

Recorded telephone conversation between Dr. J. K. Wagoner & Ms. Sherry Selevan of NIOSH and Dr. J. Rafter of J&J Research - Jan. 4, 1977

J.R. Let me tell you what I have then we'll kind of be on the same wave length maybe. I have transcript that Ms. Selevan gave at the American Public Health Association on October 20th., I have a transcript of that talk. I also have a listing of 94 deceased individuals and a more detailed listing of 17 who died from respiratory causes and finally I have some tables which I understand were given to the three companies involved in your report and I think they're probably equivalent to the slides that were shown on the..

SS 'they are equivalent. ~~3 4~~

J.R. Pardon

SS ?

J.R. So that's where I stand and now I need generally some information so I can understand how they were analyzed and maybe go over it myself so I can report to people that ask me whether or not I think it's a reasonable analysis, and so forth.

JKW Well, basically the underlying assumption of the whole analyses are that one person observed for ten years equates out with ten person years at risk, which is to say that ten persons observed for one year equates out to ten person years at risk. However, there is one additional parameter that added into it because of the fact that disease causation is not an instantaneous event, as manifest by death and that is, we analyzed our basic data, if you could draw out on a piece of paper a matrix which has on one scale, axis, duration since onset of what...which for easier terminology we classify as latency, on the other axis, you have duration of employment. Within.. if you draw out seven different categories in each one of those axis.. actually eight being the marginal total, the first category which is cell 1 x 1, you with me, is less than five years of duration of employment and less than five years since onset of employment. Going over to your right, the second cell is 5 through 19..where have you got duration of employment, on top?

J.R. on top

JKW Within latency less than five years, duration of employment 5 to 9 years, it's a nonsense cell. it's an impossibility, o.k.? You understand that.

J.R. Yes

JKW Basically, let me go back one further step. I'll give you the five variables, six variables that we consider. We consider age, which is an always increasing function,

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JKW we consider calendar time, which is an always increasing function, we consider interval since onset of employment, which is an always increasing function ..

JR that's latency, is that correct?

JKW latency, and we consider duration of employment which is a static or increasing function, depending on whether a person terminates employment or not. Those are your basic four variables that are considered other than variables such as race and sex. Now, within each one of these cells in this big matrix that I had given you, we have a life table in terms of calendar time and age, age in five year intervals, calendar time in five year intervals. The reason that we analyze in terms of these two variables is that disease is obviously associated with aging, disease is also a secular phenomenon in terms of diagnostic differences and things like this that lung cancer is an increasing function over time and what we hope to do when we analyze is to control for these nonsense variables so that later in our final analyses we can, after analyzing for these variables, we can collapse the table and just consider dosage and intervals since onset holding each of these other variables constant as we controlled for them in the analyses. O.K.

J.R. Yes

JKW On your axis you have five year intervals, less than five, five to nine, ten through fourteen, fifteen through nineteen, twenty through twenty-four, twenty-five through twenty-nine, greater equal to thirty and a total which is the largest total summation of all the events in that column row. In going down you have the same numeric breakout of less than five, five through nine... O.K. What we do is we take each individual as he comes in, we ask the basic question, when did he get employment, he began employment in 1940, entered into the life table in 1940-at the age he had achieved in 1940-at latency 0, because he had just began employment and the duration of onset of employment of 0. Assuming that he has continuous employment, he passes down through the diagonal of the table both in terms of calendar time in terms of aging, in terms of increasing employment, and in terms of interval since onset of employment until he stops employment, in which case he no longer increases in terms of duration of employment, but just increases in terms of onset, interval since onset of employment. O.K. As he ages of course, he progresses in calendar time. He can get out of the life table in terms of two different events. Either he expired, in which case he is removed from risk of dying at the date that he expired, and is removed totally from further accumulation of risk, person years at risk of dying at that point in time, or he can come to the end of the study period when everybody drops out of the study who does not expire, O.K. Now if a person continues employment from the date he began employment in 1940 and the study period ceases in 1975. He will contribute five years of risk in cell I-I. he will contribute five years of risk in cell II, O.K., because he has spent five years

at risk of dying as he was accumulating his fifth through his ninth year of employment and he was in his fifth through ninth year since onset of employment at that time. And likewise five in the third, cell 33, five in cell 44, five in cell 55, five in cell 66, and six in cell 77, that is 1970, '71, '72 '73, '74 and '75. O.K. Now let's assume that we have another individual that comes through but he dies on the 10th anniversary of his initial employment. He will contribute five years at risk in cell II, he will contribute five years at risk in cell 22 and will be removed from the life table at that point in time as deceased due to the underlying cause as certified on the death certificate. O.K. I will take a third individual who just dies on the fifteen anniversary of his employment, initial employment, but he only works for ten consecutive years. He will contribute five years in cell II, five years in cell 22, and five years in cell 23, two being duration of employment.

JR Its 32 the way that I have it, I guess, since I have duration across the top it would be 32 in terms of, o.k.

JKW Essentially, he goes on the diagonal and then drops one cell and then drops out due to the cause of death that he died from. O.K. You with me.

JR Yes

JKW The only other case that really theoretically can happen, you can work out all sorts of combinations on those, would be a person who was initially employed, worked for five years, left the industry for five years, came back and worked for another five years. Alright? That person contributes five years at risk in cell II, he contributes five years at risk in cell 12, one being less than five years of duration, but at the fifth to ninth year since onset, o.k. and then he contributes five years at risk in cell 23 during the period that he accumulated his fifth through ninth year of employment but he was in his tenth through his fourteenth years since onset of employment. That will be your third type of individual, the fourth type of individual that can fit into the life table at risk. The other condition, obviously a person who begins employment in 1920 of our study period begins in 1940 because that when the record system or that's when our follow up started because we use social security as a method of ascertaining whether a person is deceased or alive, and that system really came into effect in 1935, or '36, actually '37 or '38. If that person began in 1920 and was still on the payroll in 1940, then this is the first date of our study period. He will be in cell 5-5 when he enters our period at risk. He has accumulated 20 through 24 years of employment, he's actually on the 20th year of the onset of his employment. He contributes no risk during the interval prior to that because he has no probability of dying otherwise he would not be on the payroll as of 1940, when we had the first chance of picking

him up. O.K.

J.R. Yes

JKW Basically you have the matrix, as we send people through from our, in this case the Vermont Tail workers themselves. Each one of these obviously, as they go through each one of these cells, is put into that additional matrix within the cell of a series of sixteen age groups and approximately eight calendar periods, 1940 through 1944, 1945 through 1949, '50 through '54. O.K. These individual numbers that we are distributing are individual person years that each individual contributes that risk of dying during the period of the study. O.K. Now to get what one would expect to have occurred in this population, if they had experienced the same death rate of the control group, in this case, the U.S. white male population, we generate out for the same calendar period that we used in our life table distribution and the same age groups that we use in our life table distribution, death rates per 100,000 population due to specific causes of death. 001 through 0119 ICD code, tuberculosis, malignant ———— 140 through 199 or 205. In order to provide comparability because the coding of death has changed over a period of time, we interpret our study deaths in terms of the revision that was in effect at the time of death and then we convert that code to a seventh revision code number, for ease of handling. O.K. So we do have comparability. We code out the U.S. population and death statistics as published by the National Vital Statistics Division and put them together using that same comparability arrangement. We take these death rates for 100,000 population, specific for five years age groups and five year calendar time periods and bring them back in and multiply them by the person years at risk in the life table that we just distributed which are now specific for calendar time and age group within dosage and latency,— if you will,—and for ease of statistical notation we will say that L_{xyz} , lets make it L_{abcd} where a is dose 1, b is latency 1, c is age group 1, and d is calendar time 1, we take that person year at risk times the death rate of the general population specific for age group c and calendar time group b. O.K. That generates out the expected numbers of deaths that would occur in this population within age group c, calendar time period time d, ———— group 1, latency group 1, if they had experienced the death rate due to that particular cause of the general population. O.K.

J.R. Let me ask you a question at this point. You use these references for the United States and broke them down by, what was it, sex,

JKW sex, race, cause, age, calendar time

J.R. Oh, so there is age in there.

JKW Oh, yes. Age is in there, sex is in there, race is in there. These are race, sex specific race.

JR How about job classifications. Is there anything like that in these.

JKW Well, not at this time here. O.K. We'll get into that sub clarification at a later time.

SS You mean for the U.S. rate?

JR Yeh, I'm just trying to get an idea of what these references give.

SS The rates for the U.S. don't have any information.

J.R. I see.

JKW These are just U.S. general white male population rates. Yet anything, the use of the U.S. white male population, general population as a reference population, tends to underestimate what one would expect in a population if all things other than age and sex rate and calendar time were the same. The rate in being that a working population consists of people who are physically able enough to seek employment and are medically sound enough to pass routine company medical examinations in order to accepted for employment. They are also well enough to withstand the normal rigors of a physical type of employment whereas the general population not only includes many of the same people from that industry but all other industries, but they also contain the sickly, the people who are in hospitals with diagnosed cancer already who have yet to expire, and things like that. In addition, during the war years you tend to find that the general population, in many cases, contains many of the medical rejects and things like this which are left in the U.S. population and during those years, the population at risk really was continental U.S. not population overseas, etc. The use of the general population has been referenced in many articles as producing what we call the "healthy worker effect" and that is, is underestimate of the risk that one would experience, if in fact, everything other than these nonsense variables were equated.

JR Is this information...this reference available to me in the library someplace?

JKW What, the healthy worker effect?

JR No, the references that you used for the U.S.

JKW Yes, they're published vital statistics.

JR That's what I would ask for?

JKW Each year they put out two big volumes on it.

JR Who puts it out? Public Health?

JKW The U.S. Vital Statistics Division.

JR What about the references for Vermont? Are they also available someplace?

JKW There are two different types of references. Either you can get population and death from the same volume that we were talking about for many but not as large an array of causes of death as you can from the U.S. The U.S. breaks out about 251 specific causes of death, I think each state breaks 68 or 56. Its a less detailed breakout, in terms of specific types of causes of death, or the state of Vermont themselves have their own data available.

JR I would have to contact an agency in Vermont.

JKW I would imagine the State Health Department.

JR State Health Department, and this also has job classifications, this state Health Department?

JKW No, no, job classifications. The reason being that one assumes that the general population, as I said before, if anything, underestimates, and too that it contains, because of the fact that its a large population relative to a very small restrictive geographic region tends to contain all segments of the population and is really, in a sense, smoothed out in terms of risk factors. O.K.

JR Yes, I understand.

JKW When one gets through with this whole array that we are talking about where one increments the calendar time, and increments the age and then goes in and calculates another expected death and goes all the way through for each one of the cells, then we update the cause of death and go into the second cause of death and do all the same sequentially through the cell. When all of this is done, we sum over all calendar periods, and all age groups within specific latency and dosage cell. O.K. The reason being we have now controlled for age, the effects of age, we have standardized for the effects of age and calendar time and we are really not interested in terms of these as disease causation, standardized for and held at constant. We summarize over those and then we sum within dosage over latency and we sum within latency over dosage to get our marginal total. O.K. You with me?

JR Yes

JKW Then you can sum your marginal total and they had better come out the same. O.K. which will give you a grand total.

JR Right, of the number of deaths.

- JKW Number of deaths both observed number of deaths, expected and you can sum your person years because they're additive also. Only for descriptive purposes. the actual years of the marginal total person years. or the grand total person years in any calculation is statistically in balance because you, in a sense, have sacrificed your age calendar time consideration. O.K. You with me? Well, basically that is the general philosophy behind the distribution, people that were presented by Ms. Selevan on occasion presented the grand total for various causes of death, on other occasion presented the sub...the marginal totals according to intervals since onset of employment, as we wish to look at latency. O.K. The reason we wish to look at latency is if in fact one usually sees, or one sees that one has an excessive risk as measured by the ratio of the observed over the expected times 100, which is the SMR, early in the game, with very short latency one can become very suspicious of an occupational ~~relationship~~ toward that excessive risk. The reason being that it's impossible or very unlikely that one has instantaneous death due to an exposure for a chronic disease.
- JR Of course there is a problem there, and that is in some instances people were exposed a very short time a long time ago and it appears that they have a long latency where, you know, they have a long time since exposure but they had a very small exposure, that tends to be misleading in some cases, I would think.
- JKW Well, you've got your option in looking at both spectrums, dosage and latency, O.K.
- SS The original tables that you've got, they just looked at latency because the effect was much more pronounced there. It was a ten minute presentation, in the final draft we also looked at exposure, but that opportunity, we just didn't have enough time to give all the data and the pronounced effect was with latency a much lesser effect as there was with exposure.
- JKW Well, one can normally say is that we really don't know how much duration of employment it takes to really induce a disease, either it manifests by its diagnosis and/or death, but if it's a chronic disease ...after a person was exposed in terms of diagnosis and/or death is very minimal. Certainly all of our population studies to date have demonstrated that.
- JR I'm sorry, I didn't quite understand that, would you repeat that.
- JKW What I'm saying is that whereas your dose group 1, in your latency group 1, would be not expected to have an SMR above 100, o.k., the ratio of observed over expected should not exceed 1, the further you get down removed on the latency scale. even with the possibility of certain exposure.

if there is an effect, you would expect to see an increasing relative risk. Ratio of observed to expected would increase. If in fact, there is an occupational ideology and if in fact short term exposure is really associated with this phenomena. O.K.

- JR There is another question that occurs to me, and that is, since there...if you have very few people in your sample that you are working with, does this change what you've just said, for example, I can understand that if things would even out kind of in a lot of people, but when you have very few people can you...can mistakes be made by making that assumption because you just have so few people.
- JKW Well I think one could tend to underestimate but the likelihood of overestimating the risk would be unlikely on the basis that the test of significance uses a...? distribution take into consideration the magnitude of the numbers.
- JR Does this test of significance something that you do or is it done by your computer?
- JKW Really, we use table 40 Biometrika, Volume I, Biometrika Table for Statisticians, Persall & Hartley. Its a standard process that is used internationally in the field.
- JR So given an SMR, then you would look in this table.
- JKW Actually the table gives you the bounds on the observed number of cases.
- JR I see. I noticed in one place in these tables you made comparisons between the expected number for the Vermont miners and Vermont population, excuse me, the observed for the miners and the expected for the Vermont as well as the observed for the miners and the expected for the U. S. population.
- JKW We use two different standard populations to generate our expected, one the U.S. white male population and two, the Vermont white male population.
- JR Did you use the same table to do the analysis and does the table take into account that you are doing multiple comparisons using the same expected number of people, the same observed number of people?
- JKW No, no.

JR So its like you had several tests to do and you just did pair comparisons with each of the possible

JKW Right, right

JR Have you adjusted your P values for that at all?

JKW No, no. In this case I would doubt very much if it would make any difference in light of the extremely large relative risk. And this is going to be heresy that I'm going to state, being a graduate of Harvard University School of Public Health both in biostatistics and epidemiology but I often view tests of significance to be a crutch that have been imposed upon the statisticians by the incompetent medical profession who are too damn inept to interpret their own data. I would prefer to biologically interpret the significance of my data as well as the statistical significance of my data.

JR I should hope anyone would do that.

JKW Too often this is not the case.

JR The unfortunate thing is people will tend to look at P values and take them as gospel. I think I am agreeing with you.

JKW This basically is why we tend to restrict ourselves to just the .05 and .01, anytime you start getting down to the exact and multiple comparisons, its ludicrous.

JR Of course, the fact that you reuse the same sample several times does tend to make the conclusions more dependent upon the sample and less relevant to the total population.

JKW It depends on which standard population you are referring to.

JR Well, I assume that the underlying population is something along the lines of people who are or will be employed in talc mines, that's the inference I guess that's being...

JKW No. I mean in which general population. If one does multiple comparisons and looks at the Vermont population and says let's look at the U.S. population, certainly the first is an independent step.

JR Yes, that's true. expect you're using the same observed in each case, that was my point. Could I ask you some specific questions about the people that had died of respiratory causes. For example, on this listing there are about ten of them where its listed as smoking being "unknown", has this been updated at all, is there new information about that?

JKW I think there is update going on on it, yes. Obviously we are attempting to get the complete smoking history as possible. However, I think one has to see very categorically that I would hope that we are not going to be using smoking as a red herring, and let me explain what I mean on that. Single population consists of approximately 60% x or current smokers. We are not using U.S. white male population rates specifically for non-smokers and when one tends to say, well you haven't considered cigarette smoking and obviously it must be due to cigarette smoking, it is often stated that we would without consideration being given to the type that a sizable portion of the general white male population are also current and/or x cigarette smokers. In spite of that fact that we do have smokers vs. smokers, and they may differ in quantity of cigarette smoking but there is no data which would support that at present.

JR The only criticism I would have of that is that its generally true if you have a large sample again the fact that you have a rather small sample, cigarette smoking could be more of an influence than if you had a larger sample, even though as you mentioned, your Pason tables take into account small numbers.

JKW There are a few other things that I think we ought to consider. Since we did break the population down into miners and into millers two independent categories, and miscellaneous....

SS Miscellaneous are mixed categories, people who worked in both places .

JKW O.K.

JR Yes, I know about that.

JKW The likelihood of an independent effect of cigarette smoking in the ideology of this disease risk that we are observing seems very small unless one further evokes the hypothesis that there is job specific smoking patterns within specific corporations in the same geographic area. That is why do miners smoke less than millers, and if they don't, why do we see an excessive risk of non-malignant respiratory disease in the millers and not the miners.

SS Why, also conversely do we see an excess of respiratory cancer in the miners but not the millers.

JR Well the point is, I agree that you can make ...you can ask these questions except when you've got only like for example six people who died of cancer and if two or three of them died as awhich I don't know, but if two or three died as a result of cigarette smoking, you know that really affects the sample. If you had sixty people and two or three had died as a result that doesn't effect the sample.

JKW We're not pushing on the lung cancer at the present time.

SS We are not making any conclusions, its just that you work expect consistent patterns if smoking is truly the cause of the excessives we're observing ,you would expect the pattern not to be opposite but to be consistent and they are. That's the only point I'm making, I'm not drawing any conclusions as to the lung cancer at this point.

JR My point is that its hard to see trends when you have few people.

SS Well, the only trend that we're really specifically identifying is that and respiratory disease. It is striking.

JR Let me ask you, do you have information with regard to length of exposure and period of employment of the people other than the ninety four who died? I understand there was a sample of 405 taken. Do you have information on these people who are still alive with regard to things like exposure to talc and working history?

JKW Oh, yes. They are distributed in the matrix.

SS This includes everyone living and dead in that 405 people.

JR And they are included in the calculation of expected....?

JKW Oh, yes. In order to generate and observe and expected death you have to have people who are generating, of course, in years....

JR All of these people add up to 94, there's none of them that adds up to more than 94. I took it to mean that you only have.....

JKW Oh, no there are 94 deaths.

SS Actually there's a correction, there are 92 we had some people without death certificates and we had since found two of those 94 to be alive. But its 92 now, we will have corrected tables.

JR Is it possible for me to get pre-notes of the living people with regard to length of exposure

SS That information is confidential

JKW It will be made available.....

SS What!of the living people

JKW No, No, No.

SS He asked for living people. You want distribution of person years.

JR Well, what I would like is, that would be helpful, something which gives me a distribution as to the regard to the exposure.

SS You don't want actual individual information about individual workers.

JR No, I don't need that. I'm interested in distributions with regard to length of exposure of live people and also period of employment of live people, and if possible the smoking history of those live people.

SS We don't have smoking histories of live people.

JR Is it possible for me to get that or can I come and pick it up or can you send it to me. Can I ask another question while you are deciding?

JKW First of all we do not have cigarette smoking habits, patterns among the surviving, O.K. Many of the surviving people no longer are regularly employed with the companies in question some of them are dispersed throughout the U.S. and I think we run into a severe problem of privacy in addition to the possible harrassment of individuals trying to go back and evoke this type of information. Its cumbersome.

JR O.K. so don't give me their names, I don't want them. What about the length of exposure, tables which summarize length of exposure for living people and period of employment for living people. Are those available?

SS Well, if you wanted, you could have a master file that has nothing but work history in it. It won't have any individual identifiers, we would blind out any personal identifiers, we could give you that.

JR That would be fine. I don't care to know their names. Their ages would be nice or distribution of their ages. I don't need the raw data I can get by with summary data.

SS A life table has the number of person years per age group, we've got all that kind of breakdown, the person years rather than specific flow for each person in the various life span exposure category so that you could get that indirectly from the life table. It would be much less complicated that way.

JR These are available to me? the life tables.

JKW Well, they certainly will be made available when we have our general meeting here, O.K.

JR The point is, I've been asked by someone who I have to rely on to pay my salary, you know, to get this information as quickly as possible, and to try to make some head and tail out of it. Is it possible that I could come there or you could send me this kind of information about either the living or everybody in terms of these life tables, or both.

Pause....

While you are thinking can I ask you a second question about this.

SS Wait a second, we'll try to work this one out.

JKW Go ahead, shoot your second question.

JR There are 405 people that you talk about, is this the total number of people that were available, or is it a sample from the people?

SS It's the total number of people with.. who worked a minimum of one year with at least one day of that time between 1940, January 1st, 1940 and ...the current year has to be before 1970 and one day of that time had to be at least, one day of that time had to be after 1940.

JR So as far as you know it's a complete census as opposed to sample.....

SS It's as a matter of fact probably, well, it's as complete as we can get considering the problems with the company data, and the Health Dept. data, what with the Health Dept. data as they had in their data a greater percentage of the people with the greater exposures, and the companies had more names but the additional names all seemed to be those people who worked much less than a year, like two weeks. The companies also were missing quite a few of the people who worked there longer periods of time and we think that this is probably due to 1) the sketchy work histories kept in some of the companies in the past, 2) the fact that the companies have changed hands, quite a few of them have changed hands several times and the records were lost in the changes, but we ultimately went with the Health Dept. records, they're more reliable of their own, and there were originally 826 people in the Health Dept. and 405 fit our criteria, as is described.

JR I can continue asking questions if you want to continue thinking about the other one. We've been trying to get a hold, George Lee has been trying to get a hold of the death certificates of the people who died and he would like to know if you could provide the information with regard to the state in which the death is registered for three people. If I give you those names, could you find those out..tell me?

SS Which people?

JR One is West-Treffeley, West. Shall I continue or wait?

SS Treffeley, West? Who else?

JR The second one is Guyett, Daniel, his first name and the third one was Reil, the first name is Edson.

SS O.K., I can get that information for you. I don't have it with me right this second, I'll have to look it up in our original file.

JR George asked me to ask a second question with regard to these respiratory deaths, he noticed that in your transcript you mention that you had excluded people who had died from influenza and pneumonia and he notes that there...for people on the list of non-malignant respiratory deaths who were listed as dying from pneumonia or some.....

SS Its a coding. It's coded by the underlying cause of death. Any causes of death for the immediate cause, they die instantly of pneumonia, but that's not the underlying cause of death, and that's not the way they're coded by nosologist, a qualified nosologist. The tables that I sent you, where it had the coding, that coding by a professional nosologist and there's either three or four columns, depends on how many causes we found on them, prime cause, there's contributory cause 1, contributory cause 2, contributory cause 3 and the is the cause of death classified under

JKW As an example, congestive heart failure due to influenza due to chronic fibrosis of the lung. It would not be coded out necessarily as congestive heart failure.

SS It would be coded under the underlying causes

JR That's the ICD column, I think that's it. Is that the first cause of death?

JKW The first cause on the death certificate, underlying.

JR Yes, that's what the column ICD contains?

JKW Yes.

JR And then ClC-2 and C-3 are ..

SS Contributory cause 1, contributory cause....

JR O.K. I understand.

SS So, although the immediate cause of death might be pneumonia pneumonia might be a resulting factor from something else and in these death certificates they all were, at least according to the physician who attended the patients.

JR O.K. Well I'm out of questions now. What can we decide about getting this other data? I'll tell you, George would really like to come out there, he's asked me several times, he said that I should press that point, I don't want to become offensive to you.

JKW Yes, well let me explain my position on this. Our general feeling is that we certainly don't intend to shy away, and certainly would be more than receptive to interact with other people in the scientific community. However, we don't wish to be put in a position and we refuse to be put into a position, of dealing differentially with management and labor and my general feeling is that since there are multiple corporations involved, since there has been multiple requests from multiple corporations, I would prefer that other than what we're really talking about here, that we refrain from any further distribution of hard raw data pending the joint meeting of both management and labor, and any consultants that they wish to bring in--to very candidly go over and discuss our interpretation of the data, the analyses, any questions that may be resolved or brought up. Meetings of this nature obviously are to lead for a briefing of our feeling, our interpretation of the data, answering any questions and eliciting any opinions that may be certainly scientifically sounded, we have no corner on the market, of course, but reserving the right to interpret the final data as we so fit, consistent with good scientific interpretation and its in that sense that I'm a little reluctant to openly, essentially dump our computer volumes that are least three to four inches thick, a computer dumpout, four of them.

SS Possibly duplicated, I means, it's hundreds and hundreds of pages, and.....

JR From my personal point of view, the problem is that if I was asked to attend such a meeting, and I probably will be, it would be very beneficial to me if I had been able to look at the data before going to the meeting, otherwise it would seem to me that people would have to take what's given at the meeting, go back and digest it and then come and ask for a second meeting, so our point of view is that we would like to get as much information as possible before the meeting so that we can come prepared to discuss our feelings at that meeting.

JKW Can I ask you a question, briefly?

JR Sure

- JKW If you came to a scientific conference, do you leave the scientific conference with the feeling that you had to see somebody's basic raw data and entire distribution before you arrived at a judgement as to the validity of that data and interpretation? Forget that you're a consultant for the company?, Come on.
- JR When I go to a conference, I hear a paper, I usually don't understand it, usually five minutes after they start, I'm lost, so that I have to take what's given in terms of hand outs and go home and study it like crazy and look up in the literature what is necessary to understand it and then if I'm interested in pursuing it further, get in contact with the people that gave the talk and pursue it. The point is I really can't say that I would, I wouldn't certainly go to a meeting and call somebody a liar or anything like that.
- JKW Well, I'm not asking about liar. I'm just talking about guilt. Scientific protocol.
- JR Generally if I go to a meeting other than a statistical kind of conference and people present statistical data, it's my experience that I should question that data, I'm not saying.. you obviously know a lot more than I do about this subject, so I'm certainly not questioning you, but that's my basic feeling, that I tend to question data when people do statistics because I've seen so much misuse of it.
- JKW I don't deny that. It's too much garbage in, garbage out.
- JR My point still is, if I have to come to a meeting whereby I'm going to talk intelligently about important work that's being done, I would like to have information before that, as opposed to coming in cold and having to say, well can we talk in a week or two weeks when I've had a chance to digest the information.
- JKW Well, I'll tell you what, you tell Mr. Lee that one, we will be sending a copy of the paper out, at least a week before the meeting, o.k. and two, at that time, with discretion, we will provide a couple of pertinent matrixes to give you the answers that you're really after.
- JR You couldn't send them before that time?
- JKW Well, basically we're talking about getting the paper out within essentially a week and two days, right now, so we are not talking about any lies, o.k. The thing is that we've attempted to crank up this meeting to occur as fast as we can, however, in light of the repetitive requests that have come in from Windsor Minerals, Johnson & Johnson, & Engelhard...
- JR I suppose everybody is doing the same thing.

JKW If they wish to have the meeting, and wish to have the manuscript then you're going to have to sit back and let us finish it o.k.

JR What about these three death certificates, now can I call back or have George call back to get that information or will you send it to us?

SS We'll send them out.

JKW We'll send them out. Do you have an address there that we can send them?

JR I can give you my address, it's John Rafter, Johnson & Johnson, Research Center, New Brunswick, N.J. 08903. So that's Johnson & Johnson, Research Center, New Brunswick, N.J. 08903.

SS and your phone number?

JR Area Code 201-524-5087