MATHEMATICS

Machine Takes A Chance

Mathematicians confronted by complicated problems are using a kind of coin tossing method to get their answer. It is called the Monte Carlo Method of Solution.

➤ WHEN decision of life's little problems becomes just too overwhelming, if you can't decide whether to go home to the wife or to stay out just a little longer with the boys, tossing a coin to decide now puts you in the class with the best high-brow mathematicians who are using the new Monte Carlo Method of Solution.

But if you cheat and don't follow the advice of your coin, then you lose the full advantage of the Method, since it would otherwise guarantee that you would not make the same wrong decision all the time.

The mathematical decisions of what to do next in the midst of calculating a problem in nuclear fission, aerodynamics, or differential equations—especially when set up on a large high-speed computing machine—sometimes become just too complicated for even the skilled mathematician. In cases like this, S. M. Ulam of the Los Alamos Scientific Laboratory, told the Symposium on Large-Scale Digital Calculating Machinery, which met in Cambridge, Mass., a powerful method of procedure is to put the decision up to chance alone, hence the name "the Monte Carlo Method."

The mathematician knows that his mathematical procedure will correct itself and give the right answer if even a few of the decisions are wholly accurate. He makes the machine use random numbers to make the chance step-by-step decisions. By this procedure, he is assured that his own human failings do not enter into baffling decisions inadvertently to weight the direction of the solution in a consistently wrong direction.

Random numbers, required in profusion by the Monte Carlo Method, aren't so easy to come by, D. H. Lehmer of the University of California emphasized. Systems for computing random numbers may either fall into a repetitive pattern, giving numbers in cycles or the numbers vanish and all zeros appear in their place.

Numbers that you might dream up by yourself aren't good enough either. They might have too many odd numbers, or threes and sevens to give an unbiased Monte Carlo choice. Machine generation of pseudo-random numbers—numbers that however are random enough to use—can be accomplished, he reported.

Science News Letter, September 24, 1949

PHYSIOLOGY-MATHEMATICS

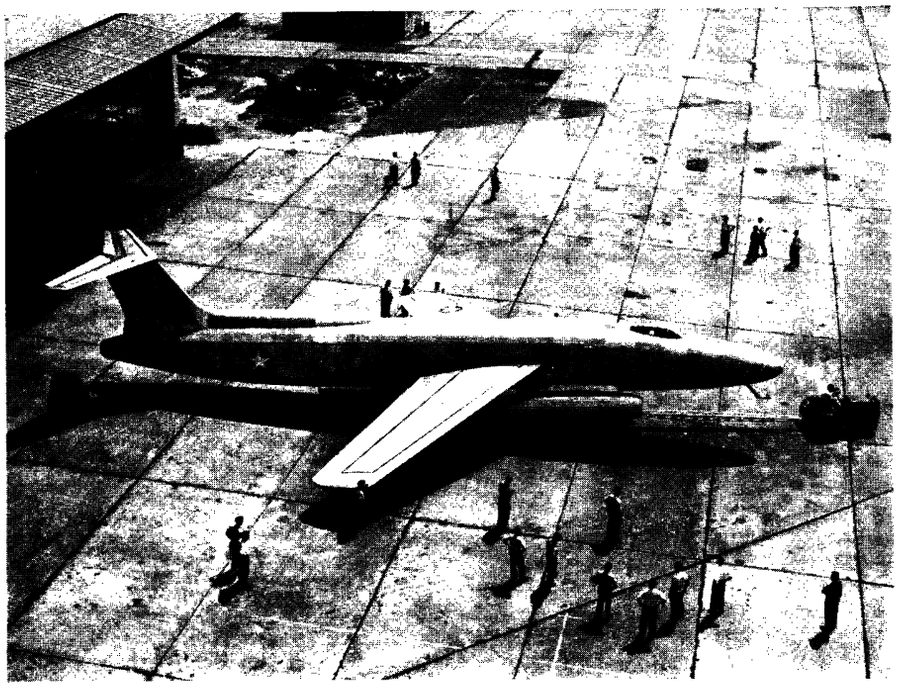
Duplicating Human Brain

➤ MAKING a real mechanical brain may be possible, but even if it is able to solve useful problems, it won't be able to think them up. Dr. William F. Crozier, professor of general physiology at Harvard University, speaking at the Harvard Symposium on Large-Scale Calculating Machinery, Cambridge, Mass., warned, however, that we don't know enough about what actually goes on in the human brain to be sure that we can duplicate it. The very simplest type of judgment, such as deciding whether one noise is louder than another, has been analyzed. This kind of mechanism in the human brain seems to work the same way as man-made devices that measure noise or make the millions of "decisions" in one of the giant electronic calculators.

But if we can build a non-living brain from purely mechanical components which seems to duplicate human thought, we still cannot be sure that it is actually going through the same processes as the human mind, Dr. Crozier stated. He said that it might turn out to be like a "push button" production line which does the same job as a production line run by men but uses very different means. Such a machine would occupy a great deal of space and require a lot of attention, he added.

Therefore, although the electronic brains will be useful to physiologists and psychologists in solving many problems, the scientists will be cautious about taking them as models of mental processes. However complex the machines are, Dr. Crozier told the meeting, they will not begin to think up new ideas all by themselves but "will function solely in terms of effects actually (even if sometimes unwittingly) built into them at the start."

Science News Letter, September 24, 1949



SPEEDY GROUND-SUPPORT PLANE—This shows the new U. S. Air Force Martin XB-51 with wings that sweep back 35 degrees and three turbo-jet engines for power, two mounted on pylons on the lower sides of the fuselage, the third in the rear of the fuselage.

AERONAUTICS

New Three-Jet Plane Will Destroy Ground Targets

➤ THE U. S. Air Force will support the Army Ground Forces with the use of a new plane, the first postwar airplane specifically designed for the destruction of surface targets in cooperation with ground troops, it was revealed by the Glenn L. Martin Company of Baltimore, Md., build-