# The Cambrian Explosion

1. The geologic timescale is marked by significant geologic and biological events, including the origin of Earth about 4.6 billion years ago, the origin of life about 3.5billion years ago, the origin of eukaryotic life-forms (living things that have cells with true nuclei) about 1.5billion years ago, and the origin of animals about 0.6 billion years ago. The last event marks the beginning of the Cambrian period. Animals originated relatively late in the history of Earth-in only the last 10 percent of Earth's history. During a geologically brief 100-million-year period, all modern animal groups (along with other animals that are now extinct) evolved. This rapid origin and diversification of animals is often referred to as "the Cambrian explosion."

Translation:重要的地理和生物事件划分了地理的时间尺度，包括46亿年前的地球诞生，35亿年前生命的起源，15亿年前的细胞生物出现，以及~~6000万~~6亿年前动物的出生。最近一次事件的起始是寒武纪时期。动物出现的时间和地球的历史比起来是很对较迟的，动物的起源相对于相处与地球历史的晚期，只有地球历史的10%，在短短的~~一千万~~一亿年短暂的时间里，所有现代的动物种类（~~以现在其他已存的动物~~包括现在已经灭绝的动物）都在进化。

Scientists have asked important questions about this explosion for more than a century. Why did it occur so late in the history of Earth? The origin of multicellular forms of life seems a relatively simple step compared to the origin of life itself. Why does the fossil record not document the series of evolutionary changes during the evolution of animals? Why did animal life evolve so quickly? Paleontologists continue to search the fossil record for answers to these questions.

翻译：~~关于这次超过一个世纪的爆发，科学家们提出了一个重要的问题：在地球的历史中，~~一个多世纪以来，科学家们对这次大爆炸一直有疑问。为什么会发生的如此之迟。相对于生命的起源来说，多细胞~~生命形成的起源~~生命的出现似乎是一个相对简单的一步。为什么化石纪录在动物的进化过程中没有记录下这一系列的进化变化？为什么动物生命会变化的如此之快？古生物学家为了回答这个问题继续调查化石记录。

One interpretation regarding the absence of fossils during this important 100-million-year period is that early animals were soft bodied and simply did not fossilize. Fossilization of soft-bodied animals is less likely than fossilization of hard-bodied animals, but it does occur. Conditions that promote fossilization of soft-bodied animals include very rapid covering by sediments that create an environment that discourages decomposition. In fact, fossil beds containing soft-bodied animals have been known for many years.

翻译：关于在这重要的一亿年内~~这些~~化石的缺失，有一个解释是~~在这重要的一百万年的时间里，~~早期动物是软体，所以不能简单的化石化 他们很难形成化石。软体动物的化石化比硬体动物的化石形成要少很多，但是它也是可以发生的。提高软体动物化石化的条件包括沉淀物快速覆盖创造一个不易分解的环境，事实上，化石层包含了软体动物这个事情广为人知已经很多年了。

sediment：沉积物

discourage:阻拦

decomposition:分解

The Ediacara fossil formation, which contains the oldest known animal fossils, consists exclusively of soft-bodied forms. Although named after a site in Australia, the Ediacara formation is worldwide in distribution and dates to Precambrian times. This 700-million-year-old formation gives few clues to the origins of modern animals, however, because paleontologists believe it represents an evolutionary experiment that failed. It contains no ancestors of modern animal groups.

翻译：为人所指的最古老的动物化石就是Ed化石，它的形成就是由软体动物的所构成的。尽然他是以澳大利亚的一个地名命名的，但是它的形成范围是遍布全世界的，~~时间都是在~~而且时间可以追溯到Precambrian时代里。这种7亿年的~~结构~~形成的地层几乎不能给现在动物的起源提供线索了，但是，因为XX学家相信它代表了一种失败的进化实验过程。~~它包含了那群没有现代动物群体的祖先~~，它并没有包含现代动物的祖先。

formation：构成

A slightly younger fossil formation containing animal remains is the Tommotian formation, named after a locale in Russia. It dates to the very early Cambrian period, and it also contains only soft-bodied forms. At one time, the animals present in these fossil beds were assigned to various modern animal groups, but most paleontologists now agree that all Tommotian fossils represent unique body forms that arose in the early Cambrian period and disappeared before the end of the period, leaving no descendants in modern animal groups.

+ 翻译：

包括了~~剩下~~动物残骸并且形成时间稍微近一点的化石形式是Tommo形成，它是以俄罗斯的一个地名来命名的。它的形成时间在Cam时期的早期，而且它只包含了软体组织的动物。同一时间，这些化石床里存在的动物样本在各个现代动物群落中都有分配体现，但是绝大部分的pale学家现在都认为所有的Tommo化石代表独一无二的动物种类，这些种类在Cam时代的早期呈现数量爆发并且在这个时代的末期消亡，没有在现代动物群组中留下后代。

+ A third fossil formation containing both soft-bodied and hard-bodied animals provides evidence of the result of the Cambrian explosion. This fossil formation, called the Burgess Shale, is in Yoho National Park in the Canadian Rocky Mountains of British Columbia. Shortly after the Cambrian explosion, mud slides rapidly buried thousands of marine animals under conditions that favored fossilization. These fossil beds provide evidence of about 33 modern animal groups, plus about 20 other animal body forms that are so different from any modern animals that they cannot be assigned to any one of the modern groups. These unassignable animals include a large swimming predator called Anomalocaris and a soft-bodied animal called Wiwaxia, which ate detritus or algae. The Burgess Shale formation also has fossils of many extinct representatives of modern animal groups. For example, a well-known Burgess Shale animal called Sidneyia is a representative of a previously unknown group of arthropods (a category of animals that includes insects, spiders, mites, and crabs).

+ 翻译：

包含了软体动物和硬体动物的第三种化石种类为Cam大爆炸的结果提供了证据。这种化石形成被叫做BS，BS是英国的一个山脉名称。在短短的Camda大爆炸之后，泥土很快的埋葬了千百种海洋动物的尸体，这种环境非常适合化石化。这些化石床提供了33种现代动物的证据，再加上20种其他动物身体形状，这些动物不同于现代任何动物,并且这些动物也没有被分类到任何现在动物群组种。这些没有被归类的动物，包括一个大型水生动物祖先，被叫做Anoma，和一个叫做Wuwa的软体动物，他们的食谱是岩屑和海藻。BS形成物也有很多现在已经灭绝的现代动物群组。~~很有现代动物群组非常有代表性的化石~~。比如一个非常有名BS动物被叫做Sidn,Sidn就是一种以前很鲜为人知的生物种类；

+ 单词

1. mud：泥淖

2. slider：滑块

3. marine：海洋的

4. detritus：岩屑，碎石

5. algae：水藻

+ Fossil formations like the Burgess Shale show that evolution cannot always be thought of as a slow progression. The Cambrian explosion involved rapid evolutionary diversification, followed by the extinction of many unique animals. Why was this evolution so rapid? No one really knows. Many zoologists believe that it was because so many ecological niches were available with virtually no competition from existing species. Will zoologists ever know the evolutionary sequences in the Cambrian explosion? Perhaps another ancient fossil bed of soft-bodied animals from 600-million-year-old seas is awaiting discovery.

+ 翻译：像BS这种化石的形成就表明进化并不总是一种被认为很缓慢的过程。Cam大爆炸就是一种非常快的进化分类，跟接着就是很多独特的动物的灭绝。为什么这种进化会如此之快呢，没有人知道。很多动物学家认为这是因为存在的物种没有很严重的竞争，这种生态环境在可以实现。动物学家知道Cam大爆炸的进化序列吗？可能其他的6亿年海洋的软体动物古老的化石床在等待~~研究~~发现。

+ 单词：

1. ecological：生态的

2. niche：舒适或者称心的工作，商机