

July 1981

CAPTAIN GRACE MURRAY HOPPER , U. S. NAVAL RESERVE

Grace Brewster Murray was born on 9 December 1906 in New York, New York. She claims as her second hometown, Wolfeboro, New Hampshire, to which she first traveled in the summer of 1907. She attended Vassar College, graduating in 1928, with Phi Beta Kappa and a Vassar College Fellowship. She attended Yale University, where she received the degrees of MA in 1930, and PhD in 1934, together with election to Sigma Xi and two Sterling Scholarships.

She returned to Vassar as an Assistant in Mathematics in 1931, becoming successively, Instructor, Assistant Professor, and Associate Professor. During this time, she received a Vassar Faculty Fellowship and studied at New York University (1941-42).

In December 1943, she entered the United States Naval Reserve and attended the USNR Midshipman's School-W at Northampton, Massachusetts. Upon graduation, she was commissioned Lieutenant (JG) and ordered to the Bureau of Ordnance Computation Project at Harvard. Here, she learned to program the first large-scale digital computer, Mark I. In 1946, she resigned from her leave-of-absence from Vassar and joined the Harvard Faculty as a Research Fellow in Engineering Sciences and Applied Physics at the Computation Laboratory where work continued on the Mark II and Mark III computers for the Navy. In 1946, she received the Naval Ordnance Development Award.

In 1949, she joined, as Senior Mathematician, the Eckert-Mauchly Computer Corporation in Philadelphia, then building the UNIVAC I, the first commercial large-scale electronic computer. She remained with the company as a Senior Programmer when it was bought by Remington Rand and later merged into the Sperry Corporation. She was appointed Systems Engineer, Director of Automatic Programming in 1952 when she published the first paper on compilers. In 1964, she became Staff Scientist, Systems Programming. She retired from the UNIVAC Division of the Sperry Rand Corporation in December 1971, while on military leave.

During the years from 1952 to the present, she has published over fifty papers and articles on software and programming languages. Her interest in applications programming sent her to the first meeting of CODASYL with a strong interest in the development of COBOL. She has also served on the ANSI X3.4 Committee on the standardization of computer languages. She is presently serving on the CODASYL Executive Committee.

She has served, starting in 1959, first as Visiting Lecturer; in 1962, as Visiting Assistant Professor; in 1963, as Visiting Associate Professor; and since 1973, as Adjunct Professor of Engineering at the Moore School of Electrical Engineering of the University of Pennsylvania. In 1971, she was appointed Professorial Lecturer in Management Science at the George Washington University and served until 1978.

In 1962, she was elected Fellow of the Institute of Electrical and Electronic Engineers. In 1964, she was selected to receive the 1964 Achievement Award by the Society of Women Engineers. In 1969, the Data Processing Management Association selected her as their first Computer Sciences "Man-of-the-

Year." The American Federation of Information Processing Societies gave her the Harry Goode Memorial Award in 1970. In 1971, the UNIVAC Division of the the Sperry Corporation initiated the Grace Murray Hopper Award for young computer personnel to be awarded annually by the Association for Computing Machinery. In 1972, she received the honorary degree of Doctor of Engineering from the Newark College of Engineering, a Wilbur Lucius Cross Medal from Yale University, and was made a Fellow of the Association of Computer Programmers and Analysts. In 1973, she received the honorary degree of Doctor of Science from the C. W. Post College of Long Island University, was elected to membership in the National Academy of Engineering, was presented with the Legion of Merit by the Navy, and was selected as a Distinguished Fellow of the British Computer Society. In 1974, she received the honorary degree, Doctor of Laws, from the University of Pennsylvania at the 50th Anniversary Convocation honoring the Moore School of Electrical Engineering. In 1976, she received the Distinguished Member Award of the Washington, D. C. Chapter of the Association for Computing Machinery, and an honorary Doctor of Science from Pratt Institute. In 1979, she received the W. Wallace McDowell Award from the Institute of Electrical and Electronic Engineers (IEEE) Society. In 1980, she received the Meritorious Service Award from the Navy, an Honorary Doctor of Science from Linkoping University, Sweden, Honorary Doctor of Science from Bucknell University, and an Honorary Doctor of Science from Arcadia University, Nova Scotia. In 1981, she received Honorary Doctor of Science degrees from Loyola University, Chicago and the Southern Illinois State University and an Honorary Doctor of Public Service from George Washington University, Washington, D. C.

She is a Fellow of the Institute of Electrical and Electronic Engineers, a member of the Association for Computing Machinery, the Data Processing Management Association, the Armed Forces Communications and Electronics Association, a Fellow of the American Association for the Advancement of Science and a member of the Franklin Institute, the U. S. Naval Institute, and the International Oceanographic Foundation.

She maintained her close connection with the Naval Reserve and was successively promoted to Lieutenant, Lieutenant Commander and Commander. At the end of 1966, she was retired with the rank of Commander in the Retired Reserve. She was recalled to active duty on 1 August 1967. On 2 August 1973, she was promoted to the rank of Captain on the retired list of the Naval Reserve. She is presently serving, on active duty, with the Naval Data Automation Command, as NAVDAC-OOH.

EDUCATIONAL BACKGROUND:

Hartridge School, Plainfield, New Jersey	1924
Vassar College, Poughkeepsie, New York	1928
BA, Phi Beta Kappa	
Yale University, New Haven, Connecticut, MA	1930
PhD, Sigma Xi	1934
Vassar Faculty Fellow, New York University	1941-42

PROFESSIONAL ACTIVITIES:

1931-43 Instructor to Associate Professor, Department of Mathematics,
 Vassar College
1943 Assistant Professor of Mathematics, Barnard College
1944-46 Mathematical Officer, U. S. Navy, Bureau of Ordnance
1946-49 Research Fellow in Engineering Sciences and Applied Physics,
 Computation Laboratory, Harvard University
1949-52 Senior Mathematician, Eckert-Mauchly Computer Corporation
1952-64 Systems Engineer, Director of Automatic Programming Development,
 UNIVAC Division of the Sperry Corporation
1959 - Visiting Lecturer to Adjunct Professor, Moore School of
 Electrical Engineering, University of Pennsylvania
1964-71 Staff Scientist, Systems Programming, UNIVAC Division of Sperry
 Corporation (on military leave 1967-71) retired 1971
1967-77 Active duty, U. S. Navy, serving in the Information Systems
 Division as OP-911F
1971-78 Professorial Lecturer in Management Sciences, George Washington
 University
1977- Active duty, U. S. Navy, serving as NAVDAC-OOH

AWARDS:

Phi Beta Kappa	1928
Sigma Xi	1934
Naval Ordnance Development Award	1946
Fellow, IEEE	1962
Fellow, American Association for the Advancement of Science	1963
Society of Women Engineers, SWE Achievement Award	1964
IEEE Philadelphia Section Achievement Award	1968
Connelly Memorial Award, Miami Valley Computer Association	1968
Data Processing Management Association, Computer Sciences "Man-of-the-Year" Award	1969
Upsilon Pi Epsilon, Honory Member, Texas A&M, Alpha Chapter	1970
American Mothers Committee, Science Achievement Award	1970
American Federation of Information Processing Societies - Harry Goode Memorial Award	1970
Honorary Doctor of Engineering, Newark College of Engineering	1972
Wilbur Lucius Cross Medal, Yale University	1972
Fellow, Association of Computer Programmers and Analysts	1972
Epsilon Delta Pi, Honorary Member, SUNY Potsdam Chapter	1973
Honorary Doctor of Science, C. W. Post College of Long Island University	1973
Elected to membership in the National Academy of Engineering	1973
Legion of Merit	1973
Distinguished Fellow of the British Computer Society	1973
Honorary Doctor of Laws, University of Pennsylvania	1974.

AWARDS (Continued):

Distinguished Member Award, Washington, D. C. Chapter, ACM	1976
Honorary Doctor of Science, Pratt Institute	1976
W. Wallace McDowell Award, IEEE Computer Society	1979
Honorary Doctor of Science, Linkoping University, Sweden	1980
Honorary Doctor of Science, Bucknell University	1980
Honorary Doctor of Science, Arcadia University, Nova Scotia	1980
Meritorious Service Medal	1980
Honorary Doctor of Science, Loyola University, Chicago	1981
Honorary Doctor of Science, Southern Illinois State University	1981
Honorary Doctor of Public Service, George Washington University, Washington, D. C.	

1981

OTHER ACTIVITIES:

Association for Computing Machinery	
Data Processing Management Association	
Institute of Electrical and Electronic Engineers	
Society of Women Engineers	
British Computer Society	
Association of Computer Programmers and Analysts	
The Franklin Institute	
International Oceanographic Foundation	
Armed Forces Communications and Electronics Association	
The Planetary Society	
New York Academy of Sciences	
The Oceanic Society	
American Institute of Industrial Engineers	
Member, CODASYL Executive Committee	1971-
Member, American Management Association	1972-
Management Systems Division Council	
Member, National Academy of Engineering	1973
Member, 1975, IEEE SPECTRUM Editorial Board	1975

MILITARY RECORD: United States Naval Reserve

Apprentice Seaman and Midshipman	4 May - 27 Jun 1944
USNR Midshipman School-W, Northampton, Massachusetts	
Lieutenant (junior grade)	27 Jun 1944
Lieutenant	1 Jun 1946
Lieutenant Commander	1 Apr 1952
Commander	1 Jul 1957
Retired with rank of Commander	31 Dec 1966
Recalled to active duty	1 Aug 1967
Captain	2 Aug 1973
AWARD: Legion of Merit	May 1973
Meritorious Service Medal	Dec 1980

SERVICE RIBBONS:

American Theatre
World War II
National Defense
Armed Forces Service
Naval Reserve

MEMBERSHIP IN OTHER ORGANIZATIONS:

Mary Murray Chapter, National Society of Daughters of the
American Revolution
Dames of the Loyal Legion
The Historical Society of Pennsylvania
The Genealogical Society of Pennsylvania
The Huguenot Society of Pennsylvania
The Pechin Society
Valley Forge Historical Society
New Hampshire Historical Society
New England Historic Genealogical Society
National Genealogical Society
New York Genealogical Biographical Society
Connecticut Society of Genealogists
Suffolk County, Long Island Historical Society
Main Historical Society
Wolfeboro Historical Society
New Hampshire Society of Genealogists
Clan Campbell Society
Clan MacPhearson Association
The Retired Officers Association

PARTIAL BIBLIOGRAPHY:

"The Education of a Computer" Meeting of the Association for
Computing Machinery - May 1952

"The Education of a Computer" Symposium of Industrial Applications
of Automatic Computing Equipment - January 1953, Midwest Research
Institute, Kansas City

"Compiling Routines" Computers and Automation - May 1953

Automatic Programming, "Definitions and Summary" Symposium on Automatic
Programming for Digital Computers, Proceedings, pp. 1-5 and 148-149, Navy
Mathematical Computing Advisory Panel, ONR, 1954

"Automatic Programming for Computers" Systems, Vol. 19, Sep-Oct 1955

"Automatic Coding for Digital Computers" Second Annual High-Speed
Computer Conference 1955, Louisiana State University, Baton Rouge,
Feb 1955

"Automatic Coding - 1955" Third Annual High Speed Computer Conference 1956, Louisiana State University, Baton Rouge - Feb 1956

"The Interlude 1954-1956" Symposium of Advanced Programming Methods for Digital Computers, Proceedings, pp. 1-2. Navy Mathematical Computing Advisory Panel, ONR, Jun 1956

"Programming Business-Data Processors" Control Engineering, Vol. 3, No. 10, Oct 1956, pp. 101-106

"Tomorrow - Automatic Programming" Petroleum Refiner, Vol. 36, No. 2, Feb 1957, pp. 109-112

"Automatic Programming for Computers" Punched Card Annual, Vol. 5, 1956-57, pp. 197-198

"Computer Programs 'in English'" Systems, Vol. 21, No. 5, Sep-Oct 1957, pp. 13-14

"Automatic Programming for Business Applications" American Management Association, Fourth Annual Electronics Conference Handbook, 1958, New York, New York

"Automatic Programming in Business and Industry" University of Alabama, Proceedings of Electronic Data Processing Conference, May 1958, pp. 1-5

"From Programmer to Computer" Industrial and Engineering Chemistry, Vol. 50, Nov 58, p. 1661

"Automatic Programming - Present Status and Future Trends" London, England - Nov 1958

"Automatic Programming Language and Programming Aids" U. S. Army Artillery and Missile School, Proceedings of Computers for Artillery Conference, Feb 1959, pp. 191-192

"Conversion of Electronic Data-Processing" American Institute of Industrial Engineers, Proceedings of 10th National Conference, May 1959, pp. 157-159

"Education can be 'Secondary'" Systems for Educators, Vol. 6, No. 2, Nov-Dec 1959, p. 8

"Progress in Automatic Coding for Business Data-Handling" Automation, Vol. 6, No. 5, May 1959, pp. 162-166

"A Data-Processing Compiler" National Machine Accountants Association, Data Processing 1959, Proceedings, pp. 69-76

"The Development of Automatic Programming" Machine Accounting and Data Processing, The Punched Card Semi-Annual, Vol. 8, 1959, pp. 28-32

"Automatic Coding - 1960" Automatic Data Processing Seminar for Federal Executives USDA, Graduate School, Washington, D. C.

"Business Data Processing - A Review" Proceedings of the IFIP Congress '62, pp. 35-39

"Business Data Processing" Tydschrift voor Efficiëntie in Documentatie Jaargang 33, No. 6, 1962, pp. 269-273

"Automatic Coding to COBOL" Historical Development: AIEE 1962, Conference Paper 62-397

"Automatic Coding" Proceedings of the NOMA Conference, Tokyo, Japan, Jun 1965

"Computers and Their People" Proceedings of the NOMA Conference, Kyoto, Japan, Jun 1965

"Language Standardization Across Manufacturers" Proceedings of the DPMA International Fall Conference, Los Angeles, Oct 1966

"A Language of Their Own" Financial Times, London, 11 Dec 1967, Annual Computer Supplement

"Standardization of High Level Languages" AFIPS Conference Proceedings, Vol. 34, p. 608, 1969, Spring Joint Computer Conference, May 1969, AFIPS Press, Montvale, New Jersey

"Looking Ahead to the 70's" Proceedings of the UNIVAC Users Association, Sep 1969, pp. 1-9

"Standardization of High Level Programming Languages" Data Processing, Vol. XIV, Jun 1969, pp. 329-335

"Standardization and the Future of Computers" Data Management, Vol. 8, No. 4, Apr 1970, pp. 32-35

"Possible Futures and Present Actions" Proceedings of the Fifth Australian Computer Conference, Brisbane, 1972, pp. 272-276

"Dispersal of Computer Power" Proceedings of Conference '73, Data Processing Institute, Ottawa, 1973, pp. 74-80

"Technology: Future Directions" Proceedings of Conference '74, Data Processing Institute, Ottawa 1974, pp. 251-256

"David and Goliath" in Computers in the Navy, Captain Jan Prokop, SC, USN, Naval Institute Press, Annapolis, Maryland, 1976

CO-AUTHOR OF:

"The Automatic Sequence Controlled Calculator"

Howard Aiken and Grace M. Hopper, Proceedings of the AIEE, Aug-Sep Oct, Nov 1946

"Influence of Programming Techniques on the Design of Digital Computers"

John W. Mauchly and Grace M. Hopper, Proceedings of the IRE, Oct 1953

"Report to the Association for Computing Machinery" First Glossary of Programming Terminology, Association for Computing Machinery, 1954

REPORTS ON:

H. L. Voysey, "Computer Pioneer Looks Ahead," The Computer Bulletin, Vol. 11, No. 2, Sep 1967, pp. 114-115

"Computer Sciences Man-of-the-Year," Journal of Data Management, Vol. 7, No. 6, Jun 1969, p. 75

Dataweek, Vol. 7, No. 12, Jun 18, 1969, pp. 6-7 and cover

"On the Top Deck of the Pentagon," Computer Survey, Jul-Aug 1969, p. 351

Laura Tatham, "Commander Grace Hopper - COBOL Pioneer Talks of the Future," The Computer Bulletin, Vol. 13, No. 8, Aug 1969, pp. 288-290

Alfred Lambeck, Zeitschrift fur Datenverarbeitung, Oct-Nov 1969, p. 549

"Le COBOL Standard, interview de Grace M. Hopper," L'Informatique, Vol. 1, No. 2, Mar 1970, pp. 40-49

"Women in Business: Pioneer in Computers," New York Times, 5 Sep 1971, Business and Financial Section

Ken Testorff, "The Lady is a Captain - She Teaches Computers How to Talk," All Hands, Number 700, May 1975, pp. 32-35

John F. Mason, "Grand Lady of Software - Grace Hopper: It's rewarding trying to do things in a new way." Electronic Design 22, 25 Oct 1976, pp. 82-86

Listed in "Who's Who;" "Who's Who American Women" and "Who's Who American Scientists."

"Computer Whiz Honored," All Hands, Number 767, December 1980, p. 22

July 1981