Subject Index

1/f fluctuation (1/*f* law), 56, 60, 173–4

Adjustable parameter, xiii, 34, 68, 70, 75–6, 77, 80–1, 82, 122, 124, 127, 130, 138, 159, 160
After effect, 57
Aging effect, 57
Application of CFP, 113–14
Arata-type cathodes, 80–1, 137–41
Artificial thermal neutrons, 28
Atomic piles, 7

Background neutrons, 28, 30–1, 59, 71, 172–3
Bad Science - The Short Life and Weird Times of Cold Fusion, 14–15
Beryllium ray, 90, 169
Bioscience, 21–2
Bohr's model, 168–9
Boundary layers, 26, 29–30
Breeding reactions, 73–4

Carbon (C), 40, 45
cf-matter, 35, 44–5, 46, 51, 57–8, 70, 72, 78, 102, 106, 108–109, 111–13, 114
CFP (Cold fusion phenomenon), as a term, 2
Chaos, 175
Cold fusion, as a term, 22–3
Cold fusion phenomenon (CFP), as a term, 2
Cold Fusion—The Scientific Fiasco of the Century, 15
Complexity, science of, 69, 110–11, 112, 116, 174, 175–6
Complex processes, 176
Continental drift theory, 17–18
Control experiment, 5, 6, 13
Coulomb lattice, 106, 108
Crystal lattices, 25–6

d-d fusion reactions, 7–8, 10–11
Decay time shortening, 40
De Ninno's experiment, 13
Department of Energy (DOE) Report, 15–17, 50, 51, 115
Deuterated alloys, 29
Deuterium (Deuteron), xii, xiii, 3, 5, 10, 13, 23, 27, 29, 30, 36, 46, 49, 51, 60, 73–4, 82, 98–9, 100–102, 113–14, 118
  see also Heavy water system
"Deutex", 83
Discovery, of CFP, 1
DOE Report, 15–17, 50, 51, 115

Electrolyte systems, 3–4, 13, 24
Electromagnetic fields, 88–9
Electromagnetic waves, 163–4
Energy differences, 11
Energy Research Advisory Board, 15
Energy spectrum of neutrons, Jones' experiments, 12–13
Events:
  inverse power law, 55–7
  number of, 31–3
Evidence, of nuclear reactions, 28
Excess heat, 4–5, 60, 78–9, 123–5, 132–5
Excess heat density, 5
Excess heat measurement, 28, 51–3
Excited neutron states, 96–8
Exotic nuclei, 96
Experimental data sets:
  Bressani et al., 158–61
  Cellucci et al., 123–5
  Chien et al., 127–30
  Clarke et al., 137–41
  Dash et al., 152–6
  Miles et al., 132–5
  Miley et al., 148–51
  Okamoto et al., 143–6

Experimental facts, and their explanation, 19–20
Experiments:
  Bressani's, 82–3
  confirmation by Fleischmann, 6–11
  De Ninno's, 13–14
  energy spectrum of neutrons, 12–13
  first paper, 2–6
  Jones', 12–13
  light water, 18–19
  Michelson–Morley, 115
  Mills', 19, 20
Explosion, accidental, 5

Facts vs. truth, 19–20
Fission threshold energy, 43–4
Fleischmann's hypothesis, 1, 2, 7, 19–20, 49, 87, 89
Flicker noise, 173–4
Fractals, 174
Free electrons, effect in metals, 85–7
Free neutron model, 91–2
Free space, 9, 37, 84–9, 90
Fusion reactions, 7–8
  in solids, 9–10

Gamma rays, 163–4
  absence of, 53
Gas contact method, for loading, 13
Gas (or liquid) discharge methods, 3
Gas contact systems, 3
Gold, 26, 111

Heat after death, 57
Heavy water system (D_2O), 3, 4, 12, 24, 61–5, 133
Helium-3, 49–50, 127–30
Helium-4, 49–50, 60, 78–9, 127–30, 132–5, 137
High-voltage discharge, 89
Hydrated alloys, 29
"Hydrex", 83
Hydrogen isotopes:
  maximum occlusion, 23–4
  in transition metals, 100–102
Hypothesis:
  Fleischmann's, 1, 2, 7
  as a term, 68, 122

Imagination:
  role of, 169–70
International Thermonuclear Experimental Reactor (ITER) project, 7
Inverse power law, for occurrence of events, 55–7
Ion band state, 83
Ion beam, 89
Iron (Fe), 40, 45, 78
Isotopic ratios, of generated nuclides, 46

Jones' experiments, energy spectrum of neutrons, 12–13, 20

Kinetic energy, 7

Lattice nuclei, 98–100, 102–10
Lattice oscillation, 87–8
Light water system (H_2O), 5–6, 18, 24, 64, 99
Localization (of nuclear reactions), 29, 36, 50, 60, 129, 143, 152, 155
Lorenz contraction, 115

Metals, effect of free electrons, 85–7
Michelson–Morley experiment, 115
Mills' experiments, 19, 20
Models:
  Bohr's, 168–9
  free neutron, 91–2
  neutron drop, 35, 36, 109–10
  polyneutron, 83
  Sandpile, 174
  as a term, 68, 122
  TNCF *see* TNCF (trapped neutron catalyzed fusion) model
  usefulness of, 68–9
Molten salt, 31
Molybdenum (Mo), 99–100

National Cold Fusion Institute, 14
Neutron, xi, xiv, 2, 4, 12–13, 15–16, 20, 27, 34, 38–9, 41, 48–9, 70–1, 73, 75, 84, 90–8, 108
  background *see* Background neutrons
Neutron affinity, 100
Neutron bands, 94–5
Neutron drop model, 35, 36–7, 70, 73, 77, 102, 109–10
Neutron drops, 106–10
Neutron energy spectrum, 60, 82–3
  Bressani's experiments, 82–3
  Jones' experiments, 12–13
Neutron halo, 96

Neutron Moessbauer effect, 95
Neutron valence band, 105
Neutron–proton interaction, 102–103
Nickel (Ni), 19, 26, 48, 64, 82, 98, 113, 148
NT (nuclear transmutation) *see* Nuclear transmutation (NT)
Nuclear chemistry, 35
Nuclear energy, 7
Nuclear fission, 7
Nuclear fusion, 7
Nuclear reactions:
  evidence of, 28
  in free space, 84–5
  in solids, 84–9
  and TNCF model, 72–5
Nuclear transmutation (NT):
  by absorption, 40–1
  by decay, 38–40
  by fission, 41–4
  general, 35–8
  isotopic ratios, 46
  stability effect, 54–5, 78
  by transformation, 44–5
Nuclei, stability of, 7
Nucleons, 37, 95–6
Number of reactions (N_x), 31–3, 59, 75–7

Observable quantities (x), 31–3, 76–7
Occluded hydrogen isotopes:
  conditions, 23–4
  interactions with lattice nuclei, 102–10
Occlusion, of hydrogen isotopes, 3–4
Optical theorem, 83–4

Palladium (Pd), 3, 26, 29, 38, 52, 56, 61, 79–81, 113, 123, 127, 132, 137, 143, 152, 158, 170
Palladium cathodes, 4, 25
Palladium deuteride, 26
Phonons, 87–8
Photons, 87–8
Planck's formula, 168
Plate tectonics, 18
Platinum, 26, 111
Polonium, 165
Potassium dideuteriumphosphate, 31
Protium (Proton), xi, xiii, 6, 8, 10, 25, 27, 29, 32, 36, 47, 49–50, 60, 73–4, 99, 100–102, 117–18, 140
  control experiment, 6
  Mills' experiments, 19, 20
  see also Light water system
Proton conductors, 27, 31

QED (Quantum Electromagnetic Dynamics), 87
Qualitative reproducibility, 5, 8, 42, 51, 58, 59–60, 112, 113, 118, 125
Quantitative reproducibility, xii, 8, 118, 135
Quantum electrodynamic coherence, 83
Quantum Electromagnetic Dynamics (QED), 87
Quantum mechanics, 83

Radial distribution function, 84
Radioactivity, 164–5
Radium, 165–7
Rayleigh–Jeans formula, 167
Reductionism, 69, 110–11
Reproducibility, 5–6, 8, 58, 113
Resonance penetration theory, 83

Sample preparation, 3
Sandpile model, 174
Simple systems, 175–6
Solid lattices, 83
Solids, effects of electromagnetic fields, 88–9
Sporadicity (Sporadic), 58
Stability effect, 59, 78
  in nuclear transmutation (NT), 54–5
Stability, of nuclei, 7
Stainless steel, 31, 99
Statistical reproducibility, 8, 113
Stochastic (process), 42, 59, 77, 113, 118, 125, 135
Super-nuclear interaction, 99, 102–103, 104–105, 109, 111
Surface layers, 26, 29–30

Technology, 113
Theory, as a term, 68, 121
Tight binding, localized neutron approximation, 93–4
Titanium (Ti), 12, 13, 26, 64, 113, 152, 158
TNCF (trapped neutron catalyzed fusion) model, xiii–xiv, 33–4, 39, 48, 50, 55, 60–4, 69–72, 76–7, 108, 123–5
  breeding reactions, 73–4
  density, 34
  explanation of CFP, 76–84
  Miles et al. data sets, 132–5
  NT analysis, 36
  premises, 69–72, 116

TNCF (trapped neutron catalyzed fusion) model (*Continued*)
reactions relevant to observables, 75
trigger reactions, 72–3
Transition metal hydrides and deuterides, 3, 25–31, 101, 102–10, 111, 170–1
Transition metals, hydrogen isotopes in, 100–102
Trigger reactions, 72–3
Triglycine sulfate, 31
Tritium (Triton), xi, 8, 10, 32–3, 34, 46–7, 50, 60, 73, 75, 118, 127–30, 132–3
Tungsten bronze, 31

Unified quantum theory, 83

Wave nature, of neutrons, 90–1
Wien's formula, 168

X-rays, 163–5