

Cambridge University Press
978-1-108-71668-0 — The Missing Two-Thirds of Evolutionary Theory
Robert Brandon , Daniel W. McShea
Frontmatter
[More Information](#)

Cambridge Elements

Elements in the Philosophy of Biology

edited by

Grant Ramsey

KU Leuven

Michael Ruse

Florida State University

THE MISSING TWO-THIRDS OF EVOLUTIONARY THEORY

Robert N. Brandon and Daniel W. McShea

Duke University



CAMBRIDGE
UNIVERSITY PRESS

Cambridge University Press
978-1-108-71668-0 — The Missing Two-Thirds of Evolutionary Theory
Robert Brandon, Daniel W. McShea
Frontmatter
[More Information](#)

CAMBRIDGE
UNIVERSITY PRESS

University Printing House, Cambridge CB2 8BS, 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

79 Anson Road, #06–04/06, Singapore 079906

Cambridge University Press is part of the University of Cambridge.

It furthers the University's mission by disseminating knowledge in the pursuit of
education, learning, and research at the highest international levels of excellence.

www.cambridge.org

Information on this title: www.cambridge.org/9781108716680

DOI: 10.1017/9781108591508

© Robert N. Brandon and Daniel W. McShea 2020

This publication is in copyright. Subject to statutory exception
and to the provisions of relevant collective licensing agreements,
no reproduction of any part may take place without the written
permission of Cambridge University Press.

First published 2020

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

ISBN 978-1-108-71668-0 Paperback

ISSN 2515-1126 (online)

ISSN 2515-1118 (print)

Cambridge University Press has no responsibility for the persistence or accuracy of
URLs for external or third-party internet websites referred to in this publication
and does not guarantee that any content on such websites is, or will remain,
accurate or appropriate.

Cambridge University Press
978-1-108-71668-0 — The Missing Two-Thirds of Evolutionary Theory
Robert Brandon, Daniel W. McShea
Frontmatter
[More Information](#)

The Missing Two-Thirds of Evolutionary Theory

Elements in the Philosophy of Biology

DOI: 10.1017/9781108591508
First published online: February 2020

Robert N. Brandon and Daniel W. McShea
Duke University

Abstract: In this Element, we extend our earlier treatment of biology's first law. The law says that in any evolutionary system in which there is variation and heredity, there is a tendency for diversity and complexity to increase. The law plays the same role in biology that Newton's first law plays in physics, explaining what biological systems are expected to do when no forces act, in other words, what happens when nothing happens. Here we offer a deeper explanation of certain features of the law, develop a quantitative version of it, and explore its consequences for our understanding of diversity and complexity.

Keywords: Evolution, random walks, null model, diversity, complexity

© Robert N. Brandon and Daniel W. McShea 2020

ISBNs: 9781108716680 (PB) 9781108591508 (OC)
ISSNs: 2515-1126 (online) 2515-1118 (print)

Contents

1	Introduction	1
2	The Zero-Force Evolutionary Law	4
3	What the ZFEL Is Not	20
4	The ZFEL Quantified	26
5	What the ZFEL Means for Biology	46
	Bibliography	71