

outlined in detail and there is a whole chapter on the Denisovians, the species known only from the remains of its mitochondrial DNA. The modern debates are woven into an analysis of how the shape of the phylogenetic tree has been transformed, becoming steadily more ‘bushy’ and showing ever less evidence of a ‘main line’ leading toward ourselves as the ultimate goal of the process. Cohen also explains why palaeo-anthropologists have followed taxonomists in abandoning the tree model in favour of cladograms that denote degrees of resemblance without presuming to identify lines of descent.

The rest of the book follows a more standard historical format, offering surveys of how perceptions of various evolutionary models have changed through time. Misia Landau’s thesis that the theories of hominization proposed since Darwin’s time have a narrative structure analogous to folk tales and adventure stories is used to argue that these are far more than abstract phylogenetic connections. There are chapters on the decline of racist assumptions, changing ideas about the significance of skull capacity and shape, the role played by women, and the problems centred on the origin of language and the development of cultures. All contribute to emphasize the decline of a linear model of development and the roles played by ideological concerns at every point in time. There are some interesting comparisons of the different concerns shown by Continental and English-speaking scholars. These are necessarily fairly broad-brush surveys, but they are comprehensive and sophisticated. If it were translated, this would be a very useful introduction for anyone teaching a history of ideas on human origins.

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Felix Lüttge, *Auf den Spuren des Wals: Geographien des Lebens im 19. Jahrhundert*

Göttingen: Wallstein Verlag, 2020. Pp. 279. ISBN 978-3-8353-3680-3. €28.00 (hardback).

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Amongst the most famous pieces of nineteenth-century literature dwells Herman Melville’s *Moby-Dick*, a story not so much about a whale as about the obsession and fate of those hunting it. Just like Melville leading his readers through philosophical, scientific, mythological and polemic reflections about the whale, Felix Lüttge takes us on a comprehensive journey following the massive mammal in and through different media in his book *Auf den Spuren des Wals* (On the Trail of the Whale). In five wide-ranging chapters, the author manages exceedingly well to combine examples from a wide variety of interest groups and approaches to show how the whale became an epistemic, political and industrial artefact during the nineteenth century while simultaneously escaping all attempts to grasp it fully. The author shows how the whale’s habitat, its so-called ‘medium’, challenged those who wanted to catch and study it. Highlighting different protagonists, he also gives an insight into how this clash of media coined modern-day oceanography, geography and zoology as much as imperial approaches and the industrial development of the Western world.

Lüttge tells the often bloody story of the whale of the nineteenth century as a study subject shifting the perspective from the cosy libraries and clean lecture halls of elite scholars to the ocean and shores where humans often faced their boundaries. Next to newly rising cetologists, whalers were the most invested in investigating the whales. The whale was not only their prey but also a unique source of information. Thanks to their observations, whalers possessed a tacit knowledge about underwater currents and coastlines that even other sailors lacked, which could, as the case of the British post ships shows, even influence how late one received one's post from Europe. One of the well-informed whalers branded by his contemporaries an 'intelligent whaleman', Timothy Folger, a cousin of Benjamin Franklin, advised the British ships to avoid the Gulf Stream on their way to New York. That his advice was in vain only added to the stylization and fame of the American whalers, who were seen as industrious and practically minded by their countrymen. Their support of American expeditions to the South Pacific to map coastal lines made them imperial heroes hunting for the frontier not by land but by ship. As the author convincingly argues, the whale was not just a resource but also a swimming archive and a measuring tool first used by whalers and slowly recognized and adapted by geographers, oceanographers, zoologists and governments.

Studying whales was not only challenging for those who tried to do so while hunting them. Beached whales, often the only alternative to get hold of a specimen for scholars, were nearly impossible to examine in their entirety. The animal's size made it impossible to study them, and their unfortunate passing was accompanied by distorting decay. Furthermore, a beached whale was not an intimate object at the hand of the gentleman observer or professional but a public happening which, despite the best efforts of passionate scholars, soon became a funfair. Thus scholars were faced with a problem of the medium: the ocean, the medium where the whale lived and thrived, was inaccessible for humans. And the land was the wrong medium for the whale to exist. Therefore, to study a whale, it 'had to become an artefact' (p. 195). It had to be dissected and exploited by whalers who took it from its inaccessible habitat, or by hardworking handymen who cut it into manageable pieces when external circumstances had thrown it onto a beach. Since studying a whole whale was impossible, those interested in it had to literally take it apart.

Even when technological innovations in the second half of the nineteenth century opened the possibility of installing tiny parts of the ocean on land, the whale eluded human grasp. During the 1860s, ambitious entrepreneurs such as the American entertainer P.T. Barnum or the Royal Aquarium in London caught whales alive and tried to display them in giant water tanks. The attempt to make the foreign habitat and its biggest inhabitant accessible failed, however, due to the lack of knowledge of the ecology of the whale and the ocean.

The last chapter opens a new perspective on the whale as a canvas for political and philosophical ideas. Annoyed by the whale's inaccessibility and uncooperative behaviour of quickly dying in large artificial tanks, some natural philosophers such as Athénaïs and Jules Michelet eventually found that the mammal lived in the wrong habitat altogether – a failure of creation – and an invitation, as the author argues, to reflect on the issue of survival in an uninhabitable environment. Facing increasingly industrialized cities and the unhealthy air they produced, the Michelets compared the urban dwellers' dwindling health and the necessity to visit more rural places to recover, preferably close to the sea and its strong, fresh winds, with the fate of the whales dying in metropolitan aquariums.

In not only describing but convincingly analysing why the whale was a medium as well as its complex relation to the 'media' of water and land, Lüttge offers a novel approach to the animal as an epistemic object. The original perspective adds significantly to recent environmental history by connecting the different layers of knowledge production and industrial interests and shedding light on the practical aspects and challenges of the

early days of modern oceanography and marine zoology. And in all these reflections, the author still manages to describe the whale and its fate with dignity, constantly reminding us that it is not just an epistemic object but, first and foremost, a living being which escapes those who do not acknowledge that.

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Kevin McCain and Kostas Kampourakis: *What Is Scientific Knowledge? An Introduction to Contemporary Epistemology of Science*

London: Routledge, 2019. Pp. 328. ISBN 978-1-1385-7015-3. £36.99 (paperback).

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History of science and epistemology are two fundamental topics in the process of construction of scientific knowledge. Although they both look back along the timeline, the interesting question of delving into contemporary epistemology arises. This way, it is not only the pure research itself that is of interest but also the philosophical approach to it. The epistemology of science is, then, no longer a subject of study relating to the past but becomes, factually, an essential complement to the research of the present. This is where McCain and Kampourakis come in, pioneering a series of discussions that extend contemporary science beyond the experimental/theoretical moment.

What is Scientific Knowledge? An Introduction to Contemporary Epistemology of Science is, in the intentions of its authors, an introductory text to enable scholars to approach various questions from the perspective of the philosophy of science. The text both is designed from a didactic point of view and can be used as a stand-alone textbook for a course in the philosophy of science oriented towards contemporary epistemology – and as an interesting collection of different starting points for other epistemological developments, in several directions. The book presents a series of nineteen in-depth chapters divided into four key areas: ‘How is scientific knowledge generated?’ ‘What is the nature of scientific knowledge?’ ‘Does bias affect our access to scientific knowledge?’ And ‘Is scientific knowledge limited?’

The first area is concerned with investigating the processes, the people and their features through which scientific knowledge is generated; the second brings together chapters that describe what the characteristics of scientific knowledge might be; the third area deals with a particularly significant point, namely how bias can play a decisive role in the researcher and the consequent construction of scientific knowledge; and the fourth and final area investigates what limits can be placed on the path towards scientific knowledge. The structure of the text is very coherent and well organized, so that the volume can be used effectively as a whole, considering only one of the four parts, or focusing the researcher’s attention on one chapter in particular.

In the panorama of the history of science and epistemology in particular, McCain and Kampourakis’s collection constitutes an extremely interesting proposal for the