



R. L. ANDERSON*

Goals: Where Are We and Where Should We Be Going?

Best wishes *Real*

1. SOME WORDS OF APPRECIATION

As a prelude, I would like to offer my profound gratitude for the services rendered by the ASA staff, especially by Fred Leone, Ed Bisgyer, Jean Smith, Jill Stormer, Ede Denenberg, and Dorothy Zimmerman. The dedication of this staff to the ASA, its members, and the general public is outstanding. I would also like to express my heartfelt appreciation for the many amenities provided by my most severe critic and constant companion, my wife, Mary.

I also wish to thank the ASA committees, and especially the chairs, for their service to the Association. I am sure that the staff and officers realize that the ASA could not function without them. We have adopted a new constitution developed by an industrious committee under the leadership of Kathleen Lamborn; the ASA-NCTM Committee under Dick Schaeffer is developing precollege teaching materials in statistics; the Future Goals Committee under Joan Rosenblatt is struggling to come up with a program that is both desirable and salable; Tom Jabine's Committee on Scientific Freedom and Human Rights has persuaded the board to take some strong action and continues to push for more definitive procedures.

One of the chief activities during the past two years has been the excellent ASA Management Review conducted by John Corson of the National Executive Service Corps. Mr. Corson's diligent, penetrating, and judicious report covered four areas: improving the functioning of the Board of Directors, reassessing ASA's programs, im-

proving the functioning of the headquarters staff, and improving the structure and outreach of the association. The report and the board's response were published in the November 1983 *The American Statistician*.

An ASA Building and Development Committee, chaired by Ralph Bradley and Margaret Martin, is developing procedures to solicit donations to a Building and Development Fund. The generosity of many of you has resulted in pledges of over \$250,000 to date. A consulting firm and a full-time coordinator have been employed to develop a "case statement" on the rationale for developing ASA programs and the need for a new building to support these programs. The committee has now shifted its operation into high gear with Fred Leone assuming a much more active role.

2. THE AMERICAN STATISTICAL ASSOCIATION

I now address my title: "Goals: Where Are We and Where Should We Be Going?" The "we" is both the ASA and the statistics profession. Although these two are intrinsically intertwined, I will attempt to indicate the "wheres" for each. At the present time, the ASA has a membership of about 15,000; unfortunately, there has been little change in this total in the last four years. Strenuous efforts are being made to find out why old members are leaving and why many statisticians have never joined.

To date we have 62 chapters, which should form the backbone of the association; unfortunately, most of them feel they have little impact on our policies, decisions, or operations. Efforts are under way to solicit and utilize recommendations from them. On the advice of Mr. Cor-

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son, Fred Leone and I have initiated periodic visits to chapters; I hope that such efforts will be continued.

Another essential role in ASA performance is played by the sections. When I joined the ASA in 1942, it had one section: Biometrics. We now have 10 sections and subsections to cover specific fields of statistical methods, theory, or applications. An ASA member can choose to belong to any number of these—from 0 to all 10. A sample from the 1978 Directory of Statisticians indicated that about 30% of the ASA members belong to four or more sections or subsections. In order to ascertain from section members their opinions regarding ASA activities, it would be useful to know which sections a member considers to be of prime importance. I have asked the Committee on Sections to find out from you ASA members whether it would be desirable and feasible to list the one or two sections that you consider to be of prime interest; then the business of the section might be transacted by only those members who designated that section as prime.

The 1978 directory is a list of members of the ASA, the Institute of Mathematical Statistics (IMS), and the two North American regions of the Biometric Society (ENAR and WNAR). I am disappointed and chagrined that the IMS has decided to issue a separate directory in 1984. I was amazed to find that approximately one-third of the American members of IMS were not members of the ASA in 1978. I am pleased that the IMS joined us in Toronto, but I feel that the two groups do not meet together often enough. This apparently ever-widening gap between the applied and theoretical statisticians is of great concern to me. What can we do to narrow this gap? For example, should we have an ASA Section on Theoretical Statistics? Perhaps we should have an ASA Section on Applied Probability, which could serve as the focus for the activities of another group of applied mathematicians who are so important in the development of the statistics profession.

I am hoping that the Committee on Committees can develop a systematic procedure for deciding what continuing committees are needed and the distinct role that each committee should play in ASA operations. Two other problems with regard to the committees are

1. How can we evaluate their performance?

2. How can the President-Elect, who fills vacancies on committees, be apprised of who would be willing and able to serve—especially the younger ASA members?

On the second question, perhaps departmental chairmen and division leaders in industry and government should be making recommendations.

As the ASA increases its number of journals, how do we best serve the membership in its journal selection process? An ad hoc ASA committee under Bob Hogg is now struggling with this so-called "unbundling" problem.

There have been complaints that the proportion of theoretical articles in our journals is increasing and many industrial statisticians state that the ASA is not catering

sufficiently to their needs. Are these impressions associated with the plateauing of the membership count? The direction we take on these matters can have a profound influence on our profession. Your advice is sincerely solicited.

An important aspect of our profession in the future will be continuing education. A tremendous variety of short courses, workshops, tutorials, and films was presented at the Toronto meeting. There have been protests concerning overlap with the regularly scheduled sessions. Should we curtail this overlap? With the rapid changes in science and technology, there will be an ever-increasing need for retraining of research personnel. It would seem desirable to have continuing education sessions at the regional meetings and there is strong support to have more frequent regional meetings. It should be apparent that increased activity by the continuing education group will entail a need for increased space and personnel.

A most perplexing problem facing the U.S. statistical community at this time is the reduction of federal budget allocations and professional staff for statistical operations. The ASA is participating in the activities of two organized groups that are leading the opposition to these cuts:

1. COSSA, the Consortium of Social Science Associations, has an executive director who issues timely legislative reports on fiscal, legislative, executive, and other relevant federal operations as they affect the social sciences.

2. COPAFS, a Council of 12 Professional Associations on Federal Statistics, is now on the last year of a three-year pilot program with a full-time director. It reviews and monitors federal statistical programs, reports to its members, issues documents and letters of concern, and arranges for presentations to congressmen on specific action. The ASA Board of Directors has approved continuation of this program.

The ASA appreciates the support of the American Association for the Advancement of Science (AAAS)—at its 1983 Annual Meeting in Detroit—of a resolution that presented the need for the maintenance and improvement of federal statistical programs and concluded with the resolve "that the AAAS Council call upon the Administration and Congress to recognize the centrality of quality statistical information systems and data bases of strategic national importance concerning the state of the economy and the state of technology, and to insure the existence of a viable, authoritative and independent unit to fulfill the needs for coordinating federal statistics and for maintaining their quality and integrity." It is essential that we continue and even expand cooperative efforts with the AAAS at all levels of statistical endeavor.

There has been considerable interaction with the U.S. Congress and the Executive Office of Management and Budget by individual members of the ASA board and other members. Senator Percy (of Illinois) convened a Conference on Federal Statistics and National Needs on

January 25, 1983, followed by a workshop on the "Data Needs of America in Transition" (with emphasis on the 1990 census) the following two days.

The ASA Committee on Law and Justice Statistics has just been awarded a grant to provide technical assistance to the Bureau of Justice Statistics. The ASA participates with the Committee on National Statistics of the National Academy of Sciences and a number of other professional organizations to sponsor a biennial Symposium on Statistics and the Environment.

One of the most active committees in this respect has been the ASA Committee on Statistics and the Environment, which has been working with the Environmental Protection Agency (EPA) to improve the statistical aspects of its program. A two-day short course, "Time Series," was offered in 1981 and another, "Quality Assurance," in 1982. The Office of Radiation Programs supported five-day symposia in 1981 and 1982 entitled "Low Order Radiation and Environmental Sampling" and "Analysis of Sampling Data: Assessment of Human Exposures and Health Effects." One was held in July 1983, entitled "Radiation and Health," with financial help from the Occupational Safety and Health Administration (OSHA).

3. THE STATISTICS PROFESSION

But what about the statistics profession? I feel that the time has come to decide whether we should have some form of professional certification and/or a code of professional ethics.

An excellent paper, "A Professional Code for Statisticians? Some Ethical and Technical Conflicts," by Roger Jowell (1981) is followed by extensive discussion. Jowell argued for an educational code covering statistical practice and relationships with respondents, funders, peers, and society at large.

An ad hoc ASA Committee on Professional Ethics, which has been struggling with this problem since 1977, submitted a report containing a set of such guidelines in the February 1983 *The American Statistician*. Many statisticians strongly supported these guidelines; however, there were a number of caveats. Since I tend to oppose attempts to legalize morality, I was impressed by Herb Solomon's comments (1983):

There are already enough constraints—economic, social and legal—that operate to keep us responsible in our efforts. The abuses of such systems (of Ethical Guidelines) would far outweigh any gains. . . . I think the ASA should keep on doing what it does well: publish journals, organize meetings, develop chapters, develop educational activities, and render statistical advice to government agencies. The notion of having a court available to resolve matters of individual behavior in statistics is anathema to me.

On the other hand, I strongly support some form of certification that an individual has the necessary training to undertake the statistical activities for which he or she is employed. How much longer are we to tolerate the minuscule requirements for statisticians in the state and

federal civil services? The requirement for a statistician in the Kentucky Civil Service is a bachelor's degree with one course in statistics, except that the college education can be replaced by experience in gathering and analyzing data on a year-for-year basis. A senior statistician has the same requirement plus only two years of experience, whereas a Statistical Supervisor requires only four additional years of experience. I presume that these requirements are typical of many states.

For a GS-5 Federal Statistician, the requirements are only slightly higher: a bachelor's degree with two three-semester-hour courses in statistics and three more courses in mathematics or statistics; however, courses can count as statistics courses if as little as 50% of the course material is statistical methods. Experience can substitute for the other course work. Advance in grade is based on professional experience or graduate course work. To be designated as a Mathematical Statistician the candidate need have only two courses in statistics, four in mathematics, and two more in statistics or mathematics.

I will discuss two impediments to our efforts to have statistics recognized as a unique scientific discipline. The first is the public's perception of a statistician as only a number cruncher—a compiler of baseball, football, basketball, track, and other sports records, Dow Jones stock averages, and the like. This was emphasized in two recent *Peanuts* cartoons in which Linus presented the horrendous statistics for their baseball team and remarked that "Statistics don't lie." To which Charlie Brown replied, "No, but they sure shoot off their mouth a lot." Then Charlie asked what they should do next season, to which the unanimous reply was: "Get a new statistician."

When Janet Norwood presents the latest Consumer Price Index (CPI) on television, few members of the audience are aware of the complex statistical tasks involved in producing it—starting with the construction of the index formula, then data collection, tabulation, and analysis of results. Somehow we need to acquaint the public with the crucial role that statisticians play in this operation. ASA's Continuing Education Department is developing media presentations that will focus on this problem; they have been too long in coming.

A second impediment to our attempts to establish that we are a unique scientific discipline is the fact that statisticians are not identified in the *Statistical Abstract of the United States* (Bureau of the Census 1981); instead, they are included with the general classification of "Mathematicians or Mathematical Scientists." The National Science Foundation (NSF) is cited as the source for the abstract's material on characteristics of scientists and engineers, including employment, salaries, and doctorates conferred. This problem was highlighted in some advice we received on information needed in submitting a proposal to the NSF to provide funds to initiate statistical training in the elementary and secondary schools; the main obstacle is the present loaded math curriculum. An article in the July 4, 1983 issue of *Business Week* is

Some of the other needed developments are as follows:

1. Promote the development of statistical quality control courses in our statistics departments and engineering and business colleges.
2. Develop SQC short courses (and, if possible, longer courses) for government agencies.
3. Although many of the major U.S. industries are now employing SQC experts, there may be a need to ascertain whether we should provide assistance to the smaller concerns.
4. Provide chapters with speakers on SQC.
5. Support the ASA Section on Physical and Engineering Sciences with funds to develop forums and seminars on SQC and related topics. A typical example was a recent seminar, "Statistics, Product Design, and Quality Control" held at Madison, Wisconsin.

4.3 Federal Statistics

As I indicated above, one of the tragedies of the recent past has been the diminution of the federal statistical system, especially at top administrative levels. Of perhaps even more importance has been the drastic reduction in force (better known as RIFing) in such agencies as the Energy Information Administration and the Census Bureau. The statistical profession must expedite procedures to diminish the chances in 1990 of a repetition of the legal tangles involving the 1980 census. An excellent review of those legal problems is presented by Barabba, Mason, and Mitroff (1983). We should urge the Census Bureau to update its quality control (QC) procedures, especially at the grass roots of local organization and data collection and compilation. A good example of what can be accomplished is the QC program at the Bureau of Labor Statistics.

One of our tasks should be to develop a mechanism to monitor the official statistics and pronouncements issued by our federal agencies on environmental pollution, unemployment and poverty, food stamps, aid to parents of dependent children, crime rates, Social Security, gross national product (GNP), producer and consumer price indices (PPI, CPI), money supply, and business and farm foreclosures, to name a few.

I commend to your attention the strong remarks of Bonnen, Fienberg, and Slater in the August 1983 issue of *The American Statistician* and urge statisticians to unite in an effort to persuade the U.S. Congress to create a Central Statistical Agency in the Executive Office of the President. In the meantime, we should support the efforts of Congress, COPAFS, COSSA, and our continuing education group to restore and enhance the prestige of statistical divisions in the federal agencies.

4.4 National Defense, Military Operations, and Human Rights

Where were the statisticians when the Vietnam War statistics were being manufactured and circulated? What are we doing about the statistics coming out of Central

America? What about the statistics on comparative military strengths? The ASA Committee on Scientific Freedom and Human Rights has been concerned with the controversy over the monitoring of progress in human rights in El Salvador and has proposed that some ASA committee should review the statistical methods and evaluation of data sources used in monitoring freedom and human rights. Many of us believe that this is our responsibility, but others feel that it would be setting a dangerous precedent. What do you think?

5. CONCLUSION

Recently I watched a rerun of the telecast of the last episode of Carl Sagan's excellent *Cosmos*. He reminded us that history is replete with the destruction of scientific and artistic achievements and even civilizations because of fear, superstition, and the lust for power. I am sure that we all join him in the plea that this should not happen again, because this could be Armageddon. The future can be an exciting time for statisticians. In the words of Johannes Kepler as quoted by Sagan, "The diversity of the phenomena of nature is so great and the treasures hidden in the heavens so rich that the human mind will never be lacking for fresh nourishment."

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