HOARE78
Hoare C.A.R.; Communicating Sequential Processes; CACM 21, 8 (August 1978) pp. 666-677.

In this paper Hoare proposes a form of synchronization control for concurrent processes. The proposal is demonstrated as a simple language which is based on three concepts. They are as follows:

A version of Dijkstra's guarded commands.

A version of Dijkstra's parallel command.

Simple forms of input and output, for communication between processes.

He next describes the language using a BNF grammar, and gives examples of the kinds of statements which can be used. The language is very simple, containing only parallel, assignment, alternative, repetitive and input/output commands. The descriptions are very good, and serve to give a feel for the language very rapidly.

He then proceeds to demonstrate the use of the language, in the solution of a number of different problems of increasing complexity. The problems range from a simple filter which can act concurrently with its supplier and consumer, to a solution for the dining philosophers problem. The paper closes with a discussion and justification of the syntax chosen.

The language is certainly a simple and powerful solution to the problem of syncronization, and Hoare points out that it would probably be a good solution for a multi-processor system in which the memory was not all shared. Unfortunately, it would seem that the implementation of the CSPs on a machine of regular architecture might not be very efficient. The paper only mentions this problem, and does not discuss it at any length. In addition, the paper mentions the problems of verification, and fairness. Again, no solution is discussed for either problem, in terms of the CSPs. The examples given certainly show a broad range of problem, with solutions using concurrency.