A FEW SEEDLINGS OF RESEARCH

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1. Sowing

Graduate students sometimes ask, or fail to ask: "How does one do research in mathematical statistics?" It is a reasonable question because the fruits of research, lectures and published papers bear little witness to the ways and means of their germination and ripening. How did that author ever come to state this theorem so aptly, to snatch this neat proof from the thin air: surely it never sprang fully armed like Pallas Athene from the brow of Zeus? No, indeed not, rest reassured. But still the question is a hard one. The answer depends much upon the field of statistics, and even more upon the tastes and skills and prejudices of the researcher. The only means of appraisal is case study, and no author has the data for any case study but his own. Without more ado or apology, I shall speak of some of my own work and how it came about: and it will have to be a personal story, with all natural drawbacks, and of course to get a proper view of things at large, you will, nay must, look elsewhere for other accounts by other men of their own work.

The Committee on Support of Research in the Mathematical Sciences, in the introduction to a volume of essays [21], wrote:

"Our task was to assess the present status and the projected future needs, especially fiscal needs, of the mathematical sciences. . . . We realize that even scientific readers of our report, let alone nonscientists, may feel that they are not adequately informed about what mathematical research, especially modern mathematical research, consists of. Similarly, even professional mathematicians . . . may be unaware of the applications. . . . To provide additional background of factual information concerning the mathematical sciences, we are supplementing our report with the present collection of essays. . . . We believe that the mathematical community has no obligations more important than those concerned with education. . . ."

The essays in this collection provide an excellent account of the substance and applications of mathematical research: it deals, as the Committee intended, with the what. It does not try to deal with the how. Yet anyone agreeing with the last sentence in the above quotation, as I heartily do, must feel that the how also deserves educational coverage. So I have conceived the present paper as if it were *one* chapter for a companion volume, yet to be compiled, on the how of mathematical research.