

A Gathering of Old Fossils : How and why the dinosaurs died out

by Allen Thurston, Faculty of Education and Social Work, University of Dundee

Approximately 70 million years ago a catastrophic event took place on Earth that resulted in the mass extinction of numerous species of dinosaurs. We know this because we find lots of dinosaur fossils prior to this date and then very few after this date. Do you have a preferred hypothesis on why the dinosaurs became extinct? Numerous researchers have developed theories on the extinction of the dinosaurs. There are a number of theories.

The debate about why the dinosaurs died out took a leap forward in the early eighties. In 1980 physicist Luis Alvarez and his son, geologist Walter Alvarez, both of the University of California, were working together on a geology expedition in Italy (pictured left).

They accidentally discovered a band of sedimentary rock that contained unusually high levels of a rare element, iridium. Chemical dating techniques put the rock at around 65 million years old. Coincidentally - or not, that is around the time the dinosaurs died out (Alvarez et al, 1980).

The research team hypothesised that the iridium, which was in a very even, widespread distribution (not just in Italy), was the result of a giant asteroid that hit Earth, sending smoke, dust, and iridium into the atmosphere. That smokescreen blocked the sun, lowering the earth's temperature, killing plants (but not seeds or roots), and eventually many species of animals, including dinosaurs. The plant-eaters died out first, followed by the meat-eaters that would have eaten them. Smaller mammals and birds could survive the cold, desolate period because of their fur, feathers, and ability to eat seeds, roots, and decaying vegetation. The pollution eventually settled to the ground, forming a thin layer of iridium. This theory became the one accepted scientific community and passed into popular culture as being the definitive truth. However even today the theory is still subject to debate (Rincon, 2004).

Luis Alvarez was an extraordinary man. He worked developing the first atomic bomb at the end of WW2. He was actually on the *Enola Gay* when it dropped the bomb on Hiroshima. There are many reports of how sickened he was by the product of his efforts. He assisted the Warren Commission that investigated the assassination of President Kennedy. He died of cancer in 1988 (WGHB, 1998).

Activity = Activité

Work in group of 6. Your group should examine the theories of why the dinosaurs died out. Report back to the rest of the room your collective group theory on why you think the dinosaurs died out.

Mettez-vous en groupe de 6. Votre groupe doit passer en revue les différentes théories expliquant l'extinction des dinosaures. Vous devrez ensuite expliquer au reste de vos camarades la théorie choisie par votre groupe et pourquoi. http://www.bbc.co.uk/sn/prehistoric_life/dinosaurs/



Read about the rise and fall of the dinosaurs. Does it surprise you to find out that dinosaurs were going extinct over millions of years and there was more than one extinction?

Lisez le texte sur l'apparition et le déclin des dinosaures. Etes-vous surpris de constater que l'extinction des dinosaures s'est déroulée sur plusieurs millions d'années et qu'il y a eu plus d'une extinction ?

This will probably be different to any theory you have come across up to now. After reading the theory do you think it is plausible?

Cette théorie est probablement différente de toutes celles que vous avez pu entendre jusqu'à présent. Après l'avoir lue, vous semble-t-elle plausible ?

This site will summarise the main theories. Does it surprise you to find more than one theory?

Ce site résume les théories principales. Etes-vous surpris de constater qu'il existe plus d'une théorie ?

Réflexion :

- 'Those who do not learn the lessons of History are destined to re-live it' is a phrase often used in relation to the Social Subjects. Are there lessons to learn from the story of the dinosaurs? If so, what are they? Do you think that Alvarez's switch from developing weapons of mass destruction to investigating extinction events was co-incidental or could the two be related?"

Ceux qui ne tirent pas les leçons de l'histoire sont destinés à en subir à nouveau les conséquences". Cette expression est souvent employée en relation avec l'étude des Sciences sociales. Peut-on tirer des leçons de l'histoire des dinosaures ? Pensez-vous que le fait qu'Alvarez soit passé du développement de la bombe atomique à la recherche sur l'extinction des dinosaures soit une coïncidence ou les deux sujets peuvent-ils être liés ?

- What implications does the examination of the science surrounding the theories relating to the extinction of the dinosaurs have for us as science educators?

We need to remember that science is fallible and that scientists themselves are human and not necessarily objective, analytical automatons. On wider issues when getting children to engage in scientific debate we need to get them to keep open minds on scientific issues so they remain critical readers of scientific 'fact'. In the classroom our science teaching should open up issues to scrutiny and debate and thus equip children with the scientific skills to critically examine and debate life issues that may affect them in their lifetime such as MMR, BSE, GM Crops.

Quelles implications l'étude des théories sur la disparition des dinosaures peut-elle avoir pour nous éducateurs scientifiques ? Nous devons nous souvenir que la science n'est pas infaillible et que les scientifiques eux-mêmes sont des humains et non des automates objectifs et analytiques. De manière plus générale, lorsque l'on engage les jeunes dans un débat scientifique, on doit s'assurer qu'ils gardent un regard ouvert et critique face au « fait » scientifique. Dans la classe, l'enseignement scientifique doit être l'occasion d'examiner et de débattre de problèmes de société auxquels les jeunes peuvent être confrontés durant leur vie tels que le vaccin ROR, l'encéphalopathie spongiforme bovine (« maladie de la vache folle ») ou les cultures génétiquement modifiées.

References :

- Alvarez, L. W., Alvarez, W., Asaro, F., and Michel, H. V., 1980, Extraterrestrial cause for the Cretaceous-Tertiary extinction: Science, v. 208, p. 1095-1108
- Rincon, P. (2004) Dinosaur Impact Theory Challenged.
- WGBH (1998) Louis Alvarez 1911-1998.