

Index

- Absorption, 71, 304, 339, 340, 349, 364, 475–476, 478–479, 495, 534
“external,” 302(table), 531
hyperattentiveness (involuntary), 504–506
residues, 508–510
internal, 218, 280, 302(table), 339, 430, 477(fig), 501, 506, 507(fig), 513–514, 517–518, 532–533, 590(outline), 628
opioids and, 507–508
preludes to, 589–590
and silence, 500, 501, 502, 635
timing and duration of, 339, 510–513, 623
- Acceptance, 445, 575, 613
- Acetylcholine (ACH), 171, 185, 270, 273, 330, 338, 401, 464, 465, 506, 614, 619, 620, 622–623
and arousal, 160–161
and depression, 585, 586
and D-sleep, 316–317
- Acetylcholine (ACH) cells, 165(fig), 319, 330, 459, 462, 463, 486, 606, 620
organization and function of ACH systems, 164–167
painful stimuli and, 455–456
- Acetylcholine (ACH) receptors, 236, 331, 592, 619, 662
muscarinic and nicotinic classes, 167–169
- ACTH. *See* Adrenocorticotrophic hormone
- Action, 670
brain functions generating, 671–672
traditional elements, 669–670, 672
voluntary and involuntary, 672–673
- Activating mechanisms, 340–341
- Activation, 158
- Actualization, 136, 647
- Actualized (buoyant, and compassionate), 47, 461, 727
- Adamic experiences, 25, 302(table), 304
- Adrenocortical stress hormones, 238–239, 344–345, 655
- Adrenocorticotrophic hormone (ACTH), 210, 212, 588
released *inside* brain, 218, 237, 238, 343, 464, 514, 590, 621, 623, 655
triggered by stress and CRF, 237–238
- Adversity, 235, 450, 535–536, 574–575, 688
“Aesthetic arrest,” 21
- Affirmation of Faith in Mind*, 700–701
- Affirmative properties (“positive” resonances), 606, 659, 695
- Aggression, 177, 178, 179, 192, 195, 201, 231, 232–233, 335
- Aging
effects on brain, 661–663
influence on alternate states, 662–663
- Agnosias, 501, 597–599
- Aitken-roshi, Robert, 647
- Alcohol (giving up), 74
- Alertness, 308, 339
- Allman, J., 271, 272
- Allocentric nerve cells, 186, 491, 498, 533
- Alpha blocking, 104–106
- Alpha rhythms, 84–85, 312
during meditation, 87, 88–89, 91, 104–105, 110
- Alternate* states of consciousness, 306. *See also* Consciousness
examples of evolving capacities for change, 688
- Altruism, 649, 651, 693–694
- Alzheimer’s disease, 186–187, 662
- Amines, biogenic, 104, 197, 235, 458, 517, 654.
See also by type
- Amnesia, 184, 186, 188, 260, 266, 490
acute transient global, 188
- Amphetamines, 169, 201, 423–424
- Amygdala, 94, 98, 104, 215, 230, 260, 596, 658
and fast emotional responses, 347–348
and fear responses, 175–176, 178–179
functional roles in behavior, 176–177
influence on visual associations 247, 249–250
and prefrontal cortex, 253–254
- Analgesia, 231, 353, 409–410
- Anesthesia, 237, 296
and dreams, 385–386
effects on hormones, 238–239
local, 397–399
- Animal research, 6, 208
differences among individuals, 175–176, 191, 195, 207–208, 231–232, 321, 568
differences among species, 180, 194, 335, 337, 403
- Annatta* (non-I), 50, 539
- Anoxia, 408–409, 444
- Anterior thalamic nucleus, 264(fig), 266, 269–270, 592
- Anti-triggers, 454
- Anxiety, 236, 567–568
- Aplysia*, 225–227, 332, 658, 685
- Apperception, 523

- Apraxia, 674
- Arcuate nerve cells, 654–655
- Arcuate nucleus, 151(fig), 194, 215, 514
- Arousal, 157–158, 203, 273, 348, 369, 517
cortical and limbic mechanisms in 163–164
hypothalamic, thalamic, and subthalamic
mechanisms in, 162–163
midbrain and, 160–162
- Arousal scale hypothesis, 32–35
- Artificial intelligence, 393, 394
- Ashoka, 8, 650, 689
- Aspartate, 654
- Association cortex, 253–254
- Association nuclei of thalamus, 265–266
- Associations, associative functions, 332, 394
- Assurance, state of, 569
- Athletic performance, 488–489 670–671, 675
- Atropine, 168, 331
- Attention, 69–73, 142, 204, 274, 294, 297, 365,
465, 480, 505, 603–604
brain activity during, 284–285, 403
involuntary, 504–506
global, and metabolism, 491–492
and parietal lobes, 245–247, 275–276
single cell studies (Areas PG and V4),
276–277
willed attentive processing, 278(table), 279
- Attentiveness, 76, 81, 127–128, 279, 281
and parietal lobes, 245–247, 402–403
- Attitude(s), 137, 351–352, 447, 640–641, 691
- Auditory cortex, 264(fig), 500
- Augmenters, 354–355, 355(table)
- Auras, 405–406
- Autoscopy, 446
- Autotopagnosia, 398
- Aversion, 229, 234, 333, 606
- Avoidance behavior, 333
- Awakening(s), 11, 295, 316, 366–367, 375, 526,
536, 617, 620–621, 636, 639, 682
potential paradoxes within, 611–612
Tozan's degrees of, 580–581
- Awareness, 69, 99, 126, 127, 133, 142, 143, 239,
323, 339–340, 418, 460, 465, 479, 481–482,
495–496, 622
and amphetamines, 423–424
and attention, 280, 465
attributes of, 296–297
conscious, 295–298, 462, 497
heightened, emotionalized (state V), 302
(table), 404
and loss of self, 503–506
and polysensory cells, 497–498
unconscious circumspatial, 488, 496(table),
672
and thalamus, 270–271
- Bacon, Francis, 47, 48
- Bankei, 119, 121, 124, 157, 189, 333, 453, 525,
554, 555, 567, 608, 636, 639, 660, 691, 692
on suffering, 355, 357
- Barbiturates, 159, 319, 462
- Basal forebrain, 167, 260, 269
- Basal ganglia, 197, 671, 675, 676
- Basal nucleus of Meynert, 165(fig), 167
- Basho, 588
- Batchelor, Steven, 253, 259
- Baudelaire, 494
- B-cognition, 576, 607
- Becker, David, 104
- Beddoes, Thomas, 407
- Behavior
deep transformations of, 305, 429, 638, 643,
656
modifications of, 191–192, 211, 239, 335–336
- Being, 141, 627–630
- Bell, Charles, 397, 398
- Benson, Herbert, 78
- Benzodiazepine, 568
- Bergson, H., 693, 696
- Beta-endorphins, 212, 214, 215, 229, 234, 238,
343, 464, 465, 514, 590, 623, 655
electrical stimuli releasing, 217–218
novelty circuits and, 219–220
in relation to states of awakening, 620–621
speculative role in “runner's high,” 218–219
- Beta-receptors, 684
- Beta rhythms, 86, 90, 737
- Biological clocks, 338–339, 341, 492–493
awareness and, 339–340
endocrine system, 344–345
and *kensho*, 615–617
light and, 345–346
meditation and, 346–347
resetting, 342–343, 587
- Biofeedback, 85, 89
- Biological cycles, 584, 587–588
- Biological intelligence, 393–394
- Blackness, absolute, 481–482, 498
“Blackouts,” 480–481
- Blindsight, 242–244
- Blink reflex, 329
- Blocking, 32
- Blofeld, J., 438–439, 540
- Blood flow, cerebral, 284, 317
- Blood pressure, 78, 444, 451
- Bodhidharma, 8, 10, 358, 628
- Bodhisattva of Compassion, 322, 651, 652,
698
- Bodhisattva of Wisdom (Manjusuri), 548, 598
- Bodhisattvas as exemplars, 669
- Bodhnath, 496

- Bohr, Nils, 548
 "Born again," 135, 447
 Borobudur, 569–570
 Boston University, psilocybin experiments on
 Good Friday at, 436–438
 Bradyphrenia, 392
 Brain
 anatomy, 149–154
 development of, 37–38
 evolution of, 685–686, 690–691
 networking functions of, 155–157
 Brain hemispheres, 358–359
 as allies, 359–360, 367
 in relation to EEGs and other tests, 92,
 363–365
 in relation to meditation and alternate
 states, 365–367
 Brain stem, 150, 151(fig), 155–156, 163, 361,
 378, 455, 460, 463, 508
 Brain stimulation "reward," 334
 Brainwashing, 103, 329
 Brain waves. *See also by type*
 frequencies and forms of, 83–86
 processes generating, 86–87
 Breathing, 107, 216, 517
 and meditation, 93–95, 99
 suspension, 97–98
 in TM, 96–97
 Brewer, W., article on operant classical condi-
 tioning, 332
 Broca, Paul, 169–170
 Bronowski, Jacob, 5–6, 696
 Broughton, R., 340, 774
 Bucke, Richard, 20, 535, 617, 621
 Buddha, 3, 7–8, 11, 125, 417–418, 636
 iconography, 11, 569–570, 639–640, 687,
 690–691
 and suffering, 355–356
 Buddha Nature, 52, 402, 552, 667
 Buddhism, 3, 7, 36, 62, 74, 355–356, 579–580,
 680, 687, 694
 Bukko, 117, 495
 Bundle of Vicq d' Azyr, 333
 Burroughs, John, 157, 371, 375, 535, 688
 Buserone, 568

 Calligraphy, 87, 513, 577, 593, 669, 805
 cAMP. *See* Cyclic adenosine monophosphate
 Campbell, Joseph, 499, 502, 635, 653
 Cannabinoids, 207
 Cannon-Bard theory, 347
 Capacity to change, evolving, 687
 Carbachol, 505
 Carbon dioxide, 421, 463
 Catalepsy, 213–214, 222–223
 Cataplexy, 320
 Catecholamines. *See* Dopamine; Norepineph-
 rine; Epinephrine
 Cats, 158, 159, 161, 178, 198, 202, 336, 456,
 491
 attentiveness in, 402–403, 480, 505
 defense reaction and aggression in, 232–233
 fast EEG activity in, 158, 160
 hypothalamus in, 191–192, 193–194
 respiration studies in, 94, 95, 98
 sleep in, 314, 315, 317, 321
 timid, 175–176
 CCK. *See* Cholecystokinin
 Central gray substance, 151(fig), 217, 218,
 233–235, 353, 658
 Cerebellum, 150(fig), 169, 676–677
 Cerebral cortex, 87, 149, 214, 216, 268, 394,
 672
 Cerebral hemispheres, 150(fig), 151(fig)
 Cerebrum, 149–151
 cGMP. *See* Cyclic guanosine monophosphate
 Chan, 7, 8–9, 60, 126, 129, 144, 645, 681
 chanting, chants, 68, 93–94, 395–396, 397,
 698
 Chao-chou (J: Joshu), 108, 112, 113, 116, 551,
 647
 Chemical messengers, 152–154
 Chimpanzees, 420, 685, 687
 China, 7, 8–9, 11, 62, 126, 144
 Chirico, Giorgio de, 577
 Chiyono, 453
 Chlordiazepoxide hydrochloride (Librium),
 568
 Chlorpromazine, 417, 419–420
 Cholecystokinin (CCK), 200, 212, 464
 Cholinergic pathways, 165(fig), 166–167, 623.
See also Acetylcholine
 Christianity (aspects of), 15, 16, 20, 21, 126,
 383, 452, 556, 576, 583, 677, 679
 Chronotherapy, 586–587
 Cingulate gyrus, 151(fig), 163, 172, 174, 386,
 455, 492, 566, 588
 Cingulum, 172, 173
 Circadian rhythms, 339, 340–341, 342
 Clarke, E., 317
 Clicks, 104–105, 106
 Clonidine, 204
 Cocaine, 201, 424
 Cognition, cognitive functions, 24, 221, 269,
 546
 Colliculi, 241, 506. *See also* Superior and infe-
 rior colliculi
 Colors
 during meditation 374, 379
 perception, 276–277, 379, 484

- Comic perspective, 414
 Commandments, 74, 525
 Commissures, 362
 Compassion, 47, 64, 461 678, 680, 727
 mudra of, 649–650
 responsibility inherent in, 650–653
 Comprehension (keynote of kensho), 496
 (table), 591, 617, 622
 Computers, 156, 393, 396
 Conditioning, 332–334, 347, 522, 621, 622
 drugs and, 222, 328–329
 to intervals of time, 561–562
 unlearning and, 329–331, 621
 Confucianism, 62, 144, 681
 Conscience, 522
 Consciousness, 280, 281, 325, 380, 431, 458,
 479, 517, 592, 605–606, 652, 653
 alternate states of, 305–311, 323, 464, 624,
 688
 daily variation in, 339, 340(fig)
 destabilization of, 308–309
 development of meanings within, 522–525
 fields within (schematic), 476(fig), 477(fig),
 602, 610(fig)
 heightening, 266, 267
 “opening up and restructuring,” 298–299
 ordinary, 295–298, 300(table), 320
 states of, 4, 299–305(tables), 769
 theories for “transcendent,” 182, 184
 theory for “emptiness” of, 287
 Controlled Substances Act of 1970, 427
 Corpus callosum, 151(fig), 358, 359, 360
 Cortex, 161, 163–164, 503–504, 518
 “athalamic,” 264, 763, 802
 Corticosterone, 238–239
 Corticotropin-releasing factor (CRF), 212,
 237–238, 464, 506, 590
 Cortisol, 239, 349, 588
 Cravings, 173–174, 424, 461
 Creativity, 63, 258, 621
 CRF. *See* Corticotropin-releasing factor
 Crying, 349, 404, 416, 612
 Cyclic adenosine monophosphate (cAMP),
 193, 204, 568, 587
 production of, 224–225
 Cyclic guanosine monophosphate (cGMP),
 412, 676, 794

 DA. *See* Dopamine
 Daigu, 453
 Daikaku, 499, 667
 Daily life practice (*Shugyo*), 23, 141, 336, 692
 Daito Kokushi, 60, 117, 274, 275
 Daitoku-ji, 10, 60

 Daiun Harada-roshi, 578
 Dalai Lama (Tenzin Gyatso), 334, 350
 Damage (caution against making functional
 interpretations based solely on), 162, 172,
 176, 735, 813
 Darwin, Charles, 349, 392, 393–394, 415, 416,
 444, 450, 685
 Davidson, J., 78, 288
 Davy, Humphrey, 407–408, 409, 411
 Deafness (transient, in absorption), 500
 Death, attitudes toward, 448–450, 569
 Death of nerve cell. *See* Excitotoxins
 apoptosis and, 819
 Deathbed experiences, 447–448, 449–450,
 451–452
 Deautomatization, 281
Declaration of a Global Ethic by Parliament of
 Worlds’ Religions, 356–357
 Deconditioning, 329, 333–334
 Defeat, 230–231
 Defensive behaviors, 40, 233
 Değişman, Arthur, 25, 34, 281
 Deja vu, 251, 252
 Delusions, 380, 398, 652
 Dendrites, 86, 87, 152, 153(fig), 154, 159, 662
 Dentate nucleus, 676
 Depersonalization, 49
 Depression, 459, 615
 biological cycles and, 587–588
 and meditation, 584–585
 and sleep deprivation, 341, 342, 586–587
 treatment of, 585–586
 Deprivation, 100. *See also by type*
 Derealization, 49
 Desires, 74
 Desynchronized sleep (D-sleep), 81, 90, 106,
 166, 202, 207, 212, 227, 312, 313, 315, 340,
 341–342, 406, 413, 462–463, 623, 772
 awakening from, 343–344
 dreams in, 323, 382
 LSD and, 422–423, 464
 functional changes during, 316–320
 and lucid dreams, 326, 327
 and rapid eye movements (REM), 320–322
 Desynchronization, desynchrony, 181–182,
 462–463
 not all fast rhythms are desynchronized,
 737, 814
 Diazepam (Valium), 237, 262, 568
 Diencephalon, 361
 Diffuseness, 128
 Disinhibition, 255, 462, 676
 Dispassion, 128, 129, 652
 Distributed functions, 393, 394, 602

- Dogen, 43, 46, 58, 60, 74, 77, 117, 124, 144, 374, 535, 536, 555, 573, 576, 625, 634, 638, 651, 676
- Dogo, 651
- Dogs, 234, 314, 328, 329, 330, 332, 568, 604
- Dominance behavior, 207, 231–232
- Donne, J., 55
- Dopamine (DA), 104, 172, 179, 200(fig), 212, 214, 225, 258, 266, 334, 368, 424, 458, 464, 465, 506, 618, 620, 760
- and depression, 585, 586
- functioning of, 197–201, 760
- and mescaline, 438, 442
- and opioids, 215, 220–221
- role of, 675–676
- stress and, 236, 238
- Dopamine cells, 198(fig), 199, 206, 459
- Dopamine receptors, 199–200, 258, 368, 420, 506, 662
- Dorsolateral prefrontal cortex, 254(table), 255–256
- Dorsal striatum, 197, 198, 200
- Dostoevsky, Fyodor, 405
- Doyle, Conan, 560, 604
- Dreams, dreaming, 312, 322–323, 374–375, 448, 464
- anesthetics and, 385–386
- brain function and, 316–318, 320–321
- lucid, 324–327, 326(table), 344, 517
- Drowsiness, 91, 313–314
- Drug addiction, 173, 174, 221
- Drugs, 130, 171, 173, 174, 204, 262, 308, 331, 334, 351, 417, 420, 423–424, 458. *See also by type*
- and amine receptors, 440–443
- anxiety and, 236, 568
- and circadian rhythms, 340–341
- and conditioning, 328–329
- excitant, 161–162
- and mystical experiences, 430–431
- psychedelic, 442–443, 464
- psychedelic and transformation, 429–430
- in relation to sensorimotor deprivation, 103–104
- D-sleep. *See* Desynchronized sleep
- Dualism, duality, 294, 546–547
- Dynorphin, 215, 222–223, 465, 507, 592, 619, 620, 656
- Earth Day, 665–666
- Eckhart, Meister, 534, 561, 576
- Ecstasy, 287–288, 405, 454
- EEG, 86–87, 162, 163, 171, 236, 270, 284, 287, 297, 327, 382, 403, 441, 536, 567
- and arousal, 157–158
- and brain hemispheres, 363–365
- introverts and extroverts and, 130, 131
- during meditation, 88–92, 97
- and pulvinar, 272, 273
- response to local barbiturate infusion, 159–160
- and seizures, 405–407
- during sleep, 227, 312–313, 314, 319
- and startle responses, 456–457
- Ego, egocentric self, 12, 35, 61. *See also I-Me-Mine*
- death of, 433–434, 448–449, 667
- Egocentric cells, 186, 491, 533
- Eightfold path, 144, 356
- Einstein, Albert, vii, 652
- Eisai, 60, 645
- Electrical stimulation, 172, 176, 190, 227, 265, 334, 335, 353, 386–387, 391, 480
- of frontal lobes, 256–257, 463
- of hypothalamus, 192, 193
- and opioids, 217–218
- of pulvinar, 272–273
- and reticular nuclei, 268–269
- of septal region, 170–171
- of temporal lobes, 384, 386–387
- Electrocorticogram, 455
- Electroencephalogram. *See* EEG
- Embedded-Figures Test, 82
- Emergent properties, 19
- Emerson, Ralph Waldo, 253, 259, 457, 494, 607, 622, 633, 641, 643, 666
- EMG (electromyogram), 326
- Emotion(s), 195, 347–350, 360, 363, 404, 410, 464, 611
- during frontal lobe stimulations, 256–257
- and limbic system, 170–171, 179, 386
- resonances into perceptions, 387, 522–523
- and septal region, 170–172
- Empathy, 429, 650, 652
- “Emperor’s clothes hypothesis” (in reverse), 416
- Emptiness, 108, 110, 570–572
- Encephalitis, 315
- Endocrine cycles, 344–345
- Endorphins, 217–218, 586
- Enkephalins, 214–215, 221–222, 223, 232, 233, 262, 465, 507, 508, 592, 619, 620
- Enlightenment, 3, 8, 117, 135, 350, 355, 526, 536, 540, 592, 622, 623, 636, 641, 666, 677, 686, 687
- approach through meditation, 11–12
- remains in memory, 187–188
- Enryaku-ji, 60

- Enso* (moon circle), 577–578, 644
- Epileptic seizures, 349, 384, 417
EEGs and, 405–407
- Epinephrine, 348, 417
- Epiphany, 21, 302(table), 304
- Epithalamian, 534
- Ergotropic systems, 287, 288
- Estrogen, 195, 199, 336
- “Etching,” 653–654
excitotoxic amino acid, 656–657, 658
- Eternity, 555, 564–565, 610
- Ether, 238–239
- Ethical base of Zen, 645–648
- Evolution, 73, 683–684
alternate states as an expression of, 688
of brain, 685–686
cultural, 686–687, 688
- Excitation, 161–162, 185, 462, 480, 591,
605–606
of cortex, 503–504
of parabrachial nucleus, 165–166
increasing tone of paraspinal muscles,
508–509
visual, 377–378
- Excitotoxins and cell death, 176, 654–655,
656–657
- Exhalation, 93–94, 461–462
- Experiant, 34–35, 507, 598, 638
- Experience(s), 12–13, 23, 27, 251, 252, 353, 404,
503, 671. *See also* Mystical experiences; Psy-
chedelic experiences; Religious experiences
mental set and, 38–39
schizophrenic, 30–31
sequences during meditative training,
131–132
- Experiential immediacy (limbic involvement
in), 386
- Experiential neurology, 697, 776
- Expiration, 93–94, 95, 461–462
- Extinction, 580, 774–775
- Extraordinary states, 23
- Extroversion, 130, 201
- “Far-death” attitudes, 449–450
- Fear, 175–176, 179, 451, 567–568, 569–570
and amygdala, 177–178, 347–348
blocked by opiates, 216–217
loss of, 608–609
- Fearlessness, 569–570
- Feedback, 393
- Fischer, Roland, 32–34, 287–288
- Flow, 297
- fMRI. *See* Magnetic resonance imaging (func-
tional MRI)
- Forebrain, 162, 190, 323
- Foresight, 256
- Fornix, 193, 565–566
- Four Noble Truths, 8
- Foxes, tame, 208
- Freedom, 63, 137, 611, 638–639, 676
- Freud, Sigmund, 35, 36, 127, 129, 134, 135,
307, 322
- Frontal lobes, 149, 169, 216, 258, 275, 278, 323,
396, 417, 604, 624, 674
attributes, 254(table)
electrical stimulation and, 387, 463
- GABA. *See* Gamma aminobutyric acid
- Gallamine triethiodide (Flaxedil), 100
- Gallup surveys, 20, 445–446, 634
- Gamma aminobutyric acid (GABA), 152, 167,
199, 209(fig), 234, 237, 319, 368, 401, 402,
592, 623
function of, 208–210
and hypothalamus, 195–196
and reticular nucleus, 267, 268–269
- Gamma aminobutyric acid (GABA) cells,
610–611
inhibited by NE, 273
inhibited by ST, 205
- Gamma aminobutyric acid (GABA) recep-
tors, 209, 568
- Gamma rhythms, 86, 674
- Garden of Eden, 426
- Gating, 267, 269, 400
- Geniculate nuclei, 263. *See* Lateral, Medial
nuclei
- Gesture, 634, 654
- Gigantocellular ACH cells, 165(fig), 166, 319
- Global positioning system, 491
- Glucocorticoids, 239
- Glutamate, 199, 209(fig), 225, 401, 614, 619,
622–623, 654–656
and GABA, 208, 209
- Glutamate nerve cells, 654
- Glutamate receptors, 225, 592, 659
- Glutamate systems, 622, 623, 655–656
- Gnostic sects, 556
- Gowers, William, 416
- G proteins, 224, 587, 659
- Grace, 50, 55, 611
- Great doubt, 110
- Great Self (capital S), 18, 52, 435
- Greeley, Andrew, 131, 553
on mystical experiences, 17–18, 19, 20, 26–
27, 28, 131, 374, 535, 634, 665
- Grof, S., 426, 682
on LSD experiments, 431–434, 581–582

- Ground squirrels, 337–338
- Gustatory nucleus, 165(fig), 229, 230
- Habenular nucleus, 165(fig), 167, 206
- “Habit energy,” 571, 813
- Habituation, 104–106, 227–228
- Hakuin, 107, 113, 114, 117, 123, 129, 324, 395, 397, 453, 457, 458, 460, 481, 503, 505, 508, 516, 536, 577, 580, 639, 640
- on ambient vision, 495, 496
- “Sound of One Hand,” 114, 116
- Zazen Wasan*, 395–396, 495
- Hallucinogens, 207, 426
- Hallucinations, 102, 304, 320, 487, 488, 494
- creating, 389–390, 482–485
- mechanisms of, 383–386, 518
- during meditation, 373, 374, 470–471, 472–473
- and psychedelic drugs, 441–442
- sleep-related, 381, 382(table), 485–486, 517, 574(table)
- stimulating, electrically, 386–387
- and vision, 240–241
- Haloperidol, 329
- Hamburger, C., 344–345
- Hamsters, 337
- Han-shan, 584
- Harding, Douglas: *On Having No Head*, 502, 803
- Hardy, Alister, 20
- Hartle, James, 555
- Hawking, Stephen, 555
- Hearing, 500, 501, 502, 508, 634, 635
- Heart of Great Wisdom Sutra (Heart Sutra), 68, 572, 627, 652, 698–699
- Heart rate, 78, 227, 236
- Heath, R., 169, 170
- Heim, Albert, 391, 443, 444–445, 446
- Heisenberg, Werner, 80
- Heraclitus, 564, 572
- Herrigel, Eugen, 16
- Zen and the Art of Archery*, 60, 670
- Hess, Walter R., 149, 190, 194, 232, 287, 314, 579, 635–636
- Hibernation, 337–338
- Hiei, Mount, 60
- “High Indifference,” 576
- Hinayana Buddhism, 8
- Hinduism, 125
- Hippocampal formation, 180
- Hippocampus, 94, 151, 180, 203, 223, 239, 260, 318, 656
- aging and, 661–662
- CA1 and CA3 cells, 182, 183(fig), 184, 185, 187, 188, 654–656, 661–662
- desynchrony in, 181–182
- functions of, 185–189
- and hibernation, 337, 338
- and opioids, 214, 220, 222
- “place cells” in spatial perception, 489–490
- Histamine, 193, 585
- H.M., 186, 260
- Hofmann, Albert, 426, 436
- Holmes, Oliver Wendell, 239, 491
- Hopper, Edward, 577
- Homovanillic acid, 201
- Hormones and brain functions, 195, 223, 231, 235, 238–239, 336
- Houston, Jean, 14, 436
- psychedelic drug experiments of, 427–430, 663
- Hsin hsin ming*, 108, 576–577, 700–701
- Hsuan-sha (J. Gensha), 666
- Hsu-yun, 452, 453
- Huai-hai, 48, 68, 681
- Huang-po (J. Obaku), 52, 100, 367–368, 519, 535, 635
- Hui-neng, 9, 116, 129, 453, 535, 551, 560, 637, 638, 645
- Humphreys, Christmas, 6
- Huntington’s chorea, 657
- Huxley, Aldous, 26
- Hyperactivity, 214, 221
- Hyperalertness, 236, 308
- prelude to trance states, 309
- Hyperarousal, 32–33, 171–172, 288
- Hyperattention, 71, 275, 485, 504–506
- Hyperawareness, 470–471, 478, 590
- Hyperexcitement, 288
- Hypnosis, 313, 439
- Hypomania, 586–587
- Hypothalamus, 151, 166, 169, 202(fig), 206, 214, 229, 315, 318, 378, 417, 451, 464, 506, 655
- anterior regions of, 193–196
- and arousal mechanisms, 162–163
- defense and aggression and, 232–233
- functions of, 189–190
- and hibernation, 337, 338
- lateral regions of, 190–192
- NE and, 201–202
- posterior regions of, 192–193
- stress and, 235, 237
- Id, 35, 350, 715
- Idealism, 525–526
- Identity (self-), 38, 446
- Ikkyu, 453, 454, 478
- Illuminated (beatific) face, 413

- Illusions, 380–381, 398, 493–494
 Imagery, 379–380, 382(table), 385, 388–389, 390, 391, 429, 574(table)
 Imagination, 157, 389, 494–495
I-Me-Mine, 44–47, 50–51, 145, 280, 527, 569, 668, 716
 eliminating, 141–143, 598, 610(fig), 645, 692
 premises, 44(table)
 Immanence, 555–556
 Immediacy, 280, 386, 479, 505
 Immobility response, 403–404
 Impermanence, 572, 712
 Impressions (deep, experiential), 524, 606–607, 608, 610, 612
 Incorporated interpretations, 21
 India, 7, 8, 250
 Indian Buddhists, 126, 144, 474, 579–580
 Individuation, 135
 Indra's net, 499
 Indus Valley, 73
 Ineffability, 24, 515–516, 548, 611, 612, 614, 643
 Infants, 230, 413, 415, 490, 567, 648
 Inferior parietal lobule, 244, 757
 Inferior temporal region, 248–249
 Inhibition, 208–209, 248
 "Initial value," 458
 Inkblot tests, 131, 132–134
 Inner journey, 14
 "Inner weather," 64, 346
 Insight, 12, 112, 114, 116, 523, 538. *See also*
 Prajna
 and inkblot tests, 132–133
 learning, 125–126
 Insight-wisdom, 24, 324, 380, 529, 554–555, 623, 639–640, 807
 and *kensho-satori*, 542–544
 Insomnia, 194, 315
 Inspiration, 93, 95
 Instinctive behaviors, 189–190, 460
 "Integration, mutual," 581
 Intelligence, biological, 156
 Interbeing, 627
 International Association for Near-Death Studies, 447
 Interviews, personal. *See* Sanzen
 Intralaminar nuclei, 264(fig), 266–267, 318–319, 787
 Introspection, 129, 130
 Introverts, 130, 131
 Intuitive process, 128–129
Ireisai, 6
 Isolation, 102, 198–199
 Isshu-roshi, 235
 Iwasaki, Yaeko, 450
 Jackson, J. Hughlings, 242–243, 349, 379–380, 391, 416, 574
Jakugo ("capping phrases"), 114
 Jamais vu, 251, 252
 James, William, 4, 15, 18, 38, 69, 70, 75, 134, 299, 378, 387, 505, 558, 561, 569, 608, 661, 697
 on mysticism, 20, 24–25, 26, 30, 31
 and nitrous oxide, 407, 408, 410, 411
 on significance, 523–524
 on space, 487, 489
 on wisdom, 225, 226, 649
 James-Lange theory, 347
 Japan, 3, 6, 7, 10, 60, 192–193, 645, 683
 Jesus, 21, 808
Jikijitsu, 123, 138
 John of Ruysbroeck, St., 1, 644
 Johnson, Samuel, 15, 20, 30, 447–448
 Jordan, G., 435
 Joshu. *See* Chao-chou
 Judeo-Christian form of monotheism, 18
 Judgment, 256
 Jung, Carl, 34, 120, 129, 135, 291, 448, 545, 573, 574, 584, 660–661, 677

 Kamakura, 10, 645
Kan, 126
 Kannon (Kanzeon, Kanjizai), 698
 Kant, Immanuel, 547, 551–552
 Kao-feng, 117, 453, 615
 Karma, 567
Karuna, 651
 Katmandu, 496
 Katou, Kiyonobu, 413
 Kaufmann, W., 24, 28, 416
Kensho, 22, 53, 116, 117, 157, 229–230, 281, 303(table), 304, 349, 395, 477, 527, 533, 536, 541–542, 551, 560, 576, 591(outline), 594(fig), 596(table)
 affirmative properties of, 606
 brain mechanisms of, 613–621, 624
 defining, 542–544
 impacts of, 48–50, 366–367, 591–592, 602–605, 611–613
 and internal absorption, 518, 622
 and loss of fear, 608–609
 mechanisms of, 613–614
 mental field in, 610(fig)
 and moon, 577–578
 and neurological disorders, 597–599
 reflection in, 593–595
 salience and, 599–601
 and *samadhi*, 477–478
 and self, 569, 609–611

- time dissolving in, 561, 563–566, 623
triggers for, 605, 615–617
- Kinesthetic sense, 400
- Kinhin*, 67, 68, 77, 127, 139
- Knowledge, 9, 52, 545–546
- Knowledge-contact experiences, 25–26
- Koan*, 9, 107–109, 139, 299, 540, 622
“original face,” 116, 540–542
realized, 117
resolving, 111–114
response to, 114–116
uses of, 116–119
- Kobori-roshi, Nanrei, 9, 60, 61, 62–64, 65, 87, 109, 112, 121, 137–138, 250–251, 327, 413, 434, 472, 473, 481, 513, 536, 571, 643, 649, 654, 676
- Kuan*, 126
- Kyogen (Hsian-yen), 453
- Kyoto, 10, 59, 60, 469
- LaBerge, S., 324, 325–326
- Language, 20–21, 31–32, 61, 62, 360–361
- Language disorders, 396–397
- Lankavatara Sutra*, 570
- Lao-tzu, 9, 120, 329, 487, 570, 681
- Laski, M., 25, 26, 27, 304, 453–454, 665
- Lateral geniculate nucleus, 263, 264(fig), 265, 369, 377, 378, 391, 501
- Lateral posterior nucleus, 264(fig), 504, 603
- Lateral septal nucleus, 183(fig), 336, 656
- Laughter, 413
and awakening, 414–418
- Learning, 177, 190, 225, 226, 677
conditioned, 328–329
and repetition, 180–181
- Left hemisphere, 150(fig), 359–361, 364–366, 388
- “Letting go,” 67, 251, 359, 622, 670
- Leu-enkephalin, 214
- Levo-dopa, 200, 201, 458, 617–618
- LH-RH. *See* Luteinizing hormone-releasing hormone
- Lie detector tests, 194–195, 597–598
- Light
biological cycles and, 345–346
enveloping bright, 27, 196, 376–379, 445–446, 451, 462
phototherapy, 587–588
- Limbic system, 151, 167, 169–170, 182, 183(fig), 505, 655
kensho and, 591, 614
repetition and long-term potentiation in, 180–181
- Lin-Chi (J. Rinzi), 9, 124
- Lindbergh, Charles, 492–493
- Linnaeus, 338–339
- Locus ceruleus, 59–60, 202(fig), 203, 204, 455
- London Zen Centre, 536
- Long-term potentiation, 181, 677
- Looking: process of, 278–281
- LSD. *See* Lysergic acid diethylamide
- Luteinizing hormone-releasing hormone (LH-RH), 211
- Lysergic acid diethylamide (LSD), 130, 161, 321, 357, 390, 425, 426, 442
and changes of self/other interface 435–436
“cosmic unity” and, 581–582, 583
effects of, 418–420, 427–435, 463–464, 465, 582–584
and interactions with serotonin systems, 207, 317, 441, 618
physiological changes and, 421–423
and sensorimotor deprivation, 103, 104
- “Magic mushroom.” *See* Psilocybin
- “Magnetic attention,” 505
- Magnetic resonance imaging (functional MRI, “fast MRI”), 284, 524
- Magnocellular ACH cells, 165(fig), 166, 319
- Mahakasyapa, 418
- Maha-prajna-paramita*, 12
- Mahayana Buddhism, 7, 8–9, 137
- Makyo*, 374. *See also* Quickenings
- Mammillothalamic tract, 183(fig), 193, 260
- Mandell, A., 184, 288–289
- Mania, 459, 586
- Mapping dimensions, 490
- Marceau, Marcel, 634
- Marihuana, 568
- Marmots, 337
- Marsh Chapel, 436–438, 575
- Maslow, Abraham, 20, 27, 28, 136, 304, 576, 607, 642, 646, 663
- Masters. *See* Roshi
- Masters, Robert, 14, 436
psychedelic drug experiments of, 427–430, 663
- Materialism, spiritual, 143, 636
- Ma-tsu, 415, 679
- MDMA (“ecstasy”), 424
- Meaning, dimensions of, 527–538, 599
- Meanings, above and beyond the self, 694
- Medial dorsal nucleus of the thalamus, 262, 264(fig), 265–266, 760
mediodorsal nucleus, 165, 254, 591, 592, 605, 656
- Medial geniculate nucleus, 263, 500, 501
- Medial orbito-frontal functions, 614

- Medial prefrontal cortex, 255
 Medial septal nucleus, 165(fig), 167
 Medial septal region, 181
 Medial temporal region, 235, 260, 386
 Medial thalamocortical projection system, 460
 Meditation, 4, 7, 8, 13–14, 57–58, 63, 227, 289, 293, 323, 359, 370, 396, 405, 420, 425, 517, 563, 582(table). *See also* Zazen
 and attention, 72, 294
 and biorhythms, 346–347
 and brain hemispheres, 365–366
 brain wave patterns in, 84–91
 and circadian rhythms, 340–341
 and consciousness, 299–303, 464, 592
 and depression, 341, 584–585
 and desynchronization, 462–463
 different methods and techniques of, 22, 72, 73, 75–76, 299, 300(table)
 effects differ from psychedelic drugs, 435
 and enlightenment, 11–12
 and enveloping light, 376–379
 eyes open or closed during, 582(table)
 functions of, 286, 370
 and locus ceruleus, 202–203
 as a mindful act, 667
 PET scans and, 282, 283
 physiological changes in, 78–83
 reducing distractions, 281
 side effects of, 373–374
 and sleep cycles, 91–92, 315
 and thalamus, 270–271
 visual system and, 390–391
 Mediators, 235, 313
 inkblot studies of, 132–134
 selection of, 129–130
 transformation of, 141–144
 Medulla, 93, 150, 159, 169, 206, 214, 451, 455, 517
 ACH cells and, 166, 463
 arousal and awareness and, 98–99
 and respiration, 94, 98
 sleep and, 319, 342
 Memory, 225, 226, 260, 483, 559, 560, 662, 677, 761
 factors influencing, 261–262
 and hippocampus, 184, 186–187, 188–189
 retained during enlightened transformations, 187–188
 spatial perception and, 489–490
 “state-bound” aspects, 261
 time constructs embedded in, 562–563
 Mental set, 38–39
 Meperidine (Demerol), 173
 Merging(s), 531–532
 Merrell-Wolf, F., 576, 628
 Mescaline, 161, 438–439, 441, 442
 Messenger molecules, 514–515
 Messenger systems (“second”), 223–225
 Metabolism (brain), 216, 282–283, 317, 491–492
 Metabotropic systems, 223, 224, 225, 659, 794
 Metamorphosis, 3, 660, 684
 Metenkephalins, 214, 215, 222, 232
 Methamphetamine, 424
 Mice, 200, 211, 230–232
 Microawakening during meditation, 92
 Microsleep during meditation, 92
 Midbrain, 93, 99, 150, 151(fig), 167, 197, 218, 227, 233, 318, 455, 459
 and arousal, 160–162
 Middle Way, 8, 240, 356, 425, 682
 Midfrontal cortex, 274
 Mind, word problems, 293–295
 Mindfulness, 126–128, 647
 evolving into intuitive and introspective dimensions, 127–128
 Mind’s eye, 488
 Miracle of Marsh Chapel, 436–438, 575
Miroku (Maitrea), 687
 Mirror analogy, 48, 593
 Mitchell, Edgar, 553
 Modulators, 223
Moksha, 611
 Monasteries, 123, 680–681
 Monastic life as a planned withdrawal, 74
 Mondo, 31, 110–111, 289. *See also* chapters 107, 123, 144
 Monkeys, 173, 186, 202, 208, 273, 335, 338, 358, 455
 attention in, 275, 276–277
 fear in, 178–179
 hypothalamus in, 190, 191
 opioids and, 216–217
 social groups and, 568–569
 temporal lobes, 251, 606
 vision in, 249–250
 Monosodium glutamate (MSG), 654–655
 Mood, 218–219
 Moon as Zen metaphor of enlightenment (enso), 577–578
 Morning hours as favorable for kensho, 620–621
 Morphine, 98, 169, 173, 231, 233, 262, 329, 507
 effects of, 213–214, 216–217, 221
 Motivational drive, 220–221, 233, 608
 Motor deprivation, 100–101
 Motor functions, integrated, 403

- Motor systems, opioids and, 220–221
- MRI. *See* Magnetic resonance imaging
- MSG. *See* Monosodium glutamate
- Mu*, 113, 477
 approach to the implications of enlightenment, 688–689
- Mu opioid receptors, 216, 233, 619
- Muscarinic ACH receptors, 167–168, 330, 401, 662
- Muscle tone, 90, 100, 222–223, 326, 508–509
- Mushin*, 293
- Music, 503
- Muso Kokushi, 415, 528
- Myokyo-ni. *See* Schloegl, Irmgard
- Mystical experiences, 131, 374, 452, 535, 634, 665
 characterizing, 23–27
 describing, 20–21
 different from schizophrenic reactions, 31(table)
 evolution of, 21–22
 psilocybin and, 436–438
 and psychedelic drugs, 430–431, 434–435
 role of, 29–30
 valuation of, 28–29
- Mysticism, 4, 14, 18, 19, 30, 125
 and science, 16–17
 types of, 429, 530–531, 534
 Western perspectives, 19–29
 and Zen, 15–16
- Naloxone, 216, 218, 219, 231
- Nan-yueh, 116
- Napping, 80–81, 315, 330
- Naranjo, C., 628–629
- Narcissism, 48
- Narcolepsy, 200, 320, 383
- Nature, 63, 666–667
 sponsoring a dual approach to the meditative traditions, 665
- NE. *See* Norepinephrine
- Near-death experiences, 391, 444, 445–446, 447, 448, 451, 452
- Neglect (inattention), 173, 274–275
- Nelson, Horatio, 398
- Neocortex, 394
- Nepal, 7
- Nerve cells, 151, 153(fig), 159, 197, 212, 214, 267, 318
 acetylcholine (ACH), 161, 164–169
 in arousal, 162–163
 dopamine (DA), 198, 200
 evolution of, 683–684
 learning and memory in, 226, 227
 messenger molecules and, 514–515
 norepinephrine (NE), 201–205
 organization of, 394–395
 response of, 223–224
 at rest, 368–369
 serotonin (ST), 205–208
 and their chemical messengers, 152–154
- Nerve compression, 479, 506, 677
- Neural networks, dynamic, 155–156
- Neurohormones, 153
- Neurological disorders, relevance to advanced Zen states and stages, 546, 595–599, 601, 604, 606, 674–675. *See also by type*
- Neuromodulators, 153
- Neurons, 151
- Neurosciences, 6, 16, 18, 149, 155, 346, 578, 634
- Neurosis, 386
- Neurotransmission, neurotransmitters, 153, 223, 622. *See also by type*
- Nialamide, 420
- Nicotine, 168–169
- Nicotinic ACH receptors, 168, 619
- Nightmares, 374
- Nigrostriatal pathway, 197
- Nirvana, 137, 579–580, 628, 815
- Nishitani, K., 475
- Nitric oxide, 412–413, 655, 676
- Nitrous oxide effects, 407–408, 620
 associated with release of opioids, 409–410
 properties of, 408–411
- Nobel prizes, 224, 327–328, 334, 358, 666
- Noetic quality, 24–25
- Nonattention, 480
- Noninterference, 607–608
- “Non-peakers,” 20
- Norepinephrine (NE), 78, 104, 153, 162, 171, 173, 185, 195, 200(fig), 222, 273, 288, 330, 401, 424, 455, 458, 568, 623, 676, 684
 and cAMP, 224–225
 and depression, 585, 586
 functions of NE systems, 201–205
 interacting with serotonin systems, 206, 442, 618
 and psychedelic drugs, 438, 441
 and stress, 237, 238, 451
- Norepinephrine (NE) cells, 202(fig), 203, 204, 222, 317, 459, 623
- Norepinephrine (NE) receptors, 153, 195, 224–225, 265, 345, 368, 440, 442, 662, 684
- No-thought, 141–143, 296, 400, 537
- Novelty, 257, 285–286, 415, 424, 454, 623
 and memory, 261–262
 opioids and, 219–220

- "Now," 509, 563–564, 623, 667, 670
 Noxious stimuli releasing norepinephrine, 202, 204, 451
 Nuclei of the diagonal band, 167
 Nucleus accumbens, 214, 234, 236, 608, 620, 821
 Nucleus of Cajal, 508
 Nucleus of the solitary tract, 165(fig), 229
 Nurture, 195
- Objectivity, 574–575
 Objective vision, 538, 573–574
 Obora, Abbot, 571
 Occipital lobes, 150, 597, 614
 Oneness, 530, 532
On Having No Head (Harding), 502
 Opiates, 213–214. *See also* Morphine effects of, 216–223
 Opioid receptors, 215, 216(table), 456, 619–620
 Opioids, 174, 178, 185, 202, 212, 229, 236, 262, 329, 465, 568, 586, 606. *See also by type*
 absorption and, 507–508
 and central gray substance, 233–235
 brain receptors for, 215–216
 functions of, 215–223
 and *kensho*, 592, 619–620
 and muscle tone, 508–509
 and nitrous oxide, 409–410
 production of, 214–215
 release of, 233–234
 relieving fear, 608–609
 relieving pain, 231, 352–353
 withdrawal from, 173, 204, 221
 Orbital prefrontal cortex, 254–255
 "Ordinary mind," 425
 Orgasm, 171, 364
 Orienting reflex, 157–158
 "Original Face" (koan), 116, 540–542
 Osumi, Yoshi, 60
 Out-of-body experiences, 325, 326(table), 445–446
 Overloading, 308–309
 "Overself," 294
 Overstimulation, 424–425, 518
 Ox (Bull) and His Herdsman, The, 581, 640–641
- Pacemaker cells, 402, 403
 Pahnke, Walter, 436–438, 542, 575
 Pai-chang, 115
 Pain
 in depression, 588
 fast and slow, 352–353, 779
 loss with defeat, 231
 opiates and, 217, 218
 pathways, 217, 234, 264, 445, 754
 relieving, 234, 352–355
 and suffering, 357–358
 P'ang Chu-Shih, 107, 399, 402, 552
 Parabrachial nucleus, 165(fig), 166, 412, 456, 619
 Paradoxes, 513–515, 516
 of Zen, 677–683
 Paradoxical sleep, 312, 320
 Parahippocampal gyrus, 180, 183(fig), 260, 490
 Parallel distributed processing, 280(modes), 395
 Parafascicular nucleus, 217
 Paragigantocellular nucleus, 202, 451
 Parietal lobes, 149, 271, 400, 614, 757. *See also*
 inferior and superior lobules
 attention and, 245–246, 275, 276, 402–403
 vision and, 244–245, 246–247
 Parkinson's disease, 200–201, 392, 585, 617–618, 675
 Parliament of the Worlds' Religions, Declaration, 356, 357
 Parmenides, 564
 Passivity, 24, 445
 Patience, 232
 Pause, 242, 286, 370, 666
 Pavlov, Ivan, 147, 157, 314, 327–328, 329, 330, 332
 PCPA, 207
 Peak experiences, 20, 28, 295, 407, 463, 646, 663
 Pecking orders, 231
 Penfield, W., 185, 196, 360, 384, 386
 Pentylentetrazol (Metrazol), 161–162
 Peptide nerve cells, 210
 Peptides, 586, 614, 655. *See also by type*
 coexistence with other messengers, 464, 514
 function of, 210–212, 514–515, 621
 nerve endings in amygdala, 175
 Perception, 48, 439, 465, 494, 554, 622
 enhanced, 32–33
 and hallucinations, 483–485
 Perceptual deprivation, 101
 Perfection (Ultimate), 537, 555
 Perky effect, 389
 Persimmon, 649, 661
 Personality, 144, 461, 645
 Perspectivism, 526
 PET scan. *See* Positron emission tomography
 Peyote, 438
 PG (area), 276, 277, 766
 PGO waves. *See* Ponto-geniculo-occipital waves

- Phantom limb, 398
 Phencyclidine (“angel dust”), 103, 174
 Phenothiazine drugs, 417, 419–420
 Physicalism, 525
 Psychological changes and meditation, 78–92, 96–97
 Physostigmine, 316–317
 Piaget, Jean, 323, 557
 Pineal gland, 196
 Pituitary gland, 210, 218, 235, 237
 Place cells, 185–186, 491–492
 Planck, Max, 578
 Plateau experience, 27, 302, 304, 638
 Play-absorption, 475
 Play, playfulness, 415, 418, 671
 Pneumatic Institution, 407, 409
 Polygraphs, 194–195, 326
 Polysensory cells (polymodal), 242, 497–498
 Pons, 93, 94, 98–99, 150, 166, 319, 463
 Ponto-geniculo-occipital (PGO) waves, 166, 456–457
 Positive feeling states, 350–352, 653
 Positron emission tomography (PET), 103, 252, 272, 274, 285, 588
 description and use of, 281–284, color plate
 Posterior parietal lobe, 603, 671
 Posterior temporal region, 248, 349
 Posture, 77, 211, 231, 675,
 erect after internal absorption, 479, 508–509
 in zazen, 58–59, 65, 81, 469–470, 478, 822
 Pragmatism, 13, 526
Prajna, 112, 126, 128, 545–546, 547–548
 as a two-edged sword, 548–549
 Praying, 88–89
 Preattentive processing, 278(table), 280–281, 505
 Preconceptions overturned, 115
 Prefrontal cortex, 150(fig), 253, 274, 492, 536, 596, 623, 655
 regions of, 254–259
 Prescription to listen, 666
 Presynaptic nerve endings and terminals, 153, 226
 Priestley, Joseph, 407
 Primates, 178–179, 205, 215–216, 220, 241, 265, 420, 480. *See also* Monkeys
 Procaine, 455
 “Promethean hyperpraxia,” 674–676
 Prometheus project, 393
 Prosopagnosia, 597
 Pseudo-dionysius, 480
 Psilocybin, 130, 207, 441
 study in Marsh Chapel, 436–438
 Psychedelic experiences, 427(table), 428–429, 432–435, 465, 581–584
 Psychic blindness, 250
 Psychic cycles, 345
 Psychic energy, 135, 660–661
 Psychoanalysis, 127, 134–135
 Psychological tests, 82–83, 130, 134, 488, 601, 604, 693
 Psychophysiology, xix, 40, 589
 Psychotropic drugs, 130
 P300 wave, 257, 285
 Pulvinar, 377, 490, 497, 603, 619, 624
 structure and function of, 271–274
 Pure Being. *See* Ultimate Being
 Purity, notions of, 637
 Purkinje cells, 677
 Quantum theory, 18, 298
 Quan-Yin, 652, 698
 Quickenings, personal descriptions, 378, 379, 390, 395–396, 399, 404, 413–414
 Rabbits, 318, 329, 403
 Rage, 175, 192–194
 Raja Yoga, 105
 Rajneeshee, 125
 Ram Dass, 419
 Raphe nuclei, 198(fig), 205, 206, 317, 456
 Rapid eye movements (REM), 312, 317, 320–322, 342, 464, 662. *See also* Desynchronized sleep (D-sleep)
 Rapture, 33, 34, 287–288, 507, 532
 Rats, 104, 176, 185, 199, 200, 202, 211, 229, 236, 237, 315, 353, 368, 409, 458, 489
 aging in, 661, 662
 brain development in, 332–333
 and fear, 177–178, 347–348
 hypothalamus in, 191, 194
 immobility response, 403–404
 and memory, 261–262
 MSG in, 654–655
 and opiates, 213–214, 218, 219–220, 221, 222–223
 and opioids, 215, 229
 self-stimulation in, 334, 335
 and time intervals, 561–562, 566
 unlearning in, 190, 329–331
 Raw experience, 21
 Reaction times, 672–674
 Realism, 117
 Reality, 13, 50, 61, 135, 306–307, 529, 537, 539, 541–542, 575, 691
 Receptors. *See types*
 Reducers, 354–355(table)
 Reflection, 47–48
 Reflections on kensho (I–IV), 593–595, 596 (table), 598–613, 617

- Reflexive interpretations, 21
 "Regressions," 134–135
 Religion, 16, 20, 135, 569, 636–637, 686, 692–694
 Eastern, 3–4
 and science, 18–19
 Religious experiences, 20–21, 584
 LSD and, 426, 428–429
 psilocybin and, 436–438
 seizures and, 405, 406
 REM. *See* Rapid eye movements
 REM sleep. *See* Desynchronized sleep (D-sleep)
 Renunciation. *See* Shila
 Reserpine, 162, 456, 458
 Respiration, 94, 97–98, 216
 Rest, 367, 368–369
 "Rest principle," 459
 Restraint (renunciation), 73–74, 126. *See also* Shila
 Restraint (physical), 236
 Reticular activating system, 150, 591, 616
 Reticular formation, 159–160
 Reticular nucleus of thalamus, 267–271
 excitation causes sensate blockade of physical self, 503–504, 518
 excitation contributing to loss of psychic self, 605, 610–611
 Retina, electroretinogram of, 389
 Retreats, 138, 375, 585, 616, 633. *See also* Sesshin
 Retrocollis, 508
 Retrospective interpretations, 22
 Retrosplenial cortex, 174
 Rhodopsin (visual purple), 684
 Ribot rule, 187
 Right hemisphere, 151(inner surface; fig), 358–361, 364–366, 388
 Right parietal lobe, 365
 Right living, 74
 Rightness (intrinsic, in kensho), 537
 Rilke, Rainer Maria, 461
 Rinzai, Master (Ch. Lin-chi), 9, 124, 633, 634
 Rinzai school, 10(table), 60, 62, 76, 139, 536, 641
 breathing and, 94–95
 koan and, 117, 118
 roshi in, 122–123
 Roget, Peter, 407, 408, 410
 Rorschach tests, 131, 132–134
 Roshi, 415, 681
 koan and, 110–118
 role of, 120–125, 139
 Rod-and-Frame Test, 82
 "Runner's high," 219
 Ryoko-in, 60–61, 62, 66–67, 107
 Ryosen-an, 469–470, 512
 Sacks, Oliver, 617
 SAD. *See* Seasonal affective disorder
 Sage knowledge, 52
 Saint-Exupery, Antoine de, 695
 Saliency, 273–274, 523–524, 599–601, 603
Samadhi, 90, 138, 287–288, 304, 514, 635, 638
 defining, 473–476
 entering, 476–477
 as prelude to *kensho*, 477–478
 Samantabhadra, 670
Sangha, 67, 680–681
Sanzen, 107–109, 122–123, 139
 Sasaki, Ruth Fuller, 18, 469, 511, 514, 644
 Sasaki-roshi, Joshu, 110–111, 122–123, 138, 528
Satori, 116, 303(table), 304, 395, 415–416, 453, 477, 533, 579, 583, 633, 637
 Schachter, S., 347, 348
 Schizophrenia, 30, 31(table), 199, 406, 423, 481
 and enhanced perceptions, 32–33
 and hallucinations, 384, 385
 language and, 31–32
 Schloegl, Irmgard (Myokyo-ni), 121, 125, 141, 333, 350, 536–537, 539, 540, 612, 641
 Schweitzer, Albert, 17, 693
 Science
 and mysticism, 16–17
 and religion, 18–19
 Scopolamine, 329, 331
 Seasonal affective disorder (SAD), 588
 Seizures, 255, 349, 396, 405–406, 407
 Sekida, Katsuki, 473, 542, 639
 Selective nerve cell death (mechanisms of), 239, 656
 Self, 22–23, 34–35, 252, 311, 446, 476(fig), 533
 changing, 658–659
 construction of, 43–47
 and death, 449–450
 death of, 448–449
 development of, 37–39
 dissolution of, 609–611
 interpretations of, 34–35
 loss of physical self in absorption, 477(fig), 503–506
 loss of psychic self in kensho, 569, 570, 575, 606, 610(fig)
 and LSD, 435–436
 omniself (throughout levels in the brain), 41–42
 physical, 40–41, 303–304
 psychic, 39–40
 and Zen training, 35–36

- Self-actualization, 136, 646
- Self-awareness, 259
- Self-discipline, 14
- Self/other world, 46(fig)
- Self-preservation, 40, 657, 658, 692
- Self-referent constructs, 244, 573
- Self-reliance, 14
- Self-restraint, 73–74, 425
- Self-stimulation, 321, 334–335
- Self-topography, disorder of, 398
- Sengai, 414, 593
- Seng-ts'an, 59, 108, 189, 545, 549, 561, 593, 700
- Senses, sensation, 79, 242, 399
 - blocking, in posterior thalamus, 503–504
 - and sensory nuclei of the thalamus, 263–265
- Sensitization, 226–228, 719
 - during meditative retreats, 454
- Sensorimotor deprivation (SMD), 142, 198–199, 289, 308
 - effects of, 101–104
- Sensory deprivation, 100–101, 494
- Sensory fixation reaction, 505
- Septal region (septum), 169, 170–172, 181
- Serotonin (ST), 98, 195, 222, 234, 238, 265, 288, 317, 345, 353, 480, 486, 623
 - and depression, 585, 586, 588
 - functions of, 205–208
 - and hippocampus, 185, 186
 - and psychedelic drugs, 436, 441, 442
 - and spinal extensor muscle tone, 508–509
- Serotonin cells, 198(fig), 486, 568
- Serotonin receptors, 207–208, 442, 618, 655, 657, 662
 - and psychedelic drugs, 441–443, 568
- Service, 402, 648–649, 651
- Sesshin*, 137, 138–140, 235, 342
- Sexual arousal, 171–172
- Sexual behavior, 407
- Shaku, Soyen, 57, 373, 642, 644
- Shapiro, David, 78, 104
- Shikantaza*, 76
- Shila*, 74, 126, 141
- Shinto, 10
- Shui-lao, 415
- Siddhartha Gautama, 6, 7–8, 136, 355–356, 535, 808. *See also* Buddha
- Significance (salience), 523–524
- Sila*, 425
- Silence, 133, 139–140, 499–500, 501, 502, 633–634
- Simplicity, 644–645
- Simultagnosia, 601, 603
- “Sinking,” 375
- Sitting, 78, 469–470, 822
- Skillful behavior, 651, 672, 692, 818
- Siu, R., 52
- Sleep, sleep cycles, 80–82, 207, 236, 261, 325, 383
 - and LSD, 422(fig), 423
 - mechanisms of, 311–313
 - and meditation, 91–92
- Sleep deprivation, 341, 342
- Sleeping sickness, 315
- Sleep-waking cycles, 308, 312, 339, 341–342, 459–460
 - altering, 462–463
 - awareness and, 510–513, 517
 - and depression, 586–587
 - and *kensho*, 615–617
 - matters of timing in, 343–346
- Slow-wave sleep (S-sleep), 312, 314–315, 319, 321, 325, 344
 - and meditation, 343, 511–512
- SMD. *See* Sensorimotor deprivation
- Smell, sense of, 263, 453
- Smiling, 413, 414, 417–418
- Social (support) groups, 568–569
- Social boundaries (hierarchies), 176, 231–232, 335
- Solitude (voluntary), 103, 634, 695
- Soto school, 10(table), 60, 62, 76, 95, 641, 647
 - habituation and, 105, 106
 - koan* and, 117, 118
- “Sound of One Hand” (Hakuin), 114, 116
- Space, 244, 246, 280, 439, 487, 521
 - awareness of (types of), 486(table)
 - construction of, 489–491
 - mental, 498–499, 522
 - semantic, 521
- Spatial mapping, 185–186, 490
- Specific sensory relay nuclei (thalamus), 263–265
- Sperry, Roger, 3, 18–19, 51, 358, 361, 589
- Spinal cord, 150, 508–509, 671
- Spinal fluid, 219, 585
- “Spiritual” evolution, 686
- Spiritual growth, stages of, 450
- Sports, performance in, 670–671, 675
- S-sleep. *See* Slow-wave sleep
- ST. *See* Serotonin
- Stage* of ongoing enlightened traits, 303
 - (table), 638–645, 652
- Startle responses, 456–457
- State VII. *See* Kensho and Satori, 303(table)
- State VIII. *See* Ultimate Being, 303(table)
- Steroids, adrenal, and steroid receptors in the brain, 238–239
- Stick (Kyosaku), 679

- Stillness, 367–368, 635
- Stimuli, 230, 308. *See also* Electrical stimuli;
 Noxious stimuli
 hypothalamus and, 190–191
 learning and, 227–228, 229
 painful, 202, 204, 455–456
 as triggers, 452–455
- Stimulus-response patterns, 332
- Stream of consciousness, 297
- Stress responses (within brain), 212, 217, 330,
 392, 451, 512, 585
 effects of, 235, 236–239, 258, 464
- Striatum, 214. *See* Dorsal and ventral striatum
- Strokes, 94, 515–516
- Styron, William, 584, 588
- Subcortical bridge, 361–363, 695
 “Submergence,” 375
- Submissiveness, acquired and innate, 231–232
- Submissive behavior and social hierarchy, 335
- Substance abuse, 424–426
- Substantia nigra, 197
 “Subtractions” during kensho, 607, 611, 614,
 657
- Suchness, concepts of, 549–553
- Suffering, 193, 213, 217, 323, 355–356; 588
 and pain, 357–358
 relief of, 213, 234
- Sufis, 288
- Sung dynasty, 10, 116, 695
- Superego, 35
- Superior colliculi, 241–242, 278
- Superior parietal lobule, 398, 504, 757
- Supreme Silence, 133
- Surge(s), 203, 237, 269, 457–460, 465
- Surprise, 286, 415
- Sutra chanting, 68
- Suzuki, Daisetz T., 11, 12, 16, 113, 117, 357,
 467, 477, 533, 542, 552, 556, 570, 617, 627,
 633, 644, 648, 665, 671
 on suchness, 549–553
- Suzuki, Shunryu, 57, 549, 550, 633
 “Switch process” (as a *deep* shift), 336, 393,
 459, 587, 592, 603
- Symbolism, 13, 569–570, 577, 593
- Synapse, 152, 153(fig)
- Synaptic leverage, 273
- Syncretism, 601–602
- Szyzygy, 346, 592
- Tachistoscope experience, 390–391, 418, 444
- Tachyphrenia, 392
- Takaori, Shuji, 59–60
- Tathaata*, 637
- Tathata*, 552
- Ta-hui, 116, 530, 536
- Tanden*, 93, 670
- Tang dynasty, 9, 10, 100, 111, 122, 681, 695
- Taoism, 9, 36, 62, 63, 144, 667, 681
- Tao-sheng, 633
- Tao Te Ching*, 12, 327, 555
- Tart, Charles, 305, 306, 307, 308, 311
- Taste, 228–230, 452
- TE area, 249
- Tea ceremony, 64
- Teilhard de Chardin, Pierre, 636, 683, 685
- Teisho*, 137
- Temporal lobes, 149, 150(fig), 260, 391, 406,
 420, 463, 465, 494, 606, 609, 614
 comparative interpretations, 251
 excitation of, 288–289
 hallucinations and, 384, 387, 483
 inferior temporal region 247–249
- Tendai school, 60
- Territory (“turf”), 176, 230–231
- Te-shan, 544
- Tesshu, 669
- Testosterone (androgen), 195, 197, 217, 741
- Tetrahydrocannabinol (THC), 568
- Thalamus, 150, 161, 163, 166, 169, 197, 222,
 260, 264(fig), 400, 417, 460, 482, 491, 548,
 603, 605, 624
 ACH cells and, 165, 168, 463
 excitation and, 504, 591
 hallucinatory light and, 377–378
 during sleep, 318–319
 structure and function of, 263–274
- THC. *See* Tetrahydrocannabinol
- Theravada Buddhist tradition, 126, 374
- Theta rhythms, 85–86, 96, 181
 during meditation, 89–90, 91
- Thich Nhat Hanh, 627, 650
- Thoreau, Henry David, vii, 621
- Thought(s), 81, 97, 141, 171, 359
 speed of, 392–395
- Thyrotropin-releasing hormone (TRH), 338,
 343, 508–509
- Time, sense of
 change during absorption, 563–564, 623
 construction, 557–560, 564–567
 dissolution in kensho, 563–566, 623
 effects of change during hypnosis, 439
 sequences involved in, 258, 566
 visceral aspects, 561–562, 566
- Time frame, personal, 251–252
 doing-time, 562–563
- Timing and duration
 of absorption, 339, 510–513, 623
 of kensho, 594, 615–617, 620–621, 623

- Timidity, 567–568
Tinnitus, 500–501
TM. *See* Transcendental meditation
Tokusan (Ch: Te-shan), 453
Touch, 399–401
Touch healing, 91
Tozan Ryokai (Ch: Tung-shan), 510, 513, 516, 580
Training, 58, 77, 119–120, 622, 627
 and experience, 131–132
 koan and, 110–118
 Zen, 461, 641–642, 646–648, 668–669, 672, 679, 688, 693
“Transcendence,” 288–289, 556
Transcendental meditation (TM), 77, 80, 81, 82, 130, 357, 375
 and breathing, 96–97
 habituation and, 105, 106
 physiological responses during, 78–79, 89
“Transcenders,” 136
Transformation, 141–144, 428, 447, 642
 and drugs, 429–430
 enlightened, 187–188
 ongoing, 637–638
Transmitters, 152
Transpersonal experience, 434
Transpersonal world, 52
Trauma, 187, 450–451, 603–604
TRH. *See* Thyrotropin-releasing hormone
Tricyclic antidepressants, 585–586
Triggers, 665
 of *kensho*, 615–617
 responses to, 452–457, 622–623, 760
 sensory stimuli as, 166, 198
Trophotropic system, 287–288
Tryptophan, 353, 585, 657
Ts’ao-shan, 9
Ts’ao-tung school (J. Soto), 9
Tung-shan (J. Tozan), 9
Ullman, M., 322
Ultimate Being (State VIII), 303(table), 304, 627–630
Ultimate Beyond, 627
Ultimate Reality, 36, 259, 600, 635
Unconscious, 63–64
 circumspatial awareness, 488, 496(table), 672
Underhill, Evelyn, 15, 20, 350
Understanding, 537–538, 623
“Union” experience, kinds of, 26, 534, 722
Unity, 530–531, 532(table), 534, 581–582, 811
“Universal Mind,” 52
Unlearning, 190, 327, 329–331, 646
Upside Down Circle, The, 417
Urna (symbol), 11, 639–640, 690–691
Ushmisha, 11, 687
Van Dusen, 577, 583
Van Ruysbroeck, 1, 532, 534
Vasoactive intestinal peptide (VIP), 212
Vecu, 252, 609
Ventral posterior lateral nucleus, 263, 264(fig)
Ventral posterior medial nucleus, 263, 264(fig), 504
Ventral striatum, 170, 197, 198(fig), 200, 221, 234, 330, 821
Ventral tegmental area, 197, 198
Vestibular system, 501–502
V4 area, 276, 277
VIP. *See* Vasoactive intestinal peptide
Vision(s), 101, 360, 383, 388, 462
 and aging, 662, 663
 ambient, 493–495, 496(table), 496–498, 801
 comprehensive, in *kensho*, 496(table)
 and hallucinations, 384–385, 389–390, 518
 and meditation, 374, 377–379, 390–391
 objective, 538, 573–577, 574(table)
 organization of, 240–244
 and parietal lobes, 244–245, 246–247
 and temporal lobe, 247–253
“Vision quests,” 373, 425
Visual agnosias, 597–599
Visual awareness, 118
Visual cortex, 273
Visual perceptions, 82–83
Visual function streams (upper and lower), 243–244, 245(table), 595, 599
Visual systems (first and second), 241(table), 242–243, 757
Vocalization, 234–235
Von Euler, Ulf, 204, 210, 211
Wakefulness, 312, 339, 343–344, 462–463, 464, 486. *See also* Sleep-waking cycles
Water, and reflection, 47–48
Water tank isolation, 102
Watts, Alan, 22, 419, 434–435, 438, 634
Way(s), 669–670, 680. *See also* Middle Way
Wei Ming, 540
Wei Shan, 115
Weiss, B., 223
Wisdom, 547, 639, 642–643, 660. *See also* Insight-wisdom; *Prajna*
World War II, 217, 535
Worlds of personal experience, 52
Wordsworth, William, 247, 664
Wu, Emperor, 628