

The Committee on National Statistics

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Virginia Woolf in 1928 wrote a wonderful book called *A Room of One's Own*. It is a luminous, lucid, compelling argument for the release of women's energies from long-continued economic and social fetters into all kinds of professional, artistic, and other fields. Virginia Woolf was particularly concerned with the woman writer, and the idea of a room of one's own epitomized the conditions, often lacking in the past, that are needed for a writer's work. I admire *A Room of One's Own* enormously; it presaged 40 years ago today's women's liberation literature, and it does so with a superior style and intellectual grasp.

Yet Virginia Woolf falls into a statistical trap. She writes of how she went to the huge library of the British Museum in London, full of plans to do library research on her topic of women and fiction, a topic whose bounds she soon transcended. She goes to the "W" section of the catalog to look at the subject of women, and she is stupefied—that is her word—to see, first, how many, many books are written about women, and, second, how large a proportion of them are by men. By contrast, there are the books about men, fewer in number, and few of them by women. "Why," asks Virginia Woolf, "are women, judging from this catalogue, so much more interesting to men than men are to women?"

You will have seen the trap. One is dealing with a two-row by two-column table of book topic by author's sex. The two rows might be for books about women and about men, and the two columns for books by women and by men. The empirical marginal material shows that there are many more books about women than about men, and

many more books by men than by women. Under those circumstances—deplorable in themselves—it is hardly surprising that books about women should mostly be by men; in fact, statistical independence of rows and columns would produce that outcome.

I do not want to belabor this point, which is only illustrative in Virginia Woolf's book, yet it does serve as an example of the interrelationship of statistics and public policy. We see today a wide concern about the role of women and of some minority groups; leaders of opinion, when discussing that concern, often quote statistics and use statistical methods, frequently with extraordinary naiveté, not to say tendentiousness. There results a numbers-game kind of rhetoric.

Certainly there is good statistical work done in connection with the status of women and minority segments of society—for example, analyses of differences in income distributions at the Bureau of the Census, at the Rand Corporation, and no doubt elsewhere—but there is a great deal of shoddy work. Where are the statistical critics of such shoddiness?

Virginia Woolf's title, *A Room of One's Own*, leads me to another kind of metaphor for statistics, considered broadly. Perhaps statisticians are too much in their own rooms, or even in their own separate houses. I see houses labeled economic statistics, agricultural statistics, mathematical statistics, and so on; they are handsome houses set on broad estates and rather far apart. There is visiting back and forth, usually rather formal and ambassadorial; there is an occasional exogenous marriage, perhaps at a celebrated school of business, leading to establishment of a new ménage; and there are annual meetings at the town hall. By and large, however, those in the houses work their own estates. It is not easy for them to notice that they have com-

mon problems and concepts—for example, that the medical statistician, the actuarial statistician, the reliability statistician, and others are all concerned with survivorship phenomena. The terminologies differ, but, at the core, the content is much the same.

Another example of a common core may be that of multiple simultaneous inferential statements. The Bureau of Labor Statistics, to give one specific instance, publishes monthly unemployment figures, in toto and by numerous categories. The accompanying text discusses changes from the prior month in total unemployment and in unemployment in a variety of categories (by age, sex, race, and so forth). In general, the text mentions a change only when it is statistically significant (although this technical term is not currently used). It would be quite possible to have, let us say, white unemployment and total unemployment not change with statistical significance, and at the same time to read that nonwhite unemployment did so change. Yet total unemployment is a weighted sum of white and nonwhite components, with positive weights, so at first blush there might seem to be an inconsistency.

Statisticians understand, in a sense, what is going on, yet I suppose that the expository difficulty, at least, must long have worried statisticians at the Bureau of Labor Statistics. And perhaps there is an underlying scientific difficulty as well. The theory and practice of multiple comparisons was, after all, developed by Henry Scheffé, John Tukey, and others for just this kind of problem in the context of analysis of variance, and multiple comparison methods have been happily used in many fields of application. The central *mathematical* idea is the description of a convex set by its bounding hyperplanes.

Return now to the house metaphor and compare the earlier one of separate houses with another, that of a single crowded house, where the phrases "economic statistics," "medical statistics," and so on are written over the unlocked doors of the rooms. It is a house in which screams of anguish or shouts of "Eureka" in one room can be heard in others, and in which the inhabitants of one room can visit another for coffee, dinner, or a long stay. Not very good for private life, I expect, but healthy and stimulating for public, professional science.

One theme, then, is the ecumenical one. The word "ecumenical" arises, af-

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ter all, from the Greek words for "house" and "inhabitant." It is important to bring more closely together professionally the many kinds of practitioners of statistics. Can the Hatfields and the McCoys live together? Can business statisticians agree to stop complaining about mathematics in journal articles, and can theoretical statisticians agree to try seriously to avoid unnecessary technicalities and to describe what they are doing in plain English, or at any rate in plane geometry? I doubt that such reconciliations will occur soon, but there can be movement in the ecumenical direction.

That call for professional togetherness leads back to statistics and public policy, as well as to the role of statistics in government. I suppose that most people regard government statistics, or federal statistics, as primarily made up of descriptive series of economic and demographic indexes: the Consumer Price Index, the gross national product, the Current Population Survey, birth and death statistics, and so on (1). Surely that is the standard notion of government statistics, and it covers highly important activities.

It seems to me, however, as it seemed to the President's Commission on Federal Statistics, that—important as the components of that standard notion are—the full scope of federal statistics is much more comprehensive (2). It includes statistical problems of weapons evaluation, social experiments, cryptography, agricultural field trials, reliability statistics for NASA, body counts and pacification statistics, predicting costs of medical programs, and on and on.

Much of that huge cloud of statistical thought and action, a cloud that suffuses all government activity, is not carried out by people called statisticians, or trained as statisticians. Much of it is not regarded as having important statistical components. Consequently, much of it is of poor quality.

One hears discussions of problems of centralization versus decentralization in the government's statistical agencies, some commentators have raised questions of political intrusion into the scientific work of those same statistical agencies, and many statisticians are concerned about questions of concept and coverage for statistical series. It seems to me that such discussions are important and necessary, but that they do not attend to a great statistical desert out there—out there where statistical problems are not recognized as such; where randomized ex-

periments, study of error structure, high standards of tabular and graphical presentation, the intelligent use of probability theory in inference, and the like lie years in the future.

So another theme I present is that of the desirability of evangelical, along with the ecumenical, activity. Statistical problems and opportunities are everywhere in national policy matters, not just in the traditional areas.

It is to these themes—and other related ones—that the Committee on National Statistics addresses itself. The committee, to begin with, is an activity of the Division of Mathematical Sciences, in the National Academy of Sciences—National Research Council. Second, the committee is, in important senses, an outgrowth and continuation of the President's Commission on Federal Statistics (2). One of these senses is that four members of the committee had been members of the commission (3). A second sense is that the committee will, it is hoped, carry out studies of a longer range than those the commission, with its brief 1-year life, could undertake.

The committee is fortunate to have substantial portions of the energies of Margaret Martin (formerly of the Office of Management and Budget) as executive director, and of Edward Tufte (Princeton University) as research director. The committee has a generous start-up grant from the Russell Sage Foundation and has been busy talking about, and taking, initiatives. Those initiatives are toward prospective activities that deal with problems the members consider important, for which they are particularly competent, and which are likely to generate financial support from government agencies or private foundations. The anticipated *modus operandi* will be by task forces for specific projects, a task force comprising some members of the parent committee, together with others appropriate for the problem at hand.

The committee has been considering projects of several kinds. One possible project represents a reaching out toward nontraditional kinds of federal statistics. It seems that a great deal of federal statistics—whether or not it is *called* statistics—gets done by private firms under contract to the government. Further, it seems that such contract work is of highly variable quality and that characteristics of the contracting and review process make it difficult to improve professional standards. Finally, the committee has ideas about how to study

this complex area, and it hopes that a far-seeing federal agency will give that study both blessing and funding.

Another possible project is the study of voting statistics: their generation, accuracy, publication, efficient retrieval for research, and so on. This is an area that lies in the intersection of federal, state, and local statistics and is clearly one of wide interest. It is hoped that the General Accounting Office will see fit to urge the committee, morally and materially, to carry out a study of voting statistics. Other possible projects relate to crime and judicial statistics. Still another concerns statistical issues of environmental problems.

Finally, I mention a different sort of problem in which the committee is interested. For any descriptive federal statistics program—money supply, mortality rates, school enrollments, price indexes—there is an inevitable tension between the desire to publish results as soon as possible and to have results as accurate as possible. This methodological problem cuts across classifications of subject matter. The Statistical Policy Division of the Office of Management and Budget, under Julius Shiskin's leadership, has been concerned about the problem and has moved toward establishing guidelines. Further study, analysis, and synthesis by the committee may well prove helpful.

There is clearly no dearth of problems; the difficulty will be to find the best and to avoid tackling too many at once. The committee welcomes suggestions from any quarter, especially if they are accompanied by ideas for specific, feasible activities.

The committee clearly must maintain close touch with the statistical professional societies. It also, of course, wants to remain in a friendly, interactive relation with the Statistical Policy Division of the Office of Management and Budget, as well as with the old-line central statistical agencies. After all, it is in those places that one finds the real heart and brain—not to speak of the muscle—of federal statistics. The committee hopes also for valuable interchange with other parts of the Executive and the Judiciary, and with members of the Congress.

Virginia Woolf was concerned that most writing about women was by men. Statisticians may be concerned that much statistical writing is by non-statisticians and that that disproportion indicates the uncertain, fettered position of professional statistics in the

world of public and governmental policy. I hope that the Committee on National Statistics will work with other groups to establish and maintain a room of its own for statistics in the house of public policy, a room of our own, with a wide, clear view and with lots of doors to the rest of the house.

References and Notes

1. Brief, nontechnical descriptions of many of these economic and demographic indexes, along with descriptions of other statistical activities, are presented in J. M. Tanur, F. Mosteller, W. H. Kruskal, R. F. Link, R. S. Pieters, G. R. Rising, Eds., *Statistics: A Guide to the Unknown* (Holden-Day, San Francisco, 1972).
2. *Federal Statistics: Report of the President's Commission* (Stock No. 4000-0269, Government

- Printing Office, Washington, D.C., 1971), 2 vols.
3. Those four members are Frederick Mosteller (Harvard University), William Shaw (E. I. du Pont de Nemours & Co.), Stanley Lebergott (Wesleyan University), and myself. The other members of the committee are Douglas Chapman (University of Washington), Cuthbert Daniel (Consultant), Bernard Greenberg (University of North Carolina at Chapel Hill), Morris Hansen (Westat), I. Richard Savage (Florida State University), and Elizabeth Scott (University of California at Berkeley).

NEWS AND COMMENT

NIH Director Stone: Another Manager on Nixon's Health Team

The first thing to say about Robert S. Stone, the new director of the National Institutes of Health (NIH), is that good management is foremost on his mind, just as one might surmise from a look at his curriculum vitae. Stone, who has been dean of the University of New Mexico's School of Medicine since 1968 (he was chairman of pathology before that), has just completed a year's sabbatical at the Alfred P. Sloan School of Management at the Massachusetts Institute of Technology. During his months in Cambridge, he read, attended classes, worked with a few students on their theses, and thought a lot. He says his experience at Sloan was "clearly one of personal renewal."

Stone was hired to be director of NIH because of his experience and interest in management—there is no doubt about that—and because officials of the Nixon Administration believe he will fit in with the health team that is being created. Charles S. Edwards, recently named assistant secretary for health in the Department of Health, Education, and Welfare (HEW), of which NIH is a part, spoke with *Science* about his view of the NIH directorship and the man chosen to fill it. "The head of NIH must understand the ingredients of science, but he need not be a great scientist himself. It is better that he be a good administrator who can provide a stable environment in which scientists can work." Stone basically shares this view of the NIH directorship and says that he and Edwards, whom he never knew until a few weeks ago, get along well. Said Edwards of Stone, referring to reasons for hiring him, "I like his personality. He doesn't come on too

strong, but has a firmness about him that is impressive." Stone, 51 years old, is a Republican.

At the NIH "reservation" in Bethesda, Maryland, where campus leaders initially were stunned by Stone's appointment, people seem to be coming around to the opinion that he may be acceptable after all. Until about a month ago, Stone was virtually unknown to the biomedical research community, although many medical school deans know who he is (*Science*, 25 May). To the man, every colleague of Stone's in the fraternity of deans who was contacted by *Science* said the Administration probably had made a good choice. The researchers were less sanguine. Many were, and are, uncomfortable with the thought that Stone is a "manager"—they would have preferred a man of considerable stature as a scientist—and they were a little put out to think that the Administration would name somebody they had never heard of. Many were naively hoping the President would appoint another James Shannon to the post. (Shannon was the tough, persuasive leader who built NIH into the research empire it is during the 1950's and early 1960's.)

But those scientists who have had a chance to deal with Stone since his arrival on the scene say they feel much less apprehensive. As one of them remarked, "We were all relieved to discover that he has only one head." Stone, apparently, has convinced at least some of his colleagues that his interest in management does not mean that he is against research and that he has no intention of supervising the demise of the NIH.

This is not an easy time to be the

director of the NIH. Money is short and investigators are continually worried about where funds are going to come from. The traditional values of the biomedical community are under attack, and, whether anyone in the Administration really wants to dismantle the peer review system (*Science*, 8 June) or substitute contract research for investigator-initiated studies, it is a fact that people outside the scientific community are asking questions that researchers find threatening.

Robert Stone sees himself as a man who must step into this breach and try to get scientists and administrators to talk to each other. He sees himself as a translator, converting the language of management to a form of English the scientists can comprehend and the language of science to one administrators can understand. Stone's own word for it is "linkage." "My perception of this job, after being here only a few days," he said, "is that there are enormous requirements for linkage."

Stone takes the case of investigator-initiated projects and grant applications as an example. Most biomedical researchers are partial to the grant system and are busy defending this way of supporting research as the one most likely to produce new and imaginative ideas. Persons versed in management, on the other hand, often see this as work that falls into the so-called research for research's sake category, which, in their view, is something this nation can no longer afford—better to conduct research by contract, in which experiments are designed to answer more specific questions.

Stone suggests that the real issue here is one of understanding. "We must dispel the notion that investigator-initiated research is a random, unplanned process that does not have much to do with getting somewhere," he says. "Actually, it is highly planned." As Stone sees it, part of the problem lies in the fact that grant applications, quite reasonably, are written in scientific terms, not those of management. He believes that most grant applications