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The earliest programs for substructure searching of chemical databases were developed in the early 1970s, and such programs have been in routine use since 1975. With the early programs, searching of databases containing up to 100 000 structures was possible, but was often slow and tedious. Many incremental improvements were made over the years, but it was not until the mid-1980s that basic redesign of the original programs was undertaken. There is now a genuine need to be able to conduct substructure searchers in databases such as the CAS Registry (11M) or the Beilstein Database (6M), and, in response to this, groups in the U.S. and Europe have developed second generation algorithms which can complete such searches tolerably quickly. The third generation of programs, already on the horizon, will be able to work with very large databases (20M or more) and will thus be able to search through files that contain more structures than have ever been described in the world's literature. In this issue of the *Journal of Chemical Information and Computer Sciences*, several papers from a Symposium held in August 1992 are published. These will provide the reader with a useful synopsis of the second generation of substructure search algorithms and should set the stage for the forthcoming third generation programs, which we hope to see within the next year.

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Editor