224D
MIT
Differential analyzer

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Professor S. H. Caldwell, MIT.

WW sees all of the space in the new building assigned to the computing center. The splendid large, specially designed room which will house the new Differential Analyzer is inspected. The panels for the 18 units are in place, all separate parts of these panels having passed inspection trials, although the panels as a whole cannot be tested until later. One integrating unit is in place for our inspection. This one unit would have been operating except for the fact that a wholly unexpected difficulty developed at the last moment with a special lubricating grease which turned out to be too gummy at the operating temperature. We inspect the operating model of the automatic device for setting initial conditions, for reading final positions, and for changing scale. This device is now practically ready for production. The function unit is the one part of the machine which is lagging furthest behind, and indeed it is becoming clear that it will not be possible to complete all of this side of the machine within the specified time, nor within the available funds. This does not mean, however, that a working and workable instrument will not be completed. In fact it is clear that development and refinements of various sorts will and should go on for some time in the future.

C. says as the machine is being assembled various problems arise which could hardly have been solved earlier and in some instances could hardly have been anticipated. One such important problem is the following. Suppose that the machine is entirely free and that one sets up a given problem on it. The design is such that the machine will automatically pick out the units which are most effective and most efficient in solving the problem in question. This problem might require, for example, apprsximately 1/3 of the actual capacity of the machine. Suppose now one comes with a second problem. Again it is true that the machine will

automatically select those of the available units which are most effectively suited to this second problem. A third problem in turn would make the best choice of the units which are left and available when it comes to the machine. But in the meantime the first problem may have been completed and the units of the machine chosen for it thus freed. If the third problem makes the best choice of the units now available, it by no means follows that the best total choice has been made for the second problem and for the third problem, the choices for the second problem having been made under conditions which no longer obtain. It would be possible to take all problems off the machine and start over; but it is important to have all of these procedures systematized in such a way that when one once punches a tape for the purpose of setting a given problem on the machine, the machine will always use this one tape so as to give the best possible setting. It would be a considerable waste of time and effort to have to punch several tapes for one and the same problem. A way has been found automatically to take care of all of these extraordinarily complicated difficulties, but this way quite understandably introduces serious complications in the automatic switches and automatic interconnections between the units.

The character of this machine is such that one will never be able to say that it is completed in a final and permanent form, but it is altogether probable that a state will be reached by the first of June which will justify an announcement that the fundamental construction period is closed. Although C. does not raise this point, it seems altogether probable to WW that some additional funds may be called for, and WW's enthusiasm for this altogether extraordinary job is such that he would be warmly sympathetic. AEB EB