

Some Remarks on the Character and History of Our Department

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UofA Geoscience's excellence, if not preeminence, has derived incrementally from:

- 1/ focusing particularly on *some* subfields, but not all;
- 2/ creating and maintaining connections between the subfields;
- 3/ mighty success in faculty searches achieved through sense of purpose and collegiality;
- 4/ a 6 decades-long tradition of appointing department heads from within & passing the torch;
- 5/ strategic and courageous actions and choices;
- 6/ demonstrated willingness to stretch when challenged;
- 7/ valuing and strenuously addressing both research and teaching;
- 8/ sustained exceptional quality efforts by strongly supportive staff committed to serving;
- 9/ building and supporting a very strong graduate program;
- 10/ conducting affairs in ways punctuated by strong doses of humanity.

The primary driver of our ever-increasing research reputation has been plentiful delivery of *impactful* science that turns heads nationally and internationally. Very high standards in seeking and recognizing excellence among candidates in faculty searches has been the path all along, through to today!

My association with the department permits me to get back, firsthand, to 1970, and even earlier still based on all I learned from close colleagues who arrived in the 50's and 60's and continued to serve well after I arrived. Much of the early history of the Department of Geology was centered on economic geology, and in fact the Department of Geology, up until 1968, resided within the College of Mines. It made sense that economic geology was the primary focus at a time when the 5 C's composed the mantra of the State of Arizona: Copper, Cattle, Cotton, Citrus, and Climate. Hero figures in economic geology in the early days included Frederick Ransome, considered "*The dean of American economic geology*", a member of the National Academy. B.S. Butler immediately followed, and, like Ransome, came to UofA following a distinguished career in economic geology in the USGS. Eddie McKee, Grand Canyon *aficionado*, was an admired, respected leader and teacher in the department, arriving in the 1940s, staying until 1953, and serving for years as Department Head. Our own Spence Titley gives a sense of the Department in the 1950s, as he earned his PhD and then shifted into his faculty role. He emphasized that the faculty in our program had applied geology in industry or government before returning to teach, and thus they brought a practical view to their instruction.

There were other notables that came to the Department in the 1950s besides Spence, *all men* – the department was simply not ahead of its time in this respect. Those that relate directly to the account I am building here include Paul Damon (geochemistry/geochronology), John Harshbarger (hydrology), Ed McCullough (geological hazards), John Sumner (geophysics), and Paul Martin (unclassifiable: he bridged ecology, anthropology, geosciences, and paleontology.). Paul Damon would establish the Department of Geochronology and contributed mightily to deciphering timing of processes and events related to tectonics and economic geology. John Sumner focused

on exploration geophysics related to ore deposits. Paul Martin came to personify the enormous returns of broad curiosity and intellectual breadth and depth that went well beyond geology. Besides his seminal work on *Pleistocene extinctions*", he and his students and colleagues became known worldwide for long-term ecological and climatic records contained in packrat middens.

The 1960s were pivotal in the life of the Department and, for that matter, the University. I think some of the gloss of the 5Cs was lost as state population began to increase, and emphasis on cattle and cotton and citrus exacerbated water issues. In near-perfect timing for the State, John Harshbarger, after years with the USGS Groundwater Branch, arrived at the UofA, headed the Geology Department beginning 1961, and designed and initiated the Hydrology Department and its associate with the Water Resources Department. The 1960s also brought us Vance Haynes, who was attracted to Arizona by the work of none other than archaeology giant Emil Haury, and Vance soon gave us and the world, "*Clovis First*", ... leading importantly later to his induction as a member of the National Academy of Sciences. And the 1960s brought us John Guilbert (economic geology), following his experience in industry with Anaconda, and Bill Bull (quantitative geomorphology) following his productive research with the USGS. Also arriving were Bart Nagy, considered one of 2 organizers of organic geochemistry as a geoscience discipline; and Ev Lindsay (vertebrate paleontology).

In about 1960 President Richard Harvill concluded that UofA needed a stronger footprint in science, and persuaded George Gaylord Simpson and Lawrence McKinley Gould to join the UofA and as faculty members in the Department of Geology; and to serve as advisors to the President in strengthening science across campus. They both arrived in 1962. Simpson had done 'little things' like publishing 150 papers in his first 15 years at the American Museum of Natural History. Modest topics: *Tempo and Mode of Evolution* (1944); *The Meaning of Evolution* (1949); *Major Features of Evolution* (1953); *Fossils and the History of Life* (1983). Simpson and his graduate students, dubbed the *Red Fireballs* as I recall, would go for long enjoyable productive seminar lunches each Friday. Gould was a charismatic figure, magnificent in language, focused in passion for Antarctica (from science to politics to peace in the world), recipient of some 30 honorary degrees, and an astute experienced administrator, a man of action disguised in magnanimous, generous spirit.

Gould, I believe, was especially influential in creating a structure within which what we now call the geosciences could flourish. He understood that if the Department of Geology remained in the College of Mines its future would be *massively* diminished. Its organizational niche would be anathema to recruiting and retaining outstanding faculty in a program of our breadth, reach, and consequence (Quaternary Studies, Economic Geology, Geochronology, Geology, Paleontology). So what happened? Gould persuaded President Harvill and the Arizona Board of Regents to establish a free-standing college, to be named the College of Earth Sciences. Harvill was led by Gould to hire Jim Zumberge as the Dean of this College, whose units would be Geology, Geochronology, Tree Rings Laboratory, Hydrology, and Water Resources. The College of Earth Sciences proved to be a prescient construction in its selection of disciplines. In this new design Geology and Geochronology were merged to become Geosciences, a taxonomy change that was well in advance of geology departments around the country, and signifying a mission of applying

physics, chemistry, mathematics, biology, atmospheric sciences, and geology to the study of earth. Zumberge, a bright, sophisticated scientist and administrator, who focused his scholarly attention on Antarctica, was recruited from Grand Valley State College where he had been appointed its President at a tender age. The Gould connection was clear, not only because of Antarctica, but Zumberge was a Michigan PhD and former professor there. President Harvill, Gould, and others saw Zumberge's task as one to pull off this reorganization, after which he would be the likely successor to Harvill as President. In this way the College of Earth Sciences, and the Department of Geosciences, were established. Ed McCullough became the Head of Geosciences in Fall, 1969, the same year that my wife Merrily and I, in Atlantic City at the 1969 Annual Meeting of the GSA, found ourselves in conversation with Jim Zumberge about an ad about to go out for a position in structural geology at the University of Arizona.

Jim Zumberge did not become President, and instead a 35-year old UofA chemistry professor, John Schaefer, got the nod in 1971. (Jim would go on to might positions, such as President of the University of Southern California). Suddenly, the UofA, and Geoscience, in its new organizational construct with McCullough as its resourceful leader, began moving to even greater heights. President Schaefer, Provost Weaver, Finance VP Gary Munsinger, and Research VP Dick Kassander (Amherst and Oklahoma geology degrees; PhD in physics) raised the bar of expectations to heights not foreseen. This set the stage for UofA to be inducted, in 1984, into the AAU, as one of the 62 elite research-oriented public and private universities in the nation. Standards and expectations for tenure and promotion rose overnight. All faculty finalists were interviewed by the President or Provost.

John Schaefer directed most of UofA's budget to faculty recruitment in all of the sciences (engineering-, physical-, biological-, medical-, social behavioral-) and at all ranks; and in building a library collection that could support the research of outstanding scholars not only in the sciences but in the humanities and social-behavioral sciences. (By 1980 our library ranking was 17th in the nation). Hardly any money was spent on anything else. He and VP Munsinger devined a new way to pay for buildings – bonding authority – and gained Arizona Board of Regents approval. They also convinced the Regents to set aside serious new money for support of innovative new research. Departments would create 'decision packages' and submit them into a competitive frenzy. Geosciences benefited enormously for we competed well, and the return was in the form of new FTEs that are still in our budget, even though the tie-lines with individual research projects are long gone.

Ed McCullough, who was appointed as the first head of Geosciences in 1970, immediately grasped the significance of and opportunities presented by Schaefer administration. He knew we needed to get our act together. In short order he led us through strategic planning to galvanize subfields of priority; and through curriculum planning to significantly strengthen undergraduate core requirements for geology major, with emphasis on mathematics, physics, and chemistry. As examples of hiring, the strategic planning caused us to build geophysics, starting in the 1970s with Bob Butler, Randy Richardson, and Marc Sbar, for John Sumner was a solid but solo act. Karl Flessa was recruited, bringing paleontology and much more. Petrology and economic geology were attended to with recruitment of Jiba Gangully, Dennis Norton, Dick

Beane, and Chris Eastoe. *Finally*, two women were appointed to the faculty, Vera Markgraf (palynology) and Susan Kidwell (stratigraphy, paleontology, taphonomy). Following the Gould mantra, "*Good is the enemy of excellence*", McCullough made tough decisions on tenure and promotion, several times overriding departmental P&T Committee recommendations...and in doing so won the respect of President Schaefer and Provost Weaver. Goodies followed, such as jump shifts in our teaching-assistantship budget, and more positions to recruit. It was an easy call for McCullough and the faculty to continue to maintain close relations with industry, one key to which was maintaining a strong, viable, meaningful, quality master's program.

I learned even more about McCullough's leadership when I followed him as Head in 1982. Just before I became Department Head Ed opened a file and pulled out paperwork that no faculty in the department had ever seen. Months earlier he realized that a big capital project served up by Schaefer and VP Munsinger to the biology departments was not getting traction. Squabbles prevented agreement on how the hypothetical building would be chopped up by the several biology faculties. Ed went directly to VP Cunningham and told him that Geosciences knows exactly how it would put a new building to use, and based on the departmental strategic planning, he explained we are 'toast' if we cannot be at the cutting edge in geochemistry and geochronology. For this we require state-of-art clean rooms, an impossibility in old geology. Included in the papers he showed me were specific office assignments for each of our faculty, and locations of all of the labs, all of which he knew was just a made-up place holder to help make his arguments. We got the building. Before it was dedicated, in 1985, I persuaded Henry Koffler to name it the Gould-Simpson Building. I wish I could take credit for how shrewd this naming proved to be. From the moment that the size and quality of the building became known during the construction phase, vultures were circling attempting to take from us some of what was promised. When ROTC made moves to take all of the lab-classrooms on our ground floor, Gould marched to President Koffler and stopped it, telling him ROTC is not going to occupy "*my*" building.

I will close with a set of events that lie at the nexus of good planning, good fortune, and courage. When Gould and McCullough invited a blue-chip committee to visit the department in about 1973, the committee, among other things, saw promise in structure-tectonics but felt it could be elevated through a senior appointment. This resulted in a new structure-tectonics position, filled by Peter Coney. I happen to have retained a copy of one of the letters of support written to Paul Damon, who chaired the search, dated February 18, 1975. It begins with: "*Peter Coney has asked me to comment to you on his suitability for the position in structural geology and tectonophysics that you described in your flyer. My advice is simple: make him the best offer you can as soon as you can get to a telephone. In my opinion, you cannot do better no matter how long you look because there is no one else quite in his class.*" The letter goes on for a page and a half of superlatives. It ends with: "*In closing' let me say that if you suspect, as I do, that long letters are sometimes a cover for uncertainty, then just focus on the first paragraph as my main theme. I added the flute music because I presume that a senior appointment of this kind requires solid documentation in these times, and it has been easy to provide. The guy is just a winner at any scale on any score.*" Signed W. R. Dickinson. The Coney appointment initiated tectonics as we know it at UofA.

Before the end of the 1970s decade it became clear that Bill Dickinson could be lured here. And Ed McCullough pulled it off, supported by Coney. Bill visited and gave talks, met colleagues, went into the field. All was in place except for one minor detail: our new Dean of Earth Sciences wasn't behind it. He told Ed: *"Dickinson can't be as good as you say, or he wouldn't want to leave Stanford."* The Dean refused to sign off. When the Dean was out of town, Ed met with Provost Weaver, who clearly grasped the opportunity presented. He would sign off. Ed said to the Provost, *"but what about the fact that the Dean is not on board?"* Al Weaver said, *"Don't worry about that. I'll sign the paperwork and put it on the Dean's desk myself so that he will see it as soon as he comes back to town."* The Dickinson appointment, 40 years ago, provided a convincing touch that demonstrated to the world that we are 'for real'.

The College of Earth Sciences proved to be a useful but transient bridge. When I was Department Head the Regents concluded that this entity was much too small, and thus not cost effective. As the College dissolved, units could choose their own destiny. Hydrology chose Engineering. Tree Rings and Geosciences chose the new *"Faculty of Science"*. Some Geosciences faculty feared this change. I welcomed it, for I knew geosciences would be a player, and I felt that science and math departments on campus would finally see firsthand our stature, and how we conduct our research. Their view would no longer be screened off by bureaucratic barriers. (Incidentally President Koffler knew before coming to campus that having two College of Engineering programs was ridiculous and somehow managed to eliminate the College of Mines). The Faculty of Science soon became the College of Science. Two of its three deans have hailed from Geosciences. Ed stepped down shortly after he won the lottery: \$7m. Joaquin served for 20 years, and this has been a great asset for Geosciences.

I have glossed over many things in these reflections, especially the budget ups and downs. We've done a lot with a little compared with so many of our peer departments. I close with the up side of this, provided to me in a serendipitous email I received Friday from Kiriaki Xiluri-Lauria, our amazing guru in computer technology: *"I was brought up in mountainous Crete, where you had to make much more with a lot less, and repurpose everything. That poses great difficulty, but also joy in the challenge and a perspective for what is essential in human life. The back of an envelope and a pencil were the action plan design tools, not the iPads or the iThings. And this is the take away for the future generations of students in our new computational facilities: they can make more with less if there is togetherness."*

Looking back at our history, I think of 'togetherness' as 'collegiality', and this condition of departmental life has been of inestimable value along our path of scholarship and mission impact.