

Resource Reviews

Carbon – The Unauthorised Biography

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Presented By: Genepool Productions and Handful of Films

Information : <https://www.thecarbonmovie.com>

Audience: General interest



On the first viewing of the film, *Carbon – The Unauthorised Biography*, I felt irritation at the anthropomorphism revealed in referring to the carbon atom as 'she' and of giving the carbon atom feelings throughout the film. The co-directors of the film are Daniella Ortega and Niobe Thompson with Daniella Ortega also being the writer. Ortega traces the genesis of the film to the short story by Primo Levi, whose wonderful book I reviewed many years ago (Palmer, 1988, pp. 91–92). A more modern book on carbon, *Carbon: One atom's odyssey*, starts carbon's history at the big bang (Palmer, 2021, p. 33) and updates Levi's classic work. I read Ortega's explanation for this decision to personify the carbon atom (Filmfreeway, 2022) and found it unconvincing as a scientist, but this issue should not cloud the usefulness of this film.

I then viewed the film more slowly, concentrating on the details, which proved more satisfying. The film is 90 minutes long and is the product of a co-operation between many different science support groups and film production companies including the Canadian Broadcasting Company (CBC) and the Australian Broadcasting Company (ABC). The main and additional intended outcomes are listed (URL: Documentary Australia). There appear to be none of the world's chemical societies listed as being directly involved in the film's production,

which is surprising. The film has been screened in Canada and will be screened in Australia soon. There is already considerable online comment about the film. Filmfreeway states that 'This film aims to break down the barriers by exploring carbon as an element, and as a character, giving people a neutral space to reopen the discussion [about climate change]'. This is a worthy intention, but difficult to achieve in practice.

In the film, Sara Snook speaks as the carbon atom. Dr Neil Degrasse Tyson, an astrophysicist and science communicator, and more than a dozen well-known scientists from different scientific fields offer their expert opinions about carbon. To tie the science together with human reality, we are introduced to a human family consisting of parents, a young girl and an unborn child, whose birth is shown in the final section of the film. There is also an introductory sequence where strange statements are made, such as 'We live in a carbon world; we have to learn how to get along with carbon.' One wonders what this statement means.

The story starts at the big bang. After the big bang, the first elements to exist were hydrogen and helium and they formed the first stars. Within these stars, new elements, such as carbon, were created. Carbon is created by

two helium atoms initially forming a beryllium atom. Another helium atom must then strike the beryllium atom immediately it is formed to create a carbon atom. Eventually those first stars died, and carbon and other new elements were then available to form new stars and planets. Carbon was amongst the most abundant of these new elements.

Information is then provided about the electronic structure of carbon and its capacity for bonding. Prof. Martin Van Kranendonk shows evidence of the earliest examples of life, which can be seen in fossilised stromatolites from the Pilbara region of Australia going back 3.5 billion years. Dr Carin Bondar then tells of the coming of plants, followed by an explanation of photosynthesis using molecular models. The story continues by showing coal mining in a non-industrialised setting, which leads to an explanation of the way in which the coal was formed. The film refers to coal as 'ancient, buried sunlight' or 'concentrated energy' as compared to wood, which contains comparatively little energy due to the different chemical bonding. Now thirty minutes of the film have now elapsed.

'When you burn me, I return, I join you back in the realm of the living'. Two historians, David Christian and Ian Miller, introduce a historical perspective that explains that coal is still the source of most of the energy we use to produce electricity. One way in which electricity benefits humanity is allowing study after dark, which accelerates the accumulation of knowledge. They also present a recent history of warfare, showing how it has accelerated technological innovation and added the use of oil as an energy source. The terrible scenes of warfare presented show negative aspects of carbon usage. Some scenes of using carbon for human welfare, health and happiness redress the balance. From the burning of fuel obtained from crude oil to provide energy, the film moves to the capacity of carbon to allow the creation of new molecules, including polymers and plastics, which raises problems of plastic pollution.

The script then poses the question as to whether we are in control of our future or not. It explains which gases in the atmosphere are 'greenhouse gases' and how the percentage of greenhouse gases in the atmosphere has increased in recent times. It also observes that small steps can change the equilibrium. The issue of methane, a greenhouse gas trapped by the permafrost in the soil of Russia and Canada is considered. Global warming is melting the permafrost creating shallow lakes and releasing the methane. The question is whether there is a 'tipping point' after which the release of methane would no longer be controllable. Sixty minutes of the film have now elapsed.

The final section of the film attempts to tie together the disparate themes that have already been identified. What happens if the tipping point is reached? A phrase called 'hothouse earth' is named with consequences of tens of metres of sea level rise, flooding, enormous dry areas, droughts, increasingly violent storms and intense fires, with the Earth eventually becoming uninhabitable for humans. Joelle Gergis (climate scientist) and Gisele Martin (the Tla-o-qui-aht Guardian) express their joy about the wonders of nature as they see it and of their fear for the future. Phil De Luna (carbon capture scientist) also describes the workings of the Direct Air Carbon Capture Facility at Squamish, which captures 3,000 tons of carbon dioxide per year whilst mankind continues to emit 40 billion tons of carbon dioxide per year. Phil De Luna suggests increasing the capacity and numbers of carbon capture stations. The destruction of the Hazelwood coal-fired power plant in the LaTrobe Valley is shown, and its replacement by a solar power station is introduced by Andy McCarthy (solar entrepreneur). McCarthy makes the point that electricity produced by solar or wind power is now cheaper than power supplied by coal. Some of the earlier speakers then return to emphasise their main points and the film concludes with the birth of the baby that was in utero at the start of the film.

The film is worthwhile viewing, if viewed carefully. I certainly enjoyed watching it more when concentrating on sections of the film rather than watching it at a single sitting. Teachers should also consider dividing the film into parts, with discussions or prepared worksheets separating the different segments, as some students might be unable to concentrate for ninety minutes. The film was planned to be made available for schools and so should fit well with curricula generally. The most impressive feature of the film is the unity of all the scientists in believing that climate change is caused by human actions and of being determined to combat its ill-effects through urgent action.

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References

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