

Understanding Species

Are species worth saving? Can they be resurrected by technology? What is the use of species in biomedicine? These questions all depend on a clear definition of the concept of ‘species’, yet biologists have long struggled to define this term.

In this accessible book, John S. Wilkins provides an introduction to the concept of ‘species’ in biology, philosophy, ethics, policy making and conservation. Using clear language and easy-to-understand examples throughout, the book provides a history of species and why we use them. It encourages readers to appreciate the philosophical depth of the concept as well as its connections to logic and science.

For any interested reader, this short text highlights the complexities of a single idea in biology, the problems with the concept of ‘species’, and the benefits of it in helping us to answer the bigger questions and understand our living world.

John S. Wilkins teaches at the School of Historical and Philosophical Studies, University of Melbourne, Australia. His main research interests include the philosophy and history of biology and classification, and the cognitive science of religion. He is the author of many books, including *Species: The Evolution of the Idea* (CRC Press, 2018).

The ***Understanding Life*** series is for anyone wanting an engaging and concise way into a key biological topic. Offering a multidisciplinary perspective, these accessible guides address common misconceptions and misunderstandings in a thoughtful way to help stimulate debate and encourage a more in-depth understanding. Written by leading thinkers in each field, these books are for anyone wanting an expert overview that will enable clearer thinking on each topic.

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Understanding Species

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University of Melbourne

Cambridge University Press & Assessment
978-1-108-98719-6 — Understanding Species

John S. Wilkins

Frontmatter

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CAMBRIDGE
UNIVERSITY PRESS

Shaftesbury Road, Cambridge CB2 8EA, United Kingdom

One Liberty Plaza, 20th Floor, New York, NY 10006, USA

477 Williamstown Road, Port Melbourne, VIC 3207, Australia

314–321, 3rd Floor, Plot 3, Splendor Forum, Jasola District Centre,
New Delhi–110025, India

103 Penang Road, #05–06/07, Visioncrest Commercial, Singapore 238467

Cambridge University Press is part of Cambridge University Press & Assessment,
a department of the University of Cambridge.

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education, learning and research at the highest international levels of excellence.

www.cambridge.org

Information on this title: www.cambridge.org/9781108987196

DOI: 10.1017/9781108982764

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First published 2023

A catalogue record for this publication is available from the British Library.

*A Cataloging-in-Publication data record for this book is available from the Library of
Congress.*

ISBN 978-1-108-98719-6 Paperback

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remain, accurate or appropriate.

‘The species problem is a vexing and important one, and John Wilkins has done more than anyone else to dig into its history and integrate it with philosophy past and present. Thus he was the perfect author for this book, which is a wonderful, accessible entryway to the diverse set of issues bearing on why species have been such a “thing” for 2,000 years. My own conclusion is to follow Darwin and acknowledge the species *rank* is a meaningless human construct – the full tree of life is what matters, not just the single level within it arbitrarily called species. But to decide whether to agree with me or not, you need to absorb the content in this book.’

Brent D. Mishler, author of *What, If Anything, Are Species?* (2021),
Distinguished Professor of Integrative Biology,
University of California, Berkeley

‘The species problem is one of the most complex issues in evolutionary biology and philosophy of biology, and not many would have succeeded in producing a comprehensive overview of it and doing justice to both science and philosophy. Written by one of the most eminent scholars in the field, *Understanding Species* is an informative and, due to the author’s eloquent writing style, at the same time also very entertaining read. It both quenches your thirst for knowledge and makes you want to dive deeper into the topic. What more can you ask of a book? Highly recommended!’

Frank E. Zachos, Natural History Museum Vienna, Austria.
Author of *Species Concepts in Biology* (2016)

‘A species is like jazz: you know one when you meet it, but on closer inspection it’s very hard to define. In this engaging book, John Wilkins guides us deftly through the philosophical minefield of what species are, how you recognise them, and how trying to find definitions for species is increasingly important for science and conservation.’

Henry Gee, author of *A (Very) Short History of Life on Earth* (2021)

‘This book is a stunning achievement, and I think nobody other than Wilkins could have tied together the disparate perspectives needed to write it. Species problems are notoriously thorny and multidisciplinary, yet Wilkins manages to shine great light on them. Most impressively, he does this in ways that many people, rather than just species experts, can understand, engage and enjoy. The writing is snappy, the choice of topics smart, and the rewards for readers will be many.’

Matthew J. Barker, Associate Professor of Philosophy,
Concordia University, Montréal

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Foreword

Everyone knows what a species is, don't they? The bear, the wolf, the shark, etc. So why a whole book on species? Well, the answer is that not everyone really knows what a species is; not because people are ignorant, but because defining species is far from simple and straightforward. Furthermore, and even more counterintuitively for us, there are no exemplars of species, nor sets of distinctive features that we can use to distinguish among them. There is no exemplar of any species. There is no such thing as 'the bear', 'the wolf' or 'the shark', but a variety of bears, wolves and sharks; they share some common features but exhibit an enormous variation in others. As John Wilkins explains in this fascinating book, humans have been preoccupied with classifying organisms around them since ancient times. Yet there has never been a single best way to do this, or to define species, which is the fundamental unit of this classification. Wilkins explains why there exist different definitions that can be in competition with each other or can be consistent with each other. Most importantly, he shows that depending on which species definition we use, we can end up with very different results with respect to classification. Yet, despite problems such as these, species is a useful concept in science. And as Wilkins concludes, understanding is not about acquiring a single true answer or definition. Rather, it is becoming aware of the different uses of a concept, and the different contexts of this use. Reading this book will make you feel that often understanding is about realising how much we do not know. But this is

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exactly the pleasure of understanding: realising that there is more out there than simplistic accounts can provide. The more you come to know, the more you realise how much else you do not know. Reading this book will make you experience this rewarding feeling.

Kostas Kampourakis, Series Editor

Preface

As a child I asked myself (not my parents or teachers) what a dog or a cat was, or what the pets known as ‘carpet snakes’ (reticulated pythons) were, and how they differed from other kinds of animals. What I was asking myself at age six, as so many children do at that age, was why cats and tigers are different kinds, or wolves, foxes and dingoes, and so on, and why breeds of dogs sometimes varied so much that one would instinctively group a wolf and an Alsatian together rather than a pug and an Alsatian (I am still not sure if the latter two are in the same group). This is the question of what a species is. Confused, and moving on to space rockets, I promptly forgot about it until I read a paper some 35 years later by one of the founders of modern philosophy of biology, David Hull, and decided to make that my PhD topic.

This is a book for the interested reader. It is not for specialists, nor is it only for those who have studied biology. If you are focused enough, I hope this book, and the readings for each chapter, will give you a good entrée to the smorgasbord of ideas surrounding species. The field is enormous, and many scientists and philosophers feel the need to add to it. This book is a summary of this plethora of options and arguments, and I aim to thread the reader’s attention through the issues. I hope it will also help those interested in conservation policy, and in the ideas and the processes of science. Most of all I hope that nobody comes away feeling that at last they have got the idea of species down pat. There is no easy answer, but there are many good questions.

This book, as with all my books, has relied upon the kindnesses of many strangers and friends. First, thanks to Kostas Kampourakis for the opportunity to write this book, and to Jessica Papworth, Olivia Boulton and Jenny van der

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Meijden at Cambridge University Press, and Lindsay Nightingale, for a really thorough reading and suggestions. I owe many biologists, but especially David Williams at the NHM, Brent Mishler at UC Berkeley, and Frank Zachos at Natural History Museum in Vienna; and many philosopher-historians, especially Matt Barker, Matt Chew and particularly Joachim Dagg, who have been very generous with their reading of drafts, and Jay Odenbaugh for advice. Paul Griffiths gave me my chance to do research in two postdoctoral fellowships, so he gets 10% of the credit and blame. I am also indebted to @Grrlscientist for some suggestions. Thanks especially to my partner Alexis for her tolerance of the writing of this book and of my general lack of attention to anything else for over a year. I'm going to need a new excuse now, though.

A Note

In this book I use *italics* to refer to the words and concepts, and roman text to refer to the things those words are attached to. This includes the formal names of things like species as well as words. We need to do this so that we do not make the common mistake of taking a noun or name as reason to think that there is some real thing that the noun or name refers to. *Unicorn* is a word, a name, but there are no unicorns. Philosophy students know this as the *use-mention* distinction.