UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

UNITED STATES OF AMERICA, Plaintiff, v. PHILIP MORRIS USA INC., f/k/a PHILIP MORRIS INC., *et al.*, Defendants.	Civil No. 99-CV-02496 (GK)

UNITED STATES' WRITTEN DIRECT EXAMINATION OF

DR. JERRY FRANK WHIDBY

SUBMITTED BY THE UNITED STATES

PURSUANT TO ORDER #471

Pages 49-50 of the written direct examination of Dr. Whidby contain information that the Court has ruled is subject to confidentiality protection pursuant to Order # 638 in United States v. Philip Morris Inc., et al., 99CV02496 (GK) (D.D.C.).

(AS CORRECTED BY DR. JERRY FRANK WHIDBY)

Q: Please state your full name for the record.

A: I am Jerry Frank Whidby.

Q: You worked for Philip Morris USA from 1972 to 1998, correct?

A: Yes, *but until 2003, Philip Morris USA was known as Philip Morris Incorporated.*

Q: Since your retirement from Philip Morris USA, you have been a paid consultant for Philip Morris, correct?

A: Yes.

Q: Part of your obligation as a paid consultant is to testify on behalf of Philip Morris in litigation, correct?

A: Yes.

Q: You have a written agreement with Philip Morris that requires you to provide scientific and technical support in legal matters, correct?

A: Yes.

Q: Your written agreement with Philip Morris doesn't make it optional for you to testify, does it?

A: No.

Q: And it doesn't say anything about whether you can pick and choose what cases you're going to testify in, does it?

A: No.

Q: And under this agreement, Philip Morris has the right to terminate you if you fail to cooperate with the company under this agreement, correct?

A: Yes.

Q: You are testifying today as a fact witness, not an expert witness, correct?

A: Yes; that is correct.

Q: Under your consultancy agreement with Philip Morris, you are being paid or expect to be paid to provide fact testimony for Philip Morris in this case, correct?

A: Yes. *As stated in the Agreement, I am paid for providing technical and scientific support in legal matters.*

Q: You have spent time preparing for your testimony in this case, correct?

A: Yes.

Q: During the time you have spent preparing for your testimony, you have been paid or expect to be paid by Philip Morris, correct?

A: Yes; that is correct.

Q: Half of your work as a consultant is litigation-related, correct?

A: Yes, *to the best of my knowledge*.

Q: Under your consultancy with Philip Morris, you get paid more to testify in litigation than you do to work on scientific matters, correct?

A: That is correct.

Q: I want to ask you some questions about your background. What educational degrees have you received?

A: In 1965, I received a Bachelor of Science Degree in Chemistry from North Georgia College, and in 1970, I received a Ph.D. in Analytical Chemistry from the University of Georgia.

Q: Let's discuss your employment at Philip Morris. The entire time you worked at Philip Morris USA, you were in the Research & Development Department, correct?

A: Yes.

Q: You started as an Associate Professional Scientist in the Analytical Research Division, and held that position from 1972 to 1973, correct?

A: Yes.

Q: Then, from 1973 to 1978, you were a Research Scientist in the Analytical Research Division, correct?

A: Yes.

Q: Then you worked in the Computer Applications Division as a Senior Scientist from 1978 to 1981, correct?

A: Yes; that's correct.

Q: From 1981 to 1987, you were Manager of the Biomaterials Science Division, correct?

A: Yes.

Q: Then you were the Manager of the Physical Research Division from 1987 to 1991, correct?

A: That is correct.

Q: Then, from 1991 to 1993, you were Director of Basic Research at Philip Morris, correct?

A: That's right.

Q: From 1993 until your retirement in 1998, you held the title Technology Fellow at Philip Morris, correct?

A: Yes.

Q: Fellow is the highest science level that Philip Morris has, correct?

A: Yes.

Q: When you were at Philip Morris, it did not have a scientist who had a position senior to your position as Technology Fellow, correct?

A: That is true, *for a non-management position.*

Q: And ever since your retirement, you have had the consultancy agreement with Philip Morris that we discussed, correct?

A: That is correct.

Q: In addition to the consultancy agreement, you receive retirement benefits from Philip Morris USA, right?

A: Yes.

Q: The budget of Philip Morris USA's Research & Development Department is very small compared to Philip Morris USA's marketing budget, correct?

A: Yes.

Q: Now I would like to discuss the diseases and other harmful health effects caused by smoking. How long have you recognized that smoking was dangerous and caused cancer, emphysema and other diseases?

A: Since years before I went to work for Philip Morris.

Q: Have you ever doubted that smoking was dangerous and caused cancer, emphysema and other diseases?

A: No; I have never doubted that.

Q: When you interviewed for your job at Philip Morris USA, Philip Morris USA told you they were interested in making a less dangerous cigarette, and that you would be working on that, correct?

A: Yes; that is correct. *The scientists at Philip Morris who interviewed me said my job would be to help in making a safer cigarette.*

Q: When you joined Philip Morris USA in 1972, you recognized that smoking was dangerous and caused diseases, including lung cancer, correct?

A: Yes.

Q: When you arrived at Philip Morris USA, activity relevant to the development of a potentially less dangerous cigarette was already underway at the company, correct?

A: Yes.

Q: One goal of the Research & Development Department at Philip Morris USA while you worked there was to make a less dangerous cigarette, correct?

A: Yes.

Q: Your understanding about your fellow scientists in the Philip Morris USA Research & Development Department – at least all the people who worked around you that you know about – was that you were looking for ways to reduce the harms caused by smoking, and you all believed that cigarettes are dangerous and cause disease, correct?

A: Yes. *My co-workers and I were working to make cigarettes less hazardous. While I cannot speak to the beliefs of all the workers in the Research & Development Department during the 26 years of my employment, I and many others believed cigarette smoking is dangerous and can cause disease.*

Q: From the time you came to Philip Morris USA in 1972 until after you retired in 1998, Philip Morris's public position was that it was not proven whether cigarettes were harmful or caused any disease, correct?

A: Yes. *I cannot tell you all of the public statements made by Philip Morris between 1972 and 1998, but I was aware of public statements by Philip Morris during this time period that reflected the absence of scientific proof that cigarette smoke causes harm.*

Q: Are you aware that, at no time prior to 2000 – months after the United States filed this lawsuit – did Philip Morris USA ever acknowledge that cigarettes caused harm, death or any disease in smokers?

A: Yes. *No. While I do not know all of Philip Morris' statements, the first one I am aware of was on its 1999 website.*

Q: Let's review some of the public statements that were made by Philip Morris or on behalf of Philip Morris on this issue. Please examine U.S. Exhibit 20,627. This is an article entitled "Defending the Weed," excerpted from the January 24, 1972 issue of the *Wall Street Journal*, correct?

A: Yes, *I see that this is the article you describe in your question, but I have never read this article. It was published several months before I became employed by Philip Morris.*

Q: Turn to the second page, which bears Bates number 50032 4163. In the third paragraph in the left column, it states:

> **"If our product is harmful," says James Bowling, vice president of Philip Morris, "we'll stop making it. We know enough that we can take anything out of our product, but we don't know what ingredients to take out."**
>
> **Did I read that correctly?**

A: Yes.

Q: Later in that paragraph, Mr. Bowling, Philip Morris Vice President, is quoted as saying: "We don't know if smoking is harmful to health, and we think somebody ought to find out," correct?

A: Yes, *that is what it says.*

Q: In the same year that Mr. Bowling made these statements, you believed – and everyone else whom you worked with at the Philip Morris USA Research & Development Department whose views you were aware of believed – that cigarettes were dangerous and caused disease, correct?

A: Yes. *This question is confusing, but if you are asking if my science colleagues at Philip Morris who shared their beliefs with me believed that cigarettes were dangerous and caused disease, the answer is yes.*

Q: Philip Morris USA now agrees that its cigarettes are dangerous and cause diseases, correct?

A: Yes.

Q: To your knowledge, from the time you started work at Philip Morris USA until today, Philip Morris never actually did "stop making" cigarettes, did it?

A: No; Philip Morris has never stopped making cigarettes.

Q: U.S. Exhibit 21,480 is an article in the June 1978 issue of *Business Horizons*, entitled "Smoking: Free Choice," authored by William F. Dwyer, listed as the Vice President of the Tobacco Institute, correct?

A: Yes, *but I am not familiar with this document.*

Q: The Tobacco Institute was a tobacco industry trade association that performed public relations functions on behalf of its members, correct?

A: Yes.

Q: These public relations functions included responding to media inquiries, issuing press releases and making other public statements, correct?

A: Yes. *I am generally aware that the Tobacco Institute performed public relations functions including press releases, but beyond that, I don't know.*

Q: The Philip Morris domestic cigarette company – now known as Philip Morris USA – was a member of the Tobacco Institute during the entire time you worked at Philip Morris USA, correct?

A: Yes.

Q: On numbered page 53 – Bates page TIMN 0074797, in the last paragraph of the article under the subheading "A Scientific Problem," Mr. Dwyer states:

> **A question often asked of the tobacco industry is whether researchers are developing a "safe" cigarette. A variation of that question is whether low "tar"-nicotine cigarettes are safer. The tobacco industry is convinced that no cigarette has been proved unsafe. Therefore, they regard any suggestion of a "safe" or "safer" cigarette as tortured logic.**

Did I read that correctly?

A: Yes.

Q: Dr. Whidby, you had been working on ways to reduce the harms caused by smoking for six years at Philip Morris USA when the Vice President of the Tobacco Institute made this statement – indicating that the idea of making a safer cigarette was viewed by the cigarette industry as "tortured logic," correct?

A: Yes, *but I have no knowledge of this statement or document.*

Q: Please review U.S. Exhibit 20,451. This is a Philip Morris Incorporated Annual Report for 1979, correct?

A: Yes.

Q: On numbered page 12 – Bates page 2043819561, this Philip Morris Annual Report states that "no conclusive clinical or medical proof of any cause-and-effect relationship between cigarette smoking and disease has yet been discovered," correct?

A: Yes.

Q: When Mr. Dwyer of the Tobacco Institute made the statement above in 1978, and when Philip Morris Incorporated made the statement above in its Annual Report in 1979, you and all the people in the Philip Morris USA Research & Development Department whose views you knew of had believed for several years that cigarettes were dangerous and caused diseases, including lung cancer, correct?

A: Yes.

Q: Now let's jump to 1999. U.S. Exhibit 87,067 is an excerpt of Philip Morris Incorporated's Answer to a Complaint filed against Philip Morris and other tobacco companies by Ellis Simon and others, correct?

A: Yes*, but I have never seen this document before except when shown to me in a deposition by plaintiff's counsel in another case*.

Q: This document is dated November 29, 1999, correct?

A: Yes.

Q: Following the number 29, the text of this document states, in the first paragraph: Philip Morris admits that smoking is a risk factor for, and may in fact cause, certain kinds of diseases in humans, but states that it has not been

scientifically established whether cigarette smoking causes any of these diseases in humans. Philip Morris further states that no constituent or group of constituents of cigarettes [sic] smoke in the quantities found in cigarette smoke has been established to cause lung cancer in humans.

Did I read that correctly?

A: Yes.

Q: When Philip Morris made this statement, you had retired after working at Philip Morris for 26 years, correct?

A: Yes.

Q: And the whole time you worked at Philip Morris USA, you and everyone else in the Research & Development Department at Philip Morris USA that you knew of believed that cigarette smoking was dangerous and caused people to get diseases, including lung cancer, correct?

A: Yes. *While I cannot speak to the beliefs of all the workers in the Research & Development Department during the 26 years of my employment, I and many others believed cigarette smoking is dangerous and can cause disease.*

Q: Now I would like to go over the nature and some of the activities of the Research & Development Department at Philip Morris USA that bear on the issue of developing a less hazardous cigarette. When you came to Philip Morris USA, there were roughly 350 or so people working in the Research & Development Department, correct?

A: Yes.

Q: And over the years that you worked at Philip Morris USA, that number generally increased in size, correct?

A: Yes.

Q: During the 26 years you worked for Philip Morris USA, how many of the 350-plus people working in the Research & Development Department were conducting biological testing on the cigarettes Philip Morris sells in the United States, to measure the extent to which these different Philip Morris brands cause tumors, cancer, and other harmful health effects?

A: Not a single one. *I am not aware of any, but as a chemist I was never involved in biological testing and have little familiarity with that area of Philip Morris' research.*

Q: You never saw any biological testing of marketed brands of cigarettes during the entire time you were an employee of Philip Morris USA – the kind of cigarettes you can go out and buy, did you?

A: I didn't see any testing of cigarettes that were bought from the marketplace and evaluated in a biological test. I didn't see that; no.

Q: Before 1998, Philip Morris chose not to conduct any biological testing on its commercial cigarettes sold to people, correct?

A: To the best of my knowledge, yes.

Q: Has Philip Morris ever taken a Marlboro cigarette that it sold in 1960 at 22 milligrams of tar and conducted any biological test to determine whether it is any more or less hazardous than a Marlboro Red currently sold on the market?

A: No; it has not. *not to my knowledge.*

Q: Do you have any empirical data indicating that the Marlboro Red produced today is any less hazardous than the one produced in 1960?

A: No; I don't. *Yes. The tar reduction that Philip Morris achieved from the date you cite, 1960, until today.*

Q: So, your personal beliefs aside, you don't know whether a Marlboro Red smoked today by an American smoker is any less hazardous than a Marlboro Red cigarette sold by Philip Morris in 1960, do you?

A: No; I don't know *that today's Marlboro Red is less hazardous than a 1960 Marlboro Red. However, based on differences in general reduction design characteristics between the two and their impact on the formation, filtration and dilution of mainstream smoke, I believe that today's Marlboro Red generally delivers lower tar to smokers than did the 1960 Marlboro Red.*

Q: You have never seen a biological test comparing, for example, a Marlboro Red – a higher tar cigarette, versus a Marlboro Light – a lower tar cigarette, correct?

A: Not directly. *Yes. I have seen recent biological tests comparing Marlboro Red and Marlboro Lights, as well as other biological testing comparing higher tar to lower tar cigarettes.*

Q: So, other than whatever personal beliefs you might have, you don't know that a Marlboro Light is any less harmful than a Marlboro Red, correct?

A: No; I don't know *that Marlboro Lights are less harmful. But based on the design characteristics of Marlboro Lights and their impact on the formation, filtration and dilution of mainstream smoke, I believe they generally deliver lower levels of tar to smokers.*

Q: You have never seen any biological testing comparing, for example, Philip Morris's Benson & Hedges cigarettes with Philip Morris's Merit cigarettes, have you?

A: No; no biological testing.

Q: Have you ever seen any tests done by Philip Morris on, for example, a Merit cigarette versus a Marlboro Ultralight, to see whether or not they cause cancer or tumors?

A: No; I have not.

Q: Philip Morris has conducted consumer taste testing within the Research & Development Department, correct?

A: Yes.

Q: In those taste tests, Philip Morris used actual products that were sold over the counter, including Marlboro Reds, Marlboro Lights, and some of the cigarette brands of Philip Morris's competitors, correct?

A: Yes.

Q: Philip Morris USA also regularly conducted chemical testing on its as-marketed cigarettes to measure tar, nicotine and other chemical constituents, correct?

A: Yes, *we used commercial "as-marketed" cigarettes as well as prototype, reference and control cigarettes.*

Q: But, prior to 1998, Philip Morris never conducted biological testing on its as-marketed brands, correct?

A: Correct. *I have not seen such testing, but I have seen biological testing on prototype, reference and control cigarettes.*

Q: And your answers to my questions about Philip Morris's biological testing of as-marketed brands include any research conducted by Philip Morris in the United States, as well as any research conducted by Philip Morris's INBIFO facility in Germany, Philip Morris's FTR facility in Switzerland, Philip Morris's CRC facility in Belgium, any testing that has been contracted out by Philip Morris with outside laboratories, and any other Philip Morris research that you know of, correct?

A: Yes; *to my knowledge* that is correct.

Q: Prior to 1998, you never recommended that Philip Morris conduct biological testing of its as-marketed brands, did you?

A: No; I did not.

Q: The only reason Philip Morris started doing biological testing on its as-marketed cigarettes was because plaintiffs' lawyers in litigation against Philip Morris were suggesting Philip Morris ought to do that, correct?

A: That is correct. *It is a reason. I don't know if it is the only reason.*

Q: Notwithstanding that, the entire time you were an employee of Philip Morris USA, you and everyone else in the Research & Development Department whose views you were aware of believed that smoking causes diseases such as lung cancer, Philip Morris USA was more than thirty-six years behind the Surgeon General in publicly acknowledging that cigarette smoking causes any disease, correct?

A: Yes. *I don't know, but I am aware of the statements on the Philip Morris 1999 website.*

Q: And even though you were an employee of Philip Morris USA for 26 years, you cannot identify any empirical evidence from research conducted at Philip Morris while you were there that Philip Morris's low tar cigarette brands are less harmful than its full-flavor cigarette brands, correct?

A: That is correct. *No. I am aware of empirical research conducted at Philip Morris demonstrating that low-tar cigarette design features affect the generation, filtration and dilution of mainstream cigarette smoke in ways that likely result in lower tar and nicotine deliveries to smokers.*

Q: Now we are going to cover the topic of low tar cigarettes in depth. Let's begin with the FTC Method. The FTC Method is a test that the Federal Trade Commission adopted in

the late 1960s to measure the tar, nicotine and carbon monoxide yield of cigarettes when smoked on a machine, correct?

A: Yes, *except the carbon monoxide testing began in the early 1980s.*

Q: Philip Morris designs its cigarettes to have certain tar and nicotine targets according to the FTC machine testing, correct?

A: Yes. *No. Tar is one of the many parameters Philip Morris uses to design cigarettes. Nicotine is not one of those parameters.*

Q: The low tar cigarettes that Philip Morris USA designs are designed to achieve low tar and nicotine deliveries in the FTC tests, correct?

A: Yes; that is correct. *No. Among other parameters, Philip Morris designs all its cigarettes to achieve desired tar deliveries as measured by the FTC test method. Philip Morris does not design its cigarettes for nicotine deliveries.*

Q: From the 1970s until today, Philip Morris has even used computer models that predict tar and nicotine delivery according to the FTC Method based upon the design of the cigarette that you put into the program, correct?

A: Yes.

Q: Did that computer, at any time when you were at Philip Morris, ever incorporate data on human smokers?

A: No.

Q: Did that computer ever incorporate any data that Philip Morris possessed about how human smokers actually smoke?

A: No.

Q: Did that computer ever predict in any way what a human smoker would actually get from the cigarette?

A: No.

Q: The computer does not deal at all with what people who smoke Philip Morris cigarettes actually get, correct?

A: That's right.

Q: Philip Morris has done some research on the amount of tar and nicotine that smokers actually get when they smoke cigarettes, correct?

A: Yes.

Q: Most people take bigger puff volumes than the machine does in the FTC Method, correct?

A: Yes. *I believe many do.*

Q: Philip Morris had research demonstrating that this is the case, right?

A: Yes. *Philip Morris has research suggesting that many smokers take bigger puff volumes than the machine does in the FTC method.*

Q: Now we are going to talk about some of Philip Morris's research on the tar and nicotine that is actually delivered to smokers. Please turn to U.S. Exhibit 35,224. This is an August 11, 1967 Philip Morris USA document from Helmut Wakeham, then Director of Research & Development at Philip Morris USA, to Paul D. Smith, then Vice President and General Counsel of Philip Morris USA, correct?

A: Yes. *I am seeing the document for the first time. I do not know who Paul D. Smith is or what his position might have been in 1967. I have no knowledge of this document.*

Q: The first paragraph states: "Two tests conducted at Product Opinions Laboratories demonstrate that in smoking a dilution filter cigaret, the smoker adjusts his puff to receive about the same amount of 'undiluted' smoke in each case," correct?

A: Yes.

Q: Product Opinion Laboratories was a facility established by Philip Morris to evaluate smokers' reaction to the cigarette brands Philip Morris was selling, as well as to Philip Morris prototype cigarettes, right?

A: Yes.

Q: In the next full paragraph of U.S. Exhibit 35,224, Dr. Wakeham states:

> **In the smoking machine the puff volume is constant so that with dilution the quantity of "equivalent undiluted smoke" delivered to the Cambridge filter is reduced. Not so with the human smoker who appears to adjust to the diluted smoke by taking a <u>larger puff</u> so that he still gets about the same amount of equivalent undiluted smoke.**

Did I read that correctly?

A: Yes.

Q: In the last paragraph of Exhibit 35,224, Dr. Wakeham states:

> **The smoker is, thus, apparently defeating the purpose of dilution to give him less "smoke" per puff. He is certainly not performing like the standard smoking machine; and to this extent the smoking machine data appear to be erroneous and misleading. It has probably always been so for diluted smoke cigarets, whether dilution is obtained by porous paper or holes in the filter.**

Did I read that correctly?

A: Yes.

Q: Are you aware of any instance, at any time between when Dr. Wakeham wrote this document in 1967 and when you left the company in 1998, in which Philip Morris informed the American public directly that the FTC tar and nicotine yields are apparently "erroneous and misleading"?

A: No.

Q: Are you aware of Philip Morris, at any time between when Dr. Wakeham wrote this document in 1967 and when you left the company in 1998, informing the public that Philip Morris's dilution filter cigarettes generated lower FTC yields than non-dilution cigarettes, but delivered about the same amount of smoke to smokers?

A: No. *But I do not agree with the premise that dilution cigarettes always, or even generally, deliver the same amount of smoke to smokers as non-dilution cigarettes.*

Q: Dilution cigarettes are those that dilute the smoke with air, such as with filter ventilation, correct?

A: Yes.

Q: The vast majority of the low tar and ultra-low tar cigarettes sold by Philip Morris in the United States – both in the past and up to today – are dilution cigarettes, correct?

A: Yes*, today that is true, but it did not become a common feature until the mid-1970s.*

Q: Take a look at U.S. Exhibit 85,073. This is a Philip Morris document dated March 1, 1974, entitled "Some Unexpected Observations on Tar and Nicotine and Smoker Behavior," correct?

A: Yes.

Q: Handwritten under the date on the first page it says: "Talk given by Dr. Wakeham – NY," correct?

A: Yes.

Q: On the second to last page, under the heading "Summary," the first numbered statement is: "People do not smoke like the machine," correct?

A: Yes.

Q: The fifth numbered statement in this 1974 document under "Summary" is: "Generally people smoke in such a way that they get much more than predicted by machine. This is especially true for dilution cigarets," correct?

A: Yes.

Q: The first statement under "Conclusion" on the last page is: "The FTC standardized test should be retained," and the first numbered statement under that says: "It gives low numbers," correct?

A: Yes*, but immediately below that reference, the author also notes that the FTC test method should be retained because it permits comparisons between brands.*

Q: By stating that people "get much more than predicted by machine," Dr. Wakeham was referring to the FTC machine-smoking test method as a predictor of human smoking intake, correct?

A: Yes. *I do not know what Dr. Wakeham meant.*

Q: This Philip Morris document from 1974 indicates that Dr. Wakeham was aware that the FTC Method yields were inaccurately low predictors of actual human smoker intake correct?

A: Yes. *I cannot speak to what Dr. Wakeham was aware of, but it appears that he believed the FTC test underestimated smoker intake. However, the FTC test method was never intended or designed to measure individual or average smoker intake or behavior. This document also presents data that indicates that cigarettes with lower FTC measured tar yields consistently deliver lower levels of tar to smokers. The data presented in this document also indicate a consistent relationship between lower FTC-measured yields and what the smoker takes into his mouth. Dr. Wakeham also appears to have believed that the FTC test permits valid comparisons between cigarette brands, which was its stated purpose.*

Q: And this document also indicates that Dr. Wakeham, the Director of Philip Morris USA Research & Development, nevertheless recommended retaining the FTC Method, because it produced yields that were such that actual smokers "get much more than predicted by machine," correct?

A: Yes. *No. The specific reasons for his recommendation are given under the heading "Conclusion" at the page ending in Bates Number 3493.*

Q: And isn't it true that, for at least 24 years after Dr. Wakeham made this recommendation – until at least as late as 1998 – Philip Morris consistently opposed any changes to the FTC Method?

A: Yes. *No.*

Q: Please turn to U.S. Exhibit 20,179. This is an August 19, 1977 Special Report from the Philip Morris USA Research Center written by Barbro Goodman, a Philip Morris Research Scientist, and entitled "Summary of Human Smoker Simulator Program," correct?

A: Yes.

Q: Philip Morris USA's "Human Smoker Simulator Program" was a program to determine how people smoke by measuring such things as their puff frequency, puff volume, puff number and other aspects of how smokers actually smoke, and to use this information to measure the actual deliveries of tar, nicotine and other smoke components to human smokers, correct?

A: Yes. *No, the Human Smoker Simulator did not measure actual smoker deliveries. The Human Smoker Simulator measured puffing behaviors. Cigarettes were then machine smoked based on recorded human puffing patterns. It was hoped that this methodology would provide meaningful data concerning actual deliveries received by smokers. But the Human Smoker Simulator did not measure the amount of tar or nicotine inhaled or retained by smokers.*

Q: You worked with the Human Smoker Simulator to get the information recorded from human smokers into a computer, so that Philip Morris could replicate on a smoking machine how humans smoke and derive tar and nicotine deliveries of human smokers, correct?

A: Yes, *except as I previously stated, the Human Smoker Simulator could not measure the actual tar and nicotine deliveries to smokers. It did measure machine yields based on puffing patterns recorded from smokers.*

Q: Turn to numbered page 1 – Bates number 1003728027. There, under the heading "Summary," this Report states:

> **The standard puffs of 35 cc volume repeated at one minute intervals are seldom seen among smokers. Of the 165 R&D smokers screened with profile recording units, there are fewer than 20% who take puffs or an average**

volume less than 35 cc. Fifty percent take puffs that average 35-55 cc and the remaining smokers take even larger puff volumes on their regular brands.

Did I read that correctly?

A: Yes*, but the FTC Test Method was not intended or designed to measure actual smoker behavior.*

Q: The Report's reference to "standard puffs of 35 cc volume repeated at one minute intervals" is a recitation of the puff volume and frequency used in the FTC Method testing procedures, correct?

A: Yes.

Q: Starting on the next paragraph on this page, the Report states:

The Smoker Simulator program has the instrumentation to measure those smoker variations that constitute a smoker's puffing profile and a programmable smoking machine to measure the resulting tar, nicotine, and water deliveries.

Did I read that correctly?

A: Yes.

Q: On the top of the next page – Bates number 1003728028, the Report states: "A cigarette designed such that it causes the smoker to take larger puffs than the compared model could easily be perceived as having more impact (desirable or undesirable as the case may be)," correct?

A: Yes*, that is what the document says. While it is true that puff volume and number of puffs may increase with increased dilution, taken as a whole, Human Smoker Simulator studies*

indicated that filter-diluted low tar cigarettes generally deliver lower tar relative to higher yield cigarettes.

Q: This portion of the Report states that cigarettes can be designed to cause a smoker to take larger puffs, correct?

A: Yes. *No.*

Q: Next, the Report goes on to say: "The varying puff sizes in turn also give increased deliveries above those of CI," correct?

A: Yes.

Q: "CI" refers to the FTC Method tar and nicotine yields reported in "Cigarette Information Reports" generated by the Research & Development Department at Philip Morris USA, correct?

A: Yes, *if you mean by "CI" the CI laboratory that was responsible for the tar and nicotine yields as measured by the FTC Test Method.*

Q: So this Special Report indicates that, when cigarettes are designed to cause a smoker to take larger puffs, those larger puffs result in the delivery of more tar and nicotine to the smoker than are reported under the FTC Method, correct?

A: Yes. *No. Philip Morris does not design cigarettes to cause smokers to take larger puffs. The Report does indicate that a smoker who takes a larger puff will receive more tar and nicotine than as measured under the FTC Test Method.*

Q: Then the Special Report states: "Thus, it is desirable to have measurements to confirm that a cigarette intended as a low delivery candidate truly will deliver less than another higher tar brand when the average consumer smokes it," correct?

A: Yes, *and what this indicates is that scientists at Philip Morris used the Human Smoker Simulator, with its limitations, as a method for studying whether low tar cigarette designs were effective at reducing deliveries.*

Q: So, Philip Morris scientists were looking into whether a low tar cigarette actually delivers less tar to smokers than higher tar cigarettes, correct?

A: Yes, *within the limitations of the Human Smoker Simulator methodology.*

Q: Next, the Report lists "[t]he physical cigarette designs that have the effect of increasing a smoker's puff volumes," and the first two design characteristics listed are "low RTD" and "high filter dilution," correct?

A: Yes.

Q: "RTD" is an abbreviation of "resistance to draw," a term which refers to how hard it is to draw on a cigarette, correct?

A: Yes.

Q: On numbered page 6 – Bates number 1003728032, under the heading "Results and Discussion" and the subheading "Smoking Profiles," the Report states: "Smoker profile characteristics have been found to be affected by the cigarette design parameters to varying degrees," correct?

A: Yes.

Q: So, this portion of the Report indicates that the way a cigarette is designed affects how intensely smokers puff on the cigarette, correct?

A: Yes. *No.*

Q: The next paragraph of the Report states:

With filter dilution added to a large number of brands, it is important to know what effect the added dilution and accompanying change in RTD will have on a smoker's puffing profile. Previous smoker studies have indicated that RTD is the most influential cigarette parameter. Two basic studies have been conducted where cigarette RTD and filter dilution were the two major variables. In these studies a ½ inch decrease in RTD of cigarettes with standard CA filters increased the smoker's puff volumes 6-8%. Their flow rates increased and puff durations decreased. Dilution also had the effect of increasing the smokers' volumes and flow rates as well as the durations.

Did I read that correctly?

A: Yes.

Q: The Report's mention of "standard CA filters" is a reference to standard cellulose acetate filters, which are the filters used on most Philip Morris brands sold in the United States, correct?

A: Yes.

Q: The results of the study and the previous Philip Morris studies referenced in this Report are that lower resistance to draw is the most influential factor causing smokers to take bigger puffs of a cigarette, correct?

A: Yes. *No, reduced resistance to draw is one of the parameters that allows smokers to take larger puffs.*

Q: At the top of numbered page 8 – Bates number 1003728034, the Report states:

In conclusion, when a smoker is presented with a cigarette other than his normal brand, it is possible to estimate the maximum flow rate to a certain

degree. The puff duration will increase with increasing RTD and/or filter dilution. Since the volume is based on both flow and duration, the puff volume will change accordingly.

Did I read that correctly?

A: Yes.

Q: Now turn to numbered pages 9 and 10 – Bates number 1003728036-1003728037. Under the heading "Tar Deliveries," the Report sets out the results of human smoker testing for

- **"full flavored cigarettes," described as having ">15.5 mg tar;"**
- **low tar cigarettes, which are defined as "in the intermediate tar range (8-15 mg)"; and**
- **"ultralow delivery cigarettes (<5 mg tar),"**

correct?

A: Yes.

Q: These test results in the Report indicate in the last paragraph of numbered page 9 that for full-flavor cigarettes, "[t]he smokers took puffs with a total average volume (puff count x average puff volume) 47% larger than volumes," and that "[t]he resulting average tar deliveries were 45% higher than CI," correct?

A: Yes.

Q: The Report also indicates on the first paragraph of numbered page 10 that, as to low tar cigarettes, smokers' "volume increases on those cigarettes averaged 70% over CI, partly due to the dilution present in these models," and that "[t]he tar deliveries showed a higher rate of increase, 81% more tar than CI," correct?

A: Yes.

Q: The Report states, in the second paragraph of numbered page 10, that: "When the panelists were presented with high dilution, ultralow delivery cigarettes (<5 mg tar), they increased their total volumes more than 100%," correct?

A: Correct.

Q: For the ultralow cigarettes, the Report also says in this paragraph that: "The average tar delivery for the 7 models smoked by the panelists were more than three times that of CI," correct?

A: Yes.

Q: This Philip Morris document indicates that Philip Morris had information indicating that lower resistance to draw resulted in higher deliveries to smokers, and that these higher deliveries were not reflected in the reported FTC Method yields, correct?

A: Yes. *No, I don't believe this to be the case. It is unrealistic to consider the effect of RTD in isolation. I agree that looking at RTD alone and holding other factors constant, some, but not all, smokers could get a higher delivery with lower RTD.*

Q: And the test results that we have just gone over show that, in 1977, Philip Morris USA was aware that FTC Method yields were substantially inaccurately low compared to actual human smoking for full flavor, light and ultralight cigarettes, and that the lower the FTC Method yield, the more inaccurate the FTC yields were, correct?

A: Yes. *No, the FTC Test Method produces accurate measurements. It was never intended to measure actual human smoker intake. It was intended and did provide an accurate basis for making relative comparisons between brands.*

Q: Did Philip Morris ever voluntarily share this information with the American public during the time you were a Philip Morris employee?

A: No. *I don't know.*

Q: Now I would like to move to some of the terminology describing the techniques Philip Morris USA used to achieve lower tar and nicotine deliveries under the FTC Method. Design techniques known as "general reduction" techniques and "selective reduction" techniques were used by Philip Morris USA throughout the time you were an employee, correct?

A: Yes, *Philip Morris employed general reduction techniques to achieve lower tar and nicotine and specific reduction techniques to achieve lower deliveries of specific smoke constituents. Furthermore, general reduction and specific reduction techniques were used by Philip Morris throughout the time I was employed.*

Q: "General reduction" techniques are techniques that are designed to reduce the delivery of cigarette smoke generally, as opposed to "specific reduction" techniques, which target specific components of cigarette smoke for reduction, correct?

A: Yes.

Q: Among the types of "general reduction" techniques that Philip Morris USA has used are filtration and ventilation, correct?

A: Yes.

Q: Dilution – which, as we have discussed earlier, includes ventilation – is a general reduction technique, correct?

A: Yes.

Q: Filtration refers generally to putting a filter on a cigarette, correct?

A: Yes.

Q: We have gone over some Philip Morris USA research on filtration, but now we will cover filtration at Philip Morris USA in more detail. Please review U.S. Exhibit 20,123. This is a June 1966 "Special Report" entitled "Market Potential of a Health Cigarette," written by Myron Johnston, then a Research Economist in Philip Morris USA's Research & Development Department, approved by William Dunn, then a scientist in Philip Morris USA's Research & Development Department, and distributed to Helmut Wakeham, then Vice President of Philip Morris USA, and Robert B. Seligman, then Director of Development at Philip Morris USA, correct?

A: Yes.

Q: On the fourth page, numbered page 1 – Bates number 1001913856, under the heading "Conclusions," Conclusion 10 is: "The illusion of filtration is as important as the fact of filtration," and Conclusion 11 states: "Therefore any entry should be by a radically different method of filtration but need not be any more effective," correct?

A: Yes, *I see the language that actually appears on page 2, Bates number 1001913857, but I have not read this document before, was not employed by Philip Morris at the time and otherwise have no familiarity with what the author meant. I believe that at all times during my employment at Philip Morris, the filters used with all of Philip Morris' brands were genuine attempts to generally or selectively reduce exposure to smoke constituents.*

Q: On numbered page 3 – Bates number 1001913858, one of the "Recommendations," stated in the last paragraph, is:

> **In the absence of legislation or a resumption of the tar derby, LongPar would probably be the best entry, since it is without question a radically different**

method of filtration and can be made to give the illusion of filtration without impairing the tobacco flavor.

Did I read that correctly?

A: Yes.

Q: Numbered page 15 – Bates number 1001913870, in the second full paragraph, refers to filter cigarettes several times as "health filters," and states that "the shifts to health filters occur concurrently with health scares," correct?

A: Yes, *I see that language.*

Q: Did you review this document when you came to Philip Morris, to bring yourself up to speed on Philip Morris's knowledge about filter cigarettes?

A: No; not that I recall.

Q: Were you aware that, six years before you started work there, the term "health filters" was used by and distributed among Philip Morris scientists to describe filter cigarettes in an internal Special Report titled the "Market Potential of a Health Cigarette"?

A: No, *and in my 26 years at Philip Morris, I never heard the term "health filter" used among anyone there.*

Q: Let's discuss a Philip Morris document written twelve years after you started working there: U.S. Exhibit 20,299. This is a December 12, 1984 Special Report with the heading "Philip Morris U.S.A. Research Center, Richmond, Virginia," and entitled "Cigarette Market History and Interpretation," correct?

A: Yes, *the author of this document is J. E. Tindall, a statistician addressing market information from 1938 to 1984.*

Q: You are a listed recipient on the distribution list on the first page, correct?

A: Yes.

Q: On Bates page 2001265019, under the heading "Delivery Trends," this Philip Morris USA Report states: "While the first filter cigarettes did not have deliveries significantly lower than nonfilters at that time, a filter on a cigarette surely conveyed the idea that something undesireable [sic] was being removed from the cigarette," correct?

A: Yes.

Q: The statement in this Philip Morris USA Report that filter cigarettes "conveyed the idea that something undesir[]able was being removed from the cigarette," is another way of saying that Philip Morris knew that its filter cigarettes convey the impression that they are less harmful, correct?

A: Yes. *I don't know what Mr. Tindall meant, but I do know as the next sentence indicates by its reference to "Reader's Digest" and "Consumer Reports" that it was generally believed that filtered cigarettes were less hazardous, and I continue to share that belief.*

Q: A few paragraphs down, it states: "As usual, I define a low-tar cigarette to be a new brand name whose advertising concentrates on its low tar, or an extension of a filter or nonfilter brand whose name implies low tar (mild or light)," correct?

A: Yes, *that is what the language says*.

Q: Later in that paragraph, the author states: "Generally, my classifications will be as we usually think of them. The primary distinction is that a brand will not be classified as low-tar based on delivery alone," correct?

A: Yes.

Q: And in this context, the author recites yields – 15mg or less of tar for low tar brands and 6mg or less of tar for ultralow brands – based on FTC Method testing, correct?

A: Yes.

Q: This Philip Morris USA Special Report defines low tar cigarettes "as usual," not by the FTC yield or by taste, but by whether the cigarette's brand name or its advertising indicates that it is low in tar, correct?

A: Yes. *I do not know what "as usual" means in the context of this question, but to my knowledge, Philip Morris cigarettes are in fact identified based on FTC yields, and it appears that Mr. Tindall does not dispute this.*

Q: On Bates page 2001265022, the Report states: "Switching to filters was motivated primarily by smoking and health publicity, but it was facilitated by the ease of the switch – the delivery of filters was not much different from the delivery of nonfilters," correct?

A: Yes.

Q: Moving to the last paragraph of that page, the author states:

> **My interpretation is that there were very few smokers in the market in 1964 who were interested in low tar. Most of the smokers had already made a delivery sacrifice in response to smoking and health pressure by switching to filters in the 1950's. Switching-mode growth of the low-tar segment had to wait for smokers who had started on filters to reach an age at which they were willing to make a delivery sacrifice in response to smoking and health pressures. By 1976 those smokers were becoming available in large numbers and rapidly switching to low-tar brands, putting the low-tar segment into a switching-mode share growth.**

Did I read that correctly?

A: Yes.

Q: This Philip Morris Special Report acknowledges that smokers were willing to make a "delivery sacrifice" to smoke low tar cigarettes, because they were concerned about their health, correct?

A: Yes*, but the Report also notes that taste is part of the decision to switch.*

Q: Please turn to Bates page 2001265042. Under the heading "Major Cigarette Developments," the document states: "While a virtually unlimited variety of changes could be made to cigarettes, there are four areas in which consumer needs or desires are glaringly obvious," and then lists four areas, correct?

A: Yes.

Q: The first two of these "areas" are: "Smokers' concerns about their own health;" and "Concerns about the possible effects of smoke on nonsmokers," correct?

A: Yes.

Q: In the last paragraph of this page, the document states:

> **Point 1 – smokers' concerns about their own health – is a problem of a different order of magnitude. This is where the industry is most vulnerable and is making the least productive effort. For thirty years the industry has addressed this area by lowering tar. That is an approach which apparently no longer satisfies smokers and which certainly will never satisfy critics of smoking.**

Did I read that correctly?

A: Yes.

Q: On the next page, in the third full paragraph, this Philip Morris USA document states:

> **[W]e should still not dismiss the possibility that there is a minimum optimum delivery–a delivery below which the industry average cannot fall without smokers in the lower range being able to easily quit, thereby maintaining the average at at least some minimum level.**

Did I read that correctly?

A: Yes.

Q: So, this document expresses the concern that, if cigarette deliveries fall below some "minimum optimum delivery" level, smokers may be able to more easily quit smoking, correct?

A: Yes. *No, I do not see this expressed as a "concern." It appears to be Mr. Tindall's speculation about what might happen in the future. Philip Morris did not intentionally alter the nicotine to tar ratios in its commercial cigarettes. I have no knowledge that Philip Morris research demonstrated that there are optimal cigarette nicotine deliveries.*

Q: Please return to U.S. Exhibit 20,123 – the Philip Morris Report titled "Market Potential of a Health Cigarette – at Bates page 1001913860. In the second paragraph, it states:

> **It seems clear from the performance of existing health cigarette entries that flavor and nicotine are both necessary to sell a cigarette. A cigarette that does not deliver nicotine cannot satisfy the habituated smoker and cannot lead to habituation, and would therefore almost certainly fail. Health claims alone**

without flavor or nicotine cannot sell cigarettes – most smokers would rather quite [sic] than switch.

Did I read that correctly?

A: Yes.

Q: So, according to this Philip Morris Special Report from 1966, if cigarettes don't provide enough nicotine, they will fail, correct?

A: Yes, *Mr. Johnston states this, but I do not know what is meant by "enough nicotine," and Philip Morris has a number of products on the market that offer varying levels of nicotine ranging from about 1.5 mg. to 0.1 mg. per cigarette as determined by FTC testing.*

Q: And the reason that enough nicotine is necessary is to satisfy the cravings smokers have because of habituation, correct?

A: Yes. *Again, I do not know what is meant by "enough" nicotine, and otherwise I do not know.*

Q: Now let's move on to the cigarette design feature known as ventilation. Ventilation means putting tiny vent holes in a cigarette filter to lower tar and nicotine deliveries by diluting the cigarette smoke with air, correct?

A: Yes.

Q: Let's discuss the insertion of these vent holes. Philip Morris USA started ventilating its cigarettes sometime in the 1970s, correct?

A: Yes.

Q: Philip Morris USA has used laser perforations for filter ventilation since the late 1970s, and uses them today, correct?

A: Yes.

Q: Philip Morris USA has used laser perforations in Marlboro Lights cigarettes since their introduction, and still uses them in Marlboro Lights today, correct?

A: Yes. *No, not since the introduction of Marlboro Lights but certainly since the availability of the laser technology. A mechanical process was used before the laser process.*

Q: Most of the cigarettes Philip Morris sells in the United States have filter vent holes that are created by laser perforation, correct?

A: Yes.

Q: Some smokers block vent holes with their lips, their fingers, or both, correct?

A: Yes.

Q: What is the effect if a smoker blocks the vent holes with his or her lips or fingers?

A: It defeats the purpose of having vent holes. *Depending upon the degree of vent hole blocking, some, most or all of the air can be prevented from entering the vent holes. I am unaware of any studies that suggest that smokers block vent holes completely all of the time.*

Q: Vent holes made by laser perforations in Philip Morris cigarettes are basically invisible to the naked eye, correct?

A: Yes, *that is true for most people.*

Q: When somebody takes the cigarette out of the pack, they can't see the vent holes on, for example, Marlboro brand cigarettes, correct?

A: That's correct; they *most people* can't.

Q: They are not circled or marked or highlighted in any way, are they?

A: No, they are not, *but the Philip Morris website contains a diagram that shows consumers the specific location of the vent holes.*

Q: Take a look at U.S. Exhibit 85,086. This is a January 21, 2000 fax sent from Philip Morris Legal, correct?

A: Yes; the fax trace says "PM Rich Legal." It would seem that "Rich" refers to Richmond, Virginia. *The document is undated, but appears to have been faxed on January 21, 2000. I have never seen this document, and it has no title, list of recipients, date or source.*

Q: The fax is a proposed presentation to familiarize new Philip Morris employees with the company's products, correct?

A: Yes. *I don't know. I never saw the document.*

Q: Turn to the third page (Bates number 2074112965). Under the heading "The cigarette," the fax describes ways to show new employees some of the parts of Philip Morris's cigarettes, correct?

A: Yes, *it appears so*.

Q: After instructions to break off the filter and "remove the tipping paper by unwrapping it from around the filter material," the fax states, in the fifth bullet point: "Observe the ventilation holes in the tipping paper by holding up to the light or by using the magnifying glass," correct?

A: Yes.

Q: So this Philip Morris document instructs the person giving the presentation that, even after the tipping paper is removed from around the filter, in order to see the ventilation holes, he or she needs to hold the tipping paper "up to the light" or use "the magnifying glass," correct?

A: Yes.

Q: Philip Morris has never included any instructions with the packaging or the advertising for any of its ventilated cigarettes telling smokers where on a cigarette the vent holes are, correct?

A: Correct. *I don't know.*

Q: Other than on the Philip Morris website, has Philip Morris told consumers where on a cigarette the vent holes are?

A: No; Philip Morris has not. *I don't know.*

Q: But Philip Morris did include instructions with packs of Cambridge cigarettes when they were first introduced in the late 1970s or early 1980s, telling smokers how to light the cigarettes, correct?

A: Yes.

Q: If Philip Morris wanted smokers to be able to tell where these vent holes are on Philip Morris cigarettes, Philip Morris could just put a visible line around the part of the filter that contains the vent holes, correct?

A: Yes.

Q: But Philip Morris has never done that, correct?

A: That is correct.

Q: Let's turn to the effect of filtration and ventilation on biological activity. "Biological activity" refers to the capacity of a chemical compound or substance to cause adverse biological reactions, such as tumor growth, cell mutations and toxic reactions, correct?

A: Yes. *I am a chemist, not a biologist, but my working definition of "biological activity" is the response of a biological system to chemicals, other materials or stimuli. This response could be a positive or negative response.*

Q: You do not know what impact increased ventilation has on biological activity, do you?

A: No. *I believe increased ventilation decreases biological activity.*

Q: If increased ventilation increased biological activity, that could call into question whether the use of ventilation is better or worse for the smoker, correct?

A: Yes.

Q: Likewise, you do not know what impact increased filtration has on biological activity, do you?

A: No. *I believe increased filtration decreases biological activity.*

Q: If increased filtration increased biological activity, that could call into question whether the use of filtration is better or worse for the smoker, correct?

A: Yes.

Q: Two types of biological activity are mutagenicity and cytotoxicity, correct?

A: Yes.

Q: Mutagenicity refers to the likelihood of generating abnormal cell growth such as tumors and cancer, correct?

A: Yes, *but not exactly. Strictly speaking, mutagenicity refers to the capacity of a compound to induce mutations in the DNA of living organisms.*

Q: Cytotoxicity refers to the degree to which something is toxic to living cells, correct?

A: Yes.

Q: Let's turn to Philip Morris research on the effect of filtration and ventilation on biological activity. Please look at U.S. Exhibit 20,399. This is a January 28, 1994 fax on INBIFO letterhead sent from Wolf Reininghaus – who has held the titles of Chairman, Director and General Manager at the Philip Morris INBIFO research and testing facility in Germany, to Cathy Ellis, then Director of the Philip Morris USA Research Center in Richmond, Virginia, correct?

A: Yes, *that is what appears on the document, but I have no recollection of ever having seen it before.*

Q: Heading number "1," on the first page, is: "Conventional cigarettes, medium versus low yield," correct?

A: Yes.

Q: The last bullet point on the first page states:

> **Increased filtration will result in a relative enrichment of gas phase constituents, leading to increased cytotoxicity and irritancy (at equal TPM doses) but will not change the TPM based "specific" mutagenicity.**

Did I read that correctly?

A: Yes.

Q: "TPM" is an abbreviation of "tar and particulate matter," which refers to everything in cigarette smoke other than nicotine, water and gases, correct?

A: Yes. *No, "TPM" is an abbreviation for Total Particulate Matter and refers to tar, nicotine and water, but not gases.*

Q: The next bullet point, on the second page, states:

Increased porosity and ventilation will lower the air flow through the cone and increase the specific mutagenicity. Cytotoxicity will not be changed.

Did I read that correctly?

A: Yes.

Q: "Porosity" refers to the amount of air that flows through the cigarette paper, right?

A: Yes.

Q: Increasing the porosity of cigarette paper is another general reduction cigarette design technique used by Philip Morris, correct?

A: Yes.

Q: At the time this fax was sent to Philip Morris USA in Richmond, you held the title of Technology Fellow, the highest science title that Philip Morris has, correct?

A: Yes, *the highest non-management science position.*

Q: Now we will focus on resistance to draw, or "RTD." Resistance to draw is an aspect of cigarette design that can restrict compensation or make it more difficult for smokers to compensate by taking bigger puffs on their cigarette, correct?

A: Yes. *I don't know since I am not an expert on compensation, but I define RTD as how hard a smoker would have to draw on a cigarette to get smoke out of it.*

Q: The higher the resistance to draw of a cigarette, the tougher it is for a smoker to compensate by taking a bigger puff, correct?

A: As far as taking a puff on a cigarette, yes. *I am not an expert on compensation, but the higher the resistance to draw, the harder it would be for a smoker to get smoke out of a cigarette.*

Q: Now let's discuss resistance to draw in the context of the cigarettes Philip Morris sells in the United States. Philip Morris has been selling Marlboro Lights since 1971, correct?

A: Yes; that is correct.

Q: And from 1971, when Marlboro Lights was introduced, until 1978 or 1979, the resistance to draw on Marlboro Lights was lower than on the Marlboro Red, which made it easier for a smoker to take bigger puffs on a Marlboro Light than on a Marlboro Red, correct?

A: Yes; there was a difference there with Marlboro Lights being easier to draw.

Q: Bottom line was, it was easier for a Marlboro Light smoker to get a bigger puff if they were so inclined, right?

A: Yes.

Q: From 1971 – when Marlboro Lights were introduced – until 1998, when you retired from Philip Morris USA, there was no difference in any of the ingredients used in a Marlboro Light and a Marlboro Red, correct?

A: There was no difference that I'm aware of; no.

Q: You have no evidence indicating that a Marlboro Light – on the market since 1971 – delivers less tar and nicotine than a Marlboro Red to any actual smoker, correct?

A: That is correct. *It is correct that I have no data as to any particular smoker. However, I believe there are design characteristics of the Marlboro Light cigarette that result in lower tar and nicotine delivery generally compared to Marlboro Red. These include increased filter ventilation, increased filtration efficiency due to more dense and longer filters, and less tobacco by weight.*

Q: In terms of any of the general reduction efforts that Philip Morris uses, they didn't impact the Marlboro Light any differently than the Marlboro Red, right?

A: Right. *No. As I stated above, I believe that differences in various general reduction design features result in Marlboro Lights delivering lower tar and nicotine than Marlboro Reds.*

Q: Let's turn to some Philip Morris research on whether Marlboro Lights deliver less tar to smokers than Marlboro Full-Flavor cigarettes. U.S. Ex. 20,348 is a September 17, 1975 memo on Philip Morris letterhead from Barbro Goodman, a Philip Morris Research Scientist, to Leo F. Meyer, right?

A: Yes.

Q: Leo Meyer was the Director of Research at Philip Morris USA at the time this document was written, correct?

A: Yes. *No, Mr. Meyer was the Director of Product Development.*

Q: This document compares the puff volume for people who smoke Marlboro and Marlboro Lights in the study that it is reporting on, correct?

A: Yes; it does.

Q: In the "Discussion" section on the first page, the first sentence says:

> **The smoker profile data reported earlier indicated that Marlboro Lights cigarettes were not smoked like regular Marlboros. There were differences in the size and frequency of the puffs, with larger volumes taken on Marlboro Lights by both regular Marlboro Smokers and Marlboro Lights smokers.**

Did I read that correctly?

A: You did; yes.

Q: Now let's go to the conclusions on page 2. This section states:

Conclusions: The smoker data collected in this study are in agreement with the results found in other project studies. The panelists smoked the cigarettes according to physical properties; i.e., the dilution and the lower RTD of Marlboro Lights caused the smokers to take larger puffs on that cigarette than on Marlboro 85's.

Did I read that correctly?

A: Yes.

Q: As we have discussed, "RTD" refers to "resistance to draw," correct?

A: Yes.

Q: Marlboro 85's refers to Marlboro full-flavor cigarettes, also known as Marlboro Reds, correct?

A: Yes; that's correct.

Q: The conclusions go on to state that:

The larger puffs, in turn, increased the delivery of Marlboro Lights proportionally. In effect, the Marlboro 85 smokers in this study did not achieve any reduction in smoke intake by smoking a cigarette (Marlboro Lights) normally considered lower in delivery. Conversely, the Marlboro Lights smokers did not increase their smoke intake when they changed to the regular delivery cigarette.

Did I read that correctly?

A: Yes.

Q: This document was distributed to Frank E. Resnik, correct?

A: Yes, *the document shows Mr. Resnik as a "cc".*

Q: Mr. Resnik was Director of Research Operations at Philip Morris USA when he received this document, and he ultimately became the President of Philip Morris, correct?

A: Yes. *I don't know.*

Q: And the first conclusion of this document, on the second page, is that "[t]he smoker data collected in this study are in agreement with the results found in other project studies," correct?

A: Yes.

Q: So, as of 1977, this study, as well as the other Philip Morris project studies that are referenced in this Philip Morris USA memorandum, indicated that low tar cigarette smokers were taking in yields of cigarette smoke comparable to those of full-flavor cigarette smokers, correct?

A: Yes. *No. In the first place, as I noted previously, the Human Smoker Simulator had inherent limitations and did not measure actual human intake. Furthermore, as of 1977, the Human Smoker Simulator studies consistently suggested that cigarettes with greater filter ventilation and lower FTC-measured tar levels yielded lower tar and total particulate matter.*

Q: Please review U.S. Exhibit 34,636. This is an Annual Report of the Philip Morris U.S.A. Research Center dated June 17, 1981, written by Barbro Goodman and entitled "Development Smoke Studies," correct?

A: Yes.

Q: You are listed on the distribution list as a recipient of this Report, correct?

A: Yes.

Q: On page 2 of the "Summary" (Bates page 10003892403), this Report states:

Many of the low delivery cigarettes developed during the year were smoked by panelists using profile recorders. The smoker puff volumes, flow rates and durations increased for the average panelist compared to the standard 35cc puff. The magnitude of change correlated to the physical parameters of the cigarette rather than to subjective preferences.

Did I read that correctly?

A: Yes.

Q: The reference to "the standard 35cc puff" refers to the fact that the FTC test method uses 35cc puffs, correct?

A: Yes.

Q: This Report states that the average panelist took bigger puffs, faster puffs and longer puffs than the FTC test method, correct?

A: Yes*, but not faster puffs. The Report says durations increased, suggesting slower puffs.*

Q: The Report goes on to state:

This was emphasized in the studies of 3 mg and 5 mg candidates where each set of experimental cigarettes was designed with the same RTD, dilution, filter, wrapper and length. The only differences were in the blends and flavors of the cigarettes. Mailout tests showed large differences in preference between some of the models, but recorded smoking profiles gave the same average pattern for all models.

Did I read that correctly?

A: Yes.

Q: This Philip Morris USA Report goes on to state: "The cigarettes with the lowest RTD and dilution levels were smoked with the largest puff volumes, which means that lower delivery cigarettes generally are smoked with large puffs than higher delivery controls. This was true in all sets of cigarettes that were tested," correct?

A: Yes.

Q: This statement indicates that all the smokers generally took bigger puffs from lower delivery cigarettes than from higher delivery cigarettes, correct?

A: Yes. *No, the document speaks in terms of what smokers did on average, not in terms of what "all" smokers did.*

Q: The next page – Bates number 1000392404 – lists as its second objective: "Interpret profile information from recorded smokings [sic] to form a database of smoking parameters, mainstream, and gas phase deliveries to an average smoker," correct?

A: Yes.

Q: The FTC Method does not determine "smoking parameters, mainstream, and gas phase deliveries to an average smoker," does it?

A: No.

Q: The FTC Method does not even measure gas phase deliveries, does it?

A: No. *It measures carbon monoxide, but not other gas phase constituents.*

Q: On Bates page 1000392407, under the heading "Puff Count Alterations," this Annual Research Report states: "The number of puffs can be varied by changing the additive level on the wrapper without changing the physical parameters to any significant degree," correct?

A: Yes.

Q: Under the FTC Method, the smoking machine takes only one puff per minute, correct?

A: Correct.

Q: As described in U.S. Exhibit 34,636, Philip Morris has the capability to lower the number of puffs of a cigarette taken under the FTC Method by making the cigarette burn faster, correct?

A: Yes.

Q: But a human smoker – unlike the machine – can just take puffs of his cigarette more often and ingest just as much tar and nicotine from the cigarette as he could before the cigarette was designed to burn faster, correct?

A: Yes.

Q: And the fact that smokers can take puffs more often than the smoking machine was no secret to Philip Morris when this document was written, was it?

A: No; it was not *a secret to Philip Morris, and I do not believe it was a secret to the FTC or smokers.*

Q: On Bates page 1000392410, under the headings "Human Smoker Simulator" and "Product Studies," the Report describes smoker simulator testing that compares new proposed products, called Macho I-II and Elite 3mg., to some of Philip Morris's as-marketed cigarettes, correct?

A: Yes.

Q: On Bates page 1000392411, in the first paragraph, the Report states:

Due to the lower RTD and higher dilution on the Macho models, the panelists took larger puffs on those cigarettes than on the controls. The puff sizes

contributed to the tar and CO deliveries being more than double the CI values for that particular panel. Control Merit and Marlboro CO deliveries increased by 37% and 60% respectively.

Did I read that correctly?

A: Yes.

Q: "CO" deliveries refers to deliveries of carbon monoxide, which are measured by the FTC Method along with tar and nicotine deliveries, correct?

A: Yes.

Q: So, all cigarettes tested in this study, including Merit and Marlboro cigarettes, delivered yields to smokers that were between 37% and more than 100% higher than the FTC yields, correct?

A: Yes.

Q: The Report goes on to state in the next paragraph:

A total of six models from the Elite (3 mg) program were tested on profile recorders. Although the cigarettes represented different blends and flavor systems, they were smoked with similar puff parameters. This can be attributed to the fact that all models were made to the same physical specifications; i.e., RTD, dilution, density and filter efficiency. For additional evidence that physical parameters, particularly RTD and dilution, are the primary determinants of average smoker parameters, the Elite models were compared to Kent III and Triumph, which have the same physical specifications. Both the Kent III and Triumph were indeed smoked with the

same puff profiles and delivered CO and TPM of the same magnitude as the Elite models.

Did I read that correctly?

A: Yes.

Q: When Philip Morris USA personnel wrote this Annual Report in 1981, they were aware that cigarette design parameters, such as resistance to draw and dilution, are the primary determinants of the average tar and nicotine yields that smokers inhale, correct?

A: Yes. *I don't know.*

Q: Please review U.S. Exhibit 20,074. This is a paper by Stanley Schachter, entitled "Pharmacological and Psychological Determinants of Smoking," correct?

A: Yes. *It appears so, but I have never seen it before. I do not know who Mr. Schachter is. It has no date or source information. After looking at this document, I am not familiar with the subject matter.*

Q: There is a stamp on the last page of this Exhibit indicating that it was received by Tom Osdene on March 2, 1977, correct?

A: Yes.

Q: When Dr. Osdene received this paper, he was Director of Research at Philip Morris USA, correct?

A: Yes. *I have no knowledge that he received it, but Dr. Osdene was Director of Research at Philip Morris at that time.*

Q: Turn to numbered page 25 – Bates page 1000046654. In the first full paragraph of this page, Mr. Schachter states:

Let us review our conclusions so far. For the confirmed smoker:

1. The psychological and probably the sensory and manipulative gratifications of smoking are illusory. Serious smokers smoke to prevent withdrawal.

2. Smokers regulate nicotine intake.

3. Variations in smoking rate which customarily have been interpreted in psychological terms seem better understood as an attempt to regulate nicotine.

4. Apparent exceptions to a regulatory model of smoking seem understandable in terms of withdrawal. The smoker who fails to regulate suffers withdrawal.

Did I read that correctly?

A: Yes.

Q: So, Philip Morris had information in 1977 indicating that smokers compensate to regulate nicotine, and unless smokers regulate nicotine, they suffer nicotine withdrawal, correct?

A: Yes. *No, this document only indicates what Mr. Schachter believed.*

Q: Directly under that set of conclusions, on page 26 – Bates page 1000046655, Mr. Schachter stated: "Given this array of facts a formidable case can be made for a purely pharmacological, addictive view of cigarette smoking and it would certainly seem that the campaign for low nicotine cigarettes is misguided and rests on a set of fallacious premises," correct?

A: Yes, *that is what this document says.*

Q: In the last sentence of Mr. Schachter's paper, he states that it is clear "that the major body of data that has been used to justify the campaign for low nicotine cigarettes does nothing of the sort," correct?

A: Yes, *that is what this document says.*

Q: As of today, roughly 28 years after the Director of Research at Philip Morris USA received this paper, Philip Morris has never told the American public that the main data used to support the conclusion that low delivery cigarettes may be less harmful "does nothing of the sort," has it?

A: No. *I don't know.*

Q: Please take a look at U.S. Exhibit 87,080. This is a Report dated July 20, 1981 with the heading "Philip Morris USA Research Center," written by Frank Gullotta and J.A. Jones and sent to William Dunn and over 40 others, including yourself, correct?

A: Yes; that is correct.

Q: When this document was written, Frank Gullotta was a Philip Morris USA Research Scientist, and William Dunn was a Principal Scientist in the Research & Development Department of Philip Morris USA, correct?

A: Yes.

Q: This page and several other in this document bear the stamp "ATTORNEY WORK PRODUCTS [sic]," correct?

A: Yes.

Q: This is a scientific report, correct?

A: Yes.

Q: You are not aware of any lawyer having contributed to this Report, are you?

A: No.

Q: The second and third pages – Bates numbers 2025986353-2025986354 – state, under the heading "The Inhalation Monitoring Program":

> **A system has been developed and implemented which permits relatively unobtrusive monitoring of a smoker's inhalation patterns outside of the laboratory setting. The ambulatory monitoring unit is the first of its kind, therefore validation and calibration testing was required. Procedural refinements yielded system accuracy readings in the range of 96% [plus or minus] 3.0%.**

Did I read that correctly?

A: Yes, *except the Bates numbers are 2025986352-2025986353.*

Q: Commenting further on the "System Accuracy" of the simulator – On Bates page 2025986389, the Report states that "[t]he accuracy checks taken at the end of each morning and afternoon monitoring session indicate that the system's accuracy was highly satisfactory throughout the experiment," and "showed a mean accuracy reading of 96%" plus or minus " 3.0% for 70 experimental sessions," correct?

A: Yes.

Q: This Report further states on Bates page 2025986353: "Preliminary results suggest that inhalation patterns are modified in response to changes in the available nicotine in the cigarette smoked," correct?

A: Yes.

Q: This Philip Morris Report, like U.S. Exhibit 20,074, which we just went over, indicates that smokers change their inhalation patterns in order to get nicotine, correct?

A: Correct, *but this Report on Bates page 2025986353 also says smokers change their inhalation patterns based on smoke acceptability.*

Q: On Bates page 2025986383, the Report states:

A major barrier to investigations on smoke-laden inhalation patterns has been the lack of instrumentation which would accurately measure inhalation parameters, and yet be unobtrusive to the smoker. The system we have acquired breaks this barrier by permitting accurate and relatively unobtrusive monitoring of inhalation patterns under natural smoking conditions.

Did I read that correctly?

A: Yes, *but it appears on Bates page 2025986382.*

Q: Two pages later, on Bates page 2025986384, the Report states:

The first smoke component which we will experimentally manipulate is nicotine. The recent trend in switching to cigarettes delivering lower amounts of tar and nicotine has raised the question of whether the smoker is actually <u>getting</u> lower amounts of nicotine, or whether he/she is becoming a more <u>efficient</u> smoker by altering the intake behavior to compensate for reduced delivery. The results from studies which analyze blood plasma and urine nicotine concentrations (Ashton et al. 1979; Russell, et al, 1980) suggest that nicotine compensation is fairly complete, but reported changes in puff size and puff count are too small to explain total compensation.

Did I read that correctly?

A: Yes.

Q: On Bates page 2025986393, the Report stated that it had only completed data collection for two smokers, but that these smokers demonstrated several things, correct?

A: Yes, *but the Report also concedes that the data collection on two subjects is not enough data from which to generalize about smokers.*

Q: One of the things these smokers demonstrated was: "Smoke-laden inhalation parameters are modifiable, and are altered as a function of the nicotine delivery of the cigarette smoked," correct?

A: Yes, *but it also says under subparagraph 1 of the section quoted that there is large variability in inhalation patterns within a particular smoker and between smokers. Subparagraph 2 addresses the variability in all measures.*

Q: The last paragraph of this Report, on Bates page 2025986397, starts by saying: "In summary, there are differences in smoke-laden inhalation patterns as a function of the cigarette smoked, and these changes involve both an acceptability/taste component as well as a nicotine delivery component," correct?

A: Yes.

Q: Next we will cover cigarette taste and flavor. Prior to Philip Morris's Merit cigarettes coming on the market in 1976, the reduced tar cigarettes were not accepted very well at all by smokers, correct?

A: That's correct. *I don't know.*

Q: Why did most smokers not like low tar cigarettes?

A: They did not have enough flavor for the consumer to like them. *I don't know.*

Q: In fact, Philip Morris has designed low tar cigarettes that taste like they are higher tar cigarettes, correct?

A: Yes. *Philip Morris develops low tar cigarettes to achieve maximum consumer acceptability. In the past, Philip Morris designed some of its low tar products to taste like its full flavored cigarettes.*

Q: Now we will discuss what Philip Morris research efforts reveal about Philip Morris's knowledge of what smokers want from low tar cigarettes. Please review U.S. Exhibit 20,166. This is a Special Report of Philip Morris USA, dated October 1975 and titled "Low Delivery Cigarettes and Increased Nicotine/Tar Ratios, a Replication,"correct?

A: Yes, *that is the information on the document, but to the best of my knowledge I have not seen it before.*

Q: Turn to the second numbered page – Bates number 1003288952. In the second full paragraph, this Special Report states: "Another objective, providing the impetus behind the present study, is the development of a low delivery cigarette that will both look and taste like a regular filter cigarette and thus will appeal to current regular filter smokers," correct?

A: Yes, *that is the language in the document.*

Q: Later in this paragraph, the Special Report states: "If a low delivery cigarette with impact and flavor were developed, it may cause the segment of current regular filter smokers who are concerned about their health but demand a flavorful cigarette to voluntarily switch to the low delivery cigarette," correct?

A: Yes, *that is the language in the document.*

Q: And the last sentence on this page states: "Furthermore, some portion of current low delivery smokers may desire to switch to a more flavorful cigarette and others may follow as

consumer experience results in changing the image of low delivery cigarettes so that smokers believe a flavorful cigarette can really be 'healthy,'" correct?

A: Yes, *that is the language in the document.*

Q: These statements in this Special Report reflect that Philip Morris was trying to develop a lower tar cigarette that looked and tasted like a full-flavor cigarette, because Philip Morris was aware that smokers don't like the lighter taste of lower tar cigarettes, but believe that they are better for their health, correct?

A: Yes. *I don't know.*

Q: Please review U.S. Exhibit 35,282. This is a Philip Morris Research Center Quarterly Progress Report authored by Helmut Wakeham that covers July – September 1975 and bears the date October 14, 1975 on the last page – Bates page 1000736385, correct?

A: Yes, *that is the language on the document, but I have no recollection of seeing it before.*

Q: On the last page, this Report cites a publication – printed in a German volume – that you co-authored, correct?

A: Yes.

Q: On Bates page 1000736381, under the headings "R&D Accomplishments" and "New Cigarette Products," this Report states: "A major contribution this quarter was our provision of models of Project Timer, a low delivery cigarette, in regular and menthol flavors. These cigarettes delivery only 9 mg of tar but provide a full-flavor smoke," correct?

A: Yes, *that is what the document says.*

Q: Philip Morris USA even had a "Low Tar/High Flavor" Program, correct?

A: Yes.

Q: Take a look at U.S. Exhibit 43,690. This is a memorandum dated May 9, 1989, with the heading "Philip Morris U.S.A. Inter-Office Correspondence," correct?

A: Yes.

Q: You are listed as a recipient on the last page of this Exhibit, correct?

A: Yes; I am.

Q: Turn to the second page – Bates number 2075820929. The heading in the middle of the page states "Low Tar/High Flavor," and the first sentence refers to Philip Morris's "low tar/high flavor program," correct?

A: Yes.

Q: At the bottom of this page, the memo refers to "Project 605," which it describes as follows: "This is a 6 mg product designed to have subjectives typical of a 10-12 mg cigarette," correct?

A: Yes.

Q: "Subjectives" refers to the subjective characteristics of a cigarette, such as taste and flavor, correct?

A: That is correct. *Yes, it does include taste and flavor, as well as other characteristics.*

Q: U.S. Exhibit 36,768 is a Philip Morris document with the title "1990 R&D Operational Plans," correct?

A: Yes.

Q: On the second page, one of the programs listed under the heading "1990 Major Programs" is "Low Tar/High Flavor," correct?

A: Yes.

Q: You are listed as a coordinator of some of the other "Major Programs," correct?

A: Yes.

Q: Turn to Bates page 2021554114. This page has the heading "Low Tar/High Flavor Program 1990 Operational Plans," correct?

A: Yes.

Q: The first roman numeral under the heading and the date of February 13, 1990 starts by stating: "Objective: To develop ultra-low tar and/or reduced nicotine cigarettes equal subjectively to cigarettes with at least twice the tar and/or nicotine," correct?

A: Yes.

Q: Please review U.S. Exhibit 37,444. On the page with Bates number 2029114214, this exhibit indicates that it is a Philip Morris USA Report from the Research Center in Richmond, Virginia for the First Quarter of 1993, correct?

A: Yes.

Q: The Report itself is dated March 11, 1993, correct?

A: Correct.

Q: On the next page, which bears Bates number 2029114215, you are listed as a recipient of this Report, correct?

A: Yes.

Q: Page 2029114219 is the beginning of a memo on "Domestic Product Development Market Place Driven programs," correct?

A: Yes.

Q: Page two of this memo – Bates page 2029114220, under the heading "V. Objective: 3mg Merit (Superlights)," states: "Design and develop a 3mg product with the subjective attributes of a 6mg cigarette," correct?

A: Yes.

Q: The next page of this memo – Bates page 2029114221, under the next heading "VI. Objective: 6mg Merit," states: "Design and develop a 6mg product with the subjective attributes of an 8mg cigarette," correct?

A: Yes.

Q: U.S. Exhibit 36,734 is a collection of papers that bears the heading "Ideal Smoke" on the first page, correct?

A: Yes.

Q: Bates pages 2021348311-2021348318 list some "Milestones" in 1994, correct?

A: Yes.

Q: Turn ahead to the page with Bates number 2021348481. This page bears the heading "Activity Based Programs," correct?

A: Yes.

Q: The listed "Objective" on this page is to develop a 3mg. Merit "which tests in the same sensory space of the current identified research" to replace the then-current 5mg. Merit, correct?

A: Yes.

Q: And under the "Objective," it states: "Scope: Build the Merit business by replacing the current 5mg tar product with a 3mg tar cigarette, or as a new packing, allowing the smoker to reduce tar level without a taste sacrifice," correct?

A: Yes.

Q: Turn to the page with Bates number 2021348488. This is another page that bears the heading "Activity Based Programs," correct?

A: Yes.

Q: The listed "Objective" on this page is to develop a 6mg. Merit "which tests in the same sensory space of the current identified research" to replace the then-current 8mg. Merit, correct?

A: Yes.

Q: And under the "Objective," it states: "Scope: Build the Merit business by replacing the current 8mg tar product with a 6mg tar cigarette, or as a new packing, allowing the smoker to reduce tar level without a taste sacrifice," correct?

A: Yes.

Q: These two pages of this Philip Morris document state that Philip Morris had as objectives the development of cigarettes with lower FTC tar yields, but that would not require smokers to make "a taste sacrifice," correct?

A: Yes.

Q: These documents represent Philip Morris research efforts directed at making lower tar cigarettes that had the taste and flavor of higher tar cigarettes, correct?

A: Yes.

Q: And Philip Morris was trying to design lower tar cigarettes with the taste and flavor of higher tar cigarettes, because most smokers prefer the taste and flavor of higher tar cigarettes, correct?

A: Yes. *I don't know.*

Q: The next topic is Philip Morris's modification of the ratio of nicotine to tar in its cigarettes. Please return to U.S. Exhibit 35,282 – the October 1974 Philip Morris Research Center Quarterly Progress Report authored by Helmut Wakeham. On Bates page

1000736384, under the heading "Behavioral Research," this Report states: "As a facet of our program for a full-flavor low delivery cigarette, we conducted a study on 10 mg cigarettes with varying nicotine to tar ratios," correct?

A: Yes, *this language is correctly quoted, but as I said previously, I have no recollection of seeing this document.*

Q: Please return to U.S. Exhibit 20,166 – the October 1975 Special Report entitled "Low Delivery Cigarettes and Increased Nicotine/Tar Ratios," and turn to the second page – Bates page 1003288951. There, under the heading "Abstract," it states: "This study provides evidence that the optimum nicotine to tar (N/T) ratio for a 10 mg tar cigarette is somewhat higher than that occurring in the smoke from the natural state of tobacco, namely, .07 [plus or minus] .01," correct?

A: Yes.

Q: On numbered page 4 – Bates page 1003288954, under the heading "Methods," and the subheading "Cigarettes," it states: "The experimental cigarettes were targeted to deliver 10 mg tar with .07, .10 and .13 N/T ratios. To obtain the two highest ratios, it was necessary to add supplementary nicotine in the form of nicotine citrate," correct?

A: Yes.

Q: These statements indicate that, at least as early as 1975, Philip Morris was trying to increase the nicotine to tar ratio of its low tar cigarettes, correct?

A: Yes, *in these experiments Philip Morris was spraying nicotine citrate on tobacco in an attempt to improve the taste of experimental low tar cigarettes. This was consistent with the recommendation of members of the public health community at the time. This process was never used in the manufacture of cigarettes sold to the public.*

Q: Take a look at U.S. Exhibit 35,661. This is a Philip Morris document with the headings "Tentative Agenda Richmond Meeting – August 2, 1983 <u>Product With Most Desirable Smoke Characteristics</u> Future Product Trends," correct?

A: Yes.

Q: You are listed as having given two presentations at this meeting, correct?

A: Yes. *No, it appears that I was scheduled to give one 30 minute presentation on NOD. I have no recollection of previously seeing this document.*

Q: On Bates page 1003177957, there are handwritten notes with the heading "Ideas for Present. at Rich. mtg.," correct?

A: Yes.

Q: The first numbered item bears the heading "Low tar high (or med) nicotine," correct?

A: Yes.

Q: And under this heading, the document states: "[C]an show using PREP technique how to balance nicotine level to achieve a real low delivery cigt. under actual smoking cond. Use smoking simulator in conj. – w/PREP if nec. Make a series of cigts. w/low tar & varying nic," correct?

A: Yes.

Q: These statements describe a plan to design cigarettes with low tar and varying levels of nicotine, to see how smokers smoke them, correct?

A: Yes. *I don't know.*

Q: Now turn to U.S. Exhibit 20,430. This is Philip Morris USA interoffice correspondence from Richmond, Virginia, dated November 8, 1990, sent from Frank

Gullotta and Cindy S. Hayes – both Research Scientists at Philip Morris USA, as well as B.R. Martin, a Philip Morris USA technician, to Cathy K. Ellis – then Manager of the Biochemical Research Division of Philip Morris USA, who later became Senior Vice President of Worldwide Scientific Affairs at Philip Morris USA, correct?

A: Yes*, but I did not receive this document and only saw it once in a deposition.*

Q: The first numbered paragraph on the first page states:

Experiments conducted in our laboratory led us to the idea of how to produce an acceptable low tar cigarette. It was our work which led to the development of cigarettes with altered tar/nicotine ratios. The tobacco blend which we advocated (Jolt) is now being used in Project Bold and may soon find its way to the market place.

Did I read that correctly?

A: Yes.

Q: The third and fourth numbered paragraphs on this page state:

We have shown that there are optimal cigarette nicotine deliveries for producing the most favorable physiological and behavioral responses. Our laboratory has demonstrated that all forms of nicotine are not behaviorally or physiologically equal. This observation is important for evaluating research cigarettes where the addition of nicotine is necessary.

Did I read those paragraphs correctly?

A: Yes.

Q: These statements indicate that Philip Morris was altering the nicotine to tar ratios in its low tar cigarettes, had demonstrated that there are optimal cigarette nicotine deliveries, and was adding nicotine to its research cigarettes, correct?

A: Yes. *No. Philip Morris did not intentionally alter the nicotine to tar ratios in its commercial cigarettes. I have no knowledge that Philip Morris research demonstrated that there are optimal cigarette nicotine deliveries. I agree that nicotine was added to experimental cigarettes only.*

Q: In conclusion, I have a few questions about the harmfulness of Philip Morris's cigarettes. Aside from any personal beliefs you may have on the topic, do you have any empirical evidence that the general reduction techniques and the selective reduction techniques that Philip Morris has used in its cigarettes have in fact made Philip Morris's cigarettes less harmful?

A: No; I do not. *Yes, as I noted previously in regard to general reduction, common cigarette design features such as filter ventilation and enhanced filtration efficiency influence the generation, filtration and dilution of mainstream smoke in ways that should, based on the scientific evidence of which I am aware, generally reduce tar and nicotine deliveries to smokers. Regarding selective reduction, I am aware, for example, that the cellulose acetate filters used in virtually all of Philip Morris' commercial cigarettes substantially reduce the level of phenols and volatile nitrosamines delivered to smokers. Furthermore, the scientific evidence of which I am aware indicates that cigarettes that generate smoke by heating rather than burning tobacco, such as Accord, selectively reduce the delivery of carcinogens and other compounds that have been identified by the public health community as potentially harmful. In addition, I am*

generally aware of scientific literature which indicates that reductions in machine measured tar yields are associated with reduced risk of harm to smokers.

Q: Do you have any evidence that the general reduction and selective reduction techniques Philip Morris has employed in its cigarettes have led to one fewer case of lung cancer in the United States?

A: I don't have any data. *I am aware that it has been reported over the past several years that there has been a decline in lung cancer rates. While I believe that Philip Morris' general and selective reduction efforts may have contributed to that decline, it is beyond my expertise to evaluate those reported findings or their cause.*

Q: Your personal views aside, do you know whether these techniques Philip Morris has used have led to one fewer cancer related death in the United States?

A: I don't know. *I rely on my answer to the preceding question.*