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INTERVIEW WITH ALAN JAMES GALLOWAY (PART II)
by Carla Ehat & Anne Kent
April 14, 1977

INTERVIEWEE: Alan James Galloway (AG)
INTERVIEWERS: Carla Ehat (C.E.) and Anne Kent (A.K.)
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CE: Today is Friday, April 15, 1977. Continuing the Oral History program of the California Room at the Marin County Library at Civic Center, this is Carla Ehat, and again, we are at the residence of Mr. Alan James Galloway. This afternoon he has agreed to tell us of his long association with the California Academy of Sciences. I understand, Mr. Galloway, the year you came to Bakersfield for Shell Oil Company and met Mr. Weston, wasn't it that same year that you made the decision to join the California Academy of Sciences?

AG: I think it was, and that means that I joined the Academy of Sciences about 1926.

CE: Mr. Galloway, under whose aegis did you join the Academy?

AG: Well, it was probably recommended by Mrs. Alan Chickering and also by Roy Weston, and I became a member of the Academy at that time. Later on, twenty years later, I wrote to the Academy asking why they had not sent me a bill for my dues and received the answer that after twenty years' membership I had become a life member of the Academy and thus had to pay no more dues - right at the time that I became more able to pay. This struck me as being very odd at the time.

CE: Initially when you were still employed with Shell Oil and had so much of your time committed to that endeavor, what was your involvement with the Academy in those early years of your career? Other than membership - did you participate?

AG: Frankly none. I did not participate in the work of the Academy, because I was in other cities. For instance, as soon as I left Bakersfield, we lived in San Francisco, and later on we lived in various places in the United States.

CE: And London, too.

AG: And London also, yes. Immediately we were transferred to London, and subsequently to that, we lived in San Francisco and - -

CE: Mr. Galloway, as a non-active member, in a certain sense, you were supporting the goals of the Academy by your membership, of course.

AG: That's right.

CE: At that time did they publish any papers or monographs that were available to the membership?

AG: They were active all this time and did not include me in any of their activities, because most of them were not geological. When I joined - -

CE: When did you join more actively, after your retirement?

AG: I joined the Academy more actively after I retired.

CE: After 1958?

AG: Yes.

CE: And what was your initial introduction as a retired volunteer? What did you do?

AG: Well, I have already related that one of the people that I had met at the Academy was Dr. G. Dallas Hanna, who at that time was head of the Geological Department, and he put me to work as soon as I retired as member of the staff of the Geological Department. As far as the work I was to do, he told me I could select anything I liked, so I naturally selected the geology of Point Reyes which I've been preparing for forty years. And at that time I had accumulated all the books and everything published, practically, on the Point Reyes Peninsula. Much to my surprise, I found that nothing much had been written since 1899.

CE: Can you explain how the structure of the Academy is in regard to these departments? For example, do you have a central library that is available to all branches? Did you have your own library? How is the organization structured?

AG: Well, it was divided by departments, which attacked various branches of natural history. The activity of the branches depended largely on what people were available. This obviously applied to me. I was available for nothing, because I wanted a place to work, and I was able to take advantage of Dr. Hanna's goodwill by doing my own work in the Academy. That's how it all started.

CE: There is a central library -

AG: There is a central library, and through doing this, I obtained a nice office at the Academy. It's the best thing a retired person can do.

CE: To walk into something like that. Of course I understand from Dr. Lindsey that people like yourself, and there were a few, I understand, contributed and made so much of their talent and time and made the Academy what it is today; they couldn't have achieved it.

AG: The Academy was almost entirely formed by amateurs, people with means of their own who could take on the job, and while they were amateurs like my father, they were mostly medical doctors, actually, in the early days, and those were the only scientists in California.

CE: Could you tell us just briefly a little bit about the beginnings of the Academy? I know its first president was a Dr. Andrew Randall.

AG: The first president of the Academy was Randall, and he, funnily enough, was the original man to own Point Reyes Peninsula.

CE: I know that, and that's very fascinating to me how this comes so close to your interest and your life.

AG: Yes, it all comes together.

CE: It's fascinating. And, of course, the story of Dr. Randall everybody knows and the tragedy thereof after he was killed, shot by a gambler, Joseph Hetherington wasn't it?

AG: That's right, yes.

CE: There is an article here from Shell News 1973, Volume 4, and I'd like to quote just briefly from this paragraph. "Such a scandal might have shaken less determined men, but the hearty directors nevertheless gathered for their scheduled weekly meeting to calmly discuss the coniferous trees of California. That was one day after Dr. Randall was done in and one day before the city's vigilante committee brought Hetherington to justice by means of a lynching. An assembly that could hold a scientific session between a murder and a hanging sure was tested to survive."

AG: Well, the Academy has survived for more than a hundred years and largely through the efforts of amateurs and people like my father who were interested in the life - scientific section of California.

CE: Well, I understand the original directors began the Academy by collecting scientific books and - - I think it was shells, didn't they start with shells?

AG: That's right. The original charter of the Academy provided that the directors should provide a collection of shells and natural history objects and describe the natural history of California, and those were the main things they had to do. They had to provide a library also.

CE: Is it true that the National Science Foundation has declared the Academy to be a national research resource?

AG: That's right.

CE: That's quite an honor isn't it?

AG: Quite an - Well, they've used our collections and they find our collections extremely useful. We're strictly - we're a taxonomic outfit, that is to say, we spend our time determining what the names of these animals and plants in California are, which is very useful in determining things like what causes epidemics in the army and particularly in eastern Asia which borders on the Pacific Ocean and has very much the same kind of animals that we see here. In the same way, the geology of eastern Asia is of interest.

CE: It has a reputation, I understand, the Academy, as the center for plant and animal research in the western United States.

AG: That's right.

CE: Tell me, who avails themselves of this - these wonderful resources?

AG: Well in particular the oil companies and exploration companies and the universities are interested --

CE: Here in the United States or does it extend further in the world? Anybody ever come and study there from abroad?

AG: Here in the United States. Oh - yes we get people from abroad all the time.

CE: Mr. Galloway, could you give us a specific example?

AG: Well, a specific example of people from abroad that we've helped would be this doctor in Zagreb, Yugoslavia. I went there in - several years ago when my daughter was there as the wife of the American Consul, and I met this man who was interested in the Academy because he'd had correspondence with Dr. Hanna about diatoms, which are the planktonic items that I mentioned he was working on. And he developed a department for the naming of these animals, which contributed quite a bit to the geology of Yugoslavia.

CE: Fascinating.

AG: We also had a case very similar of we had the biggest collection of what seems like a very minor item, mosquitoes from east Asia, which had been collected during a trip of one of our people to that country. Then, when the Vietnam War came along, the soldiers started getting an epidemic of typhus. It was found these typhus bacteria were carried by mosquitoes, and we were the only place that had a collection of mosquitoes from east Asia, thus we were able to help the army out in trying to put an end to this killing epidemic.

CE: Well, I understand, Mr. Galloway, that one of the specialties of the Academy is this extensive basic research, and then also they are always publishing their findings. Now,

are these sold at the Academy to the public at large, or are they kept within the academic milieu?

AG: Publishing the scientific results is one of the main things the Academy does. The whole results of our research are published and made available to anybody that's interested.

CE: I wonder if you would care to share with us - there has always been confusion - the Academy is physically located in Golden Gate Park, correct? It's called the California Academy of Sciences and yet how is it financed? In other words, who supports it? How does it exist?

AG: It is supported largely, the research work is supported very largely, by voluntary contributions and the membership dues.

CE: Membership dues. Would you hazard a guess of what this membership might be?

AG: Oh, I know very well because at one time I was head of the membership committee. When I left it was about 3,000, but I understand under the vigorous chairmanship of Mrs. Moore it's now more than double that, and of course, the membership expenses have gone up since, due to inflation. But, if you become a member you support this work of taxonomy.

CE: I presume that the Academy receives endowments and grants that are forthcoming.

AG: The Academy does receive quite a bit of money from people who recognize the value of its work.

CE: But, there are people who are salaried there. Is that paid from a budget that is controlled by the Academy or are any of those people supported in any way by the municipal government?

AG: Yes. Due to the will of - Steinhart's will provided that he would leave his money to the city if they would build an aquarium and have it paid for entirely by his bequest. The city agreed to do this and agreed to have the Academy run the aquarium. Therefore, today, the position is that the aquarium is paid for entirely by the city, but the other activities in the scientific line are paid for by the dues and private funds of the aquarium.

CE: Well, this new structure that was completed last year, the Wattis Hall of Man, I believe that building houses the new botany department and the herbarium. Those are specific grants of large sums of money that have brought that to fruition, are they not?

AG: The situation is that all the buildings of the Academy have been built that way, by large gifts of money, but the buildings are then turned over to the city and become a part of the city. They belong to the city- the title passes to the city.

CE: Would you say it is a happy arrangement, satisfactory arrangement?

AG: I would say it is a satisfactory arrangement. But, obviously, difficulties arise.

CE: Getting back to your beginnings in 1958, obviously you evolved as you did with your career with Shell. There is a parallel path I see here, because at one time you became Chairman of the Trustees.

AG: Well, what happened was I had just what the Academy needed at that time - -

CE: Broad experience -

AG: Broad experience in business - -

CE: In the real world -

AG: Yes - in the real world. And, enough funds to be able to carry on myself.

CE: So you gave them your expertise, and it was applicable and helpful to them?

AG: I gave them my expertise in exchange for a place to work, and of course I was working along with people that I liked and knew, which is one of the best things you can do. So, it was a very desirable arrangement as far as that goes.

CE: According to this article in Shell News, there were a couple of other gentlemen who gave some of their time. I guess it was pretty close to the period you were there, Maurice Giles - is that his name?

AG: Yes -

CE: And there was another man -

AG: Another man who worked with - -

CE: Hillmer?

AG: Yes -

CE: Were these men also interested in your subject, or did they branch out into other fields?

AG: No, they were not - Well, Maurice Giles was interested in my subject in as much as he contributed his ability along graphic lines to Dr. Hanna. Hillmer was a member of, I think, Shell Development. I didn't come in contact with him until this article was written in Shell News.

CE: I see.

AG: But, the situation was very much the same with both of them. They had retired and on a pension from Shell Oil Company and wanted to do some productive work to which they were both fitted, and the Academy was able to fit them both in.

CE: It's interesting to me, sir, that in 1973, when this article was written, that the Academy was then the fourth largest repository of natural history collection in the United

States. What were the others? Do you have knowledge of those other places they are talking about?

AG: The places they are talking about are the Smithsonian - -

CE: Boston has one - -

AG: Boston, yes, and Philadelphia has one.

CE: So that would do it. At that time when you started in 1958, did they have any volunteer docents - a docent program at that time?

AG: They did not, no. That was developed after I joined. The credit for it largely goes to Dr. and Mrs. Lindsey who were very keen on developing a docent program.

CE: I understand it's really an extensive training period. You just don't give them a little three-page pamphlet and have them read it and consider that person cleared.

AG: No - They give them a long course in the actual biology and history of mankind and animals.

CE: There seems to be a growing trend in museums and many galleries in the United States. It helps them to have knowledgeable volunteers, if they are knowledgeable and pleasant and can communicate, assist them in this effort.

AG: It's also helpful to the institutions themselves inasmuch as they get a large body of people interested and that means more members - more members nowadays means more money. But, back when I joined the Academy more members meant less money because many advantages were granted but the membership cost did not cover them, but that's very much different today.

CE: Dr. George Lindsay speaks eloquently, I think, about the host of volunteers who have helped the Academy. He says, and I quote, "In essence, they volunteer their lives to the Academy in their retirement and many of them make substantial financial contributions to its budget. This puts them in the strange position of paying us to let them work here, but they do it, and we find it difficult to get along without them."

AG: That's one of the great things that the Academy can offer to a retired man, a place to work, and nice people to work with.

CE: And you know the value of that; you can't retire and do nothing. Not a man as you have been - involved in an exciting, productive, most useful life and scholarly pursuit, it's part of your life. Look what John Thomas Howell continues to do there. He's there every day, and he still goes on field trips. Tell me, did you initiate those field trips regarding your subject? Was that your idea? I bet it was.

AG: Well, it was natural for me to establish field trips to the places I was working on, and I started the field trips to Point Reyes, which have been very successful, and actually have conducted field trips many times.

CE: Would they be offered just to the membership, sir? Or could anyone go?

AG: Originally they were offered just to the membership, but they became so popular we had to offer them to everybody.

CE: Well, I know from John Thomas Howell there were expeditions, of course. There were expeditions financed - well, like Templeton Crocker expeditions to the Galapagos Islands on the Zaca. Well, these are dramatic things requiring great funding, but I do believe perhaps you originated the field trip that has proved to be so successful.

AG: Well, very likely because I did my first field trip for the American Association of Petroleum Geologists when they had a meeting here in California, and subsequently, of course, that started the ball rolling, and then everybody wanted me to do a field trip, and I did for the Academy what I had done for these others, and it became very popular with the membership to go on these field trips.

CE: Well, you know Mr. Galloway I have a copy of one of your field trips, and it is the one to Point Reyes and the San Andreas Fault, and I notice a great deal of effort has gone into this. You have your road log with the tenths of a mile, and where you stopped, turn left, instructions how to proceed on the trip. When you stop, what to look for. Now you must have gone over that terrain many times. Would you tell us how you did it?

AG: Well, I went over the trip many times both by myself and with my wife or sometimes with members of the Geological Survey, that's the U. S. Geological Survey.

CE: Somebody drive the car and another person would be navigator -

AG: That's right.

CE: Mark off the miles and the tenths of miles -

AG: And there are problems like rest stops and things like that kind that have to be solved also. You probably remember that General Motors had a two months strike back about the time I was starting these field trips, because they wanted to have twenty minute rest period I think it was -

CE: And I notice these are compiled so beautifully. You've got a map, Shell Oil, of course on the back, coded with the stops on the trip, and one could almost take this without an escort - the way you've prepared it.

AG: Oh, yes. They're prepared so you can take the trip by yourself.

CE: All right, would you enlighten me on one thing. Would you go on this field trip on a bus or in a caravan of cars?

AG: Well, that's a question of logistics of parking, and it is impossible to find parking space for the number of people who want to come on one of these trips, so in each case I was taking a bus and sometimes two buses.

CE: All right. Then do you act as narrator along the trip and explain all of this, sir?

AG: I usually do, but it takes a certain amount of expertise to get it over to the people that are coming on the trip, particularly on the return trip, they are apt to fall asleep. So it is necessary to get all the information over in the morning.

CE: How many times have you made this trip? Have you any idea, over to this - -

AG: Over to Point Reyes -

CE: This lovely trip you planned May 1, 1971, I bet you've taken that trip many times haven't you?

AG: Oh, probably twenty, thirty times.

CE: Were there any other trips you created?

AG: That was the main one. I also did this trip for the Geological Society of America when they had a meeting in San Francisco.

CE: And I know this one pamphlet published by the California Division of Mines and Geology, Field Trip A, Bulletin 190, that it has beautiful photographs that you acquired somewhere. Did you take some of these photographs?

AG: Some of those photographs are taken by me - some are just dug up by me.

CE: I understand, Mr. Galloway, that Mr. Zumwalt assisted you in some of these efforts, and when you go to the Audubon Canyon Ranch today, which was your former home, that display in the milking barn you put up, did you not?

AG: That's right.

CE: How'd that come about?

AG: Well, that came about through Mr. Zumwalt's request that I should do something to show the geology to people visiting the Audubon Canyon, and this came very happily to me since we had originally owned this ranch, and to turn the milking barn into a museum was quite an undertaking. Particularly as we had to get large specimens of rock which would be big enough for vandals not to carry away and so forth, but we managed it finally. I attribute the success of this showing to Zumwalt who had a wonderful ability to visualize what we needed and also the ability to display.

CE: He is well known for his photographic work; did he do that for you in this project?

AG: There's a lot of photographic work in the show itself, particularly Natural History, and Zumwalt gets the credit for most of this.

CE: Well, I do think it's one of the attractions of the Audubon Canyon Ranch. I think it is a jewel. It's a small gem of a museum, that milking barn.

AG: It's one of the attractions on my field trips, that area; we stop on occasions at the ranch.

CE: I notice on your trip also, if I might ask, (end of side 1) There's a part of your tour that interests me, Mr. Galloway, and that is the stop you made - the ruins of Olema Limekilns built supposedly around the mid-nineteenth century, 1850. I have never seen those. It's on private property, I believe, even now, though it's in the preserve. Would you tell us a little bit about them?

AG: You can reach the limekilns from the road, if you know where to stop and where they are. They are down in the bottom of Olema Creek and were built about in the 1850's. It's always been the story in the area that they were built by the Russians, therefore, they were called the Russian Limekilns. But, records show clearly that the Russians did not set up anything this far south. Bodega was about as far south as they came. So, a lot of work has been done on the so-called Russian Limekilns, and it has been shown by careful dating of the trees and so forth around that the Russian Limekilns are later than the advance of the Russians down to Bodega. In fact, a search of the records shows that the owners of this limekiln land had Irish names and therefore came on the scene much later.

CE: Are they located anywhere near the Copper Mine Canyon? Where one time a copper mine briefly was in action?

AG: Records of the copper mine still show at the surface, and the limekilns are modern. The limekilns are further on up the valley, yes.

CE: Getting back to the Academy a moment, the creation of these field trips that you did which proved so successful, were there any other innovative programs that occurred during your tenure as trustee?

AG: I would say that the meetings engineered by Mr. and Mrs. Lindsay were the most innovative things that happened while I was there, but all the credit for everything done along those lines goes to them. I was not particularly interested in the meetings - -

CE: What kind of meetings? What do you mean? For the public or just for the trustees?

AG: Wel, meetings for the docents really, and for the members.

CE: What were some of the rewarding experiences you've had while you were at the Academy? Things that occurred, either that you brought about or that just took place while you were there those many years?

AG: Well, I think the building of the main building that is now the headquarters - -

CE: Well, you brought that about I understand.

AG: Well, I think the credit for that ought to go to Dr. Lindsay.

CE: I've heard otherwise. I think you're being too modest.

AG: I was there, let's say, at the time that it happened.

CE: You certainly were on the building committee at the time, and I think with your expertise you probably acted as a catalyst and constructively made it possible for that

achievement to occur. All right, we have the building and that is the one you now enter, is it not sir, up the stairs from the main concourse of the park there? What is the skeleton we see in that hall that is so appealing to everyone? It isn't a dinosaur, I don't think.

AG: It's a member of the dinosaur family. It's a fossil - -

CE: All right. Allosaur isn't it?

AG: Allosaurus, yes.

CE: I understand it was discovered right here in the United States at Utah?

AG: That's right, yes. Traditionally, every museum has a dinosaur on display in the central hall, and that goes back many years to when the finding of dinosaurs was a principal job of geologists, paleontologists in California, and goes back a hundred years. So, as soon as we got this big building, first thing we did was try and find a suitable dinosaur and that's what we did.

CE: It's the hallmark of every museum.

AG: Yes. It was very expensive.

CE: What did somebody say, “Go out and find a dinosaur, we've got a building to put it in.”

AG: Well, we put word around that we needed a dinosaur and found where the bones had already been discovered.

CE: It wasn't created, as some people feel, Professor Bolton history students created the Drake plaque? You know some people think zealous students came up with this because Professor Bolton was always saying, “Find it; it's got to be here somewhere.” And some theory is that some obliging students "found" it.

AG: Well, that was the case with the Drake's - - I mean the tale of the cow that fell in the crack on the San Andreas Fault.

CE: What's that tale?

AG: That tale was put around by - -

CE: One of the older geologists? What was the tale Mr. Galloway?

AG: The story of the tail of the cow is written in the work of G. K. Gilbert which is included in the history of the 1906 earthquake by Andy Lawson. The story is that the fault opened at this point, and a cow fell head first into the fault crevice on the Shafter Ranch, and Gilbert's reports at that time that the closure that immediately followed left only the tail visible, and that's in quotation marks. I've always felt that that story is correct, because Gilbert is one of my geological heroes, and he was always correct and always wrote very carefully. One day I took a bunch of students from the University of California out to the Shafter Ranch, and in the course of visiting these different phenomena they gathered in a group and called me over to look at what they'd found and

here was a tail of a cow sticking out of the ground. They then proceeded to donate this to me as a record of their trip, and for many years I had it made of felt hanging in my room at the Academy.

CE: And still do?

AG: I have it in my study right now.

CE: Well, Mr. Galloway, I must share something with you. Two years ago I interviewed Edna Shafter or Crist. She was then ninety. A wonderful woman. She lived at the Oakland Athletic Club, I believe. She died this year. She told me that two days after the earthquake she went over to the ranch with her father and on horseback, and she said, "I saw that tail and that cow. I know it's true. And if you want to believe me or not, I saw it."

Mr. Galloway did you, in addition to your wonderful contribution of being there and seeing that the building was achieved and creating these field trips, did you ever go on any of their expeditions?

AG: Yes, after the trips to Point Reyes were established, I went on a trip with a group of the membership to the Farallon Islands, which I was anxious to see, because they are very similar to Point Reyes itself. I was much disappointed in the trip, because the Farallons, regardless of what people say, have very little attraction. They were exceedingly dry and, of course, nothing grows there. Getting close to the shore in the boat we were attacked by numerous flying insects of all kinds, particularly flies. What I remember most about the Farallons is the flies.

CE: When you went, did you go on a Coast Guard cutter?

AG: No, the whole thing was organized by the Academy, and they acquired the boat and everything else. I've forgotten exactly how it was done.

CE: You know, one of the people we've interviewed was a woman who lived there twenty years, eighty-nine years old, Katherine Strittmatter. Her father was keeper of the light. She tells the story that, in her day, and that would be in the eighties (1880's), there was no communication at all with the mainland, and once every three months only did a boat come. And when there ever was a crisis, they would build fires along the shore, the periphery of the island, the southeast Farallon Island where the lighthouse stood, and passing schooners would be alerted, then, that there was trouble and they'd send out the boat.

AG: I'm sure that's the case. When Dr. Hanna first went out there (we have the story of his trip), the islands were practically not visited. I think the Coast Guard went there once a week, and if you wanted to go to the Farallon Islands you had to catch the Coast Guard boat out there. It's different today, you can fly right out there but at that time you had to take the Coast Guard boat which ran once a week and your visit had to coincide with one of their visits or else you didn't go.

CE: Well, as I understand it today, the light's been automated by the Coast Guard, as so many lights have, which saddens me, and I think the Point Reyes Bird Observatory people are the only ones who have entre to the islands.

AG: I think that's the case, and of course the Point Reyes Bird Observatory was started on our ranch.

CE: Well, I know the Point Reyes Bird Observatory is - its present site is your ranch, but I think it had started earlier out on the Mesa, hadn't it, out in Bolinas?

AG: Yes -

CE: Mrs. Kent made me a member of that, and we went out when they had their, I think, first picnic there.

What was your routine, Mr. Galloway? Would you go there with some regularity like you did at your place of employment, like nine to five, or did you just pop in sporadically?

AG: I went nine to five nearly every day. Of course my work was enthralling - actually writing a book, and so for about, well, for a period of several years, I went every day. Then there ensued a long period of waiting for publication of the book. Everybody had assured me that what they were waiting for was a geological work about the San Andreas Fault in Marin County, but the enthusiasm seemed to have evaporated when I actually set to work and got the book going. That, though, isn't quite the case, because a lot of interest has been shown in the book since I've finished it, and even so, it's taken a long time to get it published.

CE: Is this the book we were speaking of yesterday?

AG: That's the book we were speaking of yesterday, yes. It's going to be a bulletin of the Division of Mines.

CE: So it will not be published by the Academy?

AG: It will not be published by the Academy, because it was thought at the beginning to be too expensive. It involves all these colored maps and so forth which involved thousand of dollars in investment.

CE: Mr. Galloway, what are some of the things that really were meaningful to you during those long years of association with the Academy? Other things besides your work?

AG: Main things that were good at the Academy were my association with the other scientists, particularly the ones working on geology and paleontology. For years I ate lunch every day in the instrument shop at the Academy, which was presided over originally by Dr. Hanna, who was a geologist, and learned much of the back history of the Academy that way.

CE: Well, when you look back, it's an extraordinary thing to have that intellectual stimulus continue in your life in a subject so dear to you; that's not available to many people in this world. Do you know?

AG: That's a great advantage of the Academy.

CE: Would you like to tell us in conclusion, Mr. Galloway, any hopes or plans or directions you would like to see the Academy take in the future to continue its record?

AG: The main thing I want to see, would like to see, the Academy do is to continue its interest in geology. Basically, Randall was a geologist, the first geologist in California and therefore the Academy should continue in geology, but what the Academy does is largely based on what the people that are giving their time to it are interested in doing. That means that largely, they are interested in doing things other than geology at the present time. I think it's most important that the Academy keep up its interest in geology. Geology has become a much more important part of our life since it went through its great change, and the question of the movement of continents and so forth arrived as a big change in the science. Changes in the other sciences, like chemistry and physics, took place at the time of the atomic bomb, and a great deal was published on atomic energy right then and the whole course of chemistry and physics was changed, but geology went along in pretty much the same fashion as it had. Those of us who have retired from the science like myself, find ourselves still in the mainstream but all that has changed since continental drift has become one of the main subjects. In fact, today we are interested in the history of our own planet rather than the history of other planets which is what we had to rely on originally, and that means that people who retire from geology need a long period of education - reeducation you might say, to catch up to what the young people are doing today, and that is very important. It can be done, but it can only be done with the help of an outfit like the Academy of Sciences.

CE: Thank you very much, Mr. Galloway, for those remarkable words.