

INDEX

(references are to item numbers)

A

A-o compiler 662, 1214
Abacus 14, 324
Abraham, Karl 1331
ACE 769
 history of 940, 941
 Pilot ACE 933
 test assembly 933, 934
 Turing's 1946 report on 941
 Turing's programming for 934
ACE computer 538
Adams, Charles W. 617, 621, 622, 624
Adler, Mortimer J. 1255
Adley, Charles Coles 109
Advances in Computers 425
advertising and promotional materials
 Brunsviga 313–315
 Burroughs 228–233, 236–241
 Comptometer 293–298
 Cooper slide rule 371
 Elliott-Fisher 291
 Ferranti 602
 Fuller slide rule 372
 IBM 717, 718

MADAS 288
Marchant 336
Millionaire 289, 290
Muldivo 340–342
National Cash Register 805
Powers-SAMAS 357–359
Remington Rand 360
Scientific Computing Service
 273–275, 277, 278
Tabulating Machine Co. 373, 374
Triumphator 388, 389
UNIVAC I 1133
Agamemnon (H.M.S.) 142
Agapeyeff, Alexander d'. 216, 409
Aiken, Howard Hathaway 410, 415,
 418–422
 and the Harvard computing
 symposia 413, 414, 417
 and the Harvard Mark I 412
 manual of operation 411
 proposal 217
 and the Harvard Mark II 416
 and the Harvard Mark III 420
Airy, George Biddell 64
 and submarine telegraphy 110
 Babbage's epigram on 72
Alcosser, Edward 423

Alexander (political cartoonist) 1115
Alexander, James 112
Alexander, S. N. 641, 1182
Algebraic coding theory 486
ALGOL
 ALGOL 58 448
 ALGOL 60 813, 917
Alsted, Johann Heinrich 7
Alt, Franz L. 424, 425, 912
Amber, George H. 426
Amber, Paul S. 426
Ambrose, B. F. 672
American Arithmometer Company.
 See Burroughs Adding
 Machine Company
American Federation of Information
 Processing Societies 1341
American Institute of Electrical
 Engineers 211
 first joint AIEE-IRE-ACM
 conferences 740
American Management Association
 427
American Totalisator Company 1154
analog calculating machines 304, 402,
 403, 918

- differential analyzers. *See*
 differential analyzers
- electronic analog computers 759,
 830
- harmonic analyzers. *See*
 harmonic analyzers
- integrators 318, 840, 841
- Mallock machine 1014
- slide rules. *See* slide rules
- tide predictors. *See* tide
 predictors
- US Army use of 947
- Analytical Engine
- Babbage's accounts of 62, 84
 - Dodd's account of 69, 70
 - Menabrea's account of 60, 61
 - Lady Lovelace's translation
 61
 - Merrifield's report on 90
 - Wilkes on 1052, 1056
- Analytical Society. *See* Babbage,
 Charles
- Anderson, James 111
- Anderson, P. L. 1260
- Andrade, E. N. da C. 2
- antilogarithms 4
- Aparo, Enzo 560
- APE(X)C 495
- Appel, Richard W. 428
- Archibald, Raymond Clare 97, 98,
 429
 and *MTAC* 777
- Armer, Paul 430
- Armour Research Foundation 431,
 432
- ARPA 768
- artificial intelligence 430, 504, 635,
 643, 763, 778, 909
- “Pandemonium” model 878
 - and common-sense reasoning
 781, 782
 - and computer languages 531, 532,
 797
 - and cybernetics 435, 565, 566
- and human concept formulation
 670
- and multistage decision
 processes 455
- and neurocomputing 798
- bibliographies 599
- binary choice experiment 601
- computer checkers 874
- computer chess. *See* computer
 chess
- conferences on 809
 - early cybernetic experiments 973
 - EPAM 598
 - game tree pruning 816
 - game-playing programs 887
 - General Problem Solver 817, 905
 - geometry theorem-proving
 machine 630
 - human problem-solving
 methods 906
 - list processing languages 903
 - logic theory machine 815
 - logical AI 781, 782
 - pattern recognition 572, 742, 877
 - pattern-classifying systems 821
 - perceptron 870
 - question-answering programs
 639
 - surveys 600
 - Turing test 936
 - unification algorithm 865
- Artzybasheff, Boris 418
- Ashby, William Ross 433–436
- Asimov, Isaac 437, 438, 566
- Associated Press 169
- Association for Computing
 Machinery 442, 443, 1345,
 1398
- Communications* 441
 - first joint AIEE-IREE-ACM
 conferences 740
 - Proceedings* 439, 440
- Atanasoff, John Vincent 218, 444
- Atanasoff-Berry Computer 444
- Atlantic cable 114, 190
- of 1858 127, 142, 151, 184
 - of 1865 142, 156, 191
 - of 1866 142, 189
- Atlantic Telegraph Company 142, 151,
 152, 191
- Auerbach, Isaac L. 439
- Augarten, Stan 445
- Ault, John M. 1260
- Australia
- development of computing in
 831, 832
- automata 279, 529
- of Torres y Quevedo 386, 931
 - of Vaucanson 47
 - of von Kempelen 47
- automata theory 385, 515–517, 885, 893
- and computability 939
 - von Neumann on 965, 966, 971,
 972
- Automatic Relay Calculator 490
- automation 249, 426, 567, 638
- first automation conference 431
 - in Great Britain 499
- Automation Hall of Fame 1409
- Ayrton, William Edward 113

B

- B-o compiler. *See* Flow-matic
- Babbage, Benjamin Herschel 79, 84,
 96
- Babbage, Charles 74, 99, 101, 105, 542
- A.L.s. to Fitton 52
 - A.L.s. to Harcourt 39
 - A.N.s. to Tennent 66, 72
 - actuarial work 36
 - Analytical Engine. *See* Analytical
 Engine
 - Analytical Society 17, 18
 - and Charles Dickens 66
 - and de Prony's mathematical
 tables 301

- and Lady Lovelace 57, 61
 and Richard Sheepshanks 64
 and the Great Exhibition of 1851 67, 71
 and the International Statistical Congress 81
 barometrical observations 28
 biographies 100, 103, 104, 107, 108
 autobiography 84
 Bridgewater treatise 55, 56
 copy of Merbitz's *De varietate faciei humanae* 8
 Difference Engine. *See* difference engines
 epigrams 72
 geological works 63, 78
 mathematical tables 50, 76
 proposals for mechanizing 32, 33
 Royal Astronomical Society committee 46
 mathematical works 17, 18, 23–27
 calculus of functions 19, 21, 22
 translation of Lacroix 20
 mechanical notation 37, 73, 75, 81
 obituaries 87, 88
 occulting telegraph 93
 on Arago's electromagnetic experiments 35
 on science reform 17, 38, 67
 Moll's rebuttal 40
 on street nuisances 83
 on the Scheutz difference engine 73, 75
 parliamentary campaign 41
 portraits 49, 89
 social activities 52, 66
 works on economics 42–45, 53, 54
 Babbage, Henry Prevost 73, 75, 93–95
 Backus, John W. 446–448
 Baehne, George Walter 219, 220
 Baggs, Isham 114
 Bagrit, Leon 449
 Baily, Francis 34, 46
 Bain, Alexander 115
 Baldwin, Frank Stephen
 variable-toothed cylinder 313
 Banks, Joseph
 Babbage's epigram on 72
 Bardeen, John 450
 Bargmann, Valentine 955
 Bar-Hillel, Yehoshua 425, 451, 452, 523
 Barlow, Alfred 221
 Barlow, Peter 53
 Barnes, Gladeon M. 1119
 Baxandall, David 222, 453
 Bayes, Thomas 1
 Bayes's Theorem 1
 Beard, Maston 831, 832
 Beauchamp, James W. 608
 Becquerel, Henri 171
 Beer, Stafford 454
 Bell relay computers
 E. C. Berkeley on 457
 history of 910
 Model V 912
 Models I-III 910
 Bell Telephone Company 117
 Bell, Alexander Graham 116, 117
 telephone. *See* telephone
 Bellman, Richard 455, 456
 Belloc, Alexis 118
 Bennett, Alfred R. 119
 Bennett, John M. 504, 744, 745
 Bennett, John R. 620
 Berkeley, Edmund Callis 425, 439,
 475, 477, 479, 484, 1345,
 1369
 and the Bell relay computer 457
Computers and Automation 469
Giant Brains
 Berkeley's copy 463
 corrected typescript 460
 design drawings and
 illustrations 462
 galley proofs 461
 publisher's contract 459
 reviews and notices 465
 second edition 464
 memorial service 485
 number puzzles 470
 on applications of symbolic logic 458
 on symbolic logic 476
 robots and teaching machines 472–474, 482
 Automatic Teaching Computer 480, 481
 Brainiac 478, 483
 Simon 463, 466, 467, 471
 Squee 468
 Tyniac 478
 works from his library 424, 463,
 569, 570, 853, 893
 Berlekamp, Elwyn R. 486
 Bernath, Otto 1260
 Bernstein, Jeremy 1291
 Berry, Clifford E.
 and the Atanasoff-Berry Computer 444
 and the CEC Model 30–103 547
 bibliographies
 computer history 850, 851
 computer-generated 1073
 Bidder, George Parker 120
 Biermann, Ludwig 487
 Bigelow, Julian Himesly 956
 shift register for the IAS computer 960
 BINAC
 advertising and promotional materials 1141, 1145, 1147
 demonstrations 1147
 early tests 1139, 1143, 1144
 newspaper and magazine accounts
 Look 1150
 Philadelphia Inquirer 1146
 photographs 1140

- bionics 430
- Birge, Raymond T.
works from his library 258, 260–262, 271, 540
- bit
 coinage of term 548
- Blaauw, Gerrit A. 507
- Blavier, Edouard Ernest 121
- Blumenthal, Edwin I. 1277
- Bollée, Léon 288
- Bonelli, G. 122, 123
- Boni, Alessandro 488
- Bonn, Theodore H. 1275, 1286, 1295, 1334, 1339
- Boole, George 1, 223–226
- Boolean algebra 224, 926
 as a basis for computer circuit design 363
 Quine-McCluskey method 845
- Boone, Pat 1255
- Booth, Andrew Donald 491, 493, 494, 500, 502, 504
analog Fourier synthesis device 489
and magnetic drum storage 490
and the APE(X)C 495
 Morgan automatic computer 981
and the Automatic Relay Computer 490
on automation 499
on machine translation of languages 492, 497, 498
on numerical analysis 496
on the Commodore PET computer 501
works from his library 491, 500–502, 676, 748, 775, 807, 827, 838, 934, 956, 959, 960, 1019, 1027
- Booth, Ian J. 501
- Booth, Kathleen 490, 493, 494, 503
- Born, Max 1002
- Bowden, Bertram Vivian 504
- Brabandere, Luc de 505
- Bradbury, N. E. 1119
- Brainerd, John 1099, 1107, 1132
- Braithwaite, Richard Bevan 250, 251, 307, 356, 395
- Brandt, A. E. 218
- Brandwood, L. 498
- Bratt, J. B. 332
- Brattain, Walter 450
- Breguet, Alfred 124
- Brett, Alfred 125
- Brett, Jacob 126
- Brett, John 123, 126, 177
- Brewster, David 47, 62
- Bridge, John 227
- Briggs, Charles F. 127
- Briggs, Henry 2
- Bright, Charles 130
- Bright, Charles Tilston 109, 110, 129, 151, 154, 166, 176, 197
 and the Atlantic Telegraph Company 128, 191
 biography 130
 partnership with Clark 128
- Bright, Edward Brailsford 131
- Brinker, Robert A. 1340
- British Association for the Advancement of Science
 Babbage's involvement in 39, 48
 electrical standards committee 166, 176
- British Commonwealth Scientific Office
 works from the library of 1107
- British telegraph. *See* telegraph
- Brooks, Frederick P. 506, 507
- Brown, Albert 1340
- Brown, Donald M. 1260
- Brunel, Isambard Kingdom
 and the *Great Eastern* 132
- Brunsviga calculating machines. *See* Grimme, Natalis and Company: Brunsviga calculating machines
- Buchholz, Werner 507, 508
- Bucks, Robert M. 1356, 1363
- Bull (Compagnie des Machines Bull)
 741
 Gamma calculators 509, 510
- Bull, Fredrik-Rosing 509
- Burks, Arthur W. 421, 511–517, 959, 964, 1283
works from his library 954
- Burroughs Adding Machine Company
 British division 236–241
 history of 801
 Burroughs calculating machines 228–241, 265, 267, 285, 311
 history of 228
- Burroughs Corporation Library
works from 986, 987
- Burroughs truth-function evaluator
 794
- Burroughs, William Seward 228
- Bush, Vannevar 242–244, 520
 Memex system 519
 on instrumental analysis 245
 Rapid Arithmetical Machine Project 518
- Business (French calculating machine company) 246
- Buxton, Harry Wilmot 104

C

- CALDIC 792
- Calvin, Melvin
works from his library 1076
- Cambi, Enzo 522
- Canning, Samuel 133
- Cannon, James Graham 248
- Čapek, Karel 249
- Carey, George R. 134
- Carnap, Rudolf 523
- Carr, John W. 950
- Carter, R. H. A. 1020
- Casey, E. J. 1260

- Casey, Robert S. 524, 525
 Cassidy, Morley 1110
 Cavalieri, Bonaventura 3
 CEC Model 30–103 547
 Centre national de la recherche scientifique 526, 527
 Centro Internazionale di Calcolo 539
 Cerf, Vinton G. 528
 Challis, James
 Babbage's epigram on 72
 Chambers, Robert 55
 Chandrasekhar, Subrahmanyan 522
 Chapin, George G. 1260
 Chappe, Abraham 135
 Chappe, Claude 135
 Chappe, Ignace 136
 Chappell, E. 263
 Chapuis, Alfred 529
 Chatterton, John 137
 Chen, Wu 1326, 1353
 Cherry, Colin 530
 Chomsky, Carol 639
 Chomsky, Noam 531, 532
 Chu, J. Chuan 1243, 1245, 1246
 Church, Alonzo 250, 251, 533
 Circle computer 534
 Clark, [Josiah] Latimer 150, 151
 and the Electric Telegraph Company 152
 electrical experiments 152
 pneumatic tube system 190
 telegraph wire insulator 124
 works from his library 109, 110,
 112–115, 120–126, 128,
 129, 131–133, 137–148,
 152–156, 159–167, 172,
 175–177, 179, 180, 182–
 187, 190–192, 194–202,
 205–207, 209, 210, 213–
 215
 Clark, Forde, and Taylor 143
 Clasper, H. 731
 clearing houses 248
 Cleator, Philip E. 535
 Cleave, J. P. 498
 Clement, Joseph 52
 COBOL 543, 1260
 COBOL-61 544
 Flow-matic's influence on 662
 Cohen, Arnold A. 536
 Cohen, John 537
 Cohen, L. 1250
 Colburn, Zerah 252
 Colebrook, Francis Morley 538
 Combelic, Donn 622
 communications theory. *See*
 information and
 communications theory
 Compagnie des Machines Bull. *See*
 Bull (Compagnie des
 Machines Bull)
 computation theory 778
 computational biology
 first application of an electronic
 computer in 745
 computer architecture 831, 913
 and the stored-program machine
 1136
 first textbook on 835
 of ERMETH 916
 of the EDSAC 1023
 von Neumann architecture 959
 computer chess 504, 656, 766, 814,
 816, 882
 MANIAC I chess program 749
 Wiener on 991
 computer conferences and symposia
 564, 676, 768
 ACM meetings 439, 440
 Business Computer Symposium
 521
 Cambridge University 1019
 collection of archival
 materials 1020
 earliest electronic digital
 computer conference
 650
 first Australian 832
 first full-scale French symposium
 526, 527
 first German international
 conference on
 electronic computing
 979
 first held on US west coast 842
 first Italian electronic digital
 computer conference
 539
 first Japanese 921
 first joint AIEE-IRE-ACM
 conferences 740
 first postwar conference 429
 first Spanish 545
 Harvard conferences 413, 414,
 417, 421
 Manchester University 775
 first Manchester University
 conference 774
 National Physical Laboratory
 807, 809
 on automatic programming 665
 on computer applications 432
 on information networks 839
 on information processing 734,
 735
 on machine translation of
 languages 765, 811, 812
 on moderately-priced computers
 853, 854
 on teaching machines 552
 UNESCO conference 734, 735
 UNIVAC / Office of the Chief of
 Naval Operations 1260
 UNIVAC I maintenance
 conference 1206
 Computer Consultants
 (International) Limited 1369
 computer design 818
 computer graphics 644, 1049
 coining of term 605
 computer industry
 early investment analyses of 770
 computer languages. 531, 532, 636, 873
 See also specific languages
 and artificial intelligence 797

- list processing languages
 FLPL 630
 IPL-IV 903
 LISP 779, 780
- surveys of computer languages
 868
- computer memory systems
 cathode-ray tubes
 Selectron 848, 849
 Whirlwind 609
 Williams tube 1065, 1066
- EDIAC 927
- magnetic drum 490, 500, 536
- magnetic-core memory 764, 980
 Whirlwind I 620
- mercury delay-line 902, 1126,
 1127
- mirror memory 1347, 1351
 of the EDSAC 1017
- magnetic-tape auxiliary
 system 1037
- oligatomic memory 1375
 surveys of 861
- thin film memory 1344
- computer music 608, 659, 660
- computer privacy 946
- computer programming 409, 503, 729
 ADES programming system 948
 and artificial intelligence 817
 and the stored-program machine
 1136
 automatic programming 665,
 668
 for business applications
 667
- automatic programming
 languages
 A-o compiler 662
 A-2 compiler 1214
 Flow-matic 1227, 1238
 Unicode 1235
 UNIVAC Generalized
 Programming 1228
- EDSAC versus SEAC 795
- first general introduction in
 book form to 783
- first published examples 60, 61
- first significant program run on a
 stored-program
 computer 819
- first textbook on 1030
- floating-address systems 1032
- for EDSAC 796, 988, 1019, 1024,
 1027, 1036
- for EDSAC 2 1041
- for EDVAC 827
- for ENIAC 799, 1107
- for the ACE 934
- Harvard Mark I 411
- pseudocodes 663, 664
- PUFS 1046
- surveys of programming systems
 868
- Turing's system for the Ferranti
 Mark I 937
- UNIVAC I 1130, 1134, 1135, 1153,
 1157, 1174, 1236
- flow charts 1193, 1194
- Short Code 1189
- UNIVAC II
 Tape Read and Write
 Library 1254
- Von Neumann's variable-address
 machine language 959
- Wheeler jump 988
- Wilkes on 1021, 1030, 1031, 1034
- computer typesetting 834
- computer-aided design 673
- computer-brain relationship 625
- computers and art 855, 856
- Computers and Automation* 469
- computers and publishing 952
- computers in business and industry
 427, 428, 640, 808
- railroads 847
- computing games (for children) 741
- computing in medicine and biology
 55, 85, 220, 745, 771
- See also* cybernetics;
 neurocomputing
- first application of an electronic
 computer in 504, 744
- first use of 77
- x-ray crystallography 489, 879
- Comrie, Leslie John 253–272, 276,
 361, 540–542, 606, 1071
- Scientific Computing Service.
See Scientific Computing Service
- conferences and symposia. *See*
 computer conferences and
 symposia
- Conservatoire national des arts et
 métiers
- exhibition of calculating
 machines and
 instruments 546
- Consolidated Engineering Corporation 547
- control theory 337
- Cooke, Conrad William 279
- Cooke, Josiah Parsons 138
- Cooke, William Fothergill
 partnership with Wheatstone 139
- Cooley, James W. 548
- Couffignal, Louis 526, 550, 551
 and calculating machines 280
 and the first French electronic
 digital computer 549
 design of 281
 system of machine classification
 282
- Coulson, John E. 552
- counting computers 914
- Courant, Richard 553
- Cowan, J. D. 1068
- Cramér, Carl Harald 554
- Crank, John 555
- Crawford, Perry O. 609
- Cronkite, Walter 1188
- Crowther, James Gerald 101
- cryptography 216
- CSIRAC computer 831
- CSIRO Mk. *See* CSIRAC computer

C-T-R. *See* Tabulating Machine Company
Cummins, E. T. 1142
Curtis, Charles Ralph 283, 284
cybernetics 433–436, 550, 565, 566, 628, 789, 973
and industrial management 454
and psychology 867
biocybernetics 1007
conferences on 736, 737
Macy Foundation 556–559
second-order cybernetics 825, 826
survey of 1010
Wiener on 991–993, 995, 996, 1005, 1006
Czechoslovakia
development of computing in 918

D

Dainelli, Dino 560
Dantzig, George 561
Davenport, Mrs. Edward
works from her library 55
Davidson, Lowrie 285
Davis, Harry M. 562
Davis, Martin 563
De Forest, Lee 203
De Latil, Pierre 565, 566
De Morgan, Augustus 4
Degawa, Yujiro 1361
Dering, George Edward 140
Desborough, Walter 286
DEUCE 933
Dickens, Charles
and Charles Babbage 66
Dickinson, Angie 1255
Dickinson, Henry Winram 10
Dickson, James F. 909
Diebold, John 567, 568
difference engines

Babbage's Difference Engine
no. 1 29–33, 226, 396
B. H. Babbage's account of 96
Baily's account of 34
Brewster's account of 47
Dodd's account of 69, 70
illustrations of 79, 84, 96
Knight's Cyclopaedia
account of 68
Lardner's account of 51
Moore's account of 92
Pirondi's account of 58
Saturday Magazine account of 59
Wilkes on 1056
Babbage's Difference Engine
no. 2 75, 107
Grant's difference engine 102, 309
Scheutz difference engines 102, 396
first tables printed by 77, 85
Scheutz Engine no. 1 73
Scheutz Engine no. 2 73, 75
Scheutz Engine no. 3 73
Wiberg's modification of 82
Williams's account of 86
Wiberg's difference engine 82, 98, 102
differential analyzers
Bratt's "Meccano" model 332
Bush differential analyzer 244
Rockefeller Differential Analyzer II 244, 429
torque amplifier 244
Hartree's "Meccano" model 244, 317
Ott differential analyzer 823
IPM-Ott differential analyzer (DGM) 974, 978
textbook on 555
Wiener's design for 989

Digital Equipment Corporation 569–571, 822
Dinneen, G. P. 572, 573
Dodd, George 69, 70
Dodson, James 4
Doorhamer, Itha 1188
Dorrance, A. C. 1239
Doss, M. P. 574
Dreyer, Hans Joachim 403, 404, 974, 975, 978
Droz, Edmond 529
Drucker, Peter F. 575
Dyck, Walther von 287
dynamic programming 455, 456
DYSEAC 943

E

Eckert Research International Corporation 1407
Eckert, John Presper 1132, 1161, 1181, 1243, 1245, 1246
advertising and promotional activities 1392, 1394
and Computer Consultants (International) Ltd. 1369
and *Honeywell v. Sperry Rand* 1106, 1368, 1380
and the ACM twentieth anniversary meeting 1345
and the EDVAC 1126
JPE's copy of von Neumann's *First Draft* 1106
and the ENIAC 1107
and the ENIAC patent 1105, 1304
ENIAC patent application 1131
and the IBM-Sperry Rand cross-licensing agreement 1220

and the National Computer Conference's Pioneer Day 1399
and the Smithsonian computer exhibition 1292, 1293, 1296, 1297, 1300
and the War Manpower Commission's Committee on Scientific Research 1103
biography 1411
computer memory systems 1183, 1218
“The Memory Lesson” 1212
CD-ROM data disk storage 1410
cryogenics 1257
fixed head magnetic disc files 1371
improvements to Rajchman memory switch 1258
magnetic memory 1203, 1207, 1208
mercury delay-line 1126, 1127, 1191
mirror memory 1351, 1355
oligatomic memory 1375
survey of 1199, 1287
thick-film plated wire memory 1278
thin film memory 1344
two plane memory 1233
curriculum vitae 1367
departure from Moore School 1120–1122
diplomas and certificates
Bachelor of Science 1095
Franklin Institute 1224
high school 1088
honorary doctorate 1312
IRE 1198
Master of Science 1100
Moore School 1265
New York Academy of Sciences 1271

Office of Scientific Research and Development 1104
Sigma Xi 1102, 1117
draft deferment 1125
Eckert-Mauchly Computer Corporation 1137
Electronic Control Company business plan 1116
eulogy for Mauchly 1396, 1397
honors and awards 1217
ACM plaque 1398
Automation Hall of Fame medal 1409
Committee of 100,000 Pennsylvanians award 1357
Emanuel R. Piore medal 1387
Harry Goode medal 1341
Howard N. Potts medal 1149
IEEE award 1322
John Scott medal 1263
Moore School Gallery of Distinguished Engineering Alumni 1391
Moore School medal 1405
National Medal of Science 1359
Philadelphia Award 1379
SAM Executive of the Year award 1383
William Penn Charter Alumni Society award 1408
identification badge 1294
integrated circuits 1363
interviews 1329–1331, 1386
inventions
automatic renewal of transfer web in “tesiprinting” 1325
character display 1332
computer cycling and control system 1336
digital computing system 1333
electrical connector 1317
electrostatic keyboard 1352
ENIAC 1303
flap socket 1314
four-stage storage-enhanced logic 1362, 1381
high-speed printer 1268
hydraulic printer hammer actuator 1307
imaging mechanism in 1326, 1327
information translating apparatus 1277
integrated circuit 1328
light-modulating apparatus 1091, 1096
list of patent disclosures 1346
list of patents 1338
low cost tape system 1311
magnetic trip switch 1348
mercury delay-line memory 1191
moving coil printer hammer actuator 1308
parametric electronic device 1340
signal translating device 1275, 1286, 1295, 1334
storage-enhanced logic 1356
thin film memory 1344
time-shared tone tracks 1350
letters to 1089, 1090, 1092–1094, 1103, 1105, 1127, 1129, 1290, 1292, 1298, 1299, 1301, 1361, 1384, 1389, 1390, 1402, 1406
magnetic field recorder 1097
Moore School ID card 1378
newspaper and magazine accounts 1219
on Bonn transistor patent 1339

- on checking circuits and diagnostic procedures 1195
- on computer trends 1269, 1274, 1323
- on improving UNIVAC market 1261, 1278, 1279, 1281, 1305, 1343
- on personal computers 1404
- on project planning 1321
- on Sperry UNIVAC's problems 1374, 1376
- on the development of computing in the Soviet Union 1282
- on the stored-program concept 1212, 1318–1320, 1382, 1400, 1407
- "Preliminary draft" 1283–1285, 1288, 1289
- 1944 memorandum on 1101, 1393
- on time-sharing 1302, 1310
- patent rights dispute 1120–1122, 1129
- photographs 1086, 1151, 1152, 1252, 1255, 1264, 1365, 1385, 1395
- security clearances
- National Security Agency
 - Scientific Advisory Panel 1205
 - Remington Rand vice-presidency 1209
- speeches and addresses 1203, 1210, 1212, 1223, 1243, 1245, 1246, 1256, 1272, 1309, 1323, 1337
- on automation 1324
- on computer trends 1280, 1342, 1366, 1370
- on computers in government and politics 1372
- on data processing 1335
- on integrated circuits 1358
- on navy communications requirements 1354
- on the development of computing in the Soviet Union 1276, 1280
- on the ENIAC 1364
- on UNIVAC-LARC 1225, 1226, 1273
- summary of achievements 1407
- Voice of America 1270
- supermarket checkout and inventory system 1316
- T.L. to von Neumann 1118
- video amplifier and trigger circuit 1099
- visit to Manchester University 1373
- works from his library 964, 1087–1097, 1099, 1100, 1102–1106, 1108–1125, 1127–1129, 1137, 1138, 1140–1142, 1146, 1148–1150, 1152, 1154–1156, 1159, 1161, 1170–1172, 1183, 1188, 1191, 1198, 1199, 1203, 1205, 1207–1210, 1212, 1215, 1217–1221, 1223–1225, 1232–1234, 1239, 1241–1244, 1246, 1248–1253, 1255–1259, 1261–1410
- X program 1262
- Eckert, Wallace J. 219, 576–581
- Eckert-Mauchly Computer Corporation 1137
- list of stockholders 1232
- photographs 1138
- Edmundson, H. P. 582
- EDSAC
- blueprints and flow charts 1020
 - coding on 795
 - demonstration at 1949
- Cambridge University conference 1019
- EDSAC 2
- programming for 1041
 - magnetic-tape auxiliary storage system 1037
- memory system 1017
- order code 1020
- prime-number program 796
- programming for 988
- modifications to 1036
- Wilkes's first paper on 1017
- EDVAC 756, 1126
- early reports on 1107
 - First Draft of a Report on the EDVAC* 954, 1106
- newspaper and magazine accounts 1128
- programming for 827
- Edwards, David B. G. 748, 1373
- Egli, Hans W. (firm of)
- MADAS calculating machine 288
 - Millionaire calculating machine 288–290, 311
- Eidgenössischen Technischen Hochschule 916, 1080
- ERMETH. *See* ERMETH
- Eisenstadt, Alfred 1255
- Electric Telegraph Company 120, 152
- electromagnetic telegraph. *See* telegraph: Morse telegraph
- Electronic Control Company. *See* Eckert: Electronic Control Company
- electronic digital computers. *See also* specific computers
- first European book on 1064
 - surveys 853, 854, 944, 945, 983–987, 1213
- Elliott Brothers
- 803 computer 583
- Elliott-Fisher Company 291, 311
- Ellis, T. O. 903
- Emde, Fritz 292

Engineering Research Associates 584
English, C. C. 1346, 1350
ENIAC 511, 649, 769, 924, 1364
 anniversary celebrations 1266,
 1377, 1395
 arithmetic operations 1107
 calculation of π and e 860
 calculations for Los Alamos
 hydrogen bomb project
 1119
 cartoons of 1115
 first account of the completed
 machine 1107
 first British article on 648
 first widely published
 description 633
 history of 1411
 list of "firsts" 1407
newspaper and magazine
 accounts
 New York Times 1111, 1306
 Penn Charter News 1124
 Philadelphia Evening
 Bulletin 1110
 Philadelphia Inquirer 1109,
 1113
 Philadelphia Record 1112
 Science News Letter 1114
patent 1105, 1303, 1304, 1306
 invalidation of patent 1380
 patent application 1131
 patent dispute 1349, 1411
photographs 1108
programming 1393
programming methods 1107
 Wilkes on 1015
Ercoli, Paolo 585–595
ERMETH 916
Error analysis
 Wilkinson on 1063
Error-correction codes 646
Estenfeld, H. 403, 404
Estrin, Gerald 440, 596
ETL-Mark 2 637, 921
ETL-Mark 3 921

Everett, Joseph David 141
Everett, Robert R. 615

F

FACOM 921
facsimile machines
 Bain's automatic electrochemical
 recording telegraph 115
 Carey's selenium camera 134
 Gray's telautograph 147
 Korn's telephotography device
 171

Fano, Robert M. 597
Farr, William 73, 91
 and the International Statistical
 Congress 81
 and the Scheutz Engine no. 3
 77, 85

fast Fourier transform algorithm
 (FFT) 548

feedback devices 337

Feigenbaum, Edward A. 598–600
Feldman, Julian 599, 601
Felt and Tarrant Manufacturing
 Company 294, 299
 Comptometer 293, 295–298,
 300, 311

Felt, Dorr Eugene 293

Ferranti. *See also* Manchester
 University computers
 Atlas 604
 FERUT 440
 FINAC 560, 585, 674
 Greek series 603
 Mark I 602, 838, 1067
 at the University of Toronto
 440
 inauguration of 774
 Turing's programming
 system for 937

MUSE. *See* Atlas

FERUT. *See* Ferranti: FERUT

Fetter, William A. 605
Field, Cyrus West 142
FINAC. *See* Ferranti: FINAC
Finley, William H. 1260
Fitton, William Henry 52
Fletcher, Alan 606, 607
flight simulators 642
Flow-matic 662, 1227, 1238
Foerster, Heinz von 608
Fonblanque, Albany 57
Forde, Henry Charles 143
FORMAC 872
Forrester, Jay W. 609–624, 1345
FORTRAN 446, 447, 721
France
 development of computing in
 280–282, 397, 509, 510,
 526, 527, 549, 852, 908

Franklin Institute 1224
 Howard N. Potts medal 1149

Freiberger, Walter F. 625
Friedman, William F. 1205
Frizzell, Clarence E. 626
FUJIC 921
Fullam, James R. 1373
Fuller, John Emory 302

G

Gabor, Dennis 627, 628
Galle, Andreas Wilhelm Gottfried
 303

game theory 953
GAMM-NTG-Fachtagung 979
Gardner, Martin 629
Garlick, G. F. J. 731
Garratt, G. R. M. 203
Gaskell, Dan'l
 works from his library 55

Gassiot, John Peter 144
Gelernter, Herman 630
German Center for Aviation Research
 661, 840, 841, 974, 975

Germany
development of computing in 287, 352, 362, 376, 379, 398–401, 876, 979, 1077, 1078, 1083, 1085
Nazi documents 661, 840, 841, 974–978
Gershgorin, S. 304
Gilbert, Davies 38
Babbage's epigram on 72
Gilbreth, Lillian Moller 631
Gilchrist, Bruce 632
Gill, Stanley 617, 622, 1030, 1031, 1036
Gillon, Paul N. 1119, 1120
photograph 1108
Giser, Harold W. 1206
Githens, Perry 1123
Glaisher, James 71
Glaisher, James Whitbread Lee 305
Glass, Richard Atwood 145
Glicksberg, I. 456
Gödel, Kurt 306–308
Goldberg, H. 1260
Goldsmid, Frederic John 146
Goldstine, Adele 633
Goldstine, Herman H. 633, 634, 957–959, 961, 964, 968, 970, 1107, 1132, 1283, 1345
photograph 1108
Good, Irving John 635
Gorn, Saul 636
Goto, Mochinori 637
Grant, George Barnard 309, 310
Gray, Elisha 117, 142, 147, 148
Great Central Railway 311, 392
Great Eastern (H.M.S.) 111, 132, 142, 189
Green, Bert F. 639
Greenberger, Martin 640
Greenwald, Sidney 641
Griffiths, J. H. E. 312
Grillet, René
calculating machine 6
Grimes, David 1093

Grimme, Natalis and Company
Brunsviga calculating machines 257, 263, 267, 271, 311, 313–315
Grimston, Robert 152
Gross, O. A. 456
Gruen Applied Science Laboratories 642
Gruenberger, Fred 643, 644
Guthrie, Frederick 153

H

Hagley Museum 1403
Hale, Victor
works from his library 602, 603, 714, 716, 721–725, 727, 730–732, 813, 1020, 1036, 1041
Hall, William D. 1303
Hamilton, Eugene L. 771
Hammer, Carl 1399
Hammersley, John M. 645
Hamming, Richard Wesley 646
Hancock, Walter 154
Harcourt, William Vernon 39
harmonic analyzers 803
of Thomson 382, 383
Harr, Luther A. 1148
Harrison, George Russell 647
Harrison, Lawrence F. 1249, 1333
Hartley, Ralph Vinton Lyon 316
Hartree, Douglas R. 317, 648–655
Harvard Mark series
Mark I 217, 411, 412, 415, 542, 769
first published mathematical tables 410
photographs 422
Mark II 416
Mark III 417, 418, 420
Mark IV 420
photographs 422

Harvard University Computation Laboratory 411, 413–417, 419–421
Haueter, R. C. 641
Haupt, Ralph F. 577
Hayes, Jean E. 656
Heath, Leopold 155
Heims, Steve J. 657
Hele-Shaw, Henry Selby 318
Hellman, Ida Levin 771
Henderson, James 319
Henley, William Thomas 156
Henry, Arnold K. 1089
Herschel, John 17, 20, 26, 27, 35, 63
Hershey, Harry 1205
Hertz, Heinrich Rudolf 157, 158
Herwald, S. W. 658
Herzfeld, Val E. 1260
Hilbert, David
and arithmetic axioms 320
Entscheidungsproblem 250, 321
Hildyard, Vida Grace. 1260
Hiller, Lejaren A. 659, 660
Hollerith tabulating machines. *See* Tabulating Machine Company
Hollerith, Herman 373
Hooper, William 159, 160
Hoppe, W. 661
Hopper, Grace Murray 439, 441, 666, 1345, 1369
and the Harvard Mark I 410, 412, 415
manual of operation 411
and the Harvard Mark II 416
on Flow-matic and COBOL 1260
on programming 664
automatic programming 665, 667, 668, 950
compiling routines 662, 663
Horsburgh, Ellice Martin 322–324
Hoskiaer, Otto Valdemar 161
Householder, Alston S. 669
Hovland, Carl I. 670

Huffman, David 839
Hughes, David Edward
automatic printing telegraph 162
experiments on wireless
telegraphy 163
Hulls, Leonard R. 1340
Hun, John Gale 325
Hunt, Earl B. 670
Hunt, Robert 164
Huskey, Harry D. 552, 671, 672, 933
Hyman, Anthony 103, 104, 673

IBM 375, 378, 683–685, 689, 690, 693,
711, 719, 726, 729
See also Tabulating Machine
Company.
650 computer 714
and the ADES
programming
system 948
RAMAC 716
701 computer 626, 710
arithmetic element 871
system design 508
702 computer 713
See also Tabulating Machine
Company.
1620 computer 721–725
in pattern-recognition
experiment 742
1720 computer 730
7070 computer 727
7074 computer 727
and the Harvard Mark I 411
Automatic Sequence-Controlled
Calculator. *See* Harvard
Mark Series: Mark I
cross-licensing agreement with
Sperry Rand 1220
Deutsche Hollerith Maschinen
Gesellschaft
(Dehomag) 373, 376,
379

naval ordnance research
calculator 581
origins 373
pluggable sequence relay
calculator 579
promotional materials 718
punched cards 379, 691
punched-card tabulators 682,
705, 715, 728
519 document-originating
machine 720
accounting machine type
402–403 695
accounting machine
type 405 696,
697
alphabetic accounting
machine type 405
678
alphabetical duplicating
punch type 031
680
alphabetical verifier type 55
687
automatic summary
punches 679
calculating punch type 607
712
card punch type 24 703,
706
card punch type 26 703,
706
card verifier type 56 699,
700, 708
card-controlled tape punch
type 63 688
card-sorting machine types
82–80–75 694
collator type 077 677
collator type 89 704
electric accounting machine
type 205 681
electronic statistical
machine type 101
701, 702
form feed devices 707

model A1 card-programmed
electronic
calculator 709
port-a-punch 717
printing card punch type 26
692
reproducing punches types
513 and 514 698
tape-controlled card punch
types 43 and 44
686
rally song 377
selective sequence electronic
calculator 580
Stretch computer 507, 949
data handling system 507
program interruption
system 506
System/360 732
ICCE relay computer 929
Inaudi, Jacques 326
information and communications
theory 316, 343, 363, 597,
627, 789, 888, 890–892, 894,
898, 901, 1069
and semantics 523
application to gambling and
weather forecasting 889
channels with side information
896, 897
coding theory for noisy channels
895
conferences on 530
first British symposium 922, 923
first symposium on 920
in biology 1072
Shannon's noisy-coding channel
theorem 1068
two-way communication
channels 899
use of feedback 875
Wiener-Shannon theory of
communication 880,
881, 883
information revolution 575

Institut für Praktische Mathematik,
Technische Hochschule,
Darmstadt 398, 400, 974,
975, 977, 1084
works from the library of 447,
526, 539, 545, 564, 636,
734, 764, 774, 847, 876,
916, 921, 1079–1081

Institute for Advanced Study
IAS computer 596, 956, 961, 963
shifting register blueprints
960

Institute of Electrical and Electronics
Engineers 1322, 1387

Institute of Radio Engineers 675, 1198
first joint AIEE-IRE-ACM
conferences 740

Los Angeles Professional Group
on Electronic
Computers 842

Institution of Electrical Engineers
676
integrated circuits 1363
interactive computing 768
International Computation Centre
733

International Computers 604

International Computers and
Tabulators 604

International Congress on
Cybernetics 736, 737

International Federation of
Automatic Control 738, 739

Internet 750–754, 772
invention of term 528

Isaacson, Leonard M. 659

Istituto Nazionale per le Applicazioni
del Calcolo (INAC) 560,
674

Italy
development of computing in
488, 539, 560, 585–595,
674, 733

J

Jackson, Vincent E. 327

Jacobi, Moritz Hermann von 165

Jacquard, Joseph Marie
Jacquard loom 221, 328, 355
portrait 329

Japan
development of computing in
539, 637, 921

Jeffreys, Julius
Babbage's letter to 74

Jeffreys, Sir Harold 606

Jenkin, Henry Charles Fleeming 166,
167

Jensen, Robert A. 467, 471

Jerison, David 1012

Jeu fin de siècle (print) 168

Jevons, William Stanley 150, 330

Johnson, Lyndon Baines 1359

Johnston, Denis L. 439

Jones, Alexander 169

Jones, Rebecca 581

JR ou ordinateur (children's game) 741

K

Kabrisky, Matthew 742

Kahn, Robert E. 528

Kailath, T. 875

Kármán, Theodore von
works from his library 282, 304,
352, 488, 551, 560, 578,
580, 585–595, 628, 642,
674, 733, 755, 757, 758,
761, 843, 852, 907, 975–
977

Kay, Martin 743

Kelvin, Lord. *See* Thomson, William,
first Baron Kelvin

Kendrew, John 744–746

Kennedy, T. R. 1111

Kilburn, Tom 747, 748, 775, 1020,
1066, 1067

King, Augusta Ada, *Countess of
Lovelace* 62, 106

A.N.s. to Fonblanque 57
translation of Menabrea's
account of the
Analytical Engine 61

Kingsbury, John E. 170

Kister, J. 749

Klass, Philip J. 658

Kleinrock, Leonard 750–754

Knott, Cargill Gilston 331

Koff, Jack 468

Koga, Toyoki 755

Koons, Florence 756

Kormes, Mark 757, 758

Korn, Arthur 171

Korn, Granino A. 759

Korn, Theresa M. 759

Korselt, Alwin 333–335

Kosten, L. 1020

Kratzenstein, Christian Gottlieb
copy of Leibnitz machine 5

Krick, Irving P. 760, 761

Kuno, Susumu 762

Kurzweil, Raymond 763

Kusters, N. L. 823

L

Laboratory for Electronics 764

Laden, H. N. 1260

Lamb, Sydney M. 765

lambda-calculus 250

Laming, Richard 172

Landahl, Herbert D. 669, 785

Lardner, Dionysius 51

Larivee, Jules A. 915

Larson, Earl R. 1380

Lasker, Edward 766

- Latin America
development of computing in 876
- Laughery, Kenneth 639
- Le Sage, George-Louis 5
- Lee, Francis F. 1247, 1248
- Leibnitz, Gottfried Wilhelm
calculating machine 6
Kratzenstein's copy 5
- Lennard-Jones, John E. 332
- Letort, Pierre 509, 510
- Lettvin, Jerome Y. 790
- Leupold, Jacob
calculating machine 6
- Leutert, W. W. 1260
- Leviathan*. *See* Great Eastern
- Levy, David N. L. 656
- Lewis, Wilfrid Bennett 767
- Licklider, Joseph C. R. 552, 768
- lightning calculators 120, 252, 326
- Lilley, S. 769
- Lincoln Laboratory
CG24 computer 573
- linear programming 561
- Little, Arthur D., Inc. 770
- Llull, Ramon
logic machine 7
- Locke, William N. 497
- Lockhart, Brooks J. 411
- logarithms 301
Babbage's tables of 50
Introduction into Italy 3
Napier / Briggs version 2
- logic machines 629
of Jevons 330
of Llull 7
of Smee 366, 367
- Lohr, Lenox R. 203
- Lonsdale, K. 838
- Losey, Michael R. 1406
- Love, Albert Gallatin 771
- Lovelace, Ada. *See* King, Augusta
Ada, *Countess of Lovelace*
- Löwenheim, Leopold 333–335
- Lubar, Steven 772
- Lubkin, Samuel 756
- Ludgate, Percy 322, 323
- Lukoff, Herman 1247, 1248, 1336, 1389
autobiography 773
photograph 1152
- Lyndon, Roger C. 1077
- M**
- machine translation of languages 451, 452, 492, 498, 762, 765, 859, 982
conferences on 582, 811, 812
first book on 497
Yamato computer 925
- MacInnes, Charles Ranald 325
- MacKay, Donald M. 787
- Mallock, R. R. M.
Mallock analog calculator 1014
- Manchester University computers
774
Ferranti Mark I. *See* Ferranti:
Mark I
Manchester "Baby" 747, 819
Mark I 747, 748
MU5 1373, 1374
- Mandelbrot, Benoit 839
- Mann, Carolyn 1289, 1313
- Mann, Margaret F. 620
- Marchant Calculating Machine
Company 336
- Marconi, Guglielmo 174
- Marguin, Jean 776
- Massachusetts Institute of
Technology
Lincoln TX-2 computer 822
Whirlwind. *See* Whirlwind
- mathematical instruments 287, 303,
322, 323, 407, 793
classification of 346–348
- mathematical logic 223, 224, 251, 306,
308, 563, 926
- Entscheidungsproblem* 250, 307,
321, 356, 394
- Löwenheim-Skolem theorem
335, 365
- Quine-McCluskey method 845
- unification algorithm 865
- mathematical tables 261, 522
bibliographies of 305, 319, 606
computer-generated 410, 415
construction using mechanical
calculators 258, 260,
264
- construction using punched-
card tabulators 577
- journals on 777
- of Babbage 50, 76
- of Briggs 2
- of Cavalieri 3
- of Comrie 276
- of de Prony 301
- of Dodson 4
- of Wilkes 1035, 1038
- Mathematical Tables and Other Aids
to Computation (MTAC)*
777
- Mathematics of Computation*. *See*
*Mathematical Tables and
Other Aids to Computation*
- Matthiesen, Augustus 175, 176
- Mauchly, John W. 1107, 1116, 1132,
1161, 1297, 1345, 1357, 1390,
1401, 1402
1942 electronic calculator
memorandum 1098
and the ENIAC patent 1303
ENIAC patent application
1131
- and the Smithsonian computer
exhibition 1298
- biography 1411
- Eckert's eulogy 1396, 1397
- honors and awards
Howard N. Potts medal 1149
John Scott medal 1264
- on programming 664

on the stored-program concept 1136
patent rights dispute 1129
photographs 1152, 1255, 1365, 1385

Mauchly, Kathleen 1129, 1401, 1402

Maverick, Augustus 127

Maxwell, James Clerk 337, 369

McCarthy, John 778–782, 893

McCartney, Scott 1411

McClelland, George W. 1105

McCracken, Daniel D. 783

McCulloch, Warren S. 439, 784–791

McCullough, John M. 1146

McDonald, I. T. 1205

McGill, Don. 1260

McGovern, Patrick 469

McKay, William 1229

McNamara, F. J. 1242

McNamara, Francis J. 1209

McPherson, J. L. 1182

McTiernan, C. E. 1285, 1304

mechanical calculating machines 222, 283, 284, 286, 322–324, 327, 350, 351, 369, 393, 396, 453, 574, 793

See also specific machines or manufacturers.

and computation of statistics 833

classification of 346–348

first binary-based mechanical calculator 397

Grant's arithmetical calculator 310

histories of 776

post-1800. *See specific machines or manufacturers*

pre-1800 5, 6, 9, 13, 15, 505

scientific applications 253, 256, 271, 541, 803

as difference engines 257, 263, 265, 267, 268, 270

Meisling, Torben H. 792

memory caching 1047

memory. *See computer memory systems*

Menabrea, Luigi Federico 60, 61

Merbitz, Johann Valentin 8

Merrifield, C. W. 90

Merrill, George A. 338

Merzbach, Uta C. 102

Metropolis, Nicholas 860

Meyer zur Capellen, Walther 793

microprogramming 1028, 1033

Miehle, William. 794

Miles, William 169

Miller, Jeffrey Charles Percy 606, 607, 795, 796

works from his library 777

Minsky, Marvin 797, 798

Mitchell, Herbert F. 1181, 1260

Moigno, François Napoléon Marie 177

Moir, Ronald E. 1260

molecular electronics 658

Moll, Gerard 40

Monroe Calculating Machine Company 313

Monte Carlo method 645, 915

first symposium on 942

Montgomery, Deane 955

Moore School 634, 1266, 1391, 1405

computer museum 1388

Moore School lectures 799, 800

works from the library of 693

Moore, Edward F. 886

Moore, John Carrick 92

Morgan automatic computer 981

Morgan, Bryan 801

Morland, Samuel

biography 10

calculating machines 9

Morris, Don 1112

Morse, Samuel F. B. 178, 208, 396

biography 181

Morton, K. W. 645

Moseley, Maboth 100

Muldivo Calculating Machine Company 339–342

Muldivo calculating machine 311

Mullendore, Ralph E. 1143, 1145

works from his library 1130, 1134, 1135, 1139, 1144, 1147, 1153, 1157, 1158, 1160, 1162–1169, 1173–1179, 1184–1187, 1192–1197, 1200–1202, 1206, 1211, 1222

Multhauf, Robert P. 1292, 1293, 1296, 1299, 1300

Murphy, John S. 802

Murray, Francis Joseph 803, 804, 968

Mutch, Eric 1020, 1036

N

Nagel, Ernst

works from his library 1069, 1070

Nanus, Burt. 1260

Napier tercentenary celebration 322, 323, 331

Napier, John 2, 12, 322, 323

invention of logarithms 11

promptuary 11

Napier's bones. *See Napier's rods*

Napier's rods 11, 15, 59, 227

National Accounting Machines 267, 270

National Bureau of Standards 424

and UNIVAC I 1165

computers. *See specific computers*

symposium on Monte Carlo method 942

National Cash Register Company

mechanical calculating machines 805, 806

National Physical Laboratory 807–811

ACE computer. *See ACE*

National Symposium on Machine Translation 812

Naur, Peter 813

nervous system
mathematical theories of 669,
909
as a two-valued digital
system 625
neurocomputing 786, 787, 790, 791
neuron nets 785, 798
as Turing machines 784, 788
perceptron 824, 870
Newell, Allen 814–817, 903, 905
Newman, Maxwell H. A. 818–820
Niagara (U.S.S.) 142
Nilsson, Nils J. 821
nomography 344, 345
non-numerical computation 874
Norman, Haskell F. 2, 11, 158
NTL Parametron computer 921
numeric weather forecasting 632, 760,
761, 928
invention of 862
numerical analysis 553, 654, 655, 915,
977
von Neumann on 955, 957, 958,
970
Wilkes on 1048
Nyquist, Harry 343

O

Ocagne, Philibert Maurice d' 344–
350
Odhner, Willgott Theophil
variable-toothed cylinder 313
Office of Naval Research
1953 survey of digital computers
944, 945
Office of Scientific Research and
Development
works from the library of 1107
Olsen, Kenneth H. 822
optical telegraphy
Chappe's telegraph 135, 136
Edelcrantz's telegraph 135

Osaka University electronic computer
921
Ott, A. 352, 823

P

Packet switching 750–754
Page, Charles Grafton 179
Palmer, Aaron 353
Panagos, Peter 960
Papert, Seymour 824
Papian, William N. 620
Parametron PD-16 921
Parker, E. 636
Parr, G. 203
Pascal, Blaise
calculating machine 13, 59
Pascal's triangle 13
Pask, Gordon 825, 826
pattern recognition 572, 742, 877, 1353
Patterson, George W. 827–829
Pauling, Linus 879, 1087
Paynter, Henry M. 830
Peacock, George 17, 20, 26
Pearcey, Trevor 831, 832
Pease, Katharine 833
Pender, Harold 1094, 1121, 1122
Perry, James W. 524
Peterson, H. Philip 1009
Pfaff, Heinrich Wilhelm
Pfaff's calculating wheel 354
Phillips, Arthur H. 834
Phillips, Arturo Aldunate 837
Phillips, C. A. 1260
Phillips, James P. 423
Phillips, Mary W. 1301
Phister, Montgomery 835
Pierce, John Robinson 836
Pignoria, Lorenzo 14
Pirondi, Sirus 58
Pitts, Walter 784, 785, 790

Poleni, Giovanni
calculating machine 6
Pollard, B. W. 748, 838
Polytechnic Institute of New York 839
Porter, Arthur 317
Pösch, H. 840, 841
Posselt, Emanuel Anthony 355
Post, Emil Leon 356
Powers Accounting Machine
Company 360
punched-card tabulators 262,
269, 357
Powers, James 357
Powers-SAMAS Accounting
Machines 357–359
Prager, William 625
Preece, William Henry 180
Prime, Samuel Irenaeus 181
programs, programming. *See*
computer programming
Provisional Computation Centre 843
punched-card tabulators 283, 284,
286, 351, 524, 525, 574
*See also specific machines or
manufacturers*
Hollerith's invention of 373
scientific applications 218–220,
541, 576, 578, 683–685,
689, 690, 693, 757, 758,
803
as difference engines 262
calculation of moon tables
259, 266
in crystal structure analysis
879
United States Army's use of 771
Pylyshyn, Zenon W. 844

Q

Quetelet, Lambert Adolphe Jacques
182
Quine, Willard Van Orman 845

R

- Rademacher, Hans A. 799, 846
works from his library 414
- radio. *See* wireless telegraphy
- Railway Systems and Procedures Association 847
- Rajchman, Jan A. 421, 848, 849
- Rand, James Henry, Jr. 360
- Rand, Paul 718
- Randell, Brian 850, 851
- Rathbone, Robert R. 620
- Raymond, François Henri 852
- Rechnitzer, Alexander 288
- Rees, Mina 853, 854
- Reichardt, Jasia 855–858
- Reifler, Erwin 859
- Reis, Johann Philipp 160
- Reitwiesner, George W. 860
works from his library 441–443,
446, 486, 572, 598, 601,
635, 639, 670, 740, 778,
780, 797, 814, 864, 877,
903, 906, 950–952, 957,
1226, 1245, 1247
- Remington Rand 360
See also Sperry Rand
acquisition of Eckert-Mauchly Control Corporation 1154–1156
electrified bookkeeping machine 360
merger with Sperry 1216
- Renwick, William 861, 1017, 1023,
1025, 1026
- reproduction methods 574
- residue class system 919
- Reuter, [Paul] Julius, *Baron* 183
- Ricardo, John Lewis 184
- Rice, David E. 952
- Richardson, Lewis Fry 862
- Ridenour, Louis N. 863, 864
- Riemann zeta-function 938
- Riguet, J. 436

- Rijke, Pieter Leonhard, *Baron* 185
- Robbins, Herbert E. 298, 299
- Robinson, J. A. 865
- Robinson, Thomas Romney 186
- robots 437, 535, 537, 837, 857, 858, 866,
973
introduction of term 249
- Rochester, Nathaniel 532
- Rockefeller, Nelson A. 1385
- Rodriguez, Hernan 867
- Ronalds, Francis 187, 188
- Rosen, Saul 868
- Rosenberg, Jerry M. 869
- Rosenblatt, Frank 870
- Rosenblith, Walter A. 625
- Rosenhead, Louis 606, 607
- Ross, Harold D. 871
- Ross, Ralph H. 1092
- round-off errors 846, 957
- Royal Society 1, 29, 38, 65
- Royal Statistical Society
works from the library of 929
- Russell, William Howard 189
- Rutishauser, Heinz 1080, 1081

S

- Sabileny, H. 361
- Sabine, Robert 190
- Sacerdoti, Giorgio 585
- Sahl, Mort 1255
- Sammet, Jean E. 872, 873
- Samuel, Arthur Lee 874
- Sasse, J. E. 1260
- Saward, George 191
- Saxenian, Hrand 612
- Scattergood, Alfred G. 1090
- Schalwijk, J. P. M. 875
- Schaw, H. 192
- Scheutz difference engines. *See* difference engines
- Scheutz, Edvard 73, 97
- Scheutz, Georg 73, 97, 102
- Schickard, Wilhelm
calculating machine 13
- Schmitt, William F. 1240, 1243, 1245,
1246, 1249, 1333, 1336
- Schoeller, V. Donald. 1260
- Schomaker, Verner 879
- Schott, Gaspard
calculating machine 6, 15
- Schreyer, Helmut T. 876
model electronic computer 362
- Schultz, Claire K. 1260
- Scientific Computing Service 247,
253, 273–275, 277, 278
- Scott, Norman R. 950
- Scudamore, Frank Ives 150, 193, 194
- SEAC 424, 641, 943
coding on 795
- Selfridge, Oliver 572, 798, 877, 878
- Selwyn, Th. 195
- Shafer, Raymond P. 1357
- Shaffer, Philip A., Jr. 879
- Shaffner, Taliaferro Preston 196
- Shannon, Claude E. 363, 364, 890,
894, 898
biography 900
collected papers 901
information theory seminars 888,
889, 891, 892
on automata theory 885, 893
on channels with side
information 896, 897
on coding theory for noisy
channels 895
on computer chess 882, 884
on game-playing machines 887
on machine reliability 888
on switching circuit design 886
on two-way communication
channels 899
separate memory formula 883
Wiener-Shannon theory of
communication 880,
881
- Sharpless, Thomas Kite 902, 1127
- Shaw, John Clifford 816, 817, 903

Sheepshanks, Richard
and Charles Babbage 64, 80

Shockley, William 904

Siemens and Halske 156, 197

Siemens Brothers 197

Siemens, Charles William 197, 198

Siemens, Ernst Werner 197

Simon, Herbert A. 625, 815–817, 903,
905, 906

simplex method 561

Simpson, Thomas 16

Sims, John C. 1218, 1268

Sinden, Frank W. 1084

Skolem, Thoralf 306, 365

Slater, Robert E. 1260

slave memory. *See* memory caching

slide adders 246, 380

slide rules 302
Cooper slide rule 370, 371
first American circular slide rule
353

Fuller spiral slide rule 370, 372

Thacher cylindrical calculator
381

Smee, Alfred 366, 367
biography 368

Sminger, I. M. 1012

Smith, Josiah E. 907

Smith, Pamela 1373

Smith, William D. 1377

Smith, Willoughby 134, 199

Société d'Électronique et
d'Automatisme (SEA)
OME series 852, 908

Society for Advancement of
Management 1383

Sokoloff, Boris Alexandre 908

South Kensington Museum 369

Southern California Cooperative
Wind Tunnel 907

Soviet Union
development of computing in
1221, 1276, 1280, 1282

Spandorfer, L. M. 1247, 1248

Speiser, Ambros 1079, 1080

Spencer, John C. 178

Sperry Rand 360, 1216
See also Remington Rand
cross-licensing agreement with
IBM 1220
donation of UNIVAC records to
Hagley Museum 1403
Honeywell v. Sperry Rand 1368,
1380

Sprye, Richard 200

Stark, Lawrence 875, 880, 909
works from his library 887–889,
891, 892, 894–899, 909,
954

statistical methods 820
Monte Carlo method. *See* Monte
Carlo method
of Bayes 1
of Cramér 554
of Simpson 16

statistical tables 77, 85

Steiger, Otto 288

Stein, P. 749

Stephenson, [Rowland] Macdonald
202

Stephenson, Robert 201

Stern, Nancy 1386, 1400

Stewart, Patrick 213

Stibitz, George Robert 910–915

Stiefel, Eduard 1080, 1082

Stock, John Robert 916

stored-program computers. *See also*
specific computers
first generally available account
of 652

stored-program concept
Eckert on. *See* Eckert, John
Presper: on the stored-
program concept
effect on logical design and
programming 1136
first stored-program machine
747

von Neumann on 954, 959

Wilkes's account of 1060

Strachey, Christopher 917

Straus, Ernst 306

Stringer, J. B. 1033

Strong, Peter Fallis 420

Stroock, Daniel W. 1012

Strull, Gene 658

submarine telegraphy 111, 145, 146,
156, 190
Atlantic cable. *See* Atlantic cable
British government inquiry 151
submarine cables 167, 192
first undersea cable 126

Sullivan, Robert C. 1315

Svoboda, Antonin 421, 918, 919

SWAC 424, 671, 672

Swade, Doron 107, 108

Swain, Francis E. 615

Sweeney, Harold 1188

switching theory 421, 829

Switzerland
development of computing in
1079–1082, 1084

Symposium on communication
research 920

Symposium on information theory
922, 923

Symposium on information theory in
biology 1072

T

Tabor, Lewis P. 924

Tabulating Machine Company 373
See also IBM
British Tabulating Machine
Company 373, 374
Hollerith tabulating machines
259, 262, 266, 269, 272

TAC 921

Tadenuma, R. 925

Takahashi, S. 925

Tarski, Alfred 926

Tasco 380

Taube, Mortimer 927
TCP/IP cross-network protocol 528
teaching machines 552
Technische Hochschule, Darmstadt 398
See also Institut für Praktische Mathematik,
Technische Hochschule,
Darmstadt
Telecommunications
bibliographies 188, 211
telegraph 118, 190
See also optical telegraphy;
submarine telegraphy;
wireless telegraphy
bibliographies 188, 211
British telegraph
invention of 139
nationalization of 149, 150,
193
histories 169, 204, 208
illustrations of 168
in news distribution 169, 183
Morse telegraph 208, 396
invention of 178
Ronalds telegraph 187
Wheatstone-Cooke telegraph 139, 213
telegraph codes
Chappe's 136
Jones's 169
Morse's 178, 208, 396
telephone 119, 173
Bell's 116
patent infringement suits 117
Gray's 117, 147
histories 170
illustrations of 168
Reis's 160
telephotography. *See* facsimile machines
television 134, 203
Tennent, James Emerson 66, 72

Ternant, A. L. 204
Thacher, Edwin 381
theory of multistage decision processes. *See* dynamic programming
Thoman, Helene Valeska 420
Thomas Arithmometer 406
Thomas de Colmar, Charles Xavier 406
Thomas J. Watson Astronomical Computing Bureau 576
Thomas, Walter S. 1352
Thompson, Philip D. 928
Thomson, James 382
Thomson, William, *first Baron Kelvin* 112, 113, 138, 142, 206, 382–384
and the Atlantic Telegraph Company 205
mirror galvanometer 151
plan for differential analyzer 244
Thorenson, R. 672
tide predictors 384
Timbs, John 79
time-sharing computer systems 640, 754, 768, 1051, 1302
Tocher, Keith D. 929, 930
Tokyo University Parametron computer 921
Tomash, Erwin 584
Tompkins, Charles Brown 584
Tompkins, H. E. 829
Tonik, Albert B. 1240, 1243, 1245, 1246, 1250
Toole, Betty A. 106
Toothill, G. C. 748
Torok, E. J. 1347
Torres y Quevedo, Gonzalo 931, 932
Torres y Quevedo, Leonardo 349, 931
analog equation-solver 932
arithmometer 387
chess-playing machine 386, 932
on analog calculating methods 385
Telekino 932
transistors 450
first book on transistor electronics 904
in computers 863
in digital computers 822
Triumphator Calculating Machine Company 388–392
Triumphator calculating machine 311
troncets. *See* slide adders
Tropp, Henry 1345
Tukey, John W. 548
Turck, J. A. V. 393
Turing machine 394, 563
introduction of term 251
Turing test. *See* artificial intelligence: Turing test
Turing, Alan Mathison 504, 936, 940, 941
and the ACE 933
as a computer programmer 934, 935, 937
on computable numbers 394, 395
on Riemann zeta-function calculation 938
on solvable and unsolvable problems 939
Tyndall, John 207

U

Ulam, Stanislaw 749
and the Monte Carlo method 942
UNESCO 734, 735, 843
Unisys 228, 360, 1406
See also Remington Rand; Sperry Rand
United States Census Bureau
and UNIVAC I 1165, 1166, 1169, 1177
UNIVAC I training course 1173, 1174

- United States Naval Ordnance
Laboratory 948
- United States Patent Office 1096,
1191, 1268, 1275, 1277, 1286,
1295, 1333, 1334, 1336, 1340,
1344, 1381
- UNIVAC
development from 1951 to 1967
1360
File Computer 1237
Flow-matic. *See* Flow-matic
Generalized Programming 1228
motion picture 1253
Office of the Chief of Naval
Operations seminar
1260
photographs 1152, 1255
Scientific Systems 1215
Unicode automatic coding 1235
Unityper 1234
UNIVAC 1100/60 1392, 1394
UNIVAC I 1187, 1215
A-2 compiler 1214
acceptance testing 1165, 1166
advertising and
promotional
materials 1133, 1141,
1158
and the 1952 presidential
election 1188
C-1 instruction code 1130
C-6 instruction code 1134
C-7 instruction code 1135
C-10 instruction code 1153,
1157
Census Bureau training
course 1173
data automation system
1236
dedication 1170, 1171
diagrams, plans and charts
1162, 1164, 1167
algebraic adder 1168
function table signals
1159
- outline block diagrams
1163
evaluations 1181, 1182
Flow-matic programming
1238
job descriptions 1177
magnetic tape reel 1172
maintenance conference
1206
matrix math compiler 1229
misidentified as Soviet
computer 1221
newspaper and magazine
accounts 1161
operations and maintenance
manuals 1175, 1176,
1178–1180, 1184,
1192, 1194, 1196,
1197, 1200–1202,
1211, 1216
parts 1185, 1186, 1222
photographs 1188
program flow charts 1193,
1194
programming 1174
programming manuals 1190
Short Code 1189
supervisory control
operations 1160
textbooks 1204
UNIVAC II 1230, 1231
Flow-matic programming
1238
Tape Read and Write
Library 1254
UNIVAC Scientific 1103-A 1235
UNIVAC-LARC 1225, 1226,
1240, 1243–1246, 1251,
1259, 1260, 1273
hardware design 1247, 1248
logical design 1249
photographs 1252
programming features 1250
universal computing machine. *See*
Turing machine
- University of California
Berkeley
and UNIVAC-LARC 1259
Computer Project 792
Los Alamos Scientific
Laboratory 949
- University of Michigan
College of Engineering
courses on digital
computers 950, 951
- University of Pennsylvania.
Moore School. *See* Moore School
- V
- Vacca, Roberto 585, 587, 588, 591
vacuum-tube counters 312, 767
Vail, Alfred 178, 208
Valtat, Raymond 397
Van Dam, Andries 952
Van Vleck, John H. 421
Vanselow, Albert C. 1260
Verea, Ramón 288
Vigneron, H. 386, 387
Vincent, Julien 209
Von Neumann architecture 959, 960
Von Neumann, John 429, 657, 860,
956, 960–963, 1118, 1283
and game theory 953
collected works 969
festschrift 967
J. P. Eckert's copy of the *First
Draft* 1106
on automata theory 965, 966,
971, 972
on numerical analysis 955, 957,
958, 970
on the Jacobi method for real
symmetric matrices 968
on the stored-program concept
954, 959, 964

W

W. F. Stanley and Company 370–372
Wada, H. 925
Wahl Adding Machine 311
Wainwright, Lawrence 475
Walden, W. 749
Walker, Charles Vincent 164, 179, 182, 210
Wall, P. D. 790
Walter, William Grey 973
Walther, Alwin 398–404, 975, 977, 979
and the IPM-Ott differential analyzer (DGM) 974, 978
on rocketry-related mathematical problems 976
works from his library 526, 734, 876, 921
Wambaugh, Eugene 405
Wang, An 439, 980
Warren, Don W. 514
Warren, Thomas T. P. Bruce 406
Watanabe, S. 925
Watson Scientific Computing Laboratory 578
Watson, Arthur Francis 981
Watson, Thomas J. 373
Watson-Watt, Robert
works from his library 881
weather forecasting by computer. *See* numeric weather forecasting
Weaver, Henry 210
Weaver, Warren 881, 982
Weaver, William Dixon 211
Weik, Martin H. 983–987
Weiner, James R. 1181
Weiss, Egon H. 1194
Weld, Charles Richard
account of Babbage's calculating engines 65
Wells, M. 749

Welsh, Herbert F. 1181, 1218, 1277, 1333
Western Union
illustration of telegraph office 212
Westinghouse Electric Corporation
658
Wheatstone, Charles 150, 151, 213
partnership with Cooke 139
Wheeler, David 796, 988, 1020, 1030, 1031, 1036
Wheeler, Schuyler Skaats 211
Whirlwind 609, 623
and Wilkes's floating-address system 1032
coding 624
Whirlwind I 613
block diagrams 615
codes 610, 611
coding 621
magnetic-core memory 620
programming 612, 614
simplified teaching version 616
Summer Session computer
emulation 617–619, 622
White, Donald K. 1267
White, Weld and Company 770
Whitehouse, Edward O. Wildman 142, 151, 205, 214
Whyche, Stephanie 1403
Wiberg, Martin 82, 98
Wiener, Margaret
works from her library 657, 995, 1000, 1007, 1010
Wiener, Norbert 242, 657, 738, 802, 994, 997, 1001, 1007
autobiography 998, 1000
collected works 1013
design for a digital partial differential analyzer 989
digital portrait of 1009
festschriften 1008, 1010
inventory of Wiener archive 1011
on cybernetics 991–993, 995, 996, 999
and religion 1005, 1006
on electronic digital computing 991, 992
on information and communications theory 990
on nonlinear processes 1003, 1004
photographs 1002
symposium on 1012
works from his library 325, 338, 405, 426, 435, 454, 455, 520, 554, 557, 565, 631, 640, 647, 737, 739, 766, 802, 836, 837, 866, 867, 991, 996, 998, 1001, 1002, 1004, 1068, 1072
Wilkes, Maurice Vincent 332, 440, 917, 1017, 1019, 1020, 1036, 1037, 1039, 1040, 1042, 1050, 1058, 1061
and the Mallock analog calculator 1014
autobiography 1054
mathematical tables 1035
programming of 1038
memory caching 1047
on atmospheric physics 1016
on Charles Babbage 1052, 1055–1057
on computer graphics 1049
on computer programming 1021, 1030, 1031, 1034
EDSAC 1024, 1027
EDSAC 2 1041
floating-address systems 1032
PUFS 1046
on data transmission 1045
on ENIAC 1015
on microprogramming 1028, 1033
on numerical analysis 1048

on self-repairing computers 1044
on the 1959 UNESCO conference 1043
on the EDSAC 1022, 1025, 1026, 1053, 1059
design and capabilities 1018
logical design 1023
programming the EDSAC 1024, 1027
videotaped talk 1062
on the historical development of computers 1029
on the stored-program concept 1060
on time-sharing 1051
works from his library 332, 917, 1014, 1015, 1017, 1022, 1032–1035, 1037–1039, 1042, 1044–1047, 1049, 1050, 1052, 1055–1059

Wilkinson, James Hardy 933, 934, 1063

Willers, Friedrich Adolf 407, 1064

William Penn Charter School Alumni Society 1408

Williams, Frederic Calland 504, 775, 1020, 1067
Williams tube 1065, 1066

Willis, D. W. 1037

Wilson, E. Bright 1087

Winograd, S. 1068

wire services 169, 183

wireless telegraphy 157
Hughes's experiments with 163
Marconi's first paper on 174

Wolf, Alice K. 639

Wolfowitz, Jacob 1069, 1070

Wolk, Allen M. 423

Womersley, John R. 1071

Wood, James D. 1290

Woodger, Michael 940

Wright, Jesse B. 513, 514

X

xerography 574

Y

Yockey, Hubert P. 1072
Youden, W. W. 1073
Young, John Zachary 1074–1076
Yowell, E. C. 672

Z

Zantedeschi, Francesco 215
Zetzsche, Karl Edouard 198
Ziehe, Theodore 743
Zurmühl, R. 977
Zuse, Konrad 1078–1081, 1084, 1369
association with Schreyer 876
autobiography 1085
Z1 computer
first patent application 408
Schreyer's description of 362
Z4 computer 974, 1077, 1082
Z5 computer 487, 1083
Zworykin, Vladimir
works from his library 203