

Closing Ceremony Speech at MathPath 2011
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Absolute Truth

The Newsweek magazine of October 29, 2001, quoted Steve Jobs as saying this: I would trade all of my technology for an afternoon with Socrates.

But I ask you to spend only a few minutes with me -- now, for I am no Socrates – I am soccer T.
(*Students know this pun, for the speaker is a soccer player and he is called Dr. T.*)

Each class day to lunch the campers passed by the front of Palmer Hall where the cavernous Colorado red sandstone arches of the edifice have this engraving above.

Ye shall know the truth
And the truth shall make you free

I wondered many a time what this really meant. [*Pause*]

What truth is this referring to? What is this guarantee that we will know this truth? How does the truth make one free? And what is this freedom?

What truth is this referring to? Is it the truth about a meaning of life? Or about whether there really is a soul in each human? About what really caused the universe? About the phenomenon of time? About the structure of so-called empty space? Is it finding that P is in fact not equal to NP ? Is it that no deterministic physical process can, in the long run, elude simulation by a Turing machine? Is it the existence of a Unified Field Theory? Is it that the Law of the Excluded Middle that mathematicians depend so much on is in fact not absolutely true?

What is the truth referred to on Palmer Hall?

It certainly is not mathematical truth, for all truths in math are relative truths - **IF** something is true then something else is. Mathematics sits on mathematical logic, which, in turn, on the philosophy of logic. So the truths in mathematical logic can be truths of wider applicability than a truth, such as there are no square circles, in math. The truths in the philosophy of logic will have even wider applicability. [*Pause*]
The philosophy of logic contains also such things as the Law of Non-contradiction and the Law of Excluded Middle that mathematics proofs depend on. Logicians are divided that the Law of the Excluded Middle is a truth. But there are proven facts in mathematical logic that mathematicians and logicians accept as candidates for truth. One such is the Godel's First Incompleteness theorem published in 1931. In fact if any truth in the history of the world has given the reasoning mind a taste of freedom it is this theorem. The theorem showed that there exist logical statements whose truth value is undecidable, that is, they cannot be proved either true or false. It has given mathematicians solace

that the long resistance at proof of some problems may be indicating that they might be unprovable eternally even though they may be true. Yet, Gödel's First Incompleteness Theorem is completely unconcerned with the question of truth, and only concerns formal provability.

Concerning the nature of the truth referred to on Palmer Hall, it must be an absolute truth. Following the practice in mathematics let us try to prove that "There exists an absolute truth." Suppose we assert the negation of the statement; that is, there is no absolute truth. By making that assertion, we claim that the sentence "There is no absolute truth" is absolute truth. This means the set of absolute truths is empty as well as not empty. From this contradiction most mathematicians will conclude that there is absolute truth. But there is a problem – the conclusion uses the Law of the Excluded Middle, namely either p is or its negation is. So we can not absolutely prove that there is absolute truth. But neither can we absolutely prove that there is no absolute truth. So it seems that the existence of absolute truth is undecidable.

Supposing that the truth referred to on Palmer Hall is about Absolute Truth and Absolute Truth does not exist then the Palmer Hall statement is false. But suppose Absolute Truth exists. But then, how many absolute truths are there? Plato's theory of universals would say – just one absolute truth. Moreover, the Palmer Hall statement says "Ye shall know THE truth..." So it is referring to the one, say, Absolute Truth. It then says this truth "shall" free the knower. Suppose we take this also for granted.

We are still not done. What freedom is being referred to? Freedom has no value without permanence. So it must be referring to a non-physical state of bliss which is a situation we can not deduce from reasoning. So we are absolutely stymied in applying reason to understand the meaning of the Palmer Hall statement.

Perhaps it is referring to the freedom from desire. Which I believe is the greatest freedom.

But suppose we take the Palmer Hall statement a notch down. What truth will make us mortals free? I can only tell you what makes me free and why I feel I am free. It is the very wide view of the world – they call it worldview - provided by education and reflection. It is the truth that I am insignificant in the scheme of things of the universe, that I can gamble away everything I have and start a camp. A world view helps to elevate one above prejudices, selfishness, bondage to life itself and live in harmony with nature, which includes all humanity.

A world view can make you in to a person who desires the welfare of others. I call this freedom. Your ability in math will give you financial freedom in future. But equally or even more important, a desire for the welfare of others will make you really free.

Perhaps the Palmer Hall truth would make you desire the welfare of others. In this 10th summer of MathPath I ask you to consider that while mathematical ability may make you feel very special, there

will be millions like you in the long passage of time in this world and other worlds and that to live in harmony with the rest of creation in this one chance you have to live is at least as important. [Pause]

Parting is painful. But we can free ourselves from this pain right now by the truth that it is only the beginning. The beginning of the network of friendships we built. So go now! Go now and desire not only the welfare of these friends, but of all!

Several days later, Mr M (Prof Maurer) wrote Dr T (Dr Thomas) commenting on his speech. He meant it as a private message, but Dr T asked that it be included here, so it is.

I was very pleased that you wrote about this quotation. I had noticed it on Palmer Hall many times. One day I went inside and read the plaque about William Jackson Palmer – and found that he was from Pennsylvania and made his money building railroads in Colorado. So I looked him up on Wikipedia. I found many things of interest, but of most interest to me was that as a young man just starting out he had been secretary to the legendary (to me) John Edgar Thomson, first chief engineer and president of the Pennsylvania Railroad, responsible for building the PRR across the Alleghenies. Thomson was born near Swarthmore. Indeed, the Wells Fargo branch where I deposited MathPath checks is on Thomson Ave and Baltimore Pike, and there is a PA historical marker out in front about Thomson.

But all this digresses from the quote. I have a much more prosaic interpretation: with more knowledge you have more control over your world (an appropriate sentiment on Colorado College's first science building) and more control means more freedom. By the way, I think Palmer Hall is an absolutely beautiful building. I am inspired every time I walk by it.

I suppose we could also find the origins of the quote and how it was interpreted originally. I didn't recognize the quote, so I looked it up: John 8:32. See <http://bible.cc/john/8-32.htm> for various translations and the start of interpretations. No wonder I didn't recognize it; I don't know the New Testament very well. (It could just as well have been from the Old Testament, and then I could be embarrassed for not recognizing it.)

Unfortunately, there is another statement about something making you free that immediately springs to my mind whenever I see this otherwise inspiring quote: *Arbeit Macht Frei* - work makes you free - the statement over the gates to all the Nazi concentration camps.

Steve