

Rehabilitating Haeckel?

A review of
*The Tragic Sense of Life:
Ernst Haeckel and
the Struggle over
Evolutionary Thought*
by Robert J. Richards
University of Chicago Press,
Chicago, IL, 2008

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German scientist Ernst Haeckel has long lived in the shadow of his suspect work on embryos—at best, sloppy; at worst, fraudulent. Haeckel has also been linked with Nazi ideology, further damaging his reputation. To creationists, Haeckel is one of the worst villains in the history of evolutionary theory. To modern Darwinists, Haeckel has become a scapegoat for what was wrong in nineteenth century versions of evolution.

But Robert J. Richards, a leading historian of science, believes that Haeckel has never received the respect he deserves as a scientist. Richards' primary goal in this intellectual biography is to rehabilitate the reputation of Haeckel. As is often the case with any attempt to completely remake the reputation of a well-known historical figure, Richards goes out on a limb and is sometimes guilty of overstating his case. Still, this biography is a serious effort and cannot be written off as hagiography.

Haeckel's life

Haeckel was born in 1834 to a respectable German family. Haeckel attended medical school but never desired to practice medicine. After graduating, he began work on his habilitation,¹ the next step toward an academic career. He took up the subject of radiolarians, microscopic

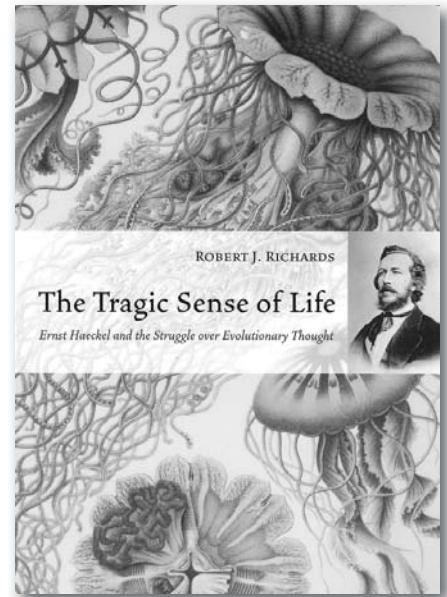
protozoa that populate the oceans in vast quantities. The monograph that resulted from his research was the first of many works on protozoa that Haeckel would write over the course of his lifetime. Richards correctly notes that Haeckel was a highly successful research scientist when judged simply by his enormous contribution to our understanding of radiolarians.

While working on his habilitation, Haeckel read Darwin's *On the Origin of Species*, newly translated into German. He was an instant convert. Haeckel was brought up in a liberal Christian culture and he had no religious reservations about embracing transmutation of species.

When Haeckel commenced his academic journey, he was deeply in love with his first cousin, Anna Sethe. They announced their engagement in 1858, just before Haeckel began his habilitation research. Haeckel completed his habilitation, was appointed to a post at the University of Jena (now Friedrich-Schiller University), and finally, in 1862, married Anna.

Haeckel was happy personally and professionally. Then tragedy struck. Haeckel's beloved wife died after an illness. The date was 16 February 1864, Ernst Haeckel's 30th birthday, the very day he learned that he had been awarded the prestigious Cothenius medal for his work on the radiolarians. Haeckel went into depression. Richards views this tragic day as a pivotal one in Haeckel's story, providing Haeckel with the "tragic sense of life" that Richards refers to in his title. Haeckel himself wrote that the death of his wife "destroyed with one blow all the remains of my earlier dualistic worldview" (p. 107).

Shortly after the death of Anna, Haeckel began his correspondence with Darwin. In his first letter, Haeckel indicated the hardening effect of the tragedy:



"Although I am only 30 years old, a terrible fate, which has destroyed my whole happiness in life, has made me mature and resolute. It has hardened me against the blame as well as the praise of men, so that I am completely untouched by external influence of any sort, and only have one goal in life, namely to work for your descent theory ..." (p. 170).

Haeckel drowned his grief in frenzied work on his massive and technical *Generelle Morphologie* (1866). In this book, he attempted to provide a definitive proof of Darwinism through arguments from morphology. This book was infused with much of the Romanticism of German science in that era. Richards is a leading expert on Romantic scientific thought, and he provides a trenchant analysis of Haeckel's place in this tradition. Many recent historians have described Haeckel as a Romantic and Darwin as a modernist. Richards does not. He makes a convincing case that Darwin and Haeckel were closer in their thinking (Darwin was more romantic and Haeckel more modern) than most historians have recognized. He believes that Haeckel understood Darwinism as accurately as Darwin did, and that Darwin himself approved of Haeckel's science.

Indeed, Darwin was so impressed with the science in Haeckel's *Generelle Morphologie* that he urged its translation into English. But Darwin thought that Haeckel's fiery rhetoric and take-no-prisoners aggressiveness did more harm than good. Haeckel himself admitted shortly thereafter that he was carried away in his zeal (and blinded to his excesses by his grief) when he wrote *Generelle Morphologie*.

Haeckel turned his attention toward writing a layman-friendly work on Darwinism, published as *Natürliche Schöpfungsgeschichte* (1868) (literally, *Natural History of Creation*). This book was wildly successful. Not only did Haeckel make the case for Darwin's theory, he also tackled the subject of human evolution head-on (several years before Darwin himself wrote on the issue).

Haeckel continued his studies on ocean creatures, but from this point on, his fame (or notoriety) was primarily tied to his stream of books, articles, and public lectures on Darwinism. Haeckel sparked controversy with

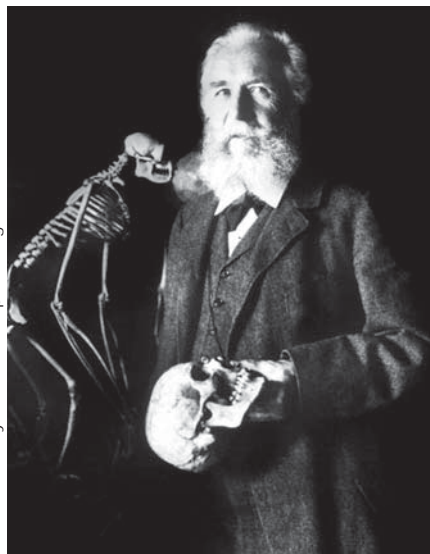


Figure 1. Ernst Haeckel was Darwin's most effective popular apostle in the late 19th and early 20th centuries.

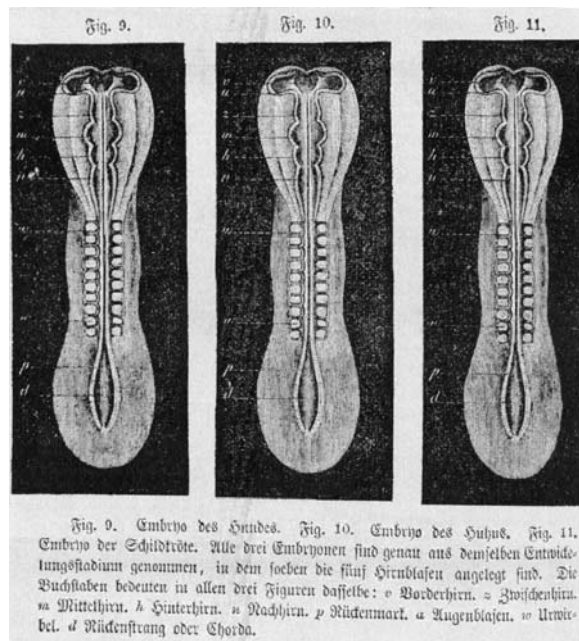


Figure 2. This woodcut was published in Haeckel's *Natürliche Schöpfungsgeschichte* (1868), purporting to illustrate the similarities between three different embryos. It was actually the same woodcut printed three times. Haeckel's sloppiness, or worse, seriously tarnished his reputation.

his increasingly strident antireligious attitude. He had acrimonious arguments with the Keplerbund, a Protestant science association, and with anyone connected with the Catholic Church, an institution for which Haeckel had a particular loathing.

As the nineteenth century turned into the twentieth, Haeckel wrote more on his philosophy of monism—mind and matter are ultimately one. Scholars trying to interpret Haeckel have seen this in different ways. Some play up the mystical side—there is an idea or 'mind' side to every material thing; others emphasize the materialistic side—mind is merely a natural outgrowth of matter. Richards interprets Haeckel plausibly enough as a materialist with throwbacks to Romanticism lingering in his thought.

In his last years, Haeckel was an ardent defender of the morality of Germany's position during the Great War. He struggled to process the defeat that he had not foreseen. Haeckel died in 1919. Through his writings, Haeckel had introduced more people to the concept of Darwinian evolution than Darwin had himself.

Haeckel and his embryos

There are two distinct sets of fraud accusations regarding Haeckel's embryo illustrations.

First is the scandal of the sandal-embryo illustration. This is largely forgotten today, but was probably the most damaging to Haeckel's own career. In the first edition of *Natürliche Schöpfungsgeschichte* (1868), Haeckel printed an illustration purporting to show three embryos at an early stage of development, the so-called 'sandal' stage. The caption read: "If you compare the young embryos of the dog, chicken, and turtle in figs. 9, 10, and 11, you won't be in a position to perceive a difference" (p. 242). The figures were actually three printings of the exact same woodcut (p. 242–243).

Richards offers a weak defense of Haeckel: he argues that Haeckel was guilty of sloppiness in illustration, but not intentional fraud (p. 333). "[H]is suggestion that the reader could use the illustrations as evidence, as opposed to devices of clarification, remained an error in judgment" (p. 243). Admittedly, it is impossible to ascertain Haeckel's intent, but Richards comes across as seriously downplaying what was, at the least, a serious 'error in judgment'.

The second controversy arose over Haeckel's illustrated lineups of embryos, still familiar from modern adaptations—different species compared at similar developmental stages. These were offered to illustrate Haeckel's 'biogenetic law': ontogeny recapitulates phylogeny.² Criticisms began during Haeckel's own lifetime, and have continued to the present. Haeckel was charged with doctoring the embryos to emphasize similarity.

Richards offers a detailed defense of Haeckel. A lengthy paper would be required to provide a detailed analysis of Haeckel's illustrations and Richards's arguments.³ For now, a few remarks will have to suffice.

Photo courtesy of www.wikipedia.org

Photo courtesy of www.wikipedia.org

Richards notes that while Haeckel did change the scale of his embryos,⁴ he did warn his readers that he had scaled the embryos to similar sizes.

Richards argues that many other differences that are seen between modern photographs and Haeckel's illustrations are within the range of legitimate 'normalization' of embryos. It was (and is) accepted practice to 'normalize' illustrations by removing the peculiar traits and markings of a particular embryo to produce a standardized depiction.⁵ Richards admits that some of Haeckel's illustrations are *double* normalized: Haeckel copied his illustrations from normalized illustrations by other authors, and Haeckel further simplified them (p. 333). This was not the best scholarly practice, but Richards contends it was forgivable, since Haeckel's books were intended to be works of popular science.

Yet normalization could never justify changing the basic proportions of the embryo to fit a preconceived pattern. Richards does not convincingly deal with the accusations that Haeckel did precisely this. For instance, while Richards discusses several papers criticizing Haeckel, by modern embryologist Michael Richardson, Richards does not so much as cite Richardson's 1995 paper, which offers a number of important criticisms of Haeckel's illustrations. In that paper, Richardson points out that Haeckel's illustrations inaccurately use "a mixture of criteria from different stages"⁶ of embryo development. Richardson criticizes Haeckel's depictions of pig, opossum,

rabbit, and human embryos (noting, among other things, fish-like features added to rabbit and human embryos).⁶ Richards does not address this, even though this is one of the most damaging accusations leveled against Haeckel.

Richards says that some other edits are tolerable instances of emphasis. An extreme example is the omission of yolk sacs in several illustrations. Sometimes the yolk sacs are more

approach is wrong—yolk sacs do play a role in morphological development, so their omission is significant.⁷ Richards does not mention this detail.)

Richards argues that Haeckel's contemporaries who criticized his drawings often did so not because of fraud, but because of different philosophical commitments about how to best illustrate nature—holding to distinct, but legitimate, bona fide, positions (pp. 306–312). As to modern criticisms, Richards contends that it is unfair to judge Haeckel by contemporary standards, with today's easy access to photography.

Richards offers a creative theory to give Haeckel the benefit of the doubt for a particular illustration of an echidna embryo. Haeckel's source showed limb buds in its illustration of the embryo; Haeckel's illustration does not. According to Richards, Haeckel needed a younger echidna than that in the source, and Haeckel deleted the limb buds to show it at the younger stage. This kind of speculation may not be the highest standard of scholarship, but it is not necessarily fraud. Yet a number of questions remain unaddressed—not least the question of what Haeckel was doing when he deleted limb buds in several other illustrations of other animal embryos.⁸ Richards does not address

this issue.

On the whole, Richards raises the bar for fraud accusations. Richards makes a good case that a number of the differences that have been used as grounds for accusing Haeckel of fraud are, at worst, scholarly sloppiness and, at best, legitimate normalization. But Richards falls short of answering all

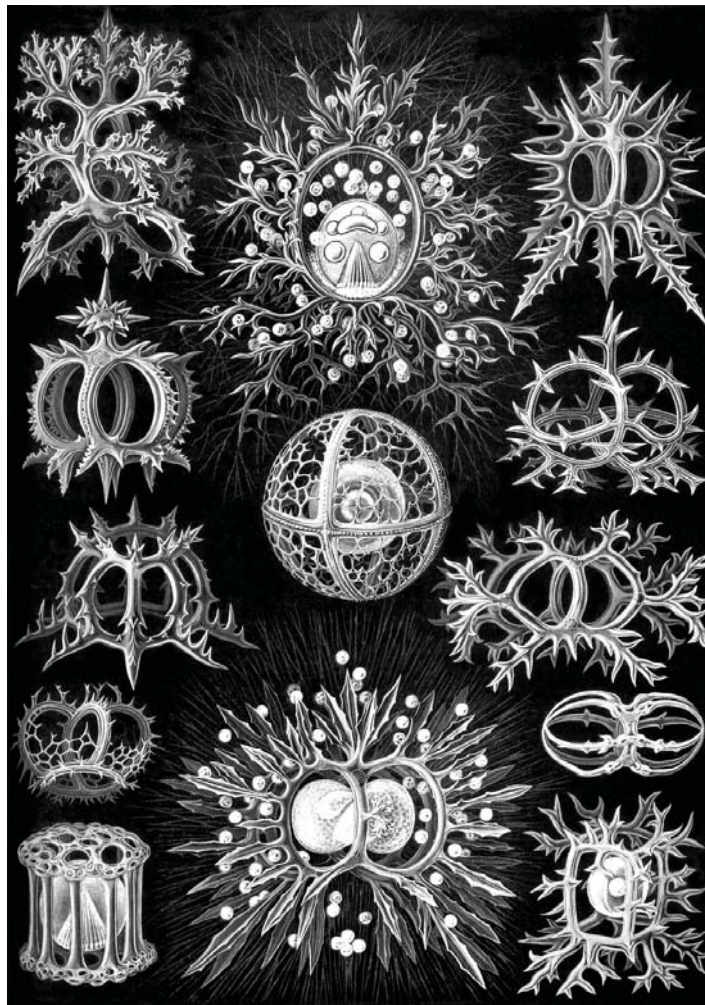


Figure 3. Haeckel's first claim to fame as a scientist was his specialty research on radiolarians. A talented artist, Haeckel lavishly illustrated his books with stunning depictions of these microscopic creatures.

drastically different among different species than are other aspects of the embryo, so Haeckel forgivably removed the yolk sacs to emphasize the similarities. Giving Haeckel the benefit of the doubt, this may not have been fraud, though it might still be biologically misleading. (Especially since the biology underlying this

Photo courtesy of www.wikipedia.org

the questions and defending Haeckel on all fronts. Whether it was intentional or not, it is still safe to say that Haeckel misrepresented aspects of the embryos he depicted.

Haeckel, Eugenics and the Nazis

The frontpiece for the first edition of *Natürliche Schöpfungsgeschichte* featured an illustration of human races aligned with species of apes. When criticized, even Haeckel had to admit that “the Australian, the Negro, and Papuan have been drawn way too pithecoïd” (pp. 225–226). Haeckel undeniably believed in a hierarchy of races. He ranked the Germans and Greco-Romans at the pinnacle of the human species (p. 245). Richards acknowledges that Haeckel was a product of his time. But Richards desires to relieve Haeckel from charges of responsibility for Nazi atrocities. To do so, Richards confronts the views of historian Daniel Gasman, who claimed that Haeckel was a virulent anti-Semite and placed Haeckel in a position of unique responsibility for Nazi ideology.

Not only does Richards deny that Haeckel was uniquely anti-Semitic, he also goes out on a limb and claims Haeckel was a philosemite. Haeckel ranked Semites highly on his racial hierarchy (pp. 245–246). Richards speculates that Haeckel was impressed with the Jewish populations he encountered on his worldwide travels. But the evidence that Richards seems to most emphasize is an interview Haeckel gave with the journalist Hermann Bahr. Richards quotes Haeckel as admiring the Jewish community as an important element of German culture. Richards does not mention that Haeckel also talked about one of his students, who was a staunch anti-Semite, and admitted that he gave credence to some of his student’s views.⁹ It seems that Richards went a bit too far in trying to remake Haeckel’s racial views.

Curiously, Richards allocates only a few lines to engaging Haeckel’s

views on eugenics. He mentions briefly that Haeckel admired the American Indians and the ancient Spartans for killing the unfit (pp. 231, 504).¹⁰ Richards writes “one might have a hard time distinguishing between our contemporary tolerance for therapeutic abortion and his own more primitive solution to the problems of debilitating and degrading chronic disease” (p. 232). He also suggests that Haeckel never advocated turning the “eugenic practice he mentioned” into a workable policy. Richards avoids Haeckel’s praise of suicide¹¹ and does not mention that Haeckel recommended euthanizing the mentally impaired.¹² And even if he was not specifically advocating their adoption, Haeckel’s comments praising the infanticide of ‘weak, sickly’, or infirm children by the Spartans and other cultures could hardly be read as *opposing* similar policies in the present day.

Richards includes a lengthy appendix on the subject of moral responsibility in history, in which he addresses the culpability of Haeckel for Nazi ideology. Richards scores points against historians like Gasman who claim that Haeckel bore some unusual responsibility for the Nazis. But Richards does not convincingly rebut the more general connection between Nazi ideology and a racist evolutionary theory. Given the fact that (a) Haeckel was Germany’s most prominent promoter of evolutionary thought for several generations, and (b) Haeckel was at the least a normal 19th-century racist, it cannot be doubted that Haeckel had some responsibility for setting the stage for Nazi ideology. Richards does not effectively rebut the evidence amassed by historian Richard Weikart,¹³ whom he unfairly charges with advancing a mono-causal theory of the Nazis (p. 508). Richards assumes that Weikart set out to explain the intellectual origins of Nazi ideology and solely fixated on Darwinian causes, when in fact Weikart set out to see if Darwinian causes contributed to Nazi ideology and found that they did. Haeckel may not bear unique moral

responsibility for the Nazis, but there is no reason to doubt that he (like so many other 19th-century intellectuals) contributed to the general *Zeitgeist* that nourished Nazism.

Conclusion

As a biography of Haeckel, *The Tragic Sense of Life* is a helpful work. Richards, with a broad knowledge of German philosophy and science, effectively places Haeckel in historical perspective.

Richards’ attempt to rehabilitate Haeckel’s reputation from the damage it has suffered through the years from accusations of racism, anti-Semitism, and fraud has decidedly mixed results. He points out areas where Haeckel has been too quickly dismissed as a fraud. At the same time, Richards’ attempts to exculpate Haeckel push too far in the other direction. In an attempt to vindicate Haeckel, Richards strains for an optimistic take on Haeckel’s more dubious conduct, and sometimes simply ignores contradictory evidence.

This book should not be disconcerting to Christians defending a biblical view of origins. Too often, we like to have clear-cut ‘good guys’ and ‘bad guys’. So, apparently, does Bob Richards. History rarely provides such clear-cut lines, and we should always take care not to exceed the evidence when we attribute error or virtue to someone like Haeckel with error or virtue. Richards errs on the one side; may it not be said that Christian apologists err on the other.

References

1. In a number of countries, habilitation is an academic qualification beyond the doctoral level.
2. That is, embryological descent (ontogeny) reflects the evolutionary line of descent of that organism (phylogeny).
3. Thanks to E. van Niekerk for sharing a draft paper on this subject, and sharing feedback on this section. See also her article: Ernst Haeckel: a hostile witness to the truth of the Bible, creation.com/haeckel2, 3 March 2011.
4. Pennisi, E., Haeckel’s embryos: fraud rediscovered, *Science* 277(5331):1435, 5 September 1997.

5. For another example, anatomy textbooks employ drawings with the purpose of illustrating a standard musculoskeletal structure, for instance, because any individual specimen will have peculiarities.
6. Richardson, M.K., Heterochrony and the phylotypic period, *Dev. Biol.* **172**:418, 1995.
7. Hickman, C.P. *et al.*, *Integrated Principles of Zoology*, 14th ed., McGraw-Hill, New York, p. 163, 2008.
8. See Richardson, M.K., and Keuck, G., Haeckel's ABC of evolution and development, *Biol. Rev.* **77**:509, 512–513, 519, 2002.
9. Not reading German, I have here relied on a description of the interview in Hermann Bahr, Ernst Haeckel, in *Der Antisemitismus: Ein internationales Interview* (Berlin: S. Fischer, 1894), provided to me by a German-speaking professional historian.
10. See Haeckel, E., *The Wonders of Life*, trans. Joseph McCabe, Watts, London, pp. 123–124, 1904; Haeckel, E., *The History of Creation*, trans. E. Ray Lankester, D. Appleton, New York, **1**:170–171, 1880.
11. Haeckel, *The Wonders of Life*, ref. 10, p. 116.
12. Haeckel, *The Wonders of Life*, ref. 10, pp. 122–123.
13. See Weikart, R., *From Darwin to Hitler*, Palgrave Macmillan, New York, 2004; Weikart, R., *Hitler's Ethic*, Palgrave Macmillan, New York, 2009.

Like the dark side of the moon

A review of
*The Dark Side of Charles Darwin:
A Critical Analysis of an
Icon of Science*
by Jerry Bergman
Master Books, Green
Forest, AR, 2011

David J. Oberpriller

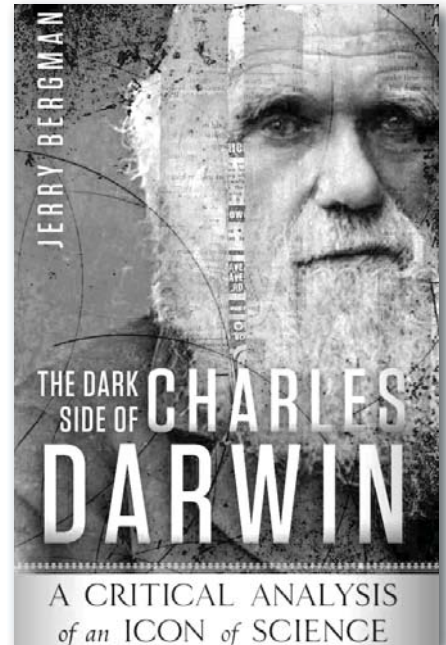
The dark side of the moon is often considered—erroneously—to be the side of Earth's natural satellite that is permanently turned away from the earth—never to be seen.¹

The book

The books and journal articles written on evolution would probably fill a moderately sized library. The books written on the man who is revered as the founder of evolution and considered by many as the greatest scientist of our age—Charles Darwin—are considerably fewer. The books written on his mental and physical failings, his errors, and his prejudices as they impacted his science work are very few indeed—and this book is one of those.

Early theories of origins credited God; but Darwin, in replacing the Deity, has become close to god-like in stature—at least to evolutionary biologists (p. 120). However, a study of the man's life and thoughts reveals a deep, dark, hidden side—one that would not even qualify Darwin as a saint (p. 2). Terry Mortenson's endorsement of this book is on target when he says of Darwin:

“... his writings on evolution used a mixture of scientific facts, faulty data, misinformation, plagiarized ideas, distortions of reality, and unbridled imagination



to deceptively advance his anti-Christian, anti-biblical agenda, which has wreaked such social, political, theological, and moral havoc in the world” (p. 2).

And that is precisely what this book is about.

Jerry Bergman has written a well-researched, thoroughly documented volume that is easy to read, even by those who have only a basic knowledge of Darwin's life and evolution theory.

The book is divided into four sections with chapters that each cover a single topic. The chapters are written in a style that makes each one appear to stand alone as a journal article—yet they are coherent when the book is taken as a whole. The similar structure of each chapter—starting with a chapter synopsis (which serves as a brief abstract) and an introduction; finishing with a summary or conclusion—supports the feel of a journal article. A disadvantage of this approach is that there is some duplication of information disseminated throughout multiple chapters; which is only noticeable when the book is read cover-