

Name Index

Bold figures indicate main reference

Vol. 1: 1–364 Vol. 2: 365–694 Vol. 3: 695–1008 Vol. 4: 1009–1330

- Abelard, P., 299, 337
Adler, A., 1157
Adrian, E. D., 941, 991
Agricola, 388, 397, 499
Akhnaton, 139
Albert of Saxony, 305
Alberti, L. B., 390
Al-Biruni, 273, 277, 337
Alcibiades, 193
Alcmaeon, 188
Alexander, 169, 198, **208 f.**, 211 f., 217, 251, 1270
Al-Fargani. *See* Alfraganus
Alfonso the Wise, 303
Alfraganus, 275, 337
Al-Ghazzali, 275, 299, 301, 337
Alhazen, 278, 302, 337, 464, 499
Al-Khwarizmi, 276, 337
Al-Kindi, 272
Al-Mamun, 271, 272, 277
Al-Mansur, 272
Al-Masudi, 276, 337
Al-Mutawahkil, 272
Al-Razi. *See* Rhazes
Amici, G., 646
Ampère, A. M., 607
Anaxagoras, 173, 176, 184 f.
Anaximander, 174, 177
Anaximenes, 174, 442
Anderson, C. D., 755, 864
Andrae, J. V., 495
Apollonius of Perga, 214, 377
Appert, C., 648
Appleton, E., 774
Archimedes, 50, 169, 185, 207, 212, 214, 218 ff., 352, 377, 383, 430, 483, 1270
Aristarchus of Samos, 178, 216 f., 498
Aristotle, 78, 165, 169, 171, 176, 184, 191, 196, **198–208**, 211, 237, 247, 271 f., 280, 294, 299 ff., 306, 346, 350, 375 ff., 383, 398, 406, 408, 420, 432, 442, 463, 470, 497, 498 f., 575 f., 623, 634, 663, 902, 1036 f., 1078, 1226
Arkwright, R., 521, 592, 670
Aryabhatas, 264, 337
Arzachel, 425, 337
Asoka, 151, 209, 1318
Astbury, W. T., 904 f., 906, 909
Astrachan, L., 915
Athanasius, 260
Ausonius, 234
Averroes, 275, 281, 299, 337, 346
Avery, O. T., 959, 990
Avicenna, 272–5 *passim*, 337, 398
Avogadro, A., 535, 629
Babbage, C., 550, 784
Babeuf, F., 1059
Bacon, F., 28, 54, 209, 300, 418, **440–45**, 447, 449, 451, 455 f., 498, 516, 529, 555, 576, 1046, 1057, 1284, 1298
Bacon, R., 28, 54, 302, 206, 310, 318, 320, 337, 351, 414, 442, 445, 455
Baer, E. von, 647, 671
Bagehot, W., 1124
Bailly, J. S., 536, 783
Baird, J., 781
Bakunin, M., 1108
Ball, J., 1045
Balmer, J. J., 739
Balzac, H., 1066
Bardeen, J., 789, 865
Barmecides, 273
Barrow, I., 481
Bartholomew the Englishman, 306
Bastiat, F., 1061
Bateson, W., 951, 991
Bawden, F. C., 913

- Bayle, P., 1056
Beard, C., 1
Beaumont, W., 938
Becher, J., 619
Bequerel, H., 733 f., 864, 994, 1297
Bede, A., 293, 295, 337
Bell, C., 653, 671
Belon, P., 388
Benedetti, 428
Bentham, J., 545, 595, 670, 1059, 1318
Bentham, S., 595
Bentley, R., 488
Berger, H., 942, 991
Bergson, H., 570, 1087, 1091
Berkeley, G., 518, 670, 1167
Bernal, J. D., 913, 1290
Bernard, C., 652, 678 f., 876, 902
Bernstein, E., 1099
Berthollet, C. L., 624
Berzelius, J., 627, 671
Bessarion, Cardinal, 406
Bessemer, H., 562, 597 f., 670, 716
Bethe, H. A., 757, 864
Bichat, X., 646, 671
Bichowsky, F. R., 1253
Biringuccio, 385, 388
Bismarck, 1109
Bjerknes, V. F. K., 801 f.
Black, J., 521, 530, 580 f., 585, 621, 670 f., 1276
Blackett, P. M. S., 764
Blake, W., 676, 1059, 1064
Boccaccio, G., 384
Bodin, J., 1046
Boerhaave, H., 512, 671
Boëthius, 211, 234, 285
Bohr, N., 727, 739 f., 747 f., 768, 772, 794, 861, 864, 994
Bondi, H., 770, 1293
Bonet-Maury, P., 936
Booth, C., 1097, 1140
Borelli, G. A., 474, 475, 480, 872
Borgia, C., 396
Boscovich, R., 676
Bose, J. C., 774
Bougainville, L. A. de, 525
Boulton, M., 530, 547, 582 f., 586, 670
Boyd-Orr, Lord, 878
Boyle, R., 213, 450, 453, 459 ff., 470 ff., 499, 577, 618, 620, 623, 1223, 1270
Braddock, General, 526
Bragg, W. H., 727, 738 f., 741, 793
Bragg, W. L., 727, 738 f., 741, 793, 795
Brahe, T., 216, 417 f., 421 ff., 442, 498
Brahmagupta, 264, 337
Bramah, J., 547, 591, 670
Bray, F., 1066
Brenner, S., 914
Broglic, L. de, 748, 785, 864
Brunel, I. K., 547, 549
Brunel, M., 592
Brunelleschi, F., 390
Bruno, G., 200, 408, 420 f., 434, 445, 498
Buchner, E., 649, 887, 990
Buchthal, F., 942
Buckle, H. T., 1080
Buddha, 173, 179, 1024
Buffon, G. L. de, 544, 638 f., 671
Buridan, J., 301, 302, 337
Burke, E., 1057
Burnham, J., 1137
Burns, R., 1057
Butler, S., 200, 1085
Butlerov, A. M., 1182
Butterfield, H., 374, 414
Byron, Lord, 1059, 1064
Calvin, J., 498, 1044
Calvin, M., 896
Camerarius, R. J., 636, 671
Campanella, 434
Canizzaro, S., 629
Cardan, H., 430, 498
Carlisle, A., 605
Carlyle, T., 1064
Carnap, R., 1159
Carnot, L., 536, 586
Carnot, S., 555, 586 f., 592, 593
Carrel, A., 934
Cartwright, E., 522
Casperssen, T., 909
Catherine the Great, 526, 530
Cato the Elder, 227
Caudwell, C., 861 f.
Caus, S. de, 576 f.
Cavendish, H., 603, 620
Cayley, A., 809
Cervantes, M., 1046
Chadwick, E., 755, 864
Chain, E. B., 926
Chamberlain, J., 871
Champagnat, A., 976
Charcot, J. M., 1154
Chardin, T. de, 12
Chargaff, E., 909
Charlemagne, 285 f., 336
Charles, J. A. C., 536
Charles I, 1047
Charles II, 448, 450, 456, 1047
Charles V, 395
Charlier, C. V. L., 12
Charmides, 193
Chatelier, H. le, 589

- Chaucer, G., 305, 351
 Cheng Ho, 352
 Chiang Kai-Shek, 1196
 Childe, V. G., 1317
 Chosroes, 258
 Cicero, 213, 227
 Clapeyron, B. P. E., 587
 Clarke, S., 674
 Clausius, R., 670, 729
 Cockroft, J., 752 f., 864
 Colbert, Marquis de, 449, 454
 Columbus, C., 398, 401 ff., 498
 Comenius, J. A., 451, 495, 1149
 Comte, A., 558, 670, 1083
 Condorcet, Marquis de, 536
 Confucius, 173, 197, 252, 1024, 1033
 Constantine, 257, 347
 Cook, J., 525, 896, 1054
 Copernicus, 4, 52, 186, 217, 219, 378, 386, 392, 405 ff., 418, 420 ff., 424 f., 427, 432, 438, 463, 487, 496, 568, 662, 673, 744, 1236
 Cornford, F. M., 194
 Cort, H., 523, 596, 670
 Coulomb, C. A., 603, 671, 678
 Crick, F. H. C., 909, 914, 991
 Critias, 193
 Crompton, S., 521, 670
 Cromwell, O., 448, 481
 Crookes, W., 730
 Ctesibius, 220
 Cullen, W., 621
 Curie, M., 727, 734 f., 864, 893
 Curie, P., 727, 734 f., 789, 864, 893

 Dædalus, 129
 Dale, H. H., 942
 d'Alembert, J. L. R., 515, 526
 Dalton, J., 184, 531, 626, 671, 733, 1270, 1276
 Damien, J., 809
 Dampier, W., 525, 801
 Dante, 306, 1042
 Darby, 512, 523, 596, 670, 676
 Darwin, C., 6, 12, 39, 51 f., 56, 485, 488, 507, 544, 556 f., 575, 643 ff., 653, 662 f., 671, 930, 944, 948 ff., 958, 961 f., 1078, 1084 ff., 1228
 Darwin, C. G., 973
 Darwin, Dr. E., 529, 544, 639, 643
 Daumier, H., 1066
 Davaine, C. J., 649
 Davisson, C. J., 785
 Davy, H., 537 ff., 553, 605, 608, 627, 671, 1270
 Day, T., 529
 Dee, J., 410

 Defoe, D., 414
 Democritus, 54, 181, 183 f., 211, 213, 383, 459, 463, 663, 1037
 Descartes, R., 4, 209, 418, 440-47, 454, 464 f., 474, 475, 480, 483, 487, 488, 498, 516, 532, 716, 937, 1057, 1236
 Dewey, J., 1092, 1139, 1159
 Dickens, C., 1064
 Dickinson, H. W., 591
 Diderot, D., 527, 670, 1056
 Diesel, R., 592, 806
 Dietrich of Freiburg, 302, 320, 464
 Dingle, H., 30, 31, 675
 Dionysius the Areopagite, 300, 308, 337
 Dionysius of Syracuse, 195, 198
 Diophantus, 214 f., 275
 Dirac, P. A. M., 616, 748, 755, 864
 Disraeli, B., 1064
 Dokuchaev, V. V., 881
 Dollond, J., 466
 Domagk, G., 926
 Drebbel, C., 416
 Dreyfus, A., 664
 Driesch, H., 933, 991
 Dudley, H. W., 942
 Dufay, C. F., 600, 671
 Dühring, E., 1108
 Dumas, J. B., 628, 671
 Du Pont, 567, 1254
 Durer, A., 400, 499

 Eaton, C., 846, 1164
 Ephantus, 216
 Eddington, A., 1280
 Edgeworth, R. L., 529
 Edison, T. A., 562, 564, 569, 613, 671, 774, 1230
 Ehrlich, P., 614
 Einstein, A., 30, 52, 425, 616, 675, 727, 733, 737, 742 ff., 749 f., 750, 792, 846, 864, 947, 1163
 Eisenhower, I., 843
 Eliot, G., 1064, 1084
 Elvehjem, C. A., 894
 Empedocles, 171, 174, 188
 Engels, F., 344, 520, 663, 670, 893, 918, 987, 1018, 1067, 1069 f., 1077 f., 1083, 1097, 1104 f., 1109, 1114, 1163, 1281, 1310
 Epicurus, 184, 191, 463, 1037
 Erasistratus, 223
 Eratosthenes of Cyrene, 217
 Erigena, 293, 295, 337, 532
 Espy, J. P., 801
 Euclid, 169, 177, 185, 214 f., 297, 485, 742, 1047
 Eudoxus, 185, 214, 216, 483

- Euler, L., 515
 Eutyches, of Alexandria, 262
 Evelyn, J., 474
- Fankuchen, I., 913
 Faraday, M., 39, 462, 507, 540, 553,
 563, 568, 608 f., 616, 627, 663, 671,
 729 ff., 751, 1236
 Farrington, B., 442
 Faust, 385
 Fell, H. B., 934, 991
 Fermat, P. de, 418, 483, 498, 748
 Fermi, E., 757 f.
 Fernel, J., 278, 395, 404, 903
 Feuerbach L., 1069
 Fibonacci, L., 303, 332
 Fischer, E., 634
 Fisher, H. A. L., 1081
 Fisher, R. A., 958
 Fleming, A., 775, 926
 Florey, H., 926
 Ford, H., 28, 807, 1254
 Forest, L. de, 775
 Fourier, F., 1066
 Fourneyron, B., 592
 Francesca, P. della, 390
 Francis I, 380, 395, 396, 498
 Franco, 1132
 Frank, F. C., 788, 865
 Franklin, B., 516 f., 526 ff., 531, 602,
 621, 671, 1053, 1091
 Franklin, R. E., 909, 913
 Frazer, J. C., 1083
 Frederick II, 302, 336
 Frederick the Great, 514, 670
 Fresnel, A., 536, 610
 Freud, S., 947, 1094, 1133, 1154 ff.
 Freysinnet, E. de, 823
 Frisius, G., 404, 418
 Froude, J. A., 1080
 Furberg, S., 909
- Gagarin, Y., 816
 Galen, 222 f., 272, 395, 398, 399, 420,
 437, 463, 499, 634, 652, 872
 Galileo, G., 4, 17, 50, 56, 183, 197, 203,
 217, 258, 300, 301, 378, 408, 411,
 426-34, 438, 439 f., 445, 449, 451 f.,
 463, 467, 469, 475, 478, 481, 482, 496,
 556, 568, 575, 576, 662, 726, 860,
 1020, 1078, 1270
 Gall, F. J., 646
 Galton, F., 950, 1085 f., 1140
 Galvani, L., 535, 603 ff., 671, 875
 Gama, Vasco da, 402, 498
 Gamov, G., 757
 Gaskell, Mrs, 1064
- Gassendi, P., 184, 418, 451, 463 f., 498
 Gauss, C. F., 607
 Gautama. *See* Buddha
 Gay-Lussac, L. J., 536, 628
 Geddes, P., 512
 Geiger, H., 737 f.
 Gell-Mann, M., 766, 864
 George, H., 1108
 George II, 553
 George III, 602 f.
 Gerard of Cremona, 303
 Gerbert, 302
 Gerhardt, C. F., 628
 Germer, L., 785
 Gerson, Levi ben, 305, 319, 400, 402,
 498
 Gesner, C., 388
 Gibbon, E., 256, 1080
 Gibbs, J. W., 589, 670, 729
 Gilbert, W., 318, 411, 418, 434 ff., 480,
 498, 599, 752
 Glinka, K. D., 881, 991
 Godwin, W., 543, 1059
 Goethe, J. W. von, 646, 670, 675, 1067
 Goldschmidt, V. M., 795
 Gosse, E., 662
 Gosse, P. H., 662
 Goudsmit, S. A., 748
 Graham, J., 605
 Graunt, J., 1047
 Gray, J., 1066
 Gray, S., 600, 671
 Green, J. R., 1085
 Gregory of Tours, 234
 Gresham, T., 419
 Grew, N., 474, 499
 Grey-Walter, W., 942
 Griffith, A. A., 788
 Grimaldi, F. M., 467
 Grosseteste, R., 302, 305 f., 320, 334,
 337, 1270
 Grotius, H. de, 1046 f., 1317
 Guericke, O. von, 418, 470, 472, 498 f.,
 577, 599
 Gyulai, Z., 789
- Haak, T., 453
 Haddon, A. C., 1083
 Hadrian, 230
 Haeckel, E. H., 664
 Hahn, O., 757, 864
 Haldane, J. B. S., 341, 938, 955, 958,
 986, 991
 Haldane, J. S., 938, 991
 Hales, S., 515, 620, 671
 Halley, E., 475, 481, 484, 486 f., 1047
 Hamilton, Lady, 605

- Hamilton, W., 733
 Hammond, J. L., and B., 1098
 Hammurabi, 107, 109, 154
 Harden, A., 894
 Hardie, K., 1096, 1138
 Hardy, G. H., 33
 Hargreaves, J., 521, 670
 Haroun-al-Raschid, 272, 336
 Harrison, J., 480, 492, 674
 Harrison, R. G., 934, 991
 Hartman, G., 434
 Harvey, G., 435
 Harvey, W., 52, 188, 378, 392, 395, 411, 418, 437 ff., 463, 469, 497, 499, 625, 1236
 Hauksbee, F., 600, 671
 Häuy, R. J., 537, 627, 671
 Hegel, G. W. F., 183, 544, 623, 670, 1057, 1069
 Heisenberg, W., 748 f., 861, 864
 Helmholtz, H. L. F. von, 555, 587 f., 670
 Helmont, J. B. van, 88, 301, 418, 439, 499, 512, 620, 654
 Henry, J., 607
 Henry the Navigator, 400
 Heraclides of Pontus, 178, 216
 Heraclitus, 171, 174, 182, 556, 768
 Herder, J., 646
 Hero, 220 f.
 Herodotus, 1037
 Heropilius of Chalcedon, 223
 Hertz, H., 568, 612, 671, 773
 Hesiod, 47, 162
 Hicetas, 216
 Hiero II, 216
 Hipparchus, 169, 216, 347, 422
 Hippias of Elis, 185
 Hippocrates of Chios, 185
 Hippocrates of Cos, 186 f., 313
 Hitler, A., 207, 721, 813, 1130, 1135, 1137, 1176, 1191, 1260
 Hobbes, T., 451, 498, 1047, 1049
 Hobhouse, L. T., 1099, 1139
 Hodgkin, D. M. C., 793, 942
 Hodgskin, T., 1066, 1150
 Holbach, H. D., 1056
 Holtfreter, J., 933
 Homer, 162, 1241
 Honnecourt, V. de, 309, 336
 Hooke, R., 450, 453, 455, 459 f., 462, 467, 469 f., 472, 475, 478-83 *passim*, 490, 499, 618
 Hopkins, F. G., 678, 867, 888 f., 896
 Hornblower, J., 584
 Hoyle, F., 770
 Huggins, W., 747, 1086
 Hume, D., 489, 518, 530, 670, 1049, 1056, 1280
 Hunain ibn Ishaac, 271
 Hunter, J., 936
 Huntsman, B., 596
 Huss, J., 295, 1042
 Hutton, J., 530, 641, 671
 Huxley, T. H., 550, 554, 1292
 Huygens, C., 448, 450, 467, 475, 478 f., 480, 482, 499, 577, 610, 627, 748
 Hwang Ti, 209
 Hyndman, H. M., 1095
 Hypatia, 233, 258
 Ibn al Haitham. *See* Alhazen
 Ibn Kahlidun, 273, 281, 337, 1044
 Ibn Tushd. *See* Averroes
 Ibn Sina. *See* Avicenna
 Imhotep, 129
 Jabir (Geber), 280, 337
 James, H., 1091
 James, W., 570, 852, 1091 f.
 James IV of Scotland, 809
 Janet, P. M. F., 1154
 Jansky, K., 778
 Jars, G., 530, 592
 Jefferson, T., 530
 Jenner, E., 649, 901
 Jeremiah, 173
 Jesus, 158, 255, 258, 268, 1024
 Jevons, W. S., 1088, 1090
 Job, 764
 Job of Edessa, 264
 Joffe, I., 787
 Johannsen, W. L., 951, 991
 John XXIII, 1158
 Johnson, S., 458
 Joliot, F., 756, 845, 864, 1290
 Joseph II of Austria, 526
 Joule, J. P., 587 f., 670
 Jung, C. G., 1157
 Justinian, 197, 230, 258, 260, 265, 336, 1038
 Kahn, H., 842
 Kamen, M. D., 896, 990
 Kamerlingh-Onnes, H., 789
 Kant, I., 542, 670, 745, 1067
 Kapitza, P., 789, 847
 Keble, J., 559
 Keir, J., 624
 Kekulé, F. A., 630, 671, 793, 1270
 Kelvin, Lord, 548, 562, 588, 589
 Kendrew, J. C., 907 f., 990, 1295
 Kepler, J., 197, 214, 217, 345, 378, 418, 421-5, 430, 434, 438, 475, 480, 481,

- Kepler (*continued*)
 483, 498, 740
 Keynes, M., 1090, **1134** ff.
 Khrushchev, N. S., 1176
 Kidinnu, 347
 Kleist, E. G. von, 601
 Klingenstjerna, S., 466
 Koch, R., 469, 649
 Köhler, W., 944, 991
 Kosambi, D. D., 39, 348
 Kosminsky, E. A., 1181
 Kossel, W., 794
 Kropotkin, P. A., 1085
 Kuo Mo-Jo, 1198

 Lagrange, J. L., 515, 733
 Lamarck, J. B., 640, 671, 958
 Landsteiner, K., 901
 Langley, S. P., 809
 Langmuir, I., 727, 794
 Lao-tze, 173, 193, 1024
 La Perouse, J. F. de G., 525
 Laplace, P. S., 174, 487, 515, 664
 Laski, H., 1099
 Lassalle, F., 1109
 Laue, M. von, 738 f., 741
 Laurent, A., 628
 Lavoisier, A. L., 472, 531, **533** ff., 536,
 574, 585, 621, **623** ff., 627, 654, 671,
 734
 Lawes, J., 655, 671
 Lawrence, E. O., 755
 Lea, D. E., 936
 Le.Bel, J. A., 631
 Leblanc, N., 624 f., 633
 Lee, T. D., 766, 864
 Leeuwenhock, A. van, 467, 499, 649
 Le Gros Clark, F., 878
 Leibniz, G. W. von, 483, 498, 514, 515,
 518, 674 f., 677, 1047, 1317
 Lemaître, G., 770
 Lenin, V. I., 746, 993, 1106, **1166** ff.,
 1172
 Lenoir, J. J. E., 670, 806
 Leonardo da Vinci, 4, 16, 300, 386, 390,
 392, **394** ff., 403, 430, 499, 809, 1270
 Leucippus, 181
 Lewis, G. N., 794
 Liebig, J. von, 550, 553, **628** f., 633, 649,
 654 f., 671, 887
 Lilburne, J., 1047
 Lilienthal, D. E., 810
 Lincoln, A., 1141
 Linnæus, C., 516, 624, **636** ff., 669, 671,
 678, **1236** f.
 Lippershey, H., 320, 425
 Lister, Lord, 651

 Lobachevsky, N. I., 1182
 Locke, J., 489, 518, 542, 670, **1049**,
 1057, 1280
 Lodge, O., 774
 Lodygin, A. N., 613, 1182
 Loeb, J., 933, 991
 Lombe, T., 521
 Lomonosov, M., 515, 621, 671
 Louis XIV, 449, 498
 Lovell, B., 779
 Lucretius, 47, 53, 184, 227, 463
 Lugal Zaggisi, 136
 Lull, R. R., 301, 323, 337, 398, 499
 Luther, M., 399, 498, 1044
 Lyell, 641 f., 671
 Lysenko, T. D., 957, 962, 991

 Macadam, J. L., 547
 McCarthy, Senator J., 1118
 Macaulay, T., 1080
 MacDonald, J. R., 1099
 McGonigle, G. C. M., 878
 Mach, E., 570, 589, 670, 733, 746, 994,
 1084, **1093** f., 1140, 1167
 Machiavelli, N., 1144
 Macnamara, R. S., 842
 Magat, M., 936
 Magellan, F., 388, 403, 498
 Magendie, F., 653, 671
 Magnus, H., 811
 Mahavira, 1024
 Mahmud of Ghazni, 273
 Maiman, T. H., 791
 Makarenko, A. S., 1183, 1188 f.
 Malpighi, M., 438, 467, 499
 Malthus, T. R., 543, **644**, 655, 670,
 973 ff., 1060
 Malus, E. L., 536
 Mandelstam, L., 794
 Mandeville, B., 1049 f.
 Mangold, O., 933
 Mani, 268
 Manson, P., 871
 Mantegna, 390
 Mao Tse-Tung, 1198
 Marconi, M. G., 773 f.
 Marcus Aurelius, 227
 Mark, H., 906
 Marsden, E., 737
 Marshall, A., 1088
 Martin, A. J. P., 873, 990
 Martineau, H., 1084
 Mary the Jewess, 222
 Marx, K., 54, 173, 183, 191, 525, 544,
 546, 554, 558, 623, 663, 670, 982, 987,
 1018, 1027, 1037, 1052, 1060 f., **1067-**
 78, 1087 f., 1095 f., **1100-1112**, 1114,

- 1159, 1163, 1167, 1170, 1177 f., 1192, 1205, 1281
 Masaccio, 390
 Mather, K., 910
 Matthaëi, J. H., 915
 Maudslay, H., 547, 591, 594, 595, 670
 Maupertuis, P. L. M. de, 515, 748
 Maxwell, Clerk. 462, 507, 567 f., 589, 590, 610 f., 616, 671, 729, 733, 742, 773 f.
 Mayer, R., 587 f., 670
 Mayow, J., 322, 472, 499, 618
 Mazarin, Cardinal, 453, 454
 Meikleham, R. S., 580
 Melville, H. W., 827
 Menæchmos, 214
 Mendel, G., 671, 931, 951, 958
 Mendeleev, D. I., 568, 671, 740, 768, 1182
 Menger, C., 1088, 1093
 Mercator, G., 418, 498
 Mersenne, M., 418, 451
 Meselson, M., 912
 Mesmer, F. A., 646
 Michelangelo, 1274
 Michelet, K. L., 1057
 Michell, J., 603
 Michelson, A., 744
 Michurin, I. V., 957
 Miklucho-Maklai, N. N., 1083
 Milan, Duke of, 395
 Mill, J., 1059
 Mill, J. S., 545, 558, 670, 1084, 1087, 1280
 Miller, S. L., 891, 986
 Millerand, 1110
 Mitscherlich, E., 627
 Mohammed, 255, 267 f., 336, 1024
 Mohorovičić, A., 797 f.
 Moleschott, J., 654
 Molière, J. B. P. de, 207
 Monge, G., 536, 592
 Monier, J., 822
 Montaigne, M. de, 498, 1046
 Montesquieu, 1055
 Montmoor, H. de, 451
 More, H., 481
 More, T., 498, 1045
 Morgan, C. L., 944, 991
 Morgan, T. H., 930 f., 951 f., 991
 Morgan, L. H., 1081, 1104
 Morin, J., 580
 Morley, E. W., 744
 Moro, L., 396
 Morris, W., 560, 1077, 1096
 Morse, S. F. B., 548
 Moseley, H., 739
 Moses, 136
 Mössbauer, R. L., 792, 864
 Muller, H. J., 953, 991, 1164
 Murdock, W., 530, 591
 Musa, brothers, 273
 Musschenbroek, P. van, 602, 671
 Mussolini, B., 1110
 Naburiannu, 347
 Napier, J., 470, 498, 673
 Napoleon, 174, 536, 537, 624, 1059
 Nasmyth, J., 590 f., 595
 Natta, G., 827
 Neddermeyer, S. H., 756
 Needham, J., 311, 317, 349 f., 351, 352, 939, 1318
 Ne'eman, Y., 766
 Nef, J. U., 839
 Neilson, J. B., 597
 Nemorarius, J., 303
 Nero, 227 f.
 Nestor, 262
 Newcomen, T., 519, 582, 586, 591, 670
 Newton, I., 4, 6, 17, 39, 50, 52, 56, 184, 186, 197, 202, 214, 217, 302, 318, 320, 375, 420, 425, 434, 439, 450, 458 f., 461, 462, 463, 466 f., 473, 475, 481-9, 490, 491, 497, 498, 509, 515, 516, 542, 556, 568, 574, 599, 600, 607, 610, 612, 627, 665, 674 f., 726, 733, 737, 742, 744, 745, 749, 751, 905, 1020, 1049, 1182, 1233, 1277, 1280
 Nicholas of Cusa, 302, 305, 337
 Nicholson, W., 605
 Nietzsche, F. W., 1087, 1091
 Nirenberg, M. W., 915
 Norman, R., 318, 434 f., 498, 599, 1223
 Oberth, H. von, 813
 Occam, William of, 294, 301, 337
 Ochoa, S., 915
 Oersted, H. C., 45, 548, 607, 608, 616, 671
 Ohm, G. S., 607
 Ohnuki, Y., 766
 Oken, L., 550, 646, 671
 Okubo, S., 766
 Oparin, A. J., 986
 Oppenheimer, J. R., 835, 844, 1277
 Oresme, 301, 302, 305, 337, 346, 351
 Origen, 260
 Ostwald, W., 570, 589, 733
 Otto, N. A., 592, 670, 806
 Owen, R., 554, 1064 ff.
 Paine, T., 1057
 Paley, W. S., 1085

- Palissy, B., 399
 Pankhurst, S., 1099
 Papin, D., 450, 462, 471 f., 577, 1232
 Paracelsus, 280, 301, 398 f., 439, 472, 499, 565
 Paré, A., 395, 439, 499
 Pareto, V. F. D., 1091
 Parmenides, 181 ff., 195, 205
 Parsons, C., 585, 592 f., 670
 Pascal, B., 461, 470, 674
 Pasteur, L., 39, 45, 469, 507, 548, 629 f., 647-52, 653, 656, 671, 716, 876, 887, 900, 923 ff., 984, 1228, 1270, 1276
 Pauli, W., 766
 Pauling, L., 795, 907, 1291
 Paulinus of Nola, 234
 Pavlov, I. P., 678, 938 f., 941, 944, 991, 1182, 1209, 1266
 Pearson, K., 950, 1140, 1280
 Pedro the Cruel, 273
 Peiresc, N-C. F. de, 451
 Penrose, L. S., 955
 Pepys, S., 476, 485
 Pericles, 169, 173, 184 f., 194, 1270
 Perkin, W. H., 631 f.
 Perrin, J., 730
 Perutz, M. F., 907 f., 990
 Pestalozzi, J. H., 1149
 Peter the Great, 515, 678
 Peter the Pilgrim, 302, 310, 317 f., 599
 Petrarch, 384
 Petty, W., 453, 1049
 Peurbach, G. von, 400, 406
 Philip of Macedon, 209
 Philolaus, 188, 205
 Philoponos, J., 258, 337, 428, 499
 Picard, J., 600
 Pigafetta, 388
 Pinturicchio, B., 331
 Pirie, N. W., 913, 976
 Pius XII, 662
 Planck, Max, 52, 727, 736 f., 739
 Plato, 53, 54, 138, 169, 173, 177, 181, 184, 191, 192-7, 200, 204, 207, 211, 213 f., 216, 227, 231, 247, 272, 383, 406, 498, 663, 945, 1023, 1029, 1034, 1037, 1167
 Plekhanov, G. V., 1167
 Pliny, 235 f., 442
 Plotinus, 197, 260
 Plutarch, 218
 Poincaré, H., 734, 1091, 1297
 Polhammer, C., 512
 Polo, Marco, 400, 1242
 Polzunov, I. I., 512
 Poncelet, J. V., 536, 592
 Popov, A. S., 774, 1182
 Pouchet, F. A., 648
 Powell, C. F., 763 f.
 Price, D. J., 346, 352, 676, 1164
 Priestley, J., 530, 531 ff., 536, 574, 603, 619, 620, 621 ff., 625, 654, 671, 1276
 Prigogine, I., 904
 Pringle, J., 602
 Prometheus, 743
 Protagoras, 173, 188, 191
 Ptolemy, 216 f., 271, 276, 303, 305, 406, 422, 432, 437, 498
 Pythagoras, 169, 171, 177 ff., 181 ff., 185, 188, 195, 196, 197, 345
 Pytheas of Marseilles, 218
 Quesnay, F., 1054
 Rabelais, F., 385, 498, 1046
 Raman, C. V., 794
 Ramsay, W., 632
 Ramus, P., 201
 Raspe, R. E., 516
 Ray, J., 474, 499
 Reade, W., 1080
 Read, W. T., 788, 865
 Réaumur, R. A. F., 148, 514, 515, 596 f., 670
 Regge, T., 766
 Regiomontanus, 400, 406
 Renaudot, E., 451 f.
 Rennie, J., 547
 Rey, Jean, 618
 Rhazes, 272, 275, 278, 280, 337
 Ricardo, D., 545, 1060 f., 1076, 1088
 Richter, J. B., 624
 Rivers, W. H. R., 1083
 Robbins, L., 1089
 Robbins, Lord, 1153
 Robinson, J., 1136
 Rochas, B. de, 806
 Rockefeller, J. D., 567, 1254
 Roebuck, J., 521, 530, 582, 624, 670
 Rondelet, G., 388
 Röntgen, K. von, 730 f., 994
 Roosevelt, F. D., 118
 Roscellinus, 301
 Rosenbergs, E. and J., 835
 Rosenfeld, L., 347, 351, 994
 Roulle, G. F., 534
 Rousseau, J. J., 535, 542, 670, 1055 f., 1149
 Rowntree, S., 1097
 Rubriquis, 400
 Rudolph II, 424
 Rumford, Count von. *See* Thompson, B.
 Ruskin, J., 559, 1064

- Russell, B. A. W., 846, 994, 1091, 1159, 1163
 Russell, H. N., 745
 Rutherford, Lord, 727, 735 f., 737 ff., 751 ff., 864, 994
 Ruzicka, E., 786, 991
- St Albert, 294, 302, 337
 St Ambrose, 233
 St Anselm, 299
 St Augustine, 233, 260, 268, 1040 f.
 St Dominic, 294
 St Francis of Assisi, 294
 St Paul, 258
 St Thomas Aquinas, 294, 299, 300 f., 302, 306, 337, 346, 496, 1042, 1050
 Saint-Simon, C. H., Comte de, 1066, 1083
 Saladin, 273, 337
 Salam, A., 766, 864
 Sanctorius, 872
 Sanger, F., 906, 990
 Sargon, 136
 Sartre, J. P., 1131 f., 1165
 Savery, T., 577 f., 670
 Say, J. B., 1061
 Scheele, C., 531, 622, 624, 671
 Schelling, F., 646, 1067
 Schleiden, M., 646, 671
 Schrödinger, E., 748 f., 864
 Schwann, T., 646, 671
 Scotus, Duns, 299, 301, 337
 Semyonov, N., 827
 Seneca, 227
 Senior, N., 1061
 Servetus, 445, 499
 Severus Sebockt, 264, 337
 Shakespeare, W., 940, 1046
 Shaw, G. B., 1097 f.
 Shelburne, Lord, 531
 Shelley, P. B., 1059, 1064
 Siemens, family, 562, 592
 Siemens, W., 563, 569, 597 f., 613, 670
 Skobeltzyn, D., 764
 Sloane, H., 516
 Small, W., 530
 Smeaton, J., 521, 582, 591, 670
 Smiles, S., 532, 558, 591
 Smith, Adam, 530, 545, 670, 1049 ff., 1060, 1076
 Smith, W., 641, 671
 Snell, W., 464 f.
 Socrates, 169, 171, 191 ff., 195, 198, 199, 208
 Soddy, F., 735, 864
 Sorel, G., 1087
 Spallanzani, L., 938
- Speiser, E. A., 119
 Spemann, H., 933, 991
 Spencer, H., 558, 1083 f.
 Spengler, O., 56, 1132, 1241
 Spinoza, B. de, 491, 498, 1047
 Sprat, T., 34 f., 453, 456 ff., 488
 Stahl, F. W., 912
 Stahl, G. E., 619, 671
 Stalin, J. V., 722, 1128, 1172, 1176, 1184, 1192
 Stamp, L. D., 975
 Stanley, W. M., 913
 Starling, E. H., 899, 991
 Steno, N., 461, 627
 Stephenson, G., 547, 584, 591, 670
 Stephenson, R., 547
 Stevin, S., 431, 499
 Stoney, J., 730
 Strassman, F., 757
 Strato, 213
 Sturgeon, W., 607
 Sturtevant, S., 414 ff., 673, 1232
 Sun Yat Sen, 1196
 Svedberg, T., 905
 Swammerdam, J., 467
 Swan, J. W., 613
 Swift, J., 455
 Swinton, C., 780
 Sydenham, T., 475
 Synge, R. L. M., 873, 990
 Szent-Györgyi, A., 897
- Tamerlane, 273
 Tartaglia, N., 428, 430, 498
 Tawney, R. H., 1099, 1139
 Taylor, G. I., 788
 Telesius, B., 442, 576
 Teller, E., 842
 Tertullian, 232
 Thabit ibn Khurra, 271
 Thales, 169, 171, 173, 174
 Themistocles, 184
 Theophrastus, 104, 213
 Thomas, S. G., 562, 597 f., 670
 Thompson, B., 538 ff., 554, 586, 670
 Thomson, E. A., 347
 Thomson, G., 76, 108, 181, 344, 345
 Thomson, J. J., 42, 730, 732 f., 744, 775, 780, 865
 Thomson, W. *See* Kelvin
 Thucydides, 190
 Tinbergen, N., 946
 Torricelli, E., 203, 452, 469 f., 499, 576
 Toscanelli, 402
 Tour, C. de la, 647
 Toynbee, A., 520
 Toynbee, A. J., 56, 1132, 1137, 1241

x · Name Index

- Trevithick, R., 547, 583 f., 591, 670
Tubal-Cain, 129
Twain, Mark, 1091
Tylor, E. B., 1081 f., 1104
Tyndall, J., 550, 1292
- Uffenbach, C. von, 510
Uhlenbeck, G. E., 748
Ulugh Beg, 273, 304, 337
Urey, H. C., 847, 986
Urukagina, 136
- Van Niel, C. B., 896
van't Hoff, J. H., 631, 671
Varahamihira, 264, 337
Vavilov, S. I., 473, 1182
Veblen, T. B., 745, 1091, 1139
Vesalius, A., 4, 219, 386 f., 395, 437, 499
Vespucci, A., 388, 403
Vico, G., 230, 544, 1044, 1056 f.
Vieta, F., 418, 430, 498
Vilmorin, L. L. de, 951
Vincent of Beauvais, 306, 442
Vinci, Leonardo da. *See* Leonardo da Vinci
Virgil, 206, 229
Vives, L., 498, 1149
Volkin, E., 915
Volta, A., 535, 605 f., 671
Voltaire, F. M. A., 489, 518, 542, 670, 674 f., 1055 f.
Vries, H. de, 951, 953, 991
- Waddington, C. H., 959
Wallace, A. R., 644, 664, 677
Wallas, G., 1099, 1139
Wallis, J., 453
Walras, M. E. L., 1088
Walter, G., 942, 995
Walton, E. T. S., 752 f., 864
Watson, J. B., 944, 991, 1159
Watson, J. D., 909, 913, 991
Watson-Watt, R. A., 778
Watt, J., 325, 521, 522, 530, 547, 581 ff., 586, 591, 624, 670, 677
- Webb, S. and B., 1097 f., 1099
Weber, M., 1139
Wedgwood, J., 529
Wegener, A., 798
Weismann, A., 950 f.
Wellington, Duke of, 536
Wells, H. G., 664, 792, 1085, 1097 f.
Went, F. W., 899
Werner, A., 641, 671
Westermarck, E. A., 1083
Wheatstone, C., 548
Whewell, W., 32
Whitehead, A. N., 532, 1159
Whitney, E., 595, 805
Whittle, F., 808
Whitworth, J., 547, 594, 670
Wiener, N., 782, 785
Wilberforce, Bishop, 550
Wilde, H., 613 f., 671
Wilkins, J., 453
Wilkins, M. H. F., 909, 913
Wilkinson, J., 529, 536, 670
Wilkinson, W., 530
William of Orange, 448
Wilson, C. T. R., 753
Winstanley, G., 1047
Witt, Cornelius de, 1047 f.
Wittgenstein, L., 1159, 1161
Wöhler, F., 628, 904
Wordsworth, W., 1059
Wren, C., 453, 469, 475, 481, 490
Wright, O. and W., 810 f., 812
Wycliffe, J., 294
- Yang, C. N., 766, 864
Young, J. Z., 942 f.
Young, T., 610
Yukawa, H., 746, 755 f., 864
- Zeno, 181, 182 f., 202
Zhukovsky, V. A., 1182
Ziegler, K., 827
Zoroaster, 252, 267 f., 1024
Zozymus of Panopolis, 222

Subject Index

Bold figures indicate main reference

Vol. 1: 1–364 Vol. 2: 365–694 Vol. 3: 695–1008 Vol. 4: 1009–1330

- Abacus, 120, 276, 333
Abbasids, 270, 272, 276, 349
Academia Sinica, 710
Academic freedom, 844 f., 1254, 1260 f.
Académie Royale des Sciences, 448, 450, **451**, 455, 497, 498, 517, 534, 537
Academies: in ancient world, 196 f., 207, 212 f.; eighteenth- and nineteenth-century, 514 f., 529, 549 f., 675; Renaissance, 451; seventeenth-century **450** ff.; Soviet, 709, 1190, 1265 ff. *See also* Royal Society, Académie Royale, etc.
Academy, The, 196 ff., 207, 450
Accademia del Cimento, 451 f., 455
Accademia dei Lincei, 451
Accelerator, particle, 714, 752 ff., 764 f., 843, 849 ff., 994
Advertising, 1142 f.
Aerodynamics, 811
Aeroplane, 712 f., **809–13**, 1257
Africa, 89, 140, 145, 153, 267, 269, 276, 281 f., 402, 707, 710, 723, 948, 1027, 1120, 1174, 1200 f., **1202** f., 1251 f.
Age of Reason, **531** f., 544, 1056
Agricultural Revolution, **524** f.
Agriculture: medieval, 287 f., 291 f., 312, 679; modern, 880 f., 970 ff.; nineteenth-century, 565 ff., 654 f.; origin of, 16, **91–6**, 99 ff., 342 f., 716; Roman, 224; seventeenth- and eighteenth-century, 511, **524** f.
Air-pump, 470 f.
Aix-en-Provence, 451
Akkad, 136
Albigenses, 294
Alchemy: and chemistry, 398 f., 439, 472 ff., **617** ff.; Chinese, 279 f., 1226; Islamic, 279 f.; medieval, 301, 306, 310; modern, 734 f.; origins of, 128, **222**; Renaissance, 324, 398
Alcohol, 279 f., **323** ff., 918
Alexandria, 161, 169, 209, 212 ff., 223, 227, 251, 257, 258, 270; Great Library, 231; Museum, 169, **212** f., 217, 223, 241, 272, 295, 450
Algebra, 122, 276, 332, 443
Algeria, 1120, 1130, 1180, 1199
Alpha particle, 735, 738, 752, 754 ff., 763
Alphabet, 156 f.
Alum, monopoly, 399
America: Philosophical Society, 526; War of Independence, 529, 805, 1053, 1057, 1317. *See also* United States, Latin America
American Indians, 70, 125, 535, 1032, 1241
Amplifiers, 776
Anarchism, 1108
Anatolia, 162, 342
Anatomy, 125, 188, 223, **392** f., **437**, 469, 645 f.
Animal behaviour, 71, **944** ff.
Antarctica, 799, 831
Anthrax, 565, 651
Anthropology, 1019, **1081** f., 1157, 1181 f., 1208
Antibiotics, 877, 924 ff., 929, 980
Anti-Communism, 16, 1122, 1124, 1128, 1130, 1132, 1137, 1157, 1264
Anti-ferromagnetism, 793, 854
Antioch, 251, 257, 270
Anti-particles, 764 ff., 767
Anti-Semitism, 1129, 1130
Apocalypse, 233, 402
Arabic numerals, 122, 264, 332, 1226
Arabs, 197, 209, 217, 253, 258, 266,

- Arabs (*continued*)
 267-84, 291, 297 ff., 300, 302 f., 317,
 320, 323 ff., 334, 380, 383, 398, 400,
 403, 428, 445, 1226. *See also* Islam
 Arab States, 1201, 1202
 Archaeology, 16, 66, 731, 1019, 1079 f.,
 1181, 1198, 1208
 Architecture: early, 121; Greek, 167;
 medieval, 310, 351, 384; modern,
 822 f.; Renaissance, 395; Roman,
 228
 Arians, 260, 262, 481
 Aristotelianism, 198-208 *passim*, 271 f.,
 299 ff., 306 f., 420, 421, 427 f., 433,
 454, 476, 575, 649, 1226
 Arithmetic, 120, 177, 264, 276, 297, 333
 Armaments industry, 561 f., 595, 706 f.,
 712 f., 843, 1254
 Art, 16, 40 f., 43, 71 f., 163, 195, 210,
 252, 332, 341, 382, 384 f., 389 ff.,
 559 f.
 Artificial fibres, 715, 906
 Artificial satellites, 722, 815 f., 995,
 1138
 Aryan Indians, 148
 Asclepiadae clan, 166, 186, 198
 Asia, 140, 210, 269, 251, 281, 347, 707,
 710, 724, 1200 f., 1207, 1251 f.
 Association of Scientific Workers,
 1290 f.
 Assyrians, 107, 137
 Astrolabe, 277
 Astrology, 122 ff., 196, 334, 342, 1162,
 1225
 Astronomy: Greek, 178, 185 f., 216 f.,
 345 f.; Islamic, 276; medieval, 303 ff.;
 modern, 745, 769 f.; origins of, 121 f.,
 344; radio-, 779 f.; Renaissance, 400,
 404 ff., 420-27, 480
 Astrophysics, 745 f., 811
 Aswan Dam, 967, 969, 1263
 Athens, 5, 153, 154, 160, 163, 169, 172,
 184 f., 190-97 *passim*, 207, 209, 210,
 213, 258, 265, 295, 344
 Atlantic cable, 548 f.
 Atomic: bomb, 2, 49, 720, 758 ff., 832-9
passim; energy, 18, 759 ff., 851, 1283;
 nucleus, 737 f., 754, 763 f., 754, 850,
 pile, 758, 759 f., 768, 953; theory, 54,
 183 f., 211, 451, 459, 463 f., 473, 568,
 626 f., 676, 732, 736, 739-41 *passim*;
 warfare, 954 f.
 Augury, 122
 Australian aborigines, 74, 84, 342,
 Austria, 224, 449, 514, 535
 Automation, 10, 712 f., 817 ff., 854 f.,
 1296, 1305
 Auxins, 900
 Aviation. *See* Aeroplane
 Avignon, 294
 Aztecs, 73, 110
 Babylonia, 3, 124, 125, 131, 138 f., 140,
 147 ff., 177, 185, 186, 261, 264, 275,
 279, 345, 347, 483, 1033, 1239, 1240
 Bacteria, 647 f., 881 f., 912 ff., 918 ff.,
 976
 Bacteriology, 647 f., 651 f.
 Bacteriophage, 912, 923
 Baghdad, 270
 Ballistics, 323, 428 f., 493, 595
 Ballistic missiles, 836, 841 f. *See also*
 Rockets
 Barbarians, 135, 140 f., 233 f., 283, 293,
 1039
 Barometer, 469 f.
 Baryon, 766 f., 864
 Beauty, 195, 560, 1021, 1029
 Beer, 342, 647 f.
 Benzene ring, 630 f.
 Bible, 93, 144, 157 ff., 201, 205, 258,
 260 f., 327, 384, 635, 640, 641 f.,
 1032 f., 1035 f., 1080, 1241
 Biochemistry, 633 f., 872, 884, 886-904,
 986; of life, 868, 902 f., 986
 Biological warfare, 16, 883, 900, 1130
 Biology: Aristotelian, 203 f., 206; con-
 trol of living environment, 869 ff.;
 dialectical approach, 981 ff.; eight-
 eenth-century, 634-40, 671; future
 of, 981-8; molecular, 904-18, 983,
 1281, 1295, 1297; nineteenth-century,
 634 ff., 641-57, 671; and social in-
 fluences, 876-86, twentieth-century,
 867-99f.; and war, 876, 880, 883, 884
 Biophysics, 872, 885
 Biosphere, 903
 Birkbeck College, 554, 1066, 1150, 1151
 Birmingham, 5, 520, 523, 525, 529 f.,
 533, 542, 582, 676, 1141
 Blast-furnace, 412
 Blood groups, 901 f., 955
 Boer War, 1099
 Bohemia, 295, 424, 451
 Bologna University, 295, 407, 667
 Botany: eighteenth-century, 516, 637 ff.,
 671; Greek, 213; Islamic, 278; mod-
 ern, 899 f., primitive, 71, 91 f., 125;
 Renaissance, 388, 474, 499
 Bow: 83 ff.; drill, 83, 85, 112, 167
 Brahminism, 1033, 1040
 Brain, 11, 72, 223, 346, 781 f., 857,
 941 ff., 947, 959
 Brewing, 107, 505, 565, 881, 1231

- Bricks, 112, 324
- Britain: capitalism, 373, 403, 560 f.; eighteenth-century, 566, 660; Industrial Revolution, 518-33 *passim*, 538 f. 540, 541 f., 546, 554, 555, 582, 591, 1221; Labour movement, 1064 ff., 1095 f., 1110 ff., 1119, 1124 ff.; modern, 977 f., 1135 f., 1140 f., 1146, 1250, 1252; nineteenth-century, 566, 633, 664, 1077 f., 1088 f., science, 28, 708, 715, 844, 1017, 1257 f., 1290 f.; seventeenth-century, 448, 1279 f.; sixteenth-century, 379, 413
- British Association for the Advancement of Science, 550, 587, 632, 655
- British Labour Movement, 1095 f., 1110 ff.
- British Museum, 516
- Bronze Age, 47, 63, 67, 91, 109-44 *passim*, 145-53 *passim*, 165, 167, 173, 238 f.
- Brookhaven, 764, 850, 954
- Buddhism, 209, 252, 254, 264, 327, 937, 1039, 1241
- Burgundy, 293, 389
- Byzantium, 233, 262, 264 f., 268, 281 f., 285 f., 1181
- Calendar, 121 f., 297, 406
- Caloric, 585 f.
- Calvinism, 181, 268, 379, 412, 512
- Cambridge University, 295, 481, 526, 732, 781, 867
- Camera obscura, 390
- Cancer, 914, 917, 934 ff., 988
- Cannons and guns, 320-23, 413, 491 f., 562, 595, 598
- Capital, 1052, 1073
- Capitalism: and the birth of modern science, 4, 247 ff., 373 f., 489-97, 1229 f., 1237 f., 1242 f.; coexistence with socialism, 1206, 1300 f.; development of 247 f., 373 f., 379; industrial, 522 f., monopoly, 11, 705-8 *passim*; and natural resources, 830; nineteenth-century, 545 f.; and science, 503 ff., 554., 808, 1253-62, 1289; and social sciences, 1020 ff., 1049 ff., 1113, 1116 f.; twentieth-century 17, 1113-19 *passim*
- Carron Works, 530, 582, 670
- Cart, 114, 116 f., 140
- Carthage, 157, 224
- Caste, 113, 194, 252, 334, 346, 1040
- Catalyst, 825 ff.
- Cathode rays, 730, 780 f.
- Catholic Church, 200, 255-62 *passim*, 267 f., 292-5, 379, 384 f., 420 f., 432 ff., 445, 446, 515, 1130, 1158
- Cavendish Laboratory, 732, 752
- Celestial spheres, 178, 185 f., 216, 303, 306, 406, 433, 487
- Cell: 915 f., 930-34, 953 f.; division, 932 f.; theory, 646 f., 671
- CERN, 764, 767, 845, 850, 1234
- Chalybes, 147, 148
- Chance, in discovery, 927
- Chartists, 545 f., 558, 1066, 1110 f.
- Chemical industry: nineteenth-century, 548 f.; twentieth-century, 823-9; fine, 828, 926 f.
- Chemical nomenclature, 623 f.
- Chemistry: eighteenth-century, 531 ff., 617-25; Greek, 222; Islamic, 279 f.; modern, 740 f., 793 ff., 823-9; nineteenth-century, 554 f., 626-34; organic, 628 f., 631 f.; primitive, 70, 125 ff., 142, Renaissance, 398 ff., 439, 472 ff.
- China: and Arabs, 278-81 *passim*; Buddhism, 254, 264; early civilization, 57, 62 f., 91, 120, 135, 138, 148 f., 153, 209, 237, 247 f., 252, 267, 495; early missions to, 262, 268, 269, 276, 418; early philosophy, 173, 233, 252, 348, 349 f., 351; early science, 4, 63, 124, 248, 344; early technique, 147 f., 248, 251, 311-21 *passim*, 412, 525, 813, 1229; paper and printing, 325 ff.; People's Republic of, 707, 709 f., 715, 786, 830 f., 881, 968, 970 f., 1120, 1170, 1173 ff., 1196 ff., 1268
- Cholera, 649, 1142
- Christianity, 158, 179, 192 f., 197, 231 ff., 247, 254-63, 267 f., 299 ff., 306 ff., 347, 348 f., 374, 375, 531 ff., 1035, 1039 ff., 1247 f.
- Chromatography, 873 f.
- Chromosomes, 912, 930 f., 951 ff., 958, 991
- Chronometer, 479 ff., 492 f., 674
- Church: early, 231 f., 254-63, 267 f.; of England, 533, 537, 542; feudal, 292 ff., 490; and Galileo, 429, 422 ff.; in Middle Ages, 292 ff., 306, 308, 327 f.; in the Renaissance, 54, 379, 384 f., 389; and science, 233, 411, 433 f., 446 f.
- Cinema, 712, 1123, 1231
- Ciampi 329
- Circulation of the blood, 437 ff., 499
- Cities, 63, 95, 102-21 *passim*, 128 f., 135-44 *passim*, 153-7, 162 f., 169

- Cities (*continued*)
 184, 191, 223 f., 233, 344, 345, 544,
 823, 1036, 1080, 1190, 1229
 Civil War (American), 518, 567
 Civil War (English), 448, 453, 454, 461
 Civilization, origin of, 99-109, 344
 Class society, 95, 101, 107 ff., 194,
 1026, 1030, 1032 f., 1103 f., 1209,
 1244-9, 1308 ff.
 Classification, 80, 198 ff.
 Clock, 315 ff., 346 f., 352, 478 f., 492,
 674, 677
 Clothing, 69, 135; industry, 252, 328,
 521. *See also* Textiles
 Cloud chamber, 753
 Coal, 413 ff., 511 f., 520 f., 562, 580,
 584, 586, 825
 Coalbrookdale, 596, 676
 Coal mining, 413 ff., 511 f., 521, 577 ff.,
 582 f.
 Co-enzymes, 890, 894, 896, 898, 903,
 928
 Co-existence, 1206, 1300 f.
 Cold War, 851, 885, 1122, 1124, 1128,
 1148, 1163 ff., 1174, 1176, 1191, 1193,
 1201 f., 1204, 1207, 1283, 1300
 Collectivization of agriculture, 1174 ff.
 Collège de France, 380, 419
 Colonial: expansion, 560, 565 ff.; re-
 volt, 13, 1119 f., 1199 ff.
 Combustion, 472, 618 f., 678
 COMECON, 1195
 Communism, 660, 994, 1070 f., 1191 ff.
Communist Manifesto, 554, 1070 ff.
 Compass, 143, 310, 317 f., 433 ff., 603,
 1231
 Computers. *See* Electronic
 Concentration of industry, 523
 Concrete, 822 f.
 Conditioned reflexes, 941 f.
 Confucianism, 230, 252, 348, 351, 1033
 Congo, 723, 864, 1318
Conquistadores, 352, 443
 Conservation of energy, 555 f., 587 ff.,
 677 f., 735, 1228
 Conservation of matter; 620 f.
 Constantinople, 228, 233, 251, 257,
 264, 282, 285
 Continuous-flow methods, 825
 Cookery, 69 f., 278, 381, 538, 648, 878
 Co-operative movement, 1065 f., 1151
 Copernican revolution, 406 ff, 420-25,
 498
 Copper, 109 ff., 113, 147, 174, 382, 895
 Cordoba, 270, 272 f.
 Cosmic rays, 763, 986
 Cosmology, 769 ff., 986
 Counter-Reformation, 410, 418, 440,
 640
 Counter-Renaissance, 410
 Crafts, 95 ff., 165 ff., 218, 264 f., 270,
 311, 395, 455, 491, 521, 526; -man,
 105 f., 113 f., 120 f., 194, 227, 267,
 291, 309, 329, 385 f., 403, 411, 434 f.,
 462, 539, 547, 577 ff., 591 f., 594 f.,
 713, 1223 f., 1241
 Creusot, Le, 530
 Cross-staff, 319
 Crusades, 268, 283, 294, 297, 400
 Crystal dislocation 789 f., 854
 Crystal structure, 741 f., 787 f., 794 f.,
 890
 Crystallography, 627, 638, 741
 Cuba, 710, 715, 723, 864, 964, 1026,
 1115, 1120 f., 1201, 1205
 Cybernetics, 582, 776, 783 ff.
 Cyclotron, 755
 Cynics, 211
 Cytology, 912, 930-39, 956 f.
- Dar el Hikhma, 271
 Dark Ages, 251, 256, 264, 289, 1226
 DDT, 833, 844
 Dead Sea Scrolls. 348
 Deficiency diseases, 896 f., 928 f.
 Denmark, 348, 411, 421, 424
 Developing countries. 13 f., 15, 18,
 710 f., 715, 723, 885, 970, 973 ff.,
 1174, 1185 f., 1260 ff., 1299 ff.
 Dialectical materialism, 183, 1102 ff.
See also Marxism
 Digestion, 931, 938 f.
 Diggers, 1047
 Diplomacy, 140
 Disarmament, 706, 843, 1158, 1300 f.
 Discovery, scientific, 11, 45 f., 607 f.,
 704, 849, 1236, 1285
 Disease, 923 f., 1226; deficiency, 897,
 928 f.
 Distillation, 222, 279 f., 323 ff., 381,
 400, 439, 581, 629, 825, 1231, 1239
 DNA, 909 ff., 914 ff., 933, 936, 956 f.
 Dodo, 963
 Domestication of animals. 91 f., 94 f.
 Dominican Friars, 294, 302
 Down House, 643
 Dubna, 764 f., 851
 DUKW, 833
 Dynamics, 85, 202 f., 258, 323, 395,
 421, 427 ff., 478-89 *passim*, 493,
 742 ff.
 Dynamo, 563, 613 f.
- Ecclesiastes*, 173

- École de Médecine, 536
 École Normale Supérieure, 536, 553, 648
 École Polytechnique, 536, 553
 Ecology, 960-72 *passim*
 Economics, 1036, 1044, 1047-53 *passim*, 1059 ff.; Keynesian, 1090, 1133ff.; marginal theory, 1087 ff.; Marxist, 1067-78, 1100 ff., 1166 f.; Soviet, 1183 ff.
 Education, 17, 74; in antiquity, 173, 191 ff., 196 f., 198, 207; in Bronze Age, 130 f.; in China, 1198 f.; eighteenth-century, 529 f., 536; medieval, 295 ff.; nineteenth-century, 552 ff.; primitive, 74; science of 1148-52; in the Soviet Union, 1153, 1187 ff.; technical, 552 f., 1153; higher, 1150 ff., 1264 f., 1275
 Egypt: anti-Hellenic movement in, 263; early civilization, 62, 100 f., 104 ff., 109, 112, 114-27 *passim*, 139, 157, 161 ff., 212, 279, 385; early science and technique, 112, 119-48 *passim*, 163 f., 177, 218, 248, 347; modern, 967, 969, 1120, 1201
 Electrical discharge, 601 ff., 617 f., 730
 Electrical industry, 563 f., 705, 729, 753, 805, 1254
 Electricity: eighteenth-century, 516, 600-606; nineteenth-century, 607-17; lags in application of, 612 f.
 Electro-encephalograph, 885, 942
 Electrolysis, 627
 Electromagnetic theory of light, 567 f., 574, 744, 1228
 Electromagnetism, 607
 Electron, 280, 473, 620, 627, 730, 732 f., 737, 739 f., 748, 751, 755, 768, 775, 780, 785 f., 793, 795; microscope, 785 ff., 873, 885 f., 931, 982
 Electronic computers, 10, 783 f., 817 f., 825, 856, 915, 982, 1145 f., 1281; theory of metals, 795 f.
 Electronics, 773-87
 Elements: Boyle's definition of, 473; establishment of chemical, 623 f.; Greek, 78, 174 f., 188 f., 199 f.; Islamic, 280; periodic table of, 568; Renaissance, 398, 439
 Élite, intellectual, 11, 130 f., 166, 212, 1033 f., 1150, 1188, 1196, 1198, 1275, 1278, 1285 f., 1287 f.
 Embryology, 647, 930-36 *passim*
 Empire, 138 f., 190, 208 ff., 224 ff., 251 f., 269 ff. *See also* Imperialism
 Enclosure Acts, 511
 Encyclopédie, 306, 526 f.
 Endocrinology, 899, 939 f.
 Engineering, 41 f., 218, 547; nineteenth-century, 590-98; twentieth-century, 804-23
 Engineers, 41 f., 137 f., 218, 395 f., 521, 547, 591 f.
 England: eighteenth-century, 509, 511, 512 ff.; Industrial Revolution, 47, 413, 414; medieval, 286, 291, 1220; nineteenth-century, 552 f., 626, 631; Renaissance, 403, 418; seventeenth-century, 441, 454, 490, 495, 497, 504, 1243; twentieth-century, 17, 1153
 Enlightenment, The, 489, 540, 543, 553, 1247
 Enzymes, 649, 796, 887 ff., 892 ff., 903, 907 f.
 Epicureanism, 212, 227, 1037
 Epidemic diseases, 565, 651 f., 879 f., 912, 977 ff.
 Eskimos, 69, 83 f.
 Essenes, 158, 255
 Ether, 199, 612, 744
 Etruscans, 210
 Eugenics, 1085 f., 1140
 Evolution: 556 ff., 575, 640-45, 662 f., 986; twentieth-century, 947-60 *passim*; and social science, 1084 f.
 Existentialism, 227, 1131 f.
 Exodus, 1032
 Expanding universe, 770 f.
 Fabian Society, The, 1097 ff.
 Fabianism, 1097 ff., 1111 f., 1119, 1124, 1140, 1167
 FAO, 897, 973, 974
 Fascism, 195, 1119, 1123, 1129 f., 1136, 1157, 1211. *See also* Nazism
 Fermentation, 70, 399, 647 ff., 877, 887
 Fertilizers, 566, 655, 657, 823 f., 881, 970 f., 974, 1304
 Feudal: system, 285-335 *passim*, 350, 1242 f.; serfs, 288; village, 287 f.
 Final causes, 201 f., 207, 213, 442, 558
 Fire, 69 f., 81, 88, 91, 133, 322, 1229. *See also* Combustion
 Fireworks, 237, 814
 First International, The, 1105, 1108 f.
 Flanders, 287, 289, 329, 389, 474, 1242
 Flatworms, 945 f.
 Flood, Noah's, 636, 640
 Florence, 5, 329, 379, 386, 396, 400
 Food-gathering, 74 f., 84
 Food industry, 655 f., 878 f.
 Food supply, 869 f., 885, 973 ff., 988, 1301 ff, 1305 f.

- Fortifications, 104, 137 f., 153
- France: capitalism, 504, 560; chemical industry, 537; eighteenth-century, 513 f., 540 f.; medieval, 286 f., 291; modern, 17, 843, 845, 1179, 1199, 1250; nineteenth-century, 544, 552 f., 555, 562, 628; Renaissance, 4, 379, 380, 1242; seventeenth-century, 248, 446, 448 f., 451 f., 477; sixteenth-century, 377, 403, 410 f.; socialism in, 1066 f.; universities, 441. *See also* French Revolution
- Franks, 285, 293, 314
- French Academy. *See* Académie Royale des Sciences
- French Revolution, 50, 489, 507, 526, 533, 535 ff., 542 f., 570, 635, 640, 641, 660, 670, 1056 ff., 1063
- Friars, 294
- Front Populaire*, 1115
- Galaxies, 12, 769 ff., 780, 994
- Galenic medicine, 222 f., 420, 437, 463, 634, 646
- Genes, 951 ff., 958
- Genesis*, 78, 159, 174, 204, 262, 344, 641, 662
- Genetic code, 18, 914 ff.
- Genetics, 949–960 *passim*
- Geochemistry, 795, 799
- Geography, 117, 217 f., 276 f., 400–406 *passim*, 547, 966
- Geology, 392, 547, 640 ff., 797 ff., 829 f., 994, 1294
- Geometry, 121, 138, 177, 185, 214 f., 345, 390, 430, 445, 485
- Geophysics, 797 ff.
- Germ theory, 649 ff.
- Germany: capitalism, 560 f., 1250; chemical industry, 631 f.; chemistry, 555; dominance of science, 569 f.; eighteenth-century, 514, 525, 675; industry, 561, 562 f.; medieval, 291, 302; nineteenth-century, 540 f., 553; Reformation, 379 ff.; Renaissance, 389, 396 f.; universities, 553, 569 f.
- Ghana, 1121, 1263
- Giessen University, 553
- Glass, 128, 165, 211, 218, 222, 320, 385, 787
- Gnostics, 211
- God, 175, 205, 306 f., 384, 445 f., 461, 464, 487 f., 518, 532 f., 662, 751, 937, 1023, 1035, 1036, 1040 f., 1044, 1052
- Gods, 88, 104 f., 123, 132 f., 138 f., 1307
- Gold, 76, 110 f., 147, 174, 280, 381
- Golgi, 931
- Goths, 285, 293, 305
- Göttingen University, 553
- Gravitation, 480 ff., 488, 742 f., 744, 768, 815
- Great Exhibition of 1851, 545, 551, 553
- Great men: role of, 45 f., 1236 f., 1297
- Greece: ancient, 159–223 *passim*; and Arabs, 197, 266, 269–81 *passim*, 284, 297 ff., 302, 317, 323, 386; architecture, 160, 167; art, 163 f., 195, 235; astronomy, 185 f., 235, 406; cities, 108, 152 ff., 162 f., 224, 235, 344, 1036; influence in scientific revolution, 375 ff., 400, 425, 430, 442, 443, 458 f., 469, 473, 475, 483, 490 f., 496, 498 f., 541; materialism, 173 f.; mathematics, 131, 177 ff., 185 f., 215, 235, 275 f., 430; medicine, 166, 186–190, 437; modern, 1116; philosophy, 163, 171 ff., 190–208 *passim*, 293, 346, 375 f., 496, 1033 ff.; science, 4, 44, 50, 128, 131, 132, 144, 159 ff., 163, 164–223 *passim*, 234 ff., 240 f., 252, 263, 346, 1226 ff.
- Gresham College, 418 f., 510
- Guided missiles, 707, 836 f. *See also* Ballistic missiles
- Guilds, 113, 329 f., 386
- Gunpowder, 310, 320 ff., 381, 471, 1229
- Guptas, 251
- Hanse, The, 328 f.
- Haemoglobin, 907 f.
- Heat: caloric, 585 f.; dissipation of, 589; early ideas of, 576; mechanical equivalent of, 587 ff.; production by organisms, 625, 903; pump, 586 f.; specific and latent, 580 ff.
- Hegelians, 1069 f.
- Helium, 738
- Hellenistic: astronomy, 216 f., 303 f.; chemistry, 222; empire, 156, 169, 211 f., 223 f., 247; geography, 217 f.; mathematics, 214 ff.; mechanics, 218 ff.; medicine, 222 f.; science, 208–23, 298, 304, 305, 334
- Heredity, 947–60, 1085
- Heresy, 259 ff., 294 f., 1039, 1042 f.
- Heretics, 260, 294 f., 379
- Hierarchy, social, 104 ff., 193 ff., 287 f., 307, 1226
- Hieroglyphics, 119, 128, 143, 156
- Hinduism, 179, 254, 263 f., 277, 334, 348
- Hippocratic: oath, 186; school, 186 ff.
- Hiroshima, 835, 953
- Histology, 646

- Historical materialism, 1070 f.
 History, 5 f., 16, 1026, 1037, 1070, 1080 f., 1105, 1181 f., 1208 f., 1310
 Hittites, 107, 148, 157
 Holland: and birth of modern science, 4, 248; dike system, 104; and the scientific revolution, 478, 490, 511, 512, 514, 1279; seventeenth-century, 373, 381, 425, 430, 448, 450, 478, 566, sixteenth-century, 403, 410 f., 413, 418
 Holy Alliance, 540
 Hormones, 899 f., 933, 939 f.
 Horse harness, 153, 229, 310, 311, 312 f., 336
 Horse-power, 586
 House, 104, 413, 719
 Huguenots, 448, 498
 Humanism, Renaissance, 310, 377, 382 ff.
 Humours, 188 ff., 235
 Hungary, 723, 864
 Hunting, 74 f., 84 f., 88 f.
 Hussites, 295, 1042
 Hydrogen, 756
 Hydrogen bomb, 7, 815, 833, 835, 839 f., 1132, 1301. *See also* Nuclear weapons
 Hypocrisy, 1079, 1127 f., 1132, 1161 f., 1212
 Ice Age, 89
 Idealism, 53 f., 195 f., 208, 517, 570 f., 746, 1159 f.
 Ilkhanic tables, 304
 Immunology, 649 ff., 900 f.
 Imperialism, 140, 507, 565 f., 705 ff., 723, 831, 964, 1099, 1112, 1166 f.
 Impetus theory, 258, 305, 323, 351, 428
 Incas, 101 f.
 Independent Labour Party, 1096
 Indeterminacy principle, 749 f., 861
 India, 1249, 1261; and ancient science, 3, 57, 82, 145, 212, 248, 251, 252, 275 f., 277, 279, 281, 298, 312, 348, 349; British rule, 523, 567, 1120, 1166; Bronze Age, 62, 63, 91, 113, 135; caste system, 111, 194, 334, 1040; civilization, 1033; flowering of culture, 263 f., 1318; Iron Age, 145, 173, 179, 185; Moguls, 284; numerals, 264, 276, 303; religion in, 254
 Indo-China. *See* Vietnam
 Indonesia, 715, 1120, 1252
 Industrial psychology, 1144, 1146 ff., 1253-62 *passim*
 Industrial research, 539, 564, 569 f., 718 f.
 Industrial Revolution, 2, 17, 28, 507, 518-71 *passim*, 657 f., 663, 1228, 1229; in France, 537; economic basis, 322, 332, 503 f., 509, 585, 591 f., 1221 f., 1235 f.; and science, 47, 49, 54, 374, 510 f., 538 f., 541 ff., 660 f.; social consequences, 1059, 1063, 1066, 1070; technical basis, 222, 315, 397, 414, 455, 510 f., 555, 582, 585, 624, 675 f., 712; new, 854 f.
 Information theory, 785
 Inquisition, The, 294, 420 f., 433 f., 449
 Institution of Electrical Engineers, 616
 Insulin, 899, 906, 928
 Intelligence tests, 1152 f.
 Internal-combustion engine, 592 f., 712, 806 ff.
 International Geophysical Year, 831, 1274
 'Invisible College', 453, 461
 Ionian philosophers, 171 ff., 184 f., 196, 200, 207 f., 345, 576
 Ireland, 234, 256, 293, 1105
 Iron and steel: discovery of, 147 f., 165, 270; eighteenth-century, 222, 512, 521, 523, 530; nineteenth-century, 562, 595 ff.; Renaissance, 412 f.
 Iron Age, 47, 62, 63, 101, 119, 125, 137, 141, 144, 145-237 *passim*, 253, 321, 1229; cities, 153 ff.; commodity production, 153; politics, 154
 Irrationals, 178 f.
 Irrigation, 100 f., 218, 234, 252, 283, 286, 350, 965 ff., 971, 1196
 Islam: astronomy, 276, 303 f.; chemistry, 279 f.; geography, 276 f.; mathematics, 185, 275 f., 1226; medicine, 278; optics, 278; religion, 158, 247, 254 f., 267 ff., 299, 1035, 1039, 1042; science, 4, 7, 248, 252, 254, 271-84, 297 f., 306, 1221
 Isomerism, 628
 Isotopes, 736, 792, 799, 864, 912
 Italy: eighteenth-century, 525, 535; Greeks in, 171, 181; medieval, 285, 287, 289 f., 293, 320, 329, 373, 386; modern, 1119, 1179, 1186, 1250; Renaissance, 4, 47, 50, 248, 377, 379 ff., 389-96 *passim*, 418, 448, 1242; Roman, 223 f.
 Jansenists, 674
 Japan, 264, 418, 567, 570, 677, 707, 715, 835, 840, 845, 953, 1129, 1176, 1201, 1244, 1250
 Jardin du Roi, 534, 638 f., 640
 Jesuits, 418, 676

- Jet plane, 485, 812 f.
 Jews, 107, 139, 157 ff., 255 f., 259, 270, 278, 307, 721, 950, 1035 f., 1039, 1241
Job, 173
 Jodrell-Bank, 779
 Jundishapur, 258, 262, 270
 Kaiser-Wilhelm-Gesellschaft Institutes, 727
Capital, Das, 554, 1073 f., 1100 ff.
 Karmatians, 270
 Koran, 158, 159, 268, 270, 265, 279, 299, 1042
 Korea, 707, 715
 Korean: printing, 327; war, 838, 864, 1116, 1128

 Labour Party, 1096 f., 1099, 1119, 1124 ff., 1135, 1137 f.
 Labour theory of value, 1052, 1060 f., 1076 f.
 Lagash, 135 f.
Laissez-faire, 1051 f., 1054, 1084, 1099
 Lancashire, 521
 Language: of animals, 946 f.; origin of, 40, 66, 72 f., 341 f., 855 f., 1317
 Laser, 791 f.
 Latent heat, 580 ff.
 Latin America, 707, 715, 723, 973, 1120, 1165, 1201, 1205, 1251 ff.
 Lathe: pole, 167 f.; slide rest, 314, 594
 Law, 32, 108, 109, 157 f., 230, 1032, 1038 f., 1046 f., 1209 f.
 Learning, 944 f.
 Leeds, 511, 519, 1063
 Leningrad, 1266
 Lenses, 218, 278, 320, 425, 464 ff., 534
 Levellers, 1047
Leviticus, 1032
 Leyden jar, 601 f., 603 ff.
 Leyden University, 485, 512, 727
 Light: wave theory, 466 f., 610 f., 748 f.
 Lightning, 517, 526, 602 f., 732
 Lipesky Var, 16
 Linnean Society, 638
 Literacy, 11, 156, 711, 1198 f.
 Literature, origin of, 156 f.
 Liverpool-Manchester Railway, 584
 Locomotive engine, 547, 583 f.
 Lodestone, 317, 792
 Logic, 182 f., 191 ff., 198 f., 213, 297, 443, 1160 f.
 Logical positivism, 1159 ff.
 Lombardy, 287, 291, 293, 329, 339, 673
 London: medieval 329; nineteenth-century, 552 f., 1071, 1074 f.; seventeenth century, 448, 451, 453, 462, 471, 674, 1317; sixteenth-century, 413; twentieth-century, 813, 832, 858, 977
 London School of Economics, 1099
 Longitude, 427, 458, 475 ff., 492
 'Loyalty' oaths, 728, 844, 1123, 1266
 Lullian mysticism, 301, 420, 645
 Lunar Society, 529 f., 639
 Lyceum, The, 198, 207, 213, 450
 Lysozymes, 891, 931

 McCarthyism, 1118
 Maccabees, 158, 255
 Macedonians, 148, 198, 209 f.
 Machines, 84 f., 218 f., 291 f., 309 f., 437, 591 ff.; automatic, 805, 853 f.; tools, 593 ff.
 Madrasah, 295, 1039
 Magic, 57, 73, 76 f., 86 f., 128, 131, 163, 334, 565, 618
 Magnetism, 76, 302, 317 f., 434 ff., 480, 599, 1231, 1234
 Magyars, 283, 285, 193, 351
 Malaria, 565, 651, 870, 879, 981
 Malaya, 870, 900, 973, 1116
 Malnutrition, 897, 976
Managerial Revolution, 1137
 Mandarins, 312
 Mandrake, 127
 Manichæism, 260, 294, 349, 1040
 Map, 217, 400, 403
 Marginal theory of value, 1061, 1076, 1087 ff., 1134
 Market research, 1142 f.
 Marxism: and science, 1, 52 f., 1104 f., 1281; and science of society, 1067-78, 1177 ff.
 Maser, 791 f.
 Mass-production, 595, 705, 712, 804 f., 807, 818, 821; social effects of, 820 ff.
 Materialism, 53 f., 174 ff., 570, 590, 1069 f., 1102 f.
 Mathematics: eighteenth-century, 516; Greek, 177 ff., 185 f., 214 ff.; Islamic, 278; as a language, 1271; medieval, 303 ff., 331 f.; modern, 741, 855; origin 120 f.; Renaissance, 430 ff.; seventeenth-century, 443 f., 458, 480 f., 489, 490 f.
 Maya civilization, 110, 1240
 Mechanics, 79 f., 88, 117, 219 ff., 252, 302, 375, 394 ff., 427 ff., 437, 475-89 *passim*, 499, 515
 Mechanism, 932 f., 937
 Medicine: Greek, 186 ff., 222 f.; Islamic, 278; -man, 86, 342; modern, 876 f., 879 f., 923-30 *passim*; nine-

- teenth-century, 562, 649 ff., 657; primitive, 124 f.; Renaissance, 392 f., 437 ff., 474 f.; social, 977 ff.; and war, 880
- Medieval: architecture, 310; art, 332, 384 f., 389, 391 f.; Church, 256 f., 292 ff., 306, 331 f., 1042 f.; economy, *see* Feudal system; friars, 294 f., 384; guilds, 291, 329, 386; peasants, 224 f., 292, 328, 1042; philosophy, 54, 195, 213, 254 f., 299 ff., 306 ff., 377, 445, 496, 516, 1042 f.; science, 49, 54, 128, 284, 295 ff., 301-6, 332 f., 351, 410, technique, 153, 274, 252, 291 f., 308-27, 332 ff., 352, 374, 412, 414, 1229; towns, 289 ff., 329; universities, 295 f.
- Mediterranean area, 145, 148, 150, 153, 171, 223 f., 248, 263, 267, 289, 315, 1239
- Memory, 785, 856, 942
- Menlo Park, 564, 774
- Merchants: Bronze Age, 108 f., 140; Greek, 171, 209; Islamic, 270, 273; medieval, 312, 328 f.; Renaissance, 440, 448, 496, 1050; Roman, 224, 227; Syrian, 263
- Mercury, 125, 180, 280, 398, 473, 622, 651
- Merton College, 305
- Meson, 753 f., 764, 768
- Mesopotamia, 47, 62, 91, 101, 102 f., 109, 116, 119, 122, 129, 135, 136, 138, 140, 144, 162, 164, 212, 275, 283, 342, 343, 1080
- Metabolism, 902
- Metallurgy, 113, 127, 147 f., 388, 398, 412 f., 595 ff., 795 f.
- Meteorites, carbonaceous, 892, 985 f.
- Meteorology, 801 ff., 811, 1294, 1303
- Methodism, 537, 1063
- Michurinism, 957
- Microbes, 648
- Microbiology, 575, 918-23
- Microscope, 178, 278, 438, 467 f., 646 f., 931 f.
- Military expenditure, 707 f., 1125, 1254
- Military research, 831-48 *passim*, 1257 ff.: expenditure on, 707 f., 846 f., 1257 f.
- Military theory, 839, 842 ff.
- Mill, 292, 312 f., 313 ff., 280, 388, 398, 795 f., 829 f.
- Minerals, 110, 213
- Miniaturization, 782, 836, 853, 855
- Mining, 113, 238, 312, 339, 381, 388, 396 ff., 491, 512, 577 ff., 582, 586
- Mitochondria, 916, 931
- Moguls, 284, 334
- Mohole, 794 f.
- Molecular asymmetry, 629 f., 648
- Molecular biology. *See* Biology
- Money, 154 f., 230, 384 f., 1043 f., 1049, 1146, 1308
- Mongols, 283, 351
- Monophysites, 260, 262 f.
- Monopoly, 399, 416, 561, 705 ff., 719, 809, 830, 1088, 1112, 1134 ff., 1174, 1246, 1253 f., 1288
- Motion, theory of, 202, 258, 301, 302, 323, 427-33, 470, 475-89 *passim*, 742 f.
- Motor-car industry, 705, 712, 806 ff.
- Mule, spinning, 521, 670
- Muscle, 646, 907, 916, 934
- Museum, Alexandria. *See* Alexandria
- Music, 72, 85, 128, 194, 197, 297
- Mutation, 951 ff.
- Myoglobin, 907 f., 1295
- Mysticism, 179 ff., 197, 231 ff., 258 f., 272, 301, 1035, 1091, 1131, 1157, 1161, 1248
- Myths, 76 f., 85, 98, 132 f., 159, 174, 194, 197, 274, 1031 f., 1132, 1157
- Nagasaki, 835
- Napalm, 838
- Naples, 171, 295, 420
- Napoleonic Wars, 506, 537, 540
- National Health Service, 979 f.
- National liberation, 723, 1120 f., 1199-1205
- National Physical Laboratory, 550, 790
- Nationalization, 707 f., 1125 f.
- Natural resources, 710 f., 829 ff., 857 f., 870 f., 963 ff., 1263, 1300, 1306
- Natural law, 1046 f.
- Nature, 94, 122, 124, 187, 190, 199, 203 f., 635, 662 f., 1220, 1228
- Naturphilosophie*, 540, 550, 607, 639, 645 f., 1069
- Navigation, 115, 218, 277, 305, 317 ff., 352, 375, 381, 400-4, 410, 448, 450, 491, 492 f., 519, 541, 1231
- Nazism, 721, 723, 758, 884, 1087, 1094, 1115 ff., 1128, 1129 f., 1193, 1238
- Nebulae, 747
- Neo-colonialism, 1121, 1200, 1205
- Neolithic Age. *See* New Stone Age
- Neo-Malthusianism, 29, 973-7 *passim*, 1130, 1212
- Neoplatonism, 197, 231, 256, 260, 271 f., 299, 300, 1160
- Nervous system, 652 f., 906, 940 ff.

- Nestorians, 260, 262
 Neurology, 652 f.
 Neutrino, 766, 768
 Neutron, 755 ff., 793, 840
 New Deal, 1116 f., 1118, 1136
 New Lanark, 1064
 New Stone Age, 62, 67, 89, 91–9, 1080
 Newcomen engine, 579 f., 670
 Nile, 100, 115 f., 122
 Nitrogen, 754
 Norman architecture, 310
 Normans, 285, 314, 350
 Norsemen, 292, 350
 Nuclear: forces, 766 ff.; power, 10, 757–63, 789; physics, 751–73, 849 ff.; radiation hazards, 953 ff.; tests, 838, 846, 955, 1164; warfare, 954, 1164; weapons, 10, 16, 1158. *See also* Atomic bomb, Hydrogen bomb
 Nucleic acid, 909 ff., 914 ff., 923, 959, 986
 Numbers, 119 f., 176 f., 264, 275 f.
 Nutrition, 550, 654 f., 868, 878
 Nylon, 713, 827
 Observatoire Royal, 477 f.
 Oceanography, 799, 800 f., 1294
 Oil, 657, 705, 824, 1202, 1240, 1243, 1308
 Old Stone Age, 62–89 *passim*, 94 f., 105, 110, 944, 1080; animal lore, 70 f., 71 f.; art, 69; myths, 76 f., 85 f.; rituals, 76 f., 85 ff.; tools, 65 ff, 71, 93; weapons, 84 f., 896
 Omayyads, 269, 270, 272 f.
 Operational research, 819, 833 f., 1144, 1289
 Opinion polls, 1141 f., 1145
 Optics, 218, 278, 320, 425, 458, 1231
 Organic chemistry, 568, 574, 628–32, 654, 825, 857 f.
 Origin of life, 918, 984 ff., 1281
 Orphism, 179
 Oxford Movement, 559
 Oxford University, 295, 302, 453, 526, 550, 1151
 Oxygen, 472, 619 f., 621 ff.
 Padua University, 295, 296, 392, 395, 407, 426, 433, 437
 Pagans, 224 f., 257 f.
 Paleolithic Age. *See* Old Stone Age
 Panama Canal, 871
 'Pansophic College', 451
 Papacy, 257, 294, 384, 399, 434, 1044 f.
 Paper, 270, 325 f.
 Paris, 4, 287, 301, 448, 454, 529, 537, 674, 784; Commune, 558, 1106 f.; University, 295.
 Particle accelerator. *See* Accelerator
 Pathology, 395, 646
 Peasants' War, 379
 Pedology. *See* Soil science
 Pendulum, 478 f.
 Penicillin, 2, 793, 833, 877, 880, 884, 926 f.
 Peoples' Democracies, 709, 1193 ff., 1164, 1267
 Periodic table, 568, 664, 740 f., 768
 Persia, 3, 63, 122, 153, 157, 159, 169 ff., 184, 209, 224, 228, 248–55 *passim*, 262 f., 267 ff., 270 f., 273, 281, 284, 315, 342, 347, 349
 Perspective, 218, 390 f.
 Peru, 101 f., 343, 1231
 Petrochemicals, 824, 826
 Pharaoh, 105, 107, 138, 1221, 1245
 Pharisees, 255
 Pharmacy, 564 f., 876 f.
 Pharmacology, 634, 878, 885
 Philosophers and philosophy: Classical, 171 ff., 190 ff., 210 f.; and early Christianity, 260 ff.; eighteenth-century, 516 f., 542 ff.; Islamic 273 f.; medieval, 296–301; modern 1130 ff., 1157–63 *passim*, 1278 ff.; nineteenth-century, 1067 ff., 1090 ff.; Renaissance, 417 f., 439 ff., 446 f., 459 ff., 490 f.
Philosophes, 513 f., 526, 529, 530, 535, 542, 1055, 1057
 Phlogiston, 619–24, 678
 Phœnicians, 150, 156, 157, 224
 Photon, 737
 Photosynthesis, 889, 896, 921, 976
 Physics: and chemistry, 796; crisis in, 772 f., 861 ff.; eighteenth- and nineteenth-century, 575–90 *passim*, 599–617 *passim*; future of, 848–60; Greek, 198–203 *passim*, 213; medieval, 302; primitive, 69; Renaissance, 429 f., solid state, 787–92; twentieth-century revolution in, 725–803 *passim*
 Physiocrats, 1054
 Physiology, 125, 223, 437 ff., 459, 461, 474, 564, 625, 652, 938 f.
 Piety, 133, 464, 1308
 Piezo-electricity, 789, 801, 852 f.
 Planetary motion, 175, 347, 421 ff., 433 f., 445, 480–89, 744 f.
 Planning, economic, 717 f., 1174 f., 1184 ff., 1191
 Plantation economy, 403, 523, 964, 973 f., 1121, 1204, 1252, 1299, 1304

- Plastics, 826 ff., 857 ff., 865, 1245
 Platonism, 35, 193-8, 256, 260, 297, 299, 301, 383, 481, 488, 556, 945, 1023, 1029
 Plasma, 761, 852
 Plough, 94, 115, 140, 149, 229, 285, 288, 314, 343, 347 f., 679, 1220
 Pneumatic Revolution, 507, 518, 530 f., 541, 574, 620-5 *passim*
 Pneumatics, 85, 220 ff., 458, 469 ff., 1231
 Poland, 407, 411, 418, 424. *See also* Peoples' Democracies
 Polaris submarine, 841, 843
 Political science, 1034-49 *passim*, 1136 ff., 1210 ff.
 Politics, 63, 153 f., 1036 f.
 Polymers, 763, 826 f., 857, 865, 909, 915
 Population growth, 13 f., 18, 544, 644, 875, 973 ff., 1060, 1239, 1301 ff.
 Portugal, 350, 381, 402 ff., 411, 449; colonies, 707, 710, 1205
 Positive electron, 755
 Positivism, 589 f., 861, 994, 1083 f., 1093 f., 1133, 1159 ff., 1167, 1279
 Pottery, 82, 96, 113, 127, 211, 228, 252, 1229
 Power, 91, 312, 471 f., 519, 525 f., 563 f., 593, 616, 658, 713, 759 f., 851, 1184, 1229, 1305; loom, 522; station, 613, 967 f.
 Pragmatism, 1091 f., 1159
 Prefabrication, 822 f.
 Pre-Raphaelites, 559 f.
 Priests, 86, 104 ff., 109, 128, 130, 131 ff., 136, 137, 138, 254, 1231
 Printing, 266, 298, 311, 325 ff., 381
 Private property, 95, 119, 344, 1038, 1059, 1210
 Productive forces and relations, 48, 1020, 1072 f., 1102 f.
 Profit, 495, 504, 719, 808 f., 870, 964, 1052, 1100, 1119, 1135, 1211, 1221 f., 1253 f
 Progress, 495, 553, 664, 1065, 1081, 1085
 Proteins, 634, 867, 874, 890-903 *passim*, 905-18, 931 ff., 956 f., 959, 976, 982, 983, 986, 990, 1295, 1308
 Proton, 755 f., 764 f., 850
 Provence, 289, 305
 Provisionalism, 12, 1281 f., 1294
 Psycho-analysis, 947, 1094, 1154 ff.
 Psychology, 947, 1040, 1154 ff., 1209
 Pugwash movement, 846, 1163 f., 1291
 Puritanism, 260, 453, 461
 Pyramids, 117, 121, 129, 1231, 1245
 Quantum theory, 727, 736 f., 747 ff., 772, 795, 994; of valency, 794, 796
 Racial theory, 721 884, 1086 f., 1119, 1129, 1130, 1163
 Radar, 715, 720, 774, 777 f., 782, 802, 832, 834, 836
 Radioactivity, 733 ff., 752, 755 f., 1297; artificial, 756 ff.; atmospheric contamination, 953 ff.; effect on organisms, 837 f., 953 ff.
 Radio-astronomy, 769, 779 f.
 Radium, 734 f., 756 f.
 Railways, 413 f., 547, 583 ff., 591
 Rationalism, 1091, 1159
 Reason, 77 f., 163, 181 ff., 205, 275, 299 ff., 441-7 *passim*; age of, 542 f., 1055 f.; reaction against, 1091, 1131 f., 1159 f., 1247 f.
 Red Army, 834, 1122
 Reformation, 260, 292 f., 294, 327, 374, 375, 377, 379, 380, 385, 399, 433, 441, 488, 1044 ff.
 Reform Bill (1832), 544, 1066
 Reformism, 1108 ff., 1119, 1124 ff.
 Refrigeration, 655 f., 878
 Relativity theory, 727, 742 ff., 746 f., 861, 864
 Religion, 43, 1029; Greek, 173, 211; Hebrew, 157 ff., 255 f., 1032, 1035 f.; Islamic, 267 f., 271 f.; medieval, 292-301 *passim*, 1039-43; organized, 231 ff., 254 ff., 1039; origins of, 76 f., 88, 98, 104 ff.; and reaction, 1062 f.; Reformation, 384, 1044 f.
 Renaissance, 16 f., 379-410; art and technique, 384-98 *passim*, 412; astronomy, 2, 216 f., 276, 400, 406 ff., 673; chemistry, 398 ff.; humanism; 237, 297, 382 ff., 1046 f.; literature, 327, 1046 f.; mathematics, 430 ff.; medicine, 392 ff., 437 ff., 565; metallurgy, 382, 387 f., 396 ff.; and science, 4, 54, 56, 167, 183, 212 f., 219, 247, 266, 271, 273, 284, 300, 301, 375 ff., 408 f., 420, 496 f., 498 f., 509, 1226 ff.; voyages of discovery, 218, 400-6, 410
 Research: expenditure, 714, 719, 832, 834, 846 f., 849 f., 1253 f., 1257 f., 1299; in Classical times, 207, 212 f.; convergent, 1289; definition of, 42; divergent, 1289; laboratories, 421, 554, 568 f., 608, 705, 713 f., 718 f., 727, 752, 843 f., 1261, 1287; organization, 708 ff., 727, 1255 ff., 1282-99 *passim*; strategy of, 1288 f.
 Respiration, 85, 625, 938

- Restoration, The, 377, 453
 Rheology, 822
 Ribosomes, 915, 931
 Ricketts, 652, 898
 Ritual, 76 f., 81, 85 ff., 98 f., 122, 341 f., 1031 f.
 River culture, 62, 99 f., 135, 140
 RNA, 909, 915, 956 f.
 Robbins report, 1153
 Rochdale Pioneers, 1065
 Rockets, 320, 782, 813 ff., 836 f., 841 ff.
 See also Ballistic missiles
 Roman Empire: agriculture, 229; and Arabs, 268 f., 281; architecture, 167, 228; civilization, 145, 148, 153, 156, 223-34, 235; collapse, 169, 230 f., 234, 252 f., 285; family, 230; law, 230, 1038; science 226 f.
 Rothamsted, 655, 975
 Royal College of Science, 553
 Royal Institution, 538 ff., 554
 Royal Observatory, 478
 Royal Society: attitude to social sciences, 453, 1017, 1047; in eighteenth century, 510, 516, 602 f.; foundation of, 419, 442, 450-63 *passim*; and Newton, 485; in nineteenth century, 549 f.; Scientific Information Conference, 1274
 Rubber, 657, 823, 1270
 Ruskin College, 1, 1149, 1151
 Russia: eighteenth-century, 514 f., 525 f., 535; medieval, 276, 281, 286; nineteenth-century, 565, 567, 570; Renaissance, 381; seventeenth-century, 411, 413, 449. *See also* Soviet Union
 Russian Revolution, 567, 717 f., 1100, 1112, 1117, 1119, 1166 ff., 1199
 Sacrifice, 93, 98
 St Sophia, 265
 Salerno, 234, 295, 323
 Sanitation, 651 f., 879, 977 f.
 Sassanian Empire, 251, 262, 349
 Sceptics, 211
 Schoolmen, 346, 383 f., 1042, 1226
 Science: application of, 41 f., 715 ff.; and art, 40 f., 43, 332; Big, 16, 17; birth of abstract, 161 f.; and capitalism, 4, 16, 32, 374, 489 ff., 503 ff., 519, 570 f., 657 ff., 846 f., 927, 1238, 1252-62, 1283, 1286 f.; class character of, 48 ff.; co-operation in, 711, 722 f., 831, 851 f., 1275 ff.; and culture, 560; cumulative tradition of, 42-6; definition of, 3, 30 f.; and dogma, 258 ff.; and economic development, 1229-39 *passim*; and engineering, 42, 819 f.; expenditure on, 714, 719, 834, 846 f., 849 f., 851 f., 995, 1253-8 *passim*, 1318; freedom of, 27, 1282-92 *passim*; and French Revolution, 535-41; and history, 1, 5 f., 18, 506, 1219-1310 *passim*; and human welfare, 11-14, 28 f., 539 f., 712 f., 829, 1237 ff., 1269 f., 1275, 1301 ff.; and imperialism, 16, 707 f.; in the Industrial Revolution, 541 ff., 1237 f.; and industry, 525 ff., 529 f., 711 ff., 819 f., 1235 f., 1253 ff.; as an institution, 32-5, 56 f., 457 ff.; language of, 38, 1271; and law, 43; and magic, 61, 131 ff.; and the means of production, 46-51; militarization of, 27, 33, 841-8 *passim*, 1257 ff.; and mysticism, 179 f., 746, 1091 f., 1160 f.; of science, 12 f., 18, 1297 ff.; organization of 549 f., 1282-91 *passim*; origin of quantitative, 117-28; origins of, 61-89 *passim*; origins of modern, 373 ff., 414; and philosophy 3, 43, 61, 1278-82; and planning, 13, 40, 717 f., 828 f., 1298 f.; popular, 553 f., 719, 1292; pure, 33, 41, 664; and religion, 43, 54, 61, 446 f., 487 f.; role of great men, 45 f., 1236 f.; secrecy in, 27, 728, 1260 f., 1277; and socialism, 11, 708 ff., 717 f., 722, 1264-9; and society, 1, 4f., 29 f., 54 ff., 719, 723 f., 1220-30, 1233 ff., 1244-8, 1304 f., 1309 f.; strategy of, 39 f., 720; and technique, 3, 44 f., 164 ff., 373 f., 491, 505 ff., 1231-9, 1289; in the transition to feudalism, 251-84; in developing countries, 13 f., 710 f., 1262 f.; in the universities, 552 f., 708, 718 f., 727 f., 843 f., 1254 ff., 1258 ff.; and war, 4, 16, 27, 28, 137 f., 562, 717, 727 f., 831-48; world's need of, 1299-1310
 Scientific: apparatus, 37; classification, 36 f., 80 f.; communication, 1271 ff., 1277; discoveries, 45 f., 52, 607 f., 704, 733 f., 926 f.; education, 418 f., 536, 1153 f., 1189 ff.; laws, 38, 51 f.; management, 1144 ff.; measurement, 36 f.; medicine, 564 ff.; method, 35-42, 334; societies, 442, 450-58, 497, 520, 549 f.
 Scientific Revolution, the, 375 ff., 379-497; astronomy in, 420-27, 433 f.; biology in, 474 f.; chemistry in, 472 ff.; coal in, 413 f.; mechanics in,

- 475-89, 491 ff.; Second, 10, 13 f., 15, 703, 993, 1298 f.
- Scientists and engineers. 41 f., **819** f., 1223 f.; organization of, 845 f., 1163 ff., **1289** ff.; responsibility of, 28 f., 34, 570 f., 720 ff., 845 f., **1291**, 1301; seventeenth-century, 490 f.; social position of, **663** f., 1267 f., **1282** ff., 1287 f.
- Scottists, 299, 301, 445
- Scotland, 651; and Industrial Revolution, 47, 351, **512**, 525, 526, 529, 530; universities, 512, 529, 536
- Scribes, 119, **129** ff., 1220
- Scurvy, 896
- Scythians, 148
- Semi-conductors, 790, 852 ff.
- Servo-mechanisms, 713, **782** ff.
- Ship, **114** f., 147, 149 f., 220, 547, 584 f., 1229
- Sicily, 171, 297, 323
- Sickle, 93 f., 140
- Slavery, 107 f., **141** f., 166, 224 ff., 403, 523, 1073, 1205, 1244 f.
- Slavs, 285, 286
- Sled, 115
- Smallpox, 565, 595, 649, 980
- Smiths, **113** f., 137, **148**, 315, 595 f.
- Social democracy, 1105, **1108** ff., 1119, 1124 ff., 1168; Social Democratic Federation, 1077, **1095** f., 1110
- Social medicine, 977 ff.
- Social sciences, **1017-1214**; in antiquity, 1030-9; application of, 1138-48; backward state of, 1020 ff; under capitalism, 1100, 1123-47; corruption of, 1147 f.; and early churches, 1039 ff.; future of, 1205-14; Greek, 1036 f.; historic element in 1026 f.; methods of, 1030; and natural science, 1019 f., 1025-30 *passim*; of schoolmen, 1042; and social change, 1024, 1116 f.; under socialism, 1025 f., 1165-99
- Social survey, 1097, 1139 ff.
- Socialism, 4, 11, 659 f., 704 f., 1025 f., 1106, 1113, 1119, 1138; rise of, 558 ff., 1066 f., 1077; and science, 11, 50, 717 f.; scientific, 1104; utopian, 1064 ff. *See also* Soviet Union
- Society: origins of, 65 f., 72 ff., 1031; theories of, 190 f., **1033** ff., 1054 f., 1077
- Sociology, 1019, 1059, **1083** f., 1098 f., 1139, 1179, 1182, **1209**
- Soil conservation, 965
- Solar eclipse, 743
- Solvay process, 633
- South Sea Bubble, 509 f.
- Soviet: aid, 969, **1263** f.; agriculture, 970 f.
- Soviet Union: Academy of Science, 709, **1265** ff., 1274; aid, 18; attitude to history, 1180 ff.; Communist Party, 1167, **1172** f., 1191; economic science, 1183 ff.; education, 1187 ff., 1275; genetics controversy, 957; planning, 1174 ff., 1177, 1184 ff.; psychology in 1182 f.; science in, 52, 708 f., 715, 717 f., **722**, 764, 815, 957, **1189** f.; Second World War, 834, 1176, 1178, 1186; social responsibility, 1186; social science, 1177-93 *passim*; transformation of Nature, 722, 830 f. **965** ff., 1192 f.; transition to communism, 1191 ff.
- Space age, 9, 18, **815** ff., 851 f., 995
- Space research, **813** ff., 841, 986 f., 995
- Spagyric chemistry, 280, **398**, 473, 795
- Spain: and Islam, 47, 270, 272 f., 297, 350; modern, 1119, 1199, 1205; Renaissance, 377, 379, 381, 397, 402 f., 411, 707; seventeenth-century, 427
- Sparta, 184, 193 ff.
- Spatial chemistry, 631
- Species, 204, 638 f., 640, **643** ff., 948 ff.
- Specific heat, 580 ff.
- Spectacles, 278, 320, 425, 1231
- Spectroscopy, 575, 739, 745, 780, 794, 865, 888
- Spectrum, 459, 747
- Speed, 817
- Spinning Jenny, 521, 670
- Spirits, **87** f., 132, 223, 323, 398 f., 472, 618, 620, 1154
- Spontaneous generation, 648, 652, 984
- Sputniks. *See* Artificial satellites
- Stakhanovites, 1021
- Stars, 769, 771
- State, **109**, 137, 193 f., 252 f., 335, 449, 496, 808, 1103, 1104, 1255 f.
- Statistics, 1030, 1049, 1139-44 *passim*
- Steamboat, 546, 547, 584 f.
- Steam-engine, 471 f., 505, 512, **576-86** *passim*, 591, 592 f., 1228
- Steam-hammer, 590, 595
- Steam-power, 519, **525** f., 675 f.
- Steel. *See* Iron and Steel
- Sternpost rudder, 311, 318 f., 1229
- Stoicism, 211, 227, 230, 231
- Structural formula, 631
- Suez, 723, 864
- Sulphonamides, 926

- Sulphur, 125 180, 280, 398, 473
 Sumeria, 105, 116, 122, 135, 141, 159, 174
 Super-conductors, 789 f.
 Surgery, 187, 278, 392 ff., 439, 925, 934, 935, 988
 Surplus value, theory of, 1052 f., 1076 f.
 Survival of the fittest, 644 f., 662 f., 1092
 Sweden, 411, 413, 449, 512, 514, 531
 Symbolism, 73, 231, 1031
 Synagogue, 1039
 Synchrotron, 755, 765, 780, 843, 845, 856, 1235
 Syphilis, 398, 634, 651, 925
 Syracuse, 195, 213, 218 ff.
 Syria, 3, 157, 165, 210, 218, 248, 262 ff., 273, 276, 305, 342, 347
 Taboo, 76, 77
 T'ang Dynasty, 250 f., 678
 Taoism, 280, 327, 1035
 Tartars, 286, 352
 Technical education, 554, 1153, 1189 f.
 Telegraph, 546, 547 f., 1230
 Telescope, 278, 320, 425 ff., 440, 462, 464, 466, 477, 745, 770; radio- 770, 779 ff.
 Television, 719, 780 f., 783, 791, 1293
 Temple, 102, 104 ff., 117, 122, 135, 138, 343, 1231
 Tennessee Valley Authority, 964, 1020, 1118
 Textiles: artificial, 826 ff.; industry, 222, 454, 504 f., 519-23, 525, 546, 585, 595, 624, 631, 676; medieval, 314, 328 f., 380; origins of, 96 f., 252
 Thebes, 138, 150
 Theology, 254-63 *passim*, 272, 299 f., 305 ff., 334, 384, 446 f., 481, 487 f., 532 f., 556 f., 640, 645 f., 662 f., 674 f., 1023, 1039 ff., 1157 ff., 1279
 Thermodynamics, 555 f., 587 f., 903 f.
 Third World, 17 f.
 Thirty Years War, 449, 451, 673
 Tissue culture, 933 f.
 Tools: machine, 593 ff.; metal, 113 f.; primitive, 65 ff., 92
 Totemism, 74 ff., 138, 1032
 Trace elements, 895
 Tracer elements, 763, 873, 902
 Trade, 108 f., 138, 149 ff., 339, 380 f., 403. *See also* Merchants
 Trade Unions, 1095, 1097, 1118, 1148, 1151; early, 1064
 Tradition, 57, 61, 81, 159, 171, 335, 507, 1029-35 *passim*; of science, 42 ff., 1220 f.
 Transducer, 789
 Transformation of Nature, 885, 965 ff., 1212, 1305 f.
 Transistor, 782 f., 790, 815, 837, 852 ff., 865
 Translating machines, 673, 855 f., 1274
 Transport, 114 ff., 149 ff., 312 f., 334, 380 f., 546 ff., 583 f., 806-15
 Trent, Council of, 1044
 Trigonometry, 276, 305
 Troy, 150
 Turbine, 585, 593, 812
 Turks, 283, 286, 334, 402, 403
 UNCSAT, 18, 711
 Underdeveloped countries. *See* Developing countries
 Unemployment, 1125
 UNESCO, 711, 831, 1273
 United Nations, 831, 977, 1120, 1204, 1317, 1318
 United States of America, 560 f., 567, 1250; agriculture, 524, 970; Atomic Energy Commission, 836, 1258; capitalism, 17, 567, 705 f., 805 f., 976, 1129, 1132, 1253 f., 1260; industry, 713, 976, 1261; military research, 843 f., 1258; science, 715, 728, 843 f., 1253-62 *passim*; universities, 844, 1254, 1258; witch-hunt, 844, 1118, 1123
 Universe, 175, 407 f., 487 f., 769 ff., 851 f.
 Universities: eighteenth- and nineteenth-century, 512, 529, 550, 552 f.; medieval, 295 f.; modern, 843 f., 1153; precursors 197, 207, 212; Renaissance, 380, 392, 396, 453; socialist, 1189 f.
 University research, 708, 719, 727 f., 775, 784, 837, 850, 943, 1254, 1256 f.
 Ur, 105
 Uraniborg, 421, 442
 Uranium, 734 f., 757 f., 759 f.
 USSR. *See* Soviet Union
 Usury, 109, 1043 f.
 Utilitarians, 545, 1059 f.
 Utopia, 1045
 Vaccination, 649, 901
 Vacuum, 183, 202 f., 450, 458 ff., 463, 469 ff., 600, 613, 730, 735, 993, 1227 f.
 Valency, 630 f., 678, 794, 796
 Value, labour theory of, 1052 f., 1076
 Values, 195, 1021, 1029
 Valve, electronic, 774 ff.
 Vandals, 293
 Venice, 234, 379, 380 f., 400, 420
 Vernalization, 957

- Versailles, 449, 529
 Vienna School, 1092 ff.
 Vietnam, 707, 715, 723, 1116, 1120, 1199
 Vikings, 283, 319, 329
 Village, 98 ff., 102 ff., 153, 287 f., 312, 328
 Viruses, 901, 905, 912 ff., 916 f., 920, 934 ff., 982, 990
 Vitalism, 933, 937 f.
 Vitamins, 793, 878, 896 ff., 928, 978

 War, 15, 48, 136 ff.; in Classical times, 184, 191, 209, 224 f.; danger of, 831-47 *passim*, 1299 ff.; origins of, 136 ff.; of Religion, 377, 410; First World, 631, 717, 721, 723, 811, 883, 1119, 1128 f., 1156, 1159, 1166, 1168, 1257; Second World, 491, 631, 677, 708, 717 f., 720, 721, 723, 728, 801 f., 805, 811 ff., 832 f., 843, 880, 882 f., 884, 926 f., 1120, 1129, 1131, 1146, 1157, 1166, 1172, 1178, 1297; Renaissance, 381, 412; and science, 218 f., 395, 831-48
 Water-frame, 521
 Water-mill, 314 f.
 Wave mechanics, 748 f.
 Weather, 801 ff., 816
 Weaving, 69, 84, 95, 96 f., 166, 252, 521 f., 1229
 Welfare State, 1072, 1124 ff.
 West Riding, 414, 525, 676

 Western Christian civilization, 311, 1094, 1122, 1129 f., 1132, 1161, 1181, 1207, 1244
 Wheel, 115 ff., 140, 1229
 Whigs, 418, 497, 509, 537
 WHO, 879, 901, 980
 Windmill, 314 f.
 Wine, 312, 342, 548, 565
 Wireless, 568, 773 ff., 1257
 Women, 65 f., 69, 74, 84, 93, 98, 115, 137, 166, 679, 735, 1187 f., 1264
 Work, 95 f.; scientific concept of, 586 ff.
 Workers' Educational Association, 1151 f.
 World Federation of Scientific Workers, 711, 845, 1290 f.
 Writing, 117 f., 1220

 X-ray analysis, 738 f., 741 f., 793 f., 795, 891, 905-13 *passim*, 927, 990
 X-rays, 730 ff., 733 f., 781, 785, 793, 936

 Yang and Yin, 176, 280, 351, 442, 677
 Yeast, 647, 649, 892, 976, 988
 Yoga, 179, 1034 f., 1157
 Yorkshire, 414, 511, 521, 525

 Zanjis, 269
 Zone melting, 790, 854
 Zoroastrianism, 99, 252, 254, 260, 262, 267, 1035