Oral history interview transcript
Interview of Dr. Peter J. Dyck by Dr. Christopher J. Boes at AAN Annual Meeting, Tuesday 4/24/2018, 1-3 pm

Chris Boes:	00:00	I'm Chris Boes, a neurologist from the Mayo Clinic and a member of the AAN History and Archives Committee. The AAN has been recording oral histories for several years and that project really honors members who have made great contributions to neurology. And Dr. Peter Dyck certainly fits the bill.
	00:23	So we'll start. You're not here to hear me talk so, I'm going to start off with a couple things. We have this private interview part, Peter, and then we're going to break around 1:50, let some more people in the room and then continue.
	00:37	So I'll start. Peter James Dyck was born October 20, 1927, in southern Russia. His Mennonite family moved to Canada in 1930 at the height of the Great Depression, among the last dissidents allowed to leave Russia for the next many years.
	00:53	And he grew up in Hepburn, Saskatchewan, in what was called Saskatchewan's Mennonite triangle. So—

Dr. Peter Dyck:	01:00	My definition—My naming.
Chris:	01:03	Oh, that's what you call it.
Peter:	01:07	The triangle is my naming.
Chris:	01:09	Oh, I didn't know that. Others don't call it the Mennonite triangle?—
Peter:	01:11	Well, there's the North and South Saskatchewan River and it comes together at Prince Albert—
Chris:	01:18	Okay.
Peter:	01:19	And Saskatoon is the base so, I named it, "the Mennonite Triangle."
Chris:	01:24	I did not know that. Geography is a skill of yours as well. So my first question, when crossing from Canada to the United States in your youth, where would you tell the border officials that you were from?
Crew:	01:44	[laughter].
Peter:	01:46	Well the first time I was on a college bus with many other students and the officer would go down the row and would ask, "Where were you born?"
Chris:	01:59	Uh-huh.
Peter:	02:00	And he came to me and I said, "Well, I'm not sure whether it was southern Russia or northern Georgia." And so, I was invited into the inner office for an interview. Later I thought maybe it would be simpler to say, "Georgia, sir."
Chris:	02:20	Yeah.
Peter:	02:21	And it got me out of that interview in the inner office—
Chris:	02:23	[laughter].
Peter:	02:24	—on several occasions actually [laughter].
Chris:	02:27	And my second question is what did your Canadian teacher Reuben Dyck, who was unrelated to you, tell you in grade school? Do you remember?
Peter:	02:36	I do.
Chris:	02:37	Yeah.

Peter:	02:38	He was a very sympathetic, decent person—warm person and I thought I was an exemplary student [laughter] and one day he confronted me in the hallway and said, "Peter, you could be doing much better than you're doing if you just tried a little harder," which came as a big surprise to me. Because I thought I was perfect [laughter].
Chris:	02:59	Did that have a big influence—well, you still remember it so, it must have had an influence on you.
Peter:	03:02	Yeah, I think it was.
Chris:	03:03	Yeah.
Peter:	03:04	Yeah.
Chris:	03:05	In looking through your family history, your father was a stretcher bearer in the Russian Army during World War I. And before college and at many other times, you worked as an attendant at a mental hospital in Saskatchewan. What thing really made you start to consider medicine as a career?
Peter:	03:28	I could have gone several directions.
Chris:	03:29	Uh-huh.
Peter:	03:30	I was involved with the limnobiology survey party at Lac La Ronge, Saskatchewan and I had wonderful summers. Four summers I was the sort of field director of the party and the limnobiology survey was a lot of fun. And I think I would have-could have become a marine biologist.
	04:00	I think my father's experience on the eastern front in the First World War was a factor. He told stories of terrible suffering.
	04:12	Incidentally, there are some wonderful stories. There's a new book that's just come out about a gentleman in Moscow. If some of you haven't read it, read it. It actually coincides with our leaving Russia. My father was a dissident.
Chris:	04:31	Uh-huh.
Peter:	04:32	And his name had appeared on a list of dissidents and so in the fall of 1929, he assembled our family in [die Vorder Stubbe 04:41], the front room of Grandfather's house and told them his name had appeared on the list of dissidents and we should leave.

	04:51	And my grandfather said, ""Ich will nicht Knecht werden" (I do not want to become a farmhand for someone else). Which was a terrible mistake because in 1958, members of the family were taken to Petrozavodsk Prison and at a later time shot.
Chris:	05:13	Hm.
Peter:	05:14	And in our visit to southern Russia we saw the place where they had taken these prisoners and shot them. And Professor [Anatoly Liev of the Luch Sanitorium at Kislovodsk 05:26], took out a bottle of cognac and Dixie Cups and all of us, including a KGB agent [laughter], we stood beside the ditch and the vineyard was in front of us, and this was the exact place where they had bulldozed the bodies. And he poured a little cognac in each of the cups and we sipped and threw the cognac on the graves of my forbearers.
	05:53	So, uh, sorry. I left your question—
Chris:	05:56	No, it's fine.
Peter:	05:56	—but to the extent, this book is focused around exactly that period in Russian history.
Chris:	06:07	Okay.
Peter:	06:08	He lived in the Metropol Hotel, which is just opposite the Kremlin. And we lived in Moscow that same year that he was in that hotel so it has a special interest for me. We were very fearful of being apprehended and sent back to Russia. So, in the spring of 1930, we went to Hamburg and then went to Canada, with money provided via the Canadian Pacific Railroad and to help settle the West.
Chris:	06:43	You talked a little bit about your biology research. Now that was in late '40s, early '50s. You were in college, University of Saskatchewan and you talked a little bit about that summer job. Do you have a copy of this? That's my first gift to you.
Peter:	07:02	Well thank you.
Chris:	07:02	It's a paper by Rawson and one thing I want—
Peter:	07:04	Yeah, yeah. Thank you.
Chris:	07:04	—to ask you. One thing I want to ask you is—
Peter:	07:08	Professor Donald Ross was a—

Chris:	07:09	Is that your [photo] in this paper?
Chris	07:15	Curly hair, slightly muscular?
Peter:	07:17	Well, you know, I can't see that well. Can I ask Jim [Dyck, his son] to see the—
Chris:	07:21	I've seen pictures of you around that time. I think that might be the top of your head holding that fish.
Jim Dyck:	07:27	That likely is.
Chris:	07:28	Yeah.
Peter:	07:29	It's likely to be.
Chris:	07:30	Okay.
Jim Dyck:	07:31	That likely is.
Peter:	07:32	But that's a great present. Thank you.
Chris:	07:33	You're welcome. So that was your summer job, with the limnobiology survey party to Lac La Ronge in Saskatchewan under this Professor Rawson. And I remember you told me you had study stations at, like, x and y coordinates over the whole lake surface, and you made various measurements. And that [paper by Rawson] actually talks all about that. Tell me about that experience and then how it influenced your later research career.
Peter:	07:59	Yeah. The highway had been built into Lac La Ronge just the year before we started. And it was known then that the lake would be exposed to sport fishermen including many from the mid states of the United States.
	08:16	And so there was concern on the part of Professor Rawson that the lake would be depleted of their fish and so, he proposed to the government that they should spend a fair part of their budget on a limnobiological survey. And the idea was to know the conditions of the water and the fauna and so on.
	08:36	Lac La Ronge flows into the Churchill River, which flows into the Hudson Bay. It has a length of about 50 miles and about 30 miles wide, a thousand islands on it.
	08:51	So we drew x and y coordinates, which we called, "stations." We would go there at regular intervals and make measurements. The first time we measured the depth, then we

		would measure the temperature of the water from the surface to the bottom on a smoky slide. And in the spring there would be no thermocline. There would be just low temperature, you know, near freezing.
	09:16	As the summer went on, you would go down about 10 meters and then there'd be a sharp change in temperature and then down. So, that's called a "thermocline."
	09:25	Lake trout stay below that level. So, we would measure the plankton of the water and we'd measure the light penetration with a Secci disk and we took dredges of the bottom fauna. Measured the oxygen and pH of the water and things of that kind.
	09:44	So the whole focus was on a natural history study of the biology of the lake. And the predictions came true that, you know, there was immediate enormous pressure on the fishing of the lake and so, the government imposed much stricter fishing limits. We then had a creel census where each night we would go from cabin to cabin to see what people had caught.
Chris:	10:11	Hm.
Peter:	10:12	And in those early years, people would come with little pickup trucks and literally stack the back of the truck with frozen fish like two tons in the truck [laughter] because you could fish 25-pound walleye, you know—
Chris:	10:29	Hm.
Peter:	10:30	—one after the other—big mature fish. But those fish take 30, 40 years to develop whereas in the southern Missouri Lake, you know, 10 years—much different. So it was comparison of conditions there to United States lakes.
	10:48	And Professor Rawson had done similar studies in an Ontario lake and Great Slave Lake, so we were the third lake in that.
	10:57	So how did you get this?
Chris:	10:59	I bought it [laughter].
Peter:	11:00	Oh. [laughter].
Chris:	11:02	You've bought me more than one book—
Peter:	11:02	Fair enough.

Chris:	11:03	—over the years and gave me this tie.
Peter:	11:04	Yeah.
Chris:	11:04	We'll talk about this [neck]tie in a little bit. I've heard you saw before that [Rawson] studied the morphometry of the lake.
Peter:	11:15	That's right.
Chris:	11:15	Did you use that later in your career to some extent?
Peter:	11:18	We did.
Chris:	11:19	Yeah.
Peter:	11:19	Early on we became interested in nerve biopsies. It was a natural development from the early 19th century. There was a great interest in natural history of diseases including Charcot-Marie-Tooth Disease, ALS, and things of that kind.
	11:41	There was a great impetus to that kind of trend—natural history and pathology with the development of newer physiological techniques. And people that were heavily involved with that were people that at the Boston City Hospital, Ed Lambert in Rochester, Minnesota, Simpson in Scotland, Fritz Buchthal in Copenhagen, Pinelli in northern Italy, and others.
	12:09	There was great interest in defining neuromuscular disease by neurophysiological techniques. So nerve conduction—first of all, motor nerve conduction and then with the study of Dawson it went to the sensory conduction velocities and EMG. But there was a shortage of pathological information.
	12:31	So I began to biopsy nerves thinking we could add to that story. And with the support of Ed Lambert and Don Mulder, but I got a grant from NINDS—from NIH to begin to study the morphological characteristic of nerves in inherited disease.
	12:56	So I got my first grant in 196[4], and was specifically on this kind of topic, correlating the characteristics of the fiber changes with the conduction velocity characteristics. And in that I proposed morphometric studies.
Chris:	13:12	Hm.
Peter:	13:12	As I began to advance in that field, we developed hand-held methods. You know, we would photograph pictures of nerves, make enlargements. I developed a little machine to count the fibers and size them. And then as I got further along, we began

to think of how do you adequately survey and I said, "Ah ha, I know how to do this." You know, we would set up stations as it were so we didn't have to count every frame of the pictures—

Chris: 13:45 Yeah.

Peter: 13:45 —but have a systematic way of sampling the area. And I was influenced by some studies in plant pathology from Iowa actually, you know, where they found that if you understood where plants were located, you could infer how they got there. Was it from animal droppings? Was it from the wind? Etcetera, you know.

Chris: 14:13 Uh-huh.

Peter: 14:13 So distribution of fiber changes was important so we then tried to correlate the characteristics of these fiber alterations with the electrophysiological features. And that led to the biopsy of human nerves and I provided one of those nerve biopsies as a healthy subject.

Chris: 14:37 Hm.

Peter: 14:37 And we studied not only the characteristics of the compound action potential *in vitro* but with the fiber changes. But that was part of that story.

Chris: 14:49 So we're going to go back and forth to your Mayo and your early life. You got into the two-year medical school class of '51 at the University of Saskatchewan and then you had to—

Peter: 15:02 I was the very last one taken. I thought [laughter] I'm not quite sure, but that's beside the point.

Chris: 15:08 How many were taken?

Peter: 15:09 Well how do I know that? Well by my marks and, you know, I was always poor and I didn't have quite the time to—

Chris: 15:17 You were working and going to school.

Peter: 15:18 Yeah, and I didn't get any support from home. It's not their fault. We just didn't have money.

Chris: 15:23 Gotcha.

Peter: 15:24 So I didn't take as much time for studying. I never bought textbooks.

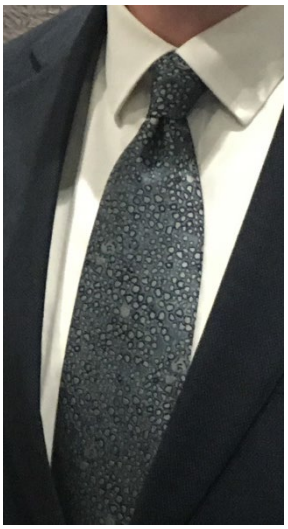
Chris:	15:29	I read that you would just go by your notes. Is that—
Peter:	15:31	Yeah.
Chris:	15:31	—right?
Peter:	15:32	But that was a terrible mistake.
Chris:	15:34	I think you said that, was it organic chemistry—
Peter:	15:36	Yes.
Chris:	15:36	—that you found particularly hard because—
Peter:	15:36	Yes, because I was dyslexic. I'm quite sure.
Chris:	15:40	That's a problem when you're taking notes from the professor; correct?
Peter:	15:42	Yeah, big mistake.
Chris:	15:44	And I think you said later you had to study to get into the United States and you found that when you actually bought a book it was much easier.
Peter:	15:50	Yeah. Harpers had this wonderful series of books [laughter].
Chris:	15:55	Well good. So then you had to get into—but you must have done well because then you had to get into another med school for your last two years.
Peter:	16:00	Yeah.
Chris:	16:01	And that was [University of] Toronto; was that right?
Peter:	16:02	Right.
Chris:	16:03	And, there was a story I read about what were you told about the Mayo Clinic when you were a medical student in Toronto?
Peter:	16:10	Well it may be unfair to the Canadian centers, but they saw Mayo Clinic as a sort of, uh, a production mill, you know, conveyer belts. And actually Der Spiegel, a German newspaper I think had a strip in which they showed people sort of supporting in the position of a proctoscopic examination going down the conveyer belt, you know [laughter].
Chris:	16:42	That's not the way it works.

Peter:	16:43	And that's how they thought about Mayo Clinic, it was a production mill.
Chris:	16:46	Got you.
Peter:	16:46	I found it to be totally different.
Chris:	16:49	When you got here.
Peter:	16:49	When I got here, yeah.
Chris:	16:51	So Peter then did four years of graduate medical education in internal medicine, neurology, neuropathology at the brand new University Hospital in Saskatoon, Saskatchewan.
	17:05	During your intern year, which was in 1955, you worked with Dr. Allan Bailey who had moved there to be a neurologist from Mayo Clinic where he worked for several years. And so, can you tell me about him. [crosstalk 17:20].
Peter:	17:20	[Allan 17:20] Bailey was a great model. He was a son of the manse. If you don't know what the manse is, it's the preacher's house.
Chris:	17:30	Hm.
Peter:	17:30	He's the son of the manse. He always bought a sort of ministerial house, but he's a Unitarian.
Chris:	17:36	Gotcha.
Peter:	17:37	Allan Bailey was a great man. Very kindly and so on. And was a great mentor and from him I [learned] history taking and physical examination. And in the the small booklet on the examination of the nervous system—the Mayo book—[Clinical Examinations in Neurology, first published in 1956]
Chris:	17:57	Yeah.
Peter:	17:58	He writes the history-taking and he makes a big point in that count of listen to what patients tell you. Use the exact quote of patients and it is such a wonderful insight because, for example, the symptoms of neuropathy can only be described by the patient. You putting it into words, like paresthesia isn't as good as actually recording the words of patients. So Allan Bailey was this really great clinical example to me. He was not a good mentor in science.
Chris:	18:46	Hm.

Peter:	18:46	I got that immediate knowledge from my working with George[Jerzy] Olszewski [18:49].
Chris:	18:51	Yep.
Peter:	18:52	He was a totally different kind of a man. He was interested in breaking new ground, setting up questions, doing new things. So, the combination of Allan Bailey on the clinical side and George Olszewski on the neuropathology side was a wonderful balance.
	19:12	And then I had a great experience with Don Baxter. Don had worked with Derek Denny-Brown. Derek Denny-Brown was the god of neurology in the '50s, '60s, and '70s in American neurology. If Denny-Brown spoke, everybody listened and Denny-Brown often was wrong. How do I know that?
	19:37	I made rounds at the Boston City Hospital later. They had a patient with Wilson's disease who was dying and I suggested they try penicillamine and Richard Mayer who was the attendant said, "Denny doesn't allow us to use that. He had tried [British antilewisite] during the war and it didn't work."
	19:58	Well, Norman Goldstein [a Mayo Clinic neurologist] had been resurrecting patients with Wilson's disease using penicillamine and so, it was a wonderful era.
	20:14	So, back to my training, Don Baxter knew a lot about what was happening at the Boston City Hospital, at the Massachusetts General Hospital, and also at Montreal. At Montreal the big gun was Wilder Penfield who exposed the brain and did experiments on humans while he treated them. A separate story. Sorry.
Chris:	20:40	No, you're—this is good.
Peter:	20:42	If I digress too much just cut me off.
Chris:	20:44	No, you're doing great. So, you mentioned the major early mentors. Tell me about your first scientific paper.
Peter:	20:54	I did, two papers in Saskatchewan—actually three I think. One was on carcinomatous neuropathy and the big point was that the patient had developed a severe sensorimotor polyneuropathy and it turned out later he had bronchogenic carcinoma.

	21:18	And at that time, [Henson 21:19] and people in London had been so interested in the relationship between cancer and neurological diseases. So, that was a case of that kind.
	21:33	So I presented that at a national meeting actually. And then we had a brain from the postmortem room and when they cut the brain it wasn't white where the white matter should be. It was brown. So we studied that and George who was colorblind said, "Peter, you're going to have to tell me whether this is metachromatic." So I said, "What's metachromatic?" He said, "It's not blue it's some, you know, pink-red color. But I don't know what pink-red is because I'm colorblind."
	22:07	So we sent slides of that case to the Mayo Clinic to, uh—who was the neuropathologist?
Chris:	22:15	Kernohan.
Peter:	22:18	Kernohan.
Chris:	22:17	Yeah.
Peter:	22:17	Thank you. James Kernohan, to Raymond Adams, and to Leon Roisen [22:20] in New York. Kernohan wrote us back almost immediately and said, "I've never seen anything like this." Adams never responded. Leon Roisen said, "My lab is torn up, but I will make a comment when you present the case at the neuropathology meeting."
[laughter]		
	22:43	So at the neuropathology meeting I presented this case as a case of metachromatic leukodystrophy because it wasn't blue. It was some off color and I wasn't sure what. And Leon Roisen got up and said, "I looked at the material. It is sudanophilic leukodystrophy" and sat down. And that was the end of that discussion.
	23:03	At those early days it was a [laughter] very Germanic, no nonsense outfit.
Chris:	23:08	Yeah.
Peter:	23:08	But a wonderful meeting, you know, great interchange, much arguing. I loved the neuropathology meeting.
Chris:	23:17	Gotcha. So you mentioned Olszewski's color colorblindness, but also at one point he had a tie and—

Peter:	23:28	Oh he did.
Chris:	23:29	—how did that influence your future creation of neckwear?
Peter:	23:33	[laughter]. Well we were at Atlantic City and I'm not sure if we were in the old Blenheim—the old Blenheim Hotel still had the potties and the jug of water on the case.
Chris:	23:44	Hm.
Peter:	23:44	I'm not sure if it was fully modern at that time. We had been to the cocktail party and George came back and said, "Look [at my tie]," and there was the cerebellum, the granular layer [and] the [inaudible 23:57] Purkinje cells and so on. And I said, "You're kidding. I didn't notice it." And he said, "Well so did nobody else."
Chris:	24:07	[laughter].
Peter:	24:08	So when I had my nerve biopsied some years later. I decided to make pictures of my own sural nerve and [create neckties with that image]… I'm not wearing it. I actually looked for it. Oh, you got one.
Chris:	24:22	This is your sural nerve. Sorry, this is being recorded, but this is my tie.
Peter:	24:28	No. No.
Chris:	24:27	That's not-yours?
Peter:	24:28	No.
Chris:	24:29	Whose is this?
Jim Dyck:	24:31	It's a rat's.
Chris:	24:31	It's a rat's [laughter].
Peter:	24:34	Yes. That's that was my first version. That's the peroneal nerve of rat. Oh.



Jim Dyck:	24:41	That's the original tie, he then made another one of his own nerve.
Peter:	24:45	I'll give you one.
Chris:	24:45	Oh, that would be great [laughter].
Peter:	24:47	We made [another tie of my sural nerve] and we made one of a patient with inherited neuropathy with Dejerine-Sottas disease.
Chris:	24:58	Alright, so you've finished your internal medicine/neurology/neuropathology training in Saskatoon. I know you were thinking about where to go, and at one point you thought about going to the National Hospital in Queen Square.
Peter:	25:12	I was.
Chris:	25:12	So what-why did you decide to not go there?
Peter:	25:15	Entirely Allan Bailey.
Chris:	25:16	Really?
Peter:	25:17	I had such great respect for him. I was going to apply for a Nuffield scholarship and had some reasons to think they would give it to me. But I decided not to when he strongly advised me. He said I would fit in better, and he had great trust in [Edward] Lambert and [Don] Mulder and Reg Bickford. I think that he thought it would be a better training experience. And I think he was right actually.
Chris:	25:56	Hm.

Peter:	25:57	Because, you know, it was a wonderful time. It's so different today. In the late '50s and '60s, the NINDS was actively providing help for the training of neurologists. They thought this was an undermanned, or womaned if you like, specialty and needed the help of the government. So they would give us double. I got a $175 a month from Mayo Clinic as a fellow and they would give an additional $175.
	26:38	They also really promoted research. So for example, I was invited to participate in Horizons in Neuroscience and Neuropathology. And at that, session they introduced us to clinical neuroscientists who were making it.
	26:58	For example, they had Jim Austin who had described the metachromatic granules in metachromatic leukodystrophy in the urine of such patients. John Eccles from where, Bruce? Sydney? No, he was from Melbourne
Bruce Taylor:	27:19	Melbourne.
Peter:	27:19	Who later became Nobel Laureate for showing that the cerebellum had an inhibitory influence. It was designed so you'd have about as many instructors as students. It was in New Hampshire and we would have lectures, but we'd also walk the grounds and talk to people under the trees and so on.
	27:44	And it was just a marvelous time. It's so amazing that, you know, a wippersnapper like myself could have an idea and, write a grant and be given the grant. And what is more, a committee came to investigate me.
Chris:	28:04	Uh-huh.
Peter:	28:04	Including good people to see whether I was for real. They decided I was and I got the grant with my own name.
Chris:	28:15	Hm.
Peter:	28:16	Made a huge difference to my career. Today, very good people are sometimes not getting grant support because there just isn't the money.
Chris:	28:26	Yeah.
Peter:	28:26	So it's a totally different time. It was so exciting to be able to propose something and, you know, they really did get their money's worth in my investment because it led to further classification of the disease. Just to make the point, when I started at my work with inherited neuropathy, there were a lot

		of people who thought—it was Venn logic. There was a big circle, another circle which overlapped another circle over here, which overlapped, and there were not genetic variants—varieties.
	29:04	So you had the motor neuropathy, if you like, the cerebellar, the sensory, and you know, they sort of all merged. Well, that wasn't true. There was a chap in Moscow, Davidenkow [29:16] and I and P. K. Thomas said, "These are very distinct genetic varieties." And, you know, it has turned out to be true.
Chris:	29:27	Yeah.
Peter:	29:28	I mean I'm not trying to make the importance of my contribution to that story, but it is true that going after these kinships really did help advance the field.
Chris:	29:41	So you came to Mayo in '59 to '61. You were sort of a fellow and then a first assistant and you never left.
Peter:	29:50	Never left.
Chris:	29:51	Who offered you the job?
Peter:	29:55	Clark Millikan.
Chris:	29:56	Yeah.
Peter:	29:56	But I was told [laughter] later that he had no business to do that because—
Chris:	30:01	Yeah.
Peter:	30:02	There was there was a strange, [Mayo Clinic neurology division] leadership with Clark Millikan, [Ken] Corbin, and Joe Brown and they were such different people. I don't know if that's of special interest here, but, Clark Millikan saw me the first day and almost immediately offered me a job. He said, "We want you to stay with us." I think he got that from Allan Bailey's letter.
Chris:	30:29	Hm.
Peter:	30:29	You know.
Chris:	30:34	Mayo at that time had three sort of rotating [neurology] section heads [after Dr. Lee Eaton died].
Peter:	30:37	Right.

Chris:	30:38	Initially you talked about your research and we'll get into that a little bit more on Charcot-Marie-Tooth Disease/peroneal muscular atrophy, but initially you did a pretty long project with Reg Bickford who was an [30:51]—
Peter:	30:51	Ho, ho, ho.
Chris:	30:51	—EEG-er.
Peter:	30:52	Yes.
Chris:	30:52	Tell me about that.
Peter:	30:54	Well this was the pre-computer days but there was a Grey Walter averager or summator. I've forgotten what it was; Grey Walter was a well-known physiologist in England. And Reg [Bickford] had discovered that if you gave small doses of pentothol, the fast waves of the frontal lobes increased.
	31:21	So I proposed that we would give a small bolus of pentothol. And then we would record serially and it was amazing. You know, if you had someone hooked up with the electrodes all over the head and I had developed with the engineers this syringe in which I would jam it home in a bolus, so they would get 25 milligrams of pentothol at a crack. And the brainwaves would be as usual and then suddenly would just burst up with sharp waves, fast sharp waves all over the frontal lobe.
	32:01	And we were going to explore in a systematic way, how that could be used for the detection and characterization of central nervous system disease.
	32:12	The problem with the Grey Walter machine was it had a series of plots which you had to adjust and I never got onto how to do that actually and so, I had engineers helping me with that. And I was trying to quantitate the thing and I lost confidence in the results.
	32:29	The phenomenon was clear, but whether it would have been useful or not I don't know. But in any case, after the third time when I went to Reg and asked him about my manuscript, he said, "You know, Peter, I think, I must have mislaid it again." And I decided it was God's will that I not do that project [laughter].
Chris:	32:49	[laughter]. So—
Peter:	32:51	And I'm really glad I didn't—

Chris:	32:53	Did he ever tell you that he purposely [lost it]—
Peter:	32:55	No.
Chris:	32:56	He just passively—
Peter:	32:56	No, but Reg—
Peter:	32:57	I remember one time the Republican canvasser came by his office in the medical science building, “So I’m collecting for the Republican Party,” and Reg said, “I’m sorry; I’m a Democrat.” And when the guy left he said, “If the Democrat comes around I say the opposite.” [laughter].
Chris:	33:15	[laughter].
Peter:	33:18	Not a nice story [laughter].
Chris:	33:19	So during your fellowship if I read correctly, you saw a patient from a small town in Minnesota with peroneal muscular atrophy and his mother was with him and—so can you describe how those two patients influenced your research career?
Peter:	33:34	Yes. The patient clearly had the classical description that we call Charcot-Marie-Tooth Disease. The pes cavus deformity. hammertoes, the thin legs, the steppage gait.
	33:52	And it was a time in which, Ed Lambert had reported one or two cases that had low conduction velocities. So I asked Ed to do the nerve conductions, but I asked the family history and I actually made a detailed pedigree. And it wasn’t clear that it was inherited.
	34:19	So I asked Mother to take off her shoes and socks and walk on her toes. She could do that, but I noticed that she had a foreshortened foot, slightly hammertoes and she really couldn’t walk on her heels.
	34:33	So I sent her along and she had low nerve conductions also in the 40s, whereas the boy was in the 20s—that is meters per second. So that gave me the opportunity to pursue that family and I had noticed that when I took the family history there were lots of clues that other members of the family might have had the similar thing. “You know, Uncle Henry had fallen off the roof and ever since that fall, he’d not been able to walk properly.” Or “Uncle George—uh, the horses had run away and he also had the leg trouble.”

	35:15	So Isabelle [Peter Dyck's wife] and I would in the evenings [after work] and on weekends looking up those families along the Zumbro River and the upper Mississippi, examining them in their homes and then, getting them to come back to Rochester to have nerve conductions. And at that time, we were doing only motor nerve conductions. Sensory nerve conductions came later.
	35:40	It became very clear that the low nerve conduction velocity was a characteristic of the disorder. So that led to developing techniques to quantify not only the clinical response but also the nerve conduction response, the histological correlates of these changes, and looking along the length of fibers, all the changes with teased fibers.
	36:17	Somewhere along the line, Don Mulder dug up this book, "Dwellers in the Vale of Siddem." It's a book from the [Minnesota School for the Feeble-Minded and Colony for Epileptics] written by [A.C. Rogers and Maud Merrill] and it begins with this doggerel, "All the wicked people in the Vale of Siddem, thought of things they shouldn't do and then they went and did 'em." [laughter].
	36:51	But what [they were] talking about was the inbred nature of the population, the fornication, the alcoholism, and it was the height of eugenics.
Chris:	37:04	Uh-huh.
Peter:	37:05	And [they] thought, you know, nothing good could come of it. There would be feeblemindedness everywhere around. Well, just to finish that part of the story, you know, it turns out they were mostly Bavarian settlers who were perfectly reasonable, good people, the families that I saw.
	37:23	Now whether the dwellers in the Vale of Siddem were the Zumbro Valley or nearer the [Twin] Cities I never could ascertain because I don't know of caves like they described in that "Dwellers." I think it's more likely to be somewhere in the Twin Cities itself, but I'm not sure.
Chris:	37:41	Yeah. Do you have a copy of the book?
Peter:	37:42	I do. It's a very rare book.
Chris:	37:45	This one?
Peter:	37:47	Oh, yes. You have that too?

Chris:	37:48	Sure.
Peter:	37:49	That's—
Chris:	37:49	I was going to give it to you. I figured you had it already because you had—
Peter:	37:51	Yeah.
Chris:	37:52	—told me about it before.
Peter:	37:52	Yeah, thank you. That's great—
Chris:	37:55	I'll give it to your son [Jim Dyck]. So, 1919—so you're right. So this was when even folks like the Mayo brothers were writing about eugenics.
Peter:	38:04	Yeah.
Chris:	38:05	They name certain people in this book. Could you trace them back to any of your—
Peter:	38:13	No.
Chris:	38:13	—patients?
Peter:	38:14	Some of the some of the places—I hate to mention it. Dumfries [Minnesota] might be one of the places.
Chris:	38:20	In the book they put a name and they put the first letter of the town, but they're quite clear that they don't really want you to know where it is.
Peter:	38:30	Yes, yes.
Chris:	38:30	Yeah, But that's what I thought too, Dumfries.
Peter:	38:32	Yeah.
Chris:	38:34	Yeah.
Peter:	38:34	I do remember Dumfries very well because one of the earliest—it was in the spring and the roads were terrible and the farmer, I was so eager to see these families that I wanted to get out. And he told me, "You are not going to be able to drive to my house but I'd be happy to meet you at a certain road with my tractor."
	38:58	So Isabelle and I were on the stand at the back of the tractor and these chunks of mud flying over us [laughter]. But that was an exciting time. You know, it was so great to discover that low

		conduction was a characteristic and that actually the pathology could provide a clue as to what was going on.
Chris:	39:22	Yeah.
Peter:	39:22	You know, they had these low conductions and I started out by just with [H and E 39:27] sections and, you know, an H and E section you don't know, exactly the diameter of fibers.
	39:35	And then I did trichrome stains and special stains using an eye micrometer and that led to developing my own system of sizing them with a plastic sheet with holes of different sizes and with a counter, which you punch the paper with it. And we used to draw our histograms by cutting out strips of paper.
Chris:	40:01	Hm.
Peter:	40:02	And doing the calculation for an exponential function with a Monroe calculator is something else.
Chris:	40:11	Yeah.
Peter:	40:11	You know, today that seems so easy, but it wasn't so easy at that time. And then I discovered a paper by [Ander 40:20]—
Chris:	40:20	Uh-huh.
Peter:	40:21	And, well, things became automated.
Chris:	40:25	Okay. You mentioned several things there I wanted to go into a little more detail before we break here in about five minutes. But the one thing I wanted to ask you was about your NIH grant. What you had told me and I read before was that Dr. Millikan sort of pushed to get a Mayo Clinic Neurology Center grant and, Milton Shy and Derek Denny-Brown visited Mayo Clinic. And it sounds like from a center grant there was very little chance it was going to be funded. But—
Jim Dyck:	40:55	Bud Rowland came too.
Peter:	40:59	Yeah, and you know, Clark Millikan was on the council of NINDS—
Chris:	41:05	Okay.
Peter:	41:05	And he just knew that that Mayo Clinic could propose a program project grant that would get strong reviews. It didn't.
Chris:	41:17	Hm.

Peter:	41:17	In fact it wasn't even rated and I know why. The reason was that many of the studies were just extensions of clinical examinations and weren't rigorous, you know, didn't propose ideas and new concepts and so on.
	41:37	But, we all filed—well, so it was turned down. Then Clark [Millikan] who wasn't easily set back, demanded that we have a site visit.
Chris:	41:49	Uh-huh.
Peter:	41:50	And on that site visit they had some very good people including Bud Rowland and as I remember Derek Denny-Brown, Milton Shy. Shy was the chairman.
Chris:	42:06	Okay.
Peter:	42:08	—and we each got turns and I was so surprised, after I made my presentation one of them, and I'm not absolutely sure whether it was Derek Denny-Brown or Bud Rowland, came out and said, "You've got to apply for your own grant. This is good stuff."
Chris:	42:26	Individual grant sort of thing?
Peter:	42:27	Yeah.
Jim Dyck:	42:29	Not to interrupt this but Bud Rowland, whenever I would see him, told me, "I turned your father down for a grant. I told him he needed to go for his own grant and I'm responsible for your father's …[inaudible 42:38].
Peter:	42:38	Alright so it may have been Bud Rowland.
Jim Dyck:	42:41	He's told me that several times.
Peter:	42:42	Okay.
Chris:	42:43	You were going to mention—do you remember the number of the grant? You were about ready to say it?
Peter:	42:50	Yeah, NS5841 as I remember. [It was NS05811].
Chris:	42:53	Okay. And do you remember how much the direct [on that grant] was?
Peter:	42:55	Yeah, $29,000. [It was $27,174 direct; $4,590 indirect]
Chris:	42:56	Yeah, okay. Times have changed.
Peter:	42:59	Yeah.

Chris:	42:59	And, I remember hearing that Dr. Ray Adams had applied for a grant on a similar subject.
Peter:	43:05	I would prefer we not talk about that.
Chris:	43:08	Sounds good.
Peter:	43:08	Right.
Chris:	43:09	We've got a few more minutes. You had mentioned light microscopy and you mentioned Wilhelm Krücke.
Chris:	43:20	German physician; correct? And what influence did he have? Was that just you know—
Peter:	43:27	Well I—
Chris:	43:27	—reading his work or what?
Peter:	43:28	—yeah, I encountered his writings in probably 1958 when I was with George Olszewski.
Chris:	43:38	Okay.
Peter:	43:38	There was a famous series of pathology texts called the Henke-Lubarsch Series.
Chris:	43:46	Okay.
Peter:	43:47	And Wilhelm Krücke and [another author] had done one volume of that series on peripheral nerve. And Wilhelm Krücke was the Director of the Max Planck Institute in Frankfurt am Mein. And his is perhaps the definitive light microscopic description of pathology of the peripheral nervous system.
	44:23	And it's terribly hard for me to read because I can speak German, but I never had scientific German. So, the Germans have these very long sentences with the action at the end of the sentence, so you have to study each sentence.
	44:41	But I realized when I read that book that when I came to Mayo, that the Mayo people had made a serious mistake when they defined infarcts in nerve and that they were, in fact, Renaut corpuscles described by a Frenchman called Renaut in I think the last decade of the 19th Century. He describes these structures in the nerves of asses, rats, cats, and humans.
	45:18	And the papers I'm referring to are a paper by Woltman and Kernohan where they show those as infarcts in nerve in patients

		with diabetes and atherosclerosis. I had a very good relationship with Kernohan when I came here. He didn't ever inhibit me. In fact it was six months [before] his death he phoned me and asked me if he could come and work in my lab. He was retired at that time. He said he would love to see what was happening. And he was in retirement.
Chris:	46:05	Oh, okay.
Peter:	46:07	But I had told George Sayre [Mayo Clinic pathologist] that they had made a mistake
Chris:	46:10	Yeah.
Peter:	46:11	And he realized that they didn't read German. But that was the really great help that I got from people like Olszewski.
Chris:	46:22	Yeah.
Peter:	46:23	That you had to open yourself to the world. And the Mayos themselves were very good about that. They would take off about a third of the year and you know this better than I do. And spend time in Eastern [United States] centers to bring back new ideas.
	46:40	They did go to Europe some, but this idea of not closing yourself to the information from other countries was such an important lesson for me and it applied to many other things.
	46:53	It applied to carcinomatous neuropathy. You know, carcinomatous neuropathy, Denny-Brown first described that. But that's not true. A German had described that.
Chris:	47:05	Hm.
Peter:	47:06	And he probably had picked that up—uh, Denny was a great guy [laughter]. But there's more to that story. A diener who was a physician was involved in the case that Denny described. I do talk about it in print in one of my books.
Chris:	47:26	Okay. And you had later—oh, we'll talk about this in the second half. But you later sort of clarified what an infarct of nerve looked like.
Peter:	47:34	Yeah.
Chris:	47:35	It doesn't look like Renaut corpuscles; is that correct?
Peter:	47:38	Yeah.

Chris:	47:38	We'll talk about it. So we may break.
Peter:	47:41	Alright.
Chris:	47:42	You can take a drink and then we'll let folks come in and then we'll start the next half. Does that sound okay?
Peter:	47:48	Sounds great.
Chris:	47:48	Thanks, Peter.
Chris:	47:50	Alright. This is the public part of the oral interview of Dr. Peter Dyck, this is part 2. We've had one component that started about an hour ago and now we're going to continue on from there.
	48:05	So I'm Chris Boes. I'm a neurologist at Mayo Clinic in Rochester, Minnesota and I'm a member of our AAN History and Archive Committee. There's been an AAN oral history project for many years and that project honors members who've made great contributions to neurology. Certainly Dr. Dyck fits that bill.
	48:27	And in the first half we talked about Peter's youth, his family's moving to Canada, Peter's training in Saskatchewan in neurology and neuropathology, and his subsequently coming to Mayo Clinic to be a fellow. We also started talking about some of his research projects at Mayo. The interview will be transcribed so you can go back and look at that part in the future.
	48:58	When we finished, we were talking about Peter's first NIH grant, from 1964, and we talked a little bit about how much money it was for and what the topic was. And the next thing we talked a little bit about was the development of fascicular or sural nerve biopsy, including Peter biopsying his own—was it your left sural nerve? Is that correct?
Peter:	49:25	Yes.
Chris:	49:26	And, uh—
Peter:	49:27	I didn't do it myself actually.
Chris:	49:28	Someone else did it [laughter]. Probably wise—
Peter:	49:33	Dr. Eric Lofgren did it.
Chris:	49:35	Did he? And did you write a paper about your—

Peter:	49:37	Yes.
Chris:	49:38	—symptoms?
Peter:	49:40	Yes I did. We wrote a paper on fascicular sural nerve biopsy and I added a footnote of the subjective experience.
Chris:	49:52	Okay.
[laughter]		
Chris:	49:55	First person account.
Peter:	49:55	Right.
Chris:	49:56	Sural nerve biopsies I understand had been done mostly by the Germans before, but I guess the words I've heard you use is that you rediscovered sural nerve biopsy; is that correct?
Peter:	50:10	Yeah, it was done very occasionally only and, so we began to do it for physiological study purposes and then physiological-pathological correlation purposes. And we were particularly interested in marrying that technique with recording of the compound action potential *in vitro* by Ed Lambert and pathological and electron microscopic studies.
	50:48	And what we were interested in specifically was why were nerve conduction velocities low in Charcot-Marie-Tooth disease. Now it turned out that the kinship that we were studying later turned to have a duplication of 17P11.2, which has PMP22 in it.
	51:14	So that kindred had that genetic variant and so that original paper was on the technique of fascicular biopsy and in that paper, Eric Lofgren in meticulous detail—he was a vein surgeon—
Chris:	51:32	Hm.
Peter:	51:32	—so he knew about veins from nerves and he makes a big point of how you tell a vein from a nerve. And he describes the nerve like an inverted elm tree. You know, an elm tree has a trunk and has branches going out obliquely. A vein tends to be like an oak. It has the branches coming off at right angles.
Chris:	51:59	Hm.
Peter:	52:00	So when you expose the side of the leg and you see before you a white structure that could be a nerve, if it has branches going at right angles, beware, that's not a nerve—

Chris: 52:15 Hm.

Peter: 52:15 —that is the saphenous vein. And it's a really important thing for physicians who do nerve biopsies. So you've got to push that aside; beneath it lies the sural nerve.

52:27 So in that paper we described the technique and the fascicular biopsy and the recording of the compound action potential *in vitro*.

Chris: 52:36 Now one thing I heard you say before was one of the best things you ever did was get funding to buy an electron microscope. So how did that change your career?

Peter: 52:45 Well we started out by using the RCA 3E and that was run by the facility. Shortly after I came to Mayo, Andy Engel came to Mayo, he'd be at Columbia, and he said our facility was not up to snuff. And we realized that very quickly. There wasn't the care to really do excellent fixation and so on.

53:12 So I spent a lot of my early life with people like Dr. [Akio] Ohnishi [53:18]. Incidentally, there are quite a few of my colleagues here who worked in the peripheral nerve laboratory who participated in some of it, so if they wish to comment, please speak up if I misspeak.

53:29 But we quickly were aware that our work wasn't of the highest quality and so we decided to get our own electron microscope. We thought we were too junior to get an NIH support for this. And so one of our administrators, Karl Ladner, said, "You should talk to my friend."

53:52 So we got the A. V. Hill representative to come there. He spent most of the dinner talking about himself—

[laughter]

54:02 —and then he said, "Boys, if you want to send me a one-page letter, I'll see what I can do for you." And within a week we got a letter that they would buy an electron microscope for us and we got a Phillips 300, which unfortunately I had to give up a year ago—

Chris: 54:21 Hm.

Peter: 54:21 —because we no longer do film-based electron microscopy.

Chris: 54:26 Hm.

Peter:	54:26	But it was a wonderful thing to have our own electron microscope. And so it turned out that the techniques you use for fixation, embedding—all those techniques have to be individualized for the tissue. Nerve is a very dis-homogenous tissue so it's very easily crushed, it's easily displaced, so you have to use isotonic solutions. So we did many papers on how to make things appropriate for electron microscopy.
Chris:	55:02	And, so that electron microscope was with you for over 50 years.
Peter:	55:07	Yes.
Peter:	55:09	The first one was given by the Hill Foundation and then later I got another one from Mr. Gallmeyer, a lawyer in Indiana.
Chris:	55:22	So, you've had several highlights in your career, and one thing I wanted to make sure I asked you about is if you could describe your original 1975 description of CIDP. How did that come about and how did you realize it was a different disorder, that sort of thing.
Peter:	55:42	So the first part of my career, the first 10-15 years were really spent looking at how to do nerve biopsies properly and how to handle the tissue. And we had a great emphasis on studying kindreds with inherited neural atrophies, and other disorders.
	56:03	But as I became known for being interested in neuropathy, people would send me idiopathic neuropathies. And one variety that was common had upper and lower limb involvement, proximal and distal involvement, motor and sensory, and sometimes but not often, autonomic involvement.
	56:26	They had low nerve conduction, but unlike the inherited neuropathies, these patients had dispersion of the compound action potential. Also they had raised spinal fluid protein. And, I knew about the cases that had been called idiopathic neuropathies, but it became obvious to me that we were dealing with an inflammatory immune condition.
Chris:	56:58	Hm.
Peter:	56:59	Now that was based partly on it was so different from the inherited neuropathies and also we began to see inflammatory cells in the nerve tissue. Also we had patients who died and I did studies with [Mayo Clinic neuropathologist Horuo] Okazaki, which showed the inflammatory infiltrates among the fields of onion bulbs, for example.

	57:23	About this time also, Jim Austin described a patient that he treated with prednisone, who responded I think 20 times. So there was this big literature of neuropathies that were simply called idiopathic.
	57:46	So I was influenced by a paper by Waksman and Adams on allergic neuritis and I was influenced by my pathology experience with inflammatory cells. And the similarity to Guillain-Barré syndrome was there. But these weren't Guillain-Barrés. You know, even the pathology was different.
	58:08	And so we wrote this paper in 1975 on chronic inflammatory neuropathies. Also I'd experienced some patients who had remarkably improved with prednisone at that time. So we wrote this lengthy paper on chronic inflammatory neuropathy. Later we called it chronic inflammatory demyelinating polyradiculoneuropathy.
	58:33	And it is an appropriate title because the pathology can extend from the nerve roots through the mixed segmental nerves to the spinal ganglia region and down. And today I guess that is perhaps the commonest treated inflammatory neuropathy.
	58:56	Now that may not actually be true—
Chris:	58:58	Hm.
Peter:	58:58	—but some colleagues of mine are working on an inflammatory neuropathy. Do you want to talk about that, Jim?
Jim Dyck:	59:06	I'm not being interviewed. You can talk about it.
[laughter]		
Peter:	59:09	Well it turns out that the Bruns-Garland syndrome [diabetic amyotrophy]—the lumbosacral plexus neuropathy—is probably more common than chronic inflammatory neuropathy. And that was given at a poster presentation here.
Jim:	59:29	By Marcus Pinto.
Peter:	59:30	Is he here? No.
Jim:	59:30	No, it was actually Peng Soon Ng not Marcus Pinto.
Peter:	59:33	Peng Soon.
Jim:	59:34	It was Peng Soon.

Peter:	59:37	Is he here? He's there.
Jim:	59:37	Sorry, Peng Soon.
[laughter]		
Peter:	59:40	So the incidence rate of that is higher than Guillain-Barre syndrome [or CIDP].
Chris:	59:45	Okay. And I remember looking at some of these patients when you were figuring this out because one of them was the mother of one of my patients. And looking back, some of them had incredibly high proteins in the CSF—
Peter:	59:59	Yes.
Chris:	59:59	—and had papilledema in fact—
Peter:	59:59	Yes.
Peter:	01:00:02	And some of them actually had a craniotomy done because their eyesight was being threatened it was that severe. So we later on were involved in therapeutic trials [of CIDP]. It is my great pleasure that the endpoint that was described this morning—the modified NIS [neuropathy impairment score] plus 7—[was used in studies of] transthyretin amyloidosis. The NIS was used in some of those early studies and it was shown that cortisone, IVIg, plasma exchange are all efficacious in [CIDP).
Jim Dyck:	01:00:48	It was shown, who is it?
Peter:	01:00:48	What?
Jim Dyck:	01:00:52	It was shown. Who is it? You showed that.
[laughter]		
Peter:	01:00:56	Well colleagues and I, yes.
Chris:	01:00:59	Showed those things.
Peter:	01:00:59	Yes.
Chris:	01:01:00	With prednisone that was probably one of—was a very early controlled trial certainly in diseases of the peripheral nerves; would you agree?
Peter:	01:01:13	It was, but it was unmasked.
Chris:	01:01:15	Yeah.

Peter: 01:01:16 And the reason it was unmasked was after much thought and talking to statisticians, I didn't think you could mask prednisone.

Chris: 01:01:24 The side effects of prednisone in the patients.

Peter: 01:01:26 So obvious.

Chris: 01:01:26 Yeah.

Peter: 01:01:28 Now in some of the studies, with the study with [Alvaro] Pineda, we actually were able to mask plasma exchange. And I think that's worth retelling because there we used a sham plasma exchange and plasma exchange in monoclonal gammopathy trials.

01:01:50 And what we did is we actually put the needles in place, ran the instrument, but returned the blood to the patient in the sham—

Chris: 01:02:02 Hm.

Peter: 01:02:02 —and then the real we did plasma exchange.

Chris: 01:02:05 So this is one of the papers that was in the *New England*—

Peter: 01:02:07 It was.

Chris: 01:02:08 —*Journal of Medicine* and you've had four full-length articles there.

Peter: 01:02:13 And there will be more.

Chris: 01:02:13 There will be more. Oh, good.

[laughter]

Chris: 01:02:19 Can I ask you? So, your brother published a paper in the *New England Journal of Medicine*.

Peter: 01:02:23 Yes, he did. Well that was good of you to notice.

Chris: 01:02:25 Yeah.

Peter: 01:02:25 My brother was an obstetrician gynecologist. He's the baby brother, two years younger and he had found that the rate of hysterectomies was strikingly different in the different regions of Saskatchewan [laughter] and they published this in the *New England Journal of Medicine*.

	01:02:54	For example, in some cities it was three times the rate than in the university town and he made the *New England Journal* before I did.
Chris:	01:03:04	And if I recall, he kind of said, "Perhaps the reason it was higher in private practice areas was because they made money from the procedure."
Peter:	01:03:11	Yes, exactly.
Chris:	01:03:12	And this made him incredibly popular with his colleagues.
[laughter]		
Peter:	01:03:14	Yes. Shortly afterwards he left for Saudi Arabia.
[laughter]		
Chris:	01:03:21	Maybe it was for the weather. So—
Peter:	01:03:23	To do medical practice there.
Chris:	01:03:25	Your son, Dr. Jim Dyck, also a peripheral nerve specialist who trained with you, describes your case report of a patient with necrotizing vasculitis related to rheumatoid arthritis and polyneuropathy in 1972 as your best case report. Can you tell us about that patient?
Peter:	01:03:51	Well, as I told you, we had an interest in ischemic effects on nerve and when I entered the field, I didn't think there were any reliable figures. Now, Chris a Woltman scholar. I have the highest regard for Henry Woltman. I knew him; he was just a great guy.
	01:04:21	But I think that the changes that they described in their paper were Renaut corpuscles and were not ischemic. So I was very interested when I began to do nerve biopsies to look for ischemic change. And when I talked to Professor Krücke from Frankfurt, he said he had never seen an infarct in nerve that was like an infarct in the brain.
Chris:	01:04:50	Hm.
Peter:	01:04:50	So an infarct in the brain causes a region of death of all tissue and it becomes liquefied. On the edges of that cavity, this is at a stage of necrosis, there are macrophages surrounding that cavity. And that is called by neuropathologists a softening--liquefactive necrosis.

	01:05:15	And I had never seen that in the nerve, so I was very interested in discovering what infarct in nerve looked like. So the occasion came when we actually saw a patient in the hospital setting that developed a rash of individual nerves being knocked off due to necrotizing vasculitis. [The patient had] rheumatoid arthritis.
	01:05:46	The patient died, and I went to the postmortem room with Okazaki and we took the spinal cord and the brain all the way to nerve roots, but the important point was we took the nerves from stem to stern as much as we could.
	01:06:03	Then we hung the nerves in these big glass cylinders and fixed them. Then we made blocks all the way along the nerve and sections from those blocks. We ended up, looking at perhaps, —
Jim Dyck:	01:06:18	Thirty-thousand—
Peter:	01:06:19	Well give or take 30,000 sections. So with the one set of sections you could look at the histological features, with paraffin sections to look at the vessel pathology. In the next block, they were osmicated so we could see the fiber changes. So we could reconstruct the vessel changes and the fiber changes. And to cut to the chase, the closed vessels were occurring at various points along the length of the nerve, but the fiber degeneration didn't begin where the vessel changes occurred-they'd begun at mid-thigh level—well halfway actually between let's say the butt and the mid thigh.
	01:07:06	And they were only in certain fascicles, wide apart. Often they were central fascicular regions, far apart and then as you got further down, they were confluent. So it was clear that the vessel closure exceeded the ischemic changes. And the ischemic changes didn't cause liquefactive necrosis; it caused degeneration of fibers but the Schwann cell tubes remained. So it was really important in delineating the nature of the infarcts from necrotizing vasculitis.
Jim Dyck:	01:07:52	You also thought those were at watershed zones.
Peter:	01:07:54	Of poor perfusion, yes. So we then with Dr. [Nukada 01:07:59] from Tokyo, Japan, and later Dunedin, New Zealand, did microsphere studies. We found if we injected one million microspheres into the blood vessels of the upper end of the sciatic nerve, you could occlude neural vessels but it didn't cause ischemic change.
Chris:	01:08:24	Hm.

Peter:	01:08:25	If you increased it to multiple millions—ten million microspheres—you would get the same sort of thing I described for the human nerve. And more important, you could actually follow individual fibers that went into those ischemic cores.
	01:08:44	So what was happening was as the fiber entered the ischemic core, it would balloon out, be filled with dark, endoplasmic reticulum, mitochondria, etcetera, and then dwindle down and disappear or it would become attenuated and survive.
	01:09:06	So it became very clear that rapid axonal transport was involved in ischemic damage to the axon and the effects of that on the three-dimensional morphology.
	01:09:22	So the human studies and the experimental studies have shown the same thing. Now you do get necrosis of all tissue elements if it is severe enough to cause gangrene.
Chris:	01:09:37	Hm.
Peter:	01:09:38	So, the similarities from the brain aren't that complete, but in the typical case, you do not get liquefactive necrosis of all tissue elements in ischemic change.
	01:09:51	So those have been extraordinarily important in understanding what happens in the nerve from ischemia. What is so distressing is that still no one has done really, rigorous studies of the efficaciousness of drugs in necrotizing vasculitis. It's not an easy study—
Chris:	01:10:19	Hm.
Peter:	01:10:20	—but most consensus panels depend on really faulty data, and for example, prednisone is used commonly, and I think there's no great enthusiasm to now do a study with prednisone.
Chris:	01:10:37	Yeah.
Peter:	01:10:38	As an example.
Chris:	01:10:40	Well great. Thank you for that. There are so many different things we could talk about, but the one thing I wanted you to discuss was your cohort studies of diabetic polyneuropathy. I know you had different cohorts, some in Minnesota, so tell me about those and what you contributed to that to our knowledge in that area.
Peter:	01:11:03	I think our studies in diabetic neuropathy may not have been as pivotal as some of our other studies.

Chris:	01:11:08	Hm.
Peter:	01:11:11	But we certainly have tried and there are some important insights. For example, I think neurologists should know that there are at least three or four major types of neuropathy whose pathogenesis, cause, and treatment are different.
	01:11:37	For example, the ordinary distal polyneuropathy, the cause of that is not the same as the neuropathy that develops in type I diabetes [patient] who is over-treated. Chris Gibbons has recently written done very good work on that, but I don't think the mechanism is the same.
Chris:	01:11:57	Hm.
Peter:	01:11:58	We tried to develop models that predicted neuropathy. You know, how much hyperglycemia, for how long a period of time, which type of diabetes. We developed equations. Useful, yes, the sad fact is that most treatment approaches other than insulin, for diabetic neuropathy for the usual sensory motor polyneuropathy have not been that efficacious.
	01:12:36	You know, there's no question that glucose control is a homerun and the DCCT trials cost more than a billion dollars were worth it.
Chris:	01:12:49	Hm.
Peter:	01:12:49	You know, this cooperative study, many centers, and they showed unequivocally, that you can retard development of the triopathy; nephropathy, retinopathy, and neuropathy by good diabetes control.
	01:13:03	But the aldose reductase inhibitors, myo-inositol supplementation, blah, blah, blah all went down in flames. Most of those trials were poorly designed. They went to battle without adequately costing the count.
Chris:	01:13:29	Hm.
Peter:	01:13:29	They didn't do the studies for long enough, carefully enough, with the adequate endpoints. What those trials taught me was that you had to be extremely rigorous in selecting the endpoints you use for trials, the people who do the evaluation, the need for reference values, the need for statistical consultation. There's no free lunch in this.
Chris:	01:14:00	Hm.

Peter:	01:14:00	And the recent transthyretin trials reported on this morning by Professor [David] Adams make that point.
Chris:	01:14:08	Yeah.
Peter:	01:14:08	There are two trials, the Ionis trial and the Alnylam trial have been homeruns. He talked about the Alnylam one this morning. You saw the graph. The group of people on placebo worsened terribly. The other group actually improved. Huge difference.
	01:14:32	In those trials, we insisted on trained investigators, trained professionals, quality control with a central laboratory, use of adequate reference values. But I think there's much to be learned in diabetic neuropathy. And the group of neuropathies that Peng Soon is working on is one group and Jim Dyck is working a lot on these lumbosacral plexus neuropathies—a common severe neuropathy, disabling. People go to wheelchairs with it and are not being well treated.
Chris:	01:15:17	Can I ask you—I believe the first edition of the textbook "Peripheral Neuropathy" was in 1975.
Peter:	01:15:24	Yes.
Chris:	01:15:24	How did that book come about?
Peter:	01:15:28	Two years, maybe three years before that, I went to a W. B. Saunders cocktail party at Mayo Clinic. And Saunders had some kind of relationship with Mayo. And there was a guy called Bob Rowan. And in chatting to him I said, "How about book on peripheral neuropathy?" And he said, "Send me a note, it sounds great."
	01:16:01	I first invited Art Asbury to join me. He thought he would like to and then he backed away. Then I asked P. K. Thomas and we then edited that book.
Chris:	01:16:15	And another thing I wanted to ask you about was the development of the Peripheral Neuropathy Association and the Peripheral Nerve Study Group. Were you in those from the beginning?
Peter:	01:16:26	Yes. It started out in several different venues. The Leprosarium had Leprosarium meetings which I went to. One of those is sometimes referred to as the beginning of the Peripheral Nerve Study Group. But we had a Peripheral Neuropathy Association. I think we originally called it the "Peripheral Neuropathy Association of America." [Eventually the Peripheral Neuropathy

		Association and the Peripheral Nerve Study Group merged to become the Peripheral Nerve Society].
	01:16:53	And in 1975, we actually had one of the largest meetings at Rochester [Minnesota]. We had about 400 people attend that. And we took them to our farm for a picnic and everybody that was there remembers it because there was a deluge that rained on our tent. But we had a cowboy yodeler and we had Don Mulder talk about the history of the upper Mississippi. And we had a bluegrass band and my wife insisted on serving hamburgers so it would be Western.
[laughter]		
Chris:	01:17:32	Is your farm in the Vale of Siddem?
Peter:	01:17:34	[laughter]. It's on the banks of the Vale of Siddem [laughter]. It is indeed.
Chris:	01:17:39	So now you were president of the American Neurological Association in '92 to '93. What did you get done?
Peter:	01:17:47	Not a lot.
[laughter]		
Peter:	01:17:50	Let me first say that I was so pleased to be president of that mainly because of some of the previous presidents. They included Weir Mitchell, Derek Denny-Brown, Ray Adams, Arthur Asbury my friend. You know, really good people. Many others, you probably know the list better than I do.
	01:18:21	So some of the pioneers in America. I thought of it as a place where an academic neurologist could get a start. And we tried hard and I think presidents since have tried also.
	01:18:43	It also emphasized rigor in research and accomplishment and I like that. Unfortunately the Annals no longer apparently can pay for its success and the American Academy of Neurology, which has become so large and successful that the ANA seems to have had trouble gaining the voice it wants I suppose.
Chris:	01:19:10	Hm.
Peter:	01:19:11	So good effort. I also had the great pleasure of having Lyra Orchestra—which is a Baroque orchestra, which I had some involvement with starting—
Chris:	01:19:26	Oh.

Peter:	01:19:27	—play at the Old South Church. I think that's the not so historic [church]. The Old North Church is the more historic in Boston.
Chris:	01:19:39	Oh.
Peter:	01:19:40	I can't remember the soloist, but she sang Mozart's Exsulate Jubilate, which was a bang on performance.
Chris:	01:19:50	So—
Peter:	01:19:50	So it was a great pleasure.
Chris:	01:19:54	They flew them from Minnesota to—
Peter:	01:19:56	They did.
Chris:	01:19:56	—Boston? Well that's nice.
Peter:	01:19:57	Yes.
Chris:	01:19:59	Um—
Jim Dyck:	01:19:59	You also had some effort to encourage young investigators that you started [during his presidency of the ANA].
Peter:	01:20:04	We did. ANA somewhat before, got into a slump I think. I remember going to an ANA [meeting] about five years before I became the president. And 15 minutes before the opening the main hall, the workmen who were supposed to be moving chairs were sitting on the edge of the podium hanging their legs over. And the lights weren't on; no one was working on the microphones. It was really amazing.
Chris:	01:20:35	Yeah.
Peter:	01:20:36	It was such an old stodgy society. You know, the AAN is so up with it, so modern. They outflank the ANA by a longshot.
Chris:	01:20:47	You have several peripheral nerve fellows in the room here. So how did the peripheral nerve fellowship come about?
Peter:	01:20:55	I didn't want to have peripheral nerve fellows.
[laughter]		
Peter:	01:21:00	And—
Chris:	01:21:01	In retrospect? No, I'm sorry.
[laughter]		

Peter:	01:21:03	No, not in retrospect and the reason was I actually enjoyed the interchange with patients and sort of the old Allan Bailey idea of recording from the patient him- or herself, that being where the truth were-was, the history.
	01:21:24	And then, uh, someone from Denver—
Chris:	01:21:28	Schneck.
Peter:	01:21:29	Uh, yes—
Chris:	01:21:30	Stuart Schneck?
Peter:	01:21:32	Uh, what was Schneck's first name?
Jim Dyck:	01:21:33	Stuart.
Peter:	01:21:33	Stuart Schneck who at that time was a professor of neurology asked to take half of his sabbatical year with me.
Chris:	01:21:43	Hm.
Peter:	01:21:44	And he would sit there and just listen in and try and help along and he would come to read nerve biopsy. And he said, "This is too good an experience," because I was essentially only seeing problem cases of neuropathy at that time. And—
Chris:	01:22:00	This is in the '80s?
Peter:	01:22:01	—yes [It was 1983]. And so, he said, "You simply have to make this available." So I took his advice.
Chris:	01:22:09	Who was your first fellow?
Peter:	01:22:10	Jeffrey Cohen.
Chris:	01:22:12	And that was in I think in 1985; does that sound about right?
Peter:	01:22:15	I think it could be. [Cohen started the fellowship in 1985]
Chris:	01:22:16	I heard one of your fellows was your son.
Peter:	01:22:22	P. James himself.
Chris:	01:22:23	What was it like having your son as a fellow?
Peter:	01:22:27	No problem.

[laughter]

Peter:	01:22:30	Bruce [Taylor 01:22:31] was worried about that as I recall, but after a while he said it was no problem because I would pick on Jim as much as I would pick on others.
Chris:	01:22:47	[laughter].
Jim Dyck:	01:22:46	No, that's not what he said.
Chris:	01:22:47	[laughter].
Peter:	01:22:48	What did he say?
Jim Dyck:	01:22:49	He said that you picked on me much more than you picked on others. The kid was in a safe zone. He lived in the Goldilocks zone.
Peter:	01:22:56	Alright.
Chris:	01:22:57	So—
Peter:	01:22:58	It was a golden year though.
Chris:	01:23:00	Yeah.
Peter:	01:23:01	At that time I think we at one time had 10 people sitting around the microscope, uh. We had a professor from Tromso, Norway.
Peter:	01:23:18	—Svein Mellgren—
Chris:	01:23:20	Okay.
Peter:	01:23:20	—who still is professor at Tromso, Norway I think. We had several people from Canada. We had people from Europe. We had people from Iraq, etcetera. It was just a great—
Jim Dyck:	01:23:32	Japan.
Peter:	01:23:33	Japan. Right.
Chris:	01:23:35	So you have created this where your work is your research and your research is your work and you see patients and then you have time in the lab. How did that develop? By the time Jim was a fellow, what would a fellow do during a peripheral nerve fellowship?
Peter:	01:23:58	We always had enough patients to see of the kind we wanted to see. We had a big referral practice, so it became easy enough to allow other people to see the patients. But from it also flowed the work of the quantitative sensation laboratory and the nerve biopsy laboratory. And then later, the skin biopsy laboratory.

	01:24:28	So there was always enough work to do and then the difficulty became having enough time to do research actually.
Chris:	01:24:39	Yeah.
Peter:	01:24:39	But in the early days, I would typically get to work at eight o'clock as most people do at Mayo. And I would go home for supper and I would come back and often work to midnight or later.
Chris:	01:24:52	And that was common amongst your colleagues at the time?
Peter:	01:24:54	It was.
Chris:	01:24:55	One of your colleagues Dr. Bill Litchy said that you always spoke in questions like, "Why is this happening to the patient?" Is that true and, did your parents do that or is that something you just developed?
Peter:	01:25:14	No, I think of this more in the scientific field. It's so easy to take the obvious explanation and often the truth is complex. For example, the paper that we're writing with Peng Soon at this time. We talked about that this morning in my room with Jim present.
Chris:	01:25:37	Hm.
Peter:	01:25:38	You know, he's been looking at the incidence—Peng Soon, can I talk about you?
Peng Soon:	01:25:45	Yeah, sure.
Peter:	01:25:46	Alright. He's been looking at the incidence of lumbosacral plexus neuropathy. And it turns out that in Len Kurland's work, the incidence of Guillain-Barre is pretty constant at 1.5 to 1.9 incidence cases per 100,000 per year.
	01:26:22	That condition [lumbosacral radiculoplexus neuropathy] is much more common.
Chris:	01:26:25	Hm.
Peter:	01:26:25	Much commoner. Really interesting. Now about two-thirds of the cases have diabetes, so you really do have to ask yourself, you know, those facts themselves are striking.
Chris:	01:26:41	Yeah.

Peter:	01:26:42	But behind those facts is the real interest. Is it diabetes? Now ask yourself, "Is it diabetes?" You know, hyperglycemia, or is it a predisposition to diabetes so there's some common genetic factors or something. Is it the environment? Is it the metabolic syndrome, overweight, poor eating, failure to exercise, you know, all those things that go into impaired glycemia?
	01:27:19	Is it an immune factor? So, we've been trying to think, what really should that message be? So this idea of not accepting the first answer is the nature of research.
Chris:	01:27:37	And so—
Peter:	01:27:37	You really do need to keep digging. You know, you need to keep asking yourself, "What does it mean? Am I missing something?" I mean if you're going to spend someone's big dollars, you've got to do some sweating.
Chris:	01:27:54	Yeah. I had heard other fellows say that you didn't really believe in Occam's razor. I think maybe that applies a little bit to what you just said. Am I interpreting that correctly?
Peter:	01:28:06	Well I believe it at a superficial level, but I think—
[laughter]		
	01:28:08	you want to go beyond that.
Chris:	01:28:15	Got you.
Jim Dyck:	01:28:17	You've said, "It's a very good rule to try to put all of the findings into one diagnosis, but it's even a better rule to realize that life is complicated and typically there are two diagnoses."
Peter:	01:28:31	Or more. Well it's obvious. If you've done any postmortems, they will have 30 diagnoses.
Chris:	01:28:39	Yeah.
Peter:	01:28:39	And they're presumably all true.
Chris:	01:28:45	So a few other things. Sir William Osler who partly Canada claims as I'm sure Canada likes to claim you, although you are an American citizen—
Peter:	01:28:56	Yes.

Chris:	01:28:57	Wanted his epitaph to be, “He taught medicine in the wards.” You’re going to be around for a lot longer of course, but what-what would you want your epitaph to be?
Peter:	01:29:09	My epitaph?
Chris:	01:29:09	Yeah. Have you thought about this?
Peter:	01:29:10	I have not.
Chris:	01:29:11	Okay.
Peter:	01:29:11	There probably won’t be an epitaph. We actually thought about that. We have a farm and on the farm is an overlook over the Mississippi River. And at great labor I and the monument guy and Isabelle lugged this stone to that point. And on it we have, “They slept with their fathers in the kingdom of God.” That will do for me and, spread the ashes. So I don’t know if there is any epitaph.
Jim Dyck:	01:29:50	You have said to me that I essentially did the same experiment over and over and that was to quantify, quantify, quantify.
Peter:	01:30:03	Yeah, but I hope I’d do it for a reason.
[laughter]		
Peter:	01:30:12	Well I certainly don’t want to put quantify, quantify on my epitaph.
[laughter]		
Peter:	01:30:19	I would rather have, “He ate well.”
[laughter]		
Peter:	01:30:26	Or “He had good colleagues.” I’ve had superior colleagues.
Chris:	01:30:31	Yeah.
Peter:	01:30:31	You know, some of the people who worked in the lab have been so outstanding. You know, Bill Litchy told me recently—I hope he doesn’t mind me saying this—that he’d come back to Mayo Clinic at least in part because of me. He wanted to work with me.
Chris:	01:30:48	Yeah.
Peter:	01:30:49	That was a great compliment to me. So if you like, I’ll have that on my epitaph. I will on my epitaph that you thought it worthy

for me to have a conversation. Quite a few of the peripheral nerve fellows are here. They can all be on my epitaph.

01:31:09 But there are people like Al Lais, Wilford Bushek, Mrs. Kathryn Sanders. Mrs. Sanders had been the histology [technician] for the man who first graded tumors like grade 1, 2, 3, and 4 at Mayo Clinic [Alfred Broders].

Chris: 01:31:29 Hm.

Peter: 01:31:30 She had a husband with multiple sclerosis and she would grind out thousands of sections for me. And then she would go home at midmorning to move him in his position in a wheelchair.

Chris: 01:31:46 Hm.

Peter: 01:31:47 Just an amazing woman.

Chris: 01:31:48 Yeah.

Peter: 01:31:51 I have Janean Engelstad who works with us. The peripheral nerve fellows all know her. Just a superior technologist. We include her in our papers. She's been an editor on one of our books.

Chris: 01:32:05 Hm.

Peter: 01:32:06 Uh, Jenny Davies who is a superb data analyst. Peter O'Brien. Peter O'Brien is a biostatistician, a wonderful human being, excellent statistician.

01:32:24 I went to Bill Taylor who was a statistician from Stanford and asked him about how one should think about segmental demyelination. I had made the observation that you could have random segmental demyelination. In other words, if you think of a fiber it has Schwann cells clothing it and if you had a random disease, you would have Schwann cells at random picked on.

01:32:54 If on the other hand it related to a single fiber degenerating, then that demyelination would be clustered.

Chris: 01:33:03 Hm.

Peter: 01:33:03 So I went to Bill Taylor and said, "How do I treat this problem statistically?" And he said, "I'm not sure I'm the person to talk to, but I have this young statistician who you could talk to, Peter O'Brien." So he developed this program to look at that question statistically. So we wrote a paper on that.

Chris:	01:33:24	Yeah.
Peter:	01:33:25	The times you really ought to pay attention is when you think you know it.
Chris:	01:33:35	Hm.
Peter:	01:33:36	You know, over and over it's been shown to others and to me that when you think you have it solved, you haven't got it solved. You'd better keep at it.
Chris:	01:33:46	Yeah.
Peter:	01:33:47	You know, when insulin was discovered by the group in Toronto, it was such a breakthrough. And I heard that story from my colleague in diabetes. He was a 15-year old boy in about 1917. He then lost weight from 135 pounds down to 75 pounds and he was ravenous and thirsty all the time.
	01:34:29	And then the Toronto preparation came along. So they took him to—this is Randall Sprague—
Chris:	01:34:35	Yeah.
Peter:	01:34:35	—endocrinologist. They took him to Toronto and he was given the Toronto preparation and he felt great. And then a week later he just came down with fever and hives all over from the horse serum in which the insulin had been prepared.
	01:34:53	And then about a year later he was given the pork insulin/Eli Lilly preparation and he felt better. And for the rest of his life, essentially his family and then later his wife would give him regular insulin four times a day. And, you know, he had few complications.
	01:35:19	Don Mulder used to say he had no complications. Not true. I saw him in the Rochester study. He had some complications, but they were mild. But, you know, it became so clear to everyone later that insulin was only part of the story.
Chris:	01:35:33	Uh-huh.
Peter:	01:35:34	A really important story, but you know, people are all over themselves trying to understand what is the metabolic syndrome. You know, exactly why is obesity bad? And what are the components of the metabolic syndrome that make for atherosclerosis and these other complications?

	01:35:55	So that story is far from told. You know, it's thought to be America's—everybody almost has the metabolic syndrome, you know, so everybody is going to hell in a handbasket. Well it's not quite true, but you know, there is that story out there.
	01:36:13	But what are the ingredients of that? You know, if you go to the Diabetes Association, people really flock to those sessions on the metabolic syndrome because the message is all the same. You know, everybody has it. It's a pandemic and in a sense it's true, but what we should be doing is really focusing on what are the components that make for the complication?
	01:36:38	In short, there's plenty of things to do in research. The problems are still there. There is a special kind of problem with research because the more successful we are, the more problems there will be probably.
Chris:	01:36:55	Hm.
Peter:	01:36:55	You know, so you preserve life just for its own sake? Yes, but then the cost increases and there are other problems that come.
Chris:	01:37:11	Can I ask you? I didn't rotate with you as a resident.
Peter:	01:37:13	I'm sorry.
Chris:	01:37:15	I know.
[laughter]		
Chris:	01:37:16	A horrible mistake on my part, but what advice do you give to every patient with peripheral neuropathy?
Peter:	01:37:23	Oh, well, it's in the Bible. Choose life. I mean that's sort of obvious, but it is so important in pain disorders and disability to keep trucking.
Chris:	01:37:37	Yeah.
Peter:	01:37:37	You know, to keep moving, to rise up, to face each day, be optimistic. You really do have to choose to be happy. I mean there's so many people that aren't happy, but if you can fasten on things that are worthwhile even though they're miniscule.
	01:37:58	I saw this patient from Minneapolis who is an artist and she partly came back to see me because she wanted to show me her folio. And she had called for a showing and no one had shown up.

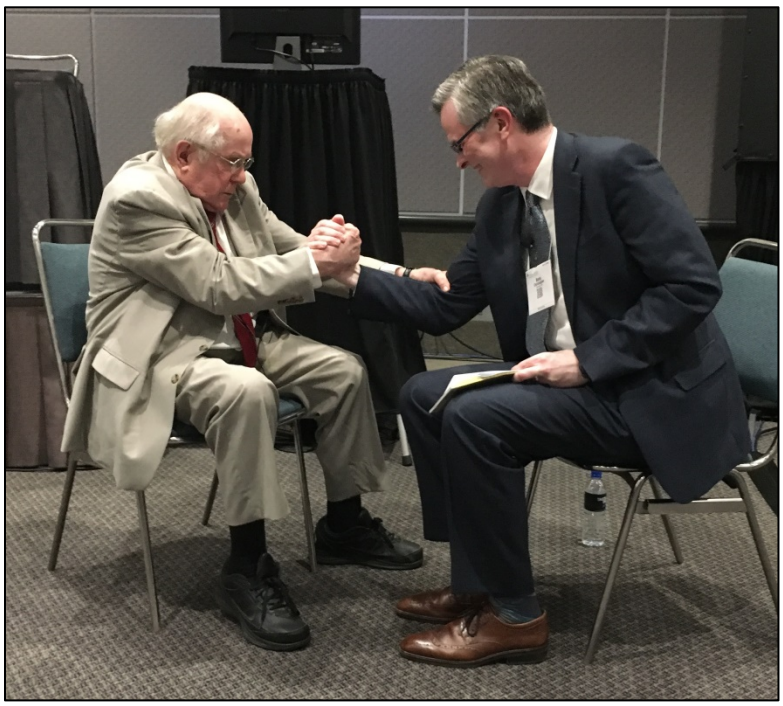
Chris:	01:38:15	Hm.
Peter:	01:38:18	So how do you tell such a person, you know, “Be happy?” You know, but you still need to. I mean for all of us.
Chris:	01:38:32	I remember hearing you would tell people to exercise until they’re red in the face. And I still use that nowadays with my patients.
Peter:	01:38:42	Oh, we do when we teach neurologists to examine patients. The patient should get red in [the face]—let me have your arm—

[laughter]

Peter:	01:38:54	—when you’re testing [strength]—

[laughter]

Chris:	01:38:55	Oh, during strength testing [during the exam]
Peter:	01:38:57	Pull, you know, both the patient and the doctor should get red in the face. That’s an old one.



Chris:	01:39:16	So we have a few minutes left. I wrote this down because I went to a talk you gave in 2006 to your colleagues and you made the following recommendations, and it stuck with me. So, “Choose your family well. It’s important. Get good associates; talk to them; encourage them to disagree with you and to argue with

		you. In your research make measurements and observations. Think about those measurements and draw reasonable conclusions and trust your conclusions. Be careful when you publish your results to publish them tentatively, to allow yourself some wiggle room at a later date."
[laughter]		
Chris:	01:39:55	This is good practical advice. So that was in 2006; so now that it's 2018, would you—
Peter:	01:40:01	Oh, I believe in all of those. The first one was from Nelles Silverthorne from the Toronto Sick Kids' Hospital. And he was an allergist and said to the medical students, "Be really careful about your spouse because if you choose someone who is allergic, those kids of yours will all be allergic—
[laughter]		
Peter:	01:40:24	And you'll be up all night with them screaming and coughing and squirming and spitting and scratching."
Chris:	01:40:32	Did you follow that advice?
Peter:	01:40:33	Yeah, my wife—well she's allergic but not—
[laughter]		
Peter:	01:40:38	—allergic to me maybe.
[laughter]		
Chris:	01:40:41	So is there a topic that you decided not to research that looking back you wish you had? Or did you just kind of keep going after everything that you wanted to?
Peter:	01:40:58	There are many that are left undone. You know, the difficulty with some projects are that you don't see a conclusion that's worth presenting. We did this enormous study of Native Americans.
Chris:	01:41:16	Hm.
Peter:	01:41:17	We studied Indians from South and North Dakota, from northern Minnesota, from Wisconsin, from some Canadian provinces and even into Oklahoma. We examined more than 500 [Native Americans]. And we did eye examinations and nerve conduction studies, quantitative sensation tests and bloodwork. And the difficulty is to say something that really

		makes a difference to the tribal people, to their health, and to science.
	01:41:55	One message that I clearly have, it ain't as bad as it's usually portrayed.
Chris:	01:42:00	Hm.
Peter:	01:42:02	But can I write a paper "it ain't as bad as it's usually portrayed"? Maybe I can, but who would read it.
[laughter]		
Peter:	01:42:09	In science you have to be able to say something that people will publish.
Chris:	01:42:16	Yeah.
Peter:	01:42:18	And we've done all these measurements and sometimes when you don't have a message, you can't publish it. It's just that's how it is. We studied the Latino population around Rochester. I learned a lot about the Latinos. I found out that most of them work under the radar, many of the people I saw, in the dairies.
Chris:	01:42:41	Hm.
Peter:	01:42:41	Did you know that there are farms east of us especially that are milking up to 500 cows a day and essentially run by Latinos. The foreman gets $12.50 an hour; the starter gets $8.50 an hour, etcetera. So I learned a lot about things of that kind.
Chris:	01:43:02	Yeah.
Peter:	01:43:02	But that doesn't make a paper.
Chris:	01:43:04	Gotcha.
Peter:	01:43:05	You know, it's like in Iolanthe. The clown. Just because your wife ran away with the milkman this morning, they don't care as long as you're funny. [Actual quote from The Yeomen of the Guard opera by Gilbert and Sullivan, sung by character Jack Point (a strolling jester): "Though your wife ran away with a soldier that day, And took with her your trifle of money; Bless your heart, they don't mind — They're exceedingly kind — They don't blame you — as long as you're funny!"]
Chris:	01:43:25	Yeah.

Peter:	01:43:25	So you do have to have a message in research—
Chris:	01:43:31	Yeah.
Peter:	01:43:31	—that can be sold. And there are some terrible things which happen in publications. The skin biopsy is now blown out of proportion-the skin biopsy is good for everything. It isn't.
Chris:	01:43:47	Uh-huh.
Peter:	01:43:47	It isn't good for everything. There are some people who maybe oversold it a bit.
Chris:	01:43:55	Gotcha.
Peter:	01:43:56	So, that's the nature of research. You can only publish real insights. There have been people who've said there should be a place for negative studies. I'm not suggesting the Indian or Latino studies were negative, but I haven't had an insight or a way of analyzing the data that gives me a message that I can, produce that you would find interesting to read or do something about.
Chris:	01:44:26	Is there one paper or project that you're most proud of? Are you able to choose or is that like choosing your favorite child?
Peter:	01:44:38	Yes, it's always the last one.
Chris:	01:44:39	Gotcha.
[laughter]		
Peter:	01:44:41	Yes. Right now I'm really excited about having found how to do quantitative sensation testing for therapeutic trials.
Chris:	01:44:55	Hm.
Peter:	01:44:56	And it is working like a charm. That is the threshold of heat pain that will replace epidermal nerve fiber for sequential and somatotopic quantitative sensation testing in industry trials. And part of the success of these amyloid trials are due to that insight.
Chris:	01:45:19	Gotcha. Well we're winding down. Is there anything else you'd want to tell me or the crowd?
Peter:	01:45:29	Well I am really pleased about the roundtable at Mayo. The roundtable at Mayo is the place where we gather for lunch. The original idea was that many of my earlier, junior colleagues

came from the Orient. And I felt that they were not learning about ordinary life in Minnesota and in human interactions sufficiently.

01:46:02 We would do our work, have brief conversation, I would sit with them only once a week or once a two weeks or something and so it was important that they—I sold it as conversational-that we have conversational English at that roundtable.

01:46:20 And over the years, people who became my colleagues like Phillip Low, Bill Litchy, Jim Dyck, Chris Klein, you know, others and the fellows would have lunch together at the roundtable.

01:46:37 And it's on the east side of the main floor of the Harwick Building and any of you who wish to join us at 11:30 each day, you will find us there. And anybody is welcome to come and meet with us. We don't turn down anybody and we discuss everything, even our problematic politics.