

Early History of the Department of Geology and Geophysics

Introduction. As the remaining member of the department of Geology and Geophysics from its Paleolithic Era, I was asked a few years ago to record some of its early history, and in particular my part in it. My version is inherently faulty. As time goes by, we tend to remember the big successes and disappointments and forget most of the day-to-day activities. Furthermore, our memories are biased towards our own participation, so that events involving mainly others may be forgotten, no matter how important they were at the time.

It is convenient to divide the Department's history into four parts. The initial period is from its origin as a department in 1958 to 1964. That was a time of great change and growth not only in the new department, but also throughout the University of Hawaii as well as in most other US colleges and universities. The department was largely carried along by events, with only moderate control over its own development. The second period, to 1970, remained a period of growth, but geology had become amalgamated into a Department of Geosciences, with virtually no control over its future. A third period was one of reemergence of a Department of Geology and Geophysics, readjustments and modest growth, and a measure of control over its destiny. There were, however, in that period of the '70s and '80s two sharp recessions that affected the State, University, and department. 1988, when GG was transferred from Arts and Sciences to the new School of Ocean and Earth Sciences and Technology, can be used as the boundary to the present era, but almost every year from 1985 to the present has had some substantial change in aim, growth, or organization, so other writers might think some year other is a better choice. The history I was asked to write for the departmental newsletter was of the first two periods (1958 to 1970). Perhaps someday I'll continue writing my version of the history to the present.

Ultimately, a department is judged by two factors. One is the set of students it has attracted, trained, and graduated. The other is the quality of its faculty. The factors are not independent. The effectiveness of a department depends more on the sum of its faculty members who attract and train the students, than on its curriculum or chairs or equipment, even though they too are important. The faculty, moreover, provides the continuity of a department when graduates of different classes or even



of different eras gather to reminisce, or browse through a newsletter.

In addition to faculty and students, the story that follows has to include organization, struggles for positions and funds, and the growth of support facilities. From the beginning of the department and the institute, the histories of the Department of Geology and Geophysics and Hawaii Institute of Geophysics have been intertwined.

For more than thirty years, Harold S. Palmer was the University of Hawaii geologist. There was no department of geology. Professor Palmer would say, he didn't occupy a chair of geology, he occupied the settee of geography, geology, and whatever else anyone gave him. When I arrived, well after Palmer's retirement, Ag Abbott and Gordon Macdonald were still exploring their way through Palmer's old quarters in Dean Hall, turning up such discoveries as filled cigar boxes labeled "long pieces of string", "short pieces of string", and "pieces of string too short to use".

Dr. Palmer's early publications had been monographs for field geologists, for example, for determining the thickness of a section if the slope of the ground, dip of the beds, and the length of the traverse across the outcrop were measured. These alignment diagrams were invaluable in the days before geologists were required to learn trigonometry, and were included in standard texts for field geology and structural geology. Later, Palmer added to our knowledge of the groundwater reservoirs under Honolulu and adjacent Oahu. He left the new geology department a modest legacy, which for many years his widow Dorothy augmented, and that for two

decades was the only discretionary funding we had. The Department uses the Palmer Fund for interest-free loans to undergraduate students attending summer field camps on the mainland.

On his retirement from Hawaiian Volcano Observatory in 1940, Dr. Thomas Jaggar was appointed a research associate in geophysics at the University of Hawaii, a position that he retained until his death in 1953. A legacy from him for the support of volcanological research at the university has become part of the support, other than salary, of the Macdonald Professor.

Half a century ago Hawaii's isolation, high cost of living, and social structure caused even more problems for recruiting and retaining university faculty than they do today. There was also the instructional obligation of 12 equivalent semester hours in the fall and in the spring at the University of Hawaii. Fifteen hours was standard at Hilo and in the community colleges that evolved from the training schools. That was reduced to 12 at the University (there was no "UH System" then, Manoa was the University and the rest were colleges), because University professors should have some time to read to update their lectures.

In the late 1950s and early 1960s there was more than one belief about the way to hire faculty. The most common way, but one that was already starting to decline, favored hiring mainlanders whose financial stability was a more important criterion than academic achievement. Those hired would be able to live a comfortable life as a professor. Their educational and economic backgrounds meant they would be able to use big words correctly in lecture, and they wouldn't slip into poverty or use the wrong fork to embarrass the university.

A second faction fought to place residents of Hawaii in the University, almost as a birthright no matter what an individual's training, experience, or reputation outside Hawaii might be.

Recruitment of a third group was spearheaded by Robert Hiatt and others who believed that Hawaii had research and scholarship potential in a number of fields, and that private foundations and especially the newly established National Science Foundation (NSF) would provide the means of funding glory for Hawaii. Bob Hiatt was an ambitious marine zoologist who became Dean of the Graduate School and Director of Research, then Interim President of UH, and later, President of University of Alaska. An early scheme he fostered was the appointment of mature and well-reputed scholars as Senior Professors, with pay at the upper end of the full Professor scale, and a reduction in teaching load from the standard 12 equivalent semester hours down to 6, thus allowing time to continue research. Shortly thereafter institutes were organized. Institutes had Researcher appointees paid 11 months without teaching obliga-

tions (R classification), and soon split research-instructional appointments (IR), were started. This was a Land Grant college, and the Legislature and Board of Regents understood that some agricultural extension specialists had split duties, to serve the public in their specialty for part of the time, and to teach during the other part. The Legislature accepted the notion that IR faculty would have split duties as well.

The matter of teaching load was all-important to young faculty members. Deans and Chairs were the gods who decided equivalent semester hours. Appointment to the curriculum or personnel committee of a College, or a decision by a science Chair that lab contact hours counted, were valuable. Publication of a book or papers beyond those based on the dissertation was also important, as that publication allowed appointment to the Graduate Faculty. The instructional load was then reduced to 9 hours per semester, because working with grad students was recognized as being so time-consuming. Promotion to Associate Professor with tenure was a significant step for a reason beyond the title and two-step pay increase. Whereas Assistant Professors on the Graduate Faculty could serve on committees, Associate Professors could chair dissertation and thesis committees. In some departments, chairing a student's committee acted to reduce the semester-hour load. Associate and full Professors were also allowed to organize and offer graduate seminar courses.

In 1955, Ag Abbott was appointed Associate Professor of Geology to replace Harold Palmer. Agatin T. Abbott had worked as a mining geologist and engineer in Arizona. After WW II he worked for his doctorate at University of Washington. His particular interests were geomorphology and economic geology, but he also taught mineralogy and the introductory Physical Geology course. Ag chaired Geology from its establishment in 1958 to 1964, and he chaired Geology and Geophysics in part of the 1970s. He was well known and maintained a high profile on campus, in membership on various committees, and as chair of the Faculty Senate for a year. He was equally active off campus, in Rotary, a theater group, and in church and Punahou affairs. He involved himself heavily in NSF's program to take science education to the (then) Trust Territories, and was a consultant geologist in Hawaii. Once the youngest of their seven children was out from underfoot, Ag's wife Paula taught religion and science at Punahou. Quiet-spoken, unflappable, of boundless energy and filled with fine common sense, Paula was a full partner in a good marriage. They lived in a beach-front house in Lanikai.

Early in 1958 Gordon Macdonald was appointed Senior Professor of Geology and Geophysics, 50% in Geology and 50% in the new Hawaii Institute of Geophysics (HIG). Thus Mac was the second member of

the geology department. He also was the second HIG appointee; Jane Kajiwara of Dean Hiatt's office was first, to ensure administrative stability in the years before a building and a Director. Trained at UCLA (BA, MS) and Berkeley (PhD), Mac worked briefly for Shell Oil before joining the USGS. He was assigned to assist Harold Stearns mapping in the Territory of Hawaii, and to report on the petrology of the volcanic rocks. Mac taught a year at USC and studied volcanoes in the Philippines, Europe, and California, but was especially well known in Hawaii for the period from 1951 to 1956 when he was Scientist in Charge of Hawaiian Volcano Observatory. Kilauea erupted in three of those years.



Gordon Macdonald

From time to time Colin Ramage, a meteorologist and also having a 50% appointment in HIG, was attached to Geology, at least on paper. Usually, however, he and those some termed his vassals were in his separate Department of Meteorology and Oceanography.

I was the third geologist in the department. Enrollment in the introductory courses and service courses (but not yet the number of majors) had increased to the point that expansion was justified. I had been working in California as a petroleum geologist but had become discouraged at the delays in getting an overseas assignment that I had been promised. Big promotions were going to those with a tour of overseas experience. Maybe I've been a sucker for promises. Anyway, my former professor Harry Hess, who had been involved in one of the vettings by the NSF of the new HIG, had alerted me, that Hawaii would be advertising soon for someone. I had seen Hawaii off and on from 1948 to 1952 in the Navy, and so I got an early copy of *Geotimes*, found the ad, answered it, and was selected. A carpetbagger, I arrived 1 September 1959, a few days after Statehood. My wife Jean, our toddler daughter, our infant son, and I had survived the 12-hour flight from Los Angeles.

The first year was a real test of whether we would survive Hawaii or not. Compared with the mainland, my salary of \$6,008 per year sounded fine until we walked the aisles of the grocery stores and searched for a house to rent. A family of four has more expenses than had a bachelor in the Navy. Paula Abbott told me later that my application was selected because it was acceptable to a wide range of the science faculty; surely a Princeton graduate meant both cash and smarts. But I had gone

East from a high school, not a prep school, on a scholarship and a work arrangement. In grad school I had the good fortune of the GI Bill, two fellowships, and especially Jean, who like the other grad-student wives, went to work earning her Ph.T (Put him Through). Eventually we found a rental on a lane in the then-rural part of Kaneohe, with my neighbor's cow tied on a rope to a stake, grazing and pooping in his front yard and in mine. So the kids went into a sort of child care and she went to work as the buyer for a department at Liberty House, and we could then afford rental of faculty housing on campus. Jean soon earned about as much as I did, we each continued to get raises, and in a few years we and the bank could buy a small house.

The eruptions of Kilauea Iki in November, at Kapoho in January, and the Chilean tsunami of May were all exciting events in my first academic year. Parking was free on the streets of a campus with attractive buildings and well-landscaped grounds. Most of the 4,000 students were in the university because they were highly motivated to learn. Geology was allowed to offer the MS, and was planning towards the PhD (that program started in 1962). Plans for HIG and for the East-West Center were progressing. The faculty was urged to contribute to a new mission statement for the University of Hawaii and I was happy that most of my sentences were included in the final version. Deans Alan Saunders of Arts and Sciences and Bob Hiatt of the Graduate School poured their souls into improving the university; they gave good advice and put me on committees that made me feel important. And my welcome by faculty across campus was warm. So I was hooked on Hawaii and stayed.

My initial teaching assignments were the soft-rock courses that Mac and Ag didn't teach, namely historical geology, structural geology, sedimentology, paleontology, stratigraphy, marine geology, their labs, and the physical geology labs. I was to develop a research program in marine geology and sedimentology. Fortunately, except for the physical geology labs the six courses were split between the two semesters. Soon we had our first senior majors, Pius Kang, Floyd McCoy, Fris Campbell, Ray Sasaki, and Stan Shimabukuro, and in my second year the physical geology labs were taught by Ray and Stan, paid as student help. I also combined sedimentology and stratigraphy, rather like cheating, but it was a way to reduce 3 more hours a year. Before the department was given positions of TAs so we could use our grad students, we had funds to hire lab instructors from PhD candidates finishing up at West Coast universities, looking for a job between Comps and turning in their completed dissertation.

Through the 1960s I was the "outside member" on several committees in Zoology, Botany, and Soil Science (chaired by Senior Professors of those depart-

ments who wanted to be sure that young faculty members became involved in more of the University than their own departments). They were generous with what facilities they had; I was given the use of skiffs at Coconut Island, an excellent X-ray diffraction instrument in Soils, and a quirky flame photometer in Botany.

Mac taught as heavy a load at his own request, even though his 50%-R appointment meant he was only responsible for 6 CH a semester, and being a Senior Professor supposedly cut that in half, to 3 SH, or one course a semester. His development and teaching of Geology of the Hawaiian Islands was great for our statistics, attracting 150 or more students a year. Mac also taught petrology, petrography, and field methods, and gave graduate seminars in volcanology, igneous petrology, and metamorphic petrology. His teaching rated at the top of students' polls year after year. Mac used to say he felt privileged to be paid for the teaching and research he loved;



Ralph Moberly (left) and Kost Pankiwskij (right)

he felt that only twice a year did he really sweat to earn his pay, when he had to give end-of-course grades.

Initially, like most others on campus (excepting Mac and those who grew up in Hawaii or California), I taught in coat and tie, and trousers. The coat went in a year, the tie a couple of years later, and from the late 60s to today it has been shorts and an aloha shirt for me. But now it's with sneakers or walking shoes; leather shoes are hot, and my funny feet didn't accept go-aheads.

With a tiny department and initially no grad students, there was a different sort of intellectual stimulation than today. The Dana Club had been founded by Harold Palmer years before, and named for James Dwight Dana, the first trained naturalist in the Hawaiian Islands (Wilkes Expedition, 1840), and America's preeminent geologist of the mid- to late-1800s. Dana, like Palmer, was a Yalie. The Dana Club would sponsor lectures by visiting geologists, but the more common event was a monthly meeting in someone's house. The geologists in Honolulu would gather in the evening, to drink beer and discuss an article they had selected the previous month for study. Besides the UH three and a couple of retirees from the mainland, there were mainly groundwater and engineering geologists. I regret I can remember so few now—only Dan Davis, Kiyoshi Takasaki, and Charlie

Johnson of the USGS, Doak Cox of the Sugar Planters Association, and John Mink, a consultant. My wife had decided everyone should collect something, and that I should collect beer mugs. Use of my pewter ones that she had bought for me date from those evenings.

A different scientific group was the local chapter of the American Geophysical Union (then AGU allowed a local chapter). It included hydrologists in agriculture, meteorologists in the Air Force, oceanographers in the Fish and Wildlife Service, an astronomer from Bishop Museum, and sundry faculty from UH. A guest lecturer once a month, and canned pineapple juice to drink.

The Dana Club, beer evenings, and the AGU meetings faded in the mid-'60s. GG and HIG had added staff, so there were too many to fit in one home, and AGU gave up its local chapters.

Indeed, the 1960s were a time of major expansion not only in the University of Hawaii but also across the nation. Science did especially well in that post-Sputnik era. Tom Hamilton as president with a strong and independent Board of Regents, plus a favorable legislature and governors Quinn and Burns, were all united in their efforts to better the University of Hawaii. But the early 1960s were also a time of great demand nationally for faculty, not only to turn small universities like Hawaii into research universities, but also to turn weathervane normal schools (Southeast Old York Teachers College) into universities, and junior colleges into four-year colleges. It was before the new PhD-granting departments could produce their graduates, and so there was sharp competition throughout the US for faculty in the 1960s.

Let me backtrack a bit to introduce HIG. In the early 1950s, Congress had appropriated funds to build a Geophysical Institute in Fairbanks at the University of Alaska. Hawaii's Territorial Delegate to Congress asked if Hawaii, too, could have a federally funded institute for geophysics. Meanwhile, NSF had been established, and so Congress asked NSF to recommend whether or not an institute in Hawaii was warranted. Bill Benson, a long-time administrator at NSF and the National Academy, friend of ocean drilling, and much later a visiting Professor for a year in Hawaii, said that a committee sent here by NSF was about to turn in a negative report. The committee recognized strong enthusiasm at the State and University levels, along with promises of support, but saw no real evidence of competence or ideas in the physical sciences faculty (this was before Hyatt's Senior Professors). Fortunately, however, geochemist Earl Ingerson of the University of Texas fell into conversation with Jack Naughton of Chemistry. Naughton spoke with conviction of opportunities in rock chemistry and geochronology, and Ingerson convinced the doubters of the committee that Hawaii should be given a chance. [How often has Hawaii eagerly promoted a venture, only

to see it wither because there is no qualified cadre to carry out the intention.]

Congress appropriated \$3 million, through NSF, to construct and equip a laboratory building in Hawaii for an institute, should one be formed. The Territorial Legislature did establish HIG: "There shall be a Hawaii institute of geophysics at the university. The institute shall be administered by a director to be appointed by the president with the approval of the board of regents of the university, to serve at the pleasure of the president. The director shall appoint the professional members of the staff and other employees." The law also gave the duties of the institute in basic research and training, dissemination of knowledge, and application of research results to Territorial problems. The staff would include the territorial geologist and territorial volcanologist. The governor, president, and board of regents were authorized and encouraged to take action to secure federal assistance in strengthening the geophysical institute. With statehood, all of this became State statute.

The University decided the Institute of Geophysics would have professionals in each of the (then) sections of AGU. As mentioned above, Gordon Macdonald was the first professional, or faculty, appointee, and a few members of faculty already in the university were given partial appointments. These included astrophysicist Walt Steiger of Physics, geochemist Jack Naughton of Chemistry, and meteorologist Colin Ramage of Meteorology and Oceanography. George P. Woollard came to Hawaii as the first Director of HIG, and most appointments stemmed from that time. The arrival of Woollard coincided with the completion of the HIG building in 1963. The State had added a few hundred thousand to NSF's three million, to include classrooms for teaching undergraduate geology, offices for the geology chair and secretary, and a floor for the State of Hawaii mainframe computer. At election time, police would guard the third floor of HIG while ballots were counted.

Factions grew at Manoa in what is broadly termed Earth Science. Hiring came from three sources of positions. We in geology received ours as instructional positions directly from our College of Arts and Sciences. We used the positions to satisfy what we felt were our most important teaching needs in the department. Some others were hired into HIG and tsunami research by Doak Cox, from those who had worked with him in Hawaii during the International Geophysical Year (that magical year of 18-month length that sparked research and international cooperation across a broad range of geophysics) Doak was also the fourth member of Geology, having a Lecturer appointment. Other new faculty came from Wisconsin and elsewhere after George Woollard's appointment as the first Director of HIG. Ag would hire a geologist to teach mineralogy; Doak would hire a



Front row (left to right): Gerard Fryer, Fred Duennebier, and John Tuttle. Back row (left to right): Don Hussong, John Carter, Arlie Halunen, George Sutton, Fris Campbell, and Grant Blackinton.

mathematician to worry about tsunamis; George would hire a physicist to run gravity surveys. Then they would get together and trade fractional positions back and forth, to give most of the faculty both teaching and research responsibilities.

For me, 1963 was a great year. I was promoted to Associate Professor, which brought an 8% raise and closer work with grad students. I could also offer a seminar in tectonics. Half of me was traded to HIG, because George wanted instructional fractions for some of his imports, and because I then had the second largest extramural funds within HIG building (next to George himself), employing grad students Gary Stice, Floyd McCoy, Paul Gilbert, and Fris Campbell, and a swarm of undergraduates, looking at beaches and sifting sand. State agencies or resort developers never took our coastal advice, but it was fun before we became cynical or developed other interests.

In 1963 the Department of Geology had 8 bodies and 2.5 positions. Professors were Abbott, Cox, Macdonald, and Woollard, while I was the Associate Professor. Two Assistant Professors were Ted Chamberlain and Gus Furumoto, and Murli Manghnani was Lecturer. Geology had a range of undergraduate courses with labs, but as was common across UH, the graduate courses were almost all seminars. Departmental policy was to stress its graduate program in support of HIG. We had large introductory courses but only a few undergraduate majors each year. We made no particular effort to recruit them or to care for them while they were juniors or seniors. They were in courses with grad students and it was sink or swim. Some faculty members were more considerate of undergraduate majors than others, but that policy held into the mid-1980s. Then a new round of faculty increases allowed Frank Peterson as Chair to work

towards a policy of equal priority for graduate and undergraduate programs.

Although a separate Graduate Field of Study in Geology and Geophysics, which I chaired, was allowed to continue a few years, from 1964 through 1970 there was neither a separate department of geology nor a separate undergraduate program. We were amalgamated with Meteorology into a Department of Geosciences. Its Chair, Colin Ramage, did not get along well with George Woollard. The favored speculation was that Woollard's selection, rather than Ramage's, as HIG Director was the reason. It's not always easy when an outsider picked in a national search comes in and displaces the one on the scene. Todd Furniss and Dave Contois, successors to Alan Saunders as Dean of Arts and Sciences, supported Ramage, whereas the higher university administration and "downtown" supported Woollard. A majority in Geosciences, including some but not all meteorologists, also supported George Woollard. So the late 1960s was at times disappointing for most of the faculty in Geosciences and HIG. Meanwhile, the astrophysicists grew in numbers and research activity, and Institute for Astronomy split from HIG. A national law establishing centers for hydrologic research allowed Water Resources Research Center to form, headed by Doak Cox.

Ramage's Meteorology and Oceanography had died early as a department. In the mid-60s Oceanography was planned and formed as a graduate-only department, and started its PhD program in 1967. In 1968 and 1969 virtually the entire Faculty in Geosciences and Oceanography tried to reorganize, on the basis of what the University of Hawaii terms Graduate Fields of Study. The names of the Fields, and their faculty, need not match the names and faculty of a department. Proposed were a GFS in Volcanology-Geochemistry-Petrology, one in Physical Oceanography, one in MGG (from faculty in Ocean or Geosc), one in Geodesy, and so on. But that was too close to the "research divisions" that were growing in HIG. Moreover, one of the recommendations of a Governor's Task Force on Hawaii and the Sea recommended a new college be formed to stress education and research in the marine and earth sciences, and to be headed by George Woollard. The Chair of Geosciences and the Dean of Arts and Sciences blocked our proposal.

Growth was continuing, still in the method of a position in Research in HIG being filled, and one in Instruction in Arts and Sciences being filled, and then attempts to swap fractions. As a rule, more research positions came than instructional ones, largely as a result of the missionary work by George Woollard at the Legislature. The first attempt between HIG and the restless geologists in Geosciences to hire towards a common goal was in 1970. Jointly we decided on attributes needed, and issued an ad approved both by the research unit

and the instructional unit. One position was available in HIG and one in Geosciences, and ads went out for two positions, each split 50-50. Two brand-new Scripps grads were selected, Gerry Morris and Herb Veeh. Unfortunately, they only lasted a year or two before their wives demanded they move. At any rate, a new scheme of faculty recruitment was initiated.

In 1971 the revolt of geologists and geophysicists was sufficiently strong that Geosciences was split into the department of Meteorology and the department of Geology and Geophysics. The size of the new GG faculty was 19 persons in 7 'T' positions; it more than doubled since 1963, even growing during the Geosciences captivity. Simo Laurila was our Chair. The faculty included the following; the percentage represents the fraction within the department. The other fractions were in HIG, except that Doak Cox and Frank Peterson were also in Water Resources, and Alex Malahoff was also in HIG and in Oceanography.

Ag Abbott	geomorphology	100%
Bill Adams	seismology	25
Doak Cox	hydrology	0
Ken Daugherty	geodesy	25
Pow Fan	geology of Asia	25
Gus Furumoto	seismology	25
Simo Laurila	geodesy	50
Gordon Macdonald	volcanology	50
Alex Malahoff	marine geophysics	25
Murli Manghnani	high-pressure geophysics	25
Ralph Moberly	marine geology	50
Gerry Morris	marine geophysics	50
Kost Pankiwskyj	Mineralogy	75
Frank Peterson	hydrogeology	50
Johanna Resig	micropaleontology	25
John Rose	geophysics	25
George Sutton	seismology	25
Herb Veeh	marine geochemistry	50
George Woollard	gravity and geodesy	0

The department organized itself by committees, and the role of department chair became that of first among equals. While the University and the State were entering a time of stagnation and faint leadership, we could, at least, have greater control over our own destiny. The R fractions of our positions still tied the department with the institute (nine of the above were hired by George Woollard). Recently, some GG faculty have asked about the name of the department; geology stemmed from the old departmental roots and geophysics from the HIG roots for us having joint appointments. Thus our ancestry was reflected in the department's name, Geology and Geophysics. Exciting years had gone by, but there were still exciting ones to come.

Ralph Moberly