

Alumni Relations Activities

Lynn Glover

I am pleased to announce that the Alumni Relations Committee has determined that our newsletter, or should I say newsmagazine, will now be issued regularly twice a year in the fall and spring. This is in response to suggestions from friends, faculty and alumni. On page 3 you will find the current staffing of the Alumni Relations Committee and, for this academic year, the new Newsletter Editorial Staff. For faculty titles and areas of specialty, please see the listing of faculty on page 26. Associate editors are chosen from the faculty and will report on their areas of interest. These positions will rotate through the faculty and over a two-year period cover all areas of interest to alumni, faculty and friends. As always, articles and news from alumni are the essence of our Newsletter. Thus alumni are encouraged to send special news articles, historical perspectives from their years at Tech, personal news updates, career profiles, commentary or opinions, obituaries, and anything of interest to our readers.

Alumni-Faculty dinners are also being expanded into off-campus areas where there are large numbers of department alumni. The first was held in Houston last March. Watch for notice of the next off-campus dinner, which we are planning to hold in northern Virginia during February or March.

Message from the Chairman: Strategic Intent, Goals, and Plans

Recently, the University completed its strategic plan following President Charles W. Steger's call to place Virginia Tech in the top 30 research universities in America by the year 2010. Now, it is timely to inform our "ambassadors" (alumni and friends) about the Department's strategic intent, goals, and action plans that are in accordance with the University's goal. As stated in my last message, as we rebuild the department with quality faculty, staff, students and modern infrastructure, we also need feedback and support from our alumni.

Our goals and aspirations are challenging, but we are committed to providing the highest quality experience to our students. The expectation from a world-class academic department is to generate knowledge with cutting-edge research and to provide up-to-date education and training by transferring such expertise and knowledge to students. As a research-oriented academic unit, in a land-grant institution, the Department's mission includes:

- Generating knowledge through research in geosciences and related areas
- Transferring knowledge to students and others through instructional courses, technologies and research
- Preparing majors to pursue meaningful professional careers or to enter graduate programs for the pursuit of advanced degrees
- Providing a broad scientific knowledge base for non-majors in order to enrich the students' life-long experience
- Applying knowledge in outreach to the Commonwealth, nation, and the global community and to further internationalization of its relationships with others, for the betterment of all

The Department's research and instructional programs enjoy international stature. Enhancement of this stature is critical to our growth. To achieve this enhancement, the Department will continue to: a) build upon the scientific, technical, and professional strengths of its select faculty, staff, and students; b) establish clear goals and objectives and systematically guide and evaluate its future prospects; c) identify and build on strengths across the university; d) establish innovative and mutually productive relationships with industry and government; and e) manage its resources efficiently.

As stated in the Five-Year External Review Report (April 2000), "the Department is on a well-established, strong, and healthy upward trajectory." It is critical that we strengthen broad areas of scientific and intellectual interest that build on existing strengths, addresses needs of undergraduate and graduate students, and focuses on clear national needs that will attract continued external funding. The following are our strategic intent to further enhance our educational programs and research excellence:

- Support the strategic intent of the University and College of Arts and Sciences
- Become a top rated geosciences department in the U.S. and maintain this stature
- Raise the quality and number of graduates of the Department
- Raise the quality of the faculty and staff

The principal goals, objectives, and strategies to support these strategic intent are summarized below:

Goal: Move the Department into the top 20 geosciences departments in the U.S. by 2010; specifically, make Virginia Tech one of the top 10 public institutions in geosciences in the country--some strategies to achieve this goal include:

- Increase scholarship activity and external research funding (\$100,000 per faculty, per year, by 2005 and \$150,000 by year 2010 as departmental averages)
- Hire only new faculty who can help achieve these objectives and reward faculty for individual contributions to meeting the Department's goal

Goal: Increase the number of graduate students to 75 by 2005--some strategies include:

- Enhance Career Advising/Awareness Program by industry partnership
- Improve the on-campus recruiting program to represent a wide spectrum of possible employers and seek new graduate fellowships from industry

Goal: Enhance the undergraduate education/experience--some strategies include:

- Keep Virginia Tech geosciences enrollment high relative to other top geosciences departments in the country
- Improve the curriculum by revising existing courses and adding new ones in high profile areas and continue enhancing marketability of Virginia Tech geosciences majors by providing strong and broad background education with critical skills
- Continue raising scholarship funds to recruit top undergraduate students and support campus visits as appropriate
- Enhance Careers Advising/Awareness Program by industry partnership

Goal: Improve the quality and number of faculty and staff--some strategies include:

- Determine areas considered "niches" to hire new faculty, while strengthening the existing programs by 2003. The niche areas are expected to attract a large amount of external funding, provide multiple jobs for students, and maintain high publication and citation rates
- Continue to judiciously use the tenure process. Each tenure and promotion should provide a clear indication that the Department is achieving its goals

Goal: Enhance alumni relations and industry/alumni partnerships--some strategies include:

- Organize on-campus and off-campus alumni-faculty meetings to enhance the communication and feedback

- Establish an Alumni-Student Mentoring Program in 2003
- Establish new endowed funds and seek support for the Alumni Scholarship Endowment Program with a goal of adding \$100,000 per year
- Establish new endowed faculty chair positions and alumni/industry partnerships
- Organize workshops for alumni and industry
- Continue seeking input on critical issues from the Advisory Board
- Publish the Alumni Newsletter on a biannual basis

Goal: Build a new Geosciences building by 2010. The most important strategy is to obtain endowments of \$2M to equip a new building with quality labs.

These challenging goals are building blocks of our commitment to providing the highest quality instructional experience to our students, while we enhance the Department's reputation.

We are aware that we need the support of the College of Arts and Sciences and University, and support and feedback of industry and alumni to reach our goals. With this support, I anticipate that the combined effort of the faculty, staff, and students will move Virginia Tech into the top 20 geosciences programs in the country by 2013 (the year of the next National Research Council ranking).

I will continue using future opportunities such as alumni-faculty meetings to give updates on the actions taken. Thank you for your encouragement and support!

Cahit Çoruh

Department History - Faculty Perspective: Don Bloss Reminisces

During his lifetime Byron Cooper, as head of the Department of Geological Sciences, infused the Department with boundless vitality. When Dick Dietrich, in 1964, attended a NSF Summer Institute at Penn State, a young assistant professor, Jerry Gibbs, greatly impressed him. After returning to Blacksburg, Dick discussed with Byron the possibility of hiring Gibbs. Ever the opportunist, Byron invited Gibbs to Blacksburg. Gibbs visited but declined Tech's offer because he feared being all by himself in, what seemed to him, the middle of nowhere. Undaunted, Byron approached a young UCLA assistant professor, Paul Ribbe. Paul was interested but was also worried about the seeming isolation of Tech.

Byron never thought small. Let's hire *more* than one mineralogist-- maybe even four. Byron's next step (Machiavelli could have learned a thing or two from him) was to have Paul and Jerry share a room at a conference. On learning they'd not be alone, both became interested. Now there were *four* people plotting— Byron, Dick, Jerry and Paul.

And they changed the plan. Instead of hiring two more young mineralogists, why not hire one who was more established. That's where I came in. Jerry had done his master's with me and would not come to Tech unless I did. And in 1962-63, Paul and I had shared an office in the Cavendish Laboratory in Cambridge, England. It's now 1965, but my retirement benefits at Southern Illinois University don't become vested until 1967. I promised Jerry I'd come to Tech in Fall, 1967. During those last two years at S.I.U., I'd get about one call per week from Jerry (who'd come to Blacksburg in 1966 in the same week as Paul) to make sure I wasn't going to change my mind.

In early Spring, 1967 Jerry, Paul, and I plane-tabled a brush-covered lot I'd bought in Blacksburg. The brush was thick and well above our heads. Back in Carbondale, I plotted the data and got the most amazing set of contours. The lot sloped away from Forest Hill Drive like there was no tomorrow. I suspected the resultant contour map to be an artifact, the natural result of three crystallographers dancing around a plane table. But it proved right and required revision of my building plans (to avoid an eight-foot step out my back door).

Dropping back to 1965, an anonymous donor had given Tech \$300,000 to set up a "Molecular Structures Laboratory." Of course Byron, the master opportunist, would conclude: 'That has to mean a crystal structure lab.' The lab, temporarily installed in Randolph Hall, an engineering building, would serve both Jerry and Paul.

Gordon Grender, our sedimentary petrologist, had been hired by Byron for the 1966-67 academic year. [How did Byron get *all* these new positions?] Recognizing Gordon's superb organizational skills, Byron installed Gordon as Assistant Head.

About then, two marvelous grad students, Gordon Brown and Gary Novak, had followed Jerry from Penn State. Like his mentor Jerry, Gordon was destined to become one of the world's outstanding mineralogists. Jerry, Paul, Gordon, and Gary—along with Monte Hall, a marvelous (but temperamental) microprobe technician lured from U.C.L.A.—all occupied Dilbert-like cubicles in the Molecular Structures Lab. Everything wafted over the cubicle walls. In Fall, 1967, we all lunched together. We had our gripes, but we always had strong support from the Administration. In fact Vice President Warren Brandt, President Hahn's right hand man, more than once came over to smooth Monte's feathers.

By 1967, Dick Dietrich had drifted upward (downward?) into administration to become an Assistant Dean under Malpass. So, in 1968, Byron hired Charlie Gilbert from the Geophysical Lab in D.C. to represent us in igneous petrology—and to give us all an example of perpetual motion. In 1970 Dave Hewitt, fresh from Cal Tech and a post-doc with Dave Wones at M.I.T., took over in metamorphic petrology. Also in 1970, Byron hired Jim Craig, from Texas Tech to teach ore microscopy and economic geology.

Prior to my arrival at Tech, Byron had encouraged me to apply to the NSF for an equipment grant and also for a Summer Institute grant. I got both. The equipment grant, which provided 20 new polarizing microscopes, proved a mixed blessing because it required matching funds and rendered the departmental budget anemic.

Some marvelous students from Southern Illinois University—Mike Phillips, Bob Popp, and Judson Mitchell—came to Tech during the 1968-69 school year. I tried unsuccessfully to recruit Paul Robinson, who had done a master's with me at S.I.U., and Kirk Nordstrom, a chemistry major who touched me by giving me, after my arrival at Tech, his cherished mineral specimens (I think they had belonged to his grandfather).

The NSF Summer Institute, funded for Summer, 1969, drew young professors from all over the country. Jerry, Paul, and I gave the lectures in the newly opened Derring Hall. It was not yet air-conditioned and we sweltered. But it was worth it. Several of the attendees, in subsequent years, sent us their best graduating seniors.

Teaching optical crystallography has always been an absolute joy for me. In 1969, Byron allowed me to invite, for Spring Quarter, 1971, Ray Wilcox of the U.S.G.S. Ray had done a great deal of work with a spindle stage, a device that, mounted on the stage of a polarizing microscope, permitted a crystal to be rotated about an axis parallel to the plane of the stage. Ray was a fan of my optics book and, from the time it was published in 1961, had been trying to get me to use a spindle stage. I resisted. How could that single axis stage be better than a 5-axis U-stage? But for single crystals, it was. I learned this in spades when, in preparation for Ray's coming, I, along with Judson Mitchell (destined to assist Ray), studied up on it.

In early 1971, President Hahn began visiting each of his Department Heads. His visit with Byron in the morning of March 26, 1971 coincided with an early-morning snowstorm. Byron had given a lecture in another building and, late for his appointment, had bounded up the stairs, two-at-a-time. Minutes later in his office, he collapsed in front of Dr. Hahn. His personal physician, Dr. Park, could not revive him. The Department had lost a vigorous, but occasionally controversial leader.

Gordon Grender stepped into the breach, temporarily at first, then permanently, and filled it marvelously. As Gordon began his tenure, Paul Ribbe and Ed Robinson drew up a departmental constitution, the first at V.P.I., that called for our Head to become a Chairman, elected by the Department (for a given term) and approved by the Dean— instead of being appointed by the Dean for an

indefinite term. Gingerly, Dean Havard approved of our intent to be led by a Chairman rather than a Head. Gordon unanimously became our elected Chairman.

Around mid-March, 1971, Ray Wilcox arrived on campus. Spurred by Wilcox's enthusiasm, I began a serious study of the spindle stage and was won over to its tremendous possibilities for optical studies of anisotropic crystals, particularly biaxial ones. With two mathematicians, Dean Riess and Mike Rohrer, I developed the computer program, EXCALIBUR. When applied to extinction positions, it permitted location of a biaxial crystal's two optic axes more precisely than ever before. The name involved EX (for extinction positions), CAL (for the calculations based on them), I (I just threw in gratuitously), and B (for Bloss), and R (for Riess and Rohrer, the mathematician and the programmer involved). The spindle stage and EXCALIBUR proved an unbeatable combination, and we had it up and running in 1972 (cf. *Am. Mineralogist*, 1973, pp. 1052-1061). Mike Phillips and Brenda Higgins compiled the crystal extinction data for testing EXCALIBUR. Dr. Michael Bown, of the University of Cambridge, during his stimulating sojourn in Blacksburg, contributed greatly to the development of the program.

Mike was one of the first of several outstanding European crystallographers who, with their families, elected to spend their sabbaticals in Blacksburg. He was followed by some marvelous professors from Germany—Friedrich Liebau and Hans Wondratschek. And from M.I.T. came another of my heroes, Martin J. Buerger. I was riding high then and, after I was appointed Editor of the *American Mineralogist* in 1972, even dared to suggest improvements in a manuscript by Linus Pauling, my all-time hero.

Around 1974 I had the great good fortune to be joined in my optical studies by an outstanding graduate student, Hugh Edward (Ed) Wolfe—my first at Tech. The accuracy of EXCALIBUR'S solutions of a crystal's extinction data depended upon how accurately a crystal's extinction positions could be determined. I used photometers to determine these extinction positions, but Ed, using his keen eyes, could determine them just as accurately, if not better, for several different wavelengths of light. Ed's thesis on the optical properties of the plagioclases was a masterpiece. Unfortunately, the microprobe went haywire and prevented determination of the crystals' compositions with comparable accuracy (in the time remaining to Ed before beginning his new job).

John Louisnathan, a postdoc from the University of Chicago, aided in refining EXCALIBUR's ability to determine whether, if extinctions were determined for more than one wave-length of light, an optic direction had undergone significant dispersion—that is, changed position significantly as wavelength was changed. In 1975-76, Ed and I measured extinction positions, at several different wavelengths, for an anorthite crystal from Myakajima, Japan as it was held at various temperatures up to 1000 degrees Kelvin. We used the strong mercury line to illuminate the crystal and, above the crystal, a filter specific to this wavelength. This eliminated the incandescent wavelengths being emitted from a red-hot crystal when its temperature exceeds 500 degrees. The data, presented during my 1977 Presidential Address to the Mineralogical Society of America, disclosed that the positions of anorthite's five important optic vectors—the two optic axes, their two bisectrices, and the optic normal—changed significantly with temperature. Inflections in the curves resulting when these positions were plotted against temperature pinpointed the temperatures at which subtle changes occurred in anorthite's structure.

More marvelous young men followed Ed and John in using the spindle stage, in combination with EXCALIBUR, to make exciting new discoveries. Kevin Selkregg determined that the so-called distortion index for cordierites, proposed by Myashiro (and accepted worldwide) was a myth. It was a function of composition (and not structural distortion from order-disorder). Thomas Armbruster, a postdoc from Germany and a joy to be associated with, extended Selkregg's study of cordierites with imaginative experiments that positioned him as the world's foremost expert on cordierites. For his master's degree, Mickey Gunter, who had arrived from Southern Illinois University in time to overlap with Thomas, determined for the andalusite-kanonaite solid solution series that, if one plotted the curves for $n(a)$, $n(b)$, and $n(c)$ versus composition—where $n(a)$ signifies the refractive index for light vibrating parallel to the a crystallographic axis, etc.—the curves for $n(a)$, $n(b)$, and $n(c)$ all intersected near a common point. In other words, at and near this point of intersection, isotropic andalusites existed but had never been reported in the literature simply because observers did not know that andalusite could be isotropic. It was easily research of doctoral quality.

As Mickey and Thomas continued their exciting work, I got a letter from China, written with impeccable English. The writer, Shu-Chun Su, wanted to study with me but needed support. I wrote back that I had no support unless Thomas Armbruster, who had just applied for a position at the University of Bern, got the job. A letter came back saying, "Well, I am not a Christian, but I am praying to God that Thomas Armbruster will get the job." And Thomas did. This opened up a fellowship for Shu-Chun to come to Blacksburg.

My students have been like sons to me, and now I had a Chinese son. In 1982-83 Shu-Chun (and Mickey) joined me at the University of New Mexico where I was the first Caswell Silver Distinguished Visiting Professor. Alerted by Mickey's discovery, my young colleague there, the late Jeff Grambling, realized that he had isotropic andalusites in some of his petrographic thin sections. "Nothing is more practical than theory."

After our return to Blacksburg from a stimulating academic year at U.N.M., Shu-Chun then joined with Paul Ribbe and me to make his remarkable study of the optical properties (versus Al/Si ordering) for the K-feldspars. Using a spindle stage in combination with X-ray techniques, the crystallographic identity of a principal vibration direction—X, Y, or Z—can be determined and maintained. The refractive indices $n(a)$, $n(b)$ and $n(c)$ were then defined as the refractive indices, respectively, for light vibrating most nearly parallel to the a , b , and c axes. So defined, the curves for $n(c)$ and $n(b)$, when plotted versus degree of ordering of Al in the tetrahedral sites, crossed and thus disclosed the true significance of the angle $2V$. Moreover, precise determinations of $2V$ —so easily done with a spindle stage—provided precise measurements of Al/Si ordering in K-feldspars, supplanting the more tedious X-ray method. Tony Stearns of the University of Massachusetts likened Shu-Chun's discoveries to a brilliant flash of light laying bare the significance of K-feldspar optics.

While Shu-Chun's studies were on-going, Laura Davis (now DeLoach) used a refractometer to determine the refractive indices for a suite of muscovite micas. The novelty was that she could measure, following the techniques of C.S. Hurlbut, all three principal indices, α , β , and γ —not just β and γ . There was now a daughter of comparable ability among all those sons.

By now, John Louisnathan had been hired by Corning and through his knowledge of optics had so improved their production of optical fibers that he was given their Stuckey Award. And Mickey had taken a position at Southern Illinois University, but later returned to do his Ph.D. with me on the mathematics of determining refractive indices by measuring the angles of total reflection on polished crystal surfaces. The goal was to measure all the principal refractive indices for any crystal in a thin section. (Ultimately, the Walter MacCrone Agency took over our quest to make an automated refractometer.)

By the early seventies, our prominence in mineralogy and crystallography—and in our service to the Mineralogical Society of America—had not gone unnoticed by our fellow mineralogists and petrologists. I rather enjoyed it when they would collectively refer to us and our students as ‘the Blacksburg mafia.’ I particularly enjoyed it when Visiting Lecturers referred to Blacksburg as the Mecca for mineralogists.

Since 1974 my long-time friend and colleague, Paul Ribbe, has flown our flag high by editing for MSA the *Reviews in Mineralogy*. In 2000, it became the *Reviews in Mineralogy and Geochemistry* as the Geochemical Society joined MSA in its sponsorship. Over 45 volumes, ranging from 300 to 1150 pages each, have been published to date.

Tech furnished the following Presidents of the Mineralogical Society of America (MSA): Bloss (1977); David Wones (1979)—A word about Dave. He was a marvelous igneous petrologist and field geologist whose enthusiasm and dedication to petrology and geology were boundless and never ebbing. It was after Charlie Gilbert succeeded Gordon as Departmental Chairman, he inveigled Dave, in 1978, to come to Tech from his position at M.I.T. Tragically, after Dave finished a term as Departmental Chairman (1980-1983) and was succeeded by Dave Hewitt (Chairman: 1984-1988), Wones died in 1984 in an automobile accident as he was driving to the Roanoke Airport to pick up a seminar speaker. Dave Hewitt had just taken over as Chairman and served from 1984-1987. The succession of Chairmen continued with me (1988-90), Jim Craig (1990-93), and Cahit Coruh (1994-). Cahit has shown Byron’s ability to pull rabbits out of a hat.

Getting back to MSA presidents, Dave Wones was followed by Gibbs (1981); Ribbe (1987); and, one of our students, Gordon Brown (1996). Another of our students, Mike Hochella, now Professor at Tech, is currently serving as President of the Geochemical Society.

In 1987, Gibbs received the Mineralogical Society of America’s highest award, its Roebling Medal. On June 3, 1988, at the annual banquet of the New York Microscopical Society, I received its Ernst Abbe Medal. It pleased me that Edwin Land of Polaroid fame was a previous recipient. In 1993 Ribbe received MSA’s Public Service medal and in 1995 the Schlumberger medal from the Mineralogical Society of Great Britain and Ireland.

In addition to presidents, our Department has furnished many other officers to the societies—vice presidents, secretaries, treasurers, recent distinguished Lecturers, lecturing across the Country, include Bob Bodnar and Mike Hochella. Largely through the yeoman efforts of our present Chairman, Cahit Coruh, we have added a panoply of stars and rising young stars to our Department as we lost Hewitt, Ribbe, Gibbs, and me through retirement. These include, on the mineralogy side, Nancy Ross and Ross Angel. In geochemistry we added Patricia Dove. It is notable that Nancy and Patricia were students here. The parade has become self-perpetuating.

I now take the prerogative of an 81-year-old to mention gratefully another parade, the parade of students who brightened my life throughout my career. It began with my first job at the University of Tennessee (1951-57). The late Lou Walter led this parade. In 1995 during a scientific meeting in my honor, Lou served as the Master of Ceremonies. He was superb. Prior to the meeting, he had gotten from Louise the photos from my past and had made them into slides. When they showed our wedding picture, the audience applauded. After the dinner, I mentioned how beautiful my wife Louise had looked. Lou said, “I know. You didn’t think they were clapping for *you*, did you?” Soon after Lou, at Tennessee, came Abe Shekarchi. I was young enough in those days to try to spike the volleyball down on his head. He’d try with equal alacrity, to do the same for me. In 1991 Abe came from D.C. just to attend my retirement dinner and give me a beautiful prayer rug made in Afghanistan. Contrary to what I remembered (and said) at the Dinner, I now recall that I never did beat Abe in ping-pong. Then there was Jerry Gibbs who sometimes baby sat my children (and somehow neglected to tell me, until 30 years later, that he caught my eldest daughter scrubbing our toilet with her tooth brush.) Finally, at Tennessee, there was Bob Milici who would have done a Ph.D. with me, if I hadn’t moved to Southern Illinois University in Fall 1957. Bob later became State Geologist of Virginia.

Among the students from my S.I.U. days was Ray Kerns. In those first few years I had no equipment except a polarizing microscope. Ray used it, and it alone, to do creditable research for his M.S. Lacking equipment in those early days at S.I.U., I concentrated on writing the optics book. Later, when I had obtained X-ray equipment and had been joined by an outstanding colleague, Jen-Ho Fang, Paul Robinson worked with us. Paul, much later, was instrumental in having a new mineral from El Salvador named blossite.

Some of my greatest pleasures came while teaching optics. It was pure pleasure to see the lights turn on in the students’ minds when they came to truly understand crystal optics. It didn’t happen right away but there was a point in the course when it usually did. And then I knew I had given them a tool that they could use, if needed, in the future. When the time for student evaluations of my course in optical crystallography, I usually got a 4.0 rating in ‘knowledge of subject.’ However, the Spring Quarter Class of 1987 did more than that. All seventeen concurred in giving me a 4.0 rating in ‘overall performance’ as well. I thank each member of that class.

In retrospect, perhaps I graded too tough. It reflected my own experience when, at the University of Chicago, I received a C in Crystallography when I darn well thought I deserved an A. But, no matter—and perhaps as a result—I mastered the succeeding course, Optical Crystallography, so well, that he did have to give me an A. Best of all, when, as his assistant in optics, I differed with him as to the solution of one problem, I bet and won a quarter. Similarly, some that I gave B’s, among them my two colleagues, Gibbs and Hochella, later scaled the heights.

A particular joy was teaching the class on spindle stage techniques. There were so many outstanding students in these classes through the years I can’t mention them all. They became more my colleagues than my students. Two, in the last class, Kurt

Bartelmehs and Bob Downs, greatly improved my computer program EXCALIBR and, together, we published a paper describing these changes and improvements.

Many of the students in my classes got jobs that involved microscopy. I like to think that each student who passed through my classes got a proper grounding in optical mineralogy.

I could not have chosen a better profession, a better University, or a better set of students than those I was blessed with.

Rebirth of Crystallography at Virginia Tech

by Ross Angel and Nancy Ross

Crystallography has had a long and distinguished history in the Department of Geological Sciences at Virginia Tech. Highlights over the past 30 years have included definitive studies of feldspars (Paul Ribbe), optical mineralogy (Don Bloss) and the structure and bonding of minerals (G.V. "Jerry" Gibbs). Although Paul, Don and Jerry are officially retired, they are still active in the department and continue to provide inspiration for faculty and students alike (see Fall 2000 Newsletter).

The arrival of Nancy Ross and Ross Angel during the academic year of 2000-2001 has led to the re-establishment of the Crystallography Laboratory (<http://vtso.geol.vt.edu/crystal/>). Nancy was an undergraduate in this department and, after obtaining her B.S. in 1979 she moved to Vancouver, Canada where she completed her M.S. at the University of British Columbia. Nancy then moved to Arizona State University where she worked with Alexandra Navrotsky, one of the leaders in the then newly emerging field of mineral physics. After obtaining her Ph.D., Nancy accepted a post-doctoral position at Stony Brook to work with Charlie Prewitt, one of the world's leading experts on crystal chemistry. Nancy also met her future husband, Ross Angel, at Stony Brook. Ross had graduated from the University of Cambridge where he worked with Andrew Putnis on polytypism in pyroxenes and related minerals and came to study at Stony Brook with Charlie Prewitt having been awarded a NATO Fellowship. As Nancy recalls, "We were both post-docs at Stony Brook during a very exciting time. The first multi-anvil presses in the United States (machines capable of generating pressures of 250 kbar and temperatures of 2000°C) were being installed and there were numerous visiting scientists, post-docs and students. There was a definite buzz around the place." When Charlie Prewitt became the Director of the Carnegie Institution of Washington's Geophysical Laboratory, Ross and Nancy moved to D.C. with him. While there, they began their wonderful journey (one that continues today) exploring the effect of pressure on minerals with Bob Hazen and Larry Finger, pioneers in this area of research. They also experienced their first taste of "big-time science," racing with other groups around the world to unravel the structure of the first high-temperature superconductors - a story that was later recounted by Bob Hazen in his book, "The Breakthrough: The Race for the Superconductor."

Ross and Nancy were married in 1988 in the chapel on the Virginia Tech campus and, shortly thereafter, moved to England when Ross was awarded a Royal Society Fellowship and Nancy was offered a Lectureship at University College London (<http://www.ucl.ac.uk>). Nancy recounts a little of UCL's fascinating history: "University College is located in the heart of the Bloomsbury district in London and opened its doors to students in 1828, just 44 years before Virginia Tech was founded. At that time, the only existing universities in England were those long established at Oxford and Cambridge where membership of the Church of England was necessary for admission to one and graduation from the other. UCL thus filled a niche by providing higher education to nonconformists, Catholics, and Jews, and by 1870 degrees were opened to women as well. UCL sought to extend the field of study to sciences involving the examination of the properties of material objects. Sir William Bragg, pioneer of X-ray diffraction (along with his son, Sir Lawrence Bragg, with whom he shared the Nobel Prize for Physics in 1915), worked at UCL for many years. We had a lab in the Lonsdale Building, named after another famous crystallographer, Dame Kathleen Lonsdale, a student of William Bragg who later became the first woman professor at UCL and one of the first women to be elected to the Fellowship of the Royal Society." Ross and Nancy joined the Crystallography and Mineral Physics Group in the Department of Geological Sciences at UCL and established a single-crystal X-ray diffraction laboratory. Nancy was promoted to Reader in 1994. Topics that she and her students have investigated in recent years include the role of water in dense hydrous silicate mineral phases, and the structures and electronic properties of transition-zone and mantle minerals.

In 1994, Ross accepted a permanent position as a staff research scientist at the Bayerisches Geoinstitut in Bayreuth, Germany (<http://www.bgi.uni-bayreuth.de/>). Bayreuth is probably best known for hosting a music festival each year devoted to Richard Wagner's works. Visitors flock to Bayreuth each summer for the six-week event hoping to attend a performance at the Festspielhaus. Tickets are allocated about six months before the festival and most requests are placed on a waiting list of thousands, where some wait for up to 15 years. The Geoinstitut is located at the opposite end of town from the Festspielhaus, on the campus of the University of Bayreuth. Similar to Wagner's festival, the Geoinstitut attracts visitors from all over the world (but they don't have to be put on a 15-year waiting list!). Scientists can perform experiments at the Geoinstitut using equipment ranging from a selection of multi-anvil presses to a transmission electron microscope. Ross was in charge of all the X-ray equipment in the Geoinstitut, including three X-ray powder diffractometers, all dedicated to characterizing the materials synthesized by other members of the Institut. He also developed, with the help of a string of talented post-doctoral colleagues, a laboratory dedicated to high-pressure crystallography built around two automated single-crystal X-ray diffractometers.

Ross and Nancy are now busy setting up the Crystallography Laboratory in 3076 Derring Hall. Visitors are always welcome and there is generally a pot of coffee on hand. A number of single-crystal diffractometers are being installed that will allow a variety of diffraction techniques to be applied to a wide variety of scientific problems in geology, physics, chemistry and materials science. The main thrust of Ross and Nancy's research program is to understand the behavior of crystalline materials under high pressures. High pressure is generated with diamond anvil cells and X-rays are used as a probe to explore the changes in the physical properties of minerals as the distances between the atoms change. As a simple example, minerals become stiffer as the atoms are moved together and their density increases. Sometimes the mineral transforms to a new phase that is non-quenched and must be studied *in situ*. The structures of new high-pressure phases can be determined with X-ray diffraction. As Ross summarizes, "We measure the changes in the atomic arrangement by X-ray diffraction and determine how the density and structure of the mineral changes with pressure. The geological applications of our high-pressure studies of minerals are direct: Minerals within the Earth are subject to high pressures, so with our diamond-anvil experiments we are measuring the minerals in their natural state."

Applied Paleontology at Virginia Tech

by Michal Kowalewski

Paleontology has been one of the many scholarly strengths of our department. Our former faculty, Jake Tillman, Dewey McLean, Richard Bambach and Norm Gilinsky were internationally recognized researchers who won prestigious awards and advised students who themselves became prominent scientists. My students and I hope to build on this reputation by maintaining and further enhancing a versatile and dynamic research program inherited from our predecessors. This essay provides an overview of our current activities and future goals. I hope this will be of interest to our faculty and students, our alumni, but most of all, to all those prospective students who are searching for an exciting graduate program in paleontology and geobiology (to learn more about our program, please visit <http://www.geol.vt.edu/paleo/>).

The Present...

We aim to excel in two research areas. First, as did our predecessors, we hope to continue discipline-shaping paleontological research in deep time by exploring and modeling large-scale evolutionary and ecological trends through the history of life. Second, we are extending our research into a more pragmatic and society-relevant realm that we like to call “Applied Paleontology.” Here is what we do right now to accomplish our goals.

Research in Deep Time. Walking in the footsteps of Tillman, McLean, Gilinsky, Bambach, and their students, we are exploring large-scale patterns entombed in the fossil record. Our recently graduated M.S. student, Matt Powell (currently a Ph.D. student at Hopkins), has opened up “a new playing field in the study of Phanerozoic diversity” (a quote from a *Geology* reviewer) by demonstrating that the structure of biological diversity changed notably through the history of marine ecosystems. Our current Ph.D. student, Alan Hoffmeister, is close to finishing an ambitious, NSF-funded project that will provide the first rigorous insight into the Paleozoic history of marine predators and their prey. This is a hotly debated topic with only few scattered data points available so far. Alan’s project, regardless of its specific outcome, will give us first comprehensive estimates of Paleozoic trends in intensity and nature of predator-prey interactions in Paleozoic times. Our former M.S. student, Andy Bush (currently a Ph.D. student at Harvard), and our current M.S. student, Jen Stempien, have used sophisticated geometric morphometric methods to evaluate how shape of mollusk shells changes among species, across environments, along latitudinal gradients, and through evolutionary time. In addition, Jen is exploring how size of brachiopods (a dominant shellfish of Paleozoic seas) changed during the Great Ordovician Radiation (when marine animals diversified dramatically) and the subsequent mass extinction in the Late Ordovician (when they got hammered). So far, it seems that brachiopods became bigger through the radiation but, and perhaps surprisingly, size appears not to have been affected by the mass extinction.

Although our research in deep time deserves more than just a brief mention, I would like to use the limited space of this article to introduce our newest and much more controversial research direction – applied paleontology.

Applied Paleontology - Research in the Not So Distant Past. It is exciting to realize that we, paleontologists, are now able to extend our research into realms relevant to our society. By applying our techniques to the Holocene “fossil” record, we can acquire information about the most recent geological past and provide critical data that complement research efforts of conservation biologists, environmental researchers, physical anthropologists, and ecologists. Applied Paleontology sounds like an oxymoron, but projects conducted here at Virginia Tech (and elsewhere) demonstrate that this is an increasingly real and relevant direction of research. Humanity can benefit from our research more than we, ourselves, thought feasible in the past. My students and I pursue this avenue of research vigorously.

How is this possible? To start with, there is increasing evidence that shell accumulations found on modern seashores and seafloors provide outstanding, high-resolution records of the pre-human history of coastal and shelf regions. Because of various post-mortem processes, shells of various ages are often mixed together - remains of dead shellfish found on modern surfaces are not contemporary, but represent typically long-term cemeteries of marine life. For example, out of 30 “modern” radiocarbon-dated shells collected from the Gulf of California, 15% were more than 1,000 years old. These pieces of calcium carbonate have survived since the time of the Vikings. Numerous case studies confirm extensive age mixing as the norm for shell deposits all over the world. Moreover, shell accumulations offer us an ideal historical record - complete time-series can be established for recent centuries and millennia by dating individual specimens.

Independently, recent advances in geochronological techniques have made dating individual shells faster, cheaper, and more reliable. Recently, our group involving researchers from Virginia Tech, University of Arizona and George Washington University dated 165 mollusk shells from the Gulf of California and established a 100% complete time-series (at 50-year interval resolution!) for the last 1,000 years of the Colorado River Delta history. In another project, in collaboration with George Washington and Sao Paulo State Universities, our former M.S. student, Monica Carroll, (now Ph.D. student at University of Georgia) has dated nearly 100 brachiopod shells from the Brazilian shelf and achieved a similar success. Our efforts show that not only can old shells be collected easily, but also the reliable dating of hundreds of such shells is now feasible.

Parallel to those geochronological refinements, considerable improvements have been made in techniques used to analyze biomineral solids for geochemical signatures (element ratios, stable isotopes, trace elements, etc.). Such signatures extracted from individual, dated shells can be used to infer temperature, salinity, bioproductivity, erosion rates and other parameters that provide data about past environmental and climatic conditions of marine and coastal systems. Computer-guided sampling devices make it possible to microsample small aliquots on a micrometric scale and laser ablation techniques allow us to achieve even finer sampling resolution. Recently, our Ph.D. student, Dave Rodland, in collaboration with University of New Mexico, obtained over 400 $\delta^{18}\text{O}$ laser ablation

measurements in modern and fossil lingulids. This analysis, funded by PRF (Petroleum Research Fund) and ORAU (Oak Ridge Associated Universities), is unmatched in its scope and resolution. It gives us fundamental insights into the scale and nature of vital effects and variability in isotopic signals within single biomineral skeletons.

Thus, complementary advances in paleontology, geochronology and geochemistry now make it possible to reconstruct, at high resolution, the environmental history of the world's coastal and shelf regions. Rigorous insights into environmental, ecological, and rapid climate changes can be achieved by dating Holocene "fossils," analyzing them for geochemical signatures, and placing them into local biological and geological contexts. Such insights are not accessible by studying modern conditions alone. This integrated approach, Applied Paleontology, is now being implemented by our group and our collaborators in the USA and Brazil. For example, by combining radiocarbon and amino-acid racemization methods, field data, satellite images, and oxygen isotope data we were able to reconstruct the productivity of the Colorado Delta benthos during the last 1000 years. We showed that, following the human-induced diversion of the river's flow, the productivity of the shellfish decreased by at least 94% and demonstrated that the current restoration efforts are inadequate. Our estimates provided a direct reference baseline for a quantitative assessment of the current benthos, the efficacy of ecosystem restoration efforts, and multi-centennial dynamics of the delta's aquatic ecosystems. We now use similar strategies (a two-year project recently funded by the National Science Foundation) to study coastal ecosystems of southern Brazil, one of the most heavily populated coasts of the Southern Hemisphere. We hope to show again that paleontology can inform us about the pre-human environments and provide hard data about community stability and biodiversity patterns in the context of both natural and anthropogenic disturbances.

...And the Future

Despite the emphasis placed here on applied research, we do not plan to abandon our more traditional research in deep time. Although often viewed as an esoteric, ivory-tower type of science, the research in deep time offers us an exciting intellectual adventure that can yield significant contributions toward our understanding of the history of life. And aren't we intrigued by that history, no matter what our profession? We will continue tackling major questions of modern paleobiology by exploring secular trends in the history of life and assessing rigorously their statistical reality.

Where do we see the applied aspect of our program in future? We think that our recent studies signal the breakthrough in developing new ways to examine the recent geological history of vital human habitats with their past serving as the key to their future. Here, the ultimate goal is to improve our ability to evaluate the current state of aquatic habitats, forecast their future, and guide their restoration. We can gain data that neither ecologists nor climate modelers can access. Such data will establish the natural range of environmental and climatic variations specific to a given system. This, in turn, will aid us in making more intelligent predictions about the inherent stability of that system and the future consequences of its intense use by humans. In addition, our program, with its explicit component of applied research, offers an ideal educational platform to train a new echelon of paleontologists that can carry out interdisciplinary projects directly relevant to key societal issues.

Let me end with a more personal note. As a rabid paleontologist by spirit and a non-applied scientist by training, I have pursued obscure truths about dead things from a dusty past for over a decade now. And I found paleontology everything I hoped for, and more. It is a discipline that is intellectually challenging, offers intriguing historical questions, and, above all, has a certain methodological, shall we say, flexibility that makes it a true art among sciences. We walk a thin line between what is creative, but still scientifically acceptable and what is speculative and of dubious value. After all, we hope to understand creatures that have been long dead, lived in environments that vanished a long time ago, and often represent stocks of life that went extinct in the very distant past. And we hope to achieve all this by using fossils and rocks, always incomplete and often circumstantial data of uncertain spatial and temporal resolution. This is paleontology. Preposterous, say some. Intellectually inspiring and scientifically important, say others. Intriguing perhaps, but irrelevant, as frequently suggest uninitiated laymen. For how can humanity benefit from knowing obscure and uncertain truths about dead things from so distant a past? I hope that in years to come, we, Virginia Tech paleontologists, will provide convincing examples of research that can answer this question positively, once and for all.

PALEONTOLOGY STUDENTS AT VIRGINIA TECH

Most Recent (2000 - 2001) Accomplishments of Our Students	Current and Incoming Graduate Students	Recent Alumni
Presentations at professional meetings: 13 Published abstracts: 18 Published/in press papers: 6 GSA student grants: 2 GSA outstanding student grants: 1 Paleontological Society grants: 1 Departmental award: 2 Other Student grants (Travel, VT, etc): 6	Barbour (Ph.D. starting in Spring '02) Hoffmeister (Ph.D. started Fall '99) Krause (Ph.D. starting in Fall '02) Rodland (Ph.D. started Fall '99) Stempien (M.S. started Fall '00)	Brame (Ph.D.) (Assist. Prof., Wright) Bush (M.S.) (Ph.D. student, Harvard) Carroll (M.S.) Ph.D. student, U. Georgia) Daley (Ph.D.) (Post-doc, UW Madison) Powell (M.S.) (Ph.D. student, Hopkins) Wilborn (M.S.) (Ph.D. student, U. Oklahoma)

Recent External Funding

- National Science Foundation (2002-2004) "Time-averaging in mixed brachiopod-mollusk assemblages along a depth gradient across a modern tropical shelf" (Kowalewski and Goodfriend)

- American Chemical Society -Petroleum Research Fund (2000-2002) “Stable Isotopes in Fossil and Recent Phosphatic Brachiopods as Indicators of Ancient Environments, Paleoclimates, and Past Marine Bioproductivity” (Kowalewski)
- National Science Foundation (2002-2002) “Predation Rates and Prey Escalation in Paleozoic Marine Benthic Ecosystems: The Role of Biotic Factors in the Evolutionary History of Marine Biosphere” (Kowalewski, Baumiller, and Bambach)
- Oak Ridge Associated Universities - A Ralph E. Powe Junior Faculty Enhancement Award (1999-2000) “Stable Isotopes in Phosphatic Brachiopods as Environmental Indicators” (Kowalewski)

Selected Recent Publications

Hoffmeister, A.P., and Kowalewski, M., 2001, Spatial and environmental variation in the fossil record of drilling predation: A case study from the Miocene of Central Europe: *Palaios* 16:566-579.

Rodland, D. L., and Bottjer, D. J., 2001, Biotic recovery from the end-Permian mass extinction: Behavior of the inarticulate brachiopod *Lingula* as a disaster taxon: *Palaios* 16: 95-101.

Kowalewski, M., Avila Serrano, G.E., Flessa, K.W., and Goodfriend, G.A. (2000) Dead delta's former productivity: Two trillion shells at the mouth of the Colorado River: *Geology* 28:1059-1062.

Simões, M.G., Kowalewski, M., Torello, F.F., Ghilardi, R.P., and Mello, L.H.C., 2000, Early onset of modern-style shell beds in the Permian sequences of the Parana Basin: Implications for the Phanerozoic trend in bioclastic accumulations: *Revista Brasileira de Geociências (RBG)* 30: 495-499.

Kowalewski, M. Simões, M.G., Torello, F.F., Mello, L.H.C., and Ghilardi, R.P., 2000, Drill holes in shells of Permian benthic invertebrates: *Journal of Paleontology* 74: 532-543.

Kowalewski, M., and Flessa, K.W. (2000) Seasonal predation by migratory shorebirds recorded in shells of lingulid brachiopods from Baja California, Mexico: *Bulletin of Marine Science* 66: 405-416.

News from the Sedimentology-Sequence Stratigraphy Group, Virginia Tech

by J. Fred Read

The Department of Geological Sciences Sedimentology-Stratigraphy Ph.D. program continues to be ranked in the top ten in the country by the U. S. News and World Report annual ratings in "Americas Best Graduate Schools for 2002." Tech owes a vote of thanks to all our Sed.-Strat. graduate alumni for making this happen, and to the other programs in the department which have greatly benefited our students.

Ken Eriksson went to Australia to analyze age distributions of zircon populations from river systems around the world to demonstrate that these can be used to define ages of terranes within the source area. His Clastic Sedimentology Group also has been active in paleolunar reconstruction studies of the Precambrian to Paleozoic using paleotidal rhythmites. In addition, his graduate students have been involved in studies of high resolution sequence stratigraphy in largely non-marine sequences in the Carboniferous. Past students in this area include Wizevich, Adkins, and Miller. His present students include Jesse Korus, working on the sequence stratigraphic setting of incised valley fills, and Jonson Miller, who is studying Pennsylvanian paleosols (fossil soils) to define paleoclimate. Jason Reed is evaluating controls on sandstone diagenesis and paleothermometry in the Carboniferous of the Appalachian Basin.

Fred Read's Carbonate Group has been continuing work on high resolution sequence stratigraphy of Mississippian carbonates, building on the work of Niemann, Nelson, Smith, and Al-Tawil; rocks of this age have gained additional importance because of the giant Caspian petroleum reservoirs. Thomas Wynn is involved in a detailed subsurface study (200 wells) of Appalachian Mississippian carbonates/siliciclastics to determine the degree to which the outcrop-based high resolution sequence stratigraphy can be applied to the subsurface. The group also is involved in a multidisciplinary deep coring program of the North Carolina Coastal Plain Mesozoic and Cenozoic succession, building on the subsurface framework of Coffey. The project involves the U.S.G.S., North Carolina government agencies and several universities. The first continuous core (1400 ft. long; greater than 95% recovery) was drilled this year and several other deep cores are scheduled for the coming years. Jenny LaGessee is studying the facies, sequence stratigraphy, and diagenesis of this core and some other shallow cores.

The Sedimentology Program thus is thriving, placing students in industry and academia, and we look forward to a bright future, maintaining the high standards set by all our past graduate alumni, and the many undergraduate helpers who have been involved in the projects.

A Student Perspective

Ph.D. 1998

by Aus Al-Tawil

I defended my Ph.D. dissertation in January of 1998, then immediately left for Dallas to spend two years with the Carbonates Research Group in the Mobil Technology Center. During that time, Exxon and Mobil announced their merger intentions, which accelerated my decision to return to my ultimate residence, my home country, Saudi Arabia. I joined Saudi Aramco in January of 2000, and I am working in the Reservoir Characterization Department, in the Gas Fields Characterization Division. The Chief Geologist, George Grover, is another Techie and Fred Read's first graduate student. I feel fortunate to have had the opportunity to get a top notch graduate education at Tech and in the Department of Geological Sciences. The faculty and students (graduate and undergraduate) provided an opportunity of total immersion in knowledge and experience. I was in Fred Read's program, where I know, even more so after leaving Tech, that I got the best training, not only in carbonate geology, but in geology, science, and yes, in life.

Since I joined Saudi Aramco, I have been working on reservoir characterization of the Permian Khuff Carbonate Gas reservoirs in the Haradh Field of southern Ghawar (the largest hydrocarbon field in the world). I am fortunate enough to have "miles" of subsurface core, as well as conventional and specialty wire-line logs to keep me busy for at least another decade. I am learning a lot by working with multi-disciplinary teams of geophysicists, petrophysicists, modelers, and engineers. The best part is that I get to enjoy being a field-boot geologist again by working the Khuff outcrop belts of Saudi Arabia; can it ever get any better than this!

I hope my friends will find time to send me a note and let me know how they are doing, and hopefully we can re-establish our contacts again. Finally, my only comment is that when I arrived in the Department of Geological Sciences, it was a point of pride that we were an "internationally recognized" department with a group of national and "international" students and faculty. Therefore, I would expect to see a reflection of that continuing history on an alumni map of the world, as well as of the USA. For example, there are at least three graduates of the department here in Saudi Aramco, and I am sure there are more all over the world. I am looking forward to hearing from all my friends, hopefully soon. Thank you. Aus

Computing Facility Dedication

“The John K. Costain Graduate Geophysics Endowed Scholarship Fund” was established by Mr. David W. Worthington to recognize the impact of Dr. John K. Costain, Emeritus Professor of Geophysics, on his students and his long-term contributions to Geophysics Programs and commitment to the Department of Geological Sciences at Virginia Tech. After receiving his degree at Marietta College in Geology with minors in Physics and Mathematics, David started graduate work at the University of Utah and accompanied John when John moved to Virginia Tech. Mr. Worthington received his M.S. in Geophysics from Virginia Tech in 1969, as John’s first graduate student from Virginia Tech.

On February 21, 2001, the reflection seismology computing facility was named the “John K. Costain Geophysics Computing Facility” to recognize and thank John for his past and continuing contributions. The scholarship will support research at the Facility.”

The John K. Costain Geophysics Computing Facility provides the Geophysics group at Virginia Tech with the hardware and software needed for research and education. The facility is sponsored by alumni, BP, Chevron, Exxon, Geographix, Landmark Graphics Corporation, Marathon, Rock Solid Images, Sun Microsystems, Texaco, the Department of Geological Sciences, and the College of Arts and Sciences at Virginia Tech. The facility now includes state-of-the-art hardware and software obtained by grants to Dr. Matthias Imhof, Assistant Professor of Geophysics, who also supervises the facility.

Software now includes packages of Landmark Graphics Corporation (ProMAX 3D, EarthCube, SeisWorks, petrophysical/stratigraphic modeling tools), Geographix (GMAplus: STRUCT, LogM, AVO, and WavX), Paradigm Geophysical (2D and 3D Disco and Focus), Rock Solid Images (Petrotools and Petrosolutions), Roxar (IRAP RMS), GOCAD, Hampson-Russell (AVO, STRATA, GEOSTAT, EMERGE) VoxelGeo.

Hardware now includes a SGI Power Challenge/Felix, Sun workstations (four Sun Blade 1000 UltraSPARC-III and one Sun Ultra 60), and access to an on-campus Beowulf cluster built from 80 PCs. Various Sun, SGI, and Linux workstations complement the facility and are used as multipurpose computers.

Departmental SEG Booth - A Big Success

This year, the Department had a booth at the annual meeting of the Society of Exploration Geophysicists. A number of posters were used to present an overview of current research activities in the Department. In addition, one poster was used to announce the new “John K. Costain Geophysics Computing Facility” and thank the sponsors.

Numerous students visited who were interested in coming to Tech for a higher degree. Of course, all the knickknacks we handed out did help, too. The booth was visited by prospective students, and by many alumni and friends of the Department who wanted to hear the latest news and share their experiences and thoughts about the past, present, and future. In summary, the booth was a big success.

The Department Requests Slides and Photos of Alumni at Work

The Department of Geological Sciences is preparing a presentation for high school students to describe the wide range of career opportunities that are available to earth scientists after they graduate. We are seeking slides or photographs of our alumni at work that we might include in our presentation. If you have a picture of yourself working in the lab, in the field, in the office, or elsewhere, that we could use, please send it to Bob Bodnar at the Department of Geological Sciences (rjb@vt.edu). Electronic images are preferred, but if you send a hardcopy (photo or slide) we will scan the image and return the original to you. Please include a short (1-2 sentences) description of the location and/or activity illustrated.

Tom Pratt in the News

by John Costain

Tom Pratt (M.S. '86; Ph.D. '92) in the news! We are grateful to Mike Huggins, M.S. '83 (biostrat) for calling our attention to the following article (abbreviated here) from the New York Times, January 23, 2001, written by Carol Kaesuk Yoon.

In a classic Seattle scene a ferry full of latte-sipping commuters is sailing serenely beneath winter clouds through the labyrinth of islands and mainland that dissect Puget Sound. Dr. Thomas Pratt and Dr. Brian Sherrod, two earthquake researchers aboard, note that the boat is sailing directly over what some scientists say is the most deadly earthquake threat in the region: the Seattle fault zone. Forty miles long and five miles wide, this huge fault zone runs right under the sound and the south end of Seattle itself.

The researchers are seeing evidence of more faults, signs of at least one unexpected hot spot of shaking and most worrisome of all, evidence that the basin upon which most of Seattle is built actually amplifies earthquake shaking. "It's like building on Jell-O," said Dr. Tom Pratt. "You put a bowl of Jell-O on a table and shake the table, that bowl of Jell-O is going to oscillate a lot." Under some conditions, Tom and colleagues were seeing as much as a five- to twelve-fold difference in shaking inside and outside the basin.

The project, known as SHIPS for Seismic Hazards Investigation of Puget Sound, was carried out by the Geological Survey along with 10 other institutions, including the University of Washington, University of Texas at El Paso, Oregon State University and the Geological Survey of Canada. SHIPS' researchers have fired off 33,000 air-gun shots from a research vessel cruising through Puget Sound and beyond. They have detonated 38 underground dynamite explosions late at night in a line running right through the city, causing some Seattle residents to jump out of their beds thinking there was an actual earthquake. "We do these things in the middle of the night when it's quiet," said Dr. Pratt, a geophysicist with the Geological Survey, to reduce the amount of extraneous noise that could muddle their results. "The trouble is that people are asleep in beds. A bed is a very good motion sensor."

SHIPS researchers even have some preliminary data that there might be previously unsuspected faults right at the bottom of the basin underlying Seattle. Scientists note that it remains to be seen whether any discovered faults actively pose earthquake risks, because a fault has to move to create a threat. Some of the SHIPS researchers' best experiments have involved seismic serendipity, like the implosion of the 200,000 pound concrete Kingdome, which sat right atop the fault zone. "That experiment really came out of a bunch of us sitting around saying, 'Hey, they're going to blow up the Kingdome, that's going to make a lot of noise,'" said Dr. Pratt. So, in addition to the breathless wonder of Washingtonians who woke up early that Sunday this past March to witness the implosion on television (and countless slow-motion replays), that Seattle mega-event produced a unique experiment. The scheduled vibrations on the fault zone in the midst of this populous city would be equivalent to a 2.3 magnitude earthquake. The result from the network of 200 seismometers deployed throughout the city is a neighborhood by neighborhood look at how Seattle could shake during an actual quake either from the fault zone or elsewhere. Scientists have already identified one unexpected hot spot of shaking in the city. "This was a major find," said Dr. Sherrod, who is now trying to verify if it is an unrelated fracture or the long-sought Seattle fault itself. "You can't see anything and then someone does an excavation and boom, the lights just come right on. We dropped everything we were doing to run over there and map it." But even as scientists continue to argue over the danger posed by the Seattle fault zone, those working to protect the area's residents are taking these faults increasingly seriously.

"The Seattle fault is absolutely in our design criteria now," said John Hooper, a structural engineer at the firm of Skilling, Ward, Magnusson, Barkshire Inc. in Seattle. The firm worked on the new baseball stadium and the football stadium under construction, both of which sit right atop the fault zone. "I design for it every day. So many bridges are likely to fall, and chunks of the Interstate 5 system," said Dr. Weaver, referring to the major north-south highway running through the state. And getting places won't be the only problem. The city's major water supply lines, sewer lines as well as liquid fuel pipelines run right through the fault zone.

But the real question on everyone's mind is "When is the big one coming?" Scientists say they cannot say much with precision about the actual timing of the next big quake, however, other than to say it is surely coming.

Addendum: The above scientific investigations involved four, possibly five, institutions that were part of the SHIPS project that used our own Professor of Geophysics John Hole's tomographic computer inversion software. His computer programs can be used to produce a 3-dimensional image of the subsurface seismic velocity structure, which can, of course, be related to lithology and geological structure. At least a half dozen papers have now been published or are in press that utilized Dr. Hole's software to look at structures from the surface basins to the Moho.

Eleventh Annual V. M. Goldschmidt Conference

The Eleventh Annual V. M. Goldschmidt Conference was hosted by the Department of Geological Sciences of Virginia Tech, May 20-24, 2001, at The Homestead in Hot Springs, Virginia. The Goldschmidt Conference is the premier geochemistry conference in the world each year. This conference was the largest Goldschmidt ever held in the United States with 925 participants coming from 29 countries. The first Goldschmidt Conference, held in 1988, was organized to mark the centennial year of the birth of the father of modern geochemistry, Victor M. Goldschmidt, a native of Norway. This meeting was the 11th in a continuing series of Goldschmidt conferences alternating between sites in North America and in Europe, with the 2003 meeting to take place in Japan. The next conference will be held in Davos, Switzerland, August 17-23, 2002.

The conference was convened by Robert J. Bodnar and Michael F. Hochella, Jr. of Virginia Tech. Other department support was received from Dr. Cahit Çoruh, Department Chairman; Ellen Mathena, Conference Secretary; Charles Farley, Audiovisual Coordinator; Connie Lowe, Virginia Tech Booth and Registration; and Linda Bland, Mary McMurray and Carolyn Williams, Registration. Invaluable assistance was given by the Lunar and Planetary Institute, Virginia Tech Continuing Education Center and The Homestead staff. A detailed photographic record of the conference was provided by Mark Fortney.

Sponsors in addition to Virginia Tech were the Geochemical Society, Mineralogical Society of America, Lunar and Planetary Institute, Oak Ridge National Laboratory, European Association of Geochemistry, and National Aeronautics and Space Administration. Corporate sponsors were Finnigan MAT, Thermo Elemental, and Micromass. Thirteen exhibitors joined us with products and information.

The Homestead, a five-star resort, proved to be an excellent location with many extra meeting rooms, activities and beautiful grounds available in addition to the large session rooms. From all comments, the program was excellent with good structure and the organization was very smooth and user-friendly. Virginia Tech faculty assisting Bob Bodnar and Mike Hochella with organizing sessions were Ross Angel, Jim Beard, Gretchen Benedix, Jim Craig, Don Rimstidt, Nancy Ross, Madeline Schreiber, and Bob Tracy. Virginia Tech alumni who helped organize the scientific program include Alan Anderson, Gordon Brown, Kevin Ross, Udo Becker and Max Vityk. Geological Sciences faculty presentations were made by Ross Angel, Andreas Audétat, Monte Boisen, Patricia Dove, Gerry Gibbs, Jing Leng, Don Rimstidt, Nancy Ross, Krishna Sinha, Chris Tadanier, and Bob Tracy. Mike Hochella, as Geochemical Society President, gave the conference's Presidential Address. Current students who co-authored presentations included Kevin Davis, Stacie Dunkle, Jim Jerden, Jeanie Jerz, Treavor Kendall, and Jay Thomas. Many of our alumni, and former post-docs and visiting faculty, joined in the conference with presentations and posters. Among those were Barry Bickmore, Dirk Bosbach, Brian Chakoumakos, Dave Chernak, Jean Cline, Robert Downs, John Grotzinger, Mickey Gunter, Robin Guynn, Bill Hames, Steven Lower, John Mavrogenes, Bob Popp, John Rakovan, Kevin Rosso, Christian Schmidt, Bob Seal, Anurag Sharma, Joe Smyth, Rob Weaver and Peter Welch.

Students responsible for audiovisual operations were Catherine Airey, Tracy Cail, Stacie Dunkle, Megan Elwood-Madden, Luca Fedele, Fang Lin, Viktor Liogys, Christine Lopano, Andrew Madden, Chelsea McRaven, Erin O'Reilly and Jackson Spain. They did an excellent job covering a total of 720 talks and helping to oversee 160 poster presentations.

Department History - Student Perspective: by Barry L. Sutphin 1965-69 Barry L. Sutphin, PG Commentary by Lynn Glover 1952

From Barry L. Sutphin, PG
R.R. 1, Box 346, Wheeling, WV 26003
6/18/01

Dear Editor:

I read the Spring 2001 Newsletter and found a comment in a student perspective letter from the class of 1981 that I found discordant with my experience within the Department. The comment was about conversation during a 'Faculty-Student dinner'. Please allow me to indulge in some recollections from the now dim and dark past. My time at Tech was hard and grim, but I graduated with a good over-all education and with the trained ability to frame a problem and think my way through it. Let me take you back to the years 1965-1969.

Tech was exploding at the seams and undergraduates were faceless - the emphasis was on expanding enrollment, especially at the graduate level, and in building infrastructure. I had to eat in only one dining hall where the food processing equipment was obsolete and the food was terrible; the one other dining hall was newer and the same food prepared there was quite good, and we students got some flexibility in where we could eat only after a minor uprising. The student recreation building was mostly shut down for remodeling almost the entire period. The campus was torn up for construction of 3 or 4 dormitories while others were closed for remodeling, the stadium was only half-built, and a couple of new academic buildings, including Derring, were added (I helped move Department stuff from Holden to Derring in my Senior year). There were very few women students, and enrollment almost doubled during that time. You could not buy a beer inside the city limits, fraternities were shadowy things not recognized by Tech, and about the only social activity was a mass flow-ebb between Radford College (all women at the time) and Tech on weekends.

And there was Viet Nam. Student deferments from the draft were precious and hard to keep. Draft boards gave you four years, and only four years, to obtain a Bachelors degree. If you fell behind your graduating date schedule, and could not demonstrate an ability to catch up by retaking a course or by doubling up on courses within that schedule, the deferment was lost. The military was hungry for manpower and we took pre-induction physicals between the Junior and Senior years so we could be in the pipeline. The Geology Department was relatively small and the required department courses were taught only once a year. A little course slippage or schedule conflict with non-department courses induced incredible tension, and if you lost a course in your Senior year you were toast. My memory is not precise, but we lost something like half to two-thirds of the '69 department degree candidates during the 68-69 year. But that was okay by the department the new building was up and running, and enrollment shot way up, and graduate facilities were improved with the promise of more to come.

I do not remember 'Faculty-Student dinners'. If we had them I did not get the word, and we had a very short grapevine. The relationship between undergrads and the Department was different. Let me try to give you a whiff of the atmosphere in Holden Hall in 1966, as I encountered it. I wanted to change my major from Engineering to Geology in my Sophomore year, but had to be interviewed and get the approval of the department head (Cooper). The department was small and wanted to expand enrollment, but at the graduate level. Cooper explained to me how he disliked major transferees, and that he really did not think I would graduate, but yeah, I could come on in. With that encouraging start in mind, flash forward to May 1969 one month before my on-time graduation. First, I received notice that I was not cleared for graduation...the department changed core requirements in 1968, Statistics was changed from 3 to 5 credits, and I had taken the previously approved 3 credit course. I had to go to the Dean of Arts and Sciences to get my department to accept the program requirements under which I started. Second, Tech had a university-wide perk for Seniors who were graduating on-schedule ... you could opt out of any or all final exams. A couple of us were hanging onto low but acceptable grades in a required department course, and could not afford the risk of blowing the final (remember that once a year course offering and draft thing discussed above). Again, a trip to the Dean to get my department in line. My memories of Dr. Cooper are not warm and fuzzy.

My memories of instructors are mostly fond but we did not have much out-of-class contact. Most instructors had help sessions scheduled for undergrads with graduate students, and I recall only one department picnic. Gibbs required the purchase of an expensive textbook that we did not use, and taught undergrads from his own unpublished course notes with all the enthusiasm of someone doing court mandated community service. Sears was a real laid back guy who seemed to enjoy his work. Pratt was a new guy who taught with genuine enthusiasm an amorphous but intriguing course called Environmental Geology (unlike many courses, this one actually seemed to have relevance to the real world even though not many careers yet existed with that emphasis). Bloss was another new guy, and he taught from his published book with infectious excitement. Tillman was a quiet gentleman who got our attention with his first, impossibly difficult, Paleo quiz, and who then led us to understand that there were actual meanings to those formed little lumps of rock with Latin names that we had to memorize; he helped me along in the general practice of combining bits of information for a purpose as contrasted to aimlessly collecting information. Along with many other students, my best and warmest memories of my days in the department center on Doc Lowry. He was not my buddy, we did not hang out, he was not my counselor, and we did not do dinner. Doc Lowry was, in fact, one of the finest teachers I have been exposed to in my academic and professional experience. He communicated his professionalism to us undergrads as if every day was the first (instead of the umpteenth). He filled

our empty heads with the wonder of what lay previously unrecognized all around us. He required of us that we think about the things he presented to us, and that we articulate the meaning drawn from our thoughts. We might be wrong, but we had to be coherent. We had to frame the question, supply bits of information, and formulate a story that was plausible. The extension of that process into the real world leads to testing of the hypothesis and translating the information into something meaningful that others can use.

This rambling account is in no way a condemnation of the Department or of Tech. Tech is a State University (name changed from VPI to VPI&SU while I was there) and had to meet the demands of a surge of us boomers. The school had to accommodate large numbers of in-state undergrads, but the stature of its departments would derive from the graduate level. We were in a pressure cooker and did not have mentor relationships. We felt that our presence was tolerated only as support for the graduate programs, and from a certain perspective we were correct. It was the classic chicken or egg question of what comes first. My education at Tech has given me an edge over competitors throughout my career, and chance encounters with other alumni in business has shown me that they stood taller than most. I wear my ring proudly as a visible diploma.

Sincerely,

Barry L. Sutphin, PG ('69, Geology)

Dear Barry,

Many thanks for writing such a thoughtful and provocative letter. It's a compelling account of one student's life in the Department during a period of great effort and intense change. I arrived as a professor in 1970, but as an alumnus of the Department I had long followed it with interest. The years 1965 - '69 witnessed the Department's heroic and successful effort to win a Centers of Excellence Grant from the National Science Foundation, an effort that led the Department out of obscurity and into national prominence. During that time we nearly doubled faculty and student body size, moved into a new building and transformed our curriculum. Recall also that we were in the midst of an era of unrest culminating in the student occupation of Burruss Hall in 1969. It was a stressful time for students and faculty alike. Regrettably you remember it as "hard and grim" but we appreciate your judgement that you had a good over-all education and developed an ability to frame and solve problems.

It is our hope that you will visit us and see at first hand changes in the Department since your graduation. There are dining halls and food courts on campus now. Squire's Student Center you would still recognize, but only after you entered the complex where you can now see the original front still preserved! Squires comprises ballrooms, food courts, several conference rooms, theaters, art galleries, game rooms and facilities devoted to student organizations.

Happily, your concern about the paucity of women students during the '60s has long been relieved. Now, to the delight of everyone, about half the student body is female. And yes, you can buy a beer inside the city limits - if you are old enough.

The draft has long since passed and the four-year limit at college has gone with it. The problem now is getting students to graduate in less than five or six years. On average, undergraduates change majors 2.5 times before graduation! Your problems in getting required courses scheduled would be rare to non-existent now. With 23 professors on the faculty there is a very broad selection of courses and with most of the faculty engaged in advising there is plenty of opportunity for student-faculty contact. A more frequent problem is getting the students to come in for advising. VA Tech and the Department have become more selective over the years - students are quite good, average SATs are well over 1200 now.

While you were here Byron Cooper (Head), and a small cadre of faculty, launched the Department on a course into the upper 10% of geoscience departments nationwide. If your memories of him are not "warm and fuzzy," neither were mine when I was an undergraduate. He was an intense leader who divided his acquaintances into those who liked him and those who didn't. Later he became my mentor (some years after telling me "to get my degree the best way I could and get out of geology - please don't work in it") and in 1970 he hired me as a professor. In recent years the Department has ranked first or second in the University for the value of its Ph.D. program, and 17th to 27th in the nation as a geoscience department. We are indebted to Byron for the start he gave us.

Your thoughts on the faculty are in concert with most of your classmates. Dr. Pratt is gone; Professors Sears and Tillman are dead. University Distinguished Professor Gibbs retired but continues to work even in retirement supported by the National Science Foundation. His course was a bear, mathematically inclined students seemed to like it, others didn't. He became the most decorated professor in the department and also won teaching awards as well as medals for his science. Dr. Lowry, of course, was everyone's favorite - the most beloved professor in the history of the Department.

You were right about the faculty-student "dinners." Now we have two departmental picnics per year, one in the fall and the other in the spring. There is a holiday get-together in December, a student-faculty dinner in the spring for graduating students at all levels in the Department, and of course the Department graduation ceremony, which includes a luncheon. We also try very hard to generate a continuing alumni connection with our graduates. We have on and off-campus alumni-faculty dinners where the Department Chair provides input on the Department's goals and strategies. This newsletter goes to all students in the Department as well as to alumni and friends.

It has been a pleasure responding to your fine letter. I hope that in the future you will attend one of our Alumni-Faculty dinners and that I can give you a tour of the Department.

Lynn Glover, III, Editor
Class of '52, Professor Emeritus

Chester F. “Skip” Watts ‘74, Congressional Science Fellow Began Term in September 2001

From September 2001 issue of *GSA Today*

Chester F. “Skip” Watts has been selected as the 2001--2002 GSA--U.S. Geological Survey Congressional (USGS) Science Fellow. Watts is the Dalton Distinguished Professor of Geology at Radford University in Virginia, where he also serves as director of the Institute for Engineering Geosciences. His teaching has focused in recent years on engineering geology, advanced engineering geology, soil mechanics, and rock mechanics. He also enjoys teaching environmental geology, hydrogeology, computer applications in geology, geomorphology, and general geology. Watts received his bachelor’s degree in geology from Virginia Tech in 1974, his master’s degree in physical science from Radford University in 1977, and a doctorate in engineering geology from Purdue University in 1983.

Watts’ research interests focus on the broad range of interaction between geologic processes and human activity. His studies range from ground water resource and contamination to flooding and dam safety to landslides and ground stability. Watts is a certified professional geologist in the Commonwealth of Virginia and the author of ROCKPACK computer software, used internationally for analyzing the safety and stability of mountain slopes, mines, quarries, highways, buildings, and bridge foundations. He serves as a consultant to numerous state highway departments, federal agencies, and engineering firms throughout North America.

The Virginia Office of the Attorney General, the USGS, the U.S. Forest Service, and the Army Corps of Engineers are among those to have enlisted Watts’ assistance. His projects have included Federal Emergency Management Administration studies in Hot Springs, Arkansas, evaluations of dam spillway stability adjacent to the San Andreas fault, rock fall and visitor safety at Natural Bridge National Historic Landmark in Virginia, wildfire rehabilitation in the Cascade Mountains of Washington, and rock-slide studies in Yosemite National Park in California.

Watts has received several regional and national teaching awards, including the 1998 State Council for Higher Education in Virginia’s Outstanding Professor Award. He recently appeared in a television documentary called “Earth’s Fury!” on TLC (The Learning Channel) and on National Public Radio while rock climbing during rock-slide investigations in Yosemite National Park.

Watts feels very honored to serve as the 20012002 GSA--USGS Congressional Science Fellow. “Many important geologic and environmental issues are rising to the political forefront. It is both exciting and educational to become a part of the public policy process,” said Watts. He hopes to become involved in science and policy issues related to the environment, public works, and natural hazards and will continue the tradition of writing perspective articles for upcoming issues of *GSA Today*.

Skip’s daughter, Stephanie is a 2001 graduate of the Department.

Papers From the Department Given at 2001 Meetings

16th Himalaya Karakorum-Tibet Workshop, Gratz, Austria

April 3-5

Law, R.D., Searle, M.P. and Simpson, R.L. *Microstructural and quartz petrofabric evidence for strain paths and deformation temperatures, South Tibetan Detachment System, Everest massif, South Tibet.*

Searle, M.P., Simpson, R.L., Law, R.D. and Parrish, R.R. *The structural geometry, metamorphic and magmatic evolution of the Everest massif, Nepal and Tibet.*

European Union of Geosciences XI, Strasbourg France

April 8-12

Saint Blanquat, M. Tikoff, B. and Law, R.D. *Contrasted tectonic and magmatic rates and transport of granitic magmas.*

Spring 2001 Meeting of the Materials Research Society (MRS) San Francisco, California

April 16-20

Davis, K.J., Dove, P.M. and De Yoreo, J.J. *Molecular-Scale Mechanism for Altered Calcite Morphologies in the Presence of Magnesium: Implications for Impurity Modification of Anisotropic Materials.*

Geological Society of America Southeastern Section Meeting, Raleigh, North Carolina

April 5-6

Anderson, K.B., and Spotila, J.A. *The relationship of geologic structure and the Giles County seismic zone in southwest Virginia, based on fracture mapping in allochthonous Paleozoic strata.*

Craig, J.R., Edwards, D.A., Rimstidt, J.D., Scanlon, P.F., and Collins, T.K. *Characteristics of lead shot and particles at shooting ranges.*

Edwards, D.A., Craig, J.R., Benedix, G. and Kimbell, J. *Corrosion and archaeological mineralogy of a Spanish 2 Real Coin.*

Hoffmeister*, A., Kowalewski, M., Bambach, R., Baumiller, T.K. *Evidence for predatory drilling in late Paleozoic brachiopods and bivalve mollusks from West Texas.* [talk]

Kavage, R.H., and Spotila, J.A. *Ephemeral Channels and Hillslope Erosion in the Southern Valley and Ridge, Southwest Virginia*

Reed, J. and Eriksson, K. *Carbonate Cement Zonation Patterns in Two Lower Pennsylvanian Sandstones, Central Appalachian Basin: Stratigraphic Control and Reservoir Quality Implications.*

Sayed*, A.Y., Hole, J.A., And Tobin, H.J. *In Situ Measurement of Seismic Velocity Across an Exposed Brittle Fault Zone.*

11th Annual Goldschmidt Conference

May 20-24

Angel, R.J. and Jackson, J.M. *Elasticity and equation of state of orthoenstatite.* [poster]

Davis, K.J., Dove, P.M., and De Yoreo, J.J. *Mechanisms of Calcite Growth Inhibition by Mg²⁺ and Sr²⁺: Comparison of Molecular-Scale Measurements to Crystal Growth Impurity Models.*

Davis K.J., Dove, P.M., and De Yoreo, J.J. *Resolving the Role of Mg²⁺ as an Impurity in Calcite Growth.*

Hochella Jr., M. *There was plenty of room at the Bottom: Nanoscience in Geochemistry.*

Kendall, T.A., and Hochella Jr., M.F. *Investigating the mechanism of siderophore-driven Fe release from mineral surfaces using Chemical Force and Confocal Laser Scanning Microscopy.*

Tadanier, C.J. and Lower, S.K. *Modeling Nanoforce Measurements between Viable Microorganisms and Mineral Surfaces: Influence of Environment on Interfacial Phenomena*

Thomas, J.B., Bodnar, R.J., and Shimizu, N. *Melt Inclusions in zircon: Microautoclaves for determination of trace element partition coefficients.*

Weaver, R.M., Hochella, M.F., Jr. *Dynamic Processes Occurring at the Cr³⁺-Manganite (-MnOOH) Interface: Simultaneous Adsorption, Microprecipitation, Oxidation/Reduction and Dissolution*

AAPG Annual Meeting, Denver Colorado

June 3-6

Wynn, T.C. and Read, J.F. *Well-cuttings Based Three Dimensional Model for Subsurface Mississippian Greenbrier Group, West Virginia.*

Annual Meeting of the Association for Systematics Collections, Chicago, Illinois

June 6-9

Eriksson, S. *University museums and using collections, panel discussion participant.*

**North American Paleontological Convention, Berkley California
June/July**

- Carroll*, M., Kowalewski, M., Simoes, M.G., and Goodfriend, G.A. *Time-Averaging in articulate brachiopod accumulations: A quantitative estimate of temporal resolution from a Holocene tropical shelf (Southern Brazil)*
- Hoffmeister*, A. Kowalewski, M., Bambach, R., Baulmiller, T.K., *Evidence for predatory drilling in late Paleozoic brachiopods and bivalve mollusks from West Texas.*
- Kowalewski*, M., Avila-Serrano, G.A., Flessa, K.W., and Goodfriend, G.A. *Time-averaged shell accumulations as records of past levels of marine benthic productivity: Implications for conservation biology and ecosystem restoration efforts.*

**American Crystallographic Association Annual Meeting
July 21-26**

- Angel, R.J., Bismayer, U. and Marshall, W.G. *High Pressure phase transition in lead phosphate $Pb_3(PO_4)_2$ evidence from neutron diffraction.*

7th International Conference on Fluvial Sedimentology, Lincoln, Nebraska, August 6-10

- Korus, J. T., Miller, D.J., and Eriksson, K.A. *Fluvial-Estuarine Deposition within Carboniferous Incised Valleys: Nonmarine Response to Relative Sea Level Changes*

**Society of Exploration Geophysicists Annual Meeting and Exposition, San Antonio, Texas
September 9-14**

- Ellison, S., Imhof, M.G., Coruh, C., Fuqua, D.A., and Henry, S. *Modeling offset-dependent reflectivity for time-lapse monitoring of water flood production in thin-layered reservoirs.*
- Imhof, M.G. *The Heterogeneity Cube: A Family of Seismic Attributes.*

**EDUCASE, Indianapolis, Indiana
October**

- Cennamo, K.S. and Eriksson, S. *Beyond access: Supporting inquiry through museum web-sites.*

**Geological Society of America Annual Meeting, Boston, Massachusetts
November 5-8**

- Burbey, T.J. *Use of compaction and hydrograph data during aquifer testing for aquifer characterization.*
- Carroll*, M., Kowalewski, M., Simoes, M.G., and Goodfriend, G.A., *Amino acid composition and diagenesis in the shells of terebratulid brachiopod *Bouchardia rosea* (SW Atlantic)* [poster]
- Craig, J.R., Rimstidt, J.D., Scanlon, P.F., Collins, T.K., Schabenberger, O., and Birch, J.B. *Lead Distribution Patterns on Shooting Ranges: Measurement, Analysis and Interpretation.*
- Dunkle, S.E., Craig, J.R., and Lusaridi, W.R. *Romarchite and the corrosion of pewter artifacts.*
- Eriksson, K.A., Campbell, I.H., Palin, J.M. and Allen, C.M. *The Grenville superorogeny revealed by detrital zircons in Apalachina Rivers.*
- Hoffmeister*, A., Kowalewski, M., Bambach, R., Baumiller, T.K. *Intense drilling predation on the brachiopod *Cardiarina cordata* (Cooper 1956) from the Pennsylvanian of New Mexico.* [talk]
- Jerz, J.K., Rimstidt, J.D., Hammarstrom, J., and Piatak, N. *Paragenesis of Efflorescent Sulfate Salts.*
- Kowalewski*, M., and Bambach, R.K. *Diastems and time-averaging: The limits of resolution in stratigraphy and paleontology.* [talk]
- Reed, J., Eriksson, K.A., and Bodnar, R.J. *Fluid inclusions in Quartz Overgrowths: Implications for Paleothermometry and Quartz Authigenesis, Pennsylvanian Sandstones, Central Appalachian Basin*
- Roland*, D.L., Kowalewski, M., Atudorei, V., Sharp, Z., and Dettman, D. *High resolution analysis of stable oxygen isotope ratios in lingulid brachiopod shells.* [talk]
- Stempien*, J., Daley, G.M. and Kowalewski, M. *Testing for Ecophenotypic Variation across a Paleoenvironmental Gradient in Small Mactrid Bivalve (Yorktown Formation, Pliocene, Virginia)* [talk]
- Spain, Jackson M. *FE(III) Heterogeneity in Controlling Bioremediation of Petroleum Contaminated Aquifers* [poster]
- Velazquez, M.*, Palmer, D. A., Kettler, R.M., Wesolowski, D.J. *Isopiestic Determination of the Osmotic Coefficient of Concentrated Acidic Ferric Sulfate Aqueous Solutions at 298.15 and 323.15 K*
- Wynn, T.C. and Read, J.F. *High-resolution Sequence Stratigraphic Model for Subsurface Mississippian Greenbrier Group, West Virginia.*

ALUMNI NEWS

'67

Martin L. Bregman (M.S. '67) has returned to Tulsa after seven years in Houston and is in semi-retirement. He refereed at the Judo World Championship in Birmingham, England in 1999, and was Chief of the U.S. Mission to the Benito Juarez Judo Championship in Mexico City in June 2001. Martin sends this message: "My regards to all of my ol' Profs at one of the greatest Geology Schools in the country." <mlbregman@aol.com>

David L. Leach (B.S. '67) is looking to retire in a few years after being with the USGS Minerals Program in Denver for 23 years. Over the past seven years, he has also been part-time with the University of Paris working on fluid flow and ore genesis in the Alpine system in Europe. Most of his research is now focused on the giant Red Dog shale-hosted deposit in Alaska. This September through December he will be the SEG International Exchange Lecturer, traveling to Europe, South Africa, China, and Brazil. <Dleach5100@aol.com>

'69

Jack Keat (B.S. '69) is manager of Computer Design Systems at Lockheed Martin Astronautics in Denver, Colorado. He enjoys being on the National Ski Patrol, Loveland Basin Ski Area, Colorado, scuba, Tae Kwon Do, and hiking and climbing. He is a student mentor at the Denver Seminary and teaches an adult Sunday School class. <Jackkeat@aol.com>

'71

Paul L. Broughton (M.S. '71) is a clastic reservoir geologist, specializing in 3D modeling with Gulf Resources Canada (soon to be Conoco Canada—merger). <emerald@cadvision.com>

'72

Scott Hughes (B.S. '72) is now Chair and Professor of the Department of Geosciences at Idaho State University. He stopped by Thanksgiving week to say "Hey," see if any of the early 70's professors were around. He says, "Keep sending field camp students!" GO HOKIES!!

'77

Eric David Gadd (B.S. '77) is working with Enron Corporation in Houston, Texas. <Eric.Gadd@Enron.com>

'79

Steve Grimsley (B.S. '79) sends a note pertaining to his new consulting assignment in India. He was in Bombay, or Mumbai as it is now called, when the earthquake occurred on January 26, 2001. Even as far as he was from the epicenter, near Bhuj, the shaking was unsettling in the old colonial building he was in, causing fresh cracks in the structure around the stairwell. The quake lasted about 45 seconds.

He sends a photo of some seismic shot records from a boat that was recording in the Gulf of Cambay. The first record is from before the earthquake and the rest were during. Needless to say, the records during the earthquake were rendered useless and discarded.

Steve is now interpreting and mapping in the deep water area off of Krishna and Godavari deltas along the southeast coast of India. Thanks. Steve. <sgrimsley_2717@yahoo.com>

'80

William L. Lassetter, Jr. (B.S. '80) is working at the Virginia Department of Mines, Minerals, and Energy in Charlottesville, VA. He sends his greetings to the class of 1980! <wll@mme.state.va.us>

'83

Stephen Gary Miller (B.S. '83) now has two children, Beck and Kalie, ages 11 and 8. He is a Principal with Commercial Tenant Construction, Inc. in Midlothian, Virginia. <sgm458@aol.com>

'84

George F. Kokkoros (B.S. '84) is currently with Conoco Asia and is living in Sarawak, Malaysia. He is enjoying diving, windsurfing, and bird watching in Borneo. <george.f.kokkoros@usa.conoco.com>

'85

Mark J. Gresko (Ph.D. '85) and his wife Jeannie have moved to Shekou, China, just outside Hong Kong, after spending nine great years in Indonesia. Mark is the Geological & Geophysical Manager for Devon Energy China. Both would welcome visits or contacts from their Virginia Tech friends from the early to mid 1980's. <mark.gresko@dvnc.com>

Chip Konrad (B.S. '85) is an Associate Professor at the University of North Carolina at Chapel Hill. He teaches and conducts research on the weather patterns associated with heavy rainfall. <konrad@unc.edu>

'86

John Fleming (B.S. '86) writes "I finally finished school." He is working as a hydrologist for the USGS specializing in the application of geophysical techniques to hydrogeologic investigations. John sends this message: "Greetings to all! Even after 15 years, I still miss Blacksburg." <jbf@usgs.gov>

Martin G. Taube (B.S. '86) has remained in Pittsburgh after receiving his Masters from the University of Pittsburgh. He has been doing business development for Nicholson Construction, a specialty geotechnical construction company, for the last year. He is now married and has three children, ages five, seven, and nine that keep he and his wife, Vaune, very busy. <mtaube@nicholson-rodio.com>

'88

Jen (Ford) Allender (B.S. '88) and Will have just settled into a home in the mountains of Colorado. Jen writes "It is nice not having to cut down kudzu to actually see the outcrops. Hello to the class of 1987-88. I'd love to hear how Big John, Peggy, Billy, Linda, Mike, and Louis are doing!" <cjallender@yahoo.com>

Kenneth B. (Keg) Alexander (B.S. '88) is a Senior Hydrogeologist with Geomatrix Consultants in Oakland, California. Ken says they are very interested in hiring geologists or hydrogeologists. <kegandmary@earthlink.net>

'89

Charlotte M. Allen (Ph.D. '89) has been in Oz ten years on 27 May 2001. She has been working with the Ore Genesis Group (OGG) in the Research School of Earth Sciences in Canberra Australia for the past three years, and in the Geology Department previous to that. John Mavrogenes (Ph.D. '94) spans those two groups (Geology Department and OGG). <charlotte.allen@anu.edu.au>

'92

David Bertolacci (B.S. '92) started working in the environmental industry after graduation. In 1994 he found an environmental laboratory in Manassas, Virginia and began analyzing materials by Polarized Light Microscopy and Transmission Electron Microscopy. A competitive move took him to Dallas in 1996. In 1998 another move led to his partnership in a Dallas lab (CA Labs). He is now Laboratory Director and they are currently one of the fastest growing startups, setting new records for revenue and profits in the state of Texas after being in business for only three years. David is considering making a transitional move into the Oil and Gas Industry. <dbert@netzero.net>

Laurie Buyrn Grote (B.S. '92) opened her own company, Coyote Printing Company, in April of 1999 in Flagstaff, Arizona. She is currently relocating the business to Chesapeake, Virginia. Laurie now also has a daughter, Marin Ashley Grote, born in December 1999. <Laurie@coyoteprinting.com>

Phil Pappano (M.S. '92) is at Rice working on his Ph.D., just passed (Sept., 2001) his research prelims and it's full steam ahead now on his research. Good luck, Phil. <phil_pappano@yahoo.com>

R. Greg Vaughan (B.S. '92) finished his Masters at UGA studying sulfur isotope geochemistry of black smoker chimneys (and getting some dive time in the Alvin!). He moved to Reno to work for a mineral exploration company, North America Exploration. He enjoyed three and a half years of field work, mostly in Nevada, until the gold price took a dive. He is currently at the Mackay School of Mines, University of Nevada Reno pursuing a Ph.D. He has received a NASA graduate research fellowship to study geological applications of remote sensing and GIS. Greg sends this message: "I would like to say hello to my former classmates and professors! Drop me an e-mail sometime." <<http://mines.unr.edu/able/vaughan.html>> <vaughan@mines.unr.edu>

'93

Rhonda Adkins (B.S. '93, M.S. '97) is in Australia working on her Ph.D. She just finished the equivalent of our pre-lims and found out that she is receiving an AAPG grant this year. She writes "Peter (Welch, M.S. '99) is definitely the super-star of his research group, even though he would deny it." She and Peter plan to be married once they return to the States. They had a nice visit with Adam Henry (M.S. '97) who visited them recently. She sends this message: "Even though things are going well here, no place compares to Blacksburg and the geo department there." <rhonda.adkins@jcu.edu.au>

David Valentino (Ph.D. '93), (left), Associate Professor, SUNY at Oswego, NY, was caught in orbit last April near Blacksburg while leading his students on a field trip. Lynn Glover (B.S. '52, M.S. '53), the gentleman (right) checking him out, was his dissertation advisor.

'95

Frances C. Hill (Ph.D. '95) is working for an organization called the Army High Performance Computing Research Center, a subsidiary of a company called netASPx, in Minneapolis, Minnesota. She is providing technical support for professors and students who use computational chemistry software. Fran writes, "We really like it here; Minnesota is a gorgeous state with endless possibilities for outdoor activities, and it's nice to be back in the midwest." <frances.hill@netaspx.com>

Mike Pope (Ph.D. '95) is an Assistant Professor of Geology at Washington State University in Pullman, Washington. Mike and his family are very happy living in the northwest and have recently adopted a boy who is nearly the same age as their daughter.

'96

Joel Maynard (B.S. '96, M.S. '99) worked for a local environmental consultant for a year. He is now a senior geologist for the Virginia Department of Environmental Quality in Harrisonburg, Virginia. He says it is a gratifying job to direct groundwater and soil remediation activities at sites in his home state of Virginia. He has just recently purchased a small cabin and acreage adjacent to the Shenandoah National Forest. <jpmaynard@deq.state.va.us>

Wendi Tibiletti (M.S. '96) and her husband Max just recently moved to Houston, Texas. She says with the oil patch being the way it is, Houston is the place to be! They have both started new jobs. Max is with Amerada-Hess as a petroleum engineer, and Wendi is working for Unocal as a development geophysicist ("yes, I'm a turncoat!"). They are loving Houston. Wendi says Gabriel is growing like a little weed and is keeping them both extremely busy. He is doing well and seems to enjoy Houston as much as they do. <wtibiletti@unocal.com>

Keith and Patricia Wood (M.S. '96) moved into a new house in Nye, Montana in June 2001. They are now located at the foot of the Beartooth Mountains. Their son Devin just turned one. <kpwood@montana.net>

'97

Jennifer H. Rea (B.S. '97) recently moved to Eugene, Oregon and is working with EarthSoft (an environmental software company) as tech

support. Jennifer writes "Ailsa Jordan, two, welcomed a little brother, Keegan Scot, born December 30, 2000. <jenhatrea@hotmail.com>

'98

B.J. Carney (B.S. '98, M.S. '00) is living in Oklahoma and working for Marathon Oil as a Geophysicist. He and Jennifer had a baby boy on April 26, Noah Thomas Carney. <BJCarney@MarathonOil.com>

John Leone (B.S. '98) received his masters in geology from Texas A&M in August 2001, and is currently working as a geologist for Chevron Texaco (hired on with pre-merger Texaco) in Midland, Texas.

Shelley Ellison Tyree (B.S. '98) just completed her Masters Degree in geophysics and is working at Anadarko Onshore Exploration in Houston, Texas. <shelley_tyree@anadarko.com>

'99

Megan W. Morsey (B.S. '99) just recently joined the LFR Levine-Fricke team as a Staff Geologist in Tallahassee, Florida. LFR is an environmental consulting firm. <mwm@lfr.com>

Amy B. Peterson (B.S. '99) is a Geophysicist for Ensign Geophysics in Houston, Texas. She and Charlie moved into a new house in June and are loving Texas. <amyp@ensigngeo.com>

'00

Paige Baldassaro (M.S. '00) received her M.S. in Geography, focusing on GIS, in August 2001. She is now working at the Institute for Software Research in Fairmont, West Virginia.

Barry Bickmore (Ph.D. '00) is now living in Provo, Utah and is working at Brigham Young University. He and his wife Keiko had their third child November 16, 2000, Autumn Fusayo Bickmore. <kbickmore@earthlink.net>

Dave Luer (B.S. '00) is working for Golder Associates as a staff geologist. He is looking to move to Alaska. <dluer@taudelta.org>

Shawn D. Weimer (B.S. '00) is currently employed as a Staff Geologist for LAW Engineering and Environmental Services in Richmond, Virginia. <sweimer@lawco.com>

'01

Steven Lower (Ph.D. '01) is now an Assistant Professor in the Geology Department at the University of Maryland. <lower@geology.umd.edu>

James Roberts (B.S. '01) is currently a graduate student at the University of Colorado pursuing a Ph.D. in Astrophysical and Planetary Sciences. <robertjh@colorado.edu>

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ALUMNI UPDATE

Please let us know where you are and what you are doing. Return this update form about yourself. If you move, remember to include us on your change of address list.

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