PART II

Prepared Contributions

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I understood that this conference was to be informal in character, and I have not prepared any detailed statement of my own views, which have been expounded before on various occasions; see, for example, some of the papers in my Essays (Bartlett, 1962).

What one hopes for in a conference of this kind is an understanding of differing viewpoints, and if possible some reconciliation of them. Let me suggest therefore that divergent opinions be honestly recognized by all the interested parties as, in inference at least, no one method can be claimed to be the only method that people do or should use. I have listed various definitions of statistics and statistical inference either directly or indirectly implied in the rather miscellaneous collection of quotations given below, which I frankly admit are highly selected and biased, and make no claim to comprehensiveness. They do, however, support my claim that we have to recognize many antagonistic points of view, which I will try to summarize as follows (the *a* and *b* versions of each pair of statements being in some sense or other rival versions):

1*a* Statistics are facts or observations, not necessarily about the State.

1*b* Historically, both in science and in popular language, statistics are about aggregates or populations of individuals or events, and their properties as a group or on the average.

2*a* Statistical inference is inductive inference.

2*b* Statistical inference is inference from statistics.

3*a* Many people, but not all, advocate a statistical or frequency theory of probability.

3*b* Many people, but not all, advocate the explicit use of other, e.g. prior, probabilities and possibly utilities.

(i) Some of these regard these probabilities as personal and subjective.

(ii) Some claim they are impersonal and objective.

Having noted these various approaches, I should perhaps indicate briefly my own position. I would myself emphasize the historical association of statistics with populations and aggregates, and note that statisticians who recognize this character of statistics will necessarily recognize the frequency theory of probability. This bifurcation of probability theory, which has been recognized by many writers, including philosophers, such as Carnap (1950), naturally affects the way in which statistical inferences are made, because statisticians, such as myself, who favour the frequency theory prefer to base their arguments as far as possible on such generally accepted probabilities and not on the so-called subjective or 'degree of belief' types of probability. The fact that we avoid as far as possible explicit use of such probabilities does not imply that our inferences are any the less rational; we simply prefer to keep the two types of probability separate.

Quotations

'This science (the theory of probability) has for its main task the study of group phenomena, that is, such phenomena as occur in collections of a large number of objects of essentially the same kind.' (Khinchin, 1949, p. 1.)

'It dawns upon us that the individual case is entirely devoid of interest, whether detailed information about it is obtainable or not, whether the mathematical problem it sets can be coped with or not. We realize that even if it could be done, we should have to follow up thousands of individual cases and could eventually make no better use of them than compound them into one statistical enunciation. The working of the statistical mechanism itself is what we are really interested in.' (Schrödinger, 1944.)

'The science of statistics is essentially a branch of Applied Mathematics, and may be regarded as mathematics applied to observational data.' (Fisher, 1925, p. 1.)