density than granite. Among them, aluminum exists in the form of aluminate. Aluminic acid is weaker than silicic acid, and its salt forming cations must be those easily soluble alkali metal or alkaline earth metal ions. When the tethered magma fell to the ground, the lowest density aluminosilicate magma must float on the top layer. When it rained, most of the alkali metals or alkaline earth metal ions were dissolved in water and taken into the sea water. The remaining insoluble aluminates and silicates formed clay [21].

A large amount of clay was transported to low-lying areas by rivers and winds, and could be accumulated into plains. If the platform at the time of formation had a higher altitude or was later raised in plate movement, a plateau might be formed.

When a large amount of aluminosilicate magma fell into seawater, clay and alkaline seawater were formed in the same chemical reaction and manner. Alkaline seawater was neutralized by later carbon dioxide to form calcium carbonate sedimentary rocks. Today we can only see almost neutral sea water, a large amount of clay on the land and the widespread limestone mountains. Low density decomposable aluminosilicate rocks have long been absent. But it must have existed in the early days. Without it, the land would be terrible, and terrestrial organisms would be difficult to evolve and survive.

Gravity polarization is the cause of geomagnetic field and lightning

The mass of an atom is mainly concentrated in the nucleus, with only a small proportion of electrons in the outer layer. Each atom constituting the earth is affected by the gravity. The atomic nucleus is always shifted downward, and the outer electrons are always pushed upward, resulting in that the center of mass of each atom cannot completely coincide with its center of charge. This phenomenon of atomic polarity caused by gravity is called atomic gravitational polarization.

Although the gravitational polarization effect of atoms is very weak, even a single atom or a small number of atoms have no measurable physical effects, the accumulation of such effects, such as from the center of the earth to the ground, is quite large for the whole earth. As a result, the earth's core is positively charged, and the asthenosphere and lithosphere above the mantle are negatively charged. The outer layer of negative electricity generates annular current with the rotation of the earth, and the annular current generates magnetic field [22], which is called geomagnetic field.

Since the Earth's axis of rotation has not been in the center of the Earth since the time of the tumbler, the density distribution of the Earth's core has always been eccentric. Therefore, the magnetic poles of the earth do not coincide with the geographical poles very well. In addition, there is differential rotation between the crust and the core, so the pole shift of the geomagnetic pole occurs.

The plate drift, especially the plate drift close to the polar region, can easily cause confusion in the magnetic pole records in rocks, and even give people the illusion that the magnetic poles have been turned over. However, the knowledge of the current planetary magnetic pole direction and rotation direction, as well as the understanding of the sun's rotation direction and its magnetic pole direction, are completely consistent with the gravity polarization model.

There is an ionosphere in the outer layer of the atmosphere, and the stability of the ionosphere depends entirely on the gravitational polarization of the atmosphere. If there was no gravitational polarization, the ionized atomic nucleus and electrons would immediately reconstitute into atoms.

When the summer storm comes, the clouds roll up and down. The small water droplets in the cloud are gravity polarized. In the violent up and down movement, the positively charged water droplets gradually sink to the bottom of the cloud layer, and the negatively charged water droplets gradually rise to the upper surface of the cloud layer. When the bottom of an upper cloud layer meets the upper surface of another lower cloud layer, a discharge is generated, that is, the lightning we see [23].

Regression year, stellar year and precession

In Chinese, "nian (年)" and "sui (岁)" are synonyms, and the difference between the regression year and the stellar year is called "precession (岁差)". In 2011, Mr. Jinjia Wang put forward a good idea to explain precession. He believed that the differential rotation between the crust and the mantle was the cause of precession [24]. However, he still made the same mistake as the current textbook, believing that the Earth revolution is just 360 degrees around the sun in a stellar year, while in a regression year, Earth revolution is less than 360 degrees. I pointed out this mistake in 2017[25]. In my opinion, the regression year is marked by the earth's tilt axis, which measures the period of the earth's center revolving around the sun, that is, the length of the regression year. A stellar year is the length of a period measured, which is marked by a certain star around it.

Due to the differential rotation of the Earth's interior, the crust rotates more slowly than the Earth's axis. When the axis or center of the Earth completes a regression year cycle, observers on the ground will have to see their star markers later. Therefore, the stellar year is longer than the regression year. Obviously, in a regression year, the Earth revolution (marked by the geocenter or axis) just is 360 degrees around the sun [26]. However, due to the delay or westward movement of the observer's ground position, when he sees the star sign again, the Earth has turned $360°+\Delta°$. Therefore, each stellar year is $(\Delta/360)$ years longer than the regression year. After $(360/\Delta)$ years, the stellar year and the regression year complete a precession cycle, and the influence of the previous precession cycle is eliminated.

Obviously, the stellar year does not affect the length of the regression year, nor does the precession affect the calendar era based on the regression year. Our ancestors have long learned to determine the length of a regression year by measurement of a rod and its shadow. It is helpful for the determination of the four seasons in a year or the 24 solar terms in a year to mark by stars [26W], but it cannot be used as the standard of calendar era.

Conclusion

This paper involves many disciplines such as astronomy, geography, geology, physics and chemistry, and integrates important astronomical events with important geographical and geological research. It has broken through the constraints of the current basic theory in many places, so it is inevitable to cause controversy in the academic community. However, since the author first established the cantilever fracture model a few years ago, the general idea and almost all astronomical, geographical and geological events involved by the author can be logically connected and consistent. Therefore, the author believes that the overall idea of this model is correct.

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