Index*

Abstraction, hierarchy of, 53
Accuracy of measurement, limits to, 1, 178ff.
Actor-language, 58ff.
Adaptive matching-response, 51, 61-69, 73, 112
Adaptive trial and error, 69, 72, 142
Advice, 131
Airy disc, 5
Ambiguities of visual perception, 69
Amount of information, measures of, 10, 42, 57, 158, 171-175
Artifacts, probabilistic, 54, 140
Artificial language(s), 35, 81, 90, 109
Attention, 61
Atomic propositions, 2, 59, 81, 172

Bandwidth, 175, 178ff.
Bar-Hillel, Y., 81
Basic symbols, 51, 54, 61
Basic vectors, 48, 72
Binary digit, bit, 16, 172
Blanc-Lapierre, A., 188
Blind spots, epistemological, 113
Boltzmann, L., 57
Brain mechanisms, 23, 26, 63
Brillouin, L., 186

Capacity of channel, 15, 134, 173
Carnap, R., 81
Central nervous system, 63-66
Coding, 46, 173
Coincidence relations, 2, 168
Commands, 100, 130

Commitment, religious, 114
Communication, 20, 74, 96, 108, 171
cross-cultural, 105
failure of, 111
system, 15, 171
untruthful, 29, 163
Complementarity, 1
Conditional entropy, 173
Conditional probabilities, 34, 62, 73
Conditional probability matrix (C.P.M.), 84, 95, 106
Conditional readiness (for behaviour), 22, 70
Consciousness, 53
Content-elements, 81
Content-measures, 81

Descriptive information-content, 12, 15, 45, 59, 82, 159
Dialogue, 126, 153

Eddington, A. S., 2, 17
Elementary events, 3, 160
Elementary symbols, 50
Entropy, 3, 57, 172
conditional, 173
relative, 173
thermodynamic, 16, 174

Ensemble of possible messages, 57
of states of readiness, 71
Equivocation, 173
Evaluatory feedback, 67, 140ff.
Evidence, weight of, 49

* Page numbers printed in italics refer to definitions or explanations of terms.
INDEX

Failure of communication, 111
Feed-back, evaluative, 67, 141
Fisher, R. A., 4, 5, 169
Fourier analysis, 184
Fourier-space, 185
Frequency-response, 179

Gabor, D., 4, 5, 165, 178, 184–185
Goal-complex, 106, 112
Goal-directed activity, 35, 60, 67, 95, 106
Goal-settings, hierarchy of, 90, 106
Good, I. J., 185

Heisenberg's Principle of Uncertainty, 1, 148
Hierarchy
of abstraction, 53
of goals, 90, 106
of readiness, 60
of transition probabilities, 69
Human beings as information sources, 153
Hyperspace, multidimensional, 44
Hypothesis-generation, 53, 70

Ideal language, 93
Imagining, 75
Imperative meaning, 101
Indeterminacy, logical, 132, 147
Indicative meaning of a question, 35, 100
Inductive probability, 81
Information, 10, 14, 19, 56, 70, 76, 89, 96, 108, 132, 158
amount of, 10, 42, 57, 158
as answer to question, 12
Fisher's measure of, 4, 169
generation of, 137
humans as sources of, 153
irrelevant, 74
operational definition of, 60, 157
quantization of, 2, 3, 164
semantic, 19, 79ff., 89, 95, 107
source of, 135, 146ff., 153
space, 44, 92, 169
and time, 16

units of, 4, 160ff.
vector, 45, 71, 92, 169
Information-content, 56, 157
descriptive or scientific, 12, 15, 45, 59, 82, 159
metrical, 4, 14, 44, 48, 159, 166
selective, 10–14, 71, 75, 147, 159, 172
semantic, 59, 83
structural, 14, 159, 165, 178ff.
Informational efficiency, 3, 15
Internal organisers, 113
Internal representation, 50, 68, 112, 125, 142
Interrogative utterances, 31, 97, 107
Intonation, function of, 32, 98
Instructions, 130

Kantian categories, 69
Learning, 70
Linguistic understanding, 121
Logical atomism, 3, 27
Logical dimensionality (of representation), 4, 5, 165, 178ff.
Logical indeterminacy, 132, 147
Logon, 4, 165
Logon-capacity, 166, 179, 189
Logon-content, 5, 102, 165, 178ff.

'Magic number 7', 103
Matching response, adaptive, 51, 61–69, 73, 112, 142
'Mathematical Theory of Communication' (C. E. Shannon), 5, 79, passim
Matrix of conditional or transition-probabilities (C.P.M. or T.P.M.), 62, 83, 95, 106
Meaning
conventional, 25, 84, 90
definition of, 24, 71, 84, 128
effective, received or understood, 25, 72, 84
imperative, 101
of indicative sentences, 22, 96
INDEX

intended, 25, 72
interrogative, 35, 100
shades of, 49
spectrum of, 48
symbolic representation of, 72
Meaningfulness, criterion of, 19, 21, 36, 89
Meaninglessness, 21, 36, 85, 111, 128
Mechanical translation, 90
Memory, 64–66
Messages as 'keys', 25, 27, 109–111
Metrical information-content, 4, 14, 44, 48, 159, 166
Metron, metrical unit of information, 5, 166
Microscope, resolving power of, 185
Miller, G. A., 103
Mismatch (in feedback system), 69
Misunderstanding, 129
Natural selection (of organizing subroutines), 141
Nervous system, 63–66
Noise, 134, 186
in automata, 136
semantic, 74
Numerical energy, 167
Occupance-relations, 2
Observer-language, 58, 61
Operational approach (to information theory), 157
Operationalists, 27ff.
Optical illusions, 69
Optical resolving power, 178, 185
Order-number (of hierarchic level), 102
Organiser, internal, 113
Organising or orienting function, 36, 96ff., 108, 111
Originality, 137
Partial participation (of elements in concept), 47
Pattern of demand, 112
Perception, 61, 68, 96
ambiguities of, 69
Physiological processes, random, 143
Popper, K. S., 153
Potentiation, physiological, 65
Probabilistic artifacts, 54, 140
Probabilities, conditional, 34, 62, 73
Probability-distribution, conditional, 73
Promises, 131
Quantization of information, 2, 3, 164
Quantum of action, 1
Questions, 31, 73, 130
Randomness, 133
Random physiological processes, 143
Reasoning mechanisms, 46, 49
Redundancy, 173
Relative entropy, 173
Relevance (of information), 49, 56, 59, 73, 170
Religious commitment, 114
Repertoire, 95
Replication (as a form of representation), 50
Representation of meaning, symbolic, 72
Representations, 3, 42, 49, 68, 80, 89, 112, 158, 161
Requests, 100, 130
Resolving power of measurements, 1, 166
optical, 178, 185
Response, matching, 61, 67
Response-space, 73
Russell, B., 27
Scientific experimentation, 11, 14
Scientific information (measures of), 43
Scientific representation, 3, 164ff.
Second law of thermodynamics, 16
Selective function (of message, question), 24, 35, 108
Selective information-content, 10–14, 71, 75, 147, 159, 172
Self-organisation, 140
Semantic information, information-content, 19, 59, 79ff., 95, 107
Semantic noise, 74
Semantic units (and criteria of truthfulness), 28
Shannon, C. E., 5, 19, 43, 59, 79, 94, 171, 184
Social groups, units, 106, 115–118
Spectrum of meaning, 48
Speed of transmission (as adaptive parameter), 66
States of (conditional) readiness, 19, 34, 60, 75, 142
ensemble of, 75
Statistical approximation to English, 139
Stimulus equivalence, 121
Structural information content, 14, 159, 165, 178ff.
Symbolic representation of meaning, 72
Symbols, basic, internal, 49–54, 113, 141
Synonymy, 86
Temporal relationships in neural networks, 66
Theory of information, glossary of terms used in, 161–177
Thermodynamics and information theory, 16, 174
Thesauri, 103
Threshold configurations (as internal representations), 141
Threshold-control, 65
Time and information, 16

Toraldo di Francia, G., 185, 188–189
‘Tractatus Logico-Philosophicus’, 2, 27
Transition-probability matrix, 52, 62
Translation, mechanical, 90
Transmission, speed of (as adaptive parameter), 66
Trial and error (adaptive), 69, 72, 142
Truthfulness, criteria of, 28

Uncertainty
absolute, 148, 150, 154
and information content, 147
principles, 1, 146
Understanding, non-linguistic versus linguistic, 121
Unexpectedness as measure of information, 57, 94, 133, 160
Units of information, 4, 160ff.
Universal language, 77
Universals, 53
Unpredictability, 146

Valutative feed-back, 67, 140
Values in relation to communication barriers, 114
Variational approach, 99, 124
Vector representation of information, 44, 71, 92, 169
Vectors, basic, 48, 72
Visual perception, ambiguities of, 69

Warning (as communication), 130
Weight of evidence, 4, 5, 49, 166
Wiener, N., 9, 171
Wittgenstein, L., 2, 27, 30, 164