

INTERVIEW with F. SHERWOOD ROWLAND

January 3, 1974

McCULLOCH: What I want to ask you first, Sherry, is, what attracted you to come to Irvine?

ROWLAND: I guess I should say that the situation for me personally was that I had decided in 1962 on sabbatical leave that the position that-- Are you going to erase that, or what?

McCULLOCH: No, I'm not erasing that; I'm leaving that, Sherry. So we're all set and going now.

ROWLAND: Starting from the--

McCULLOCH: Starting from the--

ROWLAND: But I'll start over again.

McCULLOCH: You're right.

ROWLAND: I was employed at the University of Kansas, and I had a substantial research group operating there, and ^Iit was becoming somewhat restive there about what I took to be the inherent limitations of the University of Kansas, and those became worse when Franklin Murphy, who was the Chancellor at the University of Kansas, left in 1960 to become Chancellor at UCLA. In the couple of years immediately following that, it became clear to me that the University of Kansas was not going to go up any more, but would, in fact, probably start sliding down, and that it would be to my advantage for my long-run and personal satisfaction to be somewhere else. And so one of the first things I did on my sabbatical leave in 1962, which was spent in Germany, was to think about my situation as to what I wanted to do, and then I wrote to a few people to indicate that, while I thought it was--(fire gong sounds). That's a fire--we've got to go!

I think in case anyone plays this over, we ought to tell them that it was a minor fire in the Physics Department.

McCULLOCH: All right. It's on the tape.

ROWLAND: That we evacuated the building, and no one was injured, et cetera.

McCULLOCH: Very good.

ROWLAND: Okay. In 1962, I wrote to some of my mentors in the chemistry profession and indicated that my situation at Kansas was excellent for the present, but that for the future I thought it would be better if I were to move somewhere else. Some of these people to whom I wrote were on the faculty at UCLA and at San Diego, and I'm sure that they were instrumental in my being considered when the Irvine position came up.

The first opportunity that came after I had written, which I thought about a little bit, was an opportunity to go to Heidelberg in Germany, and I decided I was an American citizen and did not want to raise my children somewhere else, and so, although scientifically that offered a superb opportunity, I would sit it out and wait for something else.

And during that period of time, say roughly from 1961, there was an article in Science magazine about the new Universities of California, and from about 1961 on, the standard comeback in discussions among disgruntled faculty members of Kansas, when they would say, "Well, if you don't like it here, why don't you leave?" I would say, "I'm waiting for one of the new Universities of California." So when Ivan Hinderaker contacted me early in 1964, then I was obviously interested in the position and ready to make a move.

McCULLOCH: And you actually came that summer of '64, didn't you?

ROWLAND: Yes, I came out here early in '64, probably in March, and I went back to Kansas, and when they asked about counter offers et cetera,

I said, "Don't bother because, if they make me an offer, I'm going." And so the offer was made, and I came out.

McCULLOCH: Delighted to have you. Well, the second question, Sherry, what memories do you carry of those conferences we had?

ROWLAND: The memory, I guess, was just simply that people had mixed views of American education at that time. Some people were specifically very unhappy with the way their disciplines were organized, and I would say social science, for example--that Jim March and those people felt that the present organization as it existed in the early '60s was just unsatisfactory.

The biological scientists, in the person of Ed Steinhaus, felt that the biological sciences had become so fragmented, and fragmented in what were now nonsensical ways, that on the molecular level things may be quite the same for vertebrate and invertebrate animals and plants and so on, but that the organization of biology had the molecular level being discussed in all of those separately, and so he looked at it as being an excellent opportunity to reorganize.

And in the physical sciences, I would say that Ken Ford and Bernie Gelbaum in physics and math and for me in chemistry, we were reasonably happy with the way physical sciences were organized, and so in that sense we were not looking to overturn the world and reorganize, but rather just set up the disciplines and get going.

McCULLOCH: We felt the same way in humanities. I felt the same way.

ROWLAND: So, in that respect, there was a trading back and forth between earthshakers and those who felt that their disciplines, at least, were suitably organized for that time and we should just get started. It was in that respect a period of some compromise in trying to provide freedom for those who felt that they were being greatly constricted by the national setups in their disciplines plus those that weren't.

I will say that in one respect there were some far-reaching complications that came out of what sounds like a rather minor kind of agreement. When we agreed at that time that we would go onto a course plan and one course was the norm for everybody, we in the physical sciences probably didn't pay enough attention to the sheer mathematics that's involved there, because chemistry in most universities was at that time a five-hour course. We had no feeling that that was too much work, but in accepting a one-course arrangement, we were going more or less from what was normally a five-hour course to four credits for that course.

And at the same time, courses like philosophy, which were normally three credits, went up to four, because they were one course, too. This is a very big difference between going from a five-hour course to one unit and a three-hour course to one unit, because when you start adding together the total schedules that everybody would be asking, the typical physical science major might very well have four courses, all of which in the old days were five-hour courses, a 20-hour load, and a very heavy load.

And the humanist or social scientist might also have four courses, all of which in the old days or in other universities would be three-hour courses or a 12-hour, a rather light, load. So everybody gave lip service to this discrepancy, but in fact it's hard for me to find any evidence that the amount of work required for a three-hour course, which became one course, was any different after the change; it was just more credit for the same amount of work.

And in the physical sciences, we somewhat later on recognized this discrepancy and have now given one and a quarter, or five hours credit, back again in a number of the courses. But in the first five to eight years, the typical load for scientists who carried four courses was very much higher than--(telephone sounds).

McCULLOCH: I will say this, though, Sherry, that we in the humanities did increase the amount of material; for example, I meet my classes mostly three times a week, sometimes more, and I certainly stepped up the material to make it four. We teach five courses in the humanities, and the sixth is supposed to be our advising. Remember Peltason said that we should have not a six-course load but a five-course load.

ROWLAND: I was thinking of it in terms of the student, rather than of the faculty member.

McCULLOCH: He takes four courses?

ROWLAND: He takes four courses, and the question of what was a fair load for a faculty member is a different matter.

McCULLOCH: Is a different matter--

ROWLAND: Or whether the student--

McCULLOCH: Right.

ROWLAND: --has much of his time involved in school work or not?

McCULLOCH: I see; I understand. Did you agree with the 6-3-3? Do you think that was a good general educational requirement we worked out at the conference? Do you remember?

ROWLAND: Right. My overall reaction was that I thought the 6-3-3 was a workable compromise that the general education requirement was, in a sense, so minimal from the science standpoint, it was hard to see how anyone could fail to meet the 6-3-3 requirement, even if he tried actively to avoid it; that is, there are enough things that one has to take in other schools that it didn't seem that this was much of a requirement; it was more just a statement of minimum fact.

Let me just give you the general attitude that I think you'll find among many scientists and that is that the scientist and the humanist see liberal education in different ways. They say sort of the same things, but

when it gets down to say, "What does that mean in terms of what courses you register for?" as you'll recall, the History Department at that meeting came in with a major that had 27 courses in history, a new world record, and that would be defended by historians as being a good liberal education to take nothing but history, or--

McCULLOCH: I can't remember that it was that high. We finally got nine plus three is twelve, so I thought we had twelve courses.

ROWLAND: Yes, but when it first came in, the History Department was the one that had, by far, the most courses prescribed within their own area.

McCULLOCH: Yes, I think so.

ROWLAND: And to find a historian who will recommend that somebody take, say, six courses in chemistry would be almost impossible. To meet the 6-3-3 by actually taking laboratory courses is something that doesn't occur to humanists. So we had a feeling that the definition of liberal arts to a humanist does not really include science, but to the scientist it has to include something about English, because he has communication problems like everyone else and so on. So there's a lot of compromise involved there, and the 6-3-3 apparently proved to some people onerous in that it forces them to take courses outside their own discipline.

McCULLOCH: But using foreign languages, too, possibly, for that comes in the humanities, too, of course; English and foreign languages and so on. I do remember in history we had a few more, but I don't think we had as many as 27, because I know now we only ask for three courses in the lower division, a year's work, and nine courses in the upper division, so nine and three are 12, a total out of 45.

ROWLAND: Well, you were beaten down from your original asking price.

McCULLOCH: Maybe we were, but I can't remember 27, but I think you've got a good point.

Now going on, Sherry, in making your appointments in chemistry, did you find you ran into problems with our Universitywide regulations, with our committees, our ad hoc committee system, and the setting up of these review committees to consider your tenure members?

ROWLAND: No. I think most people looked at it the same way, I guess, that I looked at it. It took the University of California longer to make an offer to me than it would have in most systems, but my experience was that universities weren't as selective or judicious in making offers as they should be, and so to find someone that apparently took more time and thought in making an offer was an advantage and not a disadvantage, even if it meant you had to wait for a while.

McCULLOCH: Did you lose anyone that way?

ROWLAND: No. Whether or not there is a fact of a time delay means that you're giving more thought is a separate matter, but to the person on the outside he at least can imagine that you're giving more thought, particularly if he gets an offer. Then he can have the feeling, well, I've passed through some critical judgment there, I feel better about it.

The only case that there was any problem about for us was the appointment of Marjorie Caserio. My original recommendation for Marjorie's appointment was that she should be appointed as an Associate Professor. And just parenthetically, she is now a full Professor. The difficulty was, there, that Marjorie had been connected with some very important organic chemistry, but had been a copublisher with John D. Roberts, who was a member of the National Academy of Sciences, on almost all of that work. She was a senior collaborator at Cal Tech with Roberts and had been there for seven or eight years. This meant that to the outside Review Committee she had no publishable work of which she was the senior author, and they were unwilling to buy tenure on that basis; on the other hand, it did mean that she had a

very substantial reputation. My own feeling at the time that we hired her was that she was one of the best-known persons on the faculty in the Chemistry Department and that we were in that sense getting somebody at an Assistant Professor rank who already had a national and international reputation which was remedied very quickly with her promotion to Associate Professor after two years. So that was the only place that the Review Committee procedure differed substantially from what would have happened, I think, on some other campus, not at the University. By going through the ad hoc committee, they questioned her independence--not her capability of independence, but they questioned her proof of independent operation, because she hadn't been independent. Then as soon as she proved it, then she got credit retroactively for the previous work.

MCCULLOCH: Well, this question was essentially designed for a person like Jim March. When he answered that question, he just had plain problems, because the type of person he wanted, the University of California wasn't used to, didn't know where to put them on the scale and so on.

Question number four here, how would you change the system? He would have liked it to be changed. I take that your answer to that is that you feel that the University of California has a pretty good system of making appointments. Do you?

ROWLAND: That will come back, I suppose, to the satisfaction, real or perceived, of the department Chairman or the Dean with the situation in his discipline. If you come into it feeling that your discipline is approaching things in a reasonable way, that means that there is fair agreement between you and the general consensus of the discipline about what it is that makes a good chemist, so you won't be unhappy with the judgment of a group of peers. But, if you aren't in agreement with the general feeling about the discipline, then you're very much going to say, "Well, I don't trust the

leaders of this. I'm trying to upset the Establishment." And so that would just follow inherently that March was trying to upset the Establishment, and basically I was not.

McCULLOCH: That's a good answer. Well, going on, Sherry, how do you think we did when we set up the UCI Academic Senate? Were you on that committee that helped to draft the document?

ROWLAND: No.

McCULLOCH: You weren't?

ROWLAND: I'm not really an academic lawyer. I find bylaws irritating, once you find one there that you don't like, but not so irritating but what it's worth avoiding being on committees that draw them up, because I just can't stand arguing about the wording in bylaws. If you feel that way, then you'll have to put up with the fact that sometime later somebody who can stand it will have put something in there that you don't like.

Incidentally, something that comes up in terms of asking about Universitywide administrative regulations--reasonable, helpful, or obstructive--one of the things which I found when I came in in the summer of 1964, coming in cold to hire a Chemistry Department from scratch, was that it's useful to have some help. The people at San Diego and I think UCLA and Riverside were all uniformly helpful as were the people at Cal Tech and at Berkeley. I would say that the cooperation of the other campuses in my view was excellent, and the cooperation at Cal Tech, which is not a member of the system, was just as good as was the cooperation of UCLA and San Diego and Riverside. But there was nothing that I could ever detect of any kinds of interference or failure to cooperate. Everybody was really extremely helpful in that respect. I thought that my contacts with the chemists at all the rest of these places were really very helpful in setting up the department here.

McCULLOCH: Very good. I'm glad to hear that. I had a similar situation in humanities. The only problem I had essentially was in the area of fine arts and trying to persuade them to have a Master of Fine Arts in our Creative Writing program. We needed to persuade them to grant it, but after that it was fine.

Looking at question six, are there any bylaws you feel we should change in our UCI Senate?

ROWLAND: I have no feeling about that at all. I suppose I would say that I'm much more power-oriented than I am legally oriented. I feel that the bylaws can be worked within or can be avoided fairly well by whoever wants to do it who is in power, and so I'm more inclined to be concerned about who it is who has the power rather than whether or not I can constrict him with bylaws that I like that will prevent him from doing things.

McCULLOCH: Good answer. Going on, Sherry, in what areas do you think you've had the greatest successes here at UCI?

ROWLAND: By "you" do you mean---

McCULLOCH: I mean you, as Sherry, and your department that you created and the building that you built here, because you were mostly planning this building, as I remember. You were very deeply involved with the planning of this Physical Science Building.

ROWLAND: My observation is that chemistry departments look alike all over the world, and it is no consolation whatsoever to say that we have a better building than somebody else. The differences in departments are not in the location of the hoods or whether you have chases down the middle or down the outsides. But it is a physical circumstance that you just had illustrated for you a little bit earlier that life in a chemistry department is different from life in a department that does not have laboratories. We do have explosions, we do have fires, and I suppose in that respect we have

to spend some time worrying about not having fatal explosions in freshman chemistry laboratories, et cetera. So there is a practical danger aspect that is present in our buildings at all times. It makes one have to be a little bit concerned about whether it is a fire trap, because we know that there will be fires, and we don't want them to spread. So far we have been very fortunate.

McCULLOCH: I was impressed by the way we got out of this place. It was pretty fast.

I was thinking more, Sherry, in terms of your own department---your program and your department and your personnel.

ROWLAND: One answer to that can be this: this stage, this is nine and a half years, now, since I came here. Everyone who has come to the Chemistry Department is still here, except for one person who was released for failure to make tenure. We have not lost a tenured faculty member to anyone.

McCULLOCH: That's a compliment.

ROWLAND: It's not necessarily a compliment. Either we chose people who were contented, or we chose very badly and no one wants anyone that's here, so the fact that you haven't lost anyone doesn't necessarily prove that you have anyone worth having.

McCULLOCH: Well, I assume that they have had offers, such as we've had in the humanities and we've countered the offer and kept the person.

ROWLAND: We have had offers basically to every tenured member of the faculty. I don't think we have had any just unbelievable offers.

As a partial answer to your question, one of the aspects about this department which is, I think, successful is that it is a pleasant department to work in. There are no cliques. There are, in fact, no two people on the faculty who do not want to see each other socially, so that, if you are going to invite people to a party, you don't have to say, "Well, we ought

not to have X and Y together." I wouldn't say that we are closely knit, but we have no enmities within the department; that certainly makes for a much more pleasant life for everybody. My own philosophy about this says that it's easier for this to do in a science department where the ultimate source of satisfaction for many of the people, or at least the major source of satisfaction for many of us, will be the kind of research that we can do, and how it is received outside--and outside is the key word there. Our ability to do that research depends substantially on federal funding, and whether you have federal funding or not does not depend very strongly on whether or not you get along with your neighbor in your building, and it is certainly not the question of the money going either to you or to him, since the department Chairman then and the Dean of Physical Sciences control only a small amount of money relative to the needs of the department. There isn't the advantage to be gained by knifing one another that there might be if the only source of funds were from the local campus. So I'm saying that it's perhaps easier for chemists to get along, because there's no great advantage to not getting along.

McCULLOCH: I realized it, but I hadn't heard it formulated the way you have.

ROWLAND: Within chemistry departments generally though I think we have a more congenial department, but, if all you have is congeniality, then you haven't got very much. But if you have congeniality and you have people who are working hard, then it is more pleasant to go to work and it is easier to go to work. And I think, in that respect, so far we don't have any dead wood.

McCULLOCH: That's the key word, dead wood.

ROWLAND: Everybody in the department is still active and has a reasonably good research program going, and the only reason I put reasonably in is

because, let's say, when forming a new campus, one tends to use the standards of, say, 1965 to 1968, and the desirability of research in the physical sciences has, on the national scale, gone down substantially in the last five or six years, and as a result of that on the scale of six or seven or eight years ago the federal support that we have is not as much as we would like. We're doing very well on a competitive basis, but still, on an absolute basis using the middle '60s as a guide, on that scale we would be operating in a mediocre fashion, because people do have trouble getting funds, but that's a national--

McCULLOCH: It's a nationwide problem.

ROWLAND: It's a nationwide symptom at the present time.

McCULLOCH: The other question, Sherry, is, in what areas do you think you've had the least successes? Maybe you haven't had any areas at all in this category.

ROWLAND: When I made up my mind about how to go about forming the Chemistry Department, there are some choices that one has, and the choice that I made was to try to form two groups of people who were operating in relatively narrow disciplines where they could talk to one another, and in that narrow discipline one could hope to be nationally and internationally competitive if you would have colleagues and so on, and these areas were in chemical kinetics and in physical organic chemistry. And so in our original appointments we appointed three people in each of those areas, and then one other person, Dave Brant, came in in biophysical chemistry. The original intent, then, was to add, more or less, one area every year for five or six years until we've covered most of the areas in chemistry. The general freeze on expansion that hit the faculty after '67 then meant that you were left in that sense with a chemistry department which is not covering fully all of chemistry, but rather is covering some parts of it well and other

parts not at all. That's true on the graduate research level; on the undergraduate teaching level and on the graduate teaching level we were able to cover all of the areas that I thought should be covered right from the beginning. But it makes it difficult specifically for somebody like Dave Brant in biophysical chemistry; because we weren't able to expand as fast as we could, some people like Dave were left out in the cold, not having a real coherent group to work with, and they were left out there for a substantial period of time. And it's only in the last year or two that we have been able to make some remedy for this.

Now the alternative procedure, to try to cover everything right from the beginning, would have left everybody out in the cold in about 1968, because then we wouldn't have had an established group in anything; we would have had only one or two appointments in each group.

I think at the present time people externally would describe this department as lopsided in the direction of kinetics, but that is chemical kinetics, that we are known as one of the best chemical kinetics centers in the world--not known as the best or anything of that sort, but that we have kineticists here that people know and will recognize as being contributors and that we have a number of them that are known in that fashion.

MCCULLOCH: Do you spell kineticists k-i-n--?

ROWLAND: K-i-n-e-t-i-c-i-s-t-s. And this would include Don Bunker and ~~Maxwell S~~ ^{Max Wolfsberg} and Ed Lee and myself, and we've added another man, Bob McIver, so we still have a very substantial fraction of our effort going in that area. I don't think that that has been bad, but I think some people outside would say, "Well, look at the lopsidedness that comes out of it," and say that they might prefer differently. I think it's worked out quite well from my point of view. But I'm just pointing out that that's where some people may draw that as a disadvantage.

McCULLOCH: Yes. What problems are unique to Irvine because it's new or because it's a particular campus? Can you identify, or do you feel we have very unique problems?

ROWLAND: I don't think that Irvine has unique problems.

McCULLOCH: We're not saying new because, of course, we're part of a system.

ROWLAND: Right. With the possibilities for starting a new campus, I think that the situation as it looked in 1963 and '64 for the Irvine campus was about as good as one could hope to have. In practice it would have helped if the state of California had provided more money, and I think the amount of more money that was needed was not that great, that the savings that could be made have really ^{not} justified saving to get the money. I think that to cut down the flow of money to the new campuses at their critical growing period is a very shortsighted economy and will have permanent effects on the University on those campuses for the next 50 years. But that's what the Governor and the state Legislature chose, and that's what they've got. I think that Irvine and Santa Cruz and UCSD could have been much better campuses than they are and that the most serious limitation was financial.

McCULLOCH: That's right, yes. Well, here's a question, Sherry, what would you do differently, if you had it to do all over again?

ROWLAND: On a personal basis, the Chemistry Department has had a certain amount of difficulty in its general relationships in the School of Physical Sciences because the present Dean and the only Dean we have had is a slow learner. He came in saying he knew no chemistry but that he was eager to learn it, and he still knows no chemistry and acts in this fashion. (I really don't attribute Machiavellian motives to him.) He just does those things which he thinks will be best for the School of Physical Sciences and

has to weight his judgment by those things which he thinks are interesting; those things which he thinks are interesting are high-energy physics and maybe a little bit of other physics, and chemistry and math are things about which he knows very little, and which he knows very little about because he's not very interested, so that you have for a period as we have now since 1966--we're in our eighth year of nonleadership--that is, being led by someone who has no sympathy, understanding, or aspirations at a real gut level. Of course, he's in favor of having an excellent Chemistry Department. But for the Dean, that may come at some time that having to choose between doing something for the Physics Department and doing something for the Chemistry Department the choice is always clear, it's always Physics, and over a period of time that can make some difficulties.

Oh, you asked what would I do differently if I had it to do all over again. I probably would have voted differently if I had been on the Selection Committee for the Dean. I should have been more skeptical about the ability of physicists to learn or their interest in learning. As you know, Sam, we just vacated this building because of the fire. That fire was caused by a physicist working with an open flame and with the chemical, carbon disulfide, which will flame on contact with a hot water pipe, let alone an open flame, so he simply knew no chemistry and went right ahead and fortunately burned up only his handkerchief. I guess that probably points out the answer to your question, "What would you do differently if you had it to do all over again?"

There is a different outlook in physical sciences now than there was 10 years ago, and probably we would be better off as a School of Physical Sciences if we had not been so satisfied about our own insular behavior. Chemistry was happy with the way chemistry was; physics was happy with the way physics was; math was happy with the way math was.

And the Dean was happy if you left him alone. And you grow that way, and you end up with departments that are successful and the school is not, and it's not a successful school in the sense that there is a school and there are three departments that occupy the same building but which have nothing very much in common and nothing very much to do with one another. So probably from the undergraduate point of view we could be offering a better education if there were more contact among the schools. This is a position in which the Dean should lead, but since there was no leadership there's no real excuse for chemistry and mathematics not to push it if the Dean didn't. And probably we should have done more about trying to make a more coordinated approach.

Now one has the retroactive advantage of hindsight; now we know what it's like in 1974 instead of what we think it would be like in 1974 and the projections for how big the School of Physical Science would be. On the undergraduate level we're fairly correct; on the graduate level we're woefully wrong because the plans as envisioned in the early 1960s showed an increasing fraction of graduate work at all of the new campuses, and that just hasn't happened. The plans presumably foresaw that there would be continued federal support, probably increasing. All of us are generally aware that the fraction of people employed in the educational profession has risen steadily, but the number going on to graduate work has risen steadily, and everybody knew that in their hearts, that this had to be sigmoid, that the maximum amount of money that could go to physics in the United States was limited by the gross national product, and that in fact it probably was unlikely that it would ever rise to be 10 or 20 percent of the gross national product, but the extrapolations were made as though it was an exponential and not a ^{sigmoid} ~~sigma~~ point curve.

McCULLOCH: Yes, yes.

ROWLAND: The surprise, I suppose, to most of us was that the sigmoid behavior appeared so early and that we have leveled off in aspirations and in actual ability as soon as we have.

McCULLOCH: Yes, that's putting it very well. Well, then, the second from the last question, Sherry, do you like the liberal arts and sciences organized into schools, or would you prefer a College of Arts, Letters, and Sciences? You explained that the present organization hasn't brought the three departments together, but would a liberal arts college have done any better?

~~RPW:AMD~~ The present situation of the departments is not a function of the bylaws of the Academic Senate; that's a function of the nature and personality of the person in charge.

McCULLOCH: Yes, this is right. I understand. But organizationally, how do you feel about a College of Arts, Letters, and Sciences vis-a-vis schools and colleges?

ROWLAND: I think if we had known in 1964 and were aiming toward a campus which 20 years and maybe 30 or 40 years down the line would have an undergraduate population of eight or nine thousand and a graduate population of two or three thousand, then I think that we would probably have said, "That is not so large but what the Dean of the College of Arts and Sciences can function, can manage it," and I think we would probably be better off if that had happened. The power that is on this campus rests with the Vice Chancellor for Academic Affairs. He has to administer that power, but he has a lot of other things to take up his time, and so the individual Deans become very important, and the education of the undergraduate is very much school-oriented and very little campus-oriented, and I think too much so. In that sense, it would have been better. Knowing now that that's the size that we have and it's likely to stay, then I think it would be better if we

had a College of Liberal Arts and Sciences. If we're going to twenty-seven or thirty thousand, then generally those places don't look so good, because that's just too many people for the Dean of the College to handle.

McCULLOCH: That's exactly my point and reasoning. No one thought at that time, back in 1964, that we were going to stop at about nine or ten thousand.

Well, the last question, Sherry, are there any experiences in the early years that we've missed or that you'd like to comment on? Anything that's happened? This is eight and a half years. You've been here nine and a half years.

ROWLAND: Right. You're a historian. There are, I would think, institutional histories and there are personal histories, and I take it that what we're doing here is an institutional history.

McCULLOCH: But an institution is made up of persons.

ROWLAND: If you're a student at Irvine in 1966, it may not be a great advantage to you to say, "In 1974, we will have trees all over the place," when you're walking through mud; the reality is the mud, and the reality is ^{that's} ~~that~~ what it's going to be like essentially through your college career and what Irvine is like at some later time has nothing to do with your own personal experience.

So my own personal experience here has been that I found being Chairman of the department, for what I describe as three years of building it up and then three years administering it, was a very rewarding experience. Near the end of that time, when I found that I was spending a substantial amount of time arguing with Personnel over whether a secretary should be Step II or Step III, then I decided that the bureaucracy had gotten hold sufficiently that I was no longer happy bucking it as my daily job.

As far as the opportunities here for individual faculty members in chemistry, I think they have been good; for some, they have been excellent. And I think, at the same time, we have spent a substantial amount of time in working on undergraduate teaching. It is difficult to teach undergraduates in 250-to-350-man lecture sections all the time and provide them with the feeling that they're getting personal attention. I'm afraid that maybe 10 years ago the problem of education was how to make a person think that he's getting individual attention when he's not, or how to make him feel that it is really something special to go to college or university when, in fact, everybody he knows goes, so that it isn't really anything special.

I'm happy with the fact that the Chemistry Department has done as well as it has in establishing a national reputation, at the same time establishing a local reputation for being interested in teaching and worrying about teaching. I think we have done that in the face of--well, one of the most dissatisfying aspects of being a teacher of chemistry at the present time is the overwhelming number of undergraduates that come to Irvine right now who want to be MDs. And if they want to be MDs, then most of them major in biological science, and they are required to take two years of chemistry. Now approximately half of the undergraduates ^{have} ~~on~~ biological science as their major, most of them declare that the reason they're doing this is because they're interested in premed.

There are a few that really want to be biologists, and there are a number who are not sure what they want to be, but in being unsure about what they want to be, one of the options they want to keep open is going to medical school. This fall we had 1150 students. We don't have that many undergraduates. Now, 1150 out of, say, 7000 students are taking freshman chemistry, and of those 1150, probably 1000 of them have a full or partial intention of becoming premed. The number of students that went to medical school at

Irvine last year was about 35, and somewhere along the line we, as an institution, have to take care of these thousands of premeds as they're being cut to 35 ~~and~~ actually going to medical school. And that's an unhappy kind of existence in which what you do is provide the education which they think they're taking for premed, and we know that they're not. They take it as premed, but they're not going to go to medical school. This has some dynamic consequences in the operation of a large class--350 students in a large class. It is the overwhelming experience of all the people teaching here. Cheating is a way of life. If you want to be one of three percent that are going to survive, or 10 percent or five percent and survive and go to medical school, a fair number of people will decide that they want to claw their way into that. And you spend a substantial amount of time trying to run the system in such a way that cheating is discouraged and, if not prevented, it is not rewarded. And I guess you should also put it this way: what you're doing as a teacher of freshman chemistry is lecturing to people who are not taking this course because they want to take chemistry; they're taking it because they want to go to medical school, and somebody told them that they must take it if they want to go to medical school.

What you're going to do for most of them is to show them that chemistry is hard enough that they're not going to do very well in it, and as a result they're going to have to change their career aspirations. We have a very strong possibility of becoming ogres in that situation.

McCULLOCH: Yes. I see, I see. I understand. Anything else that you can think of that you'd like to comment on?

ROWLAND: I suppose, yes, I'll put in my evaluation, that Irvine at this stage on a national scale is a second-rate university. That isn't what we tried to build. I'm not sure that we would have done much better if we had been adequately supported past the initial surge. I thought we had

adequate support until 1966, and then that was the first time that it began to be a little bit slipping, and then it's been steadily downhill since. I think the state has gotten what they bought. They put in enough money to buy a second-rate campus, and they got one. They did it, stating, as is usual for politicians, that they were putting in an amount that was enough to buy a first-rate campus. And the University never really contradicted them on the fear, I suppose, that they would then, if you said, "You're not buying a first-rate campus with that amount of money--you're buying a second-rate one," they would then cut the money so that we could be third-rate. That's a political choice on the part of the University leadership.

McCULLOCH: That's a good answer. Well, thank you, Sherry, very much. I certainly want to congratulate you on your Guggenheim. I hope you have a very fine experience in Vienna. You'll be back in June?

ROWLAND: I'll be back in June, right.