CAMBRIDGE

Cambridge University Press
0521390273 - Science and Necessity - John Bigelow and Robert Pargetter
Index
More information

General index

abstract entities, 9, 64, 350, 353–4, 376, 380–3
abstraction axiom, 369
acceleration, 349; *see also* motion
accessibility, 238–44, 263–7; *see also* similarity relations among worlds
  degrees of, 123, 263, 264
  and entailment, 115
  and miracles and laws, 227–31
  and probability, 152–4
  as a quantity, 122–3, 263
  reflexivity of, 136
  transitivity of, 247–8
actualia, 120, 222, 367
admissible evidence, 155; *see also* Principal Principle
analyticity, 344, 384
ancestrals, 355–6
antirealism, 33–7; *see also* eliminativism
  and mathematics, 346–7
  and nominalism, 384–5
a posteriori realism, *see* realism
a priori, 33, 365–6
  and logicism, 379
  and mathematics, 363, 365
  and numbers, 357
Archimedes' lever, 381–2
Aristotelian
  astronomy, 1, 5–7
  cosmology, 65
  physics, 233, 237, 296
Aristotelianism, 352, 363–4
  and essentialism, 111
  and instantiation, 363–5
Aristotle, 214, 220, 221, 224, 233, 237–8
  on the age of the earth, 295
  on the antiquity of human life, 295
  and circular motion, 306
  and doctrine of the four causes, 296–7, 306, 344, 384
  and Hempelian explanation, 300
  on motion, 71
  and teleological realism, 341
  and thought experiments, 114, 384
  and this worldliness, 352
arithmetic, 13, 363, 370, 387
  modular, 377
Armstrong, D., 39
  and *a posteriori* realism, 42, 75, 77, 94, 380
  and combinatorialism, 167
  and determinables and determinates, 52
  and direct realism, 343
  and laws, 221, 234
  and sets, 47
  and structural universals, 83, 94
  and thick and thin particulars, 290
artefacts, 323; *see also* functions (teleological)
astronomy, 1, 4–7
atomism, 214, 222
axiomatic theories, 103–20; *see also* definitions; rules
  system B, 107
  system D, 107
  system HW, 260–2
  system K, 106
  system S4, 107
  system S5, 107, 139
  system T, 107
  system VC, 136
  system VW, 136
axioms
  A1–A4, propositional, 104, 261
  A5–A6, quantifier, 104, 261
  A7–A12, modal, 106–7, 261

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521390273 - Science and Necessity - John Bigelow and Robert Pargetter
Index
More information

axioms (*cont.*)
A13, Barcan formula, 109, 261
A14–A18, counterfactual axioms, 116, 261
A19–A20, identity axioms, 141, 262
A21–25, probability, 149–50, 262
A27–A30, nomic necessity, 260, 262
choice (set-theoretical), 376
comprehension (set-theoretical), 369
empty set (set-theoretical), 371
extensionality (set-theoretical), 367
infinity (set-theoretical), 371–2
power set (set-theoretical), 371
probabilistic counterfactuals, 150
NI necessity of identity, 142–3
NNI necessity of nonidentity, 142–3
pairing (set-theoretical), 371
separation (set-theoretical), 370–1
union (set-theoretical), 371

backtracking counterfactuals, *see* counterfactuals
back-up systems, 271, 276–8, 291
Barcan formula, 125–6, 130, 135; *see also* axioms
Bayes's theorem, 188
belief
rational degrees of, *see* credence
de re and probability, 156
worlds, 158–9
Bennett, J., 29, 250
Berkeley, G., 30–2, 50
and gravity, 281
Bible, The, 216, 295, 330–1
biological functions, 323–41
biological sciences, 311, 319
blank stare, 183–9
book theories, 176–82
and canonical models, 137–40
Boolos, G., 43, 159

canonical models, 137–40; *see also* book theories
Cantor, G., and real numbers, 362
Carnap, R.
and combinatorialism, 206
and propositions, 207
and state descriptions, 166–7
Cartwright, N., 221
and causation and realism, 344
categorial languages, 100
causal laws, *see* laws of nature
causal talk, 275–9, 288
causal theories, *see also* functionalism
of individuality, 279
of representation and reference, 93
of time, 279
of time's arrow, 279
causal worlds, 279–80
causation, 2, 263–94
and abstract entities, 380
backward, 324
basic, 282
boosting probabilities, 264, 288, 299
and conditionals, 265
and conservation laws, 307
and counterfactual dependence, 316
as a higher-order relation, 289
and intransitivity, 322
and law of inertia, 306–7
local, 271, 280–1, 284
macroscopic, 287–8
and mathematical entities, 352
and necessary and sufficient conditions, 265, 291
and ontology, 380
and perception, 380
as primitive, 275, 294
probabilistic theory of, 292, 320
and realism, 344
sensory deprivation counterexample, 319
thick and thin, 290–2
and transitivity, 322
and worldmates, 190
centring, 150, 316
chains of causes and conditionals, 268
chance, 388; *see also* credence
change, 62–74
circularity, 84, 89, 172, 199, 210–11
coextensiveness, 46, 374
coherence theories of truth, *see* truth, theories of
coinstantiation, 279
colours
as determinables, 51, 54, 56
and supervenience, 27
combinatorialism, 180, 241–2, 263, 385–6
component forces, 290, 340
componential rules, *see* semantics
comprehension axiom, *see* axioms
conditional necessities, 383
and causation, 267–75
conservation laws, 307

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521390273 - Science and Necessity - John Bigelow and Robert Pargetter
Index
More information

constant conjuntion, 231; *see also* Hume, D.; regularities
contingency in mathematics, 365
Copernican physics, 186, 220–4, 237–8, 295
  and realism, 7
copulation and conception, 272–4
correspondence theory of truth; *see also* truth, theories of
  and completeness proofs, 131–40
counterfactuals
  back- and forward-tracking, 250–4
  and causation, 264
  and conditional excluded middle, 117–19
  and counterlegals, 255
  and counterlogicals, 255
  and dispositions, 113
  and impossible antecedents, 255
  and intransitivity, 115–16, 316, 322
  and perception, 319–20
  probabilistic, 148, 313
  and laws, 227–31
  and strong centring axiom, 117,
  and thought experiments, 113–14
  would and might conditionals distinguished, 118–19
counterparts, 193–203
creationism, 327–8
  and teleology, 327–8, 330–1
credence, 154–9; *see also* chance
Cresswell, M. J., 98, 135, 137, 169, 178, 206

Darwin, C., 114
  and teleology, 329, 332, 341
Darwinian theory, 328–9, 332, 340
Davidson, D.
  and identity criteria for events, 273
  and singular causal statements, 276–7
decision theory, 18, 311
Dedekind, R., 362
definitions, 260–2
Democritean worlds, 206–10
  and propositions, 208
deontic logic, 107
derived laws, 256
Descartes, R., 111, 266, 306, 363
determinates and determinables, 51, 62, 86, 263, 292–3
determinism, 270; *see also* indeterminism
Devitt, M., 32, 46
direct realism, *see* realism
dispositional properties, 333
dispositional theory of functions, 332
dispositions, 113, 174–5; *see also* propensities
  categorial basis of, 333, 337
distance between worlds, 210; *see also* accessibility; similarity relations among worlds
distribution of disjunction, 119
Dretske, F., 221
Dudman, V., 112–13
Dummett, M., 29

Einstein, A., 68–9, 188, 191, 215, 384
elementary events, 20
eliminativism, 173, 232
  semantic, 26–8
  as a theory of biological functions, 325–7
Ellis, B., 166, 382–4
empiricism, 380
empty set, 142, 371, 373–4, 376
energy, flow of, 289
epistemology, 380
  and coherence theories, 23
  naturalized, 33
equations, 349–50, 364
ersatz modal realism, *see* realism; reductionism
essences and sets, 386
essential properties, 88, 109–10
etiological theories of biological function, 326, 329–41
Eudoxus, 362
Euler, L., 61
events, 273
  identity criteria of, 317
  and probability theory, 19
  as propositions, 121
evolution, *see* Darwin
  of artefacts, 328
explanation, 2, 295–345
  as ground for realism, 159, 341–5
  hypotheticodeductive, 300
  and laws of nature, 299–310
  nomological, 300
  pragmatic dimension of, 314
  teleological, 323–41
  of what, how, and why, 295–8
explanation-sketches, 301; *see also* pragmatics
extension, 46

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521390273 - Science and Necessity - John Bigelow and Robert Pargetter
Index
More information

extensionality, 367–9
external relations, 280; *see also* forces
extroverted axiomatics, 133–4
extroverted realism, *see* realism

Fair, D, 289–90
fictional characters, 16–18
fictionalism, 346; *see also* antirealism
Field, H., 383
  and nominalism, 13–4
  and Tarskian semantics, 96
first-order; *see also* higher-order theories
  entities, 43
  universals, 53, 62, 242
fitness, biological, 331–3
  and fragility, 333, 336, 340
flux, doctrine of, 63–74
fluxus formae, 63–4
folk theories, *see* psychology; semantics,
forces, 70–1, 248, 387
  and causation, 264
  component and resultant, 287, 340
  as external relations, 283–4
  and fields, 282, 286–7
  fundamental, 287
  gravity and the Hume world, 281–2
  macroscopic, 287
  not dispositions, 282–3
  parallelogram of, 287
  as vectors, 264
forma fluens, 63–4
Forms, 49–50, 51, 54, 56, 60; *see also* Platonism
Forrest, P., 85, 89, 171, 203, 211, 212
foundationalism, 342–3
frame, semantic, 124
Frege, G., 43, 59, 76, 182–3
  and cardinal numbers, 87
  and instantiation, 94
  and propositions, 354
Frege–Whitehead–Weiner–Quine theory of numbers, 59, 79–80, 355, 357
functional dependence, 312
functionalism, 320
  and theories of representation, 93, 328–9
  as a theory of mind, 53
functions (teleological), 323–41, 331–2,
  dispositional and propensity theories of, 333–41
  and eliminativism, 325–7
  goal theories of, 325, 327
  and natural habitats, 336
  of organs, 335–6

Galilean physics, 256–7, 306, 347–53, 384; *see also* motion; realism; thought experiments
generalizations, 242; *see also* regularities
  and causal information, 298
  and laws, 272
generation, theories of, 215–18
genetics, 3–4, 142
geology, antiquity of the earth, 295
geometry, 358, 363–5, 370, 372, 377, 387
  non-Euclidean, 186, 384
  and Zermelo–Fraenkel set theory, 371–2
gnomons, 350–1
goal theories, *see* functions (teleological)
God, 65, 68, 110–11, 266, 281, 327–8, 330
golden proportion, 360–2
golden rectangle, 359–62
Goodman, N., 46–7, 234
  and nominalism, 384
gravity, 214, 256, 281–2, 287, 296, 298, 304–6, 347; *see also* motion
Griffiths, P., 340–1

habitat, 335–7
  natural, 339
Hacking, I., 221, 344
haecceities, 73; *see also* numerical identity
Hausdorff, F., 153; *see also* measure
heartbeat, function of, 338–9
Heimson worlds, 252, 259, 260, 279
  defined, 249
Hempel, C., 234; *see also* laws of nature
  on explanation and causal history, 321
  on statistical explanation, 302–4
hierarchical theory, 38–46
  introduced, 40
  and quantities, 55–62
  and structural universals, 82–92
  and vectors, 62, 82
higher-degree universals distinguished from higher-order, 293
higher-order theories, 15
  and accessibility, 241

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521390273 - Science and Necessity - John Bigelow and Robert Pargetter
Index
More information

and Hume worlds, 241
and quantification, 140, 159–64, 201, 386
of sets, 374
of structural universals, 91
of universals, 292–3
Hilbert, D., 182
Hilbert space, 209
holism and realism, 343–4
homeostatic systems, 268–9
Hughes, G., 111, 135, 137, 169
and completeness for HW, 260
Hume, D.
and association of ideas, 311
fact–value distinction, 173
and laws, 226–7, 231–8
relation regress for causation, 282
Hume worlds, 238–45, 279–82, 290; *see also* Heimson worlds
Humean supervenience, 175
hydras, 169
HW (Heimson world), 260–2; *see also* axiomatic theories

iconic representations, 202; *see also* replica theories
ideal systems, 113; *see also* thought experiments
identity, contingency of, 142–3; *see also* numerical identity
identity of indiscernibles, 239–40; *see also* Leibniz, G.
implicit definitions, 133; *see also* realism, extroverted
incredulous stare, *see* blank stare
indeterminacy, 272, 299
indeterminism, 268, 270, 291; *see also* chance
indiscernibility of identicals, 241–2
individual essences, 387; *see also* set theory
individuality, 279
inertia, 71, 113–14
and causal information, 306–7
inference, counterfactual theory of, 319–20; *see also* validity
infinitesimals, 148, 187, 372
infinity, *see* axioms, infinity (set-theoretical); set theory
initial conditions, 300–1
instantaneous velocity, 64, 67, 69, 81; *see also* flux, doctrine of
instantiation, 39–40, 48–9, 364–5, 366–9, 378, 384
instantiation principle, 182
instrumentalism, 2–7, 11, 384
intensionality of representations, 329; *see also* functionalism, and theories of representation
internal properties and relations, 205, 263, 292–3
definition of, 88
and Pauli exclusion principle, 205
intrinsic properties, 71, 88; *see also* flux, doctrine of
introversion of mathematics, 378
introverted realism, *see* realism
INUS conditions, 268–9

Jackson, F., 112
on conditionals, 150, 228
on counterfactuals, 250, 255, 258
James, W., 22
Jeffrey, R.; *see also* higher-order theories, and quantification
and completed novels, 166–7
Johnson, W., 52–3, 57

Kant, I., causal theories of time, 279
Kepler, J.; *see also* laws of nature; realism
on planetary motion, 296, 304–6
Kim, J., 318
Kolmogorov probability axioms, 149
Kripke, S., 107, 169
and the historical theory of reference, 26
on possible worlds, 21

Lagadonian
combinatorialism, 180
languages and books, 211
laws of nature, 2, 70–1, 214–62, 267, 299–310
and causation, 264
and indeterminism, 299
Galileo's law of falling bodies, 349–50
and magic and miracles, 299
not exceptionless, 218–9
and simple singular causal statements, 276–7
least time principle, 308–9
Leeds, S., 26; *see also* eliminativism, semantics

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521390273 - Science and Necessity - John Bigelow and Robert Pargetter
Index
More information

Leibniz, G., and calculus, 13; *see also* identity of indiscernibles; indiscernibility of identicals; S5
Leibnizian necessity, *see* necessities
Leibniz's law, 160–1
Lewis, D.
  accessibility, 122
  causal explanation, 320–3
  causation, 288, 291
  counterfactual dependence, 315–20
  counterfactuals, 103, 112, 116–19, 136
  counterpart theory, 126
  laws of nature, 223, 234, 227–31, 250, 255
  'one patch per puncture', 302
  Principal Principle, 154
  probability boosting, 274
  replicas, 167–70, 182–3
  structural universals, 83–6, 88, 90
Lindenbaum's lemma, 138
live performances, 193
  and iconic representations, 202
local causation, *see* causation
location, 362
  of universals, 38–9
logic, 379
  classical, 103, 120
  importance of, 1–2
logical modalities, *see* necessities
logical space
  formally defined, 154
  locations in, 157, 222, 241
  as metric space, 123
  sample space, 19, 121
  and worlds and accessibility, 123, 241
logically proper names, 96
Lucretius, 214
Lycan, W., 16, 173, 211

Mackie, J., 268–9
  on instantiation, 94
macroscopic causes, *see* causation
magic, 85, 91, 212, 238–9, 299; *see also* counterfactuals, back- and forward-tracking; miracles; primitives
  black and white, 91, 181, 212
  and causation, 299
magnitudes and directions, *see* vectors
Malebranche, N., 68–70, 266
mathematical realism, *see* realism
mathematics, autonomy of, 363
maximal consistent sets of sentences, *see* book theories; canonical models
measure, 150–2
  obtaining from metric, 153–4
  and probability, 149
measurement, 61
medieval science, 349–50
Mellor, D., 234
membership, set-theoretical, 375–6
mereology, 84–5, 88–91, 201, 212, 293
  and universals, 386
metaphysical necessity, *see* necessities
metaphysical realism, *see* realism
metaphysicalism, 388
metric space, *see* logical space, as metric space
miracles, 251, 276
  and causation, 299
modal primitives, 90, 172–5, 191, 199, 210–12; *see also* magic
modal realism, *see* realism
modalism, 172–5
  ersatz, 16
model, semantic, 125; *see also* canonical models
momentum, 289
Montague, R., 40, 98, 101
motion
  and Galileo, 70–1
  theory of, 62–82
multigrade universals, 42

natural kinds, 91
natural necessity, *see* necessities
natural numbers, *see* numbers
natural selection, *see* selection
necessary connections, 231
necessities; *see also* S5
  alethic, 140
  Leibnizian, 139, 249, 258
  logical, 131–5, 248–9
  metaphysical, 131
  natural, 245–8, 388
  nomic, 224, 248–9
  physical, 210
Newton, I., 13
  and gravity and the Hume world, 281
  and Kepler's laws, 304–6
  law of inertia of, 306–7
  theory of numbers of, 60
  third law of, 289
  thought experiments of, 114

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521390273 - Science and Necessity - John Bigelow and Robert Pargetter
Index
More information

Newtonian physics, 67–9, 215, 220, 248, 256, 281, 289, 296, 306
and the doctrine of flux, 64
nominalism, 8, 11–15, 50, 62
and antirealism, 384
and Field, H., 383
and Goodman, N., 384
and the problem of ancestrals, 355
and Tarski, A., 96–8
nonidentity, 240–3
nonqualitative identity, *see* numerical identity
numbers, 42, 82, 93, 352–7
as abstract, 350
and ancestrals, 355–6
cardinal, 87
counting, 378
and degrees of accessibility, 122–3
and geometry, 363–5
irrational, 359–62
natural, 378
as objects, 376
and perceivability, 350
real, 362–3
and von Neumann, 145, 372–4
numerical identity, 199
of energy and momentum, 289
nonqualitative identity, 73
of an object through time, 69, 73–4

Ockham, W.
doctrine of change, 64–74
principle of parsimony, 47
ontological commitment, 12–15
open sentences, 96; *see* predicates
operators and operations
mathematical, 140, 145–7
quasi-mereological, 89
syntactic, 100, 140
optics, 307–10
and teleology, 309, 326–7

pain
as a determinable, 51, 53, 54
and proportions, 61
paradigms, 50, 60
paraphrases, 13–14; *see also* fictional characters; nominalism; ontological commitment
parthenogenesis, 273–4
part–whole relation, 386; *see also* mereology
pentagons and proportions, 358–9
perception; *see also* counterfactuals, and perception
and the foundations of knowledge, 342
and functional dependence, 319–20
picture theory of meaning, 24, 96; *see also* truth, theories of
Plantinga, A., on possible worlds, 167, 173, 180, 181, 201
Platonism, 10–11, 49–50, 54, 171, 35–37, 363–4, 384–5
plural essences, 368, 372–6
Pollock, J.,
on accessibility, 122
on counterfactuals, 250, 255
possibilia, 16–18, 83, 93, 101–2, 110, 120, 125, 165, 222, 367
possibilities, kinds of, 105
represented by possible worlds, 165–6
possible worlds, 15–21, 121, 138–9, 165–213; *see also* accessibility
pragmatics, 314, 321–2
pragmatist theory of truth, *see* truth, theories of
predicates, 12
and ontology, 12–13, 94–6
primitives; *see also* magic; modal primitives; modalism
in axiomatic theories, 103
and causation, 275
moral, 173
and worldmate relation, 190–3
Principal Principle, 154–9
principle of predication, 111–12, 368
probability, 18–20
boosting, 270–1
and causation, 264
epistemic, 185–9 (*see also* belief, rational degrees of; credence)
and measure theory, 149
operators, 146–7
and possible worlds, 386
and ratios and proportions, 153–9
and realism, 388
and sample spaces and possible worlds, 386
semantics of, 147–59
subjective and objective, 154 (*see also* chance; credence)
propensities, 154, 333–8; *see also* chance; dispositions

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521390273 - Science and Necessity - John Bigelow and Robert Pargetter
Index
More information

propensity theory, *see* functions (teleological), dispositional and propensity theories of
proportions, 10, 263, 352–63, 378, 386; *see also* probability, and ratios and proportions
  Eudoxus, 362
  and falling bodies, 347–52
  and incommensurability, 359–62
propositional fragment of a logic, 105, 112
propositions
  Carnapian, 207
  as events, 180
  Russellian, 207
  as sets of possible worlds, 19, 121
propredicates, 160
psychology
  broad and narrow, 27
  and counterfactual dependence of laws, 319
  folk theories of, 267
  and functionalism, 320
  and laws, 311
  need for functions, 326–7
Ptolemy, 5–7, 214
purposes, *see* functions (teleological)
Putnam, H., 4, 8, 29–31, 43
Pythagoreans, 214, 358

quantification, 43, 127; *see also* axioms; higher-order theories, and quantification; semantics
quantities, 48–62, 263–4, 292–4, 365, 386, 387
  accessibility as a quantity, 112
quantum mechanics, 2, 285–6, 362
Quine, W., 11–13, 46–7, 60, 76–7
  analyticity, 344
  laws of nature, 234
  nominalism, 385
  proportions, 354
  semantic eliminativism, 26

Ramsey, F., 25
  and laws of nature, 234
random variables, 19–20
rationality, 188
ratios, 356–8, 362, 372, 378; *see also* probability; proportions
real numbers, *see* numbers; proportions
realism, 33–7; *see also* replica theories
  a posteriori, 42, 46, 75, 77, 94, 379
  component and resultant forces, 284–5
  direct, 342–3
  and explanation, 341–5
  extroverted, 3, 8, 11, 20, 33–7
  and Galileo and Kepler, 7
  inference to best explanation, 342–3
  introverted, 3, 8, 11
  mathematical, 10, 346–52
  metaphysical, 8–15, 159–64, 346–7
  modal, 3, 15–21, 165–72, 182–203
  and Putnam's sense, 29; as opposed to ours, 2, 8
  and reductionism, 16
  representative, 342
  scientific, 2–8, 346–7
  semantic, 21–33, 135
  teleological, 323–41
recurrences, 38–9, 219, 378
reducibility, 238–42
reductionism, 38, 83, 137, 139, 212–20
  distinguished from realism, 16
  and natural necessity, 232
  of possible worlds to books, 139
redundancy theory of truth, *see* truth, theories of
reference, 21–3, 26–8, 93, 95–102; *see also* truth, theories of; semantic value
reflexivity of mathematics, 377
refraction of light, 307–10
regularities, 219, 227–45, 367; *see also* laws of nature
  and generalizations, 242
relational theory of quantities, 55–62
relative necessities, 232
relativity, 191
replica theories, 182–203
representation, 21–37, 93, 165
  and teleology, 327
resemblance, 50
resultant forces, *see* forces, component and resultant
rules, 261
Russell, B., 40, 103–4
  and combinatorialism, 167
  and irreducible relations, 240
  and paradox, 379
  and propositions, 207
  and theory of descriptions, 143

S5, 128–9, 139; *see also* axiomatic theories
sample space, *see* logical space

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521390273 - Science and Necessity - John Bigelow and Robert Pargetter
Index
More information

Schrödinger's cat, 11
scientific Platonism, 36, 38, 385; *see also* metaphysicalism; Platonism
second-degree universals, 10; *see also* second-order
  determinables, 52–3
  properties, 374
second-order, 53, 58, 62, 69, 75, 87, 159–64; *see also* higher-order theories
selection (evolution), 329
semantic realism, *see* realism
semantic value, introduced, 99; *see also* reference
semantics
  of causal talk, 288
  of causation, 278
  and componential rules, 96–102
  and eliminativism, 26–8, 94
  and folk psychology, 26–7
  formal and/or modal, 120–40
  frame, 124
  and introverted realism, 20–1
  model, 125
  not the source of ontology, 9, 95, 142
  from ontology, 369–70
  and realism, 21–37
  Tarskian, 233
  and universals, 379
separation axiom, *see* axioms
set theory, 44–8, 144–5, 357, 363–76, 385
  a priori, 357, 364–5, 366–76
  and axioms (*see* axioms)
  and higher-order logic, 161–2
  not from semantics, 95
  and plural essences, 368–9
  and set membership, 144–5
  virtual, 11–12
sets, 93
  in semantics, 96–101
similarity relations among worlds, 122, 291
Skyrms, B., combinatorialism, 206
Snell's law, 306–8
somehows, 21–2, 39, 91, 93–5, 160–4, 386
somethings, *see* quantification; somehows
space and time, 190–2, 241, 346, 362–4
speed, 63–74
  average vs. instantaneous, 374–9
spinning disc, 72–5, 79–81
Stalnaker, R., 171, 185, 203
  and conditional excluded middle, 117–19, 129
state descriptions, 166
statistical laws, 299, 301
Strawson, P., 94; *see also* laws of nature
structural universals, 82–92, 202–13, 263–4, 292–4
subjunctive conditionals, 112; *see also* counterfactuals
substances, 48
supervenience
  and accessibility, 240–5, 263
  of causes on forces, 296
  of colours, 27
  of dispositions, 333, 337
  as entailment, 28
  failure of, for nonidentity, 240
  of laws on contents of world, 271
  of macroscopic causation, 278
  and reducibility, 239, 241–2
  of semantics, 27–8
survival-enhancing properties, 337
survival of the fittest, 332
Swift, J., 180; *see also* Lagadonian

Tarskian semantics, *see* semantics; truth, theories of
tautology, 132
Taylor, B., 31–2
teleology, 299
  and creationism, 330–1
  and optics, 309
theorems, 103–14
thought experiments, 110–14
Tichý, P., 169
  and accessibility, 122
Tooley, M. 221, 281
tracking, 310, 323
  thermometer example, 382–3
transformation rules, 103–4
transitivity, *see* causation
translation, coherence theories of, 25–6
truth, theories of, 21–37
  coherence, 22–5
  correspondence, 8, 21–37, 171; and Tarski, 96–102
  pragmatist, 22, 25
  redundancy, 22, 25–6
truthbearers, 22, 92, 181
truthmakers, 28
  for modalities, 165
types, theory of, 379

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521390273 - Science and Necessity - John Bigelow and Robert Pargetter
Index
More information

understanding, coherence theories of, 24
units of measurement, 60
universals, 8–15

validity, 1–2
valuation function, 99; *see* semantic value
van Fraassen, B., 4, 234; *see also* laws of nature
vectors, 42, 62–84, 264, 387
  magnitude and direction, 74–82
  velocity and force, 292–3
velocity, 63, 263, 292
von Neumann, J., 145, 372

weak centring, 316
Whitehead, A., 40, 43, 60, 103, 159, 354
  and Russell, theory of types, 379
Wiener, N., 76
  and proportions, 354
Wittgenstein and the balanced diet, 215
world books, 385
world properties, 83, 171–2, 203–13, 241–2, 263, 385–6, 387
world stage, 169
worldmates, 189–93

Zermelo–Fraenkel set theory (ZF), 44, 144, 161, 370–1, 375–6

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521390273 - Science and Necessity - John Bigelow and Robert Pargetter
Index
More information

Index of examples, illustrations, and stories

Adam, Eve, and Nelson: explanation and causal history, 322
age of earth and life on earth: explanation, 295
Archimedes' lever: proportion and causal processes, 381–2
atheism and the possibility of God: Barcan formula, 110

Becker's defeat of Lendl: semantics of causal statements, 277
breaking the bowl: Hempelian explanation, 301

capital of New Zealand: strong centring, 117
colour: determinates and determinables, 51–3
crystalline spheres: semantic realism, 26

'Dallas': fictional characters and modal realism, 17–18
Darwin and his father: laws and counterfactuals, 228–30
Democritean worlds: world properties, 206–10
Descartes's toy soldier: principle of predication, 111

eating bread: causes as conditions, 267–8

falling bodies
  laws, 214–15, 220–2, 237–8
  mathematical realism, 347
frogs and froggers: introverted and extroverted realism, 31–2

getting from Melbourne to London: senses of necessity, 105–6
golden rectangle: ratios and continuum, 359–62

heartbeats: functional explanation, 338–9

Gorbachev and the car: counterparts, 194
Gorbachev launching *Glaznost:* causation is local, 271
gravity
  explanation, 304–5
  forces and the Hume world, 281

history of generation: laws, 215–7
history of physics and planetary astronomy
  explanation, 295–6, 304–5, 306–7
  laws, 214–15, 220–2, 237–8
  mathematical realism, 347
  realism vs. instrumentalism, 4–7
  sematic realism, 26

If you had a drink . . . : counterfactuals and miracles, 251–4

joystick: explanation and causal tracking, 311–4

kidneys: functions and interests, 326

lumberjack and actor: transitivity of counterfactuals, 115

Marie Curie: theories of truth, 23

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
0521390273 - Science and Necessity - John Bigelow and Robert Pargetter
Index
More information

mass: quantities, 57–8, 59–60
meeting Jane: individuation of worlds, 192
methane: structural universals, 82–8
motion and velocity
  proportions, 347–52
  vectors, 63–76, 79–82

Oscar Wilde's *Ernest:* counterfactuals, 113

parents and family relationships
  ontological commitment, 12–13
  proportions, 354–7
parthenogenesis: causation and probability, 273–4

seasons, the: introduction, 1
seeing *The Fly:* conditional excluded middle, 118
sensory deprivation: counterfactual dependence and causation, 318–19
sexual congress with nearly infertile male: causation and probability, 272–4
short-circuit-caused fire: semantics of causal statements, 276
Snell's law: causation and explanation, 307–10
spinning disc: vectors, 72–3, 79–80
syphilis and paresis: causation and probability, 270–1

Tee Dum and Tee Dee: counterparts, 197–8
thermometer and temperature: proportions and tracking, 382
Thomas and René: irreducible relations, 240
three protons: reality of component forces, 284–5
Toula driving to work: representation, 198–201
Twin Earth: counterparts and representation, 194–5

van Gogh's *Sunflowers:* counterfactuals, 112

walking across the field: counterfactual dependence and causation, 318
wombat sleeps tonight, the: higher-order quantification, 159–60

your duplicate: counterparts, 196

© Cambridge University Press www.cambridge.org