NOTE ON IMPOSSIBLE DEVELOPMENTS I

(This note is put forward in the hope that the general idea might prove to be of some interest, even though the author is not at all sure of the practicability of the ideas and methods proposed.)

Use of Mammoths for breaking on cillis and a beginner on to which there is no cilli, or for dealing with two beginners both of which are too weak to be dealt with as cribs.

General outline: If we have two quite different cribs we are unable, with our present technique to use them both as we do not know the relative positions. Suppose however we have two menus M_1, M_2 (giving respectively n_1 and n_2 stops per w.o.) made up in two different cribs, and let us suppose for the moment that there is no turnover in the stretch covered by either menu. Suppose also that there are two letters, α,β common to both menus ("A", "N" are very likely candidates for this office.) Let us run M1, M2 on the same w.o. on two different Mammoths with double input on each (irrespective of the shapes of the menus) at α and β. Then if we have the right w.o. and both menus are correct there is a correct stop in each menu and the two stops must give consistent stecker; in particular $\therefore$ they must give the same stecker for α,β. We expect only $\frac{n_1 n_2}{26^2}$ pairs of stops satisfying this latter condition.

Having found these we could then compare the printed stecker given by the machines for these pairs of stops, and reject every pair in which the stecker printed by one machine contradict those given by the other. It would probably be possible to deal by hand with about 15 - 20 such pairs per w.o. (or maybe considerably more) provided that the appropriate pairs of stops can be dug out reasonably quickly. This might be fairly easily done by having the machine attendant enter the serial no. of each stop in the square of a form sheet corresponding to the steckers of the input letters or else by getting the machine actually to print the serial No. of each stop on the appropriate square of such a sheet. Thus with $\frac{n_1 n_2}{26^2} = 15$ (or may be more) we could expect to get a solution. This allows us to run extraordinarily weak menus at which even a Jumbo might jib.

Reasonably practical cases for the application of this kind of technique would be

a) One menu M1 made up on a short crib in which we could be prepared to risk a turn-over and the other crib made up into say 3 menus M_2 M_2^1 M_2^{11} covering all risks between them. This involves 3 sets of comparisons per w.o. and it would clearly be best to run all 4 menus simultaneously. If however the last only two mammoths we could run M^1 and M^{11} first and then run M_2^1 and M_2^{11} later when all the w.o. have been put down. In particular if M_1 is a cilli menu instead of a short crib menu no risks are taken.

b) A crib C_1 with menus M_1 M_1^1 and another C_2 with M_2 M_2^1. This case again could be covered reasonably well on two Mammoths but would be best dealt with on 4. There we have 4 sets of comparisons per w.o.

Jobs in which each beginner needed to be made up into 3 or 4 menus to provide even the weak kind of menus we use would really need a battery of Mammoths. It might be possible to extend our range of operations and use even weaker menus by mechanical sorting of punched cards from the machines, but I suspect that mechanical sorting would only serve to simplify the actual working out of the method without any real widening of its range.

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PS N.S.F. has just pointed out that one can not only deal this way with two cribs but with two cilli menus for the a.m. and p.m. keys respectively (with of course the obvious point that one runs rewired w.o.s on the two machines). This in a way is an ideal case as we only have two menus in all.