BOOK REVIEWS

Asking and Answering

Questions about Questions. Inquiries into the Cognitive Basis of Surveys. JUDITH M. TANUR, Ed. Russell Sage Foundation, New York, 1992. xxii, 306 pp. $34.95.

Scientists invest great effort perfecting their research instruments, no less in the social sciences than in the natural sciences. Poor questionnaire construction is as troublesome for a sociologist as a poorly shaped telescope mirror is for an astronomer. Over a century ago, statisticians noticed that census reports tabulated an inordinate number of people with round-number ages. Questions on both age and birth date were included in the 1900 U.S. census, and ever since we have realized we can get more accurate data about age by asking instead about birth date. The cost of the 1900 census age-question experiment was one or two work lifetimes, because redundant data were collected for 72 million people, and today we realize that the same could be accomplished with a random sample of a few thousand.

Such government agencies as the Bureau of Labor Statistics and the National Science Foundation have long supported studies of research methodology, and private organizations like the Social Science Research Council (SSRC) are active as well. Now, methodologist Judith Tanur has edited a wide-ranging volume from workshops sponsored by the Committee on Cognition and Survey Research of the SSRC. Most of the chapters contain extensive literature reviews, and the diversity of essays makes this suitable as a supplementary textbook for methodology classes or as a balanced introduction to the field for personal reading by specialists in many disciplines.

Roughly speaking, the people who answer survey questions can be divided into two groups. An *informant* provides objective information, whereas a *respondent* offers personal opinions, feelings, and attitudes. Informants are unpaid research assistants, far less costly than direct observation of their lives would be. When we want objective information, a person who gives opinions instead is a nuisance. But social scientists are often concerned with opinions and thus intentionally encourage their research subjects to be respondents rather than informants. The trick is to communicate the task to them as effectively as possible and motivate them to cooperate.

Several empirical studies in this collection evaluate sources of error and suggest how to improve accuracy through the ways questions are asked. A team interviewed 893 members of the nation's largest health maintenance organization about their visits to the doctor's office, comparing their answers with medical records, to see if accuracy is affected by the chronological order in which respondents are asked to recall events. Other research compared respondents' recollections about voting with official voting records, finding that some reasonable attempts to reduce false claims of voting failed to do so. Another study observed college students at a feast, then interrogated them about what they had eaten to assess accuracy of nutrition surveys. Methodological studies like these can improve accuracy in surveys on health, voting, and nutrition, and they contribute to scientific knowledge of how memory works.

A chapter by Pearson, Ross, and Dawes suggests that people go through a two-stage process when recalling personal characteristics, first noting their present attributes and then invoking an implicit theory of stability or change to reconstruct the attributes they had in the past. For example, I am a sociologist who began college as a physics major. If I believe that people tend to be consistent throughout their lives, I will tell an interviewer that my freshman skills and opinions were highly congruent with sociology. But if I believe people frequently change, I will recall far greater differences between my freshman self and the person I am now. Experiments on recollection highlight the importance of landmark events, time frames, and sequences in defining chronologies, as well as the power of current beliefs to reshape memories of the past.

One reason for the great expense of surveys is that a higher response rate is achieved by asking the questions in a face-to-face or telephone interview than by mailing out printed forms. But insightful essays by Clark and Schober and by Suchman and Jordan challenge simplistic models of interviewing. In a normal conversation, people rely upon many shared assumptions to interpret the meaning of a question, and they build up common ground through a free exchange. But when the interviewer for a major project like the General Social Survey (GSS) enters the Jones house, the ensuing interaction violates many rules of ordinary conversation. The questions are not spontaneous creations of the interviewer but an inflexible script written long before by a distant team of social scientists who never get to meet Mrs. Jones. The interviewer reads the questions verbatim, with a minimum of gestures and emotional tone, and is not allowed to converse about the meaning of items.

Ever since 1973, one battery in the GSS has asked how much confidence the respondent has in the people running a list of institutions, including "the scientific community" and "organized religion." Mrs. Jones might ask, "By science, do you mean sociology as well as chemistry and physics? By organized religion, do you mean just centrally organized churches like the Roman Catholics, or do you also mean disorganized Southern Baptists?" The interviewer is not supposed to offer guidance. "Whatever it means to you. Let me repeat the question." This is the standard way to achieve uniformity of stimulus from one interview to the next, but it treats respondents like products on an assembly line and deprives them of the usual means for verifying that they understand the interviewer's questions.

Questionnaire writers are quite aware of these problems, and a chapter by Groves, Fultz, and Martin reports a GSS pretest study that directly asked a hundred respondents how they interpreted some of the questions. Items that get into the GSS usually have a long history of use and evaluation in smaller surveys, and although people are bound to differ somewhat in their interpretation of anything, well-developed survey items do validly measure the concepts scientists want to study. Variations in the understanding of items are, it is hoped, random noise, uncorrelated with other items of interest.

Tanur's volume emphasizes fact collection on practical matters of concern to the government, but it includes essays on problems of opinion research. Krosnick and Abelson argue that it is not enough to know whether a person has a positive or negative attitude toward something, because the strength of that attitude is also important, affecting the tenacity with which the person holds it and the influence it has over his or her thoughts and behavior. They then identify five dimensions of attitude strength: how extreme the judgment is, how much emotional intensity is invested in it, how certain the person is that he or

she is right, how personally important the topic is, and how much relevant information the person knows. These simple insights add immeasurably to the job of the survey researcher, because they suggest that it may be necessary to ask five or six questions to get what amounts to one answer. Dovidio and Fazio double the researcher's burden by noting that people give different answers when responding spontaneously and responding deliberatively.

Social and cultural change transforms the meaning of questions, and researchers must be prepared to reword or replace items that become obsolete. The GSS has long asked about the proper level of funding of various government projects, including the "space exploration program," and it has retained this wording for the sake of comparability over the years, even though the emphasis in the space program has shifted from exploration of the solar system to exploitation of near-Earth orbit. Recently, the GSS has debated whether attitudinal items about "communism" should be retained, because the collapse of hostile Marxist governments has rendered this term highly ambiguous in meaning and possibly no longer scientifically interesting.

Among the more influential psychological instruments of the 1960s was the 20-statement Mach scale (named after the Italian political theorist Machiavelli), which measured a person's tendency toward guile and deceit. One item said, "Barnum was probably right when he said there's a sucker born every minute." Extreme Machiavellians have always felt that once a minute is a gross underestimate, but many of today's respondents have trouble even figuring out what this statement means. They may never have heard of circus showman P. T. Barnum, and the term "sucker" may have dropped from the slang lexicon. Another Mach item simply said, "Most men are brave." Originally, disagreement reflected the low opinion of human nature held by Machiavellians, but today many respondents react to it as a sexist remark that ignores the bravery of women.

Sane paleontologists do not talk with their fossils. Social scientists, however, must generally enlist the willing assistance of their research subjects and cope with considerable waywardness on the part of these untrained helpers. There is nothing wrong about this, although more adequate funding would sometimes allow us to use more effective research methods such as direct observation of human behavior. What joy would reign among paleontologists if they could really make the mute stones speak and ask the dinosaurs about their social life! The problems of survey research are manageable, and methodological studies like those in Tanur's collection are essential contributions to rigorous social science.

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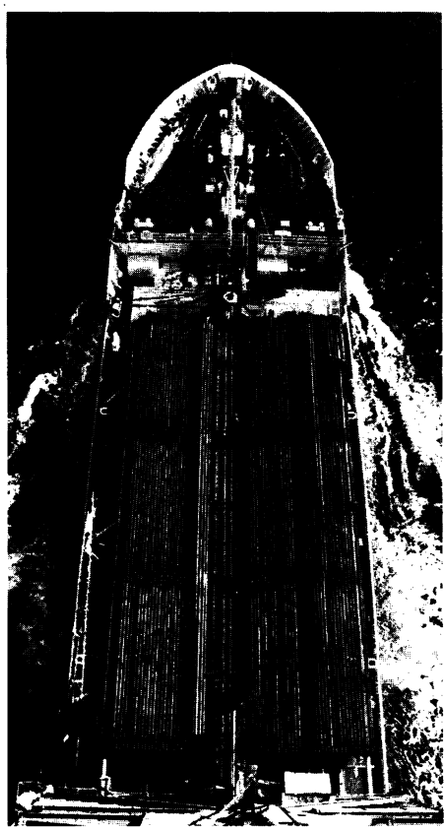
Opinions on Geology

Challenger at Sea. A Ship That Revolutionized Earth Science. KENNETH J. HSÜ. Princeton University Press, Princeton, NJ, 1992. xxxii, 417 pp., illus. $35.

Challenger at Sea: A Ship That Revolutionized Earth Science is rarely about a ship, and only sporadically about work at sea. It is about many revolutions in earth science, recent and long past, and how they happened, all strung together by the thread of the Deep Sea Drilling Project. Hsü preempts the critical reviewer by statements scattered through the preface—that the book "is not easy reading for general readers"; "it is not arranged in an orderly fashion"; "it is the story of a participant, and the partisanship is undisguised"; and, finally (appallingly), "I might as well accept the fact that my readers will only be those who want to learn something." This all makes the book sound awkward and difficult. It is not. It is written clearly, and if you have some small background in geology it is a quick and easy read. Hsü does get into some details and some complicated explanations—the listing of the 12 stages of the Cretaceous in a sentence; a complicated discussion of oxygen isotopes; an attempt to explain the measurement of the velocity structure of the earth, the petrography of the earth's interior, and the concepts of isostasy in a few short paragraphs—but if you are baffled by an item, keep going; these are isolated problems.



"Pipe rack on *Glomar Challenger.* Seven thousand meters of drill pipes are stored on [the ship]." [From *Challenger at Sea*]

As to the organization, since it is a chronological scramble and the chapters do not proceed logically from one topic to the next, it is an ideal book for browsing, so let me recommend a few of my favorite chapters.

Try chapter 15, "When the Mediterranean dried up." This is a great discussion of the stories that sediments can tell and how the key factors were discovered (by Hsü and others) to prove the dramatic concept that the Mediterranean had actually been walled off from the world ocean and dried up for a short period. The result was the deposition of salt 3000 meters below sea level and the cutting of great subaerial canyons around the basin.

Try chapter 8, "Swallowing up the ocean floor," where Hsü proves that this is not going to be a bland history of science by identifying heroes and villains in geology. On the assumption that every revolution is preceded by a tyrant, he nominates Sir Roderick Murchison for that position and suggests that Murchison's career in the mid-19th century led to the earth sciences revolution of the 1960s. Hsü demonstrates the influence of individual stubbornness and desire for self-aggrandizement in science in many short episodes. An ancient example is the history of the great controversy regarding glaciation in Europe that occurred in the latter half of the 17th and 18th centuries and resulted in the beginnings of scientific geology with Hutton and Lyell. Modern examples are the stories about how control of scientific drill sites was established by personal drive and persuasiveness.

Try the section of chapter 5 called "Isaac Newton was not Chinese." No doubt you were aware of that fact, but this section is a thought-provoking analysis by Hsü (a Chinese) of why the Chinese culture, as exemplified by the Chinese language, has not produced the sort of questioning science that the European and American culture has. The Confucian virtues of loyalty, constancy, and gratitude are great human attributes but may not lead to the develop-