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OPPORTUNITIES IN MATHEMATICAL STATISTICS, WITH SPECIAL REFERENCE TO SAMPLING AND QUALITY CONTROL

By Dr. W. Edwards Deming
BUREAU OF THE CENSUS AND BUREAU OF THE BUDGET

Seed haunted by the sun never fails to find its way between the stones. And the pure logician, if no sun draws him forth, remains entangled in his own logic.

The control chart was devised by Shewhart in 1924 to help disclose the presence of extraneous causes of variability that are worth looking for; also to give greater quality assurance in devising acceptance procedures (Problems B and A, respectively, as outlined below). If this were a group of business men, I might seize this opportunity to persuade you to make use of these methods. But speaking before mathematicians, I need not do that. Here we can talk about the next step, viz., how to harness the efforts of mathematicians to statistical problems.

I shall remind you of two problems that confront the manufacturer and the statistician in industry:

Problem A: What to do with this lot? (Accept it, reject, pass, scrap, rework, or regrade it)
Problem B: What to do with the process? (Leave it alone; or look for some identifiable cause, make some adjustment, use different raw materials)

The quality control engineer does his best work in either problem when he recognizes the existence of both, and deals with both simultaneously. In par-