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TAFT BROOME: Let's see-- I've got two issues that came to my attention since the last class that I want to go over. I want to give your papers back, but I don't want to give them back today. Also, do can Thursday wait or do you want comments on it tonight?

AUDIENCE: I can work with Thursday, yeah.

TAFT BROOME: Thursday-- I have some thoughts on your papers, and I just could not come to one conclusion [INAUDIBLE]. That's what happens with this business. Then, I want to-- did you get my news article and what I discussed there?

AUDIENCE: [INAUDIBLE].

TAFT BROOME: Then we have a couple of cases outstanding. How many, two? Ford Pinto--

AUDIENCE: And Challenger.

TAFT BROOME: And Challenger-- no, no, Challenger? I thought we were going to--

AUDIENCE: Well, you said we would finish talking about that, and then talk about Pinto. So it's like one and a half.

TAFT BROOME: All right, and then we'll assign some more, and then we'll be ready to go. Let's deal with the two issues first. Dr. [INAUDIBLE] brought up one.

And I'll tell you my thoughts on the matter, but I'd like for it to be a class discussion. Now, the way I understand the problem is, let's see if we can't-- well, I was going to act it out. I'll try. So I'll act two parts. I'll try that. I don't know if it's going to work.

But the situation is a job interview And I am just graduated from MIT, and you're going to interview me. You're this big boss on the job.

And you are my friend, my personal friend from years. So the job is one in which I'm going to be an engineer, but I'm going to have to interface the general public a lot. You know me as a person who is not exactly the nicest person in the world-- a little bit moody, and can generally irritate people occasionally. But I want this job.

So the situation is this-- I go in, and I'm all happy. And you tell me, well, sit down, Mr. So-and-so. And this is company X, and this is what we do. How can you help us out?

And I'm going to say, I'm going to meet with these people. I'm going to make them love company X. And we are going to make a lot of money together. End of situation.

Have I lied? Have I misrepresented myself to this potential employer just to get a job? Should I have portrayed myself more like quote unquote "myself"?

Is this an ethical situation, or just some other kind of situation? Is it legal? Is it business?

Now, I have the unfair advantage of having thought about this thing for about six days, five days. So if you want me to give you my reaction first, I will do it. But I'd prefer if you gave me yours. Let me give you a few minutes to think. Talk if you want.

AUDIENCE: So did you pose this question?

[SIDE CONVERSATION]

AUDIENCE: Well, that-- your background helps a little bit because as you were explaining the situation, I was thinking about, well, he's talking about the representation of personality traits. Because you said you're moody, you tend to irritate people. But what you're talking about is skills-- what you talk about first, anyway, is skill sets. And misrepresenting skill sets in a job interview is different than portraying yourself to have a certain personality. Both things are important for job [INAUDIBLE], I guess, personality and skill set, but--

TAFT BROOME: Well, would you say that interacting with the general public requires a certain skill set, also?

AUDIENCE: Mm-hmm. I feel like if you're hiring someone whose job will involve a lot of public relations, the burden perhaps falls on you to really find out what that person is like interacting with the public. I don't know.

TAFT BROOME: Can you do it in a job interview? Is there enough time? Do you have a test case? Do you have a random person in the room that you could--

AUDIENCE: Maybe, yeah. Or do a panel of interviewers or something.

TAFT BROOME: Well, I'm trying to make it as simple as possible, just one, just two persons.

AUDIENCE: Well, [INAUDIBLE]

Great, they just haven't seen you--

TAFT BROOME: Be that way all the time.

AUDIENCE: --that way at the job. But maybe I make the distinction. I think it's possible to be a certain way on the job and not really that way, because I just know a lot of people who have a different work persona. And when they get home, that's really not them, but they make it work for the job.

TAFT BROOME: Now, can we put any of this in the language of ethics, any of these views? Can we defend it, if we had to, among scholars? Does the literature help in any way with this?

AUDIENCE: So one moral rule, you're suggesting, is that one should always reveal their personality flaws in setting up a new relationship.

TAFT BROOME: I'm not suggesting that. Take that part away. I'm not suggesting that. That is really the question, isn't it?

AUDIENCE: Yeah, I mean, that's--

AUDIENCE: Or maybe it isn't imperative that you present yourself as you truly are at a job interview. I don't know.

AUDIENCE: The interviewer didn't say, are you moody? They just said, how can you help? How can you help our company?

So we're thinking about ethics-- the applicant didn't directly lie. Unless we know more about what went on in the interview, we can't say that he lied. He just talked about the skills that he thought would be helpful to the question that was asked.

TAFT BROOME: Well, the person that I was portraying, and the way I understood from your email, was a person that was worried that he or she might be using another person as a means to his own ends. And Kant says-- another formulation of the Kantian rule is that you don't use another person to advance your own ends. And the question is can it-- so the question for me is whether or not all I'm interested in is using this person.

The second question is-- there's another question. And that's a question that has a legal term, but which is also a moral term. I want to use this word from the moral point of view. The word is contract.

So we're here. You may wish to establish a contract. And the contract is not going to be to act out my real, or whatever I think my personality is with this public. The contract is to act personable with these people.

And the question is, from a psychological point of view, can I play this game for the duration of my employment? Or will the real me set in? And I think you said something that I see the point to, and that is that we do have multiple personas.

One of them is our personality. But we can put on a persona from 9:00 to 5:00, Monday through Friday, for 20 years. And the contract is you don't care what my personality is. You want to if I can do this particular job, and if I can really be the nice person.

Let's put one more little piece in the game. There's a book-- I forget the author's name, but if you find the book and you have any questions, the author is a faculty member right up the street at Harvard. And the book is called *Pygmalion in the Classroom*.

Now, this word Pygmalion, have you heard of that word before? It's a name. What have you heard?

AUDIENCE: A play. It's a play.

TAFT BROOME: Oh, George Bernard Shaw wrote a play called *Pygmalion*. You may know it better as a musical that was made for movies. It's called *My Fair Lady*. Actually, Pygmalion goes back to, I think, second or third century BC. It's a myth.

But let's deal with *My Fair Lady*. Do you remember the theme in *My Fair Lady*?

AUDIENCE: Yeah, I think there's a [INAUDIBLE] and he takes a lady some flowers [INAUDIBLE]. I think he's in bed with someone.

TAFT BROOME: That's what the key is, yeah.

AUDIENCE: And they can't tell that she was just a lady selling flowers a few months ago. They thought she came from even royalty just because she changed her manners and she spoke [INAUDIBLE].

TAFT BROOME: Yes, the issue was whether or not gentility and nobility was inborn or whether it could be taught. And these young guys had this bet. And this one guy said, well, I'll take that flower lady selling the flowers here on the street, and a year from now she'll be a lady.

And they made this money bet. And so at the end of the year, he has this coming-out party for her after training her. And all three of the guys fall in love with her, all three of these these aristocrats or whatever.

Pygmalion in the Classroom actually is an empirical science study that asks whether or not a person, a teacher, can have a preconceived notion about a student consciously and unconsciously, but mainly unconsciously, and whether or not that predisposition will have an effect on the student's performance. So he deals with gender and race issues. And he says if the teacher has a predisposition that women cannot learn math, and this is a math class, then no matter how he-- I'm going to say he in this case-- no matter how he tries to be fair, chances are the women will not perform as well as they would ordinarily.

Now let's see if they can get a real case like that. When I was in graduate school, that was actually my first educational experience that was not dominated by Blacks. So I go into the classroom, and the teacher would ask particularly deep questions that have a particularly deep answer.

And I'd raise my hand and give that particularly deep answer. Decent person, 20 minutes later, he would attribute that answer to another student. I raised my hand, and said, hold it. Kowalski didn't say that, I was the one who said that.

And I'd take my chances with irritating the person and getting a bad grade for personality conflict. The good news is, this is a decent person. And person said, oh, how could I have made that mistake?

This person's research says that the brain operates off of preconceived notions-- that you are set up. Your brain is set up to see or hear a certain thing a certain way. You really have to go out of your way to retrain your brain in certain cases.

Now we see why we're talking about why he calls it Pygmalion. There's another term that came out, I think he did not invent, was called Pygmalion effect. So it's more broadly than in the classroom.

So the question is, if I am a moody person-- going back to our situation-- a moody, mean-spirited person, can I deliver my term of the contract? Let's go a little bit further, just in case you're interested. A big literature on this same subject, and I'll give you one name that I remember.

I call this one, call this two. This is an author's name, Nel Noddings. Nel Noddings has written some books, but she mainly has collaborated with professors of nursing. The professors of nursing want to make a distinction between caring and care-giving, and the nurses want to say that a doctor can give care without caring, strictly business, but that a nurse can't give nursing care without actually caring.

Because of these effects-- that the patient will look at you, and say, you really don't care about me, and then suffer, maybe die. But we don't ask that question with the doctor. The doctor comes in there, we want the doctor to do the surgery or whatever and do it right. We don't care if the person cares about us. So they make that statement.

So the question then is, can-- another question is, can we actually do these things? Well, I want to say that my thought about the whole matter is that you have to assume that you can do it when you come into an interview, and portray yourself in this particular way to get this job, and to keep it. You have to assume that you can do it, that you can put on that business persona, and that you are sincere about it.

And if you are, then I think that you can portray yourself in that persona that has nothing to do with the way you see it yourself or the way others, your best friend, sees you, and just do that job. I think that those are the issues. And they work themselves around ethically in the mind of the person who is taking the interview, whether or not they are really using somebody else-- you don't know-- and whether or not they can keep up the persona.

And the two issues then are-- the last one is the contract, and the first one is respect for persons. So therefore, if I had to make this argument in a situation where it counted-- let's say, for example, I'm being interviewed by a judge in the Enron case. That's a good one. And the judge wants to know my opinions about this matter.

Well, the judge is not going to be very impressed if I'm giving my personal opinions. The judge is going to be impressed if I start grounding my opinions in good ethical theory. And I've just done it twice. We have just done it twice.

So that's the way I thought about that one. My wife gave me approval. Another one is Joel wrote me this note, and it picked up from the last class.

Oh, are we done with this one? I really apologize if I switch subjects too fast. Somebody else has something to say.

And that had to do with the discussion we had last time, where I made a statement that engineering was a regal [INAUDIBLE] discipline. And Joel wanted to make a remark that it's really aristocratic in its nature. And he and I've discussed this before.

And where we agree is that engineering has never been done, and cannot be done, outside of the context of authority and power. You don't go out and build a bridge because you think it's cute. I think I'll build a bridge. Engineering has always been done under the auspices, or under the control, to some extent, of kings and high priests, local populations getting involved as a brand new issue for us, as we went through last time.

And I remember the name out of Denmark-- they call it technology shops, where a local citizen group can go to a place and get technological advice about how to participate effectively in public decision making. So the city wants to build a nuclear waste dump in your backyard, not in mine, and the city has-- the city engineer comes up with all of these explanations as to why we want to put it behind yours and not behind mine. Then you can go to these technology shops and get an engineer to help you build your case.

But that's brand new. We want to think about that. And so here's the way I thought about responding to that. I need to give him some email, but it really didn't come to me until last night about 10:00.

I stayed up until 1:00 until I thought it through. And thinking it through really meant finding a concise way to put it to the class. Because it's in my book and I've already written 200 pages on this. So I'm going to see how it works, if I can just do it with a few bullets. Ready? Let's try. Yes.

AUDIENCE: Can I ask a clarifying question first?

TAFT BROOME: Yes.

AUDIENCE: So the dispute or the conflict, you're saying is regal, and Joel is saying it's aristocratic.

TAFT BROOME: Right.

AUDIENCE: And can you put that in other terms?

TAFT BROOME: Let me put it in my terms first, and lay out a logic. And then we'll put it in Joel's terms if he doesn't come--

AUDIENCE: I just wanted to understand where the concept was.

TAFT BROOME: Let's see it after I lay one out because this is kind of thinking that you won't see in any textbooks yet. But I think that's what a class like this is about, particularly when you have faculty members sitting in on the class. You get more out of it this way, I think.

My starting point for answering this question was one of the biggest problems I had in writing this book. Actually, it was in how to set up the book, how to organize it, how to organize 14 chapters. And what I had to do was do what Jacob Bronowski said to do.

I don't know if you all know him, but you don't have to. He worked in the Manhattan Project. He had a good TV program and a book called *The Ascent of Man*, which if you recall, is a mirror image of-- I'll tell you the book's name-- *The Descent of Man*. Remember who wrote it? Charles Darwin.

And what he said was that all the people he knew that made really important contributions to science started off by asking what he called an impertinent question. So I'm going to ask an impertinent question. And the impertinent question is, is engineering, the learned discipline, independent of engineers and what engineers think and do?

And you know that can't be true, right? I called it impertinent. Let's start with it. Is there something about engineering that is distinct from what engineers think and do?

Now, let me bring up one point, maybe two. Scientists in the Manhattan Project were not doing science. They were doing engineering.

So therefore, there's a difference. So the scientists, one could say-- what scientists were thinking about and doing was not science. Do engineers ever do science? But I think the invention of thermodynamics was done by engineers, but they really weren't-- they started out doing herky jerky engineering on thermodynamics. But at the end, they were doing science.

So what I want to say to Joel and to you all is that you cannot deduce what engineering is by observing and talking to engineers. There's something else. Now, why is there something else? Why is there this gap?

Can I make sense out of what I just said? Yes, because what engineers think about is divided between their conscious minds and their unconscious minds. And so to find out what engineering really is, you have to somehow get it out of both what they say and do. And some things that they don't say and don't do, you have to look down and get the unconscious dimension.

Now, that sounds like an impossible thing for anybody other than a clinical psychologist. No, there are other ways to do it. And here's one way to do it, and I'm going to have some special lectures from some faculty come in and talk about this. Already got this arranged, just have to settle on the date.

And that is that you can get the unconscious dimension out of what somebody thinks by having them write it down in a story. Because the story won't make sense unless their unconscious plays a role. And so what you can do is take a learned work of engineering-- a book, a research paper, a laboratory demonstration-- what you can do is look at that book or that research paper, and organize it in story terms. And that's one of the things we had talked about already.

And so what I want to do is to talk about engineering in story terms. And what makes one discipline different from another is chiefly-- this is my argument in my book-- is chiefly the story term that we call the point of view. Because I can take one document and put it here, and look at it from an engineering point of view, and get a whole different interpretation, or another point from looking at it from a scientific and ethical, or a musician's point.

Now this is the last piece of the argument-- remember, I'm distilling out of 200 pages-- the last piece of the argument is that I claim, I stand on this point, that the learned disciplines don't have but three points of view. They are the points of view of social order. That if you want to read ethics from the standpoint of Greek philosophy, if you want to read science the way Aristotle would read it and the way most Westerners read it, then the point of view is a person like Socrates who's looking at doing two things-- number one, he is accommodating the individual to Nature. What you're saying there is that Nature is what it is. And I want to find out how I fit with it, that is, find truth.

And the second thing is to accommodate society to the individual. Society is no better, can be no better, than its worst treatment of the individual. The individual is the unit of analysis. The Greek concept of ethics is that there's only one moral agent, only one being that can make an ethical choice, and that's an individual, not a corporation.

The notion of a corporation having personhood in law comes out of the Latin tradition, not out of the Greek. So it comes out of looking at society from a regal point of view, which is a point of view where you do not accommodate society to the individual, you accommodate the individual and Nature to society. And when I say accommodate Nature to society, what I'm talking about is if you want to cross that river, and Nature does not have a bridge for you, then you accommodate Nature to the will of society. You build a bridge.

And the third point of view when you look at something, a learned document-- you'll catch up-- is to look at it in a way where you accommodate the individual and society to Nature, to a higher cause. So when I say that engineering is regal, what I'm really saying is that if you pick up a learned document and you want to look at it from an engineering point of view, one of the things-- I haven't gone through all of the other story terms. I'm looking at only one right now, the main one. If you look at it from a regal point of view, then I claim that you will look at it the way that engineers look at it on both conscious and unconscious levels.

Now, how does that work out with aristocratic? Well, if you look at societies over time from the beginning, I think we're talking when human beings settled, began living a settled life in the Fertile Crescent, even from that point of view, that what you'll see is all three of these principles at work, and that when they started building irrigation systems, you'll see that they've built them from point of view of authority. And if for no other reason than you cannot build a bridge four different correct ways. If all of us have correct ways of building a bridge across that river, and those correct ways are different, we'll never get it built.

AUDIENCE: There has to be someone.

TAFT BROOME: There has to be an authority, that's right, a higher authority than any of the four of us, that says we'll build it his way and not yours, mine, or his. You don't operate like that, with a [INAUDIBLE].

Let's clean up any loose ends that we have with the Challenger. Ta-da-- *Washington Post*, Wednesday, August 27, 2003. The headline is "Report blames flawed NASA culture for tragedy." So I'll pass this around.

AUDIENCE: That's from the [INAUDIBLE], right?

TAFT BROOME: Yeah. So you can write down that reference. Well, I tell you what-- you can hold onto that if you want. Just bring it back. [INAUDIBLE].

AUDIENCE: That's OK. We can find it online and then--

TAFT BROOME: Yeah, download it. So any loose ends with the Challenger discussion?

AUDIENCE: I think part of thing we do-- maybe there's no answer, but we talked about--

TAFT BROOME: There will be an answer.

AUDIENCE: Are there differences, and is the problem with behaviors of management as opposed to the engineers?

TAFT BROOME: Yes.

AUDIENCE: I was doing a little more reading in the book, and it discussed [INAUDIBLE] interesting.

TAFT BROOME: Well, did you come up with anything?

AUDIENCE: We went-- what the reading talks about is dividing decisions between managers and engineers, such that managers are responsible for thinking about the well-being of the company, the organization. So that involves costs and profits. And engineers are responsible for the technical expertise and the well-being of the clients and the public.

And it's debatable whether it's clients, or public, or both. And so there's always pushback between those two kinds of decision making, which is a good thing. So the managers are expecting the engineers will always err on the side of safety.

So when they propose cuts in safety, the engineers will push back on them, and the engineers are supposing that the managers will always want to cut costs. So they'll make sure that they think about safety. Is that what you were thinking?

AUDIENCE: That's what I read. That's what I understand. I'm not sure that I necessarily disagree. But from someone who doesn't have a very extensive background in ethics, is that OK to have two different groups operating on such different ethical principles like that?

TAFT BROOME: Well, yeah, I mean, that's unavoidable.

AUDIENCE: Even if it's within an organization [INAUDIBLE]?

TAFT BROOME: Right. Now here's where you get what I was talking about, this question about the unconscious. Because you're going to get some conflict in what people will say. I think it's right for me to say that 100% of the engineering managers that I have known and read about do not make a distinction. All call themselves engineers.

I will say something around 50% of the engineers will say that they are engineers, and 50% say that they are not engineers. This debate came to a head about 10 or 12 years ago with accreditation, with A-B-E-T, ABET. Because there was this argument that engineers become engineering managers, and the argument was based on data. Two out of three persons who are engineers will become or wind up in a job description that says engineering management. That's what you do when you call going up.

There is this other line, which they call line engineer, which remains a hard-core engineer for all of his or her career. But that, they say, is about one-third, and even that's debatable because most of them have somebody, engineer working under them. There's an analogy in universities between faculty and administration.

And there's this book-- I can't remember the name of it right now. I will figure it out. I think it's the book called-- well, I'll get it out before the end of this discussion-- where the author point says, what is everybody talking about? The administration president versus the faculty-- what are you talking about? I don't know what people are talking about.

They are all professors. They've all got PhDs. They all taught at one time. They all did research at one time.

You're splitting a hair. So there is this issue that goes on, not just in engineering, but other places. And it comes out in the end, I think, that in organizations there is a line that's drawn. And the line is drawn between persons who are in engineering or management and persons who are in the line profession. And it varies from institution to institution.

In the universities, my university-- well, my other university, Howard University-- is pretty much typical. The department chairs will be categorized pretty much as faculty because in most institutions, the department chair can be fired by either administration or faculty. But deans are on the side of the administration. And so I think the ethical issue comes in with this question, again, of contract. What am I contracted to do?

AUDIENCE: Who am I primarily responsible for? Who or what? The student or the health department.

AUDIENCE: You know what bothered me though? This has bothered me-- the problem. If you said that engineering is this regal discipline, and [INAUDIBLE] come from some authority, it seems like the authority's ethics. They're the ones who really, at the end, say this is going to go, this isn't going to go. You do this.

But it bothers me that their ethics aren't grounded in something somewhat tied to what the engineers are doing, namely safety and things like that. It seems like they need to have some component of that [INAUDIBLE].

AUDIENCE: Wait, why are you saying their ethics aren't grounded in--

AUDIENCE: Because we just say people in management positions, and I'm assuming. I put authority in that category. I'm pretty much concerned-- they are the bottom line. They don't care. They just want this project to go. They want this thing to make money.

But I just think [INAUDIBLE] you need to be as safe as-- I guess you can't [INAUDIBLE].

TAFT BROOME: Well, no, you can. I think the times have changed-- let me put it this way. I think that there was a time when-- let me back up just a minute. I don't want my book and my theories about engineering to be the dominant position in this class. I don't want that to happen because I've got to assign some other readings.

Point about it when it comes to it, philosophy of engineering, is there are only a couple of places you have to do that at all. So that's where you're getting a unique experience because nobody else is really talking about this yet. But I do have one reference down there, Billy Vaughn Koen's book called *Discussion of the Method*.

There's probably-- and another one, one other one. It's called *What Engineers Know and How They Know It*, written by a man named Walter Vincenti from Stanford. He retired several years ago. Those are about the only two that are out that I really think go into depth in the philosophical thought about what engineering is as a learned discipline.

AUDIENCE: Do you consider Florman's work, *The Existential Pleasures of Engineering*, as in the category with those other two?

TAFT BROOME: A lot of people do. I don't. Because when you look at Florman's work and you look to see what he thinks engineering is as a learned discipline, he's got a short paragraph in there about two sentences long. He's going to talk about the nature of the profession.

AUDIENCE: So the other two books are engineering as a learned discipline. This one is observations of the professionals.

TAFT BROOME: Did you ever read *Existential Pleasures*?

AUDIENCE: Yeah. That's the only one I've read of all the books that you've mentioned, so that's why I asked.

TAFT BROOME: What do you think of it?

AUDIENCE: For me, it mostly served to be an inspirational book about the engineering profession, and also informative on the history of engineering. It's enjoyable reading and puts forth a vision, a lofty vision, of engineering, I think.

TAFT BROOME: I think his undergraduate degree was engineering, but his graduate degree was literature. And he writes, uses his talents in literature well. So he talks about Greece, ancient Greece, and all these things. And I would say that any engineer of the engineers who are in the generation older than me, and hardly any are still around working, but in Sam Florman's generation, I would say offhand 85% to 95% of engineers think that he has got it right.

My generation is a little bit different. We were freedom fighters and all of that other stuff, anti-war. So we're a different generation.

But I was on a panel with Sam Florman once. And actually, here's what it was-- it was a panel, but he gave the keynote address. So he gave the keynote address. I really wasn't on the panel with him, but we were there together.

And he got up-- this was right after he wrote his book-- and he said that his motivation for writing the book was his sons. Said one day his sons told him-- and I don't remember his exact words, but they were very harsh, that he and the rest of the engineers out here were just murdering people. So he sat down and wrote that book for them. And so it was an answer of a father to his sons.

AUDIENCE: That was interesting for me to learn that in the 1960s and 1970s, society was anti-technological. They were out to get engineers that they accused of polluting the waterways. I mean, just because we don't hear that message, or I hadn't heard it before, anyway.

TAFT BROOME: Well, if you're interested in the history of engineering, I'll tell you what I think is definitely a most interesting book. Now, let's not rule out Henry Petroski and David Billington. But I tell you where I think we should start-- it's a book called *The Revolt of the Engineers*.

And I'll think of this man's name. I haven't talked to him in 15 years. It's called *Revolt of the Engineers*, and when you get the book, let me suggest the first thing you do is look in the index for the word technocracy, the Technocracy Movement.

And you read that, and you will be compelled to read rest of that book. Layton, L-A-Y-T-O-N, Edwin Layton. And so if you remember basically what people said was, well, we live in a technological world now, so the world ought to be run by engineers.

AUDIENCE: So what you argue in the editorial, perhaps, is that engineers need to inform the public, so the shared running.

TAFT BROOME: Shared running, yeah. I argue straight out in my office preface that everybody should learn engineering. But on the other hand-- that's on the one hand-- on the other hand, engineers have not proven to be better citizens than anybody else. So there's something that falls in the middle, and I call it generalist expertise as opposed to specialist.

So a specialist expert does not necessarily possess what I call generalist expertise. So that's where I'm going with it. But you'll find other people who have other points of view. But a lot of this discussion is quite new.

OK, can I shift gears and start talking about Ford Pinto?

AUDIENCE: Yeah.

TAFT BROOME: All right, then I said something I really didn't mean. I want to shift gears. But you're going to talk about Ford Pinto. OK, start. Just start talking. Ford Pinto.

Let's talk about facts. Did you get the chance to read this case? Then I think we can go through and get a lot of the facts without spending a whole lot of time. Anybody want to go first? Start with the year.

AUDIENCE: What year-- so we're in the late 1960s, and Ford deciding that they want to design a car that will sell for less than \$2,000 and weigh less than 2,000 pounds. And they to compete, rush the production to happen a little more than two years compared to the usual three and a half years. And the book says so this means that a lot of the design and styling happened before the mechanical engineering, so some engineering decisions were based on design rather than design coming after engineering.

So they decided that the best place for the gas tank was between the rear axle and the bumper, between the gas tank and the bumper. No, they decided the best place for the gas tank is between the axle and the bumper. And there were bolt heads on the--

TAFT BROOME: Did they use the term sheet metal?

AUDIENCE: No, just says there were exposed bolt heads that could puncture the gas tank if the tank were driven forward towards the axle upon impact. What's the sheet metal?

TAFT BROOME: There was a code that said a certain amount of sheet metal should exist between the gas tank and passengers.

AUDIENCE: It doesn't talk about that.

TAFT BROOME: By taking that sheet metal out, it can reduce some of the weight of the car.

AUDIENCE: So anyway, we have this gas tank in a precarious position. And they did crash tests to see how often the bolt heads were driven into the gas tank, causing the explosions. And the results were that at 21 miles per hour is enough, was high enough speed for the gas tank to be puncture.

Then they made adjustments, just of putting the tank above the rear axle rather than behind it, or adding rubber bumpers on the gas tank itself. Those minor adjustments, that would have cost like \$11 per car, prevented the tank from being punctured in a crash test. But the manager's decision was that the cost of those adjustments, the \$11 a vehicle, didn't outweigh the benefits.

Those costs were too great. So the cost of the deaths and destroyed vehicles were less than the cost of \$11 per car. Does that make sense?

AUDIENCE: You put a monetary value on a person's life [INAUDIBLE]

AUDIENCE: [INAUDIBLE] \$11 so [INAUDIBLE]

TAFT BROOME: Say that part again, now.

AUDIENCE: Based on a monetary value of the lives that would be lost. They issued a report after the crash tests to-- I can't believe it. It's in writing. A memo attached to the report had those cost and benefits.

TAFT BROOME: That's the technical term, cost-benefit analysis. I don't think the word required is the right word, but in that method, it is useful to put a monetary value on a human life. I mean, that's what engineers used to do all of the time. I don't if they do it now, but we used to do it all the time, and include that in as the cost as opposed to how much you think you could get in profit. So keep talking.

AUDIENCE: [INAUDIBLE].

TAFT BROOME: You're right.

AUDIENCE: I know. Seems a little cheap.

TAFT BROOME: OK, are we done? Let me give you some background.

AUDIENCE: Some more background would be great.

TAFT BROOME: Something that you probably-- something you have certainly never experienced. I doubt if you've ever heard of-- it's called a gas line. That is driving up to a gas station, and standing in line to get gas. And you've got a quota, like being in war in England.

Where I lived in Virginia at the time, if you wanted to get gasoline at a gas station, and you had to be at work at 9:00 in the morning, you had to be in a gas line at 7:00. And you were taking your chances that by the time you got up there, they'd have some gas left. What had happened was OPEC had increased the cost per barrel, and et cetera, et cetera.

So it was really a psychological crisis in the US, given the way we think about cars-- that you have to stand in line for two or three hours to get a fill up. And you couldn't get a fill up. You could only get so many dollars worth. And then you might stand in line that morning, and get there, and they're out. So that was going on.

The most significant way to increase gas mileage was to reduce weight, the weight of a car. Now we don't think about it in those terms. We think about it in other terms of how to get more gas mileage.

But then, it hit us for the first time. We liked heavy cars. It was a mistake.

I remember one time my dad had just bought this car. It was a Chrysler. And it came out-- this was called the Push Button Age. And the first car came out, at least an American car, came out with push button transmission. You ever heard of that?

Where you want to go in reverse, you push R. When you want to go forward, you push D. It was a push button thing. And this is back in the late, late '50s.

And I had this date. I was in high school. I just gotten my license, and I was going to take this little girl to this dance in my daddy's new car with the push-button drive. And I took her to this dance.

And when we came out of the dance, people were crowded around the car. How can you have push-button drive? And so this was the first and the last time I showed off, or what we used to call showing out in a car.

We got in the car, and I wanted to demonstrate that now that I have push-button drive, I didn't have to pay attention to putting the car in gear like everybody else had to. Most cars had four gears-- a lot of them, not most of them. And so I was looking at my date and putting the car in gear, but I made a mistake and put it in reverse and hit the gas. And instead of going forward, I went back and hit a brick wall.

Now, the point that I'm making is the damage was done to the wall. It wasn't done to the car. That car had a fender that-- we used to call it 1/4-inch armor plate. But it wasn't 1/4 of an inch.

But I mean, the fender of that car-- was something like they don't make at all today. A whole new concept about fenders today. They want it to dent. Back then, you wanted to break up anything that it hit.

So there was this heavy aesthetic back in those days. And so it was very competitive to get a car out and get it out with high gas mileage. So that was a compulsion.

There's a formal term that people use when they talk about engineering, and they call it the engineering imperatives. Cost is 1. So now, when a gas crisis came out, there's another thing to be said about that-- food prices went up dramatically because the food that was brought into the grocery stores was brought by trucks.

And if the trucks had to pay more money for the diesel fuel, then they raised the price of food. So a can of beans went up. So everything started going up, everything.

So there's this big compulsion to get cars with a lot of high gas mileage. Back in those days, I drove a diesel. So I'd go out to the truck stops and get my fuel. I didn't stand in line.

So there was this other issue. And the newspapers made a big issue out of it. I don't know how it wound up in the courts, but it became a big issue for people in engineering ethics.

And that was that the newspapers put the spin on the story, that the engineers had not only calculated how much profit they would get, but they had calculated how many lawsuits they would get and how many lawsuits they would lose. And that irritated the American public to the n-th degree. And the newspapers had it out where this one lady got hit, got rear-ended. She was sitting still at a red light and the car that hit her was only going 20 miles an hour or something like that.

And the car exploded. . And they had pictures of her with all of her skin burned off. Oh, it was just a big to-do.

And so that part, the ethical part that was being discussed had a lot to do with putting a monetary value on human life, and whether or not it is right to just calculate how many lawsuits will they be able-- will you lose. Because technicalities-- you've got the better lawyers than the individual person who is driving the car. The companies have these big lawyers. And they just said that they'll just pay the cost. So what were some of the issues that the authors here point out as legitimate points of view on this thing? You remember?

AUDIENCE: Well, it's a legitimate cost-benefit analysis from a utilitarian point of view. I mean, the method of analysis, at least, is legitimate. [INAUDIBLE] utilitarian ethics gone wrong. I mean, maybe that is a perfectly valid cost-benefit analysis, but I think their point of view is skewed somewhat, that it doesn't really get at the essence of what a cost-benefit analysis and what a utilitarian approach would kind of force you to do.

AUDIENCE: Yeah, I mean, it's interesting-- yeah, I feel like this is a utilitarian approach that came to the wrong conclusion.

AUDIENCE: That's what I want to conclude. I want to say that what Ford did was wrong.

AUDIENCE: Did they get the numbers wrong?

AUDIENCE: Did they get the numbers wrong? Is that what you're saying? Yeah, so that's what I want to say is, well they just didn't put a high enough cost on human life. If they had put a higher cost, then the conclusion would have been to put the safety features into the car because they wouldn't have been saving.

AUDIENCE: But I think their audience is off, too. I mean, from their point of view, if you just consider their corporation, yes, it makes sense to not do it. But they're not considering.

AUDIENCE: I think they are, when they assign their value to this person's life. But I think they're looking at it a little too narrowly. Something went wrong, I think, in that analysis.

AUDIENCE: But there must have been society [INAUDIBLE].

TAFT BROOME: But is a company supposed to serve society?

AUDIENCE: Well, you were talking about management, strictly the company and shareholders. And then the engineers are supposed to do some of that, so some of the safety of the public. Doesn't sound like they put any weight at all in the safety [INAUDIBLE]. Because even the cost on the life was from a management point of view in terms of [INAUDIBLE].

TAFT BROOME: Well, how would you have done if you were an engineer there? Make me the bad guy. I'm the one who told you to do it. I'm your boss.

AUDIENCE: What was the cost [INAUDIBLE] management? What mandate did management [INAUDIBLE]?

TAFT BROOME: Sink that cost. You guys are coming up with too much weight. I want the weight of this vehicle down another 12 pounds. Go back and do it.

AUDIENCE: Wait, what about the regulation?

TAFT BROOME: OK, now we want to talk about regulations. I want to put a BUT in there. I don't want the Ethics class to turn into a legal class, but what I want to do is to say, well, what are the regulations?

And I want to ask, do we have an ethical obligation to abide by the regulations? That is, to use, for example-- here's my example, now. It goes back to what you've all said. The regulations allow cost-benefit analysis, or allowed. So it was legal to do that.

AUDIENCE: I think a regulation maybe to protect [INAUDIBLE] same way tenure protects [INAUDIBLE] management tells them cut the costs all the way down [INAUDIBLE] much, putting some numbers on lives. Because it doesn't [INAUDIBLE].

TAFT BROOME: Well, that's exactly what all the engineers did, and all the engineers had a right to do-- point to the regulations, say, we live within the law. What are you talking about?

AUDIENCE: [INAUDIBLE] I'm sure more regulations came out of this case, right?

TAFT BROOME: Yes, a whole flood of them.

AUDIENCE: [INAUDIBLE] something was [INAUDIBLE].

TAFT BROOME: I think that one of the things that made this case what it was, was really the question that hurt engineers a lot that came from citizen groups. How could you all do that? How could you do-- how could you just sit down, and just say, well, we we're going to kill so many people, but we can make a profit off of it because they won't win a lot of these law cases? How can you just-- how could you do something like that?

And engineers personally-- I mean, I was going to conferences roughly once every four to six weeks back in those days. And I think that I didn't go to a single conference where somebody didn't lose it emotionally, either in the audience or on the panel.

AUDIENCE: Because they got attacked for it.

TAFT BROOME: Either because they felt attacked or because they were on the attack. And some of the people who were on the attack could point to a relative of somebody who died. And the people who were defending themselves were ordinary, decent people. Engineers go to work at 9:00, get off at 5:00, do the best they can do.

And they had engineers-- there was a whole generation of engineers who had never been attacked before. The last ones were in the early, early '40s and late '30s. So we're talking about late '60s or early '70s. Engineers always thought of themselves as decent people.

There was an article-- I'm still trying to find it. Maybe you all can find it for me. It came out in a magazine.

It was one of two magazines-- it was either *Look* or *Life*. Those were magazines that were big magazines back in the '50s and '60s, maybe even the '40s and '30s, '20s. Everybody read either *Look* or *Life*.

And I remember in there, there was an article, and it had this picture introducing the article. And the picture was the ideal of American life in the 1950s-- a husband and wife and two kids living in the suburbs. The wife stays home, the husband goes to work. And the kids look up to dad like he's-- that was the-- it had that picture.

And the wife was standing in the doorway handing him, handing the husband, his lunch pail, as I recall it. And the kids were waving goodbye. And the title of it were words to the effect, he's an engineer, and his family doesn't know what he's going to do today.

And it was based on some national surveys that the families of engineers had not a clue as to what their husband or father was going to do. They were all men in those days. When I say all men, I don't mean 100%. 98%. They did not know what their father was going to do all day. They didn't know what engineering was.

I'm still trying to find that article. There was another article that I'm still trying to find that came out in one of those magazines, where they had these pictures of graduation at Berkeley. And the students, the engineering students, had these placards, and the liberal arts students had other placards.

And they were not anti-war placards. The liberal arts students had placards that said, we got an education. And the engineering placards said, we got jobs. [LAUGHS] And they were directed one towards each other.

So there was this-- I'm trying to describe the mood of the times that govern your ethical decisions. Because I argue that ethical decisions, no matter what Plato said-- actually, no matter what Aristotle said-- have a lot to do with your passions. You're trying to put your passions and your reason in some kind of harmony in a lot of them. But Aristotle said, no, it's all reason. And Plato said, no, it's all character.

Well, are you willing to take a stand on the Ford Pinto case? Can you point to somebody who did something wrong? Can you point to somebody else who did something right?

Can you tell me what you would do if you were in a situation? Would you have blown the whistle on your company when the word came down? Notice that nobody in Ford blew the whistle.

AUDIENCE: Yeah, I mean, I feel like if-- I wonder how much the engineers that were working on the car design knew about the crash test results.

TAFT BROOME: I don't know.

AUDIENCE: [INAUDIBLE] they listened to the boss. Whatever your boss says, [INAUDIBLE] they just did whatever they could do. And there was no [INAUDIBLE] back in the day. If you're talking about the type of [INAUDIBLE], they don't question. They don't-- now people are more likely to think about standing up for what they think is right. I think back then, [INAUDIBLE].

TAFT BROOME: That's a fair characterization. Whistleblowing was not new in those days. Ed Layton would show the whistleblowing-- I think he traces it back to the late 19th century, but you would find it.

But it was so rare and so-- it was equivalent to heresy in religion. I mean, if you did it, you'd get blackballed. And people thought of you as a terrible person.

AUDIENCE: [INAUDIBLE]. So if the whole city of automobiles [INAUDIBLE].

TAFT BROOME: Right, you couldn't live there anymore if you blew the whistle. You couldn't go home with your neighbors, even if they were not engineers. They'd say, oh, how could you do a thing like that? The times were different, but times were changing in those days.

Well, let me say that we're not done with the Ford Pinto. I want, in the next class, to come back and tell me if you're willing to take a stand on this case. Let me assign another case. On the list in the syllabus, we're at a point now where we can start picking and choosing.

Do you have any preferences? We don't have to go in the order that I presented, but the Pinto is a little more-- you can see why I picked this one after A7-D. A7-D was pretty straightforward. Pinto is a little hard.

AUDIENCE: And I want to be able to say that a company shouldn't sell a car that they know is going to kill someone, but--

TAFT BROOME: All cars.

AUDIENCE: So where's the threshold? How many deaths are allowable [INAUDIBLE]?

TAFT BROOME: And I'll tell you where I'm willing to stand on this. And I think that there are contrary stands you can take, too. I tell you what-- let's play a game.

Let's start playing a game, and that is whenever I ask you or whenever you decide to take a stand, it could be a stand that you will defend because you believe in it, or you can tell us you're going to be devil's advocate. Take a stand that you don't believe in. See how far you can defend it.

Well, let me see the list and let's do Chernobyl. And now, I'll tell you what, let's do two together. Let's do Chernobyl and Three Mile Island. Now, the reason for doing them together is that we can make a cultural comparison.