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TAFT BROOME: Yeah, the internet-- I was really trying to-- push is not the word, but something close to push, Doctor Ing to do something on that. So one of the things about the internet is that we've produced a generation, and the "we" is the world. Let me tell you what I mean by that.

Now, I don't know if I ever told you I was in South Africa, and I was up in Lesotho. And I'm riding down this road and it's total desolation, total. We're up in the mountains-- total desolation. And all of a sudden, there's this guy walking along the side of the road with a cellphone.

And I asked my driver, said, who is he talking to, somebody back at his village? He said, no, he's probably talking to a relative in France. So when I say "we" and I mean the world, I really mean we have produced a generation that is probably in some ways wired into the internet and other things that I am not wired into, and that you all are probably just-- I don't even know if I count you all in it.

STUDENT: We didn't have it in our childhood. [INAUDIBLE] happen after hours. So I think that must be different [INAUDIBLE].

TAFT BROOME: And what I've gotten from students is a basic moral sensibility about the internet that I don't have, and that I can argue against. But they have a basic sentimentality about it, which I think gives rise to all ethics. You have to have a sentiment. You have to have a passion about something. You have to feel something.

And one of them is that no matter what the law says, whatever you can get from the net belongs to you. It's like free water out past the 12-mile limit. There's a sensibility they have that no matter what you put up there, once it gets up there, it's in public domain.

And I say, no. You know what I mean, I'm able to argue all of that stuff. And they, OK, they believe what I-- but I look at them in their faces after I've argued. They're not buying it.

And the only argument that I can give to them that confuses them is the one where I say that I ran into this undergraduate student one day at Howard. It was a Chemical Engineering major. I hadn't had him in the class, but I knew him.

He's walking down the hall with a guitar. I said, I didn't know you play the guitar. He said, well I play at the guitar. I'm not really good at it, but I write songs.

I said, oh, really? So he opens up his guitar and pulls out, shows me this little sheet of paper, about that much of it, as a song. I said, oh, how nice. He sold it to Prince.

So I said, how much did you make for that? And it was about twice the salary I make in a year, what he got from that, royalties and all. So I say now, if you wrote a song and it's yours, I don't care if you spent 12 years on it or 12 minutes on it.

Do you want everybody downloading your song? And they will sit and think. And they've got problems with that.

But I still think that there's a possibility we have to contend with a sensibility about the net that my generation was developing about robots. So my generation was about willing to say that a robot was sentient, not really that the robot was sentient, but that we could have feelings for a machine. And I don't think we ever quite got there, mainly because we're dying off first.

But I don't know, if you ever meet somebody my age or older, ask them what they feel about their car. They might feel that--

STUDENT: What do you predict?

TAFT BROOME: Well, I mean, some people feel about a car, they get out and kiss the engine if you let them, it wasn't hot. I mean, they feel sentimentality about it. So I don't know it's an interesting thing to speculate about.

The important thing for this class is to speculate about it. Keep it in mind. Watch people. Ask them questions, because your arguments may not sink in with them past the rational level.

What I want to do today is go into some depth on these codes of ethics, but I want to entertain Q&A first. Any burning issues, outstanding stuff?

STUDENT: Related to the codes of ethics?

TAFT BROOME: Related to anything, so that I can start into the code of ethics with a clear conscience.

STUDENT: I have to show you something, I brought this to show you Professor, because [INAUDIBLE] were studying the legal applications of genetic engineering. It's like, I'm showing him--

TAFT BROOME: Ethics, as I believe most engineers understand and practice it-- hot dog-- involves the carefully calculated, responsible application of well-understood principles in accordance with established public and professional standards to produce results that are both safe and beneficial to society.

STUDENT: But this man's argument is actually you cannot call genetic-- what's done with gene, genetic engineering. These people who manipulate the genetic material of organisms, they can't assume-- they can't say this is a safe way. And no [INAUDIBLE]. There's so much uncertainty you really can't call it engineering was his main argument. But I thought it was interesting.

TAFT BROOME: Could you write down the source for me?

STUDENT: Yeah.

STUDENT: [INAUDIBLE] engineering implies ethical responsibility.

STUDENT: Exactly, so [INAUDIBLE] interesting.

TAFT BROOME: Yeah, that's an argument, if you'll recall-- you have no reason to recall this because it was the very, very, very last thing I said, but when we went to the Norwegian lecture, my very last recommendation was that we think about competency. We define competency in terms of the good, not competent, and then ask whether it's good, but it is not competent unless it is also good.

And the group didn't seem to want to spend much time on that part. They wanted to spend time on the character development. But that part was significant because-- well, for two reasons.

Well, let me just say for one reason, if I want to put the [INAUDIBLE] in that way. And that is that if you take the ethics out of the definition of competency, what you have is a lower-order standard for competence. You don't have to be really good at what you do because let's say, for example, three children come in here and one of them has got a disease that we'll all catch in 10 minutes.

Well, one way to solve the problem-- kill all the children. I wouldn't call that competent. OK, so I want to say that competency really includes ethics as a condition. Because it not only means that you have to be really highly competent, but you build in competence into the culture, that people do not look for the one that's not ethical.

And I guess I put the other one in there because it actually means the same thing. It goes back to my lecture, again, about Faust-- that if you leave out the ethics part, you're going to get what you call a competent solution, but it would be something you don't want. The monkey's paw again-- so I think the monkey's paw really defines competency without ethics.

And that's something that nobody wants, even though you have agreed a priori on the terms of the contract. So those are my arguments about that. So yeah, I'd like to see that paper.

And I'd like to-- actually, I'm trying to get Stephanie Bird in here to talk. She does ethics and science. So she wants to talk about those kinds of issues, too. And I want to bring her in here to talk about these issues because I think when you say what something is, you clarify it by saying what it is not.

So we're not talking about ethics and science, but how do we know? Well, let's have a lecture on ethics and science. So what you'll find in ethics and science is two categories of issues, basically. One is ethics in research.

Research ethics, which is what I talked about, is today almost always considered research ethics in sciences, even though it can include anything else. But all of the issues have come up with big scientists making gross violations of your basic sense of ethics. The other category has to do with what I would call political issues-- abortion--

STUDENT: Should we be doing it at all?

[INTERPOSING VOICES]

TAFT BROOME: --stem cells. That's right, should we be doing it at all. And some people will tell you if you get four philosophers in this room, one of them will say that those issues really aren't ethical issues, they are scientific issues. Because we want a scientific definition of a human being.

We all agree that we shouldn't be doing these things to human beings, but is that a human being, that fetus or whatever? And so that person will say, I'm done, walk out of the room-- not that he doesn't want to talk about it, but it's not ethics for him or her.

STUDENT: And others will say [INAUDIBLE] is a matter of definition, not just science. That's the other side of that [INAUDIBLE].

TAFT BROOME: That's on the other side is--

STUDENT: That's why it doesn't-- [INAUDIBLE] the definition [INAUDIBLE].

TAFT BROOME: There got to be--

STUDENT: [INAUDIBLE] Yeah, I mean, I think so. I would say that it's not-- science has to agree upon, scientists as a community have to agree upon the definition and the starting point [INAUDIBLE]. There's not a series of experiments that can be done. I mean, it all involves [INAUDIBLE] about what possibly [INAUDIBLE] I definitely have not [INAUDIBLE] beginning of [INAUDIBLE].

TAFT BROOME: Well, that takes time, right? I mean, you have to sit out, and you have to think about that one. Actually, what I say is, first of all, it is a philosophical argument because it belongs to the category of metaphysics. You're talking about how are you going to divide the world up. And the scientific definition can only contribute one part of that.

The other thing about it is that the affected parties are not only the fetus. You've got the mother, you've got the father. You've got a whole bunch of other people who are concerned about all that.

Then the more you step into the political domain on this issue, the more you get into the religious domain. So you've got to start dividing the house there. What are we going to talk about here?

We're going to use faith as an appeal, a legitimate source of appeal? Or we're going to stay with reason? So you've got to continue to divide the house.

And once you do that, still haven't solved the problem. So I think that having her in here-- I owe her a paper by the way, one that I'm reading for her, not one that I've written. So that would be helpful, and I hope you all have the stomach for one lecture on this. You might.

And then, we'll talk about whether or not any of it's genetic engineering, or whether it's really bioengineering. Because you are making something, like you take clay and make bricks, or like you take iron and make steel. You're making something.

STUDENT: There's a design process.

TAFT BROOME: There's a design process involved.

STUDENT: [INAUDIBLE].

STUDENT: It's not very well understood, maybe, [INAUDIBLE] It's not based on sound science yet. No one really quite understands what's going to happen when [INAUDIBLE].

STUDENT: The [? grid ?] building isn't well understood, then. There's lots of engineering practices that are not standard [INAUDIBLE] totally uncertain. So I wonder if the author of that article would say that wasn't engineering until [INAUDIBLE]. Because that goes against a lot of the definition that we discussed in this class. [INAUDIBLE].

TAFT BROOME: Well, I'm giving consideration to all of this in my research work. And I haven't finished it. But where I am now is that it goes back to the Manhattan Project.

Actually, it goes back before the Manhattan Project. It goes back, really, to radar. And that's when scientists were doing engineering.

So if you get a scientist who is doing engineering, basically they might not do it right. So you can call it engineering, I think, but it's not what I would call sophisticated engineering. Because it's like when engineers sometimes do science.

I think a good example of that is the invention of thermodynamics. If you're looking at the history of thermodynamics, engineers, boilers, and boilers for trains, developed a science using what scientists would call herky jerky methods. And so that's what I'm trying to reconcile now. And I think I'll have it reconciled before the month is out, but what happens to a thing when it is practiced by a non-practitioner.

Here's is a good example. I'll tell you a good example. I was getting on the elevator with this researcher here at MIT who is doing research on systems.

Actually, I was getting on the elevator with him at the airport. We ran into each other at the airport. And he's going to this conference on systems.

There's another person here at MIT who's the president of the organization, named Pat Hale, H-A-L-E. Don't know if you know [INAUDIBLE]. And we were discussing that, and he had organized a session.

And so I said, what did you organize your session on? And really what he said was that he belongs to the first generation of systems engineers. I said, hold up-- what are you talking about? Systems engineering had been around before you were around.

He says, no, they were all this engineer, or that business person, or the other doing systems. But we are the first ones who are really systems engineers. Everybody who was my teacher, my faculty advisor, all of these people were people who were doing engineering, but they mainly had it from this perspective of another discipline.

And so we want to organize the young people to start developing a purely systems idea. And so I think that tells a story about a lot of things. It tells it about engineering ethics because the people involved were basically mostly philosophers, and they got some engineers, and half of the engineers were practicing engineers. Many of them had been whistleblowers. Half of them were academic engineers.

So who becomes the first engineering ethicist? Well, I felt that way when I came out. I felt that I was in a generation that was the first person-- not the first person, but in the first generation at least-- not the first age generation, but in the first academic generation, who was doing engineering ethics with a combined approach that on occasion developed something that was different from the two things that made it.

And you can do that by adding to or violating one of the principles of one of the participating disciplines. And an example of that is the one where I talk about the virtue ethics from the standpoint of what I had first called African ethics, but now I have realized that it's all around the world. There's this whole other point of view that non-Western.

And so the question is, and my colleagues at Howard are debating me, is this an extension of Greek ethics, Western ethics, or is this something different? So I think that one makes a big mistake when one defines competency in a manner that does not have a moral dimension.

And scientists argue-- this used to be a big issue, then I get on to the point of the codes of ethics-- there were big debates in the '70s and '80s over the question, is science value free? Then it got narrowed down to truth. Squirrel got a nut-- is there value in that, somebody would argue. So truth can be separate from values. You have to ask yourself, if truth was not separate from values, why would we need two different words, truth and value?

STUDENT: That makes sense.

TAFT BROOME: So my take on it has come out-- since you all got me on this road. I didn't ask for this. My take on it is that truth is value free. You can think about a truthful statement and then make a value judgment about it separately.

But then I come back and say, what is scientific truth? What is scientific truth? And then there's a book, two books, three books-- well, let's say two-- that I hadn't intended to lecture about, but why not?

One is called *Patterns of Discovery* by Hanson. And the other is called-- let me start talking, then it'll come to my mind. I didn't prepare for this.

STUDENT: Is it Kuhn?

TAFT BROOME: Kuhn, Thomas Kuhn, *The Nature of Scientific Revolutions*.

STUDENT: I think it might even be the structure.

TAFT BROOME: *Structure of Scientific Revolution*.

STUDENT: Still haven't finished it, but-- now

TAFT BROOME: Both, of them talk about something called worldview. Both of them talk about something called gestalt. So both of them will talk about this figure, and you would not believe that this figure has a name called the Necker cube. Because a Swedish psychologist studied it.

I mean, we do it in engineering from day one, this thing here, if for no other reason than you'll extend this out, call that x, extend this up, call that y, extend this out and call that z, won't you? If for no other reason. Now, what they'll do is they'll ask if A is in front of B, or is B in front of A? Your mind can switch them.

You can get both. It takes a minute. Is this thing coming out of the board and down to the right, or is it coming out of the board and up to the left?

Well, the point is that we're dealing with gestalt here. And the whole range of a choice of gestalts is called world view. So if you choose to see that A is in front of B, and then you see a lot of different things with the same kind of choice, that whole thing forms your world view. And somebody coming in the door may have a different or overlapping world view.

Now, what they say is that every learned discipline has its world view. And that you can walk into a class and get lost when you are right, but you're just looking at it from a different point. You're looking at B as being behind A. Everybody else is looking at A in front of B because that's the worldview associated with this learned discipline.

So what they say, then, is that when you talk about the truth, that's one thing. But when you talk about scientific truth in the context of a scientific world view, you're talking about looking at it this way as opposed to another way. You're not talking about always looking at the truth.

And so therefore, you have put a value judgment on why you want to look at it that way as opposed to the other. And that value judgment has moral implications. So I go before these people and say, yeah, truth is value free, but scientific truth isn't because you have chosen, then, to look at it a certain way when you could have looked at it another way.

And then what Kuhn comes along and says is, that's how we get paradigm shifts in the disciplines. Somebody says we all better look at it the other way. And when everybody starts changing their worldview, when they look at the same thing and actually see something different, then you've got a paradigm shift. And now you talk about why people get Nobel Prizes, why people write dissertations, Master's theses.

Thomas Kuhn was actually here.

STUDENT: There was [INAUDIBLE].

TAFT BROOME: He wrote it back in the '40s. He was a historian. He was a historian.

And he uses that thesis to do history of science. And that thesis then tells him how to break up the errors, and that between this error and that there was a paradigm shift. And the paradigm shift was like that.

And this stuff is very interesting. We look at it, and everybody agrees that this, in fact, is a cube. I don't care how many people you get. I mean, you ask them what do they see, and everybody will agree that it's a cube.

Just think about. And this is what Hanson does. He says, just think about it. I asked you what did you see? I didn't ask you what this represents.

I asked you, what do you actually see? Everybody says, "a cube." It's not a cube. It's 12 lines on a flat surface.

Actually, what your brain sees is not even a line, it's a bitmap. You've got white dots and black dots in there. So your brain is doing all of this work to organize what you experience so that you can understand it, so you can get meaning out of it. Well, basically, this is not even a cube.

Now, there's an artist that deals with this issue. Now I'm going to tell you who this artist is. And I'm going to tell you that only one or two pieces of his work come through to me, but maybe you see Mondrian. Because Mondrian knows how to draw and color a Necker cube so that looks flat, whereas Picasso can use 6 to 10 of them to draw your face.

STUDENT: [INAUDIBLE]? Completely different? And they always use the example, if you're on a train moving, and you throw a ball in the air, it looks to you like it goes straight up and down when actually, it's taking the shape of a parabola, like in a different [INAUDIBLE].

TAFT BROOME: Right.

STUDENT: So I think a lot about that, what is [INAUDIBLE] if it's real to you that it goes straight up and down, for me looking at it from a distance--

TAFT BROOME: Well, that's the kind of thinking that we need to do in this class-- I mean, not that we haven't been doing it. But what is truth?

STUDENT: [INAUDIBLE].

TAFT BROOME: Well, let's play with that. What do you mean absolute?

STUDENT: Is there one universal truth for everyone?

TAFT BROOME: What does the word "truth" mean? All right. Well, Aristotle played around with that question. Plato did, too, and they went very far.

They went at least-- accomplished 50% of the question. And the rest of us have accomplished, added to that. Maybe we're at 90%, 95%. Let's speculate on that.

What do we mean by that? Plato said one thing about it. You want me to talk?

STUDENT: I want you to talk.

TAFT BROOME: OK. [INAUDIBLE] Plato said-- we're talking about what is truth. And I don't consider that a diversion. I wanted to talk about codes of ethics today.

Frankly, the question of what is truth is more interesting than codes of ethics. But I'm looking at the clock. We've got time. We've got time.

This is what a philosophy class is supposed to be-- supposed to be 75% ad hoc. I wouldn't say that about a math class. OK, let me start talking, but I want you all to take over the conversation if you can get to it.

Let me start with Plato. Plato said, well, let's not talk about truth first. Let's talk about something else first. Let's talk about knowledge.

What is knowledge? And Plato said, well, knowledge is a statement-- that is, a sentence that's either true or false, and that there are two kinds of knowledge, statements. One is a statement that agrees with other knowledge statements according to the rules of logic and reason. And that's called rational knowledge.

The other one is a statement that agrees with observation or experience. I'll put observation, but I don't mean just the eye. I mean all of the five senses.

So there's a cup of coffee on the table. That's a statement of knowledge.

STUDENT: Isn't that a statement of fact?

TAFT BROOME: No, it's the same thing as a [INAUDIBLE]. It's an observation of a fact. It's a statement that describes an observation of a fact, or it is a fact because it is information that is coming to my brain of the type that I call sensory information.

And then what I would speculate on is that that sensory information comes from someplace outside of the mind, call it "real world." So a knowledge statement-- well, you might come along and say, I said this was a cup of coffee. I analyze it. There's some coffee in it, but there's really strychnine in there. Pretty soon, [INAUDIBLE] the room.

So Plato doesn't have any problems with that. Plato says that you can improve upon your knowledge statements, and in the limit, you get the truth. That's why Plato was very happy to say we pursue the truth, but we make knowledge claims.

You do the same thing when it comes to value judgments. You make a value judgment and in the limit, you get the good. So now, this is called rational knowledge, and this is called empirical knowledge.

You can also say values, value judgments, and get the good. And then Plato says that if you put these two together, and imagine that this limit does exist, what do you think Plato or what do you think pretty much 90% of the philosophers that are out here-- what do you think they would call the truth and the good? If there's something out there that is perfect-- yes, that's Plato's theology. He calls this God.

STUDENT: [INAUDIBLE] in there somewhere, too?

TAFT BROOME: Values, that's aesthetic value.

STUDENT: I have a question about rational knowledge. So rational knowledge, we said, agrees with other [INAUDIBLE].

TAFT BROOME: Well, it's hard to put in words. Let me give you a starting point. Mathematics is rational knowledge. It makes no reference to experience or to objects. You ready for this? Can you see this up at the top?

STUDENT: [INAUDIBLE].

TAFT BROOME: I'll tell you what.

STUDENT: That's good. [INAUDIBLE] my mind [INAUDIBLE]. So like math, saying that the derivative of the natural log is whatever it is, is knowledge, but it makes no sense unless you know what "derivative" means or what "natural log" means.

TAFT BROOME: You've got definitions. Start with definitions. You've got symbols. You've got rules for putting them together. You call that syntax. And then you have rules for deducing other symbols. You call that semantics. So now we're talking about deducing a theorem from an axiom.

STUDENT: [INAUDIBLE] but it's not-- it can't just be [INAUDIBLE].

TAFT BROOME: Right, or I'm going to be a little bit more-- it is not empirical. I don't want to say that it can or possibly. We throw that all out. It's all mental, and it's all reason.

STUDENT: I also think of Einstein's paper [INAUDIBLE]? He talks about Euclidean geometry, and how you talk about a lot [INAUDIBLE] exists. Can you observe a line? Because it's infinitely small--

TAFT BROOME: Right.

[INTERPOSING VOICES]

STUDENT: So it's not something that you can really observe. And a point is the same thing. You can't really observe, empirically measure a point. It doesn't really exist [INAUDIBLE].

TAFT BROOME: Right. I could put a rock here, and then a smaller rock, and a smaller one, and a smaller one. We could even go down to an atomic particle, and keep going. We still haven't got a point.

But we can still talk about a point.

STUDENT: Right. [INAUDIBLE].

TAFT BROOME: And all kinds of stuff. That's right. So what Kant wanted to do is take that kind of thinking out of the scientific realm, and say, I want to base a value judgment strictly off of the rational process, strictly mental. And Mill said, I want to make a rational judgment strictly out of the empirical thinking-- knowledge, statements. So they took all of this stuff and put it into the value domain.

Now, let's talk some more about empirical knowledge. Let's talk some more. There is a genre of story that all start the same way. They end slightly differently, but they all start the same, and we can get a lot out of this.

You're driving along someplace. Look down, something looks funny about your car or for whatever reason, you get off 95, the main highway. You get on some little road, going down this little road.

And then there are no houses, no gas stations, just driving down this little road. It's getting dark, the car stops, and the road comes to an end, and there's nothing there but the woods. And for some reason, you decide to get out of your car and walk through the woods. You've got to run into something-- shopping center.

You run into a monastery. And you knock on the door, and hear a voice on the other side talking to you. And there's a little window in the door, a little window where you can basically pass. And everybody can speak the same English.

Now, all of the stories start the same way. I'm going to tell two of them. Now, one of them is that they tell you to go away at first.

You say you're hungry, you need a place to sleep. And they tell you to go away. You keep knocking on and banging on the door.

And all of a sudden, that little window falls open by itself. Nobody opened it, it just falls open, and you get a peek inside. And you look in there, and everything is yellow-- floor, walls, the ceiling, chairs, the desk, their food, their skin, their eyes, their hair. Everything is yellow.

Everything is yellow. Then you say, why is everything yellow? They don't have the word "yellow" in their vocabulary.

Then you reach in your hand, and let's say you had a pen that had red ink in it. So you squirt some red ink in there. All of a sudden, two words comes into their vocabulary at the same time-- "red" and "yellow."

Then they get to talk, and then they find the word "color" to account for both of them, and to distinguish color from other things. But they had yellow in front of them all along, but they couldn't see it. Or they could see it, couldn't distinguish it.

Only when that got that other color in there could they distinguish it. But then red and yellow come in their language at the same time. So now, that's what Kuhn is talking about when he says a new paradigm.

He's not saying that somebody is going to show you something that you've never seen before. What he's going to say is you're going to say, I don't know what word to use about my experience with this thing.

It was here all along, but did I see it? No. Then you have to find a lot of different words to describe what you did see. And you still won't. And you'll wind up speaking with people call "tongues," very abstract. It's only when the other one came in there that you could see both of them.

Now let's get to Einstein-- same story. You're at the monastery. The monks won't let you in. The door opens up.

This time, you look in there and all of the monks are blind. You don't ask them a question about generations. They've always been blind. Everybody's been blind.

So what you do is you finally talk them into letting you in. And when you get in there, you find that there's a rack in a closet, a rack of t-shirts. Now, all of the t-shirts are the same size, smell the same way, made out of the same material.

They are all the same except that they have different colors, but the blind man can't see it. The blind man cannot distinguish one from the other. He's sitting there. He knows he pulls out one, and they're all the same.

You can tell that half of them are dark red and the other half are white. They can't see it, but there's one thing the blind men know, and that is that when they put on some t-shirts and sit out in the sun, they get warm. And when they put on other t-shirts, they sit out under the sun and they don't get warm. They stay a little bit cool.

You go in there and say, well, wear the red ones when you want to get warm and wear the white ones when you want to get cool. They don't know what you're talking about. Einstein calls that "hyperspace," says that we have five senses.

If we had a sixth one, we could perceive other things. With our five senses, we can still perceive some of those things, but their behaviors don't fit in the patterns, like these traces of particles they see, these particle physicists see even to this day. They know that they're there, but they don't behave according to Newton's laws, to Einstein's special theory of relativity.

As a matter of fact, there's no pattern that you can see. And so what they say is that a pattern would exist if some alien came down here with a sixth sense who could perceive something like that. We don't have the sixth sense. We know that this thing is behaving like this.

So here's what Einstein and these physicists try to do-- what they try to do is write a position vector, not just in x , y , z , and say that these are dependent variables, and they're all dependent on time. Einstein comes back and says, let's put in α , call it the fourth dimension, do our arithmetic, and we will be able to account for that behavior even though we don't belong or can't sense the rest of this hyperspace, just like the blind men can account for the difference in t-shirts by going out in the sun, but can't see the difference or otherwise perceived it.

So that's what hyperspace is. It's an attempt to account for something you can't fully perceive-- you can't perceive but you can perceive the effects. So what you say is that in order to understand this position vector, you have to speculate another dimension. And if you do your math right, you'll get right answers.

Better stated, you will find a pattern. And then you use this α to fit in so that you fit into the pattern. And if that has a predictive quality, then you've got a law.

STUDENT: [INAUDIBLE]

TAFT BROOME: You just have to live with it, like the blind men just have to live with the fact.

STUDENT: [INAUDIBLE].

TAFT BROOME: And they're not even sure before they go out which ones are. So you take two or three of them, you go out you put them on, take a chance that one of them will. But you've tied down things a bit. You've got a science. They've got a science in there, in that monastery.

So that's where you get a lot of this abstract thinking coming along later, with people like Kierkegaard and Sartre. Let me see if I can get my French right. I qualified in French, but I don't count myself as a person who knows French, but "Sahrt," S-A-R-T-R-E. I feel more comfortable in saying "Sar-tre."

Sartre won the Nobel Prize twice. I think he won it three times, but he turned it down one time. These are people who talk about existentialism.

And if you go talk to a Zen Buddhist, he or she will talk about Nirvana. And if you talk to Einstein, or any of his intellectual descendants, he will talk about hyperspace. There's a lot of similarity in those concepts, a lot of similarity in those concepts.

And there is Kierkegaard who'll talk about existentialism, and then he does the same thing that these two guys did, when they looked at knowledge and truth, values and the good, and you look at knowledge in terms of empirical knowledge and rational knowledge, these people talk about actually empirical values and rational values. So Kierkegaard comes along and says, let's stretch out hyperspace. Can we talk about good and bad in hyperspace? In other words, not just the real world, but things that you cannot totally observe but that are there anyway?

And you get a lot of sympathy from that if you go over to the Art Department. You don't have to go to the School of Religion. You go to the Art Department, Ballet.

They'll tell you there's a hyperspace out there. There's a hyper world out there, and that some people are in touch with it, and most of the rest of us aren't. And they don't know what it is out there, but they know when you've got it, like the monks did.

They knew when you had the red shirt, but they didn't know about red and white shirts. But they know when you've got it, and those are the ones you call the geniuses. Not genius in terms of intellect, but just people who've just got it. Some people just got it, and they can touch that other world.

Ancient people knew about this stuff. Tell you how they knew about it-- they knew it in a way that we call it very concrete. They knew about it in terms of consciousness and unconsciousness. They knew about the dream state.

And when I say "ancient," I'm talking about beyond way back. I'm talking about 10,000 years ago. I'm talking about even probably before that, but when human beings began to have dreams. They say some animals have dreams-- dogs.

STUDENT: Wait, they know a particular point in time when [INAUDIBLE]?

TAFT BROOME: I don't know, but they speculate--

STUDENT: [INAUDIBLE] first start recording.

TAFT BROOME: They know when dreams became a factor in your daily life. They know that, because they were able to see what we call religious artifacts and burial. I think burial was what the cultural archaeologists say is the first, then cave drawings on walls, art, but burial-- the notion that somebody deserves some kind of ceremony after they died, and have to be buried, and something goes into the grave with them to notice the notion that there is another world.

And the other world that they thought was that you are just going to the dream state, and you'll never get out of it now, and that the dream state was just as valid as a conscious state. The price we pay for saying that the dream state is not worth anything unless you've got a real mental problem-- the price we pay for that is that we forget the obvious, and that is that our conscious minds can't be entirely trusted because there are a lot of truths that are in our mind that our conscious minds do not want to face. And we put them in our unconscious and they come out in dreams in the forms of dragons, and trolls, and all that.

So there is truth down there. That's what the mythic hero has got to do. He's got to kill that dragon. That's the symbol. That is the metaphor for solving your biggest problems in life.

You have to say that you've got all of the truth necessary to solve this problem. But some of it you have hidden, so you have to go down in the unconscious, get it, bring it up to consciousness, and make it fit, mostly morally. Because a lot of the things you have hidden down there don't fit because you don't want to accept the moral truth of it.

Notice I said "moral truth." So there are truths down there. So what the primitive-- that's the word I'm looking for-- beyond ancient-- primitive human beings understood the two different worlds and they believed that both were valid. And that whatever was down in one, some of them had mirror images of what was up in the other.

But there were other things, and you had to learn how to live in both. And there was always one individual that understood both of them. You know what they called them? Go ahead and say it.

STUDENT: I've heard you say "shaman" before.

TAFT BROOME: Yeah, the shaman. Shaman understands those two different worlds and can navigate them. And so hyperspace-- let's take this thing one more time, and then we'll try one or two of these codes before we get out of here.

Hyperspace-- let's go back to knowledge in the first place. Go back to knowledge. We're talking now about there's a term of art in philosophy, and it's called-- I'm putting it in quotes because I want you to memorize this-- it's called the "mind-body problem."

Now, the mind-body problem is this-- we know that there exists a mind. Does there exist the body? Or is the mind just telling you that things are going on, and somehow or another, you believe that there's a physical world out here that will be there even if you're dead?

Believe it or not, there's a lot of serious debate about all that right now, whether or not there's only the mind. The thing that you've got to take seriously about it is some of the best thinkers, at least that the Western world has ever had, have tried to tackle this thing. Descartes tried to tackle it. He got a big chunk of it. You remember what it was?

STUDENT: I think, therefore I am.

TAFT BROOME: There it is. He said there is one world for sure, and that you do exist because it's in your mind. Your mind exists now.

Why? Because you think. Do you think? Yeah, I think.

Then they start playing games with you. Well, what about this desk? How do you know you're not just dreaming it? How do you know that this isn't, in fact, the desk?

Because I can play a game with you, and I can make this thing out of water, and you just won't know the difference until you touch it. So I can manipulate your world. What do you know? Is this valid, this business of observation, or is it just you and your mind?

There is some other thinking that the only valid statement you can make about knowledge is your mind, but not your mind, because what you say is yours is only part of a whole. All of this has to do with-- this finds its way into ethical thought one way or another. And like I said, if you read Kierkegaard, A-A-R-D, some of these other people dealing with that hyperspace.

There any artists that deal with hyperspaces and all of this stuff. Can you imagine a fourth dimension? I thought I couldn't imagine one until I met-- until I had this discussion with a cousin of mine.

Well, this cousin of mine has the same mentality as a shaman. He was diagnosed as schizophrenic, long time, 20, 30 years ago, 40 years ago. He had all of the makings of a shaman.

He had a terrible experience as a child, and he never had a job. Lives at home with his mother. I was sitting there. His mother asked me to go talk to him one day.

I went, and sat down, and talked to him. I said, we don't have to talk if you don't want to. He said, I want to. I said, well, everybody says you've got a problem. What's your problem?

He said, sometimes he goes to sleep and he doesn't wake up for a month. And he's not laying in the bed for a month. He's walking around, talking it, but he said he's in the dream state.

Then he comes out of it. He only knows that he was in the dream state when he comes out of it. It's like the yellow. He only knows there's red--

STUDENT: [INAUDIBLE].

TAFT BROOME: People tell him he has a distorted concept of time. But there are some talents that he has. And one of those talents is the talent that-- I got the what was his name problem again. The book and the movie is called "The Picture of Dorian Gray." What's the author's name?

STUDENT: Oscar Wilde.

TAFT BROOME: Oscar Wilde, yes, yeah, Oscar Wilde. There's a movie that I've gotten also, that's written in French. I haven't looked at it. I looked at it once on television, and I went and ordered it. It's got subtitles.

And there's this young artist who falls in love with this young girl. And he tries to paint her and he can't get it right. He says he just can't bring out her inner beauty. Every time he paints her, she looks like "Picture of Dorian Gray--" it looks like something else.

So he says he knows of this old man that lives up in the hills who's a famous artist. And he's an artist who's just got it. Everybody says there's artists, and then there's some people just got it.

So he says, he's a friend of mine. I'm going to take you up to his house and I'm going to ask him to paint you. So he goes up to this man's house, small villa. Man's there with his wife.

And the old man is very reluctant to take on this job of painting this girl. And there's a real nice line in there where the old man says, well, if when I start painting her, I don't know what the paint on my brush is going to do when it hits the canvas. You may not like what you see.

And it goes on. And at the end, the last scene, he's completed the painting. He puts the cover over the painting. He takes a sledgehammer, and he breaks a hole in the brick wall.

He takes the painting-- we never see the painting-- he puts it in the hole, and he got some water, and he covers the hole back up. In other words, he was able to capture her "true self," and she looked like a beast. And he just could not give that picture to that young boy because it would tear his heart out.

That's the whole point of the thing. The whole point of the thing is that some people, like my cousin, can see that inner you. And I don't like the [INAUDIBLE] because I don't want him to see [INAUDIBLE]. But we got along, so I guess it's not so bad.

But he doesn't have the skill to put brush to paint and paint to canvas. And I tried to tell him, he developed poetic skills. And all poetic skills-- you don't have to rhyme.

But if he can see those things in people, then he is special. He's got a special talent. And a lot of artists are like that-- Jackson Pollock.

STUDENT: Does he see the world differently?

TAFT BROOME: I would not go to an ice cream parlor with Jackson Pollock. But in other words, what I think is healthy for us to say is that so far as our senses are concerned, some of these people are in hyperspace. They're perceiving things that we could perceive if we could purge our unconsciousnesses of their demons, and reconcile all that's down there with our conscious, and our reason, and our morals.

And that's what's supposed to happen when you become wise, that you're supposed to be able to purge your unconscious of all of his demons. Carl Jung said that. And he said it happens only in the old, because in order for the rest of us, the non-shaman, for the rest of us to do it and remain healthy, we have to see death.

And when we see the Grim Reaper not far away, then these demons just don't mean that much. And if we can find a moral way to accept them-- you know what I mean by moral way to accept the stuff that's down there? Well, one that's unforgettable is Freud when he talked about how a boy can have a sexual attraction to his mother. Well, that's kept down in the unconscious because that's morally unacceptable.

So there's a demon down there. But if you're getting old, and the Grim Reaper is right over there, you don't know when you're going, that becomes no longer significant. You could bring that to consciousness and deal with it. So a wise person is purged, is unconscious of all these demons, and takes on some of these skills of the shaman, and can see into certain kinds of hyperspace.

In this class-- I wouldn't say this in an engineering class, but in this class, I'm no longer in the mood to talk about codes of ethics. So I have to make that an assignment. We have a surprise. Did you read your email?

We have a visitor coming on Tuesday. What is definite is that apparently, he had asked about a class like this. This is a visitor from the Netherlands, chairman of a department, of an Engineering Department, apparently part of this whole reconstruction of education in Europe. And engineering ethics is getting on everybody's agenda over there.