

## The Way and its Teaching

Jai Grover

**Comment [PD1]:** Good title, though a sub-title explaining what your paper is about is still needed

Brouwer's article on the physics lecture is an insightful look at the issues involved in lecturing at the university level. The best way to understand something is often to take a naïve track; to actually try to do it, make the mistakes, and progress from there. Brouwer does just this, inviting a humanities student disenchanted with the physics lectures of his past, to comment on his experiences. In this way he draws out some insightful points, made more so for the human light they shed on the issue; for brevity I will address just those few that resonated with me. **COMMENT**

**Comment [PD2]:** Brouwer's

**Comment [PD3]:** student, ?

**Comment [PD4]:** repetitious

**Comment [PD5]:** Very good opener – sets the context, explains what you will do, clearly written.

**Comment [PD6]:** Necessary?

Often the academic environment is sterile, with little or no scope for imagination, and an overbearing sense of hierarchy. A lecture, a classroom, is then a church of reason. It demands obeisance. It demands respect, and sacrifice. One does not enter into a lecture lightly, no more so than a church, but rather to have some portion of the wisdom of those wiser, more holy, passed down. It is a sacrosanct place; 'higher' learning indeed

**Comment [PD7]:** Striking, powerful writing. Wish I thought all students entered my lectures in this frame of mind!

Only gradually does it become clear that science is an inherently speculative study. The ideas we have, are really rather few, but they are so powerful in their scope and generality, that they can be applied to a great many fields. This could potentially be a great boon for those teaching physics classes, for it brings within the grasp of the average undergraduate even the most esoteric physical theories. Why then do we not emphasize the principles? **COMMENT**

**Comment [PD8]:** Omit ,

**Comment [PD9]:** Omit – the verb includes the potentiality

When I started out in physics it was with an eye towards cosmology, and towards the frontiers of physics. I still read Scientific American, and popular scientific articles in magazines and newspapers. It is not that I intend to go into all or any of the various fields that are reported on, but rather that I am fascinated by the questions and ideas of physics. In much the same way, there are many who also start out enamoured with physics, but they soon find themselves lost in a sea of complications, math, and details. For them, there is little beauty left in the subject. I find this to be perhaps the most egregious offence committed by, not just lecturers, but the entire physics department; ideas give way to details, because there are oh so many details to make way for. Brouwer made an interesting point here, by attributing some of the starkness of physics lectures to the inexperience of the lecturers. In retrospect this does seem to fit my experiences rather well, but it is something most students, certainly myself, would not have been aware of without some prompting.

**Comment [PD10]:** Much though I admire your writing and layout, you seem to be taking a long time to get to your point – this is a review of a workmanlike article, not a philosophical study of physics and its teaching! Good stuff though – I don't want to be discouraging.

**Comment [PD11]:** Omit – impossible to go into them all!

**Comment [PD12]:** This implies you, too, have been disappointed – do you mean that? Ambiguous at best.

**Comment [PD13]:** Omit - ... "many start out ... who soon ... " is, in my opinion, more elegant.

**Comment [PD14]:** If you mean this one, capitalize Physics Department.

**Comment [PD15]:** ? A little flowery perhaps for this academic exercise? A matter of taste.

However, my feeling is that the problem is more systemic than inexperienced lecturers. For example I have taken three courses on quantum mechanics and it is only now that I have access to a course that discusses what it means to work with quantum mechanics. It is unlikely that there is no discussion about the curriculum within the department; instead I would expect that emphasis is placed on technical formula juggling, based on the notion that, armed with the proper foundation, a student could go on to grasp the ideas at a later time. In other words interpretation is not within the domain of the physicist. As Brouwer

put it, are we teaching to equip students with knowledge, or to equip them with the ability to think?

“Give me constancy, give me chastity, but not today, tomorrow.” St. Augustine said this, and I shall butcher it completely; “ Give me algebra, give me geometry, but damn it give me some ideas and physics to boot!”

**COMMENT. Terrific assignment! I thoroughly enjoyed reading it. I found it a little rich for an academic discourse, but that is more a statement of my conservatism than a complaint. Your organization was excellent, clear and useful, with strong start and finish. I did miss a more searching or detailed critique of B’s article. I enjoyed your philosophy and your relating of your experiences, but you didn’t deal with some of the main points brought up by the article. Tony**

**Comment [PD16]:** Pithier – “To paraphrase St. Augustine, “give me ...boot!””. When you write like this you can flatter your readers by assuming they know your allusions! However, I think your paraphrase could be even better if it included an exhortation to better teaching.