

DE #2

SUPERIOR COURT OF NEW JERSEY
LAW DIVISION: MIDDLESEX COUNTY
DOCKET NO. L-060148-87

JOHN PETERSON and SHIRLEY
MAE PETERSON,

Plaintiffs,

vs.

UNION CARBIDE CORPORATION,

Defendants.

RECEIVED
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DEPOSITION DIGEST OF
SAMUEL S. EPSTEIN, M.D.
December 1, 1989

*Epstein & S. No. Larynx
Cancer*

Digested By: Nancy K. Docherty
Legal Assistant

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UCC 089672

<u>Page</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
3	1-4	Name And Address	Samuel S. Epstein Apartment 25M 860860 N. Lake Shore Drive Chicago, Illinois 60611

DIRECT EXAMINATION BY ROBERT HOLLINGSHEAD
(Union Carbide)

3	6-25		Attorney instructions.
4	1-19		
4	20-25		(Mr. Hollingshead requested a copy of witness' current CV/resume.)
5	1-3		
5	14-25	Education/	Witness stated that he is current-
6	1-25	Employment History	ly professor of occupational and
7	1-9		environmental medicine at the
			School of Public Health University
			of Illinois Medical Center in
			Chicago. Witness further explain-
			ed that all of the degrees which
			he holds at present were the re-
			sult of his education at London
			University. He received the equi-
			valent of the U.S. version of the
			M.D. in 1950. He is not a
			licensed physician of any state in
			the U.S. In his present position
			at the University of Illinois, he
			does not diagnose, treat or see
			patients. He does not maintain
			any U.S. board certifications.
7	10-25	Witness'	Witness stated that he has
8	1-11	Publications	authored approximately 300 publi-
			cations over the course of time.
			Several of his publications dis-
			cussed the chemicals involved in
			this particular case (polyvinyl
			chloride, vinyl chloride monomer,
			polystyrene, isopropilidene resin,
			asbestos, and various chemicals
			that are emanated by welding
			fumes). He further stated that
			asbestos, vinyl chloride, and

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

UCC 089673

PageLinesSubject MatterDigest of Testimony

polyvinyl chloride were discussed by him in a book called *The Particulars of Cancer* published in 1978-79. (Mr. Hollingshead requested the list of publications that witness has authored.)

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to
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12-25
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Litigation Involving
PVC/VC

Extensive discussion was held re witness' involvement with PVC/VC litigation in the past 10 years. Witness described the four cases: *Elias v. Parke Davis and Sprayon* in 1979, *Grasso v. BF Goodrich* in 1981, *Mikyska v. Ford and Union Carbide* in 1981 and *Maliko, et al v. Union Carbide* in 1979. Elias involved an infant that subsequently developed a malignant tumor post-surgery after his incision scar was sprayed with Sprayon. The case was settled after witness' deposition. Grasso involved an individual who was exposed to VC emissions from a plant that was located one and three quarter miles from his residence. Grasso subsequently developed angiosarcoma of the liver. Witness was deposed and testified at the trial. Mikyska involved workers at a Ford plant that was exposed to VC, consequently developing a toxic hepatitis. The case was settled after witness' deposition. Mr. Hollingshead was familiar with the Maliko litigation. (Mr. Hollingshead requested copies of all documentation that witness had pertaining to the Elias, Grasso and Mikyska litigations.)

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Involvement With
Polystyrene Litigation

Witness stated that his only involvement with polystyrene litigation was the Maliko case. He further explained that other chemicals were involved in the

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

- 2 -

UCC 089674

<u>Page</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
			case also, but the main focus was PVC.
14	3-11	Involvement With Asbestos Litigation	Witness explained that he had very little involvement with asbestos litigation. (Mr. Hollingshead requested copies of any reports witness may have done on asbestos.)
14 15	12-25 1-4	Involvement With Isopropilidene, Bisphenol Resins Litigation	Witness discussed his involvement with isopropilidene bisphenol resins litigation, including the Maliko case. (Mr. Hollingshead requested a copy of all written documentation that witness had re his isopropilidene, bisphenol resins litigations.)
15	6-10	Involvement With Welding Fumes Litigation	Witness stated that prior to Peterson, he has never written an expert report re emissions from welding fumes.
15 16	11-25 1-12	Responsibilities At The University of Illinois	Witness stated that his current responsibilities as a professor of occupational medicine at the University of Illinois Medical Center included research, teaching and public service. He further explained that he teaches an intensive winter course involving a series of current issues that have a strong scientific involvement in environmental or occupational matters.
16 17 18	13-25 1-25 1-3	Research Assisted By Graduate Students	Witness stated that he would only utilize graduate students as research assistants when it involved his work at the University of Illinois. He never utilizes the aid of graduate students in his practice as a consultant.
18 19	4-25 1-8		Witness stated that of a five day workweek approximately four days involved university work and one

<u>Page</u>	<u>Lines</u>	<u>Subj ct Matt r</u>	<u>Digest of Testimony</u>
			day involved his consulting work which is primarily in the area of litigation.
19	9-18		Witness stated that his consulting work is exclusively on behalf of injured individuals in various capacities, not on behalf of any manufacturing or chemical companies.
19 20 21	19-25 1-25 1-7	Involvement With Laryngeal Cancer Litigation	Witness stated that prior to Peterson's case, he was involved in two other instances in which there was a laryngeal cancer. (Mr. Hollingshead requested a copy of any documentation witness had pertaining to the involved cases.)
21	8-14		Witness stated that due to the fact he did not have any medical qualifications in this country, he was unable to sit for any board certification examination.
21 22 23	15-25 1-25 1-9	Involvement In Peterson Case	Witness stated that in April 1988, Levinson wrote him re the Paterson case. Subsequent to the letter, they had a brief discussion where witness agreed to get involved. It was not until January 1989, that witness received materials from Levinson. He stated that since the Maliko litigation ten years ago, he has not had any professional contact with Levinson or any member of his firm.
23 24	18-25 1-18	Exhibit Epstein 1	Epstein 1 is the Notice To Take Deposition and Produce Documents. Witness produced all written documents he received from Levinson incorporated in a notebook.

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

<u>Page</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
25 to 29	22-25 1	Discussion With Velez	Witness stated that the only other person he had discussed this litigation with other than Levinson was Velez. He received two phone calls from Velez in October 1989. During the first one, Velez requested a copy of witness' report. The second phone call was for the sole purpose of requesting a copy of the Tabershaw documents. Velez did mention to witness in the second conversation that Velez was going to be deposed. He did not make notes of any of the conversations.
29 30	2-25 1-10	Tabershaw Report	Witness stated that of the three Tabershaw reports, only the Tabershaw/Gaffey Report was published and that was in 1974.
30 31	17-25 1-25		Witness stated that his notebook contained references to everything that he utilized to render his report, but not the original articles.
32	2-17	Exhibit Epstein 2	Epstein 2 is a copy of witness' Preliminary Report dated 9/13/89.
32 to 35	18-25 1-15	Updating Preliminary Report	Extensive discussion was held re four additional documents witness had brought with him to the deposition updating his preliminary report. Witness explained that at the time he authored his Preliminary Report, time constraints prevented him from obtaining additional material necessary to adequately update his report. He was advised by Levinson to bring the four additional documents to his deposition, updating his Preliminary Report. The four documents are as follows: Factors Incriminating VC/PVC As The Primary Cause Of Peterson's Laryngeal Cancer, State Of The Art On VC/PVC

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

<u>Page</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
			Toxicology Prior To 1974, Illustrative Literature On The Toxic And Carcinogenic Effects Of VC/PVC In The Respiratory Tract Of Experimental Animals and Illustrative Literature On The Toxic and Carcinogenic Effects Of VC/PVC In The Respiratory Tract Of Exposed Workers. All of the documents were contained in witness' notebook.
35 36 37	16-25 1-25 1-12	Factors Incriminating VC/PVC	Witness stated that he wrote his document entitled Factors Incriminating VC/PVC As The Primary Cause Of Peterson's Laryngeal Cancer after reading Davidson's deposition re PVC dust exposure. He further explained that all four of his additional documents were authored within two weeks prior to his deposition.
37 to 40	13-25 1-11	Peterson's Asbestos Exposure	Witness stated that he learned of Peterson's asbestos exposure from two pieces of info. Those being Peterson's X-ray and additional info he had received from Levinson's office re Peterson's occupational exposure. He further explained that it is his practice, in an attempt to save on file space, to go through all the paperwork that reaches him, extract the information, incorporate it into his notes and then discard it.
40 41	12-25 1-13	Exhibit Epstein 3 and 4	Epstein 3 is a letter dated 4/18/88 from Levinson to witness. Epstein 4 is witness' notebook.
41 42	14-25 1-25	Item No. 5 Of Notice To Take Deposition	Witness stated he has never rendered an oral report to Levinson nor had any draft copies of his original Preliminary Report in

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

<u>Page</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
			answer to Item No. 5 of Notice To Take Deposition.
43	1-14	Item No. 6 of Notice To Take Deposition	Witness stated that in response to Item No. 6, he will make available copies of prior litigations he had discussed earlier in the deposition.
43 to 52	15-25 1-12		Extensive discussion held re the various sections of witness' notebook which was previously marked Epstein 4.
52 to 55	14-25 1-7	Exhibit Epstein 4	Extensive discussion held re various sections of Epstein 4 which is witness' notebook. The sections discussed included the background summary, medical history and personal section.
55 to 58	8-25 1-13	Peterson's ATC Exposures	Witness stated that the section of Epstein 4 entitled occupational history, indicated that prior to Peterson's employment at ATC, he had no exposure to asbestos and PVC. He stated he arrived at this conclusion from information submitted to him. He never personally interviewed Peterson. Witness then explained his elaborate section under occupational health indicating Peterson's exposures at ATC.
58 59 60	14-25 1-25 1-17		Witness stated that some of the documents that he included under the heading of VC/PVC Toxicology were prepared for the Maliko case.
60 61 62	18-25 1-25 1-5	Chronic Meat Wrappers Asthma	Witness stated that he does not associate meat wrappers asthma with PVC because "the levels of VC that have been measured from PVC film are extraordinarily small and in some cases not detected at all." (Mr. Hollingshead requested a listing of all cases witness

<u>Page</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
62	6-17	Laryngeal Cancer	appeared in with regard to meat wrappers asthma and the attorneys who were involved in those cases.) Witness stated that the document entitled Risk Factors For Laryngeal Cancer was prepared by him for the Peterson case.
64 65 66	20-25 1-25 1-6	Use Of Personal Research	Witness stated that when he becomes involved in any piece of litigation, he relies on his own personal research. He reviews journals on a regular basis and keeps his files up-to-date. If his files on a particular subject are not complete, he may use Tox-line or Medline. His files are maintained by the use of index cards listed by chemicals. He would update the cards by simply listing the name of the author of the study and the date of publication.
66 to 70	7-25 1-19	Page 1 Of Witness' Report/Peterson's ATC Exposures Causally Related To His Laryngeal Keratosis And Cancer	Extensive discussion held re witness' statement on Page 1 of his expert report indicating that he had concluded that "Mr. Peterson's occupational exposures at ATC were causally related to the laryngeal keratosis he developed in 1978 and the laryngeal cancer he subsequently developed in 1984." Witness explained that keratosis is a premalignant condition involving epithelial hyperplasia which is generally characterized by atypical cells in the mucosa. He explained that Peterson's medical records indicated that Peterson was diagnosed with laryngeal keratosis in 1978 and that such a condition is a precurrence to laryngeal cancer. He explained that Peterson's occupational exposure at ATC included PVC, VC, asbestos, polystyrene, isopropilidene resin (Bisphenol

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

<u>Page</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
			A), emissions from welding fumes and heat-sealing fumes. It is witness' conclusion that all of these occupational exposures had a contributory role in Peterson's laryngeal keratosis and subsequent laryngeal cancer.
70 71	20-25 1-8	Respiratory Tract	Witness defined the respiratory tract to include the nose, nasopharynx, pharynx, larynx, trachea, bronchi, bronchials, alveoli and pleura.
71 72	10-25 1-14	Occupational Exposures All Carcinogens	Witness stated that all of the occupational exposures that Peterson had at ATC were carcinogens. In some instances, in addition to the carcinogenic effect of some of these exposures, there was a chronic toxic or chronic irritant effect.
72 to 77	15-25 1-20		Witness's extensive explanation of his notebook sheet marked ATC was halted by Mr. Hollingshead due to the fact it was not responsive to the line of questioning re Peterson's specific levels of exposure to PVC or VCM.
77 to 80	21-25 1-8	Peterson's PVC Dust Level Undetermined	Witness stated that due to the fact Peterson did not have any specific PVC monitoring, the info could be derived from two sources (description of work conditions and info on the monitoring levels in the area Peterson worked). He estimated Peterson's PVC dust levels to be in the "20 milligram per cubic meter range." He further explained that it was impossible to give a precise figure because of the failure of UC/ATC to do any PVC dust monitoring.

<u>Page</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
80 to 84	9-25 1-23	PVC Dust- Respiratory System	Extensive discussion was held, re witness' understanding of PVC dust being filtered by the respiratory system. He explained that everything that Peterson would breathe in the air would reach his larynx and particles under ten microns would reach Peterson's lungs. The remainder of the particles would remain in contact with the larynx eventually being coughed up or processed through the digestive system. (Mr. Hollingshead requested this portion of witness' answer be stricken as unresponsive to his question.) It was witness' testimony that Peterson was exposed to PVC dust in the range of at least approximately 20 milligrams per cubic meter.
84 85 86	24-25 1-25 1-11	Peterson's Expo- sure To VCM	Witness stated that he was unable to determine Peterson's VCM exposure on an average workday at ATC prior to 1975, because of the wide range of different sources of Peterson's exposure.
86 87 88	12-25 1-25 1-2	PVC Dust Asso- ciated With Respiratory Cancers	Witness discussed the various documentation he included in his notebook re the fact PVC dust was associated with respiratory tract cancers. One explanation was due to the fact VC had a rapid blood absorption.
88 89 90	3-25 1-25 1-21	VC Sources	Witness explained the various sources of VC that Peterson may have been exposed to. They included: VC absorbed on PVC resin, VC in storage areas (bins, bags, hopper cars, vans), degassing of all VC from pellets, powder and PVC dust, displacement of air in the PVC bags, fix point emission sources (dust from PVC pellets) and thermal degradation from the heat sealer and welding.

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

<u>Pag</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
90 91 92	22-25 1-25 1-21	VC Levels Prior To 1974	Witness stated that there was no VC sampling data prior to 1974 and that VC resins prior to 1974 had much higher levels.
92 93	22-25 1-10	UC Lowered Levels Of VC In 1974	Witness stated that in 1974, UC introduced a vacuum stripping technology that reduced the levels of residual VC in PVC.
93 94 95	11-25 1-25 1-3	Available Data on VC Levels Subse- quent To 1974	Witness discussed the available data on VC levels subsequent to 1974. He stated that Wheeler's simulation in modeling stated that there were levels of 0.98 ppm during bagging, where in contrast, Davidson's estimate was in the order of 10 ppms. He explained that the Gollob analytical data of 1975-76 did not take into account all possible exposures of PVC dust at ATC.
95 96 97	16-25 1-25 1-22	Peterson's VC Levels Of Exposure At ATC	Witness explained that he could not give an exact figure of Peterson's VC levels of exposure while employed at ATC because the wide range of VC sources each without characteristic types of exposure.
97 98 99	23-25 1-25 1-3	Gollob Analytical Testing	Witness stated that it was his understanding that Gollob performed their 1974 test on breathing zones of the baggers by use of personal monitoring. He further explained that the Gollob personal monitoring results were not directly relevant to Peterson because Peterson was not a bagger.
99 to 102	4-25 1-19	Peterson's PVC/VC Exposure	Witness stated that prior to 1974, Peterson was a maintenance and repair mechanic. Subsequent to 1974, Peterson was Maintenance Supervisor. Extensive discussion was held re the fact it was basi-

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

<u>Page</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
			cally impossible for witness to determine what the exposure levels were for Peterson during Peterson's employment at ATC because of his multiple and separate types of exposure.
102 to 106	20-25 1-4	Peterson's Asbestos Exposure	Witness stated that despite the fact ATC did not undertake any asbestos monitoring, there were two sources of evidence of Peterson's asbestos exposure. The first one was the radiological changes in Peterson's lungs and the second was the description of Peterson's work practices (repairing brake linings). (Mr. Hollingshead requested a copy of Peterson's employment history supplied to witness by Levinson.)
106 107 108	5-25 1-25 1-3	Peterson's Asbestos Exposure From Brake Shoes	Discussion was held re the fact Peterson never discussed asbestos exposure in his deposition. Witness stated that he arrived at Peterson's asbestos exposure from Peterson's 4/85 radiological report and the fact that Peterson changed brake shoes and assisted boiler workers in replacing the insulation of the doors with asbestos rope, 1963-73. It is his opinion that Peterson's asbestos exposure could have caused Peterson's laryngeal keratosis and subsequent laryngeal cancer.
108 109	15-25 1-24	All Asbestos Is Carcinogenic	Witness stated that despite the fact he had no idea what form of asbestos Peterson was exposed to, all asbestos is carcinogenic. He further stated that he had experience with asbestos litigation approximately three times. He stated that Peterson's last significant asbestos exposure was 1967-68 when Peterson changed brake shoes.

PRIVILEGED AND
 "CONFIDENTIAL MATERIAL
 SUBJECT TO PROTECTIVE
 ORDER"

<u>Pag</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
109 110	25 1-24	Latency Period- Laryngeal Cancer	Witness stated that it was im-possible to estimate the latency period for laryngeal cancer from exposure to a carcinogenic agent. Only smoking can be dis-cussed in relation to specifics of latency.
110 to 113	25 1-24	Vigilani Study	Witness discussed the Vigilani Study which he referred to in his Appendix 1. The Vigilani Study was an analysis of 19 asbestos workers with respiratory tract cancer and among them there was one case of laryngeal cancer. Witness stated that the general rate of laryngeal cancer in the population at large in males is about 8.5 per one hundred thou-sand. He considered it a rare cancer, especially being relative-ly uncommon under the age of 60.
113 to 117	25 1-20	Stell And McGill Study	Witness explained that the Stell and McGill Study referred to in his Appendix 1 was an analysis of 59 cases of laryngeal cancer of which 17 had a history of asbestos exposure. The 1973 study found a highly significant association between occupational exposure to asbestos and laryngeal cancer. The authors of the study recognize the limitations of the data, due to the fact that there were more non-smokers in the control group than there actually was in the test group. It was his view that the study supported the proposi-tion that laryngeal cancer can also be related to smoking ciga-rettes.
117 118 119	21-25 1-25 1-16	Smoking And Laryn- geal Cancer	Witness described various areas in his preliminary report and note-book where references were made to alcohol and smoking being recog-

<u>Page</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
			nized risk factors of laryngeal cancer.
119 to 123	17-25 1-7	Peterson's Apical Pulmonary Fibrosis	Witness discussed the fact that prior to Peterson's ATC employment, Peterson was noted to have minimal apical pulmonary fibrosis. He explained that the Stell and McGill Study indicated that apical pulmonary fibrosis was unrelated to asbestos exposure. He stated that Velez indicated that Peterson had two types of lung problems: chronic obstructive lung disease and restrictive disease characteristic of pulmonary asbestosis. It is his understanding that pulmonary asbestosis is caused by asbestos exposure.
123	8-25	Shettigara And Morgan Report	Witness stated that the Shettigara and Morgan Report of 1975 that he referred to in his Appendix 1, was a study on asbestos exposure in which smoking was considered. He made no reference in his preliminary report to the study of smoking.
124 125	1-25 1-19	Peterson's ATC Exposures - Future Risks	Witness stated that it was his opinion that Peterson's exposure to asbestos during Peterson's employment at OTD and ATC has placed Peterson at excess risk of future disease and cancer. The cancers involve bronchial/lung cancer, mesothelioma and GI cancer. The diseases involve infection (pneumonia) and various cardiovascular strains, including cor pulmonale (right heart failure).
125 126	23-25 1-13	Mesothelioma Linked To Asbestos	Witness stated that mesothelioma is a cancer that is linked specifically with asbestos exposure. There are two kinds of mesothelioma, pleural involving the lining of the lung and per-

PRIVILEGED AND
"CONFIDENTIAL MATERIAL
SUBJECT TO PROTECTIVE
ORDER"

<u>Page</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
			itoneal involving the lining of the abdomen.
127 to 131	14-25 1-16	Peterson's Likli- hood Of Developing Malignant Lung Disease	Witness explained that if an individual has asbestosis, his chances of getting malignant lung disease is five times greater than the general population. It is for that reason that Peterson's risk of lung cancer is increased five-fold that of the general population. He further explained that with the total U.S. population, the overall figures for cancer incidence, excluding skin cancer, is one out of three in terms of the risk of contracting cancer and one out of four of contracting and diagnosing. Witness referred all further questions re Peterson's cancer risk to the pulmonary/asbestos expert, Velez.
131 132	21-25 1-10	Risk Of Lung Cancer	Witness stated, "a little more than a quarter of all cancer deaths are due to smoking--more than a quarter of all cancer deaths are due to lung cancer."
133 134 135	13-25 1-25 1-3	Residue VC In Manufacturing Methods	Witness explained the amount of residue VC contained in the various manufacturing methods that were used in the resin that was shipped to ATC. According to Wheeler, the amount for suspension was 860 ppms. The amount for bulk was 5-15 ppms. The amount for solution was 1 ppm. Witness noted inconsistencies in Wheeler's statements where he indicated suspension levels of 860 ppms in <i>Wheeler v. Maliko</i> "but he changes his mind when it comes to the interrogatories where it says they go up to 2,000 ppms."

<u>Page</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
135 to 141	10-25 1-11	Rate Of RVCM's After Manufacture	Extensive discussion held re the fact witness was unable to give an approximate rate for RVCM involving the three manufacturing processes of PVC. Witness did not agree with Wheeler's conclusion with regard to the RVCM content so, therefore, "I have to approach all of his statements on VC residue levels with caution." He did say that the RVCM level would decrease rather rapidly in the beginning after manufacture eventually tapering off.
141 142	12-25 1-12	PVC Pollution By Body Fluids	Witness described the process by which the unreacted monomer can be eluded out of PVC by body fluids after the PVC was ingested or inhaled by the body.
142 143	13-25 1-9	PVC Resin-Laryngeal Cancer	Witness stated that he was not aware of any indication in any animal studies where there is a connection between the exposure to PVC resin/dust and laryngeal cancer.
143 to 146	10-25 1-12		Witness discussed various criticisms of the Keplinger and Viola Studies.
146	13-23	Viola Data	Witness stated that the Viola Study of 1970 was the first animal data linking VC with cancer. The study occurred four decades after VC was manufactured.
147	15-21	Maltoni Findings	Witness stated that the Maltoni 1969 findings reported in 1965, were the first linking VC with cancer in humans.
148	12-21	Lilis And Miller	Witness stated that in his Appendix regarding PVC and VCM, he expressed the views of Lilis and Miller when stating that the PVC dust "was likely to concentrate in

<u>Page</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
			and damage the small airways, besides also acting as the carrier for carcinogenic VC monomer."
149 150	1-25 1-6	Infante Studies Of 1981	Witness stated the reference in his Appendix re PVC/VC to the Infante Studies of 1981 noted laryngeal cancer. He explained that although Infante did not specifically include the larynx in his very wide range of cites, Infante did discuss respiratory tract cancers which could include the larynx.
150 151 152	7-25 1-25 1-25	Tabershaw And Gaffey Studies	Witness stated that in the initial Tabershaw and Gaffey Study in 1974, of the twelve workers with respiratory tract cancers, there was one extrinsic laryngeal cancer. In the subsequent study, of the 37 respiratory tract cancers, there were two laryngeal cancers.
153	1-15		Witness stated that the incidence of laryngeal cancer for all males is 8.5 per hundred thousand.
154	3-17	Tabershaw And Gaffey Exposure Levels	Witness stated that due to the fact the 19 different industries that Tabershaw and Gaffey utilized in their studies failed to monitor the work environment prior to 1974, the individual workers' exposure were ranked on the basis of work practice and exposure duration.
154 155 156	18-25 1-25 1-14	Studies Connecting VC And Cancer	Witness discussed his various tables indicating studies that show a connection between VC and cancer (lung and respiratory tract). He further stated that the three studies by Tabershaw/-Cooper/Gaffey indicated a connection between laryngeal cancer and VC/PVC.

<u>Pag</u>	<u>Lines</u>	<u>Subject Matter</u>	<u>Digest of Testimony</u>
156	15-25		(Witness was instructed by Mr. Hollingshead to review the paper by Richard Doll that was published in the Scandinavian Journal Of Work And Environmental Health in 1988 for his next deposition. It is a review of epidemiologic studies relating to the health effects of VC exposure.)
157	1-15		
157	19-25	Updating Chemical	Witness stated that when making note of recent literature on different chemicals on his index cards, he tends to be selective in obtaining more info on certain chemicals more so than others. He stated he had a "reasonable" catalog with regard to VC/PVC.
158	1-16	Index Cards	