

Notes

It all began with Noam Chomsky. Soon, however *BNF* (Backus Normal form or Backus-Naur Form) was invented to specify the syntax of programming languages. The classics are:

J. W. BACKUS, "The syntax and semantics of the proposed international algebraic language of the Zurich ACM-GAMM conference," *Proceedings of the International Conference on Information Processing (1959)*, UNESCO, 125-132.

N. CHOMSKY, "Three models for the description of languages," *IRE Transactions on Information Theory* 2:3 (1956), 113-124.

P. NAUR et. al., "Report of the algorithmic language ALGOL 60," *Communications of the Association for Computing Machinery* 3:5 (1960), 299-314. Revised in 6:1 (1963), 1-17.

Relationships between classes of languages and automata were soon investigated. In order of language type we have:

N. CHOMSKY, "On certain formal properties of grammars," *Information and Control* 2:2 (1959), 137-167.

S. Y. KURODA, "Classes of languages and linear bounded automata," *Information and Control* 7:2 (1964), 207-223.

P. S. LANDWEBER, "Three theorems on phrase structure grammars of type 1." *Information and Control* 6:2 (1963), 131-136.

N. CHOMSKY, "Context-free grammars and pushdown storage," *Quarterly Progress Report* 65 (1962), 187-194, MIT Research Laboratory in Electronics, Cambridge, Massachusetts.

J. EVEY, "Application of pushdown store machines," *Proceedings of the 1963 Fall Joint Computer Conference*, 215-227, AFIPS Press, Montvale, New Jersey.

N. CHOMSKY and G. A. MILLER, "Finite state languages," *Information and Control* 1:2 (1958), 91-112.

Normal forms for the context free languages are due to Chomsky (in the 1959 paper above) and:

S. A. GREIBACH, "A new normal form theorem for context-free phrase structure grammars," *Journal of the Association for Computing Machinery* 12:1 (1965), 42-52.

Most of the closure properties and solvable decision problems for context free languages were discovered by Bar-Hillel, Perles, and Shamir in the paper cited in chapter 3. They also invented the pumping lemma. A stronger form of this useful lemma is due to:

W. G. OGDEN, "A helpful result for proving inherent ambiguity," *Mathematical Systems Theory* 2:3 (1969), 191-194.

The text by Hopcroft and Ullman is a good place to find material about automata and formal languages, as is the book by Lewis and Papadimitriou. (These were cited in chapter 1.) Several formal languages texts are:

S. GINSBURG, *The Mathematical Theory of Context-free Languages*, McGraw-Hill, New York, 1966.

M. A. HARRISON, *Introduction to Formal Language Theory*, Addison-Wesley, Reading, Massachusetts, 1978.

G. E. REVESZ, *Introduction to Formal Languages*, McGraw-Hill, New York, 1983.

A. SALOMAA, *Formal Languages*, Academic Press, New York, 1973.

Knuth was the first to explore LR(k) languages and their equivalence to deterministic context free languages. The early LR and LL grammar and parsing papers are:

D. E. KNUTH, "On the translation of languages from left to right," *Information and Control* 8:6 (1965), 607-639.

A. J. KORENJAK, "A practical method for constructing LR(k) processors," *Communications of the Association for Computing Machinery* 12:11 (1969), 613-623.

F. L. DE REMER, "Generating parsers for BNF grammars," *Proceedings of the 1969 Spring Joint Computer Conference*, 793-799, AFIPS Press, Montvale, New Jersey.

and two books about compiler design are:

A. V. AHO and J. D. ULLMAN, *Principles of Compiler Design*, Addison-Wesley, Reading, Massachusetts, 1977.

P. M. LEWIS II, D. J. ROSENCRANTZ, and R. E. STEARNS, *Compiler Design Theory*, Addison-Wesley, Reading, Massachusetts, 1976.