Truth

For every complex problem, there is a straightforward solution that is clear, concise, and incorrect.

- George Bernard Shaw

In a lecture in which Neils Bohr was presenting his famous principle of complementarity - a somewhat more general and philosophical version of Heisenberg's uncertainty principle which had been expressed in purely mathematical terms - Bohr stated that for every measurable quantity there exists another measurable quantity which is complementary to the first such that the more precisely the one quantity is measured the less precisely the other can be known.

Following his talk, someone asked "Then tell me, what is complementary to 'Truth'?"

Bohr's immediate response was, "Clarity".

It is useful to think of that in the context of what we do as teachers. Although we claim we teach "Truth" - in fact what we do is parcel out the truth in tiny increments - increments, often incomplete and only approximate, that can be understood by our audience. We often, in fact, strip away what is real and true for the purpose of simplifying the discussion so that it can be understood. And we ourselves may only understand a somewhat simplified version of the truth. In the sciences, that is what we call model building. The attempt is to create a conceptual or even a mathematical model of a system or problem that contains the essential ideas of what is being modeled, but without the myriad of complications that make it real - albeit intractable. For example, we might talk about the motion of a projectile in the absence of air resistance or of a block sliding down a frictionless inclined plane. The reason, of course, is that for idealized problems, the effects of air resistance (as well as buoyancy or friction or the variation of the gravitational field with changes in distance from earth's center) are negligibly small compared to the other forces that act, and the essence of the problem can be understood by simplifying it – that is, we can often avoid the more difficult (indeed, perhaps even impossible) solution that including the complications (i.e., the realities) would require. Or we consider a system to obey the laws of classical physics – developed before the intellectual revolutions of the early twentieth century – when doing so yields results that are not significantly different from what we observe experimentally even though we know that a much more complete description of our universe requires the quantum theory and Einstein's relativity – which might render the problem at hand too difficult to solve.

And toward what end do we do that? ..... *Clarity.*

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<>[Written following a wonderful conversation over lunch with Professor William Little, a professor of modern languages, who brought the Neils Bohr quote to my attention, saying: "We have to talk about this!"]

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