It’s time to go again to the A Moment of Science mailbag. A listener writes:  
Dear A Moment of Science,  
I know that carbon is key to life on earth. But was carbon there from the beginning, when the planet formed? Or did it come from some other source?  
Yours from the dawn of time,  
What Came First

现在是时候再去A When of Science mailbag了。一位听众写道：  
亲爱的科学片刻，  
我知道碳是地球上生命的关键。但是，当行星形成时，碳是从那里开始的吗？或者它来自其他一些来源？  
从你的时间开始，  
你的第一个是什么

### Dear What Came First, Great question. According to a leading idea, known as the Late Veneer Hypothesis, the Earth mostly lacked volatile elements when it first formed. Volatile elements are those that have low boiling points, such as sulfur, nitrogen, hydrogen, and, yes, carbon. 我们的回应

亲爱的首先，  
好问题。根据一个被称为晚期单板假设的主要思想，地球在最初形成时大多缺乏挥发性元素。挥发性元素是具有低沸点的元素，例如硫，氮，氢，以及碳。

The hypothesis also contends that those elements were added later, from meteorites and comets that fell to Earth. But we haven’t yet found meteorites that contain the right proportions of those elements to account for their distribution in the Earth’s crust and mantle. 该假设还认为，这些元素后来被添加到陨石和坠落到地球的彗星中。但是我们还没有发现陨石含有正确比例的这些元素来说明它们在地壳和地幔中的分布。Scientists at the Guangzhou Institute of Geochemistry and at Rice University simulated the high‑pressure, high‑temperature environment deep inside the Earth and similar planets. 广州地球化学研究所和莱斯大学的科学家模拟了地球深处和类似行星的高压高温环境。And the simulation suggested an intriguing possibility: that early in the Earth’s history, our planet collided with and absorbed a small, planet‑like body. The core of the smaller planet could have fused with the Earth’s core, while the smaller planet’s carbon‑rich crust and mantle could have been distributed throughout the Earth’s upper layers. 模拟提出了一个有趣的可能性：在地球历史的早期，我们的行星与一个类似行星的小体相撞并吸收。较小行星的核心可能与地球核心融合，而较小行星的富含碳的地壳和地幔可能分布在整个地球的上层。But wouldn’t such a large collision have destroyed both bodies?

Not necessarily. After all, computer simulations have shown how the moon may have formed when a Mars‑like planet collided with Earth and threw debris into orbit around our planet.

但这样的大碰撞会不会摧毁这两个尸体？

不必要。毕竟，计算机模拟已经显示了当一颗类似火星的行星与地球相撞并将碎片扔进我们星球周围的轨道时，月球是如何形成的。