Information-losing mutations in genes coding for such imprinting recognition proteins may be a better mechanism to help explain rapid speciation after the Flood within a Genesis creation model (e.g. dog kind giving rise to coyotes, wolves, etc.).

It is important to note that speciation occurs via the sorting out or loss of pre-existing genetic information, and not the particle-to-people evolution proposed by evolutionists, which requires the generation of *new* information.

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Very rapid emplacement of Columbia River basalts in non-turbulent flow

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Flood basalts, sometimes extending over 100,000 km^2 and a few kilometres thick, are found in many areas of the world.[1] There are no modern analogs for such continental flood basalts, and the origin and emplacement of the lava is poorly understood.[2] The most studied flood basalt is the Columbia River Basalt Group (CRBG) in eastern Washington, northern Oregon, and western Idaho, USA. The CRBG is composed of about 300 remarkably homogeneous flows, a few as large as 2000 km^3. Although many believe that most of the basalts erupted over 2.5 million years, a number of researchers found evidence for rapid emplacement of each flow — of the order of days to a week or two.[3]

Recently, some scientists have attempted to slow this emplacement time to months or years.[4] For instance, Thordarson and Self,[5] and Self *et al;*[6] claim that the 1300 km^3 Roza Flow of the CRBG would have been emplaced in 5 to 15 years based mainly on finding what they believe are pahoehoe (ropy) lava lobes at the base and top of many CRBG flows. However, Anita Ho and Katharine Cashman challenge this claim by quantitative evidence for very rapid emplacement.[7]

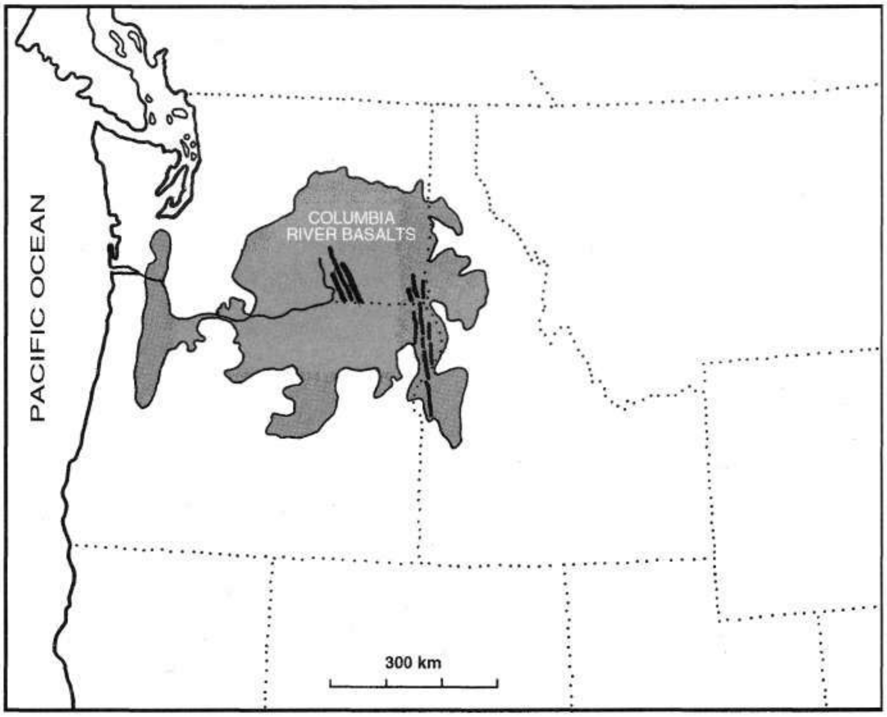
Ho and Cashman used a 'geothermometer', based on the MgO content of volcanic glass, to measure the cooling of the 1600 km^3 Ginkgo Flow of the CRBG along its 500 km flow path. The flow cooled only 10 to 20 °C over 500 km — a rate of only 0.02 to 0.04 °C/km! This compares to a cooling rate of 1 to 4.5 °C/km measured on Hawaiian áá [rough, jagged] flows and 0.6 to 1.0 °C/km observed in active Kilauea lava tubes.[8] The extremely low cooling rate of the Ginkgo Flow suggests two possibilities: 1) the flow was extraordinarily rapid, or 2) transport was extremely thermally efficient. Ho and Cashman choose the latter because of the great thickness of the flow. Both could be correct.[9]

Ho and Cashman also calculated a range of flow viscosities of the Ginkgo Flow based on the observed crystallinity of 10-20% and the slight temperature change with distance. From these calculations, they deduce that flow must have been laminar, otherwise turbulence would have caused a much greater heat loss due to a higher exposed surface area. In laminar flow, the calculated viscosities resulted in a flow velocity of 1-8 m/s, which represents a total emplacement time of 18 hours to 6 days for the Ginkgo Flow. However, these estimates are based on their highest calculated viscosity, which is three times their lowest estimate. There are also other factors that would allow a higher flow velocity, such as the presence of bubbles. So flow velocity could be significantly faster than 8 m/s. If the Ginkgo flow was extruded in 1 day and this rate continued, the whole CRBG could be emplaced in as little as 100 days.

Ho and Cashman, unable to shake their uniformitarian bias, suggest that emplacement could have been either by fast laminar flow under an insulating crust or by a slower, inflating flow. The latter is similar to flows observed on Hawaii but seems incongruous with the quantitative data presented. Laminar flow under an insulating crust requires a crust that rapidly cools, but how can a 30-70 m thick lava creep slowly enough for an insulating crust to form, when the evidence indicates rapid flow? It seems more likely that emplacement was very rapid and non-turbulent.

There are still a number of mysteries associated with flood basalts. In a catastrophic flood model for the CRBG, which I advocate, a few more variables come into play during rapid emplacement. These include the presence of water above each flow and the hydrostatic pressure of the water. Water would rapidly cool the top of each flow, allowing another flow to be emplaced quickly on top. Rapid surface cooling also cracks the lava and allows water to penetrate into the interior of the lava flow for further cooling.[10] I have previously analyzed the evidence for subaerial emplacement and now opt for a submarine mechanism during the Flood,[11] in contrast to Paul Garner who believes that the flood basalts were subaerially emplaced after the Flood.[12] Creationist geologist, Harold Coffin, who lives in the area of the CRBG, also favors a rapid submarine origin of the CRBG.[13] He bases his conclusions on four main observations: 1) massive, high energy sediments below, between, and above the basalt flows that require much water; 2) the presence of sponge spicules and diatoms between and **above** the flows; 3) abundant water reaction products; and 4) most flows are below present sea level.

Submarine eruption and flow of flood basalt would also eliminate the problem of a 'volcanic winter' that would otherwise be caused by these flows — a problem described by Garner.[14] A volcanic winter is caused when volcanic aerosols in the stratosphere reflect a significant portion of the solar radiation back to space so that much of the earth quickly drops to freezing or below, even in summer. Thordarson and Self calculate that enough SO_2 would be injected into the stratosphere by the '10 year Roza Flow' to cause a severe volcanic winter lasting a decade or more![15] Remember that the Roza Flow is just one out of about 300 flows in the CRBG, and that the CRBG is one of about ten large continental flood basalt provinces on the earth. If these flood basalts were erupted after the Genesis Flood, severe volcanic winter would be the **norm,** a problem pointed out by Roy Holt.[16] However, flood basalts are not a problem for a Flood model in which the Flood/post-Flood boundary is after the 'Miocene', since the CRBG, the youngest flood basalts within the uniformitarian timescale, are dated as Miocene.



Extent of Columbia River Plateau basalts in the north-western USA. The subparallel heavy lines show the location and orientation of known swarms of feeder dykes for the basalt flows (after Philpots).[16]

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