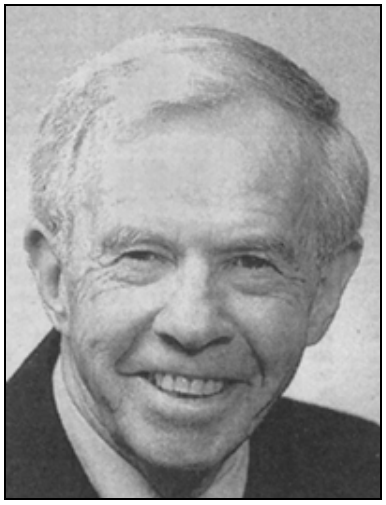

VICTOR V. VEYSEY
(1915–2001)

INTERVIEWED BY
SHIRLEY K. COHEN

July 14 & 21, 1993 and
February 4, 1994

ARCHIVES
CALIFORNIA INSTITUTE OF TECHNOLOGY
Pasadena, California

Subject area

Industrial relations; engineering; World War II

Abstract

Interview in three sessions in 1993 and 1994 with Victor V. Veysey, director of Caltech's Industrial Relations Center and lecturer in business economics, 1977-1983, and Caltech alumnus (BS, 1936). He discusses his growing up in Los Angeles and Brawley (Imperial Valley), California; education at Caltech in civil engineering, then MBA at Harvard. Joins staff of Caltech's newly established Industrial Relations Center (IRC) in 1939. After outbreak of World War II he is assigned to management duties within Caltech's rocket project under leadership of Earnest Watson; involved in retrorocket, High Velocity Aircraft Rocket (HVAR), and barrage rocket programs for the navy. Concerned in later stages of the war with transfer of Caltech wartime personnel to Aerojet Corporation, the navy, and Jet Propulsion Laboratory. Involvement with Project Camel (atomic bomb housing) as assistant to Trevor Gardner. In postwar period Veysey returns to ranching in Brawley and enters local and state politics; eventually elected to California legislature (1962) and the US Congress (1970). Appointed assistant secretary of the army for civil works by President Ford in 1974. Returns to Caltech as director of the IRC, 1977; recalls IRC colleagues Robert Gray and Arthur Young, their innovative projects. Further comments on living and working in Sacramento and Washington, DC.

Administrative information

Access

The interview is unrestricted.

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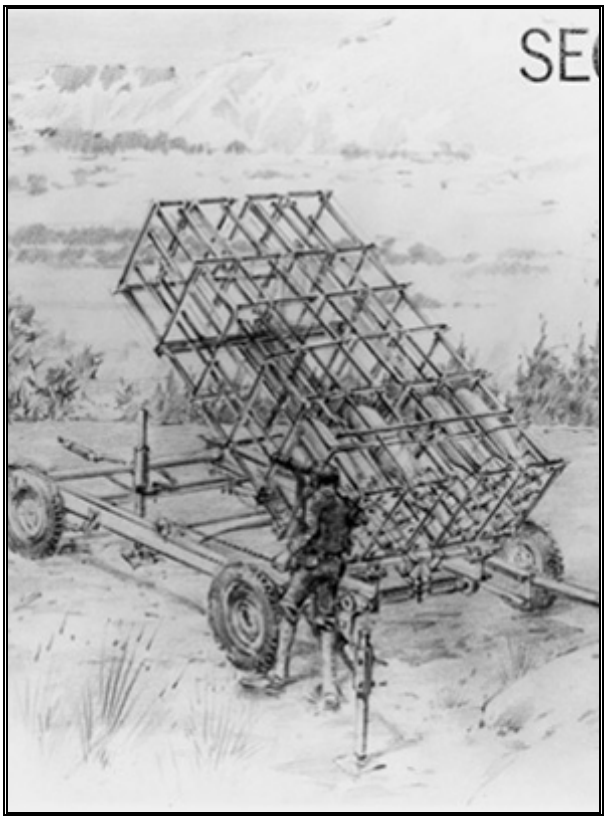

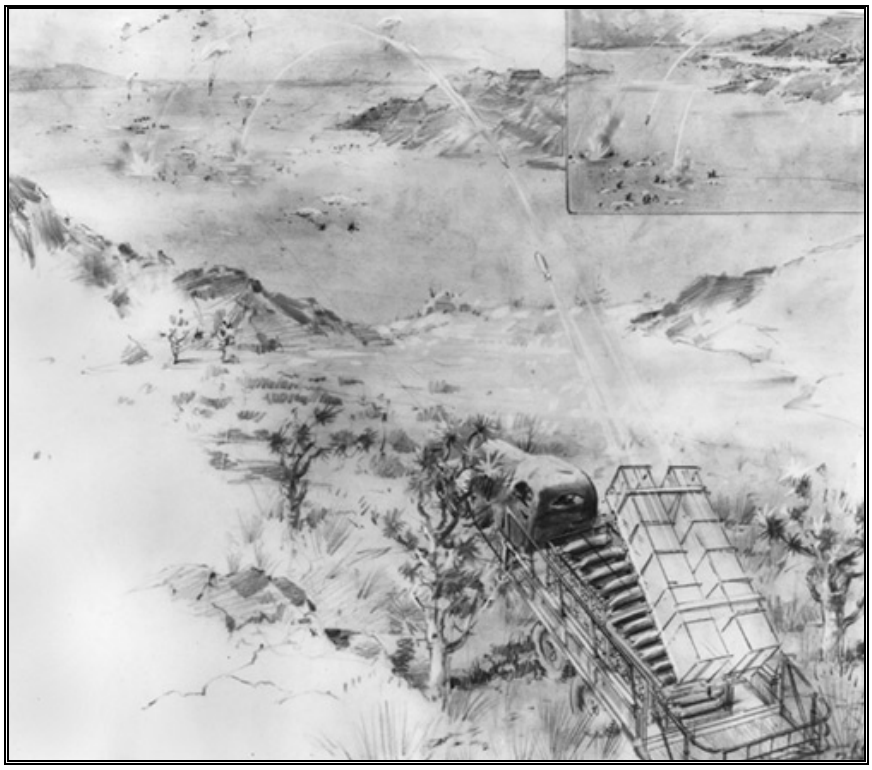

During the Second World War, Victor Veysey and his team worked on the production of the versatile barrage rocket, used extensively in the South Pacific theater. The photograph (top left), and Russell Porter's 1942 visualizations of their use to defend the California coastline, illustrate how the rockets were to be deployed. Caltech Archives

CALIFORNIA INSTITUTE OF TECHNOLOGY
ORAL HISTORY PROJECT

INTERVIEW WITH VICTORY V. VEYSEY

BY SHIRLEY K. COHEN

PASADENA, CALIFORNIA

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CALIFORNIA INSTITUTE OF TECHNOLOGY
ORAL HISTORY PROJECT

Interview with Victor V. Veysey **by Shirley K. Cohen**

Pasadena, California

Session 1	July 14, 1993
Session 2	July 21, 1993
Session 3	February 4, 1994*

COHEN: I see that you are really a Los Angeleno and have grown up here. Could you tell us just a little bit about growing up and going to school in Los Angeles.

VEYSEY: [Laughter] Yes, I'm a native of Southern California, which is a little surprising in my age group, because there aren't too many of us that were born here. But my parents moved to Southern California in 1910, coming here from the Pacific Northwest. They found a piece of property in Eagle Rock, just west of Pasadena, got a hilltop there and built a house.

COHEN: Where did they come from?

VEYSEY: They came from the Grays Harbor area, in Washington. My father and his brothers were in business together in the logging woods, which included Aberdeen, Hoquiam, Montesano, and Elma—small towns, when the logging was going on heavily there. They had general-merchandise stores; that is, they had everything from groceries to fur coats in the one store. They made two or three efforts at that, finally got pretty good at it and were quite successful. But my father opted out of the business, because there was a typhoid-fever epidemic in the community, and he was very ill for a year or two. So he dropped out of the business. And my parents traveled some, and then came to Southern California, and hit two places that they really liked. One was Eagle Rock, where they decided to build a house and did so. And the other was the Imperial Valley, where my father got some farmland near Brawley, California.

* Note: Session 3 of the Victor Veysey interview has been integrated into the earlier two sessions in this transcript.

COHEN: So it was very early on that they were involved with land in the…

VEYSEY: Pretty early. There was lots of vacant land around then. Eagle Rock was a quiet little valley and had orange trees and things like that in it. It's interesting that my father acquired two pieces of ground there; one was a hilltop, where they built the house, and the second was a flat piece of ground, which was farmed in produce and vegetable gardens by some Japanese.

COHEN: What year are we talking about?

VEYSEY: Well, 1910 is when they came here. I didn't arrive until 1915. But that second piece of ground, where the produce was raised, is now the site of the Eagle Rock High School.

COHEN: Then you went to that high school.

VEYSEY: Yes indeed I did. I divided my time between going to school in Eagle Rock and in Brawley, California, which is in the Imperial Valley about 25 miles north of the Mexican border. That's where the ranch is located. I think the first day I ever went to school was at Brawley, but then we were back and forth several times in the interim. And I have fond memories of both of those schools.

COHEN: Where did you actually graduate?

VEYSEY: I graduated from Eagle Rock High School, and was probably well aimed toward going to Occidental College, because it's nearby. I had three redheaded sisters, all of whom went to Occidental College, so that seemed like a natural thing for me to do. But a strange event took place, which changed my direction quite a lot. I had a very forceful high-school chemistry teacher, whose name was Miss Bessie Butcher. She was strong and very good, and very devoted to her students. She ran special classes, or group meetings, for more advanced students. So she said, "So you're going to Occidental College." I said, "Yeah, I think that's what I'll do." She

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As a result, no session or tape breaks are indicated.

said, “No, that’s not right. You should go to Caltech.” I said, “I don’t think I could get in there.” “Well,” she said, “the entrance examinations are a week from Saturday, and you’re to go there and take them. See if you can’t get in.” So I did, and I did. So I came this way.

COHEN: What years were you at Caltech as a student?

VEYSEY: I came here in 1932 and graduated in 1936.

COHEN: Were you in engineering?

VEYSEY: Yes, I was a civil engineer. But, of course, we took a lot of other courses in addition, and I have some wonderful memories of my early years here and the wonderful professors that I had. For example, in chemistry I had Linus Pauling one year and Arnold Beckman another year. You couldn’t match that. I remember in particular that I was having some trouble in my sophomore year with sophomore physics; it was hard for me to grasp. But Bill Pickering was young, working on his doctor’s degree at that time, and he was the section leader. And he spent a lot of time with me and got me going; and I’m very grateful for that.

COHEN: Do you remember any particular classmates that you’d like to mention?

VEYSEY: Well, that’s an interesting thing. Yes, I could mention some. This is kind of at random, but the first contact I had with any classmates was going to the frosh camp. I went there and I met several who became lifelong friends. Frank Davis is one. Frank Davis was my lab partner most of the way through Caltech. He was captain of the football team. He is a distinguished alumnus of Caltech, and now lives in the La Jolla area. Walfred Swanson, another. He was a civil engineer. He was a very good tennis player, captain of the tennis team. And I did a lot of work with him. A third one would be Hugh Colvin. Hugh ran a large business here in the Pasadena area for a number of years. He is now dead. But he and his wife were very close associates of ours. In particular, I worked with him on the undergraduate publication, the *California Tech*. I was editor of the *California Tech* in my junior year, I think. And he was the sports editor. And we had a very close association.

COHEN: So then you finished Caltech. What did you do at that point?

VEYSEY: I finished Caltech. And I liked engineering well enough. But I had a feeling that there was something more to life than standing at a drafting table. And I wanted to find out if there was. My father wanted me to go to law school, but I didn't have a liking for the law. He was an attorney himself, and he wanted me to do that. But I decided I didn't want to. And I got considerable input from Caltech economics professors—Horace Gilbert, who had come here from Harvard Business School, and Phil Fogg, likewise from Harvard Business School. They influenced me quite a lot and sort of got me going in the direction of an MBA.

COHEN: Did you take courses from Horace Gilbert?

VEYSEY: Yes, from Horace and from Phil Fogg as well. And there were others, of course, in the Humanities Division: Ray Untereiner would be one; Graham Laing, who was an economist; George McMinn; John MacArthur, who was dean of freshmen at that time; William B. Munro. And in the Engineering Division, I was particularly attracted to Franklin Thomas, who I guess was head of Engineering at that time, maybe later was something else. Fred Converse. Romeo R. Martel. And Dean Frederic Hinrichs, who was dean of undergraduates.

COHEN: So where did you go to get your MBA?

VEYSEY: To Harvard. It was a broadening and very interesting thing to do. First of all, a different part of the country—totally different than Southern California, and I'd never lived anyplace else. So living in Boston was quite an experience. I went there in '36 and came back in 1938.

COHEN: So this is all still the Depression.

VEYSEY: We were emerging a bit from the Depression by then. I think of the depths of the Depression as being '32, '33, '34. But it was a slow climb back out. It was getting better, but

the Depression years were pretty hard. I remember coming to Caltech in one of the Depression years—it might have been ’33 or ’34—and tuition was a hundred dollars a semester, which seemed like a very large sum. But I went to register on that particular day, and had to tell Mr. Barrett, who was comptroller and ran the business end of the Institute, that I couldn’t give him any money. The banks were closed; the bank holiday was on; you could not draw a check, you could not do anything. I said, “I don’t have any money.” He said, “Well, what can we do?” So I signed a note, went to school, and eventually got it paid off. But it was quite a wrenching experience to do that. We used to see how many days we could go without spending even a penny. And if you had arrangements for your food and your clothes—which you didn’t change very often—why, you could make it. But it was tough times. It was extremely difficult to get any kind of work. I finally did get a job, I think, in about my junior year. The City of Los Angeles had opened the Griffith Planetarium, and I got a job as a guide there. I would go there afternoons and evenings and guide school groups through the exhibits and usher them into the planetarium facility and do that sort of thing. And that was a fine job, because we got fifty cents an hour, and we did very well. That was a deluxe job. And I learned a little astronomy that way. It was a delightful place to be—very pleasant.

COHEN: How long were you in the East going to school?

VEYSEY: Two years exactly. And upon getting my MBA, I was contacted by Caltech, much to my surprise, and they said, “Would you like to come back here and start teaching?” I said, “Well, I don’t have anything else to do, I guess I might as well do that.” So I came back. And Caltech made up a kind of interesting composite job—it wasn’t really any one job. I became an instructor in Business Economics at $1200 a year.

COHEN: So you were then working with Horace Gilbert.

VEYSEY: Yes, I was back with Horace and Phil Fogg, and Ray Untereiner, and Graham Laing. I graded papers and did all the things that you do in that sort of an assignment. And that worked out very well. I became a resident associate in Fleming House, so I had a place to live and a way to eat. And then I worked in the business office, for Mr. Barrett, on an available-time basis. My

particular assignment there was to review and supervise the student loans. So I was right back to ground one. [Laughter] So we had some interesting times.

COHEN: You stayed at that job until when?

VEYSEY: Let's see. In 1939, the Industrial Relations Center opened. I had been very inclined to favor that field when I was at Harvard. I was greatly enamored of Sumner Slichter, who was the outstanding labor economist in the country at that time. He taught courses in industrial relations and labor economics. So my interest had shifted through several stages—from engineering to industrial management, and then, through Slichter, to the human-resources side of it. Caltech wanted me to go over into that field. So I became one of the first staff of the Industrial Relations Center, which was established on the third floor of Dabney Hall. We had several rooms up there—a library, offices, and classrooms.

There were two courses offered—one for undergraduates, EC 48, which was called "Industrial Relations," and a graduate course, EC 110.

COHEN: Engineers would take these courses?

VEYSEY: Yes, mostly engineers. What got the Industrial Relations Center started was a Robert Millikan idea. He was concerned that Southern California was becoming an industrialized portion of the country. Previously there was agriculture and oil, and that was about it. But now it was becoming manufacturing, with the aircraft people here, and other manufacturers. And he could see in the future a great clash coming between the unionized work forces in manufacturing and the Southern California industrialists, who were largely represented by the Merchants and Manufacturers' Association, which was violently anti-union. They were going to build a wall around Southern California and keep the unions out—never would the unions come in here. Millikan didn't believe that was possible, didn't think that was right, and thought that some place that could be more of a neutral ground should be studying these problems and issues, and hopefully trying to find some solutions. So that was Robert Millikan's idea. He got together a number of prominent people in Southern California. Well, for example, the oil companies, the aircraft manufacturers, quite a few of the big department stores, and big operators like that. He

brought them together, and they became sponsors of the Industrial Relations Center. It was set up initially on a five-year program. They agreed to sponsor it for five years and then see what it looked like and go from there. So they put in the appropriate amount of money, for five years. There was also a grant or two from some Eastern foundations to help it along. So it took off and went from there. And it's flourished very well since that time. William B. Munro was vitally interested in it. Max Mason also. Millikan, Munro, and Mason were sort of the directorship of it. I came in as an instructor and later became an assistant professor, and worked in various teaching and research programs.

There were two temporary directors of the Industrial Relations Center before Bob [Robert D.] Gray came, and he was the director for thirty-five years or more. The first of those was Dr. Dwight Palmer, who came from MIT for a one-year stint as acting director, to help get things going. And he also had roots in Southern California, because he had worked for Lockheed Aircraft, in personnel. The second temporary director was Dr. Everett Hawkins, who came from the University of Maryland, also for a one-year period. We went along that way, before Bob Gray was finally selected as the permanent director. He came the year after Hawkins. And I was still on the staff. We had a small staff—a librarian, an assistant librarian, and a few people in the office. You see, by this time, we were edging up to World War II. So the Engineering, Science and Management War Training Program [ESMWT] came to Caltech, with Earnest Watson leading it. The Management side of it was delegated to Bob Gray. So we set up a great many courses.

COHEN: Who took these courses?

VEYSEY: That's interesting—people from industry. They might be shoe clerks, or realtors, or they might be secretaries, or whatever else—people who wanted to convert or improve their skills, in the war program. For example, the aircraft industry was growing in Southern California. Douglas and Lockheed and all those companies were hungry and eager for people who could plan the tooling for making aircraft—who knew how to do production control, to get the parts to come to the right place at the right time. So we were training people in those fields, and the companies were gobbling them up as fast as we could get them ready. We retrained all kinds of people.

COHEN: Typically, how long was a person here taking these courses?

VEYSEY: Well, they could take a series of courses. The courses were usually one semester in length. My particular role was to teach the basic industrial-management program—which was a large one, because a lot of these people didn't understand the organization and structure of business and industry. They didn't understand how things moved to get results. So that was our job. We ended up teaching those courses in many Southern California locations. I would give a lecture one night a week at Caltech, and then the students would go to Lockheed, in Burbank; or to Douglas Aircraft in Santa Monica; or Vultee Field or other places around the area, for smaller meetings, with a section leader. Hugh Colvin was one of those section leaders. You could take a series of these courses and eventually put together the equivalent of a degree—though it was not accredited by Caltech. But you could assemble kind of a business-engineering degree. You got a certificate from the Industrial Relations Section, Caltech.

COHEN: These courses were paid for by industries themselves, sending their people?

VEYSEY: No, the government paid for the instruction, and the overhead. Oft times, companies would give their employees time off to take courses.

COHEN: Was this part of the war effort?

VEYSEY: Yes, it was a strong part, in the early stages of the war—to train a very large number of people.

COHEN: So that was a real Caltech service?

VEYSEY: Yes, I think it was, and one that has continued. The Industrial Relations Center offers updated versions of those programs today—not on a wartime basis.

COHEN: So then the war got more serious.

VEYSEY: Well, a lot of things happened. I decided, somewhere along in there, that I wanted to go back to school and get my PhD. So Caltech gave me a leave of absence to go to Stanford. That would be '40-'41, I guess—just before the war started. I had gotten married by that time. So we went to Stanford and found a place to live. I got a teaching assistantship with Professor Paul Holden, who was the outstanding teacher in industrial management at Stanford Business School. That went along pretty well. I was taking a mixture of courses to round out what I didn't have, which would give me a minor in engineering and a major in industrial management. Then, also, I took quite a few industrial-relations courses at that time with Paul Eliel of their Industrial Relations Center. Paul Holden called two or three of us in one day and said, "Well, I've got news for you; I'm going to Washington." He had been appointed to head up the Materials Allocation Program for the government. And he said, "Now, here's the textbook, and here's the class, and here's the roll book, and you're on." [Laughter] That was quite a surprise. So I completed teaching Holden's courses that year.

But then Caltech did not renew my leave of absence. They said, "No, come on back here; we've got a lot of stuff to do in Pasadena." So I came back, and I never did complete my PhD. I never completed my dissertation. Instead I plunged into this program, which had two parts to it: One was the continuation of the work I had been doing in the ESMWT. And the second part was that Caltech was deeply involved in the rocket-development program. So they said, "We want you to work in the rocket-development program." And the first thing that happened was that they moved my office to Green Street. There was a building—which is still there on Green Street—that the Navy got some way, and the rocket people began moving in there. And they said, "Now, you've studied industrial relations, you're supposed to know about personnel and stuff. So you're going to have an office up here, and you're going to recruit the people to work on this project. We've got to set up the test range at Inyokern, at China Lake. And we've got to man all these facilities. So you're supposed to get those people."

COHEN: Who was the person at Caltech who was directing the research?

VEYSEY: Yes, there was a lot of research going on. It all really came through Earnest Watson, but it went down into the Physics Department for the ballistic rockets, where my old friend and

classmate Tommy Lauritsen was working on it, along with Willy [William] Fowler, Charles Lauritsen, and a few others. They were doing the physics side of the design of rockets. And Bruce Sage was doing the propellant work. He had a little location up in Eaton Canyon where they had an extrusion press; they extruded the propellant through the press and made it into grains of a certain size and a certain configuration. And those became the propellant grains for the rocket, if they didn't blow up. Oft times at night, you'd hear a huge boom, and they were off the air for a while. [Laughter] Bill Lacey and Bruce Sage, they were the chemists who did the propellant work. And Charlie Lauritsen, the father of Tommy, was actually heading the Physics group. But I, of course, interacted more with Tom and with Willy Fowler.

The Navy was involved in it by that time. They set up an office here, a contracting office. Admiral Ralston Holmes was in charge of the Navy side of it. But young Lieutenant Commander Dale Hilton was the contracting officer I had to do most of my work with. Hilton was a Navy flier, who later became a Captain and commanded an aircraft carrier; he was captured by the Japanese and imprisoned for some time. But after his retirement from the Navy he returned to Pasadena; we see him frequently. The Navy wrote this big contract with Caltech that covered—you could do almost anything under it, if approved by the Navy, and Caltech was reimbursed for costs plus a fee.

COHEN: And you were involved in the writing of that contract?

VEYSEY: Not in the writing of it, no—but in the execution of it.

COHEN: Who did the actual writing of the contract?

VEYSEY: I don't know how that was put together—probably between Earnest Watson and the Navy people, and maybe the legal people here at Caltech. But it gave Caltech very broad latitude. Caltech would be reimbursed for its expenses plus its overhead in developing rockets. Well, it's impossible to know or to estimate how much it's going to cost to develop a new rocket. You know, sometimes it works and sometimes it doesn't. But they gave us this broad contract and gave us the opportunity to develop and test certain rockets until ready for production.

COHEN: Did you have anything to do with Theodore von Kármán's group?

VEYSEY: A little bit later on I did, but not at that point. That group was working, among other things, on the development of the JATO unit—the Jet-Assisted Takeoff. We linked up with them a little bit later on. But our first work was in developing ballistic-rocket applications. And here we had fallen—I don't know, it had been a hundred years since the military in America had ever used any rockets. So the military resorted to copying designs being used with success around the world. I got into the metal-parts side of the rocket development. We opened a facility on Foothill Boulevard—some of the buildings are still there, and one of them now has a sign on it saying "Space Bank," and it's used for storage. The 210 Freeway now runs through the property. That was a big struggle, to pull together machine tools.

COHEN: So you were actually producing the rockets?

VEYSEY: In small quantities for test and development purposes. Now, Caltech wasn't intended to be a big munitions-manufacturing place. We were supposed to work on the developmental stages. So we would design and test a rocket for a certain application and produce a hundred units for test purposes, then redesign and retest. And then it would be turned over to the Navy. And the Navy would take it to Ford Motor Company, or somebody, and order thousands of rockets and get them produced that way. We didn't have high-production equipment, but we could produce small quantities. And we could change the design. The Lauritsens would say, "No, it flies end over end. That's no good!" [Laughter]

COHEN: So who actually was working at the Green Street and the Foothill facilities?

VEYSEY: Well, Green Street was just offices. And I soon moved from there out to the Foothill plant. There we were on a constant interface with the test range at China Lake. And I would go up to China Lake all the time—every week—and fly often with Dale Hilton, who also went back and forth. At China Lake, they would take these ten rockets that we made and fire them; and two of the rockets would fire and two of them wouldn't, and two of them would fall over, or whatever. Then we'd change the design and bring ten more out, and so on to get acceptable

performance.

Some of the applications were interesting. One of the first threats was submarine warfare, because Germany had a lot of submarines and they were doing great damage to our convoys, which were crossing the ocean, trying to take munitions to England and elsewhere. So we developed a series of antisubmarine weapons. An early one was called a retrorocket. The theory behind it was that you would have this—not really so much a rocket as a depth charge—and mount it underneath a plane. The plane would fly low over the water, and there would be a gaussing ring—a loop of wire—underneath the plane, which could pick up a magnetic field from a metallic mass, presumably a submarine, down there. And when this signal would register maximum, the plane would be directly over the target and the rocket would automatically fire. It was geared to fire backward at the same speed that the plane was going forward, so that it would drop vertically, like a stone, exactly on that spot. Well, this seemed like a pretty ingenious thing. But we bombed an awful lot of old hulks and wrecks and anything that was made out of iron. [Laughter] And some submarines, I guess. That was one approach to the problem, and it was used for a time. But the Germans quickly figured out that they could put an anti-gaussing ring around the submarine to kill its magnetic field, so our thing didn't work anymore. Then we developed means of throwing a pattern of depth charges from the deck of a destroyer, to trap a submarine.

COHEN: Who was in charge, actually, of the design of the retrorocket project?

VEYSEY: Well, I guess the Lauritsens were probably the principal designers of that project—their group in Physics.

COHEN: And this would have been about what year?

VEYSEY: We really got into the war before 1941.

COHEN: So this project was already organized before the war began.

VEYSEY: Yes it was. Our national program of supplying the "arsenal of democracy," as we

called it at that time, was to furnish various types of aids, including Lend-Lease destroyers and aircraft and other hardware, to Great Britain, because the British were clearly besieged, and we thought they might be overcome by Hitler and his forces. And so we were aiding them before a war was officially declared.

COHEN: How many people were involved at this time?

VEYSEY: I don't know, but it was a somewhat smaller group than what it built up to later. I think the ballistic rocket metal parts group grew from a dozen employees to about 1200.

So it was a series of new weapons to meet new military needs. They became larger and more sophisticated—probably better, more effective—as we went on. We made the prototypes for the 5-inch HVAR rocket [High Velocity Aircraft Rocket], which was a formidable-looking thing. It was an aluminum-tube rocket, five inches in diameter, fin-stabilized, and quite long, that was designed to be airborne and to fire at very high velocity directly at a target on the ground. So these rockets were suspended underneath the wing of P-38 aircraft, which were present in England at that time.

COHEN: Now this was fulfilling a direct need.

VEYSEY: Yes. There was a direct need, which was unanticipated by the military until they got into it. The Allied Forces made their landings in Normandy, and successfully established a beachhead but could not move out of that because the Germans had such force and such effective tank capacity that they controlled all the roads leading out, and the Allies could not move out. So they were bottled up in there for a considerable period of time. And that was a disappointment, because they had expected to move right along.

So the military came up with this need for an aircraft-flown rocket that could patrol the roads and strike at German tanks. So that's what we developed. And it was a powerful thing, I'll tell you, a powerful rocket. And I remember that the Nobel Prize-winning physicist Dr. Carl Anderson, who worked with Robert Millikan, came out to the plant to help us devise a sight for the rocket, so that the pilot could aim at whatever he wanted to hit. He took a coat hanger and bent a ring in it with a pair of pliers, and then something else, and another ring, and then he says,

"Now, when you see the tank there, on the road, right at the end of that fin inside the circle, you push this button."

COHEN: And was this rocket tested at China Lake?

VEYSEY: Yes, it was tested at China Lake. Instead of giving it an explosive head—it did not need anything like that—we just made a cast-steel solid head, and it would go right straight through a tank. It didn't have to explode, because the destruction was terrible inside. We thought that was great, because we really felt, all of us, that England was threatened, and we were threatened, and everybody was threatened by Hitler.

COHEN: So it wasn't a morality question at this time.

VEYSEY: Not for me at that point. I was gung-ho for doing this. So we did a remarkable thing, from the first request to Tom Lauritsen's group from the military that they needed such a round, we designed it, we made a few, we tested them, changed the design, made a few more, tested them again—back and forth like that several times. And then we produced, I think, 100,000 rounds and flew them to England, in a total of less than 60 days.

COHEN: Where was this produced, right here on Foothill?

VEYSEY: No, they were assembled, inspected, and shipped from Foothill, but we mostly did our work by contracting out. Oil-well tool suppliers who had machine shops, they were all called into the breach, in the area. And we had a fleet of trucks to take to them this special aluminum tubing from which the rocket was made, and they would machine it to specification. We would haul it back to the plant, inspect each one to be sure it was right, and then all the seals and fins and everything else that went with it.

COHEN: You were in charge of this production, then?

VEYSEY: Yes. And that was a superb example of what a project like that can do when it really

gets up and running. As soon as those rockets arrived in England and the P-38s started flying them, they cleaned the roads of German tanks, and we rolled right straight out of there—right across France and Germany. So that was a remarkable achievement, I thought.

COHEN: So then you moved on to develop other things. What year are we at now?

VEYSEY: 1944. Well, of course, after V-E Day the emphasis then shifted to the Pacific. And our work shifted to other types of rockets, known as barrage rockets, which were little, short, stubby things. Not very pretty, but produced in large quantities, and they could be fired from landing craft or rowboats, or anything else, because there's no recoil from them. And they could saturate a beachhead area on the islands in the Pacific. They had little accuracy, but you just put enough of them there and you would hit almost everything before you were through. And they were pretty effective, whereas you couldn't haul enough artillery in there to do that job. So they had their purpose. We made two versions: We had fin-stabilized ones, which would fly like a dart with a fin on it to keep it straight, and spin-stabilized ones, which were smooth but had a rocket nozzle plate with canted holes that caused the thing to spin like a rifle bullet, and stay on course that way. We made many models of those; they were used widely. Of course, the production—they needed hundreds of millions of those, so they were all made in other places. But we worked on development of them a lot here. We made more sophisticated things as time went on, but the simple ones seemed to work the best. [Laughter]

COHEN: When did you realize that the rocket project was going to use stock design and it was going to end pretty soon?

VEYSEY: Well, I think it was in that period when we switched over to the Pacific theatre that we felt that the war was going to come to a close and there's no need for high-speed research and development. So we knew that that was going to close down. And I think the emphasis shifted to guided missiles at that point, rather than rockets.

COHEN: Were there any people directly involved in this that were particularly Caltech professor types?

VEYSEY: Well, I mentioned Tommy Lauritsen, Carl Anderson, Bruce Sage, Willy Fowler. On the Navy side of it there was Admiral Ralston Holmes, and Lieutenant Commander Rintelen, and Lieutenant Commander Dale Hilton. And Dr. William MacLane—he was in underwater ordnance at San Diego for the Navy before he came back to Caltech. Bill MacLane and I had been classmates at Eagle Rock High School long before, so we got back together. And then he designed a very good round, which had sophisticated heat- seeking capabilities. It's still in use, actually—it's called the Sidewinder. That was developed at Inyokern, and we worked on that, but that was the final thing before we began to shut it down, as far as rockets were concerned. We didn't work on liquid-fuel rockets at all, had no capability in that area.

COHEN: How did you go about hiring people to work at these facilities? How did that work?

VEYSEY: Well, we got a lot of local people. I was fortunate to get Walter Padgham and George Morrow in the personnel office. They filled job openings during the war and continued their careers at JPL after the war. Of course, other industries were shutting down for want of materials. You couldn't make automobiles; you couldn't make anything. But we had materials allocated for our work; so we'd get people that way. Some were patriotically motivated; they wanted to get in—they had a brother who was in the military, or whatever. We put out posters across Oklahoma and Texas that said, "Come to work at beautiful China Lake." And on the posters there would be a lake and palm trees. And here's a sailboat sailing across the lake. And there's no such thing up there at all. [Laughter] But we got some people. We never got enough people, but we got good people, and used them very successfully. And of course, you see, they all became Caltech employees. Caltech had some flexibility that ordinary businesses wouldn't have, probably, in paying them. These jobs weren't highly paid, but they were good jobs. And people liked to work for Caltech.

Dr. William Saylor, a Caltech graduate, worked for the Navy, and he ran a good bit of this operation down here. And it went into some very strange directions. Our contract was so broad that you could legally get reimbursed for anything that the Navy said you ought to do. One thing the Navy wanted us to do was to explore the characteristics of missiles entering water at high speed, like a rocket or a torpedo launched from a plane. The trouble is, it'll skip like a

stone, or perhaps dive, depending on the shape. So we developed and built the variable-angle launcher, which was at Morris Dam, above Azusa. It was a launching platform whose angle could be changed mechanically, for test purposes.

VEYSEY: One development that came out of the war was that Mr. William O'Neil, the president of the General Tire & Rubber Company, in Akron, Ohio, got very interested in the JATO unit, because he had lost a son, who was a flier and was shot down, or went down, in some little atoll in the Pacific. And the Navy couldn't get down to rescue him. When O'Neil heard about the JATO unit, he thought that would have been just the thing, because the Navy could have landed there for a rescue and taken off again. It's basically a rocket, you'd say, that could be fastened to an aircraft and would give additional thrust for take-off purposes. So he got in touch with the GALCIT people who had done that development work. At that time, they were a little company here in Pasadena called Aerojet, and they had a garage on Colorado Boulevard, where they made their units. Aerojet was founded by the early pioneers, including Fritz Zwicky, Clark Millikan, and several others from that group. But they were scientists; they were not very good managers, not business-type people at all. And they realized that. And so they sold part of their interest to General Tire around 1944. They were acquired by General Tire, and they moved to Azusa, because they needed space for their powder work.

Out of all of this was set up an organization called General Tire & Rubber Company Rocket Division, a part of General Tire of Akron, Ohio, headed by Dan Kimball, vice-president of General Tire, but located in Pasadena. As we approached the slowing-down phase of the war—we were out of Europe by then; we were just in the Pacific—and you could see the end of that coming. And Caltech was eager to get out of the munitions business. There always was a feeling that Caltech really shouldn't be in manufacturing; and I guess that's right. But the developmental side of it—they felt they should do that. So now they were eager to get out. Anyway, we transferred an awful lot of these Caltech employees to the General Tire Rocket Division, and a lot of them to Aerojet, and then quite a few of them to JPL; and some to the Navy. So the groups of people we had worked with went in different directions.

And in the latter stages of the war, the atomic-bomb project came along. The Army Corps of Engineers turned to Caltech to do a phase of that work, which was the detonating mechanism. The general scheme was that you could have a bomb with disassembled segments

of what would become an active core. When these segments were forced together all at once, then you had a bomb that really went off! So Bruce Sage and the other people in the propellant business were given the task of inventing a propellant to force these segments together. So that's what we did during that period.

COHEN: So the Lauritsens were still in charge of this.

VEYSEY: Yes. Nobody thinks war is a beautiful, lovely subject—at least, I don't. Maybe some military people do. But I felt personally that this was worthy, necessary, and entirely appropriate in the case of the European campaign. In the case of the campaign against Japan, I was furious with Japan for the attack on Pearl Harbor and bringing us into the war that way. But as time went on, it looked to me like it was going to have a terrible outcome—that we were going to have to frontally attack the Japanese on Okinawa and the other Japanese islands, and that they were fanatically dedicated to dying before they would let us come ashore. So I just had the feeling that this was going to be a slaughter beyond description. And what could be done?

Well, of course, the American answer was the atomic bomb, which was originally developed as a weapon against Hitler but didn't get there in time, but was perfected in time to use against the Japanese. Two different versions of that bomb.

COHEN: Do you know anything about the sequence of people coming to the Lauritsens?

VEYSEY: No, I don't. I was not in that loop in any way. But I guess it was General Groves, who was heading the Manhattan Project, who probably made the initiative and brought them in this direction. And I stand in awe of the great management job that they did to bring that project together. But I still think of it as a hideous project. I think you can rationalize that it saved uncounted American lives. But it cost uncounted Japanese lives. That's the trade-off. And that's where I came down ambivalent. I have a Japanese professor friend who just now is fighting a bout with pituitary cancer, which probably is a residual of that.

COHEN: When would this have been when they came here, when this projected started?

VEYSEY: In 1944.

COHEN: But the people were still in place.

VEYSEY: Oh, yes, the same people. But it was a selected group from within the same organization.

COHEN: So you were called in early on and presented with all this?

VEYSEY: Well, I didn't have to make any decision as to whether we were going to do it or not. In fact, when I first heard about it, I said, "Boy, they're smoking something, because that defies any physical laws that I know anything about." But I was persuaded that that's what we were to do. And then it was on such a highly classified and confidential basis that it was really amazing. When the first materials and units were shipped here, they came addressed not to Caltech or to the Rocket Project, or to the Navy, or anything like that; they came addressed personally to the purchasing agent. They tried to deliver them to his home. [Laughter]

COHEN: Who at Kellogg [Lab] were in on this besides the Lauritsens?

VEYSEY: The Lauritsens and Willy Fowler. As I knew it, they were the people I thought were principal.

COHEN: So they were cleared and probably not many other people there.

VEYSEY: It was very closely held. And in fact, security came down on us horrendously, I thought, out there at Foothill. We had to re-screen all these employees who had been cleared for top secret; now they had to have a further level of clearance. And I remember one—and this I felt was kind of an unfair, devastating thing—a very promising young man we had as a manager in one of the departments there. They just came one day and said he couldn't be cleared.

COHEN: Do you remember his name?

VEYSEY: Yes. His last name was Rolff. He was the son of luggage manufacturers from Wisconsin. A very attractive young man, who seemed totally fine to us, but they just said quietly, "Can't be cleared." I said, "Why?" "We can't tell you anything, but he's got to be out of here today."

COHEN: So they went through every single person that was there. How many people were there?

VEYSEY: Not a large number, several hundred. But that particular case stuck with me.

COHEN: Were there very many of them that you could not clear?

VEYSEY: No, really only a few. But they were absolutely adamant in saying "They've got to be out of here, and we don't tell you anything about reasons." So it wasn't debatable at all; it was just non-negotiable. We had no choice but to make some changes, which I thought were kind of unfair, unreasonable—but I guess there were reasons that I didn't know anything about, just as there were about the whole project. It was the most amazing sort of development to work in that atmosphere. But it produced results.

COHEN: Can you tell me something about what you actually would do? It's no longer a secret.

VEYSEY: Our group never worked on the active, radioactive materials. We worked on the detonating system—the tooling, the molds, and all the parts of the detonating mechanism that brought the high-velocity components of the bomb together. It's like a big orange; you cut it into segments, pull them apart, they all fit back together. So the whole thing was detonated by explosive charges, which were a kind of rocket offshoot. You could drive these segments together at high speed simultaneously and create a sphere of critical mass, and then it would go on its own. And that was our job.

COHEN: Do you remember them using the word "pumpkin?"

VEYSEY: No, I don't recall the term "pumpkin" being used in conjunction with it but it might well have been. We puzzled for a long time about the spherical geometry of the whole process.

COHEN: Now you were just involved with the testing and the procuring of the parts?

VEYSEY: We were involved with the construction of the tooling for making the molds of the… Well, it was rocket propellant, really, that was used, but it was called the "slow component." [Laughter] It didn't seem slow to us; we thought that was pretty fast. But the other—the fast component—was the nuclear material. And we had no connection with that at all. Ours was just to bring it together.

COHEN: Where were these tested?

VEYSEY: At Los Alamos.

COHEN: So they were assembled here in Pasadena.

VEYSEY: Well, the one that I saw was assembled in a railroad car in the Foothill plant.

COHEN: And that, by train, went straight to Los Alamos to be tested.

VEYSEY: Yes. And I didn't believe it was going to work. [Laughter]

It was a super-secret project. That was my first experience with the Army Corps of Engineers; they were running that project, and they were very good project managers. I was greatly impressed by what they were able to do. But they did it in such great secrecy. It was all under a code name—"Project Camel." And nobody knew what the "camel" was. So we worked on that for some time. And all these materials would come to Project Camel. I didn't know what they were for, for a while. Finally it came together, and it worked.

COHEN: How many of them did you assemble?

VEYSEY: I don't really know; not very many. But in the unique and redundant way in which the Corps of Engineers approached the project, they developed two distinctly different designs that worked on entirely different principles, and brought them both to production at the same time. There was "Fat Man" and "Little Boy." And this was the "Fat Man."

COHEN: Do you have any idea of the time span, from testing to the bomb going off, when you started the project?

VEYSEY: A good many months. Of course, several years of preliminary work had gone on in laboratories in Chicago and elsewhere, making sure that it did in fact work and would be a viable device. But we were unacquainted with all that. We came in only on the detonating mechanism.

In the main, we didn't have production facilities. We didn't have an aluminum foundry, for example, which is required in this design. You make a large, carefully machined, aluminum casting, and within that casting has to be incorporated cooling coils, metal coils to circulate coolant fluid in there. We had no facility for doing anything like that, so we had to go outside and get one supplier to fabricate the cooling coils, and then get them to the foundry and have them cast the aluminum mold. A lot of times the aluminum would be porous or with surface flaws, and we couldn't use it.

COHEN: So you found these places right in the area?

VEYSEY: Yes. And they were wonderful suppliers, fortunately.

COHEN: And they didn't ask why they were doing it?

VEYSEY: We couldn't tell them, and they didn't ask. But then these had to be highly finished inside, smooth, so that the material would slip out of them. And we had a great deal of trouble there getting the type of surface characteristics; not too much porosity in the aluminum, but very smooth, slick surface, and very exact.

COHEN: So you didn't need a test ground for these, because you just assembled them, developed them, and they were sent off to Los Alamos?

VEYSEY: Yes.

COHEN: Now what was Trevor Gardner's part in all this?

VEYSEY: Trevor Gardner, when I first knew him, was an instructor in the Industrial Relations Center in the Engineering, Science, and Management War Training Program here. He was very successful in that work. He worked for Dan Kimball at General Tire. Then he became in charge of the Caltech rocket project metal-parts operation, a whole facility to furnish the hardware. It could be a wide variety of things, whatever the military, the Navy, ordered, or the Atomic Energy people ordered through the Navy. They had a blanket contract.

COHEN: So how did you interact with him?

VEYSEY: Well, I was his next assistant. I got to know him very well.

COHEN: Was he part of Project Camel also?

VEYSEY: Oh, yes. He was on top of the pile on Project Camel. Then at the end of the war, he left and became an assistant secretary of the Air Force.

COHEN: Was he an American?

VEYSEY: Oh, yes. He was of Welsh ancestry, but he was American, educated at USC in engineering.

COHEN: So he went to Washington. And have you ever had any contact with him after?

VEYSEY: Oh, he's been deceased for many years. Yes, we were pretty close to his family and

his two children. Actually, we're godparents of his two children. We haven't heard from them much since they became adults.

COHEN: How long did Project Camel last—until the bomb actually dropped?

VEYSEY: Yes. Well, after the bomb dropped on Japan, things wound down very quickly. They used the second bomb, and that convinced the Japanese that there was no hope for them in enduring more destruction.

COHEN: Coming back a little bit on the testing—when they tested that first bomb at Alamogordo. Did you know about that?

VEYSEY: We heard about it, but we were not there.

COHEN: So the people that were cleared, working on this, were well aware of what was going on.

VEYSEY: Yes, but it was well aware on the basis of you know only what you have to know to do your job, not general knowledge of it. And a hilarious thing happened. After the mushroom-shaped cloud from the first atomic tests registered on people's mind as a distinctive thing, there was a fellow that had a greasy-spoon café across the street from the Foothill plant. And he said, "That's interesting. I think I'm going to change the name of my café and I'm going to call it the Atomic Inn."

COHEN: Where did he get the mushroom idea from?

VEYSEY: Well, pictures were in the paper of this mushroom-shaped cloud.

COHEN: Of this explosion. But people didn't know that it was an atomic bomb?

VEYSEY: Well, they were told, at the time, that's what it was. But he wasn't supposed to know

that *we* were connected with it, or anything else. That was pure happenstance. So he put up a mushroom-shaped cloud in front of his restaurant and renamed it the Atomic Inn.

COHEN: Where would he have picked this up? From people talking at lunchtime?

VEYSEY: I don't know if he had any knowledge of what we were doing at all. I don't think most of the people in the plant even knew—wouldn't make the connection. Well, the authorities didn't know what to do. So the Navy intelligence and the FBI were just going wild. And finally they decided to do nothing. They just tore their hair around there for days.

COHEN: Did he actually make the sign?

VEYSEY: Yes. It was pretty funny for a while. Of course, the war was soon over after that. I stayed on there for a while. The contract continued, and we made some special equipment for atomic tests out in the Pacific—special cameras and instruments. And then that pretty well wound it up. Those contracts were closed out. All the Caltech people were transferred—many, many of them to JPL. Walt Padgham, my personnel manager, went over to JPL and was personnel manager there for many years, until he died.

COHEN: Any other people in the project worth mentioning?

VEYSEY: Well, let me see. John Trigg was plant superintendent. Fred Berg was in charge of maintenance. Johnson had transportation.

COHEN: Where did they go after the war?

VEYSEY: Well, John Trigg went back to some precision-manufacturing company in Los Angeles. There was another, John Cronin, who sort of followed after John Trigg, and he actually succeeded him as superintendent, he went with Aerojet at Sacramento as a plant superintendent.

COHEN: So these people all stayed in that type of work. And were they aware that this was

called Project Camel?

VEYSEY: Yes, maybe that's about all some of them knew.

COHEN: So, anyway, that was a major, major contribution you did during the war.

VEYSEY: In a way, it was; if you're looking at it from a military-technology point of view, it was. When you look at it from a moral point of view, you come down a little bit on each side. Very difficult.

The interesting thing in my conversation with Judy [Goodstein] was the moral dilemma that pursuing the atomic bomb posed to me. I lived with that, but I didn't like it at all, because I knew that we burnt to a crisp, tens of thousands of Japanese who were presumably innocent, but nonetheless they were the victims of war. The other choice would have been to have our troops assault Japan, and probably be mowed down by the thousands.

COHEN: Were these thoughts you had afterwards, or thoughts while you were doing it?

VEYSEY: Well, they began to come to me while we were doing it, but then it suddenly was all over, and they remained with me for a long time. So I decided to go away. I was kind of sick and tired of everything by then. And I decided I wanted to take some time off. I'd seen enough pressure and enough war and enough everything. There was a need for some work and improvement in our peaceful ranch operation in the Imperial Valley. So we decided to go down there for six months. Well, it didn't turn out to be six months; it turned out to be several years, in fact. But we went down there and that was interesting—a change. But one of the hardest things I ever had to do was to tell Lee DuBridge I was leaving Caltech. He said, "You can't do that."

COHEN: What year would that have been?

VEYSEY: 1948.

COHEN: I assume you had a family by then.

VEYSEY: Oh, yes, married with children. We went to Brawley, California, and dug into a quite different environment. What happened there was that I got interested in the local schools—Brawley Elementary School District. Before long, I was telling them what they should do. Then I got elected to the school board. So that went along pretty well, and we got some things changed. There was no local college program available down there—no community college, no anything. So we decided we'd better have a community college, and I got busy on that. We organized and got bonds voted and built Imperial Valley College, which now has over 2000 students.

COHEN: And in the meanwhile, you were running your ranch.

VEYSEY: Oh, yes. So I became sort of a minor celebrity, a farmer who got the community college going. I was on the founding board of the college. [Laughter] Then one day in 1959, a group of associates in the education business came to me and said, "We want you to run for the State Assembly." And I said, "Where is that?" [Laughter] I thought that was the craziest thing I ever heard. But I did ultimately run for the Assembly, and by some sort of a miracle won a seat, against all odds. It was a very unlikely thing to do. So then I went to Sacramento. That was in the days when the State Legislature was a part-time job. You went up there for six months one year, and about six weeks the next year to do the budget. They could do the budget in six weeks then. [Laughter] So I got interested politically and got involved that way. I met a totally different group of people. It was a different environment altogether. I didn't know very much about politics and had to learn gradually. I'm a Republican, just sort of by inheritance more than anything. I'd never really thought about it very much. But that whole area in the Imperial Valley is strongly Democratic—mostly people who migrated from Texas and Arizona and Oklahoma. They're Democrats historically, but not necessarily wedded to everything the Democrats espouse. Well, they certainly were not like the urban Democrats; they're not liberal, they're quite conservative people. So we got along all right.

I won the first election by 417 votes, which is not very many. So off to Sacramento, and learning that whole experience. I spent eight years in Sacramento in the State Legislature.

COHEN: Did you enjoy that?

VEYSEY: Yes, I really did. That was an extremely enjoyable time. I started off under circumstances that you wouldn't think would be too good, because Jesse Unruh, the famous speaker of the Assembly, was in charge in those days; and he didn't favor my getting elected, because I was a Republican. In fact, the only reason I got elected, really, was because Jesse Unruh made a big mistake. He came down to the Imperial Valley to support my opponent, who was a real nice guy—his name was Leverette House, and he was chairman of the Agriculture Committee and well situated. But at some meetings Jesse Unruh made some serious mistakes. He said, "Now listen, you people of Imperial County. If you ever expect to get anything from Sacramento, why you better elect Lev House and send him back up there, because that's the only way you'll ever amount to anything. Otherwise you're dead." Well, people down there are just independent enough that they didn't like that.

People didn't spend much money on campaigns then. You went around and shook hands and that's all. And had an occasional barbecue or some event. But we spent a little bit of money and taped Jesse Unruh's remarks and played them over and over again on the local radio. It worked. I came to Sacramento, instead of the favored son. But Jesse and I got to be very good friends. We got along fine later on, but at first it was tough. I had some wonderful experiences up there in that time.

I served while Pat Brown was governor, and I liked him enormously. He's a wonderful, nice man. And then Ronald Reagan became governor, and I served under him. And saw Willie Brown come to the Assembly and eventually take over, and he's still running it. And Dave Roberti, until recently President Pro Tem of the Senate, they both came in at that time.

I became chairman of the Education Committee of the Assembly and worked on school problems for a long time. That was always my particular interest, so I did quite a bit with that.

Then in 1970, the congressman from our area, John Tunney, decided to run for the U.S. Senate. So that left a vacancy there. Once you get into politics, you sort of step on a moving belt, and it just takes you along. You just go wherever it takes you. So that was the logical thing to do. I ran, and got elected to that office, and then went to Washington, where I was greatly disappointed with the Congressional system of operation, as compared with the State. I think I

was in state government during more or less the golden era for the California Legislature. We had enough money to work with; we were able to do good things. The operation wasn't run on a highly partisan basis. It was not seniority-ridden. As a young person, you could come in and do some things. It didn't matter whether you were a Republican or a Democrat; if you had a good idea, it would go, and it was delightful. In Washington, it was the exact opposite. Huge House, highly partisan, seniority-ridden all the way. So you should go there when you're about 27 years old and wait about 15 or 20 years, and then you can start functioning. Well, I was much too old to do that.

COHEN: You moved the family to Washington at this point.

VEYSEY: Yes. Our older children were off on their own by that time. But our youngest son was still in high school. So we moved to Falls Church, Virginia, and he finished high school there, then came out to the University of California at Davis. He's somewhere between a master's and a PhD in microbiology at the present time. So all of this took place and changed a lot of things for me.

I terminated my political career by being reapportioned out of my district. This was a time when after every election they reapportioned the districts because they didn't have them right, to some new standard. So they did them over and over again. Phil Burton, who was an assemblyman, and later a congressman with me, was sort of the evil genius of reapportionment. He had a remarkable mind. He could visualize all these maps and charts. And how you could take out a few Democrats here and put a few Republicans there. He had a lot of power that way. He once told me early on that he would get me. I got to thinking, well, that's kind of crazy, he can't do that. After all, the southern boundary of my district is the Republic of Mexico, and he can't change that line. And the eastern boundary is the State of Arizona, and he can't change that one either. And he's fiddled with all the places in between, trying to influence the outcome, and it hasn't worked at all. So I don't care what he thinks—it doesn't matter. But he came up with a distinct and ingenious plan. He took my district, which was quite large geographically, and cut it into three equal parts, and joined each of those thirds onto two-thirds of the adjacent districts. So that any way you looked, you would be running two-to-one against an incumbent. And there was just no way to do it. So I got out of the political business at that point.

In 1974, Gerald Ford appointed me assistant secretary of the Army for Civil Works—a position that was newly created. It had been authorized for some years but had not been filled. They wanted a person with an engineering background and a congressional background to fill it, because I was supposed to be kind of a liaison between Congress and the Corps of Engineers. And I had great respect for the Corps of Engineers from my wartime experience with them. I thought it was a tremendous organization. So I did that for two years. And that was a most enjoyable thing to do. The Panama Canal was also part of my responsibility. We still had the Panama Canal at that time. And I had to go down there quite a bit, because they'd been negotiating for twenty years on a treaty to change the terms, but it hadn't really gotten anywhere. It was clear that something was going to happen, but we didn't know what.

I left after President Carter came in. He wanted to do something about Panama and do it right away. So they entered into this current treaty, which I did not think was a very good idea. But they did it anyhow. And so that's what we've got now, and we still haven't seen the end of it.

At that point, Bob Gray and Neil Pings contacted me for Caltech. Bob was still the director of the Industrial Relations Center. But he was in failing health. He was getting weaker and weaker, and he said he couldn't continue. Neil was Provost. They wanted me to come back and take over the Industrial Relations Center. And I said, "Well, I've done everything there is. I'll be glad to help out." And they said, "Well if you could do it for five years that will transition us and get it going again." So I took it on for five years.

COHEN: After you finished up with the rocket project at the end of the war and went back to your ranching, and then, by way of the school board, got into politics in a serious way, did you, during that period, have any further contact with people from Caltech?

VEYSEY: Well, yes I did. I maintained pretty good contact with the Industrial Relations Center people. In particular, Bob Gray, who was doing some wonderful things as director, and Arthur Young, who was a lecturer in industrial relations, had had a long and remarkable career in the industrial-relations field, having come to Caltech from being the vice-president for Industrial Relations at the United States Steel Corporation. Arthur Young as a lecturer was very instrumental in helping shape the programs of the Industrial Relations Center; he had

enormously wide contacts in the industrial world. His vice-presidency at the United States Steel Corporation was at that time possibly the most important industrial-relations post in the nation. Prior to that, he had been with the McCormick Harvesting Company and had had a long career there, and had also been with Standard Oil of New Jersey. So he had wonderful contacts in the field and was able to bring to the Center an outstanding array of lecturers and speakers, whom he had known as personal friends over the years. He lived in Carpinteria—he was semi-retired at a lemon grove there—but he was here in Pasadena most of the time. A wonderful man. He was, interestingly enough, self-educated. He never went to college, but he had the most marvelous vocabulary. I don't know how he developed it, but he could use the English language in a formidable way. And I know that all the secretaries were tremendously impressed by his use of language in his dictation.

COHEN: Did he make any financial contributions to Caltech?

VEYSEY: I'm not exactly sure how that finally did work out. I think he very well may have. He had one son, who lived in the San Marino area. And I think the property went to him, and then it finally came down possibly to Caltech.

COHEN: At this time, you were in Brawley.

VEYSEY: Well, you see, my leaving Caltech at the end of the war was kind of a burnout situation, of too many rockets, too many atomic weapons—too much of that—and I just wanted to get completely away from that environment. Plus, the fact that family needs directed me, as the only son in the family, to try and do something about the ranching property that my father had acquired in about 1912 or so, which needed some help. So I went down there, presumably on a six-month deal; but we stayed longer—we stayed fifteen years.

COHEN: What sort of ranch did you have? It's mostly produce and vegetables down there.

VEYSEY: No, we never got into the produce side of it so much. But there's a lot of general farming that takes place there; a great deal of alfalfa hay is grown there. Cotton came along as a

viable crop, and we grew that. Sugar production, sugar beets, and we even grew sugarcane down there—experimentally, at least. And then a good many other minor crops were produced there. I got active in some of those—for example, I was president of the local sugar-beet-growers' association. But my principal nonagricultural pursuit was with the public schools. And we had a lot of fun with that. It worked out, and the time was right. That's an isolated area, and it had no access to higher education. So we were fortunate enough to be able to bring some leadership—and I don't know, still, how this could have happened. You would say today there's no way that people would vote for a bond issue to bond themselves to build a community college in the area. It just doesn't happen anymore. But those hard-bitten and very conservative farmers voted about 9 to 1 to bond themselves, to build a community college. And then we got San Diego State University to offer higher-division programs there, particularly directed toward teacher training and that sort of thing.

COHEN: Is that ranch still part of your family?

VEYSEY: Oh, yes it is, very much. And I have two sons there continuing the farming operation, and nowadays it's going down to grandsons, who have graduated from Cal Polytechnic University San Luis Obispo and returned to the ranch. So we have that sort of input.

COHEN: During that time, you still had contact. And then later in Congress, what kinds of contacts did you have here?

VEYSEY: Well, quite frequently with Bob Gray. We would talk very frequently. And I came to quite a few of the programs that he put together at the Industrial Relations Center. He and Art Young initiated a series of programs which they called "Dinner Discussion Meetings." And they consisted of people from industry, people from academia, people from government, and they came together to discuss some particular topic. Art Young was instrumental in bringing those people together, and often he presided at these meetings. They were very splendid meetings. After I returned I restarted them under another name; they're called the "Executive Forum." So I went to those meetings pretty regularly, and kept in touch with Caltech that way.

Bob Gray was very innovative and had a lot of ideas going. For example, he started off

with some research projects. I think he identified early on one of the big problems in the industrial-relations field, which was the inadequacy of first-level supervisors. The company might have very lofty and beautiful policies that were up on the wall somewhere, but nobody down in the ranks understood them and applied them, did anything about them. Gray thought that was a great shortfall. So he set up a project on the selection, training, and evaluation of supervisors. It was intended to start with the foreman on the floor, the first management person down there. So we did a lot of work with that. And we began doing training programs in various companies in Southern California. For example, I did management training at Lockheed and Menasco Manufacturing, and ARCO. A series of publications were put together in that field, and probably were sort of pacesetting of that type. Later, the emphasis shifted upward from the first-line supervisor to higher management levels. And appropriately so, but it started off at the bottom level.

A second project that Bob initiated was collecting union agreements, which he got in a lot of different ways, and analyzing them for their content. And that was done with a kind of crude punch-card system, called a McBee Key Sort. He designed a big card that had all the terms of the union agreement around the edge, and slotted out different ones to match terms of the agreement for one company. Then by inserting combinations of needles into these slots, you could separate all the cards that represented large companies located in Southern California that had vacation with pay for all employees—or any other clause in agreements. So a great deal of that was done. Of course, that method has now been replaced by more sophisticated ways of getting such information. But that was the way it was done at the time.

A third contribution Bob Gray made to the industrial-relations business was an adaptation of public-opinion polling. We did a great deal of work in this field: the polling of employees about their perception of company policies and how they were applied, and what the policies should be, and how they'd like them changed. We compiled a lot of material in that field, which showed some interesting trends over the years.

COHEN: So this went on all these years. Now you mentioned a relationship with the Humanities Division. Briefly, what would that have been?

VEYSEY: The Industrial Relations Center is an anomaly in terms of organization at Caltech. It's

not a division; it's a center. It has been debated a number of different times whether the name should be changed to something else. It started off as the Industrial Relations Section. But nobody knew what it was a section of. So they changed it to Center in a year or two. Now, it did teaching for Caltech students within the Humanities Division. The Humanities Division, back in the forties, was quite different from what it is today. It was strictly a teaching division, to accommodate Caltech student needs. And indeed, there has always been a heavy requirement for humanities among Caltech undergraduates and graduate students. So the Industrial Relations Center taught two courses in the Humanities Division.

Later on—and this was during the time that I was not here on the campus—the Humanities Division underwent a substantial self-improvement and became much more research oriented.

COHEN: What year would that be?

VEYSEY: This would probably be in the sixties and seventies. They became much more research-oriented, began shifting in terms of faculty appointments in that way. And a curious sort of a friction developed between Bob Gray and those on the Humanities faculty.

COHEN: Who would that be? Do you remember anybody specifically?

VEYSEY: Well, there were several economists on the Humanities faculty, but they were all pretty theoretical. Bob was, if anything, very much on the applied side of things. The friction came about because Bob's courses were extremely popular with undergraduates, and graduate students as well. So he did a lot of teaching. And since the Caltech program was set up so that a student had to choose so many units in the Humanities, Bob sort of gobbled up many of those units, and there would be few students left over for ethics or other traditional Humanities topics. And some faculty felt offended at that. And I think they had good reason to be concerned about it, because a Caltech education should be much broader than just how to be an engineer. But Bob was pursuing his own way. So the Humanities Division at one point, as I understand it, undertook to say that there should not be an Industrial Relations Center. That came up at faculty meetings, and ultimately came up to the trustees, as I heard the story. The trustees then went to the

extreme of polling all the industrial companies that they had contacts with. And they found out that strangely enough, the Industrial Relations Center was the part of Caltech best known to these companies. So they said, "Well, in no way are we going to abolish that or divorce it." One proposal was to set it aside as a separate center, not at Caltech but nearby. Or do away with it altogether. But the Trustees said, "No, we're not going to abolish it." That kind of settled the dust for a while, but there was ill feeling for a long time. And the Humanities faculty really tried to get rid of Bob at that time, which they couldn't do. But they would have liked to have seen him go away. So that was a bitter time, a difficult time.

COHEN: Well, I guess the Humanities Division has its problems here.

VEYSEY: Oh, yes. They're neither fish nor fowl. They have improved the quality of their faculty greatly, and they do some pretty significant research these days, which was not the case under Clinton Judy, who was head of the Humanities for a long time. He just liked to teach. It was a service to Caltech, and a good one, too. They did a fine job, but then they wanted to evolve out of that into something a great deal more. And that's where they began to run into troubles with Bob Gray.

COHEN: So then you went off to Sacramento, and you really enjoyed that.

VEYSEY: Yes, very much. That turned out to be an unlikely thing to do, but it happened. It was fortuitous, I guess, that that was probably the golden age of the Legislature in Sacramento. There's never been anything that good before or since that time. But, of course, a good many of the prominent legislators who are there now came aboard during that period. Willie Brown, Speaker of the Assembly, for example. I remember him coming in as a freshman when I was about halfway through my eight years there. And he was a pretty wild hare, but he gradually settled down and later became a very bright guy and a very constructive force.

For example, one of the things that I fell heir to was the chairmanship of the Education Committee at the time that the student riots were taking place at Berkeley and elsewhere around the country. So they set up a special committee to look into the situation in higher education and decide what to do. We held a hundred days of hearings and went very intensively into that

whole thing. Willie Brown was a member of that committee, although he kept a very low profile. He didn't want to expose himself to certain elements that might be against him. But he was very responsible and very helpful in illuminating some of the issues. For example, there were a lot of things wrong at University of California, Berkeley, the focal point. It had become a wonderful research institution but neglectful of the undergraduate. California was sending our brightest there, and they just got lost in the great shuffle of thousands of students, and would never meet any faculty member other than a teaching assistant. It was a very great disappointment to them. So we got senior faculty to honor their obligation to undergraduates. But things were pretty turbulent there for some time.

Well, the university administration hadn't conducted its role properly. And the faculty were guilty of a lot of things, too: they would rather do research and consult and publish than deal with undergraduates. Administrators were weak in enforcing the rules. So we accomplished some changes. I remember we went over to the State University at San Francisco the day that S. I. Hayakawa became a famous name. [Laughter] I saw him do his thing there, which was very interesting. But fortunately, the situation cooled down. People did begin to perform in some reasonable way. But there was, of course, a lot of bitterness, which carried over for a long time. One of the saddest episodes I can remember concerned Wallace B. Sterling, who left Caltech to become president of Stanford. And he was a pretty popular president. But there was a rump group of malcontents at Stanford in the sixties who wanted to do something wild. So they broke into his office at night and burned his library books. That was falling about as low as you could go, I thought.

COHEN: So you felt you were really in the right place at the right time, doing exciting things.

VEYSEY: I'll have to tell you about an incident during that period, when Willie Brown was on my committee. I used to confer with him pretty regularly, and we happened to be sitting in the back of the Assembly chamber, talking about something. And all of a sudden he grabbed my arm and said, "Vic, we're in a lot of trouble. Look over there." And that was the time when the Black Panthers broke into the Assembly Chamber. They pushed the guards aside and broke open the door and came inside. They didn't really do anything; it was a publicity stunt for them. But Willie thought for sure they were after him.

COHEN: During that time on the Education Committee, did you have any close contact, or just sort of social contact with your Caltech friends, like Bob Gray?

VEYSEY: Not really close contact. Just on occasion, they would invite me to events here. And then I would see them. Bob Gray appeared in Sacramento pretty often. He was for many, many years a member of the State Personnel Board. And the State Personnel Board presides over personnel matters for all State employees; they would have hearings in Sacramento all the time. So he'd appear regularly up there, and we'd always get together and have a good visit.

COHEN: So you really never, in all these years, lost your contact with Caltech.

VEYSEY: No, kept that up.

COHEN: So then you went off to Washington, which was a big move, because you had to relocate your family.

VEYSEY: Yes, that was a big move. And in retrospect, it was not necessarily all a good move for me. The Congress was quite a disappointment compared to the California Legislature. I felt not so good about that. I suppose I would have always wanted to do it, just to see what it was like. It was disappointing. But I had a lot of good times there. I served on the House Education Committee, on the Committee on House Administration, and then later the Appropriations Committee. So I had a chance to see an awful lot about government. I worked in 1974 on the revision of the budgetary process of the Congress. And we thought we were going to get it fixed so that they would work to a balanced budget. But Congress found a hundred and ten ways to get around all the rules that we set up. And it's never worked out at all. It's just outrageous; there's no self-control there at all. And they do some terrible things.

COHEN: Did you live in Washington during that period?

VEYSEY: Yes, in Virginia. And when I was assistant secretary of the Army, I went to Panama a

great deal. It was most interesting to work with the Corps of Engineers again. They're a remarkable organization, very bright, very dedicated people.

COHEN: And they're not political at all.

VEYSEY: Well, they're political in the sense that they are able to persuade Congress to do a lot of things that they want to have done—funding of projects and that sort of thing. But they stay out of politics.

COHEN: So a senator can't go to them and say, "Look I want this bridge on this road."

VEYSEY: No, it has to go through a definite process. And it's a long one. It takes on the average seventeen years to get a project approved and ready to go. And it becomes a political process, because there's a certain amount of pork-barrel trading of votes to get it there. But the Corps is an admirable organization. They do a wonderful technical job. They're just great.

COHEN: And who makes the decisions on what projects they do?

VEYSEY: Congress does. And that was the most enjoyable experience, to have that again.

COHEN: So that was really more interesting to you than being in Congress.

VEYSEY: It really was, yes. Well, there were a lot of interesting things going on. For example, we were starting to build the Alaska pipeline at that time. And the Corps of Engineers was given the responsibility for the environmental aspects of the pipeline. Now, traditionally, the Corps had not been thought of as any kind of environmentalist organization. They poured concrete and placed steel. But they didn't bother with the environment. And that was a great transition that the Corps underwent at that time. The National Environment Protection Act legislation was passed, which required all federal actions to have public hearings preceded by an environmental-impact statement. The Corps of Engineers didn't much believe in that at all, but it was the law, and that's what they had to do. And they got into some fairly major troubles with endangered

species and inadequate environmental statements before they ever got tuned in to the process. And there was some grumbling in the Corps, but they took it on pretty well, and they've done a good job of it, I think, altogether. It was exciting to have a part in the new orientation of the Corps of Engineers.

COHEN: How many years were you assistant secretary?

VEYSEY: Two years.

COHEN: And then you got the call to come back?

VEYSEY: Yes. Well, Bob Gray was in declining health. He had a kidney malfunctioning and things like that. He'd never paid any attention to his health at all. So he was unable to take on any new programs or sustain the existing ones. And he knew it. And everybody knew it. He was just hanging on to get something worked out. I guess he thought I'd be a good one to come back. Then, Neil Pings was finally the one who came to me and asked me to run the Industrial Relations Center.

COHEN: Had you known Neil Pings from before?

VEYSEY: Yes, I'd known Neil for a long time—he'd been a regular here at Caltech. I told him I'd do it for five years; that would wind up my career. So I took it on for five years. And during that time, we had to do a whole lot of new things at the Center. The Center was doing some undergraduate instruction; it had turned outward—to training executives and managers. And this is kind of back to Millikan's theory that if you're a very competent engineer they won't let you be an engineer. They make you be a manager, because you've got to be in charge of ten engineers, or some number. And your toughest problems become other than strictly engineering. So we were training a lot of people in engineering-management fields. Today, the Center has about 3000 students a year, almost all from industry.

COHEN: What length of time? Would this be one night a week?

VEYSEY: No, it could be a variety of programs. There's an engineering-management curriculum that requires taking six or seven subjects. But there are other programs that last maybe only three full days at a time, short-term things. That's become very popular, and people pay big fees to come here from around the world. These programs really support the Center, and Caltech gets a lot of money out of that.

COHEN: Now do professors from other departments come in and teach for you?

VEYSEY: Sometimes. Not typically. On many occasions, we have used professors, specialists in certain fields. But more typically, instructors will be recruited from some place that has a broader program in technical-management fields, like Stanford or MIT. And they'd come in and teach their specialty. We've had remarkable success with programs for high tech managers. The Center knows how to organize them, and recruit students. The Center teaches some programs on campus, where a mixed group comes together. Others are in-company programs for large companies. We take the teaching to them. But the Center itself has four good-size classrooms, and a library, and office facilities, and storage. It's pretty well equipped.

COHEN: It's really its own place. It doesn't really interact a lot with the Institute as such.

VEYSEY: Not really, no. But I think it's an important link between Caltech faculty and the industrial world—a connection that has its value in many ways. Much of this is adopted from the wartime ESMWT programs.

COHEN: So you were here for five years.

VEYSEY: Yes, five years as Director of IRC.

COHEN: What year was it when you retired from Caltech?

VEYSEY: '83, I guess. I returned to Caltech in '77.

COHEN: And did you stay in Pasadena after you left?

VEYSEY: Yes, we located in Pasadena, and stayed here. Although I went up to Sacramento for a year on a special assignment in the State Industrial Relations Department with Governor Deukmejian. There's a secretary of industrial relations, and I held that job for a year, and then came back again. We had an apartment in Sacramento temporarily, and went back and forth.

COHEN: So now, here you are, you're back again. And still serving Caltech in many ways.

VEYSEY: I have accused Caltech of being either very forgiving or very poor record keepers, because they let me come back so many times. [Laughter]

COHEN: And now you serve on many of these other committees. You do SURF.

VEYSEY: Yes, the SURF [Summer Undergraduate Research Fellowship] program. That's a very interesting project, and one that I've worked on for a long time. The Friends of the Caltech Libraries, and the Caltech Y, and Project SEED. And various things like that.