ON THE CONSTRUCTION OF FACTOR STENCILS*

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The simple observation that if A and B are any two entries in a table of linear forms then the product AB is also an entry is of great importance in connection with the computation of such tables, as was pointed out in a previous paper.† The consequences of this theorem are of even greater importance in the construction of factor stencils, rendering unnecessary the computation of stencils for composite residues, and furnishing a valuable check on the accuracy of the work at every stage.

A factor stencil consists of a sheet of paper ruled in squares, each square representing a prime. In the stencils which the author is at present constructing under the auspices of the Carnegie Institution of Washington there are fifty columns and one hundred rows, which give a cell for each of the five thousand primes listed on the first page of his *List of Primes*, and includes all the primes from 1 to 48,593. For a given number a stencil is made which has holes punched in those squares which correspond to primes which have that number for a quadratic residue. The mere superposition of two different stencils will give at a glance the list of primes having the two corresponding numbers for residues. The problem of factorization is thus reduced to the problem of finding quadratic residues.

For each stencil there is a "conjugate" stencil obtained by punching out the squares left unpunched in the original. A stencil and its conjugate when superposed allow no holes to appear. We express this by the notation $(A)(A')=0$. If a new stencil is constructed by first cutting all the holes of A and then afterward all the holes of B the new stencil will show all the holes of A and B. We express this by the notation

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