WILL THE REAL SCIENTISTS PLEASE STAND UP?[1]

AN APPROXIMATELY-JUST-SO STORY

EARL W. STEVICK

The 2000 issue of PRISM: A LEARNING JOURNAL consisted of the work of a panel of four people on the question "When are we justified in using the word "scientific" in talking about the learning or teaching of language?" The panel consisted of a pragmatist, a social-constructivist, an exponent of Gattegno's Science of Education, and me.

Once upon a time,[2] when the world was young, The People lived not as we do, but in the State of Nature. The State of Nature was a time of Old Innocence. In those days The People communicated with one another, but no one of them communicated equally with everyone else. There were impediments caused by terrain, or by differences in family history, or by differences in temperament or age or by many, many other factors. Before our story begins, this unevenness in communication had led to the formation of a number of Us-groups. Us-groups were more or less tightly organized, but at the same time they were more or less overlapping, for each person belonged to several: male, female, old, young, people-of-the mountain or people of-the-plain, and so forth. And the people within an Us-group came to know one another and to trust one another even though sometimes they squabbled.

Life in this same State of Nature made The People more or less familiar not only with one another, but also with a number of tribulations: "flood, fire, desiccation of grasslands, restraint of princes, piracy on the high seas, physical pain and fiscal grief"[3] — not to mention the more prosaic usual suspects (hunger, thirst, extremes of ambient temperatures, and sex). Competition over limited resources for dealing with these tribulations led to yet another tribulation: mutual destruction or the threat of it.

And so it came about that as time went on, each Us-group developed for itself its own set of conceptual categories. Within these categories, the group amassed its own store of knowledge about their tribulations and about how to deal with them. Sitting down in their rare free moments, they were then able to form from their collected bits of knowledge a number of topics they could talk about easily among themselves, and could teach to their children. These talk-about-ables included what we now call "Beliefs."

Unfortunately, the parents of The People, and their parents' parents, and so on all the way back had known only the Way of Observing Now and Then but not keeping track; or of observing and then just guessing what might go with what and what might lead to what. Or if they did actually pay attention to relationships between one thing and another, they didn't bother to keep track also of whether earlier observations fitted with later observations. This was how the earlier generations had accumulated most of the Beliefs they had taught to their children.

It should not be surprising, then, that the belief-systems that came into being in this haphazard way were incomplete, inadequate, often internally inconsistent, often just plain wrong. Frequently, therefore, existing belief systems failed to take care of the tribulations they were supposed to take care of. Nevertheless, they seemed better than nothing, so the members of each Us-group tended to treat their beliefs and their belief system almost as sacred, defending them from anyone who proposed — whether by precept or by example — to violate them or to change them. The same defensiveness extended to anything that might serve as a representative *of* the belief system: the exact pronunciations of certain words, or nuances in their meanings. (This too led to mutually destructive activities, whether physical or symbolic.)

Then one day there came onto the scene a traveler whom people called The First Searcher. The First Searcher saw how one Us-group sought to ward off malaria by eating whole grasshoppers; how another tried to ensure plentiful rainfall by sacrificing infants to their volcano-god; and how a third thought that foreign languages could be learned in no time flat by means of a certain simple ritual, being engaged the while in mortal combat with a fourth Us-group that agreed, but held to a different ritual. Yet members of the first Us-group continued to die of malaria; the second was still troubled by occasional years of drought; and the language abilities of the third and fourth never rose conspicuously above those of their neighbors.

The Basic Way of Searching

The Way of the First Searcher consisted of a cycle of twelve activities that could be applied to most or all of life's tribulations. Here are the steps, stated in very general terms:

#1. Observe something (a "what") such as air temperatures. If you stop here, you will have learned nothing. You will only have done again what you already knew how to do: attach a name or number to something.

#2. Observe something else (another "what"), such as times of the day. Again, you have learned nothing.

#3. Observe the relationships among all the things you have observed.

#4. Summarize in one or more sentences ("Propositions") the relationships that you have found in #3. Your summary comes close to being a guess, a prediction, a "conjecture," a "hypothesis" about what you or anyone else would find if you observed the same kinds of "whats" again. Such a set of Propositions can at least suggest answers to questions such as "What will the temperature be at 3 p.m. tomorrow?" "What hour of next Thursday will be the coolest?"

#5. Write each summary in such a way that is "falsifiable," that is, that it *may* turn out *not* to fit your subsequent observations.

#6. Make another set of observations of similar data, summarize them, and compare this summary with what you produced in #4.

#7. Compare the summary in #6 with the summary in #4. Are they the same? Try to summarize the summaries.

#8. On the basis of your summary, try to predict the answers to such questions about other days, in other places. As you try to apply your predictions in other seasons of the year and in other parts of the earth, your summary in #7 will of course prove either more satisfactory or less so. You have moved from the question "What is what?" to a new question "What is likely to lead to what?"

#9. Summarize what you found in Steps #7 and #8.

#10. Invite others to look at your summaries, and at your summaries of summaries, to see where they are either internally inconsistent with themselves, or are unclearly worded.

#11. Think of additional kinds of data (latitude? time of year?) that might produce a more generally usable summary.

#12. Find ways to obtain those other kinds of data.

Repeat Steps #8-#12 for these data, continuing indefinitely. Your goal is nothing less than to arrive at a statement in words — in Propositions — that will hold good for all parts of the earth at all times of the year. Other topics might be how to predict the next darkening of the sun, for example; or just which differences in sound are used in the Kigeni language to make up the words that are spoken and heard.

In brief, then, "The Way of Searching" is first to observe, then to summarize, then to scrutinize for unclarity or inconsistency, and most important of all, to bring your summary up against observable reality. When you do this, you can either:

- try to find observable data *that will fit* within your summary, *and notice the points at which you have succeeded or failed in getting such supporting data*;

- or you can try to find observable data that will *not* fit within your summary, *and notice the points at which you have succeeded or failed in getting such falsifying data.*

Some people stop after having done just enough observing so as to support their own summary or to shoot down someone else's. This is all right if one just wants to win arguments, but it will never lead to new knowledge because it does not force you to notice where there is a gap in your own present knowledge.

(Another possible pair of "whats" are consumption of various foodstuffs and degree of hyperactivity. Still another might be whether students have "scaffolded conversation" as a significant part of their program, and how well or how willingly they speak the language five days or five years or fifty years later).

"In this way," said The First Searcher, "you will begin to find out not only about what is what, but also about what goes with what, and even about what leads to what. I warn you that this will take patience. It will also require a great deal of imagination in deciding what to observe next, and ingenuity in finding ways to make your observations." With this warning The First Searcher also gave The People a promise: that they would find new ways of dealing with malaria and with others of their tribulations, and that those ways would be better and more dependable than the ones they had been following up to then. And to this way of finding out was given a new name, and that name was "Science."

From a practical point of view, the purpose of Science was to enable The People (or the Searchers among them) to develop "Sciences of" a great number of fields: a science of the laws that govern the stars, a science of the effects that foodstuffs have on the body, or a science of learning and teaching foreign languages, for example. Stated simply, a "science of X" consists of a series of general statements which can be applied to any situation in the field of X and allow the applier to come up with solutions to local problems.

Some of The People believed The First Searcher, and they followed his Way and became Searchers themselves, and the Searchers found that they could indeed devise new ways of dealing with many of their tribulations, and new tools, and that the new were indeed more effective and more reliable than the old had been. And the name of Science waxed mighty among all The People, and the scientists were looked upon with great awe. To be able to say one was a "scientist" definitely placed one at a better address as far as credibility and financial support were concerned. Soon all The People were using what the Scientist-Searchers were able to give them, and so they emerged from The State of Nature into The Modern World — the world in which we now live. This was the end of Old Innocence.

After they had tried the Way of The First Searcher for a few years and had seen some of the wonderful things they could do with it, The People began to say one to another, "Truly this Way has vastly improved our condition.   Let us therefore extend it to all of our lives!" (For some of the tribulations still persisted: laziness, carelessness, the tendency to various forms of mutual annihilation, and of course the common cold.   Oh, yes, the language students continued to achieve only varying degrees of success.)   And in their New Innocence The People did try to extend their new Way without limit, for the New Innocence at least as powerful in the Modern World as the old had been in the State of Nature.

NEW INNOCENCE LOST

Sometimes the Way of The First Searcher worked well, but often the results were disappointing.   Then arose Sages among The People, Sages who pointed out that that there were limitations after all on The Way of The First Searcher: One such difficulty was that sometimes there were SO MANY FACTORS at work — so many variables, so many "whats" to identify and observe — that it became difficult to sort out which combinations of factors went with which other combinations of factors. As the science of statistics developed, it helped to "tease out" some of the answers, but not all.

Another difficulty was that sometimes certain of the factors at work in a tribulation were DIFFICULT TO MEASURE and keep track of.

Third, when the observations were of the relationships between actions and their results, it often happened that the results were WIDER than the observers had had in mind in the first place: a pesticide would indeed lower the population of agricultural pests, but it proved also to be accompanied by an increase in certain human illnesses; a method for teaching languages would indeed produce a high degree of grammatical correctness, but it also brought with it a deep reluctance on the part of the learner to say anything of significance.

The Sages went on to make a suggestion about how to deal with these three limitations. Their suggestion had to do with Perspectives: that the Long-term, Comprehensive Perspective be maintained, in which the search for unfalsified conjectures with worldwide applicability would continue; but that Searching should also be done within other Perspectives that were more immediate —and particularly within the Perspectives of Us-groups. An Us-group, by its very nature, possesses a shared knowledge-base not entirely like the shared knowledge-base of any other group. It also has its own needs for quick, usable guidance on the kinds of questions that the Searchers investigate within the Comprehensive, Long-term Perspective, but they need that guidance without having to wait for a definitive answer which is likely to be both abstract and complex, and which will be both expensive and long in coming. If only the issues were not so complex and the factors so numerous! Isn't there a way to weed out some of these causes of delay?

There is, of course, said the Sages. One can take advantage of the fact that **by** the very nature of Us-groups, members of an Us-group of teachers may share age, native language and socioeconomic backgrounds of students, for example. Many of the parameters that would have to be taken into account by a comprehensive statement cease to be variable, at least if one is seeking an approximate answer and not a neat one. Suppose the question is whether hearing before speaking is more effective than speaking before hearing. Answers to such a question could be searched for by many different Us-groups: all the Spanish teachers in a particular school system, or all the beginning language teachers in a particular school, or even a single teacher for her or his own classroom.

Even when searching for answers within a limited perspective, the Sages pointed out, one can still keep one's observations systematic, disciplined and clearly recorded rather than hit-or-miss, random, and limited to occasional striking events. Conclusions may be submitted to scrutiny, rather than being written up in a burst of enthusiasm. This is one aspect of what came to be called "action research." Under these conditions, the Sages said, one's teaching would be less likely to be the plaything of hunches, bright ideas, and improvisation — or lack thereof.

It was thought, furthermore, that giving recognition to non-comprehensive searching would bring with it a number of advantages. some of which were social (1) the line would be blurred between those who were Searchers and those who were merely People (or merely Teachers). (2) The relationships among Searchers, Sages and Seers might be transformed from their existing strongly hierarchical nature. Then Sages and Seers would get ideas from Searchers, Searchers might get useful information and useful perspectives from Sages, and so forth. Hierarchical structure both creates and is created by the natural human desire to be in a higher status than someone else is. Depending on whether that desire is satisfied or blocked, it can give rise either to arrogance and complacency, or to frustration and resentment. Reducing those feelings can free up the flow of information, turning it from unidirectional seepage into vigorous multidirectional flow. Or in another metaphor, professionals in all categories work together like parts of the body, each fulfilling its function, and depending on the other parts as they fulfill theirs.

A fourth difficulty with the Way of the First Searcher was that both observing and summarizing require USE OF THE BRAIN. One complication here is that the brain also produces its own whats — its own products. A second complication is that most of the working of the brain is automatic, with most of what it does being hidden from conscious awareness. It identifies objects, for example, and assigns values to them. But, as another Sage, David Bohm, pointed out, when some of the whats are produced by and in the brain, then the process feeds back into itself. The process thus inevitably becomes unstable and hard to control. This is particularly true in dealing with psychological problems and problems of

human relationship. One of Bohm's examples is "a man who suddenly realize[s] that he [is] very susceptible to flattery. He might well put forth the idea that he ought to be immune to flattery, and then he would of course have the problem of overcoming his tendency to 'fall' for anyone who told him how wonderful a person he was."

A fifth and final difficulty is that some factors are subject to VALUES CONFLICTS: Is a high degree of grammatical correctness to be welcomed as improving the learners' opportunities for acceptance and success among monolingual native speakers? Or is its chief effect to prop up an elite? For that matter, what about "propping up an elite," which from another point of view is sometimes labeled "preventing anarchy and chaos"? The paradox mentioned in the preceding paragraph therefore makes this arena a dubious one for "Science."

NEW PERSPECTIVES

But Searchers can ask questions only about what their conceptual framework recognizes, and they can observe only what they are aware of. If such a framework becomes saturated, or too rigid to accommodate new data, it is sooner or later replaced through what is called a "paradigm shift." Meantime, Searchers continue collecting and examining data, but with some of the First Searcher's rules relaxed in what may be called "pre-science." Under the rules of "pre-science," it is fair to look for information and new ideas anywhere — in the clever thing we did in class yesterday, or in the breathtaking demonstration we saw at the convention, in drama, music, mysticism, introspection, the various branches of psychology, or any other source — and to play around with them.

Every now and then, someone adds to the framework within which the Searchers do their searching. An example is the idea that the brain is not just a black box, but is something on the physical activity of which the mind depends. Even more rarely, someone radically transforms the framework — the idea of the Self as active energy constantly shaping and reshaping itself and the physical resources at its disposal, for example. Those occasional individuals who bring not just new Propositions, and not just new Perspectives, but new Pictures, may in their own way be called Seers — not just Searchers and not just Sages.

"Paradigms," or "conceptual frameworks," are by their very nature perhaps the most abstract and most general structures in which the human mind participates — or for which the human nervous system provides a home. Many of their components are connected to emotional material so subtle and so deep, so central to motivation, that a purely rational choice between available frameworks is, quite literally, unthinkable. An interesting further question would be how we can balance "honest confidence" (standing up for what seems to us to be most fundamentally and most urgently true), with "appropriate diffidence" (recognizing our own fallibility and the fallibility of our intellect).

F O U R   V A G A B O N D   W I S E P E R S O N S

Finally, in the latter days and in their unfathomable wisdom, the Editors of PRISM were moved to consider the question of when and how we should (or should not) use the word "scientific" about the learning or teaching of languages. To this end they went out into the highways and by-ways and recruited unto themselves four supposed Wisepersons, and brought them onto the scene (actually, only onto the fringes of the scene). These worthies were later to be known as the Four Worriers (for there were four of them, and all were known to be experienced in the art of worrying).

The Four Worriers, beholding the various Pictures of Language Learning, and the rich array of Perspectives from which the Pictures were being examined, and the constant making and remaking of Propositions, set out to consider the question:

<p align="center">Who is being "scientific," and when?</p>

The Four Worriers worried about questions such as these:

- Does following the Basic Way of Searching within the Comprehensive Perspective qualify one as "being scientific"?

- Does following the Basic Way of Searching within some Limited Perspective qualify one as "being scientific"?

- Does using ideas or tools that have come from the Searchers qualify one as "being scientific"?

- Does being a Sage, one who finds valuable new Perspectives, qualify one as "being scientific"?

- Does being a Seer who brings a new Picture within which to use the Way of Searching qualify one as "being scientific"?

- Or what?

A N   O R A C L E

As of this writing at least, the Worriers have not reached consensus. Meanwhile, the Oldest Worrier, who at times displays a tendency toward oracular expression, replies:

<p align="center">Should a paramecium be called an "animal"?[4]</p>

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[1] This was my contribution to an e-mail round-robin correspondence among four people including me, who were asked to consider the question "When are we justified in using the word 'scientific' in talking about the learning or teaching of languages? The full correspondence in edited form was published as the 2000 issue of *PRISM.*

[22] The choice of this quasi-fairy tale style was anything but an attempt to be cute. Readers who don't care for the style may be comforted to know that it will be intermittent, and will wane as we go along. My reasons for choosing it were: (1) I found that in our exchange of correspondence, each member of the panel was using his or her own set of terms, or seemed to be using slightly different meanings for a single term; (2) switching genres might help me as writer and perhaps some readers to approach the topic with a slightly cleaner slate.

[3] This list of "familiar tribulations" is taken, just for fun, from *For the Time Being,* a long poetic work by W. H. Auden.

[44] A PERSONAL NOTE: "What is Wisdom?" "Is it the same as Knowledge?" "Where does Truth fit in?" About seven years ago, a friend fired these questions at me out of a clear blue sky. The circumstances were such that I couldn't sidestep them, so I paused for a moment to consult my own vast resources of Ignorance and Unwisdom. I remember reminding myself to stick within the good old minimal-nonsense Anglo-Saxon word stock of the English language. Then I heard myself say, "Well, I guess Knowledge amounts to knowing what is what. So then Wisdom would be knowing what is likely to lead to what. And Truth, well, maybe that word just means 'the way things are.'" Readers have probably come up already with better, philosophically more tenable answers than these, but over the intervening seven years I have not, so let me use them once more.

From time to time in the correspondence on our assigned topic, I have heard each of the four of us express in one way or another a natural, in fact a universal human desire. That is the desire for answers to our recurring questions — answers that will come to us in a voice we can trust, representing a big picture that our inner selves can accept as somehow "corresponding" to us. Questions may be small-scale and very practical ("How, if at all, should I correct my students' errors?") or broader and deeper ("Is all this concern for students' feelings just unproductive coddling?") or very, very basic: ("What is the significance of a career in language teaching in relation to how things really are?"). In summary, "What is Truth?"

In this story about Searchers and Sages and Seers, I have tried to show how the quest for Truth may be pursued through the accumulation of as-yet-unfalsified Propositions, and through the discovery of new Perspectives, and through the creation of new Pictures. Each of these has undoubted value in finding, storing and transmitting Truth at one level or another. For me, however, at the deepest level Truth is neither a set of Propositions nor a wise choice of Perspectives nor even a Picture. Truth is a Person.

S E Q U E L

In the edited and published version of the findings of our panel, one of my contributions was used as the final chapter, which later became the preceding part of this AFTERWORD. Here is what the editors of the collection said on the last page of the issue:

It had been our intention to close this debate with an analysis of the various conclusions (or lack of them) reached by our contributors. However, Stevick's parting shot does the job with greater imagination and elegance than anything that we editors can muster. The job of synthesis isn't an easy one. And not simply because of the complexity, intelligence and length of some of the contributions. On re-reading these papers, it would be optimistic to say that everyone was alway00s able to agree upon a definition of the term 'scientific'. At times, there are apparently unnecessary digressions and, as when all discussions become heated, moments when we don't seem to be listening.

Stevick's concluding remark that "truth is a person" struck us as invaluable. This, we said to ourselves, is how we should finish.

What every contributor has, apart from generosity and enthusiasm, is the strict desire to be genuine. Everything said is said with the aim of seeking the truth. Although the participants at times seem to doubt that they even share the same values, we would suggest that this authenticity is common to all. It is thus that we have understood Stevick's conclusion.

Dear Editors — My copies of the latest PRISM arrived last week. Congratulations to you for the way in which you originated and superintended this creative effort on our part, and for the appearance of the pages. Thanks also for your patience!

I found your reaction to my closing sentence quite interesting. I guess I got too concerned with brevity and conciseness. I probably should have anticipated this misunderstanding, and done something to clear up the ambiguity. Anyway, when I said that for me "Truth is a Person," I was thinking of what Jesus said in John 14:6. My own understanding of "I am the Truth" is something like "I embody all the information that humans need in order to understand the most important things about their place in the universe." Actually, my Christian point of view was mentioned on p. 38, but I shouldn't have assumed readers to be as aware of such details while reading as I was while writing. As I would use the word, "Truth" is still "the way things are"; genuineness and authenticity are necessary to the Truth-seeker, but they are not sufficient.

I hope you can print the above in the next issue of PRISM. Meantime, congratulations on an original, lively and stimulating magazine. I've been having some really interesting exchanges recently with a variety of people based on my reading notes on the Krishnamurti issue (Winter 1998).   Earl

| E-mail laubly (the editor) to stevick, July 28, 2000 |

Dear Earl, Just found your message--I had been in California for one month. I am also leaving in about ten minutes for Normandy, so I will answer more fully when I return at the end of summer...

Yes, we had a LONG discussion about your closing sentence before printing....I had written the intro to the roundtable, and Philip wrote the afterword....he felt that this sentence "Truth is a person" sounded too Christian (whatever that means). I didn't read that into it at all, but we left it as he wrote it. We will definitely print your last comments on this matter in the next issue of Prism...

I had a long and interesting talk with Mark Lee (interviewed in the Krishnamurti issue) in California this summer. They are doing some very fine work in the schools.

Back to you after vacation,   Richard

Dear Richard,   Thank you for your very informative response to my recent e-mail about truth as a person. I in fact sympathize not only with Philip but with quite a number of my closest and dearest friends in the profession who are committed to openness to all, and then get put in a position where that policy is tested by having to decide whether or not to allow media access to someone who is perceived as not committed in the same way to that policy.

In fact, the "openness"-"certainty" issue has been much on my mind recently. This has led to two recent unpublished papers. One is my contribution to a panel organized by Jane Arnold at TESOL 1999 (2100 words). The other is THE SCUMSCRAPE LETTER (3500 words), an unauthorized sequel to the *Screwtape Letters* of C. S. Lewis, and in my best approximation of the same style. Neither of these would be suitable for PRISM, but I'll be glad to send an electronic copy to anyone who requests one.

Keep up the good work! Thanks again! And best wishes to Philip!   Earl