

Letter to the Editor

Philipian/Watsonian High (Flying) Philosophy

Dear Sir,

Two courageous Australian scientists, Philip and Watson (1986), have finally and definitely refuted geostatistics with their masterly article: "Matheronian Geostatistics: Quo Vadis." Incidentally, I appreciate the fact that the authors render unto Caesar that which is Caesar's, and unto the Devil that which is his.

Readers will no doubt appreciate the authors' lively prose. Nowhere is it marred by anything so unaesthetic or commonplace as a mathematical equation; nor are any references to the mundane problems of the mining industry made. Their tact and discretion are also worthy of note. Their delicate allusions to "poached eggs" (p. 103) will undoubtedly appeal to Isobel Clark's sense of humour.

But above all, readers will be fascinated by the logic of arguments propounded by Philip and Watson. For instance, their proof (p. 97) that ore bodies could not possibly be (statistically) stationary is mind-boggling:

"... with stationarity, observations are assumed to be realizations of *independent*, identically distributed random variables. The covariance function of geostatistics (i.e., the semivariogram) is a measure of *interdependence* of adjacent random variables, i.e., the theory of regionalized variables must assume first that *no spatial dependency* exists in adjacent measurements. ..."

What could be clearer or more decisive! The rest of the article continues in the same vein: flashy prose covering over fundamental errors and faulty logic. I shall not attempt to unravel this inextricably tangled mess, point by point.

However I would like to dwell on two of the criticisms of geostatistics that the authors particularly insist on. These are that (1) geostatistics is false and (2) that it does not constitute a scientific theory.

(1) *Geostatistics is false*. This conclusion clearly follows from the fact that predictions made using geostatistics are not in agreement with observed results. So, for example, kriging (p. 100, 101, and 113) "... will give rise to local bias, and since it ignores local trends, local fidelity in interpolation cannot be

expected." I am not sure what "local bias" and "local fidelity" are, but nevertheless, clearly, kriging is being criticized for not being in agreement with reality. In the same way on p. 110, we find that "... results are similar to IDW observations interpolation" (which is not good at all) "and can give a worse prediction for other natural data." So clearly, geostatistics is false because it can be (and according to the authors, has been) refuted experimentally. One might wonder why the mining industry has not noticed this over the past 20 years, but we shall come back to that point later.

(2) *Geostatistics is not a scientific theory.* The authors (p. 100 and afterward) use Karl Popper's demarcation criterion to determine whether geostatistics is scientific, and conclude that it is not because no predictions capable of being tested experimentally can be made using geostatistics. We can readily understand their disappointment: "For when we first came to geostatistics, the untestable nature of Matheron's assertions frustrated us" (p. 109) and likewise their irritation: "That we write so ascerbically is because we resent the time that we have wasted upon it" (p. 96).

So geostatistics is the only theory in existence which has the curious property of being at one and the same time, *false and yet unfalsifiable*. It is unfalsifiable, and hence nonscientific, because no experimental testing is possible; and yet it is false because the predictions made using it are in flagrant contradiction with reality. This may seem extraordinary, or even contradictory to mere mortals. But the explanation is simple. Geostatistics is a religion, but not just any old religion: it is a "one-dimensional religion" (p. 95).

One might reasonably be surprised to learn that a whole international scientific community has remained "unaware of what constitutes a scientific theory" (p. 109) and has been "sequestered from the mainstream of knowledge" (p. 95) for over 20 years. What is even more astounding is that the decision makers in the mining industry who are normally such down-to-earth realists, particularly when money is concerned, have also been duped and have agreed to fund such suspect activities (p. 112). But all of this is clear now: geostatistics is just a dastardly conspiracy organized, with diabolic cunning, by a secret order of one-dimensional Jesuits.

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