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### New Insights from Old Programs

*The Structure of The First ALGOL 60 System*

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## APPENDIX B

### BIBLIOGRAPHY

- AA. Vv., *Automatic Digital Computation — Proceedings of a Symposium Held at the National Physical Laboratory*, Her Majesty's Stationery Office (1954)
- AA. Vv., *FORTRAN II for the IBM 704 Data Processing System*, reference manual C28-6000, IBM (1958)
- AA. Vv., *Initial Specifications for a COmmon Business Oriented Language*, reference manual 1960 O-552133, United States Department of Defense (1960)
- AA. Vv., *ECMA Subset of ALGOL 60*, CACM 6(10), pp. 595–597 (1963)
- AA. Vv., *Report on SUBSET ALGOL 60 (IFIP)*, CACM 7(10), pp. 626–628 (1964)
- AA. Vv., *Report on Input-Output Procedures for ALGOL 60*, CACM 7(10), pp. 628–630, and ALGOL-Bulletin 16.3.1.2 (1964)
- AA. Vv., *ECMALGOL and the Implementation of a standard for ALGOL 60*, ALGOL-Bulletin 20.2.5 (1965)
- AA. Vv., *B5500 Information Processing Systems Extended ALGOL*, reference manual 1028024, Burroughs Corporation (1966)
- ALLEN, C. D., CHAPMAN, D. N., JONES, C. B., *A Formal Definition of ALGOL 60*, technical report 12.105, IBM Laboratory Hursley (1972)
- ARDEN, B., GRAHAM, R., *On GAT [Generalized Algebraic Translator] and the Construction of Translators*, CACM 2(7), pp. 24–26 (1959)
- ASHCROFT, E. A., *Mathematical Logic Applied to the Semantics of Computer Programs*, PhD Thesis, University of London (1970)
- BACKUS, J. W., et al., *The FORTRAN Automatic Coding System for the IBM 704*, reference manual 32-7026, IBM (1956)
- BACKUS, J. W., et al., *The FORTRAN Automatic Coding System*, Proceedings of the Western Joint Computer Conference, pp. 188–198 (1957)
- BACKUS, J. W., et al., *Report on the Algorithmic Language ALGOL 60* (1960)
- DE BAKKER, J. W., *Formal Definition of Programming Languages, with an Application to the Definition of ALGOL 60*, Mathematical Center Tracts 16, Mathematisch Centrum (1967)
- BAR-HILLEL, Y., PERLES, M., SHAMIR, E., *On formal properties of simple phrase structure grammars*, Zeitschrift für Phonetik, Sprachwissenschaft und Kommunikationsforschung 14(2), pp. 143–172 (1961)
- BARRON, D. W., BUXTON, J. N., HARTLEY, D. F., NIXON, E., STRACHEY, C., *The main features of CPL*, Computer Journal 6(2), pp. 134–143 (1963)

- BARNETT, M. P., FUTRELLE, R. P., *Syntactic Analysis by Digital Computer*, CACM 5(1), pp. 515–526 (1962)
- BAUMANN, R., et al., *ALGOL-Manual der ALCOR-Gruppe*, Elektronische Rechenanlagen 3(5), pp. 206–212, 3(6), pp. 259–265, 4(2), pp. 71–85 (1962)
- BACHELOR, G. A., et al., *SMALGOL-61*, CACM 4(11), pp. 499–502 (1961)
- BEMER, R. W., *A Politico-Social History of ALGOL*, in Halpern, M. I., Shaw, C. J. (eds.), Annual Review in Automatic Programming 5, Pergamon Press, pp. 151–237 (1969)
- BENTLEY, J., *Programming Pearls — Writing Correct Programs*, CACM 26(12), pp. 1040–1045 (1983)
- , *Programming Pearls*, Addison-Wesley (1986)
- , *More Programming Pearls*, Addison-Wesley (1988)
- , *Programming Pearls*, Addison-Wesley (1999)
- BÖHM, C., *Calculatrices digitales — Du déchiffrage de formules logico-mathématiques par la machine même dans la conception du programme*, Annali di Matematica Pura ed Applicata 37(1), pp. 175–217 (1952)
- BROOKER, R. A., MORRIS, D., *An Assembly Program for a Phrase Structure Language*, Computer Journal 3(3), pp. 168–174 (1960)
- , *Some Proposals for the Realization of a Certain Assembly Program*, Computer Journal 3(4), pp. 220–231 (1960)
- , *A General Translation Program for Phrase Structure Languages*, JACM 9(1), pp. 1–10 (1962)
- BROOKS, F. P., *No Silver Bullet — Essence and Accidents in Software Engineering*, IEEE Computer 20(4), pp. 10–19 (1987)
- BURKS, A. W., WARREN, D. W., WRIGHT, J. B., *An Analysis of a Logical Machine Using Parenthesis-Free Notation*, Mathematical Tables and Other Aids to Computation 8(46), pp. 53–57 (1954)
- BURSTALL, R. M., *Formal Description of Program Structure and Semantics in First Order Logic*, in Meltzer, B., Michie, D. (eds.), Machine Intelligence 5, pp. 79–98 (1969)
- BUXTON, J. N., COULOURIS, G. F., HARTLEY, D. F., NIXON, E., PARK, D., RICHARDS, M., STRACHEY, C., *CPL Working Papers*, University of London Institute of Computer Science and University of Cambridge Mathematical Laboratory (1966)
- CANTOR, D. G., *On the Ambiguity Problem of Backus Systems*, JACM 9(4), pp. 477–479 (1962)
- CHOMSKY, N., *Three Models for the Description of Language*, IRE Transactions on Information Theory 2(3), pp. 113–124 (1956)
- , *On Certain Formal Properties of Grammars*, Information and Control 2(2), pp. 137–167 (1959)
- CHURCH, A., *The Calculi of Lambda-Conversion*, Princeton University Press (1941)
- CONWAY, M. E., *Design of a Separable Transition-Diagram Compiler*, CACM 6(7), pp. 396–408 (1963)
- DAHL, O.-J., NYGAARD, K., *SIMULA — A language for programming and description of discrete event systems*, Norsk Regnesentral (1965)
- DEMILLO, R. A., LIPTON, R. J., PERLIS, A. J., *Social Processes and Proofs of Theorems and Programs*, CACM 22(5), pp. 271–280 (1979)
- DIJKSTRA, E. W., *Communication with an Automatic Computer*, PhD Thesis, University of Amsterdam (1959)

- , *Recursive Programming*, Numerische Mathematik 2, pp. 312–318 (1960)
- , *Making a Translator for ALGOL 60*, ALGOL-Bulletin Supplement 10 (1961)
- , *An ALGOL 60 Translator for the X1*, ALGOL-Bulletin Supplement 10 (1961)
- , *Operating Experience with ALGOL 60*, Computer Journal 5(2), pp. 125–127 (1962)
- , *A Primer of ALGOL 60 Programming*, Academic Press (1962)
- , *An Attempt to Unify the Constituent Concepts of Serial Program Execution*, technical report MR46, Mathematisch Centrum (1962)
- , *Objectprogramma, gegenereerd door de MC-vertaler*, technical report MR55, Mathematisch Centrum (1963)
- , *The Structure of the “THE” Multiprogramming System*, CACM 11(5), pp. 341–346 (1968)
- , *Notes on Structured Programming*, in DAHL, O.-J., DIJKSTRA, E. W., HOARE, C. A. R., *Structured Programming*, Academic Press, pp. 1–82 (1972)
- , *On the cruelty of really teaching computing science*, EWD1036 (1988)
- , *In reply to comments*, EWD1058 (1989)
- FENYMAN, R. P., *Personal observations on the reliability of the Shuttle*, Appendix F of AA. Vv., *Report of the Presidential Commission on the Space Shuttle Challenger Accident* (1986)
- FLOYD, R. W., *On the Nonexistence of a Phrase Structure Grammar for ALGOL 60*, CACM 5(9), pp. 483–484 (1962)
- , *On Ambiguity in Phrase Structure Languages*, CACM 5(10), pp. 526, 534 (1962)
- , *Syntactic Analysis and Operator Precedence*, JACM 10(3), pp. 316–333 (1963)
- , *Bounded Context Syntactic Analysis*, CACM 7(2), pp. 62–65 (1964)
- , *The Syntax of Programming Languages — A Survey*, IEEE Transactions on Electronic Computers 13(4), pp. 346–353 (1964)
- GINSBURG, S., GREIBACH, S., *Deterministic Context Free Languages*, Information and Control 9(6), pp. 620–648 (1966)
- HAMBLIN, C. L., *Computer Languages*, Australian Journal of Science 20(5), pp. 135–139 (1957)
- HARDY, G. H., *Mathematical Proof*, Mind, 38(149), pp. 1–25 (1929)
- HENHAPL, W., JONES, C. B., *A Formal Definition of ALGOL 60 as Described in the 1975 Modified Report*, in BJØRNER, D., JONES, C. B., *The Vienna Development Method: The Meta-Language*, Lecture Notes in Computer Science 61 (1978)
- HOARE, C. A. R., *Algorithm 63 — Partition*, CACM 4(7), p. 321 (1961)
- , *Algorithm 64 — Quicksort*, CACM 4(7), p. 321 (1961)
- , *Hints on Programming Language Design*, memorandum AIM-224, Stanford Artificial Intelligence Laboratory (1973)
- HUSKEY, H. D., *Semiautomatic Instruction on the Zephyr*, Proceedings of a Second Symposium on Large-scale Digital Calculating Machinery, pp. 83–90 (1949)
- , *Compiling Techniques for Algebraic Expressions*, Computer Journal 4(1), pp. 10–19 (1961)
- HUSKEY, H. D., HALSTEAD, M. H., McARTHUR, R., *NELIAC — A Dialect of ALGOL*, CACM 3(8), pp. 463–468 (1960)
- HUSKEY, H. D., WATTENBURG, W. H., *A Basic Compiler for Arithmetic Expressions*, CACM 4(1), pp. 3–9 (1961)
- , *Compiling Techniques for Boolean Expressions and Conditional Statements in ALGOL 60*, CACM 4(1), pp. 70–75 (1961)

- INGERMAN, P. Z., *Thunks, A Way of Compiling Procedure Statements with Some Comments on Procedure Declarations*, CACM 4(1), pp. 55–58 (1961)
- IRONS, E. T., FEURZEIG, W., *Comments on the Implementation of Recursive Procedures and Blocks in ALGOL 60*, CACM 4(1), pp. 65–69 (1961)
- IRONS, E. T., *A Syntax Directed Compiler for ALGOL 60*, CACM 4(1), pp. 51–55 (1961)
- , “Structural Connections” in *Formal Languages*, CACM 7(2), pp. 67–71 (1964)
- IVERSON, K. E., *A Programming Language*, Wiley (1962)
- JONES, W., *Synopsis Palmariorum Matheseos* (1706)
- KANT, I., *Principiorum primorum cognitionis metaphysicæ nova dilucidatio* (1755)
- KLEIN, J., *Greek Mathematical Thought and the Origin of Algebra* (tr. E. Brann), MIT Press (1968)
- KNUTH, D. E., MERNER, J. N., *ALGOL 60 Confidential*, CACM 4(6), pp. 268–272 (1961)
- KNUTH, D. E., et al., *A Proposal for Input-Output Conventions in ALGOL 60*, CACM 7(5), pp. 273–283 (1964)
- KNUTH, D. E., *Man or boy?*, ALGOL-Bulletin 17.2.4 (1964)
- , *Teaching ALGOL 60*, ALGOL-Bulletin 19.2.1 (1965)
- , *On the Translation of Languages from Left to Right*, Information and Control 8(6), pp. 607–639 (1965)
- , *Semantics of Context-Free Languages*, Mathematical Systems Theory 2(2), pp. 127–145 (1968)
- , *A torture test for TeX*, technical report STAN-CS-84-1027, Stanford University (1984)
- , *T<sub>E</sub>X: The Program*, Addison-Wesley (1986)
- , *The Art of Computer Programming*, volume 1, Addison-Wesley (1997)
- KRUSEMAN ARETZ, F. E. J., *The Dijkstra-Zonneveld ALGOL 60 compiler for the Electrologica X1*, technical report SEN2, CWI (2003)
- LAKATOS, I., *Proofs and Refutations*, Cambridge University Press (1976)
- LANDIN, P. J., *The mechanical evaluation of expressions*, Computer Journal 6(4), pp. 308–320 (1964)
- , *A Correspondence Between ALGOL 60 and Church’s Lambda-Notation: Part I and Part II*, CACM 8(2), pp. 89–101 and CACM 8(3), pp. 158–165 (1965)
- LANING, J. H., ZIERLER, N., *A Program for Translation of Mathematical Equations for Whirlwind I*, engineering memorandum E-364, MIT Instrumentation Laboratory (1954)
- LAUER, P., *Formal Definition of ALGOL 60*, technical report 25.088, IBM Laboratory Vienna (1968)
- LE CHARLIER, B., *Réflexions sur le problème de la correction des programmes*, PhD Thesis, University of Namur (1985)
- LEIBNIZ, G. W., *De vera proportione circuli ad quadratum circumscriptum in numeris rationalibus*, Acta eruditorum publicata Lipsiæ, pp. 41–49 (1682)
- LEROUY, H., *A Proposal for Macro-Facilities in ALGOL*, ALGOL-Bulletin 22.3.8 (1966)
- LEWIS, P. M., STEARNS, R. E., *Syntax Directed Transduction*, IEEE Seventh Annual Symposium on Switching and Automata Theory, pp. 21–35 (1966)
- , *Syntax-Directed Transduction*, JACM 15(3), pp. 465–488 (1968)
- LIONS, J., *A Commentary on the UNIX Operating System*, Bell Laboratories (1977)
- ŁUKASIEWICZ, J., *O znaczeniu i potrzebach logiki matematycznej*, Nauka polska, X, pp. 604–620 (1929)

- McCARTHY, J., *Revisions of the [Symbol Manipulating] Language*, memorandum 4, Artificial Intelligence Project, Research Laboratory of Electronics and MIT Computation Center (1958)
- , *Programs in LISP*, memorandum 12, Artificial Intelligence Project, Research Laboratory of Electronics and MIT Computation Center (1959)
- , *Recursive Functions of Symbolic Expressions and Their Computation by Machine*, CACM 3(4), pp. 184–195 (1960)
- , *A formal description of a subset of ALGOL 60*, in Steel, T. B. (ed.), *Formal Language Description Languages for Computer Programming*, pp. 1–7 (1966)
- McCARTHY, J., et al., *LISP Preliminary Programmer's Manual — Draft*, MIT Computation Center and Research Laboratory of Electronics (1960)
- MILNES, H. W., *Logical Programming and Algebraic Interpretation*, Industrial Mathematics 8, pp. 17–26 (1957)
- MOSSES, P., *The Mathematical Semantics of ALGOL 60*, technical monograph PRG-12, Oxford University Computing Laboratory (1974)
- OETTINGER, A. G., *Automatic Syntactic Analysis and the Pushdown Store*, Proceedings of Symposia in Applied Mathematics 12, American Mathematical Society, pp. 104–129 (1961)
- PAINTER, J. A., *Semantic Correctness of a Compiler for an ALGOL-Like Language*, PhD Thesis, Stanford University (1967)
- PERLIS, A. J., SMITH, J. W., VAN ZOEREN, H. R., *Internal Translator (IT) — A Compiler for the [IBM] 650*, Computation Center, Carnegie Institute of Technology (1957)
- PERLIS, A. J., SAMELSON, K., et al., *Preliminary Report — International Algebraic Language* (1958)
- VAN DER POEL, W. L., *The Logical Principles of some Simple Computers*, PhD Thesis, University of Amsterdam (1956)
- POPPER, K. R., *Science: Problems, Aims, Responsibilities*, Proceedings of the Federation of American Societies for Experimental Biology 22, pp. 961–972 (1963)
- POST, E. L., *Formal Reductions of the General Combinatorial Decision Problem*, American Journal of Mathematics 65(2), pp. 197–215 (1943)
- RANDELL, B., RUSSELL, L. J., *Discussions on ALGOL Translation, at Mathematisch Centrum*, technical report W/AT 841, English Electric Company (1962)
- , *ALGOL 60 Implementation*, Academic Press (1964)
- REYNOLDS, J. C., *The Discoveries of Continuations*, LISP and Symbolic Computation 6(3-4), pp. 233–248 (1993)
- RUTISHAUSER, H., *Automatische Rechenplanfertigung bei programmgesteuerten Rechenmaschinen*, Mitteilungen aus dem Institut für angewandte Mathematik an der Eidgenössische Technische Hochschule in Zürich, 3 (1952)
- SAMELSON, K., BAUER, F. L., *Sequential Formula Translation*, CACM 3(2), pp. 76–83 (1960)
- SATTLEY, K., *Allocation of Storage for Arrays in ALGOL 60*, CACM 4(1), pp. 60–64 (1961)
- SCHORRE, D. V., *Meta II, A Syntax-Oriented Compiler Writing Language*, Proceedings of the 1964 ACM National Conference, pp. D1.3-1–D1.3-11 (1964)
- SHAW, J. C., NEWELL, A., SIMON, H. A., ELLIS, T. O., *A Command Structure for Complex Information Processing*, Proceedings of the Western Joint Computer Conference: Contrasts in Computers, pp. 119–128 (1968)
- SHERIDAN, P. B., *The Arithmetic Translator-Compiler of the IBM FORTRAN Automatic Coding System*, CACM 2(2), pp. 9–21 (1959)
- TENNENT, R. D., *Principles of Programming Languages*, Prentice Hall (1981)

- TURING, A. M., *Proposed Electronic Calculator*, report E.882, National Physical Laboratory (1945)
- WEGSTEIN, J. H., *From Formulas to Computer Oriented Language*, CACM 2(3), pp. 6–8 (1959)
- WILKES, M. V., WHEELER, D. J., GILL, S., *The Preparation of Programs for an Electronic Digital Computer*, Addison-Wesley (1951)
- WIRTH, N., HOARE, C. A. R., *A Contribution to the Development of ALGOL*, CACM 9(6), pp. 413–432 (1966)
- WIRTH, N., WEBER, H., *EULER: A Generalization of ALGOL, and its Formal Definition: Part I and Part II*, CACM 9(1), pp. 13–23 and 25 and CACM 9(2), pp. 89–99 (1966)
- ZONNEVELD, J. A., *Automatic Numerical Integration*, PhD Thesis, University of Amsterdam (1964)