Comments on *"Confirmation and Parsimony"*

Professor Schlesinger presents us with an argument which he hopes will justify use of his methodological principle, that of picking among competing hypotheses the simplest one which is not contradicted by the evidence. The argument seems to take several different forms none of which I find convincing. Let me try to explain briefly what seems to go wrong.

Professor Schlesinger remarks (p. 331) that, at least when our behavior is concerned, we cannot remain agnostic with respect to many propositions about the unobserved. And (though this is not explicitly said) if we are not to form our beliefs about the unobserved arbitrarily or randomly, we presumably must form them by rules, or at least in a rule-governed way which admits of description by lawlike regularities. If such a rule or regularity picks out general hypotheses that cover observed cases as well as unobserved, clearly it must be required that the rule not pick out any hypothesis which actually conflicts with what has been observed. Professor Schlesinger's argument now seems to proceed like this. There is only one rule which meets these conditions, that of picking the simplest hypothesis compatible with the evidence. Thus, if we are to use any rule at all, it must be this one.

That only the "principle of simplicity" can pick determinate general hypotheses is initially argued by example: Suppose we know that something moves on a closed orbit, and we know only three (nonlinear) points of the orbit. Professor Schlesinger claims that only the rule of picking the simplest curve satisfying these conditions uniquely determines a specific hypothesis describing the way the curve might look (p. 334). It is then suggested that in general only "the principle to pick the simplest of all hypotheses generally leads us to pick a unique hypothesis" (p. 335).

The initial example is disquieting, because it suggests that Professor Schlesinger means to require of a methodological rule that, given the

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data, it literally *determine* the favored hypothesis; that, given the data and the rule, one should be able to determine the favored hypothesis mechanically. But no methodology, much less the suggested rule of simplicity, will enable an investigator to crank out from the data Newton's mechanics or Einstein's general theory of relativity. We may hope that Professor Schlesinger had some weaker interpretation of "determine" in mind. He might have wished to say that the principle together with the data must make a unique selection from among all actually proposed hypotheses.

Much more to the point, the central claim, that only the rule of simplicity picks determinate hypotheses, is plainly false. Professor Schlesinger himself recognizes this (p. 338), observing that the rules directing us to choose by lots or to choose the hypothesis thought of first would both have the property claimed for the rule of simplicity, of yielding a determinate selection. Let me add to the counterexamples one which may help to make later points more clear. My proposed alternative to the rule of simplicity is the lexicographical rule: pick the hypothesis which occurs lexicographically first among those compatible with the data. The lexicographical ordering of hypotheses is determined by rewriting all mathematical expressions occurring in hypotheses as their verbal equivalents and then ordering as one does in a dictionary. If one is of a mind to identify certain syntactically distinct forms as representing the same hypothesis, a hypothesis' place in the ordering is determined by the first occurrence of one of its representations.

Armed with this further example, let us see what Professor Schlesinger says about the multiplicity of uniquely selecting rules. He claims that we have reason for preferring the rule of simplicity because any alternative rule will rely on something "extraneous" to the observations in yielding predictions about the unobserved (p. 339). In such cases, he seems to believe, past observations would not *"in themselves"* determine "which particular description we should choose for projecting into the future" (p. 339). These remarks leave me puzzled on many accounts. For example, what is to count as genuine evidence and what as extraneous to the evidence? Why should not the outcome of drawing lots or the word of a specially designated person (Professor Schlesinger's examples of extraneous information (p. 339)) simply count as part of the evidence to be used in evaluating hypotheses? I am also wholly unclear about what is meant by saying that past observations *in*

themselves do or do not determine choice of hypotheses. Consequently, I am at a loss over what the connection is supposed to be between such determination and the presence or absence of things "extraneous." Perhaps most troubling is that we are given no reason to opt for a rule which makes no use of extraneous information and which enables past observations in themselves to determine selection of hypotheses. Hence, even if something were to be said about the unclear terms, we would still have been given no reason to use the rule of simplicity rather than some competing rule.

It seems to me unlikely that these difficulties can be surmounted. No appeal to what is and is not extraneous and what it is for data to function in itself in confirmation, however these terms are plausibly understood, can justify selection of Professor Schlesinger's rule of simplicity over all others. To be convinced of this, compare the rule of simplicity with the lexicographical rule. In any plausible sense of the term, the one rule is as free from reliance on "extraneous" information as the other. Both rules rely only on the evidence (however "evidence" is to be analyzed) and on a certain ordering of hypotheses. These orderings seem, from a preanalytic point of view, to be entirely comparable in every general relevant respect which we know how to describe. Both are relative to the same language. Both are completely determined by formal characteristics of the syntactic objects which represent the hypotheses in the language. (This last claim can, of course, be known to hold for the ordering according to simplicity only when we know what that ordering is. But Professor Schlesinger's examples indicate quite clearly that he has such a formally described ordering in mind.) Similarly, what ever plausible (and nonquestion-begging) sense is given to the expression "determine in themselves," both rules seem equally to allow observations in themselves to determine selection of hypotheses. The two rules simply do not seem to be differentiated by these two characteristics. Hence, even if these characteristics could be argued to be relevant, it does not seem that they could provide a basis for preferring the rule of simplicity to the lexicographical rule.

In footnote 3 Professor Schlesinger takes up the objection that no reason has been given to prefer the method distinguished by freedom from "extraneous" elements. He replies by saying that unless we settle on the principle of simplicity we are faced with indefinitely many principles to choose from and no way to choose among them.

This is (as Professor Schlesinger recognized) just a meta-level version of the original argument for the principle of simplicity; and reapplication of the argument at a meta-level fares as poorly as did the original application. The point is, very simply, that there are a great many meta-rules of methodology selection which one could adopt. Some of these will select the principle of simplicity; many others will select other principles. For example, the meta-rule of selecting the first counterexample to Professor Schlesinger's thesis which came to Paul Teller's mind yields the lexicographical rule. We have been given no reason for selecting one meta-rule rather than another (or, for that matter, a reason for not selecting a determinate methodology arbitrarily), and it is hard to see how, a priori, we could be given any such reason. Consequently, despite Professor Schlesinger's forthright efforts, I do not see that we have been given any reason in support of his methodology of simplicity.