The model and initial data used for calculations: In each calculation variant, migration of 250 bodies ejected from the Earth was studied for the same values of an ejection angle $i_{ej}$ (measured from the surface plane), a velocity $v_{esc}$ of ejection, and a time step $t_s$ of integration. The bodies started their motion at the height of 10 km from the point of Earth’s surface located most far from the Sun. In different variants, the values of $v_{esc}$ equaled to 30°, 45°, or 60°, and $v_{esc}$ equaled to 11.22, 12, 12.7 or 16.4 km/s. The symplectic code from the SWIFT integration package [1] was used for integration of the motion equations with $t_s$ equal to 1, 2, 5, or 10 days. The gravitational influence of the Sun and all eight planets was taken into account. Bodies that collided with planets or the Sun or reached 2000 AU from the Sun were excluded from integration. The motion of bodies was studied during dynamical lifetime $T_{end}$ of all bodies which was about 200-350 Myr. The probabilities of collisions of bodies with the Moon were calculated based on the arrays of orbital elements of migrated bodies (stored with a step of 500 years) similar to [2].

Calculations with different values of an integration time step: Most of calculations were made with a step $t_s$ equal to 10 days. The motion of considered bodies is chaotic due to close encounters of bodies with planets. Therefore, the probabilities of collisions of bodies with planets are different for integrations with a different time step and for close initial data. Calculations with smaller values of a time step (equalled to 1, 2, and 5 days), made for $v_{esc}=11.22$ km/s and $i_{ej}=30°$ or $i_{ej}=45°$, and at $v_{esc}=12.7$ km/s and $i_{ej}=45°$, showed that the probabilities of collisions of considered bodies with the Earth, the Sun, Mercury and Mars and of ejection into hyperbolic orbits obtained at $t_s=10^4$ are similar to those obtained at smaller $t_s$. However, the ratio of the probability $p_E$ of a collision of a body with Venus at $t_s=10^4$ to that at smaller $t_s$ was in the range from 1.2 to 1.8 at a time interval $T=10$ Myr and from 1 to 1.2 at $T=100$ Myr.

Probabilities of collisions of bodies with the Earth: The fraction $p_E$ of bodies collided with the Earth during the first million years was about 0.01-0.02 at $v_{esc}$ equal to 11.22 and 12 km/s, and it equaled to 0.004 at $v_{esc}=16.4$ km/s. For $T=10$ Myr, $p_E$ was about 0.056-0.12 at $v_{esc}$ equal to 11.22, 12 and 12.7 km/s, and was in the range 0.02-0.05 at $v_{esc}=16.4$ km/s. For $T=10$ Myr, the ratio of the values of $p_E$ at $i_{ej}=45°$ to the values at $i_{ej}=30°$ was mainly greater at greater $v_{esc}$ and varied between 1.2 and 2.4. At $i_{ej}=60°$ the value of $p_E$ was mainly not smaller than that at $i_{ej}=45°$. For $T=100$ Myr and at $T=T_{end}$, the values of $p_E$ were typically greater by a factor of 1.5-2 than at $T=10$ Myr, and were in the range 0.1-0.2. In total for the considered calculations, about 16% of bodies fall back onto the Earth during $T_{end}$. The values of $p_E$ at $T=T_{end}$ usually exceeded the values of $p_E$ at $T=100$ Myr by less than a factor of 1.1.

Probabilities of ejection of bodies and of collisions of bodies with other planets and with the Sun: After 100 Myr less than 10% of bodies were left in elliptical orbits. The fraction $p_{ej}$ of bodies ejected into hyperbolic orbits during a whole considered time interval $T_{end}$ did not exceed 0.1, exclusive for $v_{esc}=16.4$ km/s and $i_{ej}=30°$ (with $p_{ej}=0.26$). At $v_{esc}=16.4$ km/s $p_{ej}$ was greater for $i_{ej}=30°$ than for $i_{ej}=45°$ and $i_{ej}=60°$. The values of $p_{ej}$ were mainly greater for greater $v_{esc}$. The fraction $p_{esc}$ of bodies collided with the Sun was between 0.34 and 0.49. The probability of a collision of a body with Mercury was between 0.036 and 0.08, and the probability of a collision with Mars did not exceed 0.024. The probability $p_V$ of a collision of a body with Venus was about 0.2-0.25.

Discussion on the growth of the Moon embryo: The ratio of probabilities of collisions of bodies with the Earth and the Moon was mainly about 20-30, and the values of the probability with the Moon were often about 0.006. In my calculations of the ejection of bodies from the Earth, I considered bodies that left the Hill’s sphere of the Earth and moved in heliocentric orbits. At some collisions, the mass of the Moon could not increase due to ejection of material. With the present orbit of the Moon, the probability of collisions of the ejected bodies with the Moon was even less for the bodies that did not leave the Hill’s sphere of the Earth than for the bodies that moved in heliocentric orbits. Bodies ejected from the Earth could participate in the formation of the outer layers of the Moon. In order to contain the present fraction of iron, the Moon had to accumulated the main fraction of its mass from the mantle of the Earth [3]. Bodies ejected from the Earth and fallen onto the Moon embryo in its present orbit probably were not enough for the growth of the Moon from a small embryo. So formation of a large Moon embryo close to the Earth is preferred.

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