

Contents



Preface xi

I Science and Revolution

- | | | |
|---|---|----|
| 1 | Introduction | 3 |
| 2 | The Stages of Revolutions in Science | 26 |
| 3 | Evidence for the Occurrence of Revolutions in Science | 40 |

II Historical Perspective on 'Revolution' and 'Revolution in Science'

- | | | |
|---|--|----|
| 4 | Transformations in the Concept of Revolution | 51 |
| 5 | The Scientific Revolution: The First Recognition of
Revolution in Science | 77 |
| 6 | A Second Scientific Revolution and Others? | 91 |

III Scientific Revolutionaries of the Seventeenth Century

- | | | |
|---|---|-----|
| 7 | The Copernican Revolution | 105 |
| 8 | Kepler, Gilbert, and Galileo: A Revolution in the Physical
Sciences? | 126 |

9	Bacon and Descartes	146
10	The Newtonian Revolution	161
11	Vesalius, Paracelsus, and Harvey: A Revolution in the Life Sciences?	176

IV Changing Concepts of Revolution in the Eighteenth Century

12	Transformations during the Enlightenment	197
13	Eighteenth-Century Conceptions of Scientific Revolution	213
14	Lavoisier and the Chemical Revolution	229
15	Kant's Alleged Copernican Revolution	237
16	The Changing Language of Revolution in Germany	254
17	The Industrial Revolution	262

V Scientific Progress in the Nineteenth Century

18	By Revolution or Evolution?	273
19	The Darwinian Revolution	283
20	Faraday, Maxwell, and Hertz	301
21	Some Other Scientific Developments	313
22	Three French Views: Saint-Simon, Comte, and Cournot	328
23	The Influence of Marx and Engels	342
24	The Freudian Revolution	352

VI The Twentieth Century, Age of Revolutions

25	The Scientists Speak	369
26	The Historians Speak	389
27	Relativity and Quantum Theory	405
28	Einstein on Revolution in Science	435
29	Continental Drift and Plate Tectonics: A Revolution in Earth Science	446
30	Conclusion: Conversion as a Feature of Scientific Revolutions	467
	Supplements	473

Comparisons of Scientific and Political Revolutions	473
Matthew Wren and the English Revolution	477
Cromwell and Revolution	479
The Reformation as Revolution	479

Revolution, Newness, and Improvement	481
Humanism and Revolution in Science in the Sixteenth Century: Vesalius and Copernicus	485
Revolutions in Mathematics	488
Copernicus's Revolutionary Advocacy of Scientific Realism	491
Some Seventeenth-Century Judgments on Copernicus and Astronomy	494
Luther, Melancthon, and Donne	496
J.-S. Bailly and the Historian's Invention of a Revolution	498
Francis Bacon's "Revolutio Scientiarum"	500
Descartes and Revolutions in Mathematics	505
John Freind on Harvey and Medicine	508
Paracelsus and Revolution	509
J.-S. Bailly's Theory of Scientific Revolutions	511
Symmer's and Marat's Self-Proclaimed Revolutions	512
Engels' Comparison of Lavoisier's Revolution in Chemistry and Marx's Revolution in Economics	514
Lichtenberg on Revolutions in Science and Lavoisier's Chemical Revolution	517
Hume's Alleged Copernican Revolution	519
Some Nineteenth-Century Theorists of Revolution in Science	521
Revolution and Evolution: Marx, Poincaré, Boltzmann, Mach	532
Evolution vs. Revolution in Claude Bernard's Writings about the Devel- opment of Science	540
Darwin's Awareness of Revolution	544
Vogt: The Scientist as Quondam Political Revolutionary	547
Some Statements by Engels on Revolution in Science	549
The 'Electra Complex'	550
Some Additional Opinions of Twentieth-Century Scientists on Revolu- tion in Science	551
A Bergsonian Revolution?	555
Revolutions in the Social Sciences	558
Some Twentieth-Century Alternatives to Revolution in Science	559
Duhem on Evolution and Revolution in the Sciences	561
The Influence of T. S. Kuhn on the Historiography of Continental Drift	563
<i>A Note on Citations and References</i>	571
<i>Notes</i>	573
<i>References</i>	623
<i>Index</i>	679