

ALIAS NEAL PINGS

Give a busy man another job, and you get a busier man. If he's C. J. Pings, you also get the job done.



Once upon a time a university professor could, with a clear conscience, hew to his scholastic specialty and let administrative chips fall where they might. But at Caltech those days are long gone. In fact, it's a rare scholar who *doesn't* have an administrative assignment outside his classroom and lab. It's even a rare man who doesn't have a couple of them. But "rare" is hardly adequate to describe a man who takes on three or four.

Take C. J. Pings, professor of chemical engineering and chemical physics, who is *also* executive officer for chemical engineering, vice provost, and dean of graduate studies. Membership in a clutch of committees and professional societies, co-editorship of the journal *Physics and Chemistry of Liquids*, and editorship of a new journal *Chemical Engineering Communications* round out his multifaceted and admirable career.

Admirable, that is, except for his troubles with the FBI. This blot on the escutcheon of someone who has risen to such heights at his alma mater—and become a highly respected scientist elsewhere as well—dates back to 1951 when Pings was a senior at Caltech. Though he had acquired the name "Cornelius" at birth in 1929 (via his father, his great-grandfather, and his mother's sister Cornelia), he had adopted "Neal" for all practical purposes. But the solemnity of a possible job with the Atomic Energy Commission after graduation led him to inscribe "Cornelius" on his application. The AEC sent a standard request for a recommendation to chemistry professor Ernest Swift. His crisp reply that he had never heard of any Cornelius Pings brought a swarm of FBI agents buzzing around Pings' hapless head.

"Living under an alias was over," says Pings. "Before applying for any more jobs, I knew I had to make the switch from Neal to Cornelius. I started by going to the Registrar's office to get my named changed on my transcript—and that's when I found out my troubles had just begun. There was no way, I was told, to make the change. I produced my birth certificate; the Registrar's staff was not impressed. I admitted that I had lied about my name when I entered Caltech; they suggested I get a

court order for them to make the alteration. I think we finally compromised by putting Cornelius in parentheses on the records.”

Cornelius John Pings is a native of Conrad, Montana, a small rural community on the east side of the Rockies. His family lived in Montana because his grandfather had left the family home in Wisconsin to take out a homestead in the West. (A generation earlier his great-grandfather had immigrated to the United States from Germany, about the same time that his mother’s ancestors arrived from Ireland.) Neal’s father struggled through the Depression years as an electrician with the Rural Electrification program, and finally in 1942 went looking for his greener pastures in California.

Those early years of economic insecurity gave Pings some sturdy opinions about what an education is for. The quest for knowledge excited him, but a strong motivation for getting a college degree was its promise of economic benefits.

At Hollywood High School, Pings was interested in history and English, and was editor of the school paper. His grades were almost all A’s. As a senior he considered going to UCLA—and eventually to law school—but finally he and a group of his friends applied to Caltech. Though the possibility of being admitted seemed fairly remote, 1947 turned out to be a record year for Hollywood High graduates to make the grade at the Institute. Of the six who applied, five were admitted—and all five graduated four years later. (Ken Berg is now a research specialist with the Whittaker Corporation in El Cajon; Dick Brewer is a research staff member with IBM in San Jose; Winston Royce lives in Los Gatos and is a member of the technical staff of TRW Systems; and George Trilling is a physicist at UC Berkeley and the Lawrence Livermore Laboratory.)

Pings entered Caltech planning to become a nuclear physicist—an ambition that lasted just one term. But chemistry immediately filled the void—perhaps, he suggests, partly because of the quality of instruction he received. Linus Pauling and Norman Davidson taught him freshman chemistry, and Ernest Swift was his instructor in sophomore year. (“Anyone who survived that course will testify to its intellectual thoroughness.”) Howard Lucas, professor of organic chemistry, taught him most of what he knows about laboratory techniques.

With visions of going to work eventually for a chemical or petroleum company, Pings took his BS in applied chemistry—having financed four years of college with a

combination of scholarships, summer jobs, and student loans. And with the hope that this eventual job would be one of substantial technical responsibility in industry, he persisted through a PhD program in chemical engineering. It was with some surprise, then, that in 1955 he found himself turning down some attractive job offers in industry to go with his fellow alumnus Dave Mason, then on the staff at JPL, to set up a new chemical engineering department at Stanford. “I decided to try academic life for one year,” he says, “and I’ve been at it ever since. So much for my industrial aspirations. But I often tell students about myself when they ask me for career advice. My experience is that flexibility is an asset.”

Pings will testify that a little flexibility can take a man a long way—to northern Greenland, for instance. Thanks to his reading a notice posted on a campus bulletin board, that’s where he spent the summers of 1955, ’56, and ’57. Graduate student Mark Meier, now a noted authority on glaciers, was organizing a geology field trip and recruiting a staff.

Right then, Pings liked what that job offered—summer work, distance from Pasadena, outdoor life, and moderately good pay. It also made good use of his research background (heat transfer and thermodynamics), and he is still proud of three professional papers resulting from the experience. (“And my children are still young enough to be impressed when I point to Greenland on the globe and say, ‘I was there.’ ”)

After four years at Stanford, Pings came back to Caltech in 1959 as associate professor of chemical engineering and as resident associate for Fleming House. Two problems cropped up soon after he arrived. The first was overcoming his student-bred reticence at calling senior faculty members by their first names. Will Lacey, now professor emeritus of chemical engineering, cured that

difficulty with a few well-chosen words. "You've graduated from calling me Doctor," he said. "My name is Will!"

The other problem was that hardy perennial—complaints about student-house food. As resident associate Pings had a head-on verbal collision about it with the dietitian and manager of the student houses, Marjorie Cheney. His recollection of the effectiveness of his battle in behalf of an improved cuisine is hazy. (Marjorie says: "At first I thought that he would be easier to cope with than the undergraduates, but . . . !") One result was an "honest-to-God campus romance." He and Marjorie were married in 1960.

Pings made a decision in his first year at Stanford about the general area of research he wanted to pursue—to understand liquids at the molecular level. He was struck by the fact that a fairly sizable body of knowledge existed about gases and solids, but comparatively little about liquids.

"There's a component of engineer in me," he says, "but I wanted to go into the hard science aspects of the liquid state. My experiments have been designed to lead ultimately to better theory, which may then be applied to practical problems. Now, 16 years after I started, the problems are far from solved, but I think we've made some progress."

Pings and his research group are currently interested in mixtures. Understanding mixtures by the brute force of numbers of experiments is hopeless; there are too many possibilities. The aim is to develop some rules for utilizing what is known about simple substances to say how they will behave when they are combined.

Essentially, the research is divided into three sub-groups, each involving use of a different technique and the simplest available systems (monatomic rare gases such as argon and krypton, which are liquid at the temperatures and pressures used in the experiments).

The technique Pings started working with, which is still the backbone of his research, is that of X-ray diffraction. Using it, his students are able to measure the structure of fluids—the average number of neighboring atoms and their distance apart.

The second technique is a study of the refractive index of fluids, chiefly at the critical state—in the borderline region between liquid and gas. The refractive index is a measurement of how much a beam of light is bent as it stabs through a liquid. The amount of bending is indicative of the electrical environment of local areas of the liquid and also gives some idea of its density.



Marjorie Pings

The third technique is to use lasers for light-scattering to study the motion of the molecules in fluids. This is fairly new, and with it, Pings says, "We can make some very exciting measurements and get some wholly new information. And we don't yet have any idea of its full potential."

While the orientation of Pings' research group is basically experimental, he makes sure that they keep in touch with theoreticians. "We try to find experiments to challenge or confirm the theories we hear about," Pings says. "Then, from our data, we are able to suggest new approaches to the theoreticians, and we listen when they suggest what we should be doing in the laboratory."

Of course, Pings doesn't listen to just the local theoreticians. He is a regular participant in scientific meetings, including the Gordon conferences—a series of week-long summer conferences for scientists, held on the campuses of various New England prep schools. The Gordon Research Conference on the Physics and Chemistry of Liquids meets biennially, and Pings has attended the last seven of them. (He was chairman of the one in 1969.) Attendance is limited to 120 researchers, carefully chosen for a good mix between already established and younger scientists. "Those conferences are a beautiful experience," Pings says. "For one whole week you're with your colleagues—theoreticians and experimentalists—in continuing conversation. And we correspond over the intervening months too—asking questions, checking results, making suggestions. I grumble a lot about meetings, but not about these."

Meetings are a fact of life for Pings. For example, his calendar for last May shows four trips out of town—to Washington for a monthly meeting with the provost-level



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representatives of seven other universities (he stopped en route to deliver a research seminar at the Sandia Laboratories); to China Lake for a meeting of the Advisory Committee of the Naval Weapons Center; to Washington again for a conference on the Financial Crisis in Higher Education; and to Tucson, where he is Caltech's administrative representative on the board of directors of the Associated Universities for Research in Astronomy. In between, he attended meetings on the campus of the Faculty Board, the Board of Trustees, the Institute Administrative Council, the Graduate Study Committee, the board of directors of the Alumni Association, and the faculty committee on Affirmative Action. He served as chairman at four sessions of an ad hoc committee on business economics and management science, sat on two PhD oral examination committees, attended three research seminars, and sandwiched in a large number of appointments with individuals.

Bringing ability and good nature to his meetings, Pings makes both friends and progress in the process. Some of his success must surely stem from his genuine commitment to Caltech and to higher education. "I want to do what I can to help both of them thrive, to adapt to changing times, and to stay ahead of their problems," he says.

Pings has taken some razzing about the number of jobs and titles he carries, but he doesn't feel that his case is noteworthy. "A lot of people around here are carrying administrative tasks and practicing the trade simultaneously," he says, "and it's not all that hard. The bureaucracy is minimal, which makes it possible to get hold of people and talk things out. Of course, you have to make choices. I regret losing some of the rapport I used

to have with undergraduates. I missed teaching last year, so I'm glad to be back at it now—giving the thermodynamics course for sophomores this fall and winter. I suppose there's some ham in me, but to stand up in front of a class and feel you're conveying knowledge and maybe affecting attitudes can be very satisfying. But I won't go into class half prepared."

Juggling the requirements of his various posts and his available time also keeps Pings from getting into the lab to make his own measurements. But he meets with his research group (smaller in these days of funding difficulties than it used to be) as often as he can, and he makes himself available for conferences on individual problems. The formalities of setting up such meetings are a little more complex than they once were, but he feels responsible for keeping track of what's going on and trying to be helpful. William Corcoran, professor of chemical engineering and vice president for Institute relations, who has known Pings since 1952, puts the matter succinctly: "Nobody ever gets short-changed by Neal."

The list of Pings' contributions over the years on many Caltech administrative and faculty committees is a long one, and his chairmanship of the Ad Hoc Committee on the Aims and Goals of the Institute (1969-1970) epitomizes that kind and degree of service. Rodman Paul, Harkness Professor of History, who has known Neal since he taught him history as an undergraduate, was also a member of that committee. He recalls that through all the long months of its deliberations Neal "displayed tremendous fairness, calmness, and breadth of understanding. He is a good scientist who deals with human beings in human ways. When Harold Brown was chosen as president of the Institute, it was clear that somehow he would have to be thoroughly briefed. It was Neal more than anyone else who pointed out that the report of the Aims and Goals Committee would be exactly what was needed to do the job. So, we shoved it through with a speed that didn't seem possible, and gave it to the president. I think it was the most thorough analysis and appraisal of Caltech that has ever been made."

Pings says, "Working on that committee convinced me—and others—that an institution like this doesn't run itself. We're fortunate here that the faculty is involved in decision making. It was clear at the time the committee was appointed that we were heading into a period when we were going to be subject to severe constraints, that we were going to have to live by our wits. There were going to be choices and decisions, and if the faculty wanted to

get in on those, it was going to have to make its views known and some of its members available for administrative positions. It's probably not a coincidence that 60 percent of the committee's members have ended up in administration."

Neal's own administrative posts include being executive officer for chemical engineering, vice provost, and dean of graduate studies. One reason he continues as executive officer is that the chemical engineering faculty is, on the whole, very young and involved in starting their own research. "It doesn't make sense to dilute their time with administration at this point," says Pings. "We're really victims of our own strategy, because we have deliberately been recruiting young men—but it will pay off in the long run."

Most of the day-to-day operations of the graduate office—admission and support of students, management of the office, direct contact with the various option representatives, and participation in national and regional groups concerned with graduate education—have been turned over to Associate Dean Stirling Huntley, with Pings being involved in policy making, budgeting, and working with the Graduate Studies Committee.

As vice provost, he has specific responsibility for all new and renewal appointments on the research ladder, for the faculty portion of the Institute's Affirmative Action Program, for the library and the Industrial Relations Center, and for interdisciplinary programs. Basically, however, he sees his task to be relieving the load carried by Provost Robert Christy. Somewhat ruefully he points out: "We have to handle questions that once didn't even arise: How do you try to do as much, and maybe more, research on less money? How do you keep a young faculty when you can't afford to appoint new people?"

"There are lots of kinds of jobs around here, and I like to sample them," says Pings. "I enjoy feeling useful; I like to free time for others to do what they want to do. And there's enough of the competitor in me that I don't mind working at being successful. Each of my jobs calls on different talents, responses, parts of temperament, and combinations of whatever abilities I have. And each makes vulnerable different kinds of shortcomings. Research demands analytical thought processes plus whatever creativity I have, and that rather severely exposes the limits of my intellect. Supervision of personnel and administration in general require exercising judgment on problems dominated by values and the ramifications of

human personality. I often find myself failing in these situations—either because I try to find an exact answer to a diffuse problem or, at the other extreme, I compromise in making a difficult decision because I give in to a desire to be liberal or compassionate."

Administrative work is harder than either teaching or research as far as Pings is concerned—a fact which, he thinks, may reflect his lack of training in its techniques. The problem boils down to persuading other people to do things for him, and he attacks it by assuming that the people he deals with are reasonable individuals.

Like many another Caltech professor, Pings often takes a loaded briefcase home. Even when he leaves his work at the office, he finds it hard to take a real break from his duties unless his family can lure him out of town—preferably to the mountains or the beach. He feels that he is overdue for a leave of absence for about six months at another university. Such breaks in routine lend perspective. But he expects the experience will just confirm his conviction that Caltech really is an outstanding place.

He has been investing in that conviction for a long time. As an undergraduate Neal Pings was a member of the Beavers, the Board of Control, the Interhouse Committee, Throop Club, and—with real devotion—the varsity football team. All this adds up to top-notch credentials for his election to the board of directors of the Alumni Association. He took on this three-year job in 1970 not only because he was interested but because he had a two-way feeling of responsibility. He believes the faculty hasn't made adequate use of the talents of the alumni, and that the alumni could do a lot more for Caltech. As a man with a foot in each camp, he thinks he may be able to improve communications between the two groups.

If Pings' services as vice chairman of Pasadena's Community Redevelopment Agency seem tangential to the academic circle in which he usually operates, the appearance is only superficial. He's not there as an official representative of Caltech, but he points out: "I'm concerned that 20 years from now Caltech will be located in a city where it's still pleasant to live and to send children to school. The decisions that are being made right now will affect that. Faculty members here have always been involved in national affairs, but local involvement is just as important. Caltech can't isolate itself from Pasadena, and maybe I can be a bridge."

Not even the FBI could find anything wrong with that.

—Jacquelyn Hershey