Unedited posts from archives of CSG-L (see INTROCSG.NET):

Date: Sat Jan 14, 1995 3:26 am PST
Subject: Scientific rumors

[From Bill Powers (950113.0930)] Bruce Abbott (950112.0830 EST)

RE: movement control

What you have in this literature is a story that is mostly unsupported by evidence and strongly guided by the way these people think behavior OUGHT to work. There is, of course, evidence, but much of it is like a piece from a jigsaw puzzle: a great deal of imagination is required to make it seem to go with other pieces. Also, the language of neurology has a nice stock of terms that sound important but mean nothing. For example, you cite this:

> These cells receive visual, orbital, and neck afferent information. The integration of the information from these different sources generates a neural code representing the location of an object with respect to the body and the head (Andersen et al. 1985b).

Both sentences are probably true. It is probably true that parietal cells receive signals from those other areas. It is probably true that Anderson et. al. said what they said. But what is "integration?" What is a "neural code?" What is "representation?" And when a cell "receives information," what kind of information is received? The time at which a signal occurred? The rate of change of some variable? The logical relationship between two variables? A weighted sum? When information is received, what is done with it? Is it stored in a card file until someone can read it?

There is a whole vocabulary for talking about processes in the brain that allows a person to construct bridges between isolated observations without seeming to leave any gaps. This is a skill much like the one that an experienced public speaker can draw upon when suddenly asked to say a few words when he isn't sure where he is, who the audience is, who the other speakers are, or what they have been talking about.

"My friends -- and I am sure that in this distinguished gathering there are many whom I would be pleased to count as friends and allies -- the occasion that brings us together is an important one, and one that well deserves marking with ceremony. There are those who say that assemblages of this sort are a waste of time and money, but all you have to do is note the distinguished personages both behind the podium and in the audience to see that responsible people disagree. There is more than reputation and empty show here; we have a purpose in meeting, a goal, an objective, a reason. It is the same sort of reason and purpose that has brought souls together throughout history. I am reminded of what Abraham Lincoln said about Alexander Hamilton, on the occasion of his wife's birthday. Honest Abe was leaving the Illinois State House when he was accosted by ....."

And there you have two minutes of a stirring speech being put together on the spot while the speaker scans his audience for informative reactions. The speaker assumes that everyone else knows the subject matter and what has been said; he counts on them to supply their own confirming details that will put meaning into his generalizations. With any luck he will leave the audience with the impression of having heard something relevant and important, even though he has not actually said anything at all. "So let us go on, with hope for the future and appreciation of the past, but most of all remembering what Abe Lincoln's wife said: it's the present that counts (friendly laughter). Thank you."

Then we have the trick of converting an opinion into a fact:

> Psychophysical observations by Morasso (1981) have suggested that this planning stage is carried out in extrinsic coordinates that represent the motion of the hand in space.

Note that the observations suggested this, with Morasso merely serving as the deliverer of the message. It would be much less impressive to say "A guy named Morasso thinks that ...". This is part of a very old tradition in science, where the scientist is merely a trained observer who relays the self-evident facts to those who can use them. When an author cites someone in this manner, Morasso (1981), the rule is that you are supposed to assume that the author has read the citation, understood it, and verified that the conclusion is inescapable. Thus the mere mention of the name and the fact that the opinion has been published is supposed to lend more weight to the author's use of the opinion.

In fact, it often happens that when you look up the citation you find the same statements followed by (Jones et. al. 1980), which leads to (Petersen 1975) and so on, with nobody actually taking responsibility for the "fact." This is especially true of statements about feedback and control processes. The authors, not having any first-hand acquaintance with control theory, cite conclusions published by well-known names in the field who do not have any first-hand acquaintance with it, either, thus turning the process of citation into a sort of formalized rumor mill.

What matters in peppering a paper with terse citations is to show that you are a member of a vast group in which these matters have been considered and conclusions have been reached on which we can build further. What these people who are cited actually said, and whether their conclusions were forced on them by observation or merely invented to try to make sense of confusing data, is of no importance. What matters is to give an impression of solid backing of one's own guesses.

I suspect that this is an important reason for the resentment that springs up so readily when PCTers say that basic ideas in traditional behavioral sciences are mistaken. If that's true, it removes the comforting support of all these citations and leaves one standing alone before the world, faced with the necessity of defending one's guesses without help from authorities.

Just think how many arguments in how many papers would collapse if it were generally known that Taub's de-afferentation experiments show that deafferentation completely ruins motor control! Taub was actually trying to disprove a claim that nobody had ever made: that without feedback, there can be no motor action. The fact is that deafferented organisms can still tense their muscles and cause limb movements. But they have lost all kinesthetic control. Nevertheless, we have Bizzi et.al. citing deafferentation experiments to show that feedback isn't necessary! That's how the scientific rumor mill works.

Best, Bill P.