Who Knows?

Does anyone really know anything? I postulated in my previous essay that we, man in general, can never know anything. Our knowledge and so called truths are but creations of our society used as tools to predict the phenomenon of our perceived r?O surrounding. This knowledge itself and truth for that matter is subject to radical change, citing examples of both biblical and scientific nature previously for evidence. This makes our so called truths and innate knowledge as fragile as an airtrack subject to contortion and blunt change by man' ideas. Yet for this essay in order avoid a repeat of my last essay I will assume that we can in fact know something about our world and the phenomenon we observe daily. This knowledge is not to be thought like ten commandments, stone slabs given to the various scientists by God. Instead think of this knowledge we ?. glean as a set of tools. Both a chain saw and an awl can be used to trim wood, the chain saw is less accurate and faster, just as there are numerous ways to solve physics problems, again some being more accurate or faster than others, but none the less they both arrive at a similar solution.

Physics tends to be a less tangible subject to asses what one knows, than for example woodcutting. It is obvious from the noise and finish product that a chain saw has been turned on, used and put away, your result be it good or bad is right in front of you. You know you have cut down a tree, or trimmed a doorframe, your result is perceivable with in your limited sensory capabilities. Physical insights tend to be less obvious. Personally I feel that I know a part of the knowledge labeled physics, when I can use that thought or idea to solve problems. Not merely the problems given to us at the end of each chapter but the problems we find in the textbook of life. For example I knew that I had fully mastered elastic collision theories when I used the concept of momentum to win a pool game in the common room, thus adding five dollar. Although pool sharks probably have no idea about the concept of conservation of momentum, they use them in what they would call common sense and trial and error to determine the angle that they would shoot at. For me by applying this concept to something not related to "the classroom", I generated an internal sense that I had some knowledge witch could be used other than to do the problems assigned. (Anyway how do we know these are not special altered or "fudged" problems generated to give students a false sense that they have actually learned something?).

I therefore feel there are varying levels of which I know things; the first is that of a computer or robot, it is the knowledge of memorization, regurgitating facts or ideas without truly understanding them, not being able to apply them to a problem without being told how, (can I call this knowledge by my definition?), the second level is where the fact or idea that I have memorized becomes comprehensible, a tool that I can use to solve the problems of the textbook and similar "classroom world" or perfect problems, the third level is obtained when this idea can be taken with me outside of this ideal world into life and used to solve non-classroom related problem, as I described previously with the pool game. Each level in this three-tiered analogy becomes more difficult to achieve and thus reflects various degrees of learning. The first step is so simple and easy to obtain that we can get a computer to do it, the second level requires more thought, but again mechanical objects can be programmed to perform similar functions. It is the third level of knowledge, the most difficult to obtain, which appears to be selectively human. It describes the ability to take something learned in one context and apply it to a totally different occurrence in order to explain it or to predict what may occur.

The way in which we learn physics varies; it can be learned from textbooks, taught in a lecture or discovered by oneself through laboratory work. Generally when one reads a textbook the sort of knowledge they get is the first type I described, an ability to regurgitate facts, examples and ideas similar to those they read in a textbook. When one is taught or lectured, having problems explained to them and methods by which to solve them, they tend to receive the second type of knowledge, the ability to solve text problems on paper and on tests. This results in decent class averages and high test scores but how much is really learned. It is learning through labs, discovering relationships and ideas for oneself that produces the third type of knowledge the most useful and pure. Unfortunately there is no way to evaluate this type of knowledge and students are not therefore force to achieve it, limiting themselves to being human computers, solving problems by the method their teacher has programmed into them. It is not impossible to achieve the second and third level of knowledge from reading and being lectured, it merely requires additional time and effort spent thinking and doing abstract and different problems.

Therefore in order to study for tests and exams I read the information and memorize the important concepts, examples and ideas in case we are given a regurgitation question witch is basically free marks if the time and effort is spent. Then I go through the problems at the end of the chapter making sure I can do them, by getting the textbooks results I know I am answering the questions the way the book wants me to. I then also realize that I should be able to answer any test questions since they are but variations of the books questions. Finally I attempt to take the ideas and apply them to different problems not those from the textbook but that I encounter in various situations around my boarding house. If I can do this successfully, a difficult task, I know that what I have learned is useful and that I

have an ability to use it as a human, not a computer made of flesh. This enables me to answer the test questions that ask us to explain various situations. I do well on a test if I am able to do all of the preparatory work as well as explain a removed situation. I do poorly on a test if I forget to memorize part of the text, miss a type of textbook problem, but most importantly I do very badly when I can't take my knowledge and explain a different phenomenon that displays similar qualities.

Primarily my physics teacher and I differ, in that he has a mustache and a stupid sounding accent. Yet these physical are present between students as well. The physics teacher assigns tests, readings and assignments. Yet again this seems to be a trivial difference. Our teachers in general differ from us in that they already know what it is we are supposed to be learning, they are merely aiding us to learn these ideas and concepts they already know. They can try and explain their own knowledge and show us what happens during a specific instance, but we must some how process the ideas just as we must process the ideas from a book in order to make them useful later on in explaining similar phenomenon. Physics teachers also differ from students in that they tend to have a general aptitude towards this subject, they find it easier to visualize the concepts and do so faster than the average person.

Thus, I believe students effectively are acting as teachers in lab group instances. For when one member of a group figures out something they are trying to discover he can, most likely just as effectively communicate the idea to his partner(s), or teach them the required material. As previously discussed lab work tends to produce a higher level of knowledge than the other forms of learning discussed, therefore it is a more useful, producing a better understanding of the work that is covered on that lab. This is coupled by the fact that you receive extra teachers, your lab partners, to aid you with difficult problems. Hence lab groups tend to produce a more useful, better understood knowledge than from a text. ? Students also learn how to express their ideas and to teach them to other students when they are in a group situation. By forcing students to teach each other ideas the student teacher himself must have a very good understanding of the concepts to be presented. This forces the student to think through the ideas over again in an attempt to explain them. This process is almost as good as applying their ideas and concepts to practical situations, but not quite. Unfortunately lab group settings allow for greater freedom, where students can slack off, not inquiring into concepts and ideas they don't understand allowing for the group to learn things they don't themselves. This atmosphere also allows for the omission of inconsequential boring textbook equations and definitions. Thus when standard tests are introduced whole groups could be missing certain textbook ideas, and individuals could be missing all the ideas of both the class and group. This produces lower test scores and grade averages, something Appleby has a distaste for, thus this method is thought of as a poor learning method, not for proper learning. My analysis is that this method weeds out the lazy people and those who can't apply their knowledge to life, but who merely regurgitate the facts.

Although there is no real way to test ones true knowledge, other than life itself I am sure their are better ways than to ask redundant text book questions and to ask for the definition of textbook words that have little or no meaning for students. I propose therefore a new evaluation technique. Students having experienced all three types of learning, reading, lecturing and lab work on a specific subject, instead of writing a test filled with the same studied questions that a computer could answer, would instead be forced to generate for themselves a problem with in the specific area studied at the time and to answer it for themselves. Upon completing their question they would exchange their question with another students question answering finally both their own and the other students question. The evaluation would be based on the ability for the student to apply their knowledge outside of a textbook context, accurately and precisely. The time to complete the question would be limited to a number of days but the resources used would be up to the students' discretion

In the completion of this essay I find myself at the beginning, asking myself "Self, now that I know physics, how do I do it?" I conclude thus as I began with a chain saw. When a tree has been cut down and chopped up there are signs, no more tree and a pile of logs, woodcutting has been done. Although the signs are less obvious in the application of physics they exist nonetheless. Many times physics is done with out the doer actually being aware of it. Instead of loud buzzing, the yell of timber and the crashing of trees, the physicists inside of us calculates the angle and velocity to shoot a pool ball before we shoot. We naturally judge the angle to place a ladder against a wall so that its torque doesn't either flip us or the lack of friction, allow the ladder to slip and fall down. When down hill skiing we calculate the number of turns naturally to make as the pitch of a slope changes in order to keep our speed constant. Thus it seems physics is done by our minds through visualizing ideas and concepts and calculating the right choice to make everyday of our lives, if we realize it or not.