A History of the University of Georgia Department of Geology

PREFACE

The University of Georgia was founded in 1785 and thus was the first state-supported institution of higher education in the United States. However, it did not offer classes until 1801 and thus only graduated its first class in 1804. Its function thereafter was disrupted by war, most notably the U.S. Civil War and World War II, and occasionally impeded by its own administration. Nonetheless, today it is the flagship institution of the University System of Georgia and an R1 research university (one of the "Doctoral Universities – Very High Research Activity" in the Carnegie Classification of Institutions of Higher Education).

Geology has been taught at the University of Georgia since 1823, and the modern Department of Geology was founded in 1961. This document provides a history of the teaching of geology at the University. It consists of six parts, of which Part I is a lengthy narrative history. Part II is a list of faculty members who have taught geology at the University of Georgia from 1823 to the present, and Part III consists of lists of heads, associate heads, and staff members. Part IV provides information about course offerings through time. Part V presents biographies of some of the earlier professors, and Part VI presents auto-biographies of some of the later professors.

This document's account of events before 1961 has little practical significance. Its account of more recent actions may help future faculty members see why some decisions were enacted to generate positive results and/or what mistakes were made in the past. Its biographies and autobiographies of faculty members after 1961 may help students and young faculty members to see the expectations and possibilities of a professorial career more broadly than otherwise imagined. The biographies and autobiographies may also let young faculty members learn from the strengths and achievements (and weaknesses and failures) of their predecessors. Perhaps the document will also entertain alumni, students, and even others unaffiliated with the University, and it may remind them that the teaching of geology at the University of Georgia – from the 1820s to the present – been enhanced by various forms of generosity and support from people like them.

This document has the filename "UGA GeologyHistory202102.pdf" to correspond to a link in the UGA website that is challenging to modify; the document was in fact last updated in October 2023.

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PART I. THE TEACHING OF GEOLOGY AT THE UNIVERSITY

EARLY HISTORY (1823-1946)

(in part from the research of Dr. Vernon J. Hurst)

The University of Georgia was chartered in 1785 and thus was the first state-supported university in the United States. However, the University really only began in 1801, when its location was chosen and the first classes were held. The first class did not graduate until 1804. In these early years, the University was known as, and consisted only of, the Franklin College. It had so few professors (for example, six in 1840) that one spoke not of "departments" but instead of "professorships" of given disciplines, or more commonly professorships of combinations of disciplines.

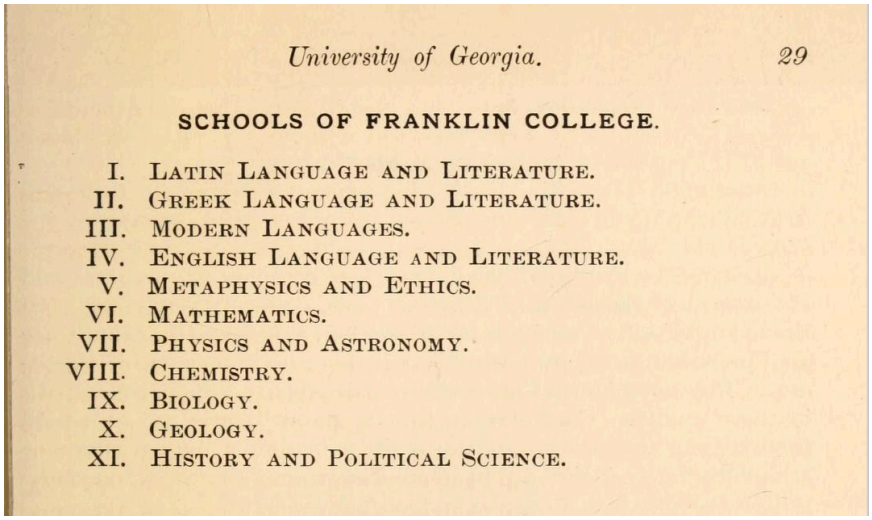
In 1823, seven years before the publication of the first edition of Charles Lyell's *Principles of Geology*, the University appointed its first Professor of Chemistry and Geology, James Wayne Delton Jackson, who had been a member of UGA's first graduating class in 1804. In 1824 the mayor of Savannah donated a collection of mineral specimens, and the Trustees authorized purchase of a “mineralogical cabinet” for storage of the collection. In 1829 the Trustees allocated $2000 for purchase of “a cabinet of minerals”. All of that was probably lost in a fire in 1830 that destroyed New College, but allocations and donations in the 1830s to 1850s rebuilt the collections. Those collections were housed in the Ivy Building, which was constructed in 1832 to replace the burned New College and still exists as the southern half of the Hunter-Holmes Academic Building (McPherson et al., 2020).

In 1862 the collections were moved into the newly-built Library Building, which today is the northern half of the Hunter-Holmes Academic Building. The third floor of the new building featured murals perhaps painted by Mary Jett Franklin, an Athens native who had been trained in Philadelphia and Paris (McPherson et al., 2020). The ceiling of the third-floor classroom in which Geology was taught was painted with images of a variety of fossil organisms, including ichthyosaurs. The University's Bulletin for 1869-1870 reports that "an elegant hall with enlarged pantings on the walls of representative fossils of all the geologic periods, enabling the student to take in at a glance the successive unfoldings of the life of the globe, has been especially fitted for this department. Besides, maps, sections, and collections of fossils are constantly employed in illustrating the lectures." The Bulletin also reports on the "excellent collection of minerals in the museum of the University" which "enables the student to acquire practical familiarity" with mineralogy. By the early 1880s the mineralogical collections had accumulated roughly 6,000 specimens (McPherson et al., 2020).

In the 1850s to 1870s, Geology was taught by a number of faculty members who most noticeably included Joseph Le Conte and William Louis Jones, otherwise known as "Old Ichthy" to his students. The early professors were not a diverse group: Three of five (Le Conte and the two Joneses) came from one county in Georgia, and two of those (Le Conte and William Louis Jones) were cousins who had studied at the same institutions; two others (Harry Hammond and Joseph Jones) went to the same medical school. All came from wealthy and/or powerful families, most or all of whom were advantaged by the labor of enslaved persons.

Geological collections seen in a photograph believed to date from about 1897. These collections were probably housed in the present Hunter-Holmes Academic Building. Note that the right margin of the image suggests at least one more cabinet analogous to the one filling much of the image above. McPherson et al. (2020, Journal of the History of Collections) reported that "By the early 1880s the mineralogical collection totalled nearly 6,000 specimens and was increasing, and in 1880 the museum was valued at $5,000 (the equivalent of $125,000 today). A large collection of minerals from Georgia had been obtained during a geological survey, which represented all the mineralogical formations in the state."

James Wayne Delton Jackson's appointment as Professor of Chemistry and Geology began an affiliation of Geology with Chemistry at UGA continued until about 1872. In 1888 Geology was affiliated with Biology, and then it returned to its affiliation with Chemistry. Among persons teaching in this era were George Little and J.W. Spencer. These professors represented a transition toward faculty members who were truly geologists rather than chemists or general natural scientists, who had Ph.D. degrees, and who taught only geology. Sadly, this was also a trend, at least for the next few decades, toward faculty members who only stayed at the University a year or two.



University of Georgia. 29

SCHOOLS OF FRANKLIN COLLEGE.

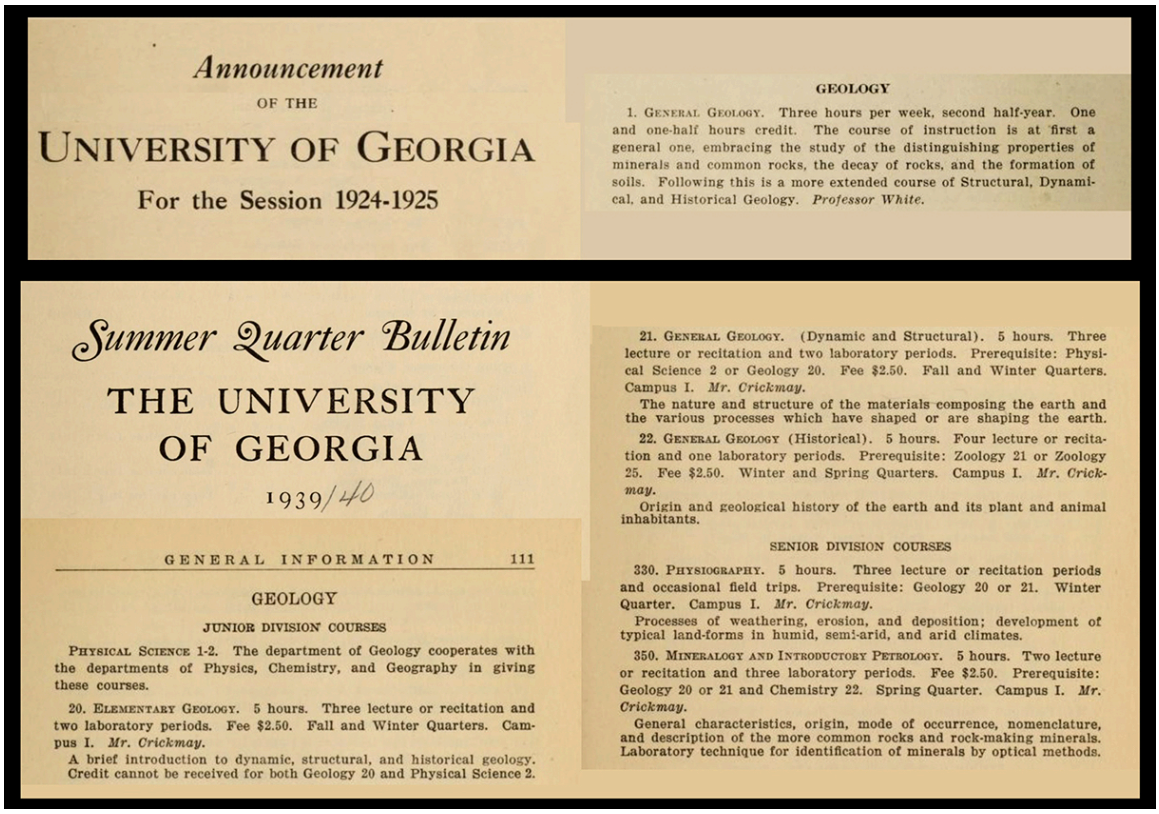
I. LATIN LANGUAGE AND LITERATURE.
II. GREEK LANGUAGE AND LITERATURE.
III. MODERN LANGUAGES.
IV. ENGLISH LANGUAGE AND LITERATURE.
V. METAPHYSICS AND ETHICS.
VI. MATHEMATICS.
VII. PHYSICS AND ASTRONOMY.
VIII. CHEMISTRY.
IX. BIOLOGY.
X. GEOLOGY.
XI. HISTORY AND POLITICAL SCIENCE.

Geology among the Franklin College "Schools" in the 1896 University of Georgia catalog. In 1896, geology was in fact taught by the Professor of Chemistry.

In 1900, the University had a School of Mining and Metallurgy, but Bulletins from the late 1800s to at least 1918-1919 report that the Geology Department was "temporarily" vacant, and the geology course was taught by Henry Clay White, the Professor of Chemistry. White was, with W.G. McAdoo, co-author of the 1881 book *Elementary Geology of Tennessee*, and he was an early supporter of Charles Darwin's theory of evolution.

In the 1920's, an attempt was made to revive Geology at UGA, and Dr. Eyolf Cullin generated a curriculum of eleven courses, each with an exceptionally lengthy course description (see Part IV). His curriculum began not with Physical Geology but with Mineralogy and Petrology (which had a prerequisite of a year of chemistry). Cullin's logic was seemingly that there was no reason to teach about broader-scale topics until students knew about the fundamental materials involved. That approach, which delayed contact with interesting topics and processes in geology until a student's fourth class, may explain why Cullin's relationship with the University of Georgia lasted for only one year.

In 1932, a single course in geology reappeared in the College of Education and in the Department of Civil Engineering, where it was taught by Charles Morton Strahan, who also taught courses on "Reinforced Concrete" and "Strength of Materials, Framed Structures, Arches". Somewhere between 1890 and 1960 the mineralogical collection accumulated in the mid-1800s was lost.



Announcement
OF THE
UNIVERSITY OF GEORGIA
For the Session 1924-1925

GEOLOGY

1. General Geology. Three hours per week, second half-year. One and one-half hours credit. The course of instruction is at first a general one, embracing the study of the distinguishing properties of minerals and common rocks, the decay of rocks, and the formation of soils. Following this is a more extended course of Structural, Dynamical, and Historical Geology. *Professor White.*

Summer Quarter Bulletin
THE UNIVERSITY OF GEORGIA
1939/40

GENERAL INFORMATION 111

GEOLOGY

JUNIOR DIVISION COURSES

Physical Science 1-2. The department of Geology cooperates with the departments of Physics, Chemistry, and Geography in giving these courses.

20. Elementary Geology. 5 hours. Three lecture or recitation and two laboratory periods. Fee $2.50. Fall and Winter Quarters. Campus I. *Mr. Crickmay.*

A brief introduction to dynamic, structural, and historical geology. Credit cannot be received for both Geology 20 and Physical Science 2.

21. General Geology. (Dynamic and Structural). 5 hours. Three lecture or recitation and two laboratory periods. Prerequisite: Physical Science 2 or Geology 20. Fee $2.50. Fall and Winter Quarters. Campus I. *Mr. Crickmay.*

The nature and structure of the materials composing the earth and the various processes which have shaped or are shaping the earth.

22. General Geology (Historical). 5 hours. Four lecture or recitation and one laboratory periods. Prerequisite: Zoology 21 or Zoology 25. Fee $2.50. Winter and Spring Quarters. Campus I. *Mr. Crickmay.*

Origin and geological history of the earth and its plant and animal inhabitants.

SENIOR DIVISION COURSES

330. Physiography. 5 hours. Three lecture or recitation periods and occasional field trips. Prerequisite: Geology 20 or 21. Winter Quarter. Campus I. *Mr. Crickmay.*

Processes of weathering, erosion, and deposition; development of typical land-forms in humid, semi-arid, and arid climates.

350. Mineralogy and Introductory Petrology. 5 hours. Two lecture or recitation and three laboratory periods. Fee $2.50. Prerequisite: Geology 20 or 21 and Chemistry 22. Spring Quarter. Campus I. *Mr. Crickmay.*

General characteristics, origin, mode of occurrence, nomenclature, and description of the more common rocks and rock-making minerals. Laboratory technique for identification of minerals by optical methods.

Geology reappeared as a department later in the 1930s in the Franklin College of Arts and Sciences, and it was housed in Meigs Hall. Its multiple courses (no longer just one course in geology) were taught by Dr. Geoffrey W. Crickmay, a Yale Geology Ph.D.. Crickmay, whom the university bulletins suggest was the entire Department, left the University of Georgia to serve in the armed forces during World War II. When he returned, he found that the geological collections had largely disappeared, and he left the University. Among the students present during Dr. Crickmay's last years at UGA was the young Vernon J. Hurst, of whom more will be told below.

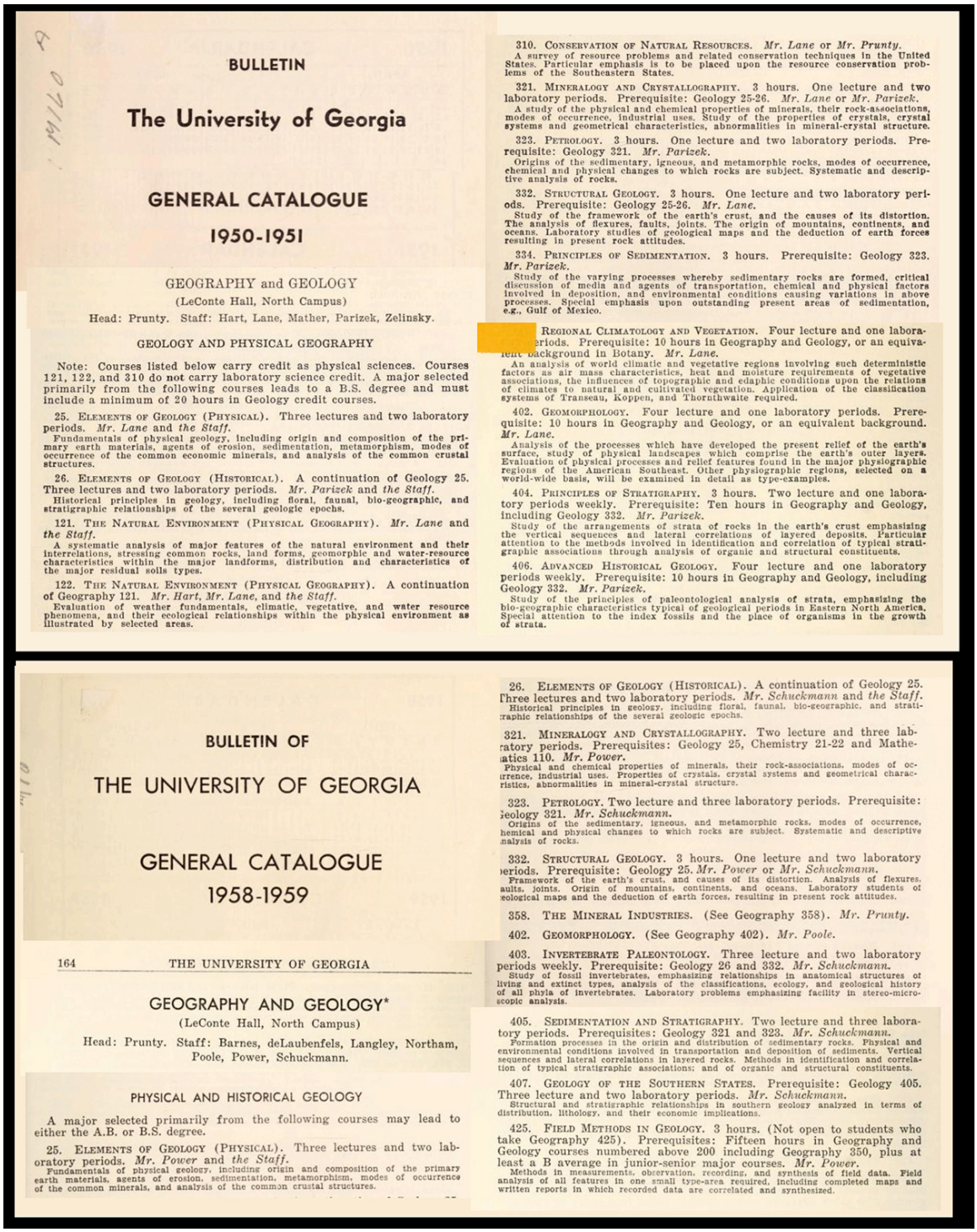
THE DEPARTMENT OF GEOGRAPHY AND GEOLOGY (1946 to 1961)

A Department of Geography and Geology was begun in 1946 under the headship of the newly hired Dr. Merle C. Prunty, Jr. Prunty was a geographer, but he remembered geology enough to claim much later that he had, through a quirk of administration, "initiated both geography and geology departments at both the University [of Georgia] and at Georgia State" (Prunty, 1979, AAAG 69, 53-58). The Department of the late 1940s nonetheless consisted of five geographers and just one or two geologists. The principal geologist was Eldon Parizek, whose Ph.D. was in petroleum geology and thus who had to retrain himself for the geology of the Piedmont and Blue Ridge during his seven years on the faculty (~1949-1956). During these years, the Department was housed in Le Conte Hall, an appropriate place in light of Joseph Le Conte's role in teaching geology in the Franklin College in the 1850s.

By the 1950s, the faculty of the Department of Geography and Geology included a few more geologists, some of whom would be part of the Department of Geology in 1961. The curriculum in the 1950s looked like that of the late 1900s and 2000s, but without a hint of water underground or in the oceans. In 1958 or 1959 the Department moved south from Le Conte Hall to the new Math-Geography-Geology Building in the "Science Loop" that consisted of Physics, M-G-G, Chemistry, Biosciences, Poultry Science, and Food Science. Later the Math-Geography-Geology Building would be Geology-Geography-Math (as in the 1966-1967 Bulletin) and Geography-Geology-Speech (in the 1970s, 1980s, and early 1990s) before becoming the Geography-Geology building.

Vince Matthews recalls being an undergraduate as the Department(s) of Geography and Geology began to divide. He began as a student at the University in the fall of 1960, taking engineering courses but deciding that he wanted to major in Geology. He went to the G&G department office in the fall of 1960 to register as a major, but the staff seemed nonplussed by someone wanting to major in geology and essentially said, "There's a guy up on the third floor who can probably help you, Dr. Power." Thus Bob Power was Vince's advisor for his first year, before Power left to become Chief Geologist for Georgia Marble in Tate. After spending the fall of 1961 working in New Mexico, Vince began taking Geology courses in the new Geology Department in the fall of 1962 with Larry Ramspott's Physical Geology class and then Ken Hamblin's Historical Geology class. Vince went on to take a long series of courses from Ramspott: Physical Geology, Mineralogy, Petrology, Structure, Optical Mineralogy, Igneous and Metamorphic Petrography, and Geotectonics. After finishing his BS in 1965, Vince went on to earn his M.S. at UGA and Ph.D. at UC-Santa Cruz, and ultimately to be State Geologist of Colorado.

The south plaza and north entrance of the Geography-Geology Building.



BULLETIN

The University of Georgia

GENERAL CATALOGUE

1950-1951

GEOGRAPHY and GEOLOGY

(LeConte Hall, North Campus)

Head: Prunty. Staff: Hart, Lane, Mather, Parizek, Zelinsky.

GEOLOGY AND PHYSICAL GEOGRAPHY

Note: Courses listed below carry credit as physical sciences. Courses 121, 122, and 310 do **not** carry laboratory science credit. A major selected primarily from the following courses leads to a B.S. degree and must include a minimum of 20 hours in Geology credit courses.

25. Elements of Geology (Physical). Three lectures and two laboratory periods. *Mr. Lane* and *the Staff.*
Fundamentals of physical geology, including origin and composition of the primary earth materials, agents of erosion, sedimentation, metamorphism, modes of occurrence of the common economic minerals, and analysis of the common crustal structures.

26. Elements of Geology (Historical). A continuation of Geology 25. Three lectures and two laboratory periods. *Mr. Parizek* and *the Staff.*
Historical principles in geology, including floral, faunal, bio-geographic, and stratigraphic relationships of the several geologic epochs.

121. The Natural Environment (Physical Geography). *Mr. Lane* and *the Staff.*
A systematic analysis of major features of the natural environment and their interrelations, stressing common rocks, land forms, geomorphic and water-resource characteristics within the major landforms, distribution and characteristics of the major residual soils types.

122. The Natural Environment (Physical Geography). A continuation of Geography 121. *Mr. Hart, Mr. Lane,* and *the Staff.*
Evaluation of weather fundamentals, climatic, vegetative, and water resource phenomena, and their ecological relationships within the physical environment as illustrated by selected areas.

310. Conservation of Natural Resources. *Mr. Lane* or *Mr. Prunty.*
A survey of resource problems and related conservation techniques in the United States. Particular emphasis is to be placed upon the resource conservation problems of the Southeastern States.

321. Mineralogy and Crystallography. 3 hours. One lecture and two laboratory periods. Prerequisite: Geology 25-26. *Mr. Lane* or *Mr. Parizek.*
A study of the physical and chemical properties of minerals, their rock-associations, modes of occurrence, industrial uses. Study of the properties of crystals, crystal systems and geometrical characteristics, abnormalities in mineral-crystal structure.

323. Petrology. 3 hours. One lecture and two laboratory periods. Prerequisite: Geology 321. *Mr. Parizek.*
Origins of the sedimentary, igneous, and metamorphic rocks, modes of occurrence, chemical and physical changes to which rocks are subject. Systematic and descriptive analysis of rocks.

332. Structural Geology. 3 hours. One lecture and two laboratory periods. Prerequisite: Geology 25-26. *Mr. Lane.*
Study of the framework of the earth's crust, and the causes of its distortion. The analysis of flexures, faults, joints. The origin of mountains, continents, and oceans. Laboratory studies of geological maps and the deduction of earth forces resulting in present rock attitudes.

334. Principles of Sedimentation. 3 hours. Prerequisite: Geology 323. *Mr. Parizek.*
Study of the varying processes whereby sedimentary rocks are formed, critical discussion of media and agents of transportation, chemical and physical factors involved in deposition, and environmental conditions causing variations in above processes. Special emphasis upon outstanding present areas of sedimentation, e.g., Gulf of Mexico.

Regional Climatology and Vegetation. Four lecture and one laboratory periods. Prerequisite: 10 hours in Geography and Geology, or an equivalent background in Botany. *Mr. Lane.*
An analysis of world climatic and vegetative regions involving such deterministic factors as air mass characteristics, heat and moisture requirements of vegetative associations, the influences of topographic and edaphic conditions upon the relations of climates to natural and cultivated vegetation. Application of the classification systems of Transeau, Koppen, and Thornthwaite required.

402. Geomorphology. Four lecture and one laboratory periods. Prerequisite: 10 hours in Geography and Geology, or an equivalent background. *Mr. Lane.*
Analysis of the processes which have developed the present relief of the earth's surface, study of physical landscapes which comprise the earth's outer layers. Evaluation of physical processes and relief features found in the major physiographic regions of the American Southeast. Other physiographic regions, selected on a world-wide basis, will be examined in detail as type-examples.

404. Principles of Stratigraphy. 3 hours. Two lecture and one laboratory periods weekly. Prerequisite: Ten hours in Geography and Geology, including Geology 332. *Mr. Parizek.*
Study of the arrangements of strata of rocks in the earth's crust emphasizing the vertical sequences and lateral correlations of layered deposits. Particular attention to the methods involved in identification and correlation of typical stratigraphic associations through analysis of organic and structural constituents.

406. Advanced Historical Geology. Four lecture and one laboratory periods weekly. Prerequisite: 10 hours in Geography and Geology, including Geology 332. *Mr. Parizek.*
Study of the principles of paleontological analysis of strata, emphasizing the bio-geographic characteristics typical of geological periods in Eastern North America. Special attention to the index fossils and the place of organisms in the growth of strata.

BULLETIN OF

THE UNIVERSITY OF GEORGIA

GENERAL CATALOGUE

1958-1959

164 THE UNIVERSITY OF GEORGIA

GEOGRAPHY AND GEOLOGY*

(LeConte Hall, North Campus)

Head: Prunty. Staff: Barnes, deLaubenfels, Langley, Northam, Poole, Power, Schuckmann.

PHYSICAL AND HISTORICAL GEOLOGY

A major selected primarily from the following courses may lead to either the A.B. or B.S. degree.

25. Elements of Geology (Physical). Three lectures and two laboratory periods. *Mr. Power* and *the Staff.*
Fundamentals of physical geology, including origin and composition of the primary earth materials, agents of erosion, sedimentation, metamorphism, modes of occurrence of the common minerals, and analysis of the common crustal structures.

26. Elements of Geology (Historical). A continuation of Geology 25. Three lectures and two laboratory periods. *Mr. Schuckmann* and *the Staff.*
Historical principles in geology, including floral, faunal, bio-geographic, and stratigraphic relationships of the several geologic epochs.

321. Mineralogy and Crystallography. Two lecture and three laboratory periods. Prerequisites: Geology 25, Chemistry 21-22 and Mathematics 110. *Mr. Power.*
Physical and chemical properties of minerals, their rock-associations, modes of occurrence, industrial uses. Properties of crystals, crystal systems and geometrical characteristics, abnormalities in mineral-crystal structure.

323. Petrology. Two lecture and three laboratory periods. Prerequisite: Geology 321. *Mr. Schuckmann.*
Origins of the sedimentary, igneous, and metamorphic rocks, modes of occurrence, chemical and physical changes to which rocks are subject. Systematic and descriptive analysis of rocks.

332. Structural Geology. 3 hours. One lecture and two laboratory periods. Prerequisite: Geology 25. *Mr. Power* or *Mr. Schuckmann.*
Framework of the earth's crust, and causes of its distortion. Analysis of flexures, faults, joints. Origin of mountains, continents, and oceans. Laboratory students of geological maps and the deduction of earth forces, resulting in present rock attitudes.

358. The Mineral Industries. (See Geography 358). *Mr. Prunty.*

402. Geomorphology. (See Geography 402). *Mr. Poole.*

403. Invertebrate Paleontology. Three lecture and two laboratory periods weekly. Prerequisite: Geology 26 and 332. *Mr. Schuckmann.*
Study of fossil invertebrates, emphasizing relationships in anatomical structures of living and extinct types, analysis of the classifications, ecology, and geological history of all phyla of invertebrates. Laboratory problems emphasizing facility in stereo-microscopic analysis.

405. Sedimentation and Stratigraphy. Two lecture and three laboratory periods. Prerequisites: Geology 321 and 323. *Mr. Schuckmann.*
Formation processes in the origin and distribution of sedimentary rocks. Physical and environmental conditions involved in transportation and deposition of sediments. Vertical sequences and lateral correlations in layered rocks. Methods in identification and correlation of typical stratigraphic associations; and of organic and structural constituents.

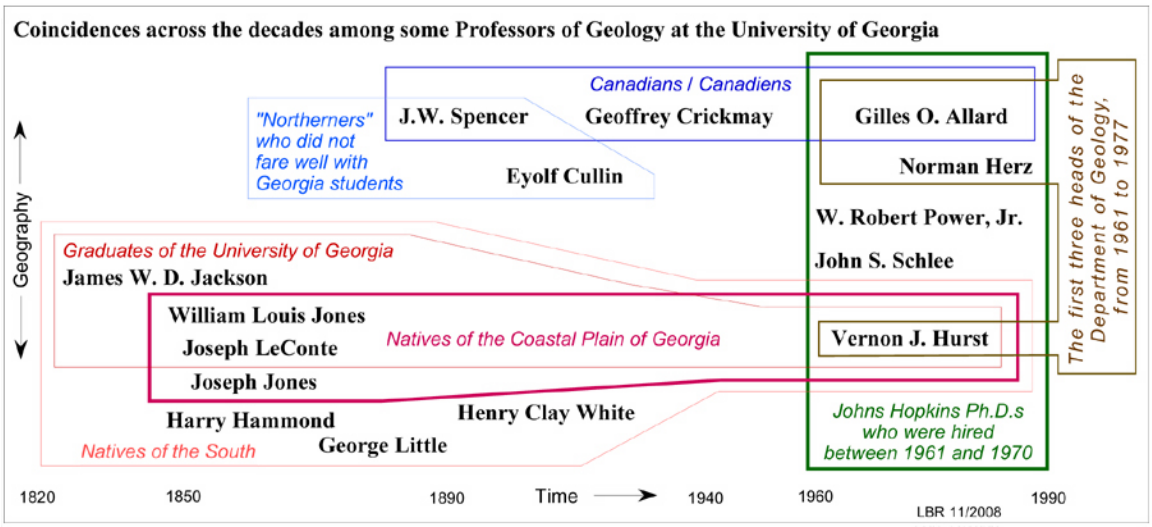
407. Geology of the Southern States. Prerequisite: Geology 405. Three lecture and two laboratory periods. *Mr. Schuckmann.*
Structural and stratigraphic relationships in southern geology analyzed in terms of distribution, lithology, and their economic implications.

425. Field Methods in Geology. 3 hours. (Not open to students who take Geography 425). Prerequisites: Fifteen hours in Geography and Geology courses numbered above 200 including Geography 350, plus at least a B average in junior-senior major courses. *Mr. Power.*
Methods in measurements, observation, recording, and synthesis of field data. Field analysis of all features in one small type-area required, including completed maps and written reports in which recorded data are correlated and synthesized.

Pages of UGA Bulletins showing the courses of the Department of Geography and Geology

The Department of Geography and Geology was divided into a Department of Geology and a Department of Geography on July 1, 1961. Merle Prunty, who had been head of the Department of Geography and Geology for fifteen years, became head of the new Department of Geography and held that position until 1970. It is perhaps because of Prunty's continuity as head from Geography and Geology to Geography that the myth emerged that Geography was the

department of longer standing and that "Geology was split off from Geography", rather than the other way around. In fact, in reading Prunty's later accounts, one might infer that the Department of Geography (and only of Geography) was founded in 1946. However, so far as the University of Georgia and the rest of the world were concerned (and as is evident from the University's Bulletins), the Department of Geography and Geology was founded in 1946 and divided into two departments of equal standing, a Department of Geology and a Department of Geography, in 1961. However, the geographers' myth allowed the Department of Geography to claim more than half of the space in the building, and well into the 21st Century the Department of Geography willfully called the Geography-Geology Building "the Geography Building". The myth may have survived because Prunty, as Geography's head from 1961 to 1970, was "a person of strong will and firm decision . . .[who] could be formidable" (Aiken, 1983, Southeastern Geographer 23, 1-9). However, Prunty was soon faced with a head of the Geology Department who was also "a person of strong will and firm decision".



THE MODERN DEPARTMENT (1961 to present)

The Department's early years

The modern Department of Geology of the University of Georgia began in July, 1961, with the division of the previous Department of Geography and Geology. Dr. Vernon J. Hurst was recruited from the Georgia Geological Survey to be Head of the new Department of Geology. Dr. Hurst brought to the department not only his academic credentials but also his credentials as a native of Georgia, a graduate of the University of Georgia, and an expert on the geology of Georgia. The new Department of Geology began the fall quarter of 1961 with three or four professors (Hurst, Charles Salotti, John Schlee, and perhaps Vernon James Henry, although he may have arrived a year later) and one secretary. Its resources were few but included the X-ray diffractometer that Dr. Hurst somewhat controversially brought with him from the Georgia Geological Survey. It was the first step in moving from an essentially technology-free

Department of Geography and Geology to a Department of Geology capable of mineralogical and geochemical analysis.

The new Department of Geology was housed with the new Department of Geography in the recently-constructed building on Field Street then called the "Geography, Geology, and Mathematics Building" for the three departments that it housed. The building had been planned with one large office complex for the Department of Geography and Geology, a suite on the second floor complete with a balcony looking toward (and, in those days, perhaps into) Sanford Stadium. The new Department of Geography took that space, forcing the new Department of Geology to carve an office complex from a jumble of rooms on the third floor. Elsewhere in the building, competition for space was the norm, and legend tells of locks on doors changed by one department and then by the other. Dr. Hurst sketched plans in the 1960s for a large multi-story Geology Building to be located west of Sanford Stadium, but it was never built. In the split between Geology and Geography, the new Geography Department claimed more than half of the space in GGS (or GG). That division of space remains, despite the subsequent growth of the Geology Department.

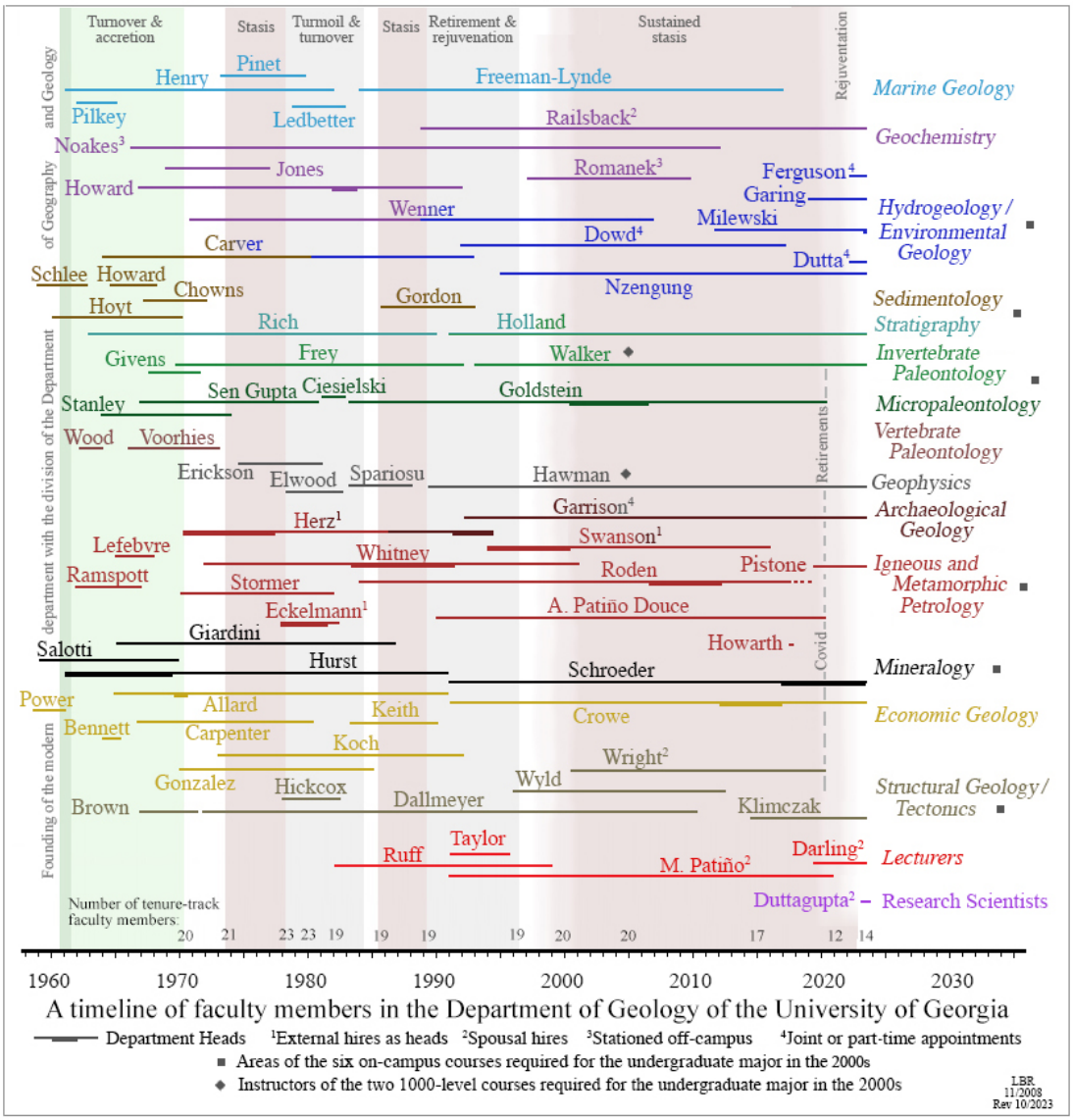
Another long-term result of the division of one department into two arose when geomorphologist James Woodruff decided to be in Geography rather than Geology. The result was that geomorphology as a discipline has stayed in the Geography Department, rather than in Geology, to this day. Much later, a sort of rapprochement began in the 1990s when Geography's George Brook, who was trained in karst geomorphology, and Geology's Bruce Railsback, who was trained in carbonate petrology, began thirty years of collaboration to understand stalagmites as records of past climate. A similar but not geomorphological collaboration began in 2009 between Geography's Andy Grundstein, a climatologist, and Geology's John Dowd, a hydrologist.

Faculty members in the new Department of Geology were not a randomly selected group with regard to their graduate education, a trend that can be traced back into the previous Department of Geography and Geology. Charlie Salotti, Ken Hamblin, and Armando Giardini all received their Ph.D.s from University of Michigan between 1955 and 1960, and John Hoyt had a 1952 M.S. from Michigan, the institution from which Jim Woodruff (who chose to be in Geography) had earned his Ph.D. in 1952. In a similar vein, Norm Herz, Vernon Hurst, Gilles Allard, John Schlee, and Bob Power all earned their Ph.D.s from John Hopkins between 1950 and 1960.

This non-random pattern was also true with regard to the headship of the Department. For the Department's first seventeen years, from 1961 to 1977, the heads were all Johns Hopkins Ph.D.s. (Hurst, Allard, and Herz). Over the twenty years from 1981 to 2000, three of the four heads were Stanford Ph.D.s (Howard, Whitney, and Swanson) interrupted only by the three years in which Herz (again a Johns Hopkins Ph.D.) was head for his second time.

Department heads in the 1960s could hire and fire at will, and the Geology Department went through stormy years in the middle to late 1960s. However, in the late 1970s and early 1980s, storms hit hurricane level, and disputes within the Department reached the point that many younger faculty members left permanently (e.g., Elwood, Ciesielski, Ledbetter, Stormer and Pemberton), took leave to work elsewhere temporarily (e.g., Whitney and Wenner), or in one case maintained a tenure line in Geology but otherwise migrated to a center outside the Department's reach (Noakes). By the 1970s, the Department was housed in parts of four buildings (Geography-

Geology-Speech, Riverbend Research Labs, Barrow Hall, and the Hydrothermal Lab), a fact that probably did not favor departmental cohesion. One remarkable indicator of the turnover is that Bob Frey's vita indicates that in 1982-1983, in a department of at most about twenty faculty members, he chaired a search committee for *five* positions (marine geologist, micropaleontologist, geophysicist, economic geologist, and mineralogist, which presumably led to the hiring of Freeman-Lynde, Spariosu, Goldstein, Keith, and Roden). As the storm settled, Jim Whitney became head and, as his first act, removed a barrier at the door to the departmental office that had served as a physical and symbolic barrier between the department's administration and its faculty. The storm subsided, but throughout the field of Geology the Department had a reputation for infighting that persisted for years thereafter.



Graduate Degrees

The Department's first M.S. thesis was defended in June 1964 by Jack Harold Medlin, who went on to earn a Ph.D. from Penn State and to teach at West Georgia College before a long career with the U.S. Geological Survey. The Department's first Ph.D. dissertation was defended

in October 1970 by Robert B. Cook, Jr., who went on to a professorship and headship at Auburn University. The Department's third M.S. thesis and second Ph.D. dissertation were defended by William H. McLemore, who went on to be State Geologist of Georgia. The Department's sixth M.S. thesis was defended by Vincent Matthews (who was the first graduate student not to have Vernon Hurst on his MS committee or as his advisor); Vince went on to be State Geologist of Colorado.

The first three, and five of the first eight, M.S. theses that were defended were supervised by Dr. Vernon J. Hurst, as was the first dissertation to be defended. Most early theses dealt with geologic areas or problems in Georgia, but by the 1970s and 1980s thesis topics included geologic work around the world as well as in Georgia. Theses and dissertations in the Department have dealt with geologic problems in or on Bermuda, the Bahamas, the Cayman Trough, the Caribbean, the Gulf of Mexico, Mexico, Costa Rica, Venezuela and the Venezuelan Basin, Brazil, Argentina, the South Atlantic, Morocco, Ethiopia, Namibia, South Africa, Madagascar, the Indian Ocean, Australia and the Australian Basin, the East Pacific Rise, the Eastern Equatorial Pacific, Thailand, Russia, Greece, Italy, England, Norway, Iceland, Quebec, the United States, and Mars and Mercury.

The number of M.S. theses defended peaked in the early 1980s, with a high of twenty-three in 1982 (just after the price of crude oil reached its pre-1990 high). Defenses of M.S. theses declined in the early 1990s and reached a 1900s low in 1993, when only five were defended. However, by 1996 that number had rebounded to fifteen, well over the average for years since 1974. By May 2019, at least 518 M.S. theses and doctoral dissertations had been successfully defended in the Department.

The Department's graduate program changed in the 1990s and 2000s as University funding for graduate student assistantships diminished in response to budget cuts. In the late 1980s and early 1990s, if not before, University-funded graduate assistantships were supported to the extent that some could be used for research assistants and to the extent that the occasional student who was found to have a limited command of the English language could be excused from teaching. One result was the master's students who were nominally expected to complete their degrees in two years were commonly given three or four years of aid, and doctoral students were likewise given extended aid. Another result was that students were commonly admitted with no linkage to prospective advisors, and instead it was assumed that they would find their way to advisors whose interests matched their own. This changed in the later 1990s and 2000s to a system in which no University-funded graduate assistantships could be used for research assistantships (except those allocated by the Dean to induce specific professors to serve as heads), in which aid for M.S. students was strictly limited to two years and that for Ph.D. students to four, in which a student's admission depended on a faculty member's specific commitment to serve as that student's advisor, and in which advisors were strongly encouraged to find grant support for their advisees (and in which pressure on members of the Admissions Committee increased). The result was a more efficient program in term of years to completion of degrees, but one in which the average number of M.S. defenses per year from 2011 to 2020 was 7.3 (from 1981 to 1990 it had been 15.0), and in 2018 there were only two M.S. defenses (and no doctoral defenses at all).

Research

The history of early research published by faculty members in the Department of Geology is difficult to trace because Web of Science does not list addresses of authors for papers before 1973. One well-known early paper was Allard and Hurst (1969) "Brazil-Gabon Geologic Link Supports Continental Drift", published in *Science* v. 163, pp. 528-532, which grew out of Gilles's work in Brazil before coming to UGA but was still cited in 2018. Web of Science reveals that, beginning with papers published in 1973, the most prolific publisher on the faculty in the early-to-mid-1970s was geochemist Lois Jones. Among her first-authored publications were Jones, Hurst, & Walker 1973 Strontium Isotope Composition of Amphibolite of the Cartersville-Villa Rica District, Georgia published in Geological Society of American Bulletin v. 84, pp. 913-918, and Jones Walker & Allard 1974 Rubidium-Strontium Whole-rock Age of Major Units of Chibougamau Greenstone Belt, Quebec, published in Canadian Journal of Earth Sciences v. 11, pp. 1550-1561.

For the years after 1972, Web of Science provides data that include author addresses, but one must remember that Web of Science is incomplete, and any author or group of authors will report more publications than are listed in Web of Science. With that caveat, one finds that Web of Science report that, in the years from 1973 to 2018 inclusive, 840 papers were published for which the Department of Geology of the University of Georgia is listed as the address of at least one of the authors. The most prolific publisher on the faculty was Dave Dallmeyer, for whom Web of Science lists 159 article, reviews, and proceedings papers (by comparison, the second and third most prolific faculty members in that category over that time were Bruce Railsback and Steve Holland, each with about 57 such publications while at UGA). The most widely cited papers on which a UGA Geology faculty member was first author were published by Alberto Patino Douce, who published three papers that each had been cited more than 400 times by the end of 2018. Alberto produced eight papers cited more than 130 times by the end of 2018, Bob Frey and Dave Dallmeyer had five meeting that criterion, Steve Holland and Jay Stormer had three, Jim Whitney and George Pemberton had two, and Al Erickson, John Ertel, J. Howard, Bruce Railsback, Mike Roden, Paul Schroeder, and Dave Wenner each had one published during their residence at UGA.

A final caveat about the above is that Web of Science does not report books, like those by Vernon Hurst, Bob Carver, Steve Holland, Alberto Patino Douce, Sally Walker, Paul Schroeder, and Norm Herz and Erv Garrison. It also does not report published field guides and maps produced by many Geology faculty members, perhaps most notably Gilles Allard.

The 1990s and 2000s

The early 1990s saw the retirements of six faculty members (Drs. Mark Rich, Vernon J. Hurst, Gilles O. Allard, Robert E. Carver, George S. Koch, Jr., and Norman Herz) who had each served the Department for more than 20 years. In 1992, the Department also mourned the untimely passing of Drs. Robert W. Frey and J. Hatten Howard III, each of whom had also served the Department more than 20 years.

These departures led to the hiring of several new faculty members in the early and middle 1990s. If the Department's faculty members in the 1960s and 1970s were concentrated in economic geology, igneous petrology, marine geology, and paleontology, hiring in the 1990s made hydrogeology one of the Department's areas of focus, along with continuing concentrations of faculty in igneous petrology and paleontology. Almost all of the faculty members hired in the 1990s were recent Ph.D.s, leading to a relatively young and active faculty.

The 1990s also saw major changes in the curriculum. For graduate students, one milestone was the end of the GLY 800 requirement in the summer of 1992. GLY 800 was a one-quarter course on the intricacies of igneous, sedimentary, and metamorphic petrology, and it had been required of all M.S. students, regardless of their area of study.

A major change in the undergraduate curriculum in the 1990s was the elimination of the traditional sequence of courses required of Geology majors under the quarter system. That sequence had consisted of Mineralogy, Petrology, Structural Geology, Paleontology, and Sedimentation & Stratigraphy. Instead, beginning with the transition to the semester system in Fall 1998 under Head Samuel E. Swanson, who had come to the Department after a career elsewhere and thus was not tied to the existing curriculum. Under Sam's leadership, the Department instituted a more modern curriculum requiring four "core" courses for Geology majors. Those four courses were Earth Materials; Surficial and Near-Surficial Processes; Life, Environments, and Ecologies of the Past; and Internal Earth Processes. That curriculum of fewer courses, and courses in which prerequisites were less intricate, was intended to let undergraduate students (who often come to the Geology major late in their studies) move through the B.S. program more quickly. However, the rest of the faculty came to feel that too many gaps were left uncovered by the four-course core system, and in about 2003 two more courses, Sedimentary Geology and Structural Geology, entered (or more accurately re-entered) the core curriculum, giving it a content and structure nearer that of the old curriculum.

The six pre-1998 quarter-system courses required of geology majors	*The six post-2002 semester-system courses required of geology majors*
Mineralogy and Crystallography (GLY 321)	Earth Materials (GEOL 3010)
Optical Mineralogy and Petrology I (GLY 322)	Internal Earth Processes (GEOL 4020)[2]
Petrology II (GLY 323)[1]	Surficial and Near-Surficial Processes (GEOL 3020)
Structural Geology (GLY 332)	Structural Geology (GEOL 4060)[2]
Invertebrate Paleontology (GLY 403)	Life, Environments, and Ecologies of the Past (GEOL 4010)[3]
Sedimentation and Stratigraphy (GLY 405)	Sedimentary Geology (GEOL 4500)[3]

[1]GLY 323 included sedimentary petrology, which was not included in GEOL 4020.
[2]Structural geology and plate tectonics were were originally topics in GEOL 4020.
[3]GEOL 4010 originally included sedimentology and stratigraphy,which later became the topics of GEOL 4500.

The 1990s also saw a corresponding change toward an environmental focus in the Department's offerings for non-majors. At the beginning of 1994, GLY 115 changed from "Earth Processes and Resources" to "Earth Processes and Environments". In the change from the quarter

system to the semester system in 1998, GLY 116 or "The Earth Through Time" changed to "Earth's History of Global Change" (GEOL 1122). Other environmental courses, including "Introduction to Environmental Geology", "Geologic Hazards", and "Applied Environmental Geology", also joined the undergraduate curriculum at the 200, 300, and 400 levels, respectively. In the early 2000s, a new basic course titled "Environmental Geoscience" (GEOL 1120) was added to the curriculum.

Pre-1994 quarter-system courses largely for non-majors	*Post-2004 semester-system courses largely for non-majors*
	Environmental Geoscience (GEOL 1120)
Earth Processes and Resources (GLY 115) →	Earth Processes and Environments (GEOL 1121)
The Earth Through Time (GLY 116) →	Earth's History of Global Change (GEOL 1122)

The 1990s also saw a major change in the Department as hydrogeology became integral to the Department. Bob Carver, a sedimentologist, had taught a hydrogeology course, but the hiring of John Dowd and then Valentine Nzengung, along with Bruce Railsback's flirtations with groundwater geochemistry, led to a change in the balance of the Department. Previously, the Department's faculty had been divided into rigid hard-rock and soft-rock camps, but Sam Swanson subtly but meaningfully began to divide the Department into hard-rock, soft-rock, and "no-rock" wings that lessened the entrenched division of the previous forty years.

Departmental insignia, on the left as initiated by Jeff Clippard and Sam Swanson in the 1990s, and on the right as created by the Geology Club in about 2017.

In the early 2000s, the Department began a series of renovation projects to update classrooms that had undergone little change since the Geography-Geology building was built in the late 1950s. One milestone was the renovation of Room 200A, the Department's large lecture hall, and another was the renovation of Room 327, the room for classes needing microscopes.

Room 200A GG, the Department of Geology's principal lecture room, before and after renovation

Room 327 GG (now the Allard Petrology Laboratory) before and after renovation. Seating was rotated 90° counter-clockwise: the cabinet-shielded wall on the left in the top image is the wall with the blackboard and screen on the right in the lower image.

Those updates hinged on renovation proposals generated by Associate Head Mike Roden, demonstrating both Mike's contribution and more generally the potential significance of the new position of associate head.

The Department also made history in 2000 when it appointed Dr. Susan T. Goldstein as its Head and thus as the first woman to be head of a department in the Physical Sciences at the University of Georgia. Dr. Goldstein was also the first head who was not a member of the "hard-rock" faculty of the Department. She also introduced the innovation of an associate headship, a position to share the growing administrative burden in the era of constant accountability and assessment. The first associate head, Dr. Michael F. Roden, went on to be head from 2006 to 2012, when he handed over the reins to Dr. Douglas E. Crowe.

The 2010s

Amidst the ongoing publication of research results in journal articles by departmental faculty and students, the 2010s were also watershed years in terms of publication of books. These included Alberto Patiño-Douce's 722-page *Thermodynamics of the Earth and Planets* published by Cambridge University Press in 2011; Steve Holland's *Stratigraphic Paleobiology*, co-authored with Mark Patzkowsky, Steve's colleague at Penn State, and published by the University of Chicago Press in 2012; Paul Schroeder's *Clays in the Critical Zone* published by Cambridge University Press in 2018; and Erv Garrison's *New Directions in the Search for the First Floridians* published in 2019. At the same time, Sally Walker was finishing her book on paleocecology to be published by Cambridge University Press, and Bruce Railsback's Earth Scientist's Periodic Table of the Elements and Their Ions was translated into Portuguese, Catalan, and German, joining previous translations of the Table into Chinese and Spanish and following on the heels of the Table's second re-publication by the Geological Society of America in 2009.

The 2010s were also a watershed in terms of faculty recognition. In a striking recognition of scholarship, Sally Walker became a Fellow of the American Association for the Advancement of Science late in 2012. She joined Norman Herz (and perhaps others) among the Department's faculty members who had achieved that honor. Her honor followed on the earlier award of the Paleontological Society's Schuchert Medal to Steve Holland. In 2020, Valentine Nzengung was named a Fellow of the National Academy of Inventors, and Sally Walker became the Department's first Shellebarger Professor in Geology, thanks to the generosity of Jeff and Sydney Shellebarger.

Another departmental accomplishment in the same time period, but of a different sort, was a trifecta of presidencies of scholarly societies. In 2011, Paul Schroeder was president of the Clay Minerals Society, in 2013 Sue Goldstein re-assumed the presidency of the Cushman Foundation (the scholarly society of micropaleontology), and in 2014 Steve Holland became president of the Paleontological Society. During the same period, Sandra Wyld was editor of the Geological Society of America's journal Geology, a post she assumed not long after Sue Goldstein's editorship of the Journal of Foraminiferal Research.

In 2011, revitalization of the Department began when, after fifteen years without an outside search for a new faculty member, it hired Adam Milewski as an assistant (now full)

professor in groundwater resources. That hire was followed in 2014 by the recruitment of Christian Klimczak as an assistant (now associate) professor in structural geology, in 2017 with the recruitment of Geoff Howarth as an assistant professor in mineralogy, in 2018 of Charlotte Garing as an assistant professor of groundwater studies, and in 2019 with the hiring of Mattia Pistone as an assistant professor of igneous petrology. These hires were an encouraging sign of support from the University as the Department passed its fiftieth anniversary and as it approached the two-hundredth anniversary of the teaching of geology at the University of Georgia.

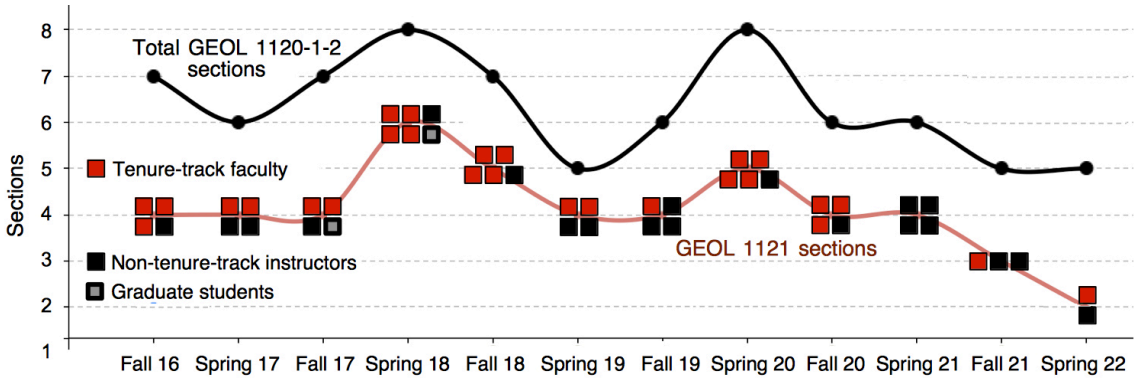
Another sign of departmental development was Doug Crowe's work as head, and after his headship, to encourage external financial support of the Department. The most visible example was the endowment of Shellebarger Professorship in Geology by Jeff and Sydney Shellebarger, but many less visible private and corporate contributions made the Department a better place, both supporting students and facilitating hiring of new faculty members. Hopefully that pattern will continue in the future.

The early 2020s: The Covid-19 pandemic and faculty shrinkage

March 2020 saw the beginning of a tumultuous period at UGA with the onset of the Covid-19 pandemic, which caused a complete transition to on-line courses to finish Spring Semester 2020 and much online or hybrid instruction during the 2020-2021 academic year. An offer of a generous retirement package combined with the pandemic to inspire many faculty retirements across the campus. In Geology, Susan Goldstein, Alberto Patiño Douce, and Jim Wright retired in December 2020 (simultaneously with the retirements of staff members Chris Fleischer and Michael Lewis), and Marta Patiño Douce retired in December 2021. None of the faculty positions were filled with new hires, although Marta's position had to an extent been pre-filled with the hiring of Andy Darling as an instructor in 2019. The number of tenure-track faculty members fully in the Department, roughly eighteen in previous decades, thus diminished in December 2020 from fourteen to eleven.

One result of this shrinkage of the faculty was a decrease in the number of sections of GEOL 1121 and GEOL 1122 taught. For the first time since perhaps 1961, a non-majors historical geology course (GLY 116 or GEOL 1122) was not taught in Spring Semester 2021 (and it was only taught in Spring 2022 as the result of a one-time course-banking arrangement). The number of sections of GEOL 1121, long viewed as the Department's most numerically significant seat-filler, decreased from a high of six in Spring of 2018 to a long-term (if not all-time) low of two in Spring 2022. Hiding behind these numbers were two thoughts relevant to future shrinkage: After May 2020, GEOL 1122 was taught only by the Department's professor of longest residence (Railsback), and of the two sections of GEOL 1121 taught in Spring 2022, one was taught by a professor of nearly as long residence (Crowe). Future retirements therefore threatened complete abandonment of GEOL 1122 and a major impact on GEOL 1121. (GEOL 1120 continued unaffected by retirements, but as of Spring 2022 it had never been offered in more than two sections per semester, one of them commonly small).

One potential solution to issues of this kind has been for doctoral students to serve as instructors (and thus instructors of record). This has been done many times during fall and spring semesters by students such as (but probably not limited to) Joe Elkins, Lisa Gardiner, Scott

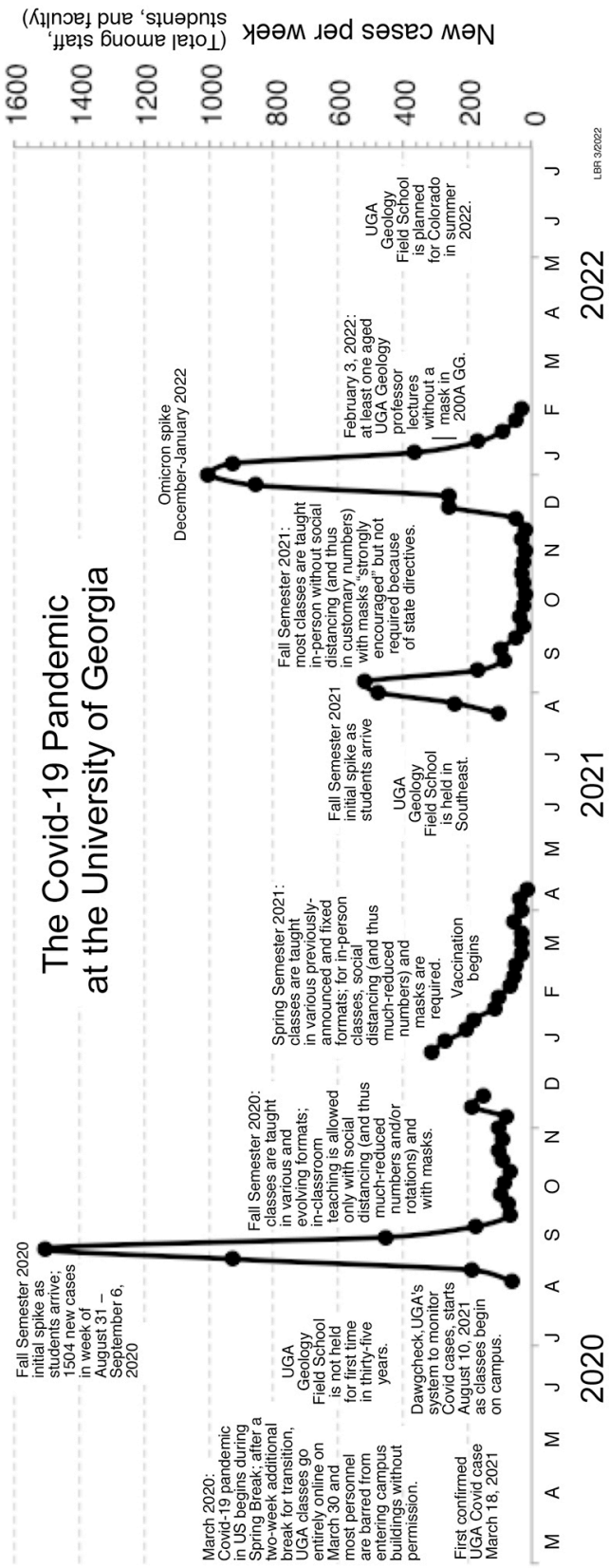


Trends in UGA Geology offerings of 1000-level non-majors courses from 2016 to 2022.

Harris, Chris Kelson, Nick Radko, Nina Sermon, Sheldon Skaggs, and most recently Michael Durham. This practice has long been viewed as a way for doctoral students to gain professorial-level experience before seeking academic positions, and it may also be a way to maintain the Department's enrollments at levels sufficient to satisfy UGA's higher administration.

Steve Holland teaching his GEOL 4500 (Sedimentary Geology) course in Room 200A GG in Spring 2021, during the Covid-19 pandemic. The cell phone on the tripod was one of various ad-hoc mechanisms that professors used to present information in the classroom while also providing access for students participating electronically, typically via Zoom connectivity. White signs on seats indicated seats that were not to be used, thereby enforcing a six-foot distance between each person. Masks were required, cleaning wipes were available outside the room, and dispensers of hand sanitizer were available at entryways to each floor.

Sources:
As noted above, recent research into the early history of Geology at UGA began with the efforts of Dr. Vernon J. Hurst. The great trove of early history is Thomas Walter Reed 's History of the University of Georgia, (~1949). Additional information about William Louis Jones is in part from Tracy Coley Ingram, "Academic Building is two-in-one": Athens Daily News and Banner-Herald June 28, 2000, Hometown page 1. In that article, Ingram cited an article by T.W. Reed in the 1937 Alumni Record and A Pictorial History of Athens by James Reap. Geology's history in Meigs Hall is from a UGA history of Meigs Hall . Some of the information about the Department of Geology and Geography in the 1940s is from articles by Fraser Hart and others in James O. Wheeler and Stanley D. Brunn (eds.) The Role of the South in the Making of American Geography: Centennial of the AAG, 2004. Information about early collections is from Uncovering the early history of the Georgia Museum of Natural History, 1785–1900 by Megan McPherson, Byron J. Freeman and Suzanne E. Pilaar Birch (Journal of the History of Collections, 2020, 14 pp.).



A timeline of Covid-19 cases at the University of Georgia, and the implications for teaching of geology.

PART II. A LIST OF FACULTY MEMBERS TEACHING GEOLOGY AT THE UNIVERSITY OF GEORGIA

Name	Area of Specialization	Terminal Degree, Institution, & Year	Years on Active Faculty	Faculty rank
James Wayne Delton Jackson		A.M., University of Georgia, 1804	1823-1850	Professor of Chemistry and Geology
William Louis Jones		A.B., University of Georgia, 1845 M.D., College of Physicians and Surgeons of New York, 1848 S.B., Harvard, 1851	1851-1892	Professor of Chemistry and Geology
Joseph LeConte		A.B., University of Georgia, 1841; M.D., College of Physicians and Surgeons of New York, 1845; S.B., Harvard, 1851	1852-1856	Professor of Chemistry and Geology
Joseph Jones		M.D., University of Pennsylvania - LL.D.	1857-1858	Professor of Chemistry and Geology
Harry Hammond		A.B., University of South Carolina M.D., University of Pennsylvania	1858-1860	Professor of Chemistry and Geology
James Woodrow		Ph.D., Heidelberg.	- - -	Professor of Chemistry and Geology
George Little		Ph.D., University of Göttingen	1876-1878	Professor of Geology
J.W. Spencer	Glacial geomorphology; sedimentary geology	Ph.D., University of Göttingen	1888-1890	Professor of Geology
Henry Clay White	Chemistry	University of Virginia	1872-1927	Professor of Chemistry and Geology
Sten Ragner Eyolf Cullin	Petroleum Geology	Ph.D., Pittsburgh, 1923	1923	Associate Professor
Geoffrey W. Crickmay	General Geology	Ph.D., Yale, 1930	1937-1945	Associate Professor
Eldon J. Parizek	Geomorphology	Ph.D., Iowa, 1949	1940s-1950s	Assistant(?) Professor
James F. Woodruff	Geomorphology	Ph.D., Michigan, 1952	Middle 1950s	Assistant(?) Professor
W. Robert Power, Jr.	Economic Geology	Ph.D., Johns Hopkins, 1960	late 1950s-1961	Assistant(?) Professor
Charles A. Salotti	Mineralogy	Ph.D., Michigan, 1960	1959-1970	Associate Professor
Vernon J. Henry	Geological Oceanography	Ph.D., Texas A&M, 1961	1961-1982	Professor
John H. Hoyt	Sedimentology	Ph.D., Colorado, 1960	1960-1970	Associate Professor
John S. Schlee	Marine Sedimentology	Ph.D., Johns Hopkins, 1956	<1961-1962	Associate Professor
Vernon J. Hurst	Economic Geology	Ph.D., Johns Hopkins, 1954	1961-1991	Professor
Lawrence D. Ramspott	Igneous Petrology	Ph.D., Penn State, 1962	1962-1967	Assistant Professor

Name	Area of Specialization	Terminal Degree, Institution, & Year	Years on Active Faculty	Faculty rank
Orrin H. Pilkey, Jr.	Coastal Geology	Ph.D., Florida State, 1962	1962-1965	Assistant Professor
Paul A. Wood	Vertebrate Paleontology	Ph.D., University of Arizona, 1962	1962-1964	Assistant Professor
Kenneth Hamblin	Sedimentology	Ph.D., Michigan, 1955	1962-1963	Associate Professor
Mark Rich	Stratigraphy	Ph.D., Illinois, 1959	1963-1990	Professor
Landis			1963-<1966	Assistant Professor
Robert E. Carver	Sedimentology	Ph.D., Missouri, 1961	1964-1993	Professor
Edward A. Stanley	Paleopalynology	Ph.D., Penn State, 1960	1964->1975	Professor
Paul Bennett	Economic Geology	Ph.D., University of Arizona, 1961	1964	Assistant Professor
Thelma Isaacs			1964-1965	Assistant Professor
Armando A. Giardini	Mineralogy	Ph.D., Michigan, 1956	1965-~1986	Professor
Gilles O. Allard	Economic Geology	Ph.D., Johns Hopkins, 1956	1965-1991	Professor
Keith Frye	Mineralogy	Ph.D., Penn State, 1965	1965-1966	Assistant Professor
Warren C. Forbes	Mineralogy	Ph.D., Brown, 1966	1965-1966	Assistant Professor
Richard H. Lefebvre	Igneous & Metamorphic Petrology	Ph.D., Northwestern, 1966	1965-1967	Assistant Professor
James D. Howard	Marine Sedimentology	Ph.D., Brigham Young, 1965	1965-1968	Assistant Professor
E. Jane Durisek	Igneous Petrology	M.S., Penn State, 1964	1965-1967	Instructor
Sumner Long	Stratigraphy	Ph.D., Colorado, 1966	1966-ca. 1970	Assistant Professor
Dennis Radcliffe	Mineralogy	Ph.D., Queens, 1966	1966-1971	Assistant(?) Professor
Michael R. Voorhies	Vertbrate Paleontology	Ph.D., Wyoming, 1966	1966-1973	Associate(?) Professor
Arthur Ritchie	Geochemistry		1967-1968	Assistant Professor
John E. Noakes	Geochronology	Ph.D.,Texas A&M, 1962	<1968-2011	Professor
Charles W. Blount	Geochemistry	Ph.D., UCLA, 1965	1967-<1975	Assistant Professor
Anton Brown	Structural Geology	Ph.D., Queens (Canada), 1968	1967-1971	Assistant Professor
Hartmut U. Wiedemann	Sedimentology	Ph.D., Stuttgart, 1966	1967-1970	Assistant Professor
Barun K. Sen-Gupta	Micropaleontology	Ph.D., India Inst. of Tech., 1963	1967-<1981	Professor
Robert H. Carpenter	Economic Geology	Ph.D., Wisconsin, 1965	1967-<1981	Professor
J. Hatten Howard III	Geochemistry	Ph.D., Stanford, 1968	1967-1992	Associate Professor
Timothy N. Chowns	Sedimentology	Ph.D., Newcastle (U.K.), 1968	1967-<1972	Assistant Professor
Charles R. Givens	Invertebrate Paleontology	Ph.D., UC-Riverside, 1968	<1968-<1972	Assistant Professor
Arthur David Cohen	Coal Geology	Ph.D., Penn State, 1968	1968	Assistant Professor
Norman Herz	Igneous Petrology Geoarcheology	Ph.D., Johns Hopkins, 1950	<1972-1994	Professor

Name	Area of Specialization	Terminal Degree, Institution, & Year	Years on Active Faculty	Faculty rank
George S. Koch, Jr.	Economic Geology	Ph.D., Harvard, 1955	<1972-1992?	Professor
Serge Gonzales	Economic Geology	Ph.D., Cornell, 1963	<1972-<1986	Associate Professor
T. H. Pearce	Igneous Petrology	Ph.D., Queens, 1967	<1972-<1975	Assistant Professor
Lois M. Jones	Geochemistry	Ph.D., Ohio State, 1969	1970-<1981	Assistant(?) Professor
George F. Oertel	Geological Oceanography	Ph.D., Iowa, 1971	<1972-<1975	Assistant Professor
Robert W. Frey	Invertebrate Paleontology	Ph.D., Indiana, 1969	<1972-1992	Professor
David B. Wenner	Geochemistry	Ph.D., Cal Tech, 1971	1970-2007	Associate Professor
R. David Dallmeyer	Structural Geology; Gechronology	Ph.D., SUNY-Stony Brook, 1972	1972-2010	Professor
John C. ("Jay") Stormer, Jr.	Mineralogy & Igneous Petrology	Ph.D., Berkeley, 1971	1971-1983	Associate Professor
James A. Whitney	Igneous Petrology	Ph.D., Stanford, 1972	1972-2001	Professor
Albert J. Erickson	Marine Geophysics	Ph.D., M.I.T., 1970	<1975-<1981	Assistant Professor
Paul Pinet	Geological Oceanography	Ph.D., Rhode Island, 1972	<1975-<1981	
F. Donald Eckelmann	Igneous Petrology	Ph.D., Columbia, 1956	<1981-<1986	Professor
C. Woodbridge Hickcox	Structural Geology	Ph.D., Rice, 1971	<1981-<1986	Assistant(?) Professor
Brooks B. Elwood	Paleomagnetism	Ph.D., Rhode Island, 1976	<1981-1983	Associate Professor
Paul F. Ciesielski	Micropaleontology	Ph.D., Florida State, 1978	<1981-1983	Assistant (?) Professor
Michael Ledbetter	Marine Geology	Ph.D., Rhode Island, 1977	<1981-1983	Assistant(?) Professor
S. George Pemberton	Sedimentology	Ph.D., McMaster, 1978	1978-1981	Assistant Professor
Willis B. Hayes	Biological Oceanography	Ph.D., UC-San Diego, 1969	<1981-~1992	Research Associate
G. Cleve Solomon	Geochemistry	Ph.D., Cal Tech, 1989	1983-1985?	Assistant Professor
Barbara L. Ruff	Vertebrate Paleontology	M.S., Georgia, 1975	1982-1999	Instructor
Daniel J. Spariosu	Paleomagnetism	Ph.D., Columbia, 1983	1983-1989?	Assistant Professor
Susan T. Goldstein	Micropaleontology	Ph.D., UC Berkeley, 1983	1984-2020	Professor
Michael F. Roden	Igneous Petrology	Ph.D., M.I.T., 1982	1984-~2018	Professor
Raymond P. Freeman-Lynde	Marine Geology	Ph.D., Columbia, 1980	1984-~2018	Associate Professor
Jeffrey D. Keith	Economic Geology	Ph.D., Wisconsin, 1982	1984-1990	Associate Professor
Elizabeth A. Gordon	Sedimentology	Ph.D., SUNY-Binghamton, 1986	<1986-1993?	Assistant Professor
John R. Ertel	Marine Chemistry	Ph.D., Washington, 1985	<1988-1993?	Assistant Professor
L. Bruce Railsback	Sedimentary Petrology	Ph.D., Illinois, 1989	1989-present	Professor
Robert B. Hawman	Geophysics - Seismology	Ph.D., Princeton, 1988	1990-present	Associate Professor
Alberto E. Patino-Douce	Experimental Petrology	Ph.D., Oregon, 1990	1990-2020	Professor

Name	Area of Specialization	Terminal Degree, Institution, & Year	Years on Active Faculty	Faculty rank
Steven M. Holland	Stratigraphy	Ph.D., Chicago, 1990	1991-present	Professor
Douglas E. Crowe	Economic Geology	Ph.D., Wisconsin, 1990	1991-present	Professor
Paul A. Schroeder	Clay Mineralogy	Ph.D., Yale, 1992	1991-present	Professor
Marta L. Patino-Douce	Igneous Petrology	Ph.D., Buenos Aires, 1990	1991?-2021	Senior Lecturer & Adjunct Professor
Bert H. Taylor	Photogeology	M.S., Georgia, 1990	1991?-1995?	Instructor
Robert M. Kalin	Hydrogeology	Ph.D., Arizona, 1994	1992-1995?	Assistant Professor
John F. Dowd	Hydrogeology	Ph.D., Yale, 1984	1992-~2018	Assistant Professor
Ervan G. Garrison	Geoarcheology	Ph.D., Missouri, 1979	1992-present	Professor
Sally E. Walker	Invertebrate Paleontology	Ph.D., UC Berkeley, 1988	1993-present	Professor
Samuel E. Swanson	Igneous Petrology	Ph.D., Stanford, 1974	1994-2015	Professor
Valentine A. Nzengung	Groundwater & Bioremediation	Ph.D., Georgia Tech, 1993	1995-present	Professor
Sandra J. Wyld	Structural Geology / Tectonics	Ph.D., Stanford, 1991	1996-2012	Professor
Christopher S. Romanek	Low-temperature geochemistry	Ph.D., Texas A&M, 1991	1997-2009	Associate Professor
James E. Wright	Geochronology / Tectonics	Ph.D., UC Santa Barbara, 1980	2000-2020	Professor
Adam M. Milewski	Groundwater Resources	Ph.D., Western Michigan Univ., 2009	2011-present	Associate Professor
Christian Klimczak	Structural Geology	Ph.D., Univ. of Nevada, Reno, 2011	2014-present	Associate Professor
Geoffrey Howarth	Mineralogy and Petrology	Rhodes University, South Africa, 2012	2018	Assistant Professor
Charlotte Garing	Hydrogeology & Petrophysics	University of Montpellier, France, 2011	2018-present	Assistant Professor
Andy Darling	Tectonic Geomorphology	Arizona State University, 2016	2019-present	Lecturer
Mattia Pistone	Petrology & Volcanology	ETH-Zurich, Switzerland, 2012	2019-present	Assistant Professor
Avishek Dutta	Groundwater microbiology	Indian Institute of Technology, 2019	2022-present	Assistant Professor
Brennan Ferguson	Groundwater geochemistry	Clemson University 2022	2022-present	Assistant Professor

PART III. LISTS OF HEADS, ASSOCIATE HEADS, AND STAFF MEMBERS OF THE DEPARTMENT OF GEOLOGY

A LIST OF HEADS OF THE DEPARTMENT OF GEOLOGY OF THE UNIVERSITY OF GEORGIA

Name	Area of Specialization	Ph.D-granting Institution & Year	Years as Head
Vernon J. Hurst	Economic Geology	Johns Hopkins, 1954	1961-1969
Gilles O. Allard	Economic Geology	Johns Hopkins, 1956	1969-1970
Norman Herz	Igneous Petrology	Johns Hopkins, 1950	1970-1977
F. Donald Eckelmann[1]	Igneous Petrology	Columbia, 1956	1978-1981
J. Hatten Howard III	Geochemistry	Stanford, 1968	1981-1983
James A. Whitney	Igneous Petrology	Stanford, 1972	1983-1991
Norman Herz	Igneous Petrology / Archeological Geological	Johns Hopkins, 1950	1991-1994
Samuel E. Swanson	Igneous Petrology	Stanford, 1974	1994-2000
Susan T. Goldstein	Micropaleontology	UC-Berkeley, 1984	2000-2006
Michael F. Roden	Igneous Petrology	MIT, 1982	2006-2012
Douglas E. Crowe	Economic Geology	Wisconsin, 1990	2012-2017
Paul A. Schroeder	Clay Mineralogy	Yale, 1992	2017-2023
Adam M. Milewski	Groundwater Resources	Western Michigan, 2009	2023-

[1] Ph.D. student of J. Laurence Kulp, who was also Ph.D. advisor to Wally Broecker, Dick Holland, and Karl Turekian. Before coming to UGA, Eckelmann was head of the Department of Geology (1961-1968) at Brown and Dean (1968-1971) at Brown, and he was subsequently Dean of the College of Arts and Sciences at Ohio University (1985-1994). He is thus far the only head to retire from an institution other than UGA.

A LIST OF ASSOCIATE HEADS OF THE DEPARTMENT OF GEOLOGY OF THE UNIVERSITY OF GEORGIA

Name	Area of Specialization	Ph.D-granting Institution & Year	Years as Associate Head
Michael F. Roden	Igneous Petrology	MIT, 1982	2000-2006
Paul A. Schroeder	Clay Mineralogy	Yale, 1992	2006-2014
Raymond P. Freeman-Lynde	Marine Geology	Columbia, 1980	2014-2017
Adam M. Milewski	Groundwater Resources	Western Michigan, 2009	2017-2023
Douglas E. Crowe	Economic Geology	Wisconsin, 1990	2023-

[2] The position of associate head in the Department of Geology did not exist prior to July 1, 2000.

A PARTIAL LIST OF STAFF MEMBERS OF THE DEPARTMENT OF GEOLOGY OF THE UNIVERSITY OF GEORGIA

Name	Work Area	Years Served
Donnie Kitchens	Secretary	1961-1967
Sylvia B. Young	Office Manager	1967-1995
Billie Mack Rosser	Electronics Technician	1967-1992?
Edna Parham	Degree Program Assistant	1981-1987
Helen Pilcher		<1987
Sandra Whitney	Microprobe Lab Technician	1970s
Patricia Ann Hancock	Accountant; Office Manager	early 1970s; 1982-2007
Marianna Paulsen	General Technician	1983?-1985
Karen E. Rabek	Microprobe Lab Technician	-1983
Michael J. Dorais	Microprobe Lab Technician	1983-1985
William W. Barker	General Technician	1985-1987?
Christopher J. Fleisher	Electron Microprobe Lab Coordinator	1985-2020
Kitty Earnest	Degree Program Assistant	-1988?
Virginia Sheffield	Secretary	1987?-1988?
Patti P. Gary	Administrative Secretary; Office Manager	1981?-1999 2005-2009
Otis Chip Malcolm	General Technician	1987?-1992?
Beatrice R. Stephens	Degree Program Assistant	1988?-2010
Kimberly Kirkland	Receptionist	1988?-1991
Mary Lou Grimes	Secretary	1991-1994?
H. Kevin Dooley	General Technician	1992?-1994?
William R. McClain	General Technician	1994?-1995?
William R. McClain	Research Coordinator II - Isotope Lab Technician	1995?-2002
Jeffrey E. Clippard	Network Services Specialist IV	1995-2005
Vicki L. Mullis	Administrative Secretary	1996?-1999
Mary A. Crowe	Administrative Secretary	1999-2005
Karen Jackson Daniel	Administrative Secretary	1999-2000
Mark Heiges	Computer Services Specialist IV	2001-2004
Julia Elaine Cox	Isotope Lab - Research Coordinator II	2002-present
Robert Phares	Web Developer Associate	2005-2015
J. Michael Lewis	IT professional	2005-2020
April F. Myers	Accountant	2007-2008
Cynthia Fouche	Interim Office Manager / Administrative Assistant I	2009-2019
Rachel Ashton	Business Manager	2009-2021*
Ashley Moore / Ashley Arnold	Administrative Assistant II	2010-present
Catherine Moore	Administrative Assistant II	2017-2020
Tabiatha Simmons	Administrative Assistant II	2021-2022
Jhemika (Shay) Nash	Administrative Assistant II	2022-

* Transferred by Franklin College into its centralized "Franklin Works" staffing system, at which point she became Business and Fiscal Affairs Manager for the Departments of Geology and Genetics.

Part IV. Curriculum and Courses

This section provides some snapshots of the Geology curriculum through time. For the period from 1934 to 2000, it shows pages from UGA's catalogs of courses, specifically for 1896, 1924-1925, 1934, 1939-1940, 1951-1952, 1963-1964, and 1979-1981. The 1979-1981 catalogue was divided into undergraduate and graduate sections, leading to redundancy with regard to 400-600-level courses. The catalogues were accessed at archive.org, and the pages shown here are unmodified, except for trimming of the pages for 1934.

For the period after 2000, this section shows lines from UGA's post-hoc schedules of classes, specifically for 2002-2003 and 2019-2020. These were available from the UGA Registrar's website, and multiple pages of pdf documents were condensed into one-page or two-page listings for academic years, mixing information from the fall and spring semesters.

University of Georgia Catalog 1896

GEOLOGY.

VACANT.*

The Class meets the professor three hours per week during the second term of the Senior year. The course of instruction is at first a general one, embracing the study of the distinguishing properties of minerals and common rocks, the decay of rocks, and the formation of soils. Following this is a more extended course of Structural, Dynamical, and Historical Geology.

*Temporarily under the charge of the Professor of Chemistry.

23. Grades and Grading. A detailed study of the grading rules of the various associations. Practice work in grading. Lecture, collateral reading, field work. Three hours, one term. One hour credit. Open to Juniors. M. W. F., 10:45. *Adjunct Professor Barrett.*

24. Mill Organization. The development of the modern sawmill and its equipment. Labor efficiency. Various systems of management. Lecture, collateral reading. Three hours, one term. One hour credit. to Juniors. M. W. F., 10:45. *Adjunct Professor Barrett.*

26. Wood Physics. A study of the strength of wood under different conditions and shapes, also the physical effect of moisture, heat and preservatives upon its strength. Three laboratory periods, first half-year. One and one-half hours credit. Open to Juniors. Fee, $1.75. T. Th., 2:35. *Adjunct Professor Barrett.*

27. Forest Mensuration. Timber estimating and scaling. Methods used in the construction of volume, growth and yield tables. Two recitations and one laboratory period the entire year. Required of Sophomores. Fee, $3.50. T. Th., 10:45; lab., S., 10:45. *Adjunct Professor Smith.*

Advanced Courses are given in the Graduate School.

GEOLOGY

1. General Mineralogy and Petrography. After a summary of the chief crystallographic, physical, and chemical characteristics of minerals, the course becomes descriptive and deals with one hundred and fifty of the minerals most important from the industrial and scientific point of view. Following this is a brief survey of the subject of Petrography, consisting of a study of the common rocks, their mineralogical and chemical composition, structure, origin and relations. Three hours of lectures and two hours of laboratory per week. First term. One and one-third hours credit. Laboratory fee, $1.50. Prerequisite: one year of Inorganic Chemistry. *Associate Professor Cullin.*

2. Historical Geology. A study of the origin of the earth and its development up to the present day, dealing with the geographic, structural and climatic conditions prevailing during the various geological ages and the evolution of the plant and animal life. Special stress on organisms with important geologic relations and recognition of at least one hundred of the most common index fossils. Three hours of lectures and two hours of laboratory per week. Second term. One and one-third hours credit. Laboratory fee, $2.00. Prerequisite: Geology 1. *Associate Professor Cullin.*

3. Physical Geology. A study of the geological processes and the development of the structural and morphological features of the earth's crust, including a general discussion of its plains, table-lands, hills, valleys, mountains, oceans, rivers and lakes. Special attention given

to the destruction of rocks and formation of clastic material. The laboratory work consists of interpretation of topographic and geological maps and sections, with study of the common rocks with regard to their most important structural relations, the elements of geological surveying, and local field trips. Three hours of lectures and two hours of laboratory per week. Third term. One and one-third hours credit. Laboratory fee, $2.50. Prerequisite: Geology 1 and 2. *Associate Professor Cullin.*

4. Engineering Geology. A course designed for those students who desire a training in Applied Geology; covering fundamentally courses 1, 2 and 3, but with the exception that Physical as well as Historical Geology are more briefly dealt with and the time instead devoted to topics of engineering interest, such as ores, fuels, building stones and road material, the geological conditions controlling and affecting underground water supplies, landslides, the relation of soils to sewage disposal and water purification, the structure of rocks in relation to tunneling operations and dam and reservoir foundations, etc., all problems the student is likely to meet with in actual engineering practice. Three hours of lecture and two hours of laboratory per week. Three terms. Four hours credit. Laboratory fee, $5.00. Prerequisite: One year of Inorganic Chemistry. *Associate Professor Cullin.*

5. Mineralogy. A continuation of course 1 entering more thoroughly into the subjects of Crystallography and Determinative methods and dealing with the paragenesis and chemical relations of minerals, with a study of one hundred and fifty additional minerals, the laboratory exercises consisting of study of crystallographic types, with measurement and projection of crystal forms and the determination of their physical constants. Three hours of lecture and two hours of laboratory per week. First term. One and one-third hours credit. Laboratory fee, $2.00. Prerequisite: One year's work in Geology. *Associate Professor Cullin.*

6. Petrography. Igneous, sedimentary and metamorphic rocks, their genesis and relations. Magmatic differentiation, sedimentation and alteration. A study of optical crystallography and the determination of minerals by optical methods. The laboratory exercises consisting of microscopical identification of various types of rocks and determination of the physical and chemical conditions which controlled their formation. Three hours of lecture and two hours of laboratory per week. Second term. One and one-third hours of credit. Laboratory fee, $2.00. Prerequisite: Geology 1, 2, 3, 5, or 4 and 5. *Associate Professor Cullin.*

7. Economic Geology. A study of the mineral resources of industrial value including ores, fuels, building stones, cements, clays, fertilizers, salts and abrasive materials, etc., with a general summary of the

mineral production. The theories of ore deposition extensively discussed with a number of illustrations from the most typical occurrences in the various parts of the world. A brief survey of the mineral deposits and discussion of the possibilities for prospecting within the state of Georgia. Three hours of lecture and two hours of laboratory per week. Third term. One and one-third hours credit. Laboratory fee, $2.00. Prerequisite: Geology 1, 2, 3, 5, 6, or 4, 5, 6. *Associate Professor Cullin.*

8. Dynamic and Structural Geology. An amplification of course 3, entering more fully into the problems of orogeny, volcanism, metamorphism, and seismology, and discussing in detail the destructive agencies of the atmosphere and hydrosphere in the sculpturing of the land surface and the erosion cycle under various physiographic conditions. Three hours of lecture and two hours of laboratory per week. First half-year. Two hours credit. Laboratory fee, $2.50. Prerequisite: Geology 1, 2, 3, or 4. *Associate Professor Cullin.*

9. Paleontology. An intensive study of the field of Invertebrate Paleontology with special reference to the North-American Continent, familiarizing the student with the subject of Stratigraphy and methods of correlation by means of fossil faunas. Three hours of lecture and two hours of laboratory per week. Second-halfyear. Two hours credit. Laboratory fee, $2.00. Prerequisite: Geology 1, 2, 3 and 8, or 4 and 8. *Associate Professor Cullin.*

GERMANIC LANGUAGES

X. A course for beginners. Three hours per week. Three terms. Three hours credit. Sec. 1, M. W. F., 9:50; Sec. 2, T. Th. S., 12:35. *Professor Morris.*

1. Continuation of X; grammar completed; translation of about 200 pages of modern narrative prose. Three hours per week. Three terms. Three hours credit. T. Th. S., 9:50. Optional for Freshmen and Sophomores. *Professor Morris.*

2. Conversation and sight reading with the object of giving a practical mastery of the language. Optional for Sophomores. Three hours per week. Three terms. Three hours credit. M. W. F., 10:45. *Professor Morris.*

20. Elementary course offered as one of the Junior language options. Conducted exclusively in German. Optional for Juniors and Seniors. Three hours per week. Three terms. Three hours credit. M. W. F., 11:40. *Professor Morris.*

21. Continuation of 20. Translation of about 600 pages of modern prose. Optional for Seniors. Three hours per week. Three terms. Three hours credit. T. Th. S., 10:45. *Professor Morris.*

Advanced Courses are given in the Graduate School.

BOTANY

101. Mycology. Course 6 with extension (two hours graduate laboratory). Two other suitable undergraduate courses in Botany are prerequisite. Minor. *Professor Reade.*

105. Mycology. An extension of the graduate work of 101. Course 6 and one other undergraduate course in Botany are prerequisite. Minor. Three hours per week. *Professor Reade.*

103. Mycology. 105 with the addition of a thesis. Prerequisite; 6 and two other suitable undergraduate courses. Major. Four hours per week. *Professor Reade.*

104. Systematic Spermatophytes. Work in field and herbarium under supervision. Prerequisite: Two suitable undergraduate courses in Botany. Three hours per week. Minor. *Professor Reade.*

ZOOLOGY

104. Vertebrate Morphology. Special problems for individual investigation are assigned to each student. A thesis is required, satisfactorily presenting the results of the investigation, together with a complete bibliography. Four conference hours and eight laboratory hours per week. Prerequisites: Zoölogy 3, 4, and 5. Major. *Professor Krafka.*

GEOLOGY

Professional training for qualified students who intend to enter any phase of business connected with the exploitation of natural resources, such as ores, coal, petroleum, natural gas, or building materials, or for those who expect to engage in the geological work of federal or state surveys: lectures, select reading, conferences, laboratory exercises, and field work. Prerequisite: At least two years of undergraduate Geology and a thorough knowledge of surveying. The right is reserved to withdraw course 101 unless there are as many as three applicants, and course 102 unless there as as many as five.

101. Advanced Economic Geology. An amplification of prerequisite Geology 7, the problems to be adjustable to the needs of individuals on small groups of students and the subject matter and method of presentation to be modified to meet various conditions. Detailed study of the mineral resources of Georgia and the possibilities of prospecting. The student will select some locality of geological interest within the state to serve as a basis for a thesis, the investigation consisting of observation and collection of material in the field, geological mapping, microscopical investigation in the laboratory, and the application of geological principles to the working out of the problem. Four hours of lecture and conference and eight laboratory hours per week. Major. *Associate Professor Cullin.*

102. Geology of Petroleum and Natural Gas. After a study of the origin, accumulation, and occurrence of petroleum and natural gas, and a comparative consideration of the various oil and gas fields and promising regions of the world not yet tested, the student is introduced to the methods used in actual oil field practice, such as determining chances of success in locating oil and gas wells, determining the value of oil and gas properties, methods of examination and making reports upon properties, etc. The laboratory work consists of exercises and investigations with geological maps, oil field maps, statistics and drilling records. A thesis is required. Four hours of lecture and conference and eight hours of laboratory per week. Major. *Associate Professor Cullin.*

COMMERCE

101. Studies in Industrial and Economic Geography. Intensive study of selected commodities, and also of the international exchange of goods. Prerequisite: Commerce 1, 60, a, b, c; 75, a, b, c; 80, a, b, c. Three hours per week. Major. *Professor Jenkins.*

102. Industrial Development of the American Peoples. Advanced work in economic history, either of some section of the United States or of Latin America. Prerequisites: Economics 1, 2, 5. Three hours per week. Minor. *Adjunct Professor Johnson.*

105. History of Economic Thought. A general study of the development of economic thought from ancient times to the present, with emphasis on the English classical economists. Prerequisite: Economics 5. Three hours per week. Minor. *Professor Brooks.*

112-113. Auditing and Cost Accounting. This course is the third year of Accounting. It is open to either seniors or graduate students. Prerequisites: Commerce 6 and 11. When taken by graduate students, one hour per week of strictly graduate work will be required. Four hours per week. Minor. Not offered in 1924-1925. *Professor Heckman.*

114-115. Advanced Accounting Problems and Income Tax Accounting. These two courses alternate with 112-113. Open to seniors who have had Commerce 6 and 11, and to graduate students. When taken by graduate students one hour per week of strictly graduate work will be required. *Professor Heckman.*

CIVIL ENGINEERING

101. Baker's Masonry Construction. Irrigation, based on Wilson, Newell. Land Drainage, Elliott, and United States Irrigation Papers. Hydraulic Concrete, Turneaure, Taylor and Thompson. Hydraulics, Russell, Merriman. Lectures. Various essays and designs are required of the students. Six hours per week. Major. *Professor Strahan.*

1934:

tory fee, $5.00. Breakage deposit, $5.00. Winter quarter. *Mr. Mote.*

A continuation of Chemistry 190.

290. RESEARCH IN PHYSICAL CHEMISTRY. Double minor.

GEOLOGY

See Civil Engineering.

CIVIL ENGINEERING

JUNIOR COLLEGE COURSES

1-2. SURVEYING. Six recitation periods [illegible] three hours field prac-

and free-hand [illegible]es.

SENIOR COLLEGE COURSES

55a-b-c. STRENGTH OF MATERIALS, FRAMED STRUCTURES, ARCHES. Three recitation periods per week. Triple half-course. Fall, Winter, and Spring quarters. *Mr. Strahan.*

Lectures and design problems.

57a-b-c. HYDRAULICS AND SANITARY ENGINEERING. Three recitation periods per week for three quarters. Triple half-course. *Mr. Strahan* and *Mr. Davenport.*

Lectures and design problems.

59a-b-c. REINFORCED CONCRETE. Three recitation periods per week for three quarters. Triple half-course. *Mr. Strahan.*

Lectures and design problems.

64a-b-c. DESCRIPTIVE GEOMETRY. Three recitation periods per week for three quarters. Triple half-course. *Mr. Clement.*

Shades, shadows and perspective. Plates and problems.

66. GRAPHIC STATICS AND DESIGN. Six hours per week for one quarter. Single course. *Mr. Strahan.*

80. GEOLOGY. Six recitation periods per week for Spring quarter. Single course. *Mr. Strahan.*

Emphasis laid on Dynamic Geology. Required for Civil Engineering students. Elective in other degree courses.

[illegible] ELECTR[illegible] MACHINERY AND APPARATUS. Direct current. Three

1939-1940:

GEOLOGY

JUNIOR DIVISION COURSES

PHYSICAL SCIENCE 1-2. The department of Geology cooperates with the departments of Physics, Chemistry, and Geography in giving these courses.

20. ELEMENTARY GEOLOGY. 5 hours. Three lecture or recitation and two laboratory periods. Fee $2.50. Fall and Winter Quarters. Campus I. *Mr. Crickmay.*

A brief introduction to dynamic, structural, and historical geology. Credit cannot be received for both Geology 20 and Physical Science 2.

21. GENERAL GEOLOGY. (Dynamic and Structural). 5 hours. Three lecture or recitation and two laboratory periods. Prerequisite: Physical Science 2 or Geology 20. Fee $2.50. Fall and Winter Quarters. Campus I. *Mr. Crickmay.*

The nature and structure of the materials composing the earth and the various processes which have shaped or are shaping the earth.

22. GENERAL GEOLOGY (Historical). 5 hours. Four lecture or recitation and one laboratory periods. Prerequisite: Zoology 21 or Zoology 25. Fee $2.50. Winter and Spring Quarters. Campus I. *Mr. Crickmay.*

Origin and geological history of the earth and its plant and animal inhabitants.

SENIOR DIVISION COURSES

330. PHYSIOGRAPHY. 5 hours. Three lecture or recitation periods and occasional field trips. Prerequisite: Geology 20 or 21. Winter Quarter. Campus I. *Mr. Crickmay.*

Processes of weathering, erosion, and deposition; development of typical land-forms in humid, semi-arid, and arid climates.

350. MINERALOGY AND INTRODUCTORY PETROLOGY. 5 hours. Two lecture or recitation and three laboratory periods. Fee $2.50. Prerequisite: Geology 20 or 21 and Chemistry 22. Spring Quarter. Campus I. *Mr. Crickmay.*

General characteristics, origin, mode of occurrence, nomenclature, and description of the more common rocks and rock-making minerals. Laboratory technique for identification of minerals by optical methods.

GERMAN

JUNIOR DIVISION COURSES

101. ELEMENTARY GERMAN. 5 hours. Fall and Winter Quarters, Campus I. Fall Quarter, Campus III. *Mr. Morris, Mr. DuBose,* and *Mr. Terry.*

The first half of a two-course sequence in beginning German, em-

1951-1952:

422. AMERICAN LITERATURE AFTER 1865. *Mr. Eidson* and *Mr. Parks.*

425. ROMANTICISM IN AMERICAN LITERATURE. *Mr. Eidson* and *Mr. Parks.*
A study of the works of Emerson, Whitman, and Hawthorne.

427. REALISM IN AMERICAN LITERATURE. *Mr. Eidson* and *Mr. Parks.* (Not offered in 1951-52.)
A study of the works of Mark Twain, Henry James, and William Dean Howells.

429. SOUTHERN LITERATURE. *Mr. Eidson* and *Mr. Parks.*
A survey of the intellectual thought and literary achievement in the South from 1610 to the present time, with emphasis upon Poe, Timrod, and Lanier.

440. SHAKESPEARE TO 1600. *Mr. Walker.*
Romeo and Juliet; A Midsummer Night's Dream; The Merchant of Venice; King Richard the Second; King Henry the Fourth, Part I; Much Ado About Nothing; As You Like It; Hamlet.

441. SHAKESPEARE AFTER 1600. *Mr. Walker.*
Twelfth Night; Macbeth; King Lear; Antony and Cleopatra; Coriolanus; The Winter's Tale; The Tempest.

442. EARLY VICTORIAN LITERATURE. *Mr. Everett.*
A study of the works of Carlyle, Tennyson, and Browning.

451. MUSIC AND LITERATURE. *Mr. Brown.*
A comparative study of the forms, relationships, and aesthetics of music and literature. Admission by consent of the instructor.

452. LATE VICTORIAN LITERATURE. *Mr. Everett.*
A study of the works of Arnold, Ruskin, and Swinburne.

FINE ARTS

(Fine Arts Building, North Campus)

Given under the general direction of the Chairman of the Division of Fine Arts.

300. MUSIC AND THE VISUAL ARTS. No credit will be allowed for Fine Arts 300 when credit is already shown for Art 317 and Music 343. *Mr. Dodd* and *Mr. Hodgson.*
Nature and materials of the visual arts in their relation to man, with emphasis on the influence of art products in contemporary living and thinking. A field of study comprising painting, sculpture, architecture, graphic arts, arts of industry and commerce. Also a study of works of outstanding figures in music taken chronologically.

FRENCH

(See Modern Foreign Languages)

GEOGRAPHY and GEOLOGY

(LeConte Hall, North Campus)

Head: Prunty. Staff: Hart, Lahey, Mather, Parizek, Zelinsky.

HUMAN AND REGIONAL GEOGRAPHY

Note: Courses listed below carry credit as social sciences and a major selected primarily from the following courses leads to an A.B. degree.

101. WORLD HUMAN GEOGRAPHY. *Mr. Mather* and *the Staff.*
A survey of world human geography, emphasizing population characteristics, distribution of economic activities and geo-political problems within the major natural regions. Particular emphasis will be placed upon the regions of Eurasia as a basis for appreciation of international affairs.

341. PROBLEMS IN POLITICAL GEOGRAPHY. Prerequisite: Geography 101 or History 110 x-y. *Mr. Hart.*

A survey of geographic influences upon the nature and history of states and nations. Especial attention will be devoted to geo-political conditioning of international affairs since 1917.

352. GEOGRAPHY OF ANGLO-AMERICA. Prerequisite: Geography 101 or History 110 x-y. *Mr. Mather.*

A regional analysis of the human geography of the United States, Canada, Alaska, and the continental possessions of Britain, emphasizing the physical and economic factors affecting the utilization of the several regions. Particular stress will be given the Southeastern States.

358. ECONOMIC GEOGRAPHY. Prerequisite: Geography 101, History 110 x-y, or one course in Economics. *Mr. Prunty.*

Study of the relation of geographical and geological factors to economic conditions in determining the nature, volume of production, and location of the various basic productive occupations. Stress upon occupations dealing with output of raw materials. Analysis of transportation, distribution, and marketing of materials analyzed in terms of effects upon nature of their production. Particular emphasis upon natural resources and industries of the U. S. Southeast, their actual and potential development. Concluding section on role of geographical and geological factors in influencing international trade.

365. GEOGRAPHY OF SOUTHEAST ASIA. Prerequisite: Geography 101 or History 110 x-y. *Mr. Zelinsky.*

A regional analysis of the physical geography and problems in the economic and political geography of Southeast Asia. Emphasis on Japan, China, and India.

436. HUMAN AND RESOURCE GEOGRAPHY OF THE SOUTHEASTERN UNITED STATES. Prerequisite: Ten hours in courses from one of the following departments: Geography and Geology, History, or Economics. *Mr. Prunty* or *Mr. Zelinsky.*

Geographical appraisal of the regions of the Southeastern States, including (1) physical resources—geology, landforms, soils, climates, economic minerals, original vegetation, and (2) human geography of the South emphasizing aboriginal settlement, routes and sources of settlement and population, agriculture, the extractive industries, transportation, and present urban settlement. Concluding section of course summarizes some major problems of Southeastern development and suggests geographical approaches to their solution.

441. CARIBBEAN AMERICA. 3 hours. Prerequisite: 10 hours in Geography and Geology, or an equivalent background in either Spanish or History. *Mr. Lahey* or *Mr. Prunty.*

A regional analysis of the geography of the Caribbean Area, including Caribbean South America, the West Indies, Middle America and Mexico, with emphasis upon the cultural and economic ties of the American South with the Caribbean area. This course will meet on alternate days with Geography 442—SOUTH AMERICA—and should be taken in the same quarter with Geography 442.

442. SOUTH AMERICA. 3 hours. Prerequisite: 10 hours in Geography and Geology, or an equivalent background in either Spanish or History. *Mr. Mather.*

A regional analysis of the geography of equatorial and southern South America including treatment of physical, cultural, and economic characteristics of the several regions within the South American nations. Particular stress upon the prospects for expansion of settlements, development of resources and growth of industries. This course will meet on alternate days with Geography 441—CARIBBEAN AMERICA—and should be taken in the same quarter with Geography 441.

444. EUROPE AND THE MEDITERRANEAN. Prerequisite: 10 hours in Geography and Geology, or an equivalent background in History or Modern Languages. *Mr. Hart.*

A regional analysis of the human geography of peninsular, western, and central Europe and the Mediterranean Basin, emphasizing physical, ethnographic, and economic factors affecting the utilization and political problems of the several nations.

446. GEOGRAPHY OF THE SOVIET UNION. Prerequisite: 10 hours in Geography and Geology, or an equivalent background in Modern Languages or History. *Mr. Hart.*

A regional analysis of the physical, ethnographic and economic geography of the U. S. S. R. designed to evaluate the industrial and political strength of the Soviet Union.

TECHNIQUES AND METHODS IN GEOGRAPHY AND GEOLOGY

350. CARTOGRAPHY AND GRAPHICS. Five laboratory periods. *Mr. Hart* or *Mr. Zelinsky.*

Theory and practice in map and chart design and construction. Emphasis on compilation techniques, use of source data for map construction, application of aerial photos to mapping problems, graphic presentation of statistical materials. Includes practice in use of all basic cartographic instruments, construction of basic types of geographical, geological, and statistical maps. Intended for the student who has had no training in mapping or drafting procedures.

420. USE AND INTERPRETATION OF AERIAL PHOTOGRAPHS. Two lectures and three laboratory periods. Prerequisites: 4 or more quarters of forestry or agriculture, Geography 350 and one other 300 level course, or permission of the instructor. *Mr. Hart* or *Mr. Zelinsky.*

Analysis of theory and procedures in use of aerial photos for mapping, planning, terrain and contour identification, forest and vegetation identification. Procedures in correction of photo errors, for preparation of base-maps, will be stressed. The student will be trained, through laboratory periods, in use of standard photogrammetric instruments, and in planning photo-reconnaisance of sample areas.

421. ADVANCED CARTOGRAPHY LABORATORY. Five laboratory periods. Prerequisite: Geography 350 or 420, or the equivalent. *Mr. Zelinsky.*

Laboratory instruction on individualized cartographic or graphic problems related to the major interests of the student. Recommended for students, in fields other than geography, whose subject-areas can be enhanced by cartographic procedures.

422. ADVANCED PHOTOGRAMMETRY LABORATORY. Five laboratory periods. Prerequisite: Geography 420 or equivalent. *Mr. Zelinsky.*

Laboratory instruction on individualized photogrammetric problems related to the major interests of the student. Recommended for students, in fields other than geography, to which photogrammetry applies, such as forestry, agronomy, agricultural engineering, botany, landscape architecture, geology. Students will be required to acquire mastery in use of advanced photogrammetric instruments.

425. FIELD METHODS IN GEOGRAPHY AND GEOLOGY. 3 hours. Prerequisites: 15 hours in Geography and Geology courses numbered above 200 including Geography 350, plus at least a B average in junior-senior major courses. *Mr. Lahey* and *the Staff.*

Basic methods in measurement, observation, recording, and synthesis of field data in Geography and Geology. Complete field analysis of all features in one small type-area will be required, including completed maps of publication standard and a written report in which all recorded data are correlated and synthesized.

429. AREA ANALYSIS METHODS IN RESOURCE DEVELOPMENT. 3 hours. Prerequisite: 10 hours in courses numbered above 200 in Geography and Geology, or in Economics, or equivalent. Background in cartography or statistics is very desirable. *Mr. Prunty* and *the Staff.*

Semi-independent application of area-analysis techniques to selected problems in the development of mineral properties, or raw-material producing regions, to industrial plant locations, and to location and evaluation of market regions. Typical analysis problems will be selected to fit individual student interests, but application of at least ten basic methods will be required of each student.

800. SEMINAR IN GEOGRAPHICAL METHODS. 2 hours. *Mr. Prunty.*

Required for graduate majors in geography. Research methods and aids, philosophical bases of geographical methods, contemporary problems in geographical methods principally as related to regional and economic geography.

GEOLOGY AND PHYSICAL GEOGRAPHY

Note: Courses listed below carry credit as physical sciences. Courses 121, 122, and 310 do not carry laboratory science credit. A major selected primarily from the following courses leads to a B.S. degree and must include a minimum of 20 hours in Geology credit courses.

25. ELEMENTS OF GEOLOGY (PHYSICAL). Three lectures and two laboratory periods. *Mr. Lahey* and *the Staff.*

Fundamentals of physical geology, including origin and composition of the primary earth materials, agents of erosion, sedimentation, metamorphism, modes of occurrence of the common economic minerals, and analysis of the common crustal structures.

26. ELEMENTS OF GEOLOGY (HISTORICAL). A continuation of Geology 25. Three lectures and two laboratory periods. *Mr. Parizek* and *the Staff.*

Historical principles in geology, including floral, faunal, bio-geographic, and stratigraphic relationships of the several geologic epochs.

121. THE NATURAL ENVIRONMENT (PHYSICAL GEOGRAPHY). *Mr. Hart* and *the Staff.*

A systematic analysis of major features of the natural environment and their interrelations, stressing common rocks, land forms, geomorphic and water-resource characteristics within the major landforms, distribution and characteristics of the major residual soils types.

122. THE NATURAL ENVIRONMENT (PHYSICAL GEOGRAPHY). A continuation of Geography 121. *Mr. Lahey* and *the Staff.*

Evaluation of weather fundamentals, climatic, vegetative, and water resource phenomena, and their ecological relationships within the physical environment as illustrated by selected areas.

310. CONSERVATION OF NATURAL RESOURCES. *Mr. Hart* or *Mr. Prunty.*

A survey of resource problems and related conservation techniques in the United States. Particular emphasis is to be placed upon the resource conservation problems of the Southeastern States.

321. MINERALOGY AND CRYSTALLOGRAPHY. 3 hours. One lecture and two laboratory periods. Prerequisite: Geology 25-26. *Mr. Parizek.*

A study of the physical and chemical properties of minerals, their rock-associations, modes of occurrence, industrial uses. Study of the properties of crystals, crystal systems and geometrical characteristics, abnormalities in mineral-crystal structure.

323. PETROLOGY. 3 hours. One lecture and two laboratory periods. Prerequisite: Geology 321. *Mr. Parizek.*

Origins of the sedimentary, igneous, and metamorphic rocks, modes of occurrence, chemical and physical changes to which rocks are subject. Systematic and descriptive analysis of rocks.

332. STRUCTURAL GEOLOGY. 3 hours. One lecture and two laboratory periods. Prerequisite: Geology 25-26. *Mr. Prunty.*

Study of the framework of the earth's crust, and the causes of its distortion. The analysis of flexures, faults, joints. The origin of mountains, continents, and oceans. Laboratory studies of geological maps and the deduction of earth forces resulting in present rock attitudes.

334. PRINCIPLES OF SEDIMENTATION. 3 hours. Prerequisite: Geology 323. *Mr. Parizek.*

Study of the varying processes whereby sedimentary rocks are formed, critical discussion of media and agents of transportation, chemical and physical factors involved in deposition, and environmental conditions causing variations in above processes. Special emphasis upon outstanding present areas of sedimentation, e.g., Gulf of Mexico.

401. REGIONAL CLIMATOLOGY AND VEGETATION. Four lecture and one laboratory periods. Prerequisite: 10 hours in Geography and Geology including Geography 122, or an equivalent background in Botany. *Mr. Lahey.*

An analysis of world climatic and vegetative regions involving such deterministic factors as air mass characteristics, heat and moisture requirements of vegetative associations, the influences of topographic and edaphic conditions upon the relations of climates to natural and cultivated vegetation. Application of the classification systems of Transeau, Koppen, and Thornthwaite required.

402. GEOMORPHOLOGY. Four lecture and one laboratory periods. Prerequisite: 10 hours in Geography and Geology, or an equivalent background. *Mr. Mather.*

Analysis of the processes which have developed the present relief of the earth's surface, study of physical landscapes which comprise the earth's outer layers. Evaluation of physical processes and relief features found in the major physiographic regions of the American Southeast. Other physiographic regions, selected on a world-wide basis, will be examined in detail as type-examples.

403. INVERTEBRATE PALEONTOLOGY. Three lecture and two laboratory periods weekly. Prerequisite: Geology 26 and 332, plus Zoology 26, or equivalent background. *Mr. Parizek.*

Study of fossil invertebrates, emphasizing relationships in anatomical structures of living and extinct types, analysis of the classifications, ecology, and geological history of all phyla of invertebrates. Lectures, readings, laboratory problems emphasizing facility in stereo-microscopic analysis.

404. PRINCIPLES OF STRATIGRAPHY. 3 hours. Two lecture and one laboratory periods weekly. Prerequisite: Ten hours in Geography and Geology, including Geology 332. *Mr. Parizek.*

Study of the arrangements of strata of rocks in the earth's crust, emphasizing the vertical sequences and lateral correlations of layered deposits. Particular attention to the methods involved in identification and correlation of typical stratigraphic associations through analysis of organic and structural constituents.

406. ADVANCED HISTORICAL GEOLOGY. Four lecture and one laboratory periods weekly. Prerequisite: 10 hours in Geography and Geology, including Geology 332. *Mr. Parizek.*

Study of the principles of paleontological analysis of strata, emphasizing the bio-geographic characteristics typical of geological periods in Eastern North America. Special attention to the index fossils and the place of organisms in the growth of strata.

476. VEGETATION OF NORTH AMERICA. (See Botany 476)

HONORS WORK

H-500. HONORS COURSE.

GERMAN

(See Modern Foreign Languages)

GREEK

(See Classics)

HISTORY

(Academic Building, North Campus)

Head: Coulter. Staff: Brandon, Davis, Jones, Martin, Montgomery, Smith, Thompson, Vinson.

110 a-b-c. HISTORY OF WESTERN CIVILIZATION. 9 hours (3 hours in each of three quarters.) (For Pharmacy students only.) *Miss Thompson.*

A course designed to acquaint the student with the development of the institutions of the Western World and to show how they became a part of modern civilization. This course must be taken in the sequence indicated.

110 x-y. HISTORY OF WESTERN CIVILIZATION. 10 hours (5 hours in each of two quarters). For sophomores. *Mrs. Brandon, Mr. Davis, Mr. Jones, Mr. Montgomery, Mr. Smith,* and *Mr. Vinson.*

The same as History 110 a-b-c. This course must be taken in the sequence indicated.

History 110 is prerequisite to all courses which follow.

310. HISTORY OF THE FAR EAST. *Mr. Vinson.*

A survey of Oriental history with special emphasis on the role of China and Japan in world affairs during the last two centuries.

325. ANCIENT HISTORY. *Mr. Jones.* (Not offered in 1951-52.)

A survey of the political, social, and economic world from the Stone Age to the end of the Western Roman Empire in 476 A. D.

330. EUROPE SINCE 1914.

A study of the causes, main phases, and results of the First and Second World Wars, the chief political, economic, social, and cultural problems of the countries of Europe between these two wars, and the chief problems of these countries since 1945.

340 x-y. ENGLISH HISTORY. 10 hours (5 hours in each of two quarters, either quarter elective for final credit, though it is recommended that the whole course be taken). (Not offered in 1951-52.)

A survey of English history from the earliest times to the present. The division point in the two parts of this course is 1688.

350 x-y. AMERICAN HISTORY. 10 hours (5 hours in each of two quarters). Open only to juniors and seniors. *Mr. Martin, Mr. Montgomery,* and *Mr. Vinson.*

An interpretation of the development of the American nation from the age of discovery down to the present.

1963–1964:

404. (FORESTRY) WATERSHED HYDROLOGY. 3 hours. Two lectures and one laboratory period. Prerequisite: Physics 127, 128, and Geography 122. *Mr. Shear.*

Measurement and regulations of the aggregate resources of a drainage basin; control of erosion, streamflow and floods. Role of water as unifying factor in physical landscapes. Required fieldtrips.

420. USE AND INTERPRETATION OF AERIAL PHOTOGRAPHS. Five laboratory periods. Prerequisites: Four or more quarters of forestry or agriculture, or Geography 350 and one other 300 level course, or permission of the instructor. *Mr. Barnes* or *Mr. Avery.*

Theory and procedures in use of aerial photos for mapping, planning, terrain and contour identification, forest and vegetation identification. Procedures in correction of photo errors, for preparation of base-maps. Training in use of standard photogrammetric instruments, and in planning of photo-reconnaissance of sample areas.

422. ADVANCED PHOTOGRAMMETRY LABORATORY. Five laboratory periods. Prerequisite: Geography 420 or equivalent. *Mr. Avery.*

Laboratory instruction on individualized photogrammetric problems related to the major interests of the students. Mastery of advanced photogrammetric instruments.

425. FIELD METHODS IN GEOGRAPHY. 3 hours. Prerequisites: 15 hours in Geography courses numbered above 200 including Geography 350, plus at least a B average in junior-senior major courses. *Mr. Woodruff.*

Methods in measurements, observation, recording, and synthesis of field data. Field analysis of all features in one small type-area required, including completed maps and written report in which recorded data are correlated and synthesized.

429. SPECIAL PROBLEMS IN AREA ANALYSIS. 3 hours. Prerequisite: Fifteen hours in courses numbered above 300 in Geography. Approval of instructor concerned, and head of department, must be obtained for admission to this course *prior* to registration. *Mr. Prunty* and *The Staff.*

476. VEGETATION IN NORTH AMERICA. (Botany 476). *Mr. Plummer.*

802. QUANTITATIVE METHODS IN AREA ANALYSIS. 3 hours. *Mr. Barnes* and *The Staff.*

Cartographic and other quantitative procedures in analysis of occupance, settlement, and physical land types. Procedures and contemporary problems. Required for all graduate majors.

812-813-814. PROBLEMS OF CLIMATE AND WATER RESOURCES. 3 hours each. Prerequisite: Geography 401 or 404. *Mr. Shear.*

Advanced problems in climatology and water resources. Topics and areas involved may vary.

816-817-818. PROBLEMS IN GEOMORPHOLOGY. 3 hours each. Prerequisite: Geography 402. *Mr. Woodruff.*

Advanced problems in geomorphology — physiography. Topics and areas may vary.

821. ADVANCED PROBLEMS IN CARTOGRAPHY. Two lecture and three laboratory periods. Prerequisite: Geography 350 or 420, or equivalent background, plus other advanced course work in Geography. *Mr. Barnes.*

Cartographic problems in projections, design, reproduction. Application of cartographic processes to regional analysis. Problems in photogrammetric control in cartographic compilation. Selected current research problems.

GEOLOGY*

(Geography, Geology and Mathematics Building, South Campus)

Head: Hurst. Staff: Hamblin, Henry, Hoyt, Pilkey, Ramspott, Salotti.

125. ELEMENTS OF GEOLOGY (PHYSICAL). Three lectures and two laboratory periods. *Mr. Salotti* or *Mr. Ramspott.*

Fundamentals of physical geology. Nature and origin of minerals and rocks. Agents of erosion, development of land forms, sedimentation, vulcanism, metamorphism, origin of mountains.

*Students will be held responsible for breakage in laboratory courses.

126. ELEMENTS OF GEOLOGY (HISTORICAL). A continuation of Geology 125. Three lectures and two laboratory periods. *Mr. Hamblin* or *Mr. Henry.*

Methods by which earth history is interpreted. Geologic history of North America by areas. Time scale. Evolution of plant and animal kingdoms.

320. DETERMINATIVE MINERALOGY. 3 hours. Three laboratory periods. Prerequisites: Geology 125 and Chemistry 121-122. *Mr. Hurst* or *Mr. Salotti.*

Systematic identification and classification of minerals, their rock-associations, modes of occurrence. Procedures in mineralogical analysis.

321. MINERALOGY AND CRYSTALLOGRAPHY. Two lecture and three laboratory periods. Prerequisites: Geology 125, Chemistry 121-122 and Mathematics. 210. *Mr. Hurst* or *Mr. Salotti.*

Physical and chemical properties of minerals, their rock-associations, modes of occurrence, industrial uses. Properties of crystals, crystal systems and geometrical characteristics.

323. PETROLOGY. Two lecture and three laboratory periods. Prerequisite: Geology 321. *Mr. Ramspott.*

Characteristics of the common igneous, sedimentary, and metamorphic rocks. Their classification and field identification.

332. STRUCTURAL GEOLOGY. Two lecture and three laboratory periods. Prerequisite: Mathematics 210. *The Staff.*

Geologic structures and their recognition in the field. Framework of the earth's crust; origin of mountains, continents, oceans. Physical properties and behavior of rocks; solution of structural problems.

403. INVERTEBRATE PALEONTOLOGY. Three lectures and two laboratory periods. Prerequisites: Geology 126 and Zoology 225 or approval of instructor. *Mr. Hamblin* or *Mr. Henry.*

Study of fossil invertebrates emphasizing relationships in anatomical structures of living and extinct types. Classification. Geologic history of all invertebrate phyla.

405. SEDIMENTATION AND STRATIGRAPHY. Two lectures and three laboratory periods. Prerequisites: Geology 321 and Geology 323. *Mr. Hamblin.*

The origin and distribution of Sedimentary rocks. Environmental conditions involved in the transportation and deposition of sediments. Vertical sequences and lateral correlations in layered rocks. Typical stratigraphic associations.

407. GEOLOGY OF THE SOUTHERN STATES. Prerequisite: Geology 405. Three lectures and two laboratory periods. *The Staff.*

Structural and stratigraphic relationships in southern geology analyzed in terms of distribution, lithology, and their economic implications.

408. OPTICAL MINERALOGY. Three lectures and two laboratory periods. Prerequisite: Geology 321 or equivalent. *Mr. Hurst.*

The optical properties of minerals. Determination of minerals with the polarizing microscope. Introduction to universal stage techniques, point count, etch and stain methods.

409. MARINE GEOLOGY. Five lectures. Prerequisite: Geology 405. *Mr. Henry.*

Structure, physiography. Marine sediments and processes. Problems in marine geologic research.

410. SEDIMENTARY PETROLOGY. 3 hours. Three laboratory periods weekly. Prerequisites: Geology 405 and 408. *Mr. Hamblin.*

Megascopic and microscopic petrologic examination of sedimentary rocks. Relationships of their properties to environments during deposition; post-depositional history of the rocks.

411. PRINCIPLES OF GEOCHEMISTRY. 3 hours. Three lectures. Prerequisites: Chemistry 223, Physics 127-128, Geology 323. *Mr. Salotti.*

Composition of the earth. Distribution of elements in minerals and rocks. Principles governing the migration and concentration of elements. Introduction to nuclear geology and geochemical prospecting.

414. CRYSTALLOGRAPHY (MORPHOLOGICAL AND X-RAY). Three lectures and two laboratory periods. Prerequisites: Mathematics 254, Physics 128. *Mr. Hurst* and *Mr. Salotti.*

Symmetry elements, crystal projections, point groups, space groups, crystal systems, crystal notation, optical goniometry. Determination of cell dimensions and space group; X-ray powder methods, single crystal X-ray methods.

425. FIELD METHODS IN GEOLOGY. 3 hours. Prerequisites: 15 hours in Geology courses numbered above 200 plus at least a B average in junior-senior major courses. *The Staff.*

Geological field methods in preparation of geological maps.

430. CLAY MINERALOGY. 4 hours. Two lectures and two laboratory periods. Prerequisites: Geology 405, Geology 408, Chemistry 223, Mathematics 210. *Mr. Hurst.*

Structure and properties of clay minerals. Effects of environmental factors on their origin and uses. Identification of clay minerals by optical and X-ray methods.

500. GEOLOGY FOR TEACHERS. Lecture and demonstration. Five hours each week. Prerequisite: 20 hours physical and/or biological sciences, at least 5 of which must be chemistry. Graduate credit will be limited to candidates for the Master of Education degree. *The Staff.*

Cultural and practical aspects of earth study. Identification of common rocks and minerals. Geologic principles and processes; outline of earth's history.

501. PRINCIPLES OF SCIENCE FOR TEACHERS — EARTH SCIENCE. Three two-hour lecture-demonstration class sessions and two two-hour laboratory sessions each week, and a full-day trip on alternate weeks. This course in earth science is designed specifically for elementary and junior high school teachers of science.. *Not open to Geology Majors.*

810. PETROGRAPHY AND PETROLOGY OF IGNEOUS ROCKS. 3 hours. Three laboratory periods. Prerequisites: Geology 323 and 408. *Mr. Ramspott.*

Study of rocks in thin section. Interpretation of textures, structures, and mineral associations of igneous rocks.

811. PETROGRAPHY AND PETROLOGY OF SEDIMENTARY ROCKS. 3 hours. Three laboratory periods. Prerequisites: Geology 405 and 408. *Mr. Hamblin.*

Study of rocks in thin section. Interpretation of textures, structures, and mineral mineral associations of sedimentary rocks.

812. PETROGRAPHY AND PETROLOGY OF METAMORPHIC ROCKS. 3 hours. Three laboratory periods. Prerequisites: Geology 323 and 408. *Mr. Hurst.*

Study of rocks in thin section. Interpretation of textures, structures, and mineral associations of metamorphic rocks.

930. THESIS. 5-50 hours. *The Graduate Faculty.*

GERMAN

(See Modern Foreign Languages)

GREEK

(See Classics)

HISTORY

(LeConte Hall, North Campus)

Head: Parks. Staff: Coleman, Jones, Kennett, McPherson, Montgomery, Murdoch, Oliver, Smith, Tresp, Vinson, Wynes.

All students receiving a degree from the University of Georgia are required to pass an examination on the history of the United States and Georgia (given at the beginning of the freshman year) unless credit is presented in (1) History 100 or (2) History 351-352 or (3) History 459 and one other course in American History.

100. SURVEY OF AMERICAN HISTORY. (Not open to students who have credit for either History 351 or History 352). *The Staff.*

This course is designed to satisfy the state law requiring that all students receiving degrees shall pass an examination on the history of the United States and of Georgia.

1979–1981:

planning and decision-making. The ecosystem concept in the basic framework for the course, and the major ecosystems of the earth are viewed as discreet resources.

416. Cartographic Design and Reproduction. 5 hours. Three lectures and two lab periods.
Prerequisite: GGY 350 or consent of instructor.
Principles of design, readings from the literature, map reproduction methods and their effects on design. Practice in the production of thematic maps from the collection of data to their final form; use of advanced instruments.

419. Computer-Assisted Cartography and Graphics. 5 hours.
Prerequisite: GGY 350.
Introduction to the theory and application of computer technology in the preparation of thematic maps and other graphics. Emphasis is placed on the creation, analysis, and display of statistical surfaces. Students experiment with existing computer mapping programs and develop their own cartographic software in certain instances.

420. Use and Interpretation of Aerial Photographs. 5 hours. Three lectures and two lab periods.
Prerequisite: Four or more quarters of forest resources or agriculture, or GGY 350, or permission of instructor.
Principles of air photo interpretation and photogrammetry. Use of photos and photogrammetric instruments in planimetric, topographic and type mapping; in remote-sensing; in making measurements and inventories; in sampling; and in planning. Emphasis on interpretation of terrain, vegetation and culture.

422. Advanced Photogrammetry. 3–5 hours.
Prerequisite: GGY 420.
Directed work on photogrammetric problems related to the interests of individual students. Mastery of photogrammetric techniques and instruments.

423. Remote Sensing of Environment. 5 hours.
Prerequisite: PCS 128, GGY 420, or permission of instructor.
A consideration of the principles of remote sensing with emphasis on aerospace applications in the natural sciences. A review of fundamental properties of the electromagnetic spectrum followed by studies of remote sensing devices such as multispectral cameras, thermal infrared line scanners, and television and radar imaging systems. The course is oriented toward the particular interest of participating students.

425. Field Methods in Physical Geography. 4 hours.
Prerequisite: 15 hours in geography courses numbered above 200 including GGY 350, plus at least a B average in junior-senior major courses.
Methods of measurements, observation, recording, and synthesis of field data. Field analysis of all features in one small type-area required, including completed maps and written report in which recorded data are correlated and synthesized. Required for all graduate majors.

429. Special Problems in Area Analysis. 3–5 hours.
Prerequisite: 15 hours in courses numbered above 300 in geography. Approval of instructor concerned, and head of department, must be obtained for admission to this course prior to registration.

GEOLOGY (GLY)

The major in Geology includes at least 40 quarter-hours of Geology courses. Required Geology courses are GLY 321, 323, 332, 403, 404, 405, 408, and either 425 or 426; the remaining major hours—and some elective hours—can be fulfilled by any of the other Geology courses. CHM 121 and 122, PCS 127 and 128, MAT 254 or STA 421, and a Geology field course are specific requirements; since CHM 121 and GLY 125 and 126 are prerequisites to some major courses, they are best taken during the student's freshman or sophomore year.

105. Geology for Elementary Teachers. 5 hours.
A self-paced, modular course. A laboratory centered study of basic principles in geology designed for prospective elementary school teachers. The course utilizes modular and self-paced instruction. Enrollment is limited to students in the College of Education majoring in Early Childhood, Middle School, or Elementary Education.

125. Elements of Geology (Physical). 5 hours. Three lectures and two lab periods.
Fundamental principles of physical geology: the nature and origin of rocks and minerals; the mechanisms and processes of vulcanism, metamorphism, weathering, erosion, soil formation, sedimentation and glaciation; how landforms evolve. The tectonic processes of continental drift, sea-floor spreading and plate-tectonics are discussed and their effects throughout geologic history are evaluated.

126. Elements of Geology (Historical). 5 hours. Three lectures and two lab periods.
A continuation of GLY 125. Methods by which

earth history is interpreted. Geologic history of North America. Time scale. Evolution of plant and animal kingdoms.

235H. Physical Geology (Honors). 5 hours. Three lectures and two lab periods. Not open to students with credit in GLY 125.
Nature and origin of minerals and rocks. Physical processes that shape the earth; gradation, deposition, vulcanism, glaciation, weathering, rock deformation, mountain building, and metamorphism. Mineral resources.

236H. Historical Geology (Honors). 5 hours. Three lectures and two lab periods. Not open to students with credit in GLY 126.
A continuation of GLY 235H. Age of the earth; geologic time scale. Fossils, evolution and faunal succession. Organizing the stratigraphic record. History of the earth as recorded in rocks. Evolution of North America and the development of life on earth.

301. Gems and Gem Materials. 5 hours.
Gem materials; historical, cultural, mineralogical, technological and scientific aspects. The identification and evaluation of gems.

302. Mineral Resources and the Environment. 5 hours. Five lectures plus field trips.
Historical influence of mineral resources. Energy resources and domestic energy policy. Mineral economics, environmental problems and sufficiency of mineral resources. Resource recovery and future mineral technologies.

303. Elementary Oceanography. 5 hours.
Introduction to oceanography, especially its geologic and biologic aspects. Origin, development and major physiochemical properties of marine waters, basins, sediments, and mineral resources. Classification of marine environments. Overview of interdisciplinary relationships. This course may not be used in sequence to satisfy the physical science requirement for the A.B. degree.

304. History of Life. 5 hours. Five lectures plus field trips.
The record of fossils. Past and present diversity of life. Evolutionary development and geologic history of plants and animals. Broad features of ancient marine and terrestrial environments and their effects on the life of the past. Not open to geology majors. (Spring quarter)

321. Introduction to Mineralogy and Crystallography. 5 hours. Two lectures and three lab periods.
Prerequisite: CHM 121.
Physical and chemical properties of minerals, their rock-associations, modes of occurrence, industrial uses. Properties of crystals, crystal systems and their geometrical characteristics.

323. Petrology. 5 hours. Two lectures and three lab periods.
Prerequisite: GLY 321.
Characteristics of the common igneous, sedimentary, and metamorphic rocks. Their classification and field identification.

332. Structural Geology. 5 hours. Four lectures and one lab period.
Prerequisite: GLY 125; 323 recommended.
Geologic structures and their recognition in the field. Framework of the earth's crust; origin of mountains, continents, oceans. Physical properties and behavior of rocks; solution of structural problems.

403. Invertebrate Paleontology. 5 hours. Three lectures and two lab periods.
Prerequisite: GLY 126 or BIO 102.
Principles of invertebrate paleontology. Study of fossil specimens, emphasizing relationships between living and extinct marine organisms. Classification and history of major invertebrate phyla.

404. Geology Seminar. 1–6 hours.
Reviews and discussions of classical studies; lectures on current research, new developments. Special lectures by visiting scientists.

405. Sedimentation and Stratigraphy. 5 hours. Three lectures and two lab periods.
Prerequisite: GLY 126; 323 recommended.
The origin and distribution of sedimentary rocks. Environmental conditions involved in the transportation and deposition of sediments. Vertical sequences and lateral correlations in layered rocks. Typical stratigraphic associations.

407. Geology of the Southern States. 5 hours. Three lectures and two lab periods.
Prerequisite: GLY 125 and 126.
Structural and stratigraphic relationships in southern geology, analyzed in terms of distribution, lithology, and economic implications.

408. Optical Mineralogy. 5 hours. Three lectures and two lab periods.
Prerequisite: GLY 321 or equivalent.
Determination of the optical properties of minerals with the petrographic microscope. Identification of the common rock-forming minerals using oil immersion and thin-section techniques. Introduction to the petrographic description of rocks.

409. Marine Geology. 5 hours.
Prerequisite: GLY 125 and 126.
Study of the geologic aspects of ocean basins, including morphology, sedimentation processes, and mode of origin.

411. Principles of Geochemistry. 3 hours. Three lectures.
Prerequisite: CHM 122, PCS 128, and GLY 323.
Composition of the earth. Distribution of elements in minerals and rocks. Principles governing the migration and concentration of elements. Introduction to nuclear geology and geochemical prospecting.

414. X-Ray Crystallography. 5 hours. Three lectures and two lab periods.
Prerequisite: MAT 253.
Symmetry elements, crystal projections, point groups, space groups, crystal systems, crystal notation, optical goniometry. Determination of cell dimensions and space group; X-ray powder methods, single crystal X-ray methods.

415. Applied Oceanography. 5 hours. Lectures and field excursions.
Prerequisite: CHM 121, PCS 127, MAT 253.
Examination of physical, chemical, geological and biological aspects of marine environments, emphasizing the application of principles and methods of solving specific problems in marine science. Lectures, data analysis and field trips focus upon research problems currently being investigated in Georgia waters.

422. Hydrogeology. 5 hours.
Prerequisite: GLY 125 and 126 or equivalent.
The hydrologic cycle and review of the quantitative treatment of its elements. Quantitative methods for ground-water flow, open-channel flow, sediment transport, channel characteristics, and drainage networks. Introduction to water chemistry and quality. Water as a resource. (Surface hydrography is covered in detail in FRS 411/611.)

425. Field Methods in Geology. 2 hours.
Theory and practice of field measurement, large scale planimetric and topographic mapping, and grid surveying. Graphic presentation of field data.

426. Geologic Mapping of Saprolite. 3 hours.
Prerequisite: GLY 323.
The weathering processes of saprolitization. The recognition of parent rock by the field examination of saprolite. Geologic mapping in deeply weathered terrains. Preparation of a geologic map.

427. Geology Field School. 5 hours. Five field weeks in June and early July.
Prerequisite: GLY 321, 323, 332; GLY 405 recommended.
Introduction to geologic mapping techniques: training in the use of aerial photographs, topographic maps, and stereographic projections; basic methods of description and measurement of stratigraphic sections. Regional geologic settings stressed through reports which accompany field maps.

430. Clay Mineralogy. 4 hours. Three lectures and one lab period.
Prerequisite: GLY 321, 405; CHM 121.
Structures and properties of clay minerals. Effects of environmental factors on their origin and uses. Identification of clay minerals by optical and X-ray methods.

431. Metallic Ore Deposits. 5 hours. Five lectures plus field trips.
Prerequisite: GLY 321 and 332.
Classification and origin of metallic ore deposits; relationships between mineral deposits and host rocks; ore controls. Discussion of the major deposits of base metals, precious metals and ferrous metals.

432. Industrial Rocks and Minerals. 5 hours. Four lectures, one lab period plus field trips.
Prerequisite: GLY 321 and 332.
Classification and origin of industrial rocks and minerals. Relationships between deposits and formative geologic processes. Emphasis on resources important in domestic and international trade. Economics of exploration and development.

435. Geochemistry and Petrology of Ore Deposits. 5 hours. Three lectures and two lab periods.
Prerequisite: CHM 121; GLY 434.
Applications of geochemistry and isotope geology to problems of ore deposits. Petrology of major classes of ore deposits.

436. Exploration and Evaluation of Ore Deposits. 5 hours. Four lectures and one lab period.
Prerequisite: GLY 321 and 332.
Exploration methods. Surface expression of buried ore deposits. Planning of drilling programs. Computation and presentation of ore reserves. Exploitation methods. Mine valuation and financing.

437. Geostatistics. 5 hours. Four lectures and one lab period.
Prerequisite: STA 200 or 421.
Statistics applied to geology. Distributions, sampling, inference, analysis of variance distributions and transformations, geological sampling, variability in geological data.

438. Geology of Energy Resources. 5 hours. Four lectures, one lab period plus field trips.
Prerequisite: GLY 332 and 405.
Origin and occurrence of principal geologic energy resources: petroleum, coal and uranium. Discussion of tar sands, oil shale, synthetic hydrocarbons from coal and geothermal steam. Emphasis on major deposits, reserves, explora-

tion practices, production methods, economics and environmental considerations. Domestic energy policy.

441, 442, 443. Introduction to Research. (Field to be inserted). 2–5 hours credit each.
A. Mineralogy
B. Geochemistry
C. Geophysics
D. Oceanography
E. Petrography
F. Petrology
G. Stratigraphy
J. Paleontology
K. Palynology
An introduction to the literature of geology, research procedures and instrumental techniques.

444. Principles of Chemical Mineralogy. 5 hours.
Prerequisite: CHM 122; MAT 254; PCS 128.
The study and application of thermochemical principles and methods to problems in mineralogy, petrology, and geochemistry.

445. Geochronology and Isotope Geology. 5 hours. Three lectures and two lab periods.
Prerequisite: CHM 122.
Introduction to the theory and application of age determination of natural materials. Application of isotopes as tracers in natural processes and as geothermometers.

451. Micropaleontology. 5 hours. Three lectures and two lab periods.
Prerequisite: GLY 126 or BIO 102.
Morphology and systematics of principal groups of animal microfossils. Stratigraphic, paleoecologic, and phylogenetic relationships, with particular emphasis on Foraminifera.

452. Introduction to Paleoecology. 5 hours. Four lectures and one lab period.
Prerequisite: GLY 403 or equivalent.
Study of factors governing the abundance and distribution of ancient organisms, with emphasis on marine invertebrates. Comparisons with ecology of extant organisms. Survey of ecological principles, adaptation of organisms, and environmental parameters. Preservability and taphonomy of organisms. Paleoecology as a tool in sedimentary geology.

453. (ZOO) Vertebrate Paleontology. 5 hours. Three lectures and two lab periods plus field trips.
Prerequisite: ZOO 226 or GLY 126.
The evolution of vertebrate animals as seen in the fossil record, with emphasis on their relationships, ecology, and functional morphology.

460. Solid Earth Geophysics. 5 hours.
Prerequisite: GLY 323; PCS 128, or equivalent; and MAT 254.
Application of the principles of physics to understanding the dynamic and bulk properties of the solid earth. Topics covered include earthquake seismology, geology, geomagnetism, the thermal history of the earth, and the composition and state of the earth's interior.

461. Planetary Geology. 4 hours. Two lectures, one seminar, and one lab period.
Prerequisite: GLY 323 and 332.
Geology of the moon and extraterrestrial planets: composition, structure, planetary geological processes, origin, and history. Literature and techniques of astrogeology.

462. Exploration Geophysics. 5 hours. Three lectures and two lab periods.
Prerequisite: GLY 323 and 332, MAT 254, and PCS 128.
Application of the principles of geophysics to determine the presence and extent of economically valuable deposits of minerals or energy sources beneath the earth's surface. The course covers gravity, seismic reflection and refraction, magnetic, and electrical techniques, as well as geothermal exploration.

463. Photogeology. 4 hours. Two lectures and two lab periods.
Prerequisite: GLY 323, 332; GGY 420/620; recommended—GLY 405/605.
Advanced principles of photogeology. Geologic interpretations and measurements from aerial photography. An introduction to geologic interpretation of color photography and spacecraft imagery of planetary surfaces.

496H, 497H, 498H. Independent Reading and/or Projects. 5 hours each.
These courses afford Honors students of senior division standing the opportunity to engage in individual study, reading or projects under the direction of a project director who must be an assistant professor or higher.

499H. Honors Thesis. 5 hours.
This course provides opportunity for an Honors student to undertake individual research in the field of his major or in a closely related field.

500. Geology for Teachers. 5 hours. Lecture and demonstration.
Prerequisite: 20 hours physical and/or biological sciences, at least 5 of which must be chemistry. Not open to Geology majors.
Cultural and practical aspects of earth study. Identification of common rocks and minerals. Geologic principles and processes; outline of earth's history.

501. Principles of Science for Teachers— Earth Science. 5 hours. Three 2-hour lecture-demonstration class sessions each week, and a full-day trip on alternate weeks.
This course in earth science is designed specifically for elementary and junior high school teachers in science. Not open to Geology majors.

520. (LAR) Environmental Geology. 5 hours. Four lectures and one lab period plus field trips. Discussion of geologic materials and processes with an emphasis on environmental interpretation for planning, land use and construction practices. Role of water, geologic hazards and geotechnical inputs to environmental-impact assessment. Site evaluation, sequential land use, mined-land reclamation and waste management. Course not open to Geology major or Geology graduate students.

GERMANIC AND SLAVIC LANGUAGES

A student continuing a language taken in high school will be placed in the appropriate course on the basis of scores on the College Entrance Examination Board Scholastic Achievement Tests and other pertinent information.
No student may receive credit for any course which is a prerequisite to a course for which he has already received college credit. Exception may be made only by the head of the department.
Majors in German or Germanic and Slavic Languages must satisfy the relevant Bachelor or Arts Degree requirements of the Franklin College of Arts and Sciences as defined in this Bulletin.
Opportunity for study at the University of Erlangen/Nürnberg in Germany is offered under the University System of Georgia Studies Abroad Program every summer. German 410, German 420 or equivalents, and one other course are usually offered.

German (GER)

Any course numbered below 200 is considered elementary and will not count toward the minimum of 20 hours required to major in language. GER 103 and higher numbered courses are conducted largely in German.

101, 102. Elementary German. 5 hours each.
Fundamentals of grammar, pronunciation, conversation, composition, reading, and translation. Addtional language laboratory work required.

103. Intermediate German. 5 hours.
Prerequisite: GER 102 or two entrance units in German.
Grammar, reading and translation of intermediate texts, composition, and conversation. Additional language laboratory work required.

104. Intermediate German. 5 hours.
Prerequisite: GER 103.
Readings in modern German prose, composition and conversation. Additional language laboratory work available.

114H. German: Accelerated Intermediate German. 5 hours.
The course reviews the grammar and emphasizes conversation, composition and reading ability. German is the language of instruction.

145. German Diction. 1 hour.
Prerequisite: Permission of instructor.
A study of German pronunciation, with special emphasis on the fundamentals of German phonetics and sound production as applied to reading and singing. Primarily for voice majors.

201. Introduction to German Literature I. 5 hours.
Prerequisite: GER 104 or equivalent. May be taken before or after GER 202.
A study of the main literary movements and representative works before 1900 in the original language.

202. Introduction to German Literature II. 5 hours.
Prerequisite: GER 104 or equivalent. May be taken before or after GER 201.
A study of the main literary movements and representative works of the 20th Century in the original language.

210. Conversation and Composition. 5 hours.
Prerequisite: GER 104 or equivalent.

310. Literature and German Culture. 5 hours.
Prerequisite: GER 104 or permission of instructor.
The role of literature in the philosophical, political, and sociological trends of the 19th and 20th Centuries.

350. Techniques of Translation. 5 hours.
Prerequisite: Permission of instructor.
Review of grammar, idioms, and vocabulary; practice in translating moderately difficult technical and non-technical German texts into correct English.

360H. Early Heroic Literature. 5 hours.
The oldest northern European medieval literary movements studied as historical remnants from the Age of Migrations to the Viking Period, with influences from mythology and folklore.

809. Seminar in Bioclimatology. 3 hours.
Prerequisites: GGY 409/609 or permission of instructor.
Advanced problems in bioclimatology, including research design, applications of statistical methods, model building, and related methodology.

812, 813, 814. Directed Problems in Climate and Water. 3 hours each.
Prerequisite: GGY 401 or 404.
Advanced problems in climatology and water resources. Topics and areas involved may vary.

816, 817, 818. Directed Problems in Geomorphology. 3 hours each.
Prerequisite: GGY 400/600 and/or 402/602.
Advanced problems in geomorphology and physiography. Topics and areas under investigation may vary.

821. Advanced Problems in Cartography. 3 hours.
Prerequisite: GGY 802.
Special problems in the application of cartographic and related techniques to regional analysis. Emphasis on problems involving current research. Required of all graduate majors.

825. Problems in Remote Sensing of Environment I. 3 hours.
Prerequisite: GGY 420/620, 422/622, or 423/623.
Advanced problems in photointerpretation, photogrammetry and remote sensing. Topics and areas of investigation may vary. Emphasis on research and applications.

826. Problems in Remote Sensing of Environment II. 3 hours.
Prerequisite: GGY 825.
Advanced problems in photointerpretation, photogrammetry and remote sensing. Topics and areas of investigation may vary. Emphasis on research and applications.

827. Problems in Remote Sensing of Environment III. 3 hours.
Prerequisite: GGY 826.
Advanced problems in photointerpretation, photogrammetry and remote sensing. Topics and areas of investigation may vary. Emphasis on research and applications.

930. Thesis. 5–50 hours.

GEOLOGY (GLY)

F. Donald Eckelmann
(Geography-Geology-Speech Building, South Campus)

Doctoral language requirement: one or two foreign languages, at the discretion of the student's advisory committee, with the department responsible for determining proficiency in the second language.

The department offers instruction and opportunities for research in archaeological geology, economic geology, geochemistry, geophysics, hydrogeology, marine geology, mineralogy, paleontology-micropaleontology, petrology, stratigraphy-sedimentology, and other fields. Graduate programs leading to the M.S. and Ph.D. are individually arranged to fit each student and his/her background.

Facilities for graduate training and research include analytical and experimental laboratories containing X-ray diffraction and fluorescence equipment, emission and atomic absorption spectrographs, mass spectrometers, electron microscopes, and an electron microprobe. Special facilities include a stable isotope laboratory, a potassium-argon laboratory, a carbon-14 dating laboratory, a neutron activation analysis laboratory, paleontological and sedimentological laboratories, and laboratories for sample preparation, optical determination, and photomicroscopy. Geochemical laboratories house cold seal "bombs," high P-T large volume autoclaves and NBS type tetrahedral anvil. Geophysical laboratories house equipment for magnetic, compressibility, phase transformation, and gas-solid interaction studies, and for studies by triaxial stress techniques. The university's Marine Institute on Sapelo Island and the Skidaway Institute of Oceanography at Savannah provide facilities for research in marine geology. Companion facilities include the university computer center, electron microscopy laboratory, field vehicles, instrument shops, and rock, mineral, and fossil collections.

603. Invertebrate Paleontology. 5 hours.
Three lectures and two lab periods.
Prerequisite: GLY 126 or BIO 102.
Principles of invertebrate paleontology. Study of

fossil specimens, emphasizing relationships between living and extinct marine organisms. Classification and history of major invertebrate phyla.

604. Geology Seminar. 1–6 hours.
Reviews and discussions of classical studies, lectures on current research and new developments. Special lectures by visiting scientists.

605. Sedimentation and Stratigraphy.
5 hours. Three lectures and two lab periods.
Prerequisite: GLY 126, GLY 323 recommended.
The origin and distribution of sedimentary rocks. Environmental conditions involved in the transportation and deposition of sediments. Vertical sequences and lateral correlations in layered rocks. Typical stratigraphic associations.

607. Geology of the Southern States.
5 hours. Three lectures and two lab periods.
Prerequisite: GLY 405/605.
Structural and stratigraphic relationships in southern geology analyzed in terms of distribution, lithology, and their economic implications.

608. Optical Mineralogy. 5 hours. Three lectures and two lab periods.
Prerequisite: GLY 320 or 321.
Determination of the optical properties of minerals with the petrographic microscope. Identification of the common rock-forming minerals using oil immersion and thin section techniques. Introduction to the petrographic description of rocks.

609. Marine Geology. 5 hours. Four lectures and one lab period.
Prerequisite: GLY 125 and 126.
Study of the geologic aspects of ocean basins, including morphology, sedimentation processes, and mode of origin.

611. Principles of Geochemistry. 3 hours.
Prerequisite: CHM 122, PCS 128, and GLY 323.
Composition of the earth. Distribution of elements in minerals and rocks. Principles governing the migration and concentration of elements. Introduction to nuclear geology and geochemical prospecting.

612. Palynology. 5 hours. Three lectures and two lab periods.
Prerequisite: GLY 126, BIO 102, or approval of instructor.
The application of pollen and spore analysis of geological, botanical, ecological, aerobiological, and archaeological studies with practical experience in extraction, identification and interpretation of pollen and spore diagrams.

613. Paleobotany. 5 hours. Three lectures and two lab periods.
Prerequisite: GLY 126, BIO 102 or approval of instructor.
Phylogeny and taxonomy of fossil plants with emphasis on their use in stratigraphic, paleoclimatic and paleoecological studies.

614. X-Ray Crystallography. 5 hours. Three lectures and two lab periods.
Prerequisite: MAT 253.
Symmetry elements, crystal projections, point groups, space groups, crystal systems, crystal notation, optical goniometry. Determination of cell dimensions and space group, X-ray powder methods, single crystal X-ray methods.

615. Applied Oceanography. 5 hours.
Lectures; field excursions.
Prerequisites: MAT 253, PCS 127, CHM 121.
Examination of physical, chemical, geological, and biological aspects of marine environments, emphasizing the application of principles and methods of solving specific problems in marine science. Textures, data analysis, and field trips focus upon research problems currently being investigated in Georgia waters.

622. Hydrogeology. 5 hours. Four lectures and one lab period.
Prerequisite: GLY 125 and 126, or equivalent.
The hydrologic cycle and review of the quantitative treatment of its elements. Quantitative methods for ground-water flow, open-channel flow, sediment transport, channel characteristics, and drainage networks.

625. Field Methods in Geology. 2 hours. One lecture and one lab period.
Prerequisite: 15 hours in geology courses numbered above 200 plus at least B average in jr. sr. major courses.
Theory and practice of field measurement, large scale planimetric and topographic mapping, and grid surveying. Graphic presentation of field data.

626. Geological Mapping of Saprolite. 3 hours. One lecture and two lab periods.
Prerequisite: GLY 323.
The weathering processes of saprolitization. The recognition of parent rock by the field examination of saprolite. Geologic mapping in deeply weathered terrains. Preparation of a geologic map.

627. Geology Field School. 5 hours. Five weeks of field training arranged between end of Spring and start of Fall quarters.
Prerequisite: GLY 321, 323, 332; GLY 405 recommended.
Introduction to geologic mapping techniques; training in the use of aerial photographs, topographic maps, and stereographic projections; basic methods of description and measurement of stratigraphic sections. Regional geologic settings stressed through reports which accompany field maps. (Five field weeks in June and early July.)

630. Clay Mineralogy. 4 hours. Three lectures and one lab period.
Prerequisite: GLY 405, CHM 121; GLY 321.
Structure and properties of clay minerals. Effects of environmental factors on their origin and uses. Identification of clay minerals by optical and X-ray methods.

631. Metallic Ore Deposits. 5 hours. Five lectures plus field trips.
Prerequisite: GLY 321 and 332.
Classification and origin of metallic ore deposits; relationships between mineral deposits and host rocks; ore controls. Discussion of the major deposits of base metals, precious metals and ferrous metals.

632. Industrial Rocks and Minerals. 5 hours. Four lectures and one lab period plus field trips.
Prerequisite: GLY 321 and 332.
Classification and origin of industrial rocks and minerals. Relationships between deposits and formative geologic processes. Emphasis on resources important in domestic and international trade. Economics of exploration and development.

634. Mineralogy of Opaque Minerals. 2 hours. Two lab periods.
Prerequisite: GLY 408/608.
Physical and optical properties of opaque minerals. Identification of opaque minerals by mineragraphic methods—reflectivity, micro-hardness, and rotation properties.

635. Geochemistry and Petrology of Ore Deposits. 5 hours. Three lectures and two lab periods.
Prerequisite: CHM 121; GLY 634.
Applications of geochemistry and isotope geology to problems of ore deposits. Petrology of major classes of ore deposits.

636. Exploration and Evaluation of Ore Deposits. 5 hours. Four lectures and one lab period.
Prerequisite: GLY 321 and 332.
Exploration methods. Surface expression of buried ore depostis. Planning of drilling programs. Computation and presentation of ore reserves. Exploitation methods. Mine valuation and financing.

637. Geostatistics. 5 hours. Four lectures and one lab period.
Prerequisite: STA 200 or 421.
Statistics applied to geology. Distributions, sampling, inference, analysis of variance, distributions and transformations, geological sampling, variability in geological data.

638. Geology of Energy Resources. 5 hours. Four lectures and one lab period plus field trips.
Prerequisite: GLY 332 and 405.
Origin and occurrence of principal geologic energy resources: petroleum, coal and uranium. Discussion of tar sands, oil shale, synthetic hydrocarbons from coal and geothermal steam. Emphasis on major deposits, reserves, exploration practices, production methods, economics and environmental considerations. Domestic energy policy.

641, 642, 643. Introduction to Research in (Field to be inserted). 2–5 hours.
An introduction to the literature of geology, research procedures and instrumental techniques.
a. Mineralogy
b. Geochemistry
c. Geophysics
d. Oceanography
e. Petrography
f. Paleontology
k. Palynology

644. Principles of Chemical Mineralogy.
Prerequisite: CHM 122; MAT 254; PCS 128.
The study and application of thermochemical principles and methods to problems in mineralogy, petrology, and geochemistry.

645. Geochronology and Isotope Geology. 5 hours. Three lectures and two lab periods.
Prerequisite: CHM 122.
Introduction to the theory and application of age determination of natural materials; application of isotopes as tracers in natural processes and as geothermometers.

651. Micropaleontology. 5 hours. Three lectures and two lab periods.
Prerequisite: GLY 126 or BIO 102.
Morphology and systematics of principal groups of animal microfossils; stratigraphic, paleoecologic and phylogenetic relationships; with particular emphasis on Foraminifera.

652. Introduction to Paleoecology. 5 hours. Four lectures and one lab period.
Prerequisite: GLY 403 or equivalent.
Study of factors governing the abundance and distribution of ancient organisms, with emphasis on marine invertebrates. Comparison with ecology of extant organisms. Survey of ecologic principles, adaptations of organisms, and environmental parameters. Preservability and taphonomy of organisms. Paleoecology as a tool in sedimentary geology.

653. (ZOO) Vertebrate Paleontology. 5 hours. Three lectures and two lab periods.
Prerequisite: GLY 126 or ZOO 226.

The evolution of backboned animals as documented by the fossil record. Taxonomy and ecology of fossil vertebrates.

660. Solid Earth Geophysics.
Prerequisite: GLY 323, PCS 128 or equivalent, and MAT 254.
Application of the principles of physics to understanding the dynamics and bulk properties of the earth. Topics covered will include earthquake seismology, geodesy, geomagnetism, the thermal history of the earth, and the composition and state of the earth's interior.

661. Planetary Geology. 4 hours. Two lectures, one seminar, and one lab period.
Prerequisite: GLY 323 and 332.
Geology of the moon and extraterrestrial planets; composition, structure, planetary geological processes, origin, and history. Literature and techniques of astrogeology.

662. Exploration Geophysics. 5 hours. Three lectures and two lab periods.
Prerequisite: PCS 128, MAT 254, GLY 323 and 332.
Application of the principles of geophysics to determine the presence and extent of economically valuable deposits of minerals or energy sources beneath the earth's surface. The course will cover gravity, seismic reflection and refraction, magnetic, and electrical techniques.

663. Photogeology. 4 hours. Two lectures and two lab periods.
Prerequisite: GLY 323, 332; GGY 420/620; recommended—GLY 405/605.
Advanced principles of photogeology. Geologic interpretations and measurement from aerial photography. An introduction to geologic interpretation of color photography and spacecraft imagery of planetary surfaces.

700. Geology for Teachers. 5 hours. Lecture and demonstration.
Prerequisite: 20 hours physical and/or biological sciences, at least 5 of which must be chemistry. Graduate credit will be limited to candidates for the Master of Education degree.
Cultural and practical aspects of earth study. Identification of common rocks and minerals. Geologic principles and processes; outline of earth's history.

701. Principles of Science for Teachers—Earth Science. 5 hours. Three 2-hour lecture-demonstrations, two 2-hour laboratory sessions, and a full-day field trip on alternate weeks.
Designed specifically for elementary and junior high school teachers in science. Not open to geology graduate students.

720. (LAR) Environmental Geology. 5 hours. Four lectures and one lab period plus field trips.
Prerequisite: Enrolled in professional programs in LAR or permission of instructor.
Discussion of geologic materials and processes with an emphasis on environmental interpretation for planning, land use and construction practices. Role of water, geologic hazards and geotechnical inputs to environmental-impact assessment. Site evaluation, sequential land use, mined-land reclamation and waste management. (Course not open to geology majors or geology graduate students.)

801, 802, 803, 804. Advanced Topics in (Field to be inserted). 1–5 hours.
Intensive study under the direction of staff members on approved topics.

a. Mineralogy
b. Geochemistry
c. Geophysics
d. Oceanography
e. Ore Deposits
f. Palynology
g. Petrology
j. Sedimentation
k. Stratigraphy
m. Structural Geology
n. Paleontology

805. Advanced Stratigraphy. 3 hours.
Prerequisite: GLY 403 and 405.
Major concepts in lithostratigraphy and biostratigraphy. Paleozoic, Mesozoic and Cenozoic stratigraphic sequences in North America.

806. Advanced Sedimentology. 5 hours. Lectures and field trips.
Prerequisites: GLY 405, MAT 253, or equivalent.
Physical and mathematical analysis of sediment erosion, transport, and deposition, with application to ancient and modern sedimentary environments, mineral resources, and environmental problems. Basic fluid dynamics, dynamics and energetics of sediment transport, development of sedimentary structures, and depositional system models.

810, 811, 812. Petrography and Petrology. 810-Igneous, 811-Sedimentary; 812-Metamorphic. 3 hours each. Three lab periods.
Prerequisite: GLY 405 and 408.
Study of rocks in thin section. Interpretation of textures, structures, and mineral associations.

816. Advanced Igneous Petrology. 3–5 hours.
Prerequisite: GLY 444/644 and 810.
Mineral interactions in igneous rocks; phase transformations; thermodynamic parameters; element distribution and fractionation; isotopic distribution; acquisition and analysis of data

pertaining to the origin, intrusion, and crystallization of magmatic material.

817. Experimental Petrology. 3–5 hours.
Prerequisite: GLY 408/608 and 414/614 or 430/630.
Synthesis of minerals and rocks; high temperature-high pressure experimentation. Crystal growth.

820. Geotectonics. 3–5 hours.
Prerequisite: GLY 323, 333, 405 and permission of instructor.
Analyses of the geometry and global distribution of major tectonic features. Emphasis is on tectonic processes and the geological and geophysical evidence bearing on their origin. The role of such processes in the structural evolution of the Appalachians is evaluated through seminars and field trips.

821. Advanced Mineralogy.
Prerequisite: GLY 321 and 414/614.
Physical and chemical mineralogy of common silicates and sulfides. Solid solution series, stoichiometry, order-disorder and phase transitions in minerals. Crystal growth and crystal defects. Isomorphism and polymorphism.

822. Advanced Metamorphic Petrology. 3–5 hours.
Prerequisite: GLY 816.
Mineral interactions in metamorphic rocks as functions of pressure, temperature, and time; phase transformations; effects of environmental fluids and gases on metamorphic rock systems; exercises in data acquisition and analysis and calculations of thermodynamic parameters.

823. Structural Analysis of Metamorphic Tectonites. 5 hours. Three lectures and two lab periods, several field trips.
Prerequisite: GLY 332; recommended—GLY 812.
Interpretation of mesoscopic and megascopic structures of metamorphic tectonites. Field and laboratory methods for correlation of strain and three-dimensional geometric analysis. Examination of the temporal relationship between deformation and metamorphism.

825. Plate Tectonics. 3–5 hours.
Prerequisite: GLY 323, 332, 405/605, and at least three other senior division or graduate geology courses.
Orogenic belts and world rift system; physical properties, chemical composition, and mineralogy of the earth's mantle; structure and petrology of the earth's crust; geosynclines and the orogenic cycle; continental drift; paleomagnetism; polar wandering; sea floor spreading.

826. Geological Data Analysis. 3–5 hours.
Prerequisite: GLY 437/637.
Analysis of geological data with emphasis on statistical methods. Geological trends; multivariate data analysis; ratios and variables of constant sum; problems in theoretical and applied geology.

830. Marine Paleoecology and Taphonomy. 5 hours. Lectures, laboratory work, and field trips; summer course.
Prerequisite: GLY 452 or ZOO 460 or equivalent.
Paleoecological significance of present-day marine organisms and their potential means of preservation as fossils. Field surveys of (1) living organisms, (2) the proportion of organisms potentially apt to be preserved as fossils, (3) the characteristic remains of dead organisms and how they accumulate, and (4) the degree to which the accumulated preservable remains may reflect original distributions. Course based at Skidaway Institute of Oceanography, Savannah.

831. Coastal Geology of Southeastern United States. 5 hours. Lectures and field trips; summer course.
Prerequisite: GLY 605 and 609.
Lectures and field studies on the geologic history and development of Quaternary coastal features of the Southeastern States. Field excursions to selected rock exposures and present-day depositional environments. Course based at Skidaway Institute of Oceanography, Savannah.

900. Research Problems in Geology. 1–5 hours.
Prerequisite: Permission of instructor.
This course permits students to pursue intensive study under the direction of the faculty on approved research problems in various fields of geology. Maximum credit of 50 hours, with no more than 10 hours credit with grade toward satisfying the requirements for any one degree.

930. Thesis. 5–50 hours.

2002-2003:

Course #	Course Title	Instructor	Avail	Cr Hrs	Days	Period Begin	Period End	Total Taken	Total Req	Bldg	Room
GEOL 1121	EARTH PROC & ENVIR	KELSON	Open	3.0	MWF	0905A	0955A	60	90	1002	0200A
GEOL 1121	EARTH PROC & ENVIR	CROWE	Open	3.0	TR	1230P	0145P	123	200	1003	202
GEOL 1121	EARTH PROC & ENVIR	WYLD	Open	3.0	TR	1100A	1215P	88	90	1002	0200A
GEOL 1121	EARTH PROC & ENVIR	PATINO-DOUCE	Open	3.0	MWF	0125P	0215P	81	90	1002	0200A
GEOL 1121	EARTH PROC & ENVIR	WRIGHT	Open	3.0	TR	0200P	0315P	82	90	1002	0200A
GEOL 1121	EARTH PROC & ENVIR	PATINO-DOUCE	Open	3.0	MWF	1220P	0110P	86	90	1002	0200A
GEOL 1121	EARTH PROC & ENVIR	SCHROEDER	Full	3.0	MWF	1115A	1205P	25	25	1002	325
GEOL 1121	EARTH PROC & ENVIR	RODEN	Open	3.0	MWF	1010A	1100A	48	65	1001	553
GEOL 1122	HIST GLOBAL CHANGE	FREEMAN-LYND	Open	3.0	MWF	1010A	1100A	50	90	1002	0200A
GEOL 1122	HIST GLOBAL CHANGE	RAILSBACK	Open	3.0	TR	0930A	1045A	29	90	1002	0200A
GEOL 1250	PHYSICAL GEOLOGY	HAWMAN	Open	4.0	TR	0930A	1045A	9	30	1002	143
GEOL 1121	EARTH PROC & ENVIR	KELSON	Open	3.0	MWF	1220P	0110P	67	90	1002	0200A
GEOL 1121	EARTH PROC & ENVIR	CROWE	Open	3.0	TR	1230P	0145P	88	90	1002	0200A
GEOL 1121	EARTH PROC & ENVIR	PATINO-DOUCE	Open	3.0	MWF	0230P	0320P	87	90	1002	0200A
GEOL 1121	EARTH PROC & ENVIR	WENNER	Open	3.0	TR	0930A	1045A	67	90	1002	0200A
GEOL 1121	EARTH PROC & ENVIR	DALLMEYER	Open	3.0	TR	0200P	0315P	23	90	1002	0200A
GEOL 1121	EARTH PROC & ENVIR	NZENGUNG	Open	3.0	TR	0800A	0915A	16	90	1002	144
GEOL 1122	HIST GLOBAL CHANGE	PATINO-DOUCE	Open	3.0	MWF	1010A	1100A	28	90	1002	0200A
GEOL 1122	HIST GLOBAL CHANGE	HOLLAND	Open	3.0	TR	0930A	1045A	23	25	1002	218
GEOL 1122	HIST GLOBAL CHANGE	PATINO-DOUCE	Open	3.0	MWF	1115A	1205P	39	90	1002	0200A
GEOL 1250	PHYSICAL GEOLOGY	PATINO-DOUCE	Open	4.0	MWF	1115A	1205P	12	30	1002	143
GEOL 3010	EARTH MATERIALS	CROWE	Open	4.0	MW	0905A	0955A	19	24	1002	325
GEOL 3020	SURF&NEAR-SURF PROC	GARRISON	Open	4.0	TR	0930A	1045A	7	20	1002	144
GEOL 3090	GEMS/GEM MATERIALS	PATINO-DOUCE	Open	3.0	TR	0200P	0315P	20	21	1002	327
GEOL 3030	ELEM OCEANOGRAPHY	RAILSBACK	Open	3.0	MWF	0125P	0215P	60	61	1002	0200A
GEOL 3120	GEOLOGIC HAZARDS	DALLMEYER	Open	3.0	R	0200P	0445P	6	40	1002	143
GEOL 3150	COASTAL PROC & CONS	DALLMEYER	Open	3.0	F	0230P	0425P	6	40	1002	143
GEOL 3220	WATER ISSUES IN GA	WENNER	Open	3.0	TR	1230P	0145P	22	25	1002	143
GEOL 3350	DINOSAURS	FREEMAN-LYND	Full	3.0	TR	1100A	1215P	98	95	1002	0200A
GEOL 4020	INTERNAL PROCESSES	PATINO-DOUCE	Open	3.0	MW	0905A	0955A	12	15	1002	327
GEOL 4060	STRUCTURAL GEOLOGY	WRIGHT	Open	4.0	W	0125P	0425P	10	25	1002	325
GEOL 4090	MARINE GEOLOGY	FREEMAN-LYND	Open	3.0	MWF	1010A	1100A	10	25	1002	143
GEOL 4110	PRIN OF GEOCHEM	RODEN	Open	3.0	TR	0930A	1045A	3	20	1002	144
GEOL 4340	ARCHAEOMETRY	GARRISON	Open	3.0	TR	1100A	1215P	14	20	1002	143
GEOL 4500	SEDIMENTARY GEOLOGY	HOLLAND	Open	3.0	T	1230P	0315P	9	25	1002	327
GEOL 4520	PALEOECOLOGY	WALKER	Open	3.0	TR	1230P	0315P	4	30	1002	218
GEOL 4950	GEOLOGY SEMINAR	DALLMEYER	Full	1.0	R	0330P	0445P	16	16	1002	0200A
GEOL 4010	LIFE ENVT&ECOLOGY	WALKER	Open	4.0	MW	1220P	0110P	10	25	1002	218
GEOL 4220	HYDROGEOLOGY	DOWD	Open	3.0	MWF	1115A	1205P	37	50	1002	0200A
GEOL 4300	IGN & MET PETROLOGY	PATINO-DOUCE	Open	3.0	AR			5	18	1002	327
GEOL 4370	GEOSTATISTICS	HOLLAND	Open	3.0	TR	0930A	1045A	14	20	1002	VR
GEOL 4600	SOLID EARTH GEOPHYS	HAWMAN	Open	3.0	MWF	1010A	1100A	7	10	1002	143
GEOL 4670	ENV INST ANAYLSIS	WENNER	Open	3.0	WF	0125P	0215P	2	10	1002	144
GEOL 4700	ARCHAEO GEOLOGY	GARRISON	Open	3.0	TR	1230P	0145P	51	60	1002	0200A
GEOL 4750	EARTH SCI MID SCH	SWANSON	Open	4.0	MWF	1220P	0215P	18	25	1060	215
GEOL 4950	GEOLOGY SEMINAR	CROWE	Open	1.0	R	0330P	0445P	12	30	1002	0200A
GEOL 8120	PALEOBIODIVERSITY	WALKER	Open	3.0	M	0230P	0530P	7	25	1002	218
GEOL 8180	SANDSTONE PETROLOGY	RAILSBACK	Open	3.0	MWF	0800A	0850A	4	25	1002	327
GEOL 8270	CONTINENTAL TECTON	WYLD	Open	3.0	TR	0200P	0315P	1	15	1002	202
GEOL 8700	PHYSICAL HYDROGEOL	DOWD	Open	3.0	TR	1100A	1215P	1	25	1002	325
GEOL 8150	EARTH SURF GEOCHEM	RAILSBACK	Open	3.0	TR	0800A	0915A	6	40	1002	143
GEOL 8160	ADV IGNEOUS PETROL	RODEN	Open	3.0	TR	1230P	0145P	3	25	1002	306
GEOL 8460	ISOTOPE GEOCHEM	CROWE	Open	3.0	R	0930A	1045A	8	25	1002	325
GEOL 8740	HYDROLOGIC MODELS	DOWD	Open	3.0	VR			6	20	1002	VR

Courses listed in the schedule of classes in Fall Semester 2002 and Spring Semester 2003 (the earliest listings available when such listings were accessed in 2021). Courses are sorted by number here only at the level of thousands. Lab sections and readings or research courses are not included. 6000-level analogs of 4000-level courses are not included (and thus enrollments may have been greater than as listed here). Honors courses are not distinguished from non-honors courses and can only be inferred from room numbers and class sizes. "Total taken" and "total req" are seats filled and seats both filled and unfilled. Goldstein was Head and Roden was Associate Head. The number of classes shown is fifty-two.

2019-2020:

SUBJECT	COURSE NO	TITLE	DEPARTMENT						CLS	SEATS
CRN SEC	STAT	CREDIT HRS	DAYS	TIME	BLDG	ROOM	INSTRUCTOR		SIZE	AVL
GEOL	**1120**	**Environmental Geoscience**	**Geology**							
52962 0	A	3.0 - 3.0	T R	03:30 pm-04:45 pm	1002	0200A	Garing		87	68
52970 0	A	3.0 - 3.0	T R	09:30 am-10:45 am	1002	0200A	Nzengung		87	66
GEOL	**1121**	**Earth Proc and Envir**	**Geology**							
22288 0	A	3.0 - 3.0	T R	02:00 pm-03:15 pm	0081	0350	Crowe		88	17
35347 0	A	3.0 - 3.0	T R	03:30 pm-04:45 pm	0081	0214	Darling		88	79
45720 0	A	3.0 - 3.0	T R	11:00 am-12:15 pm	1002	0142	Patino-Douce		25	2
52971 0	A	3.0 - 3.0	M W F	12:20 pm-01:10 pm	1002	0200A	Pistone		87	58
52972 0	A	3.0 - 3.0	T R	02:00 pm-03:15 pm	1002	0142	Wright		20	1
GEOL	**1121H**	**Earth Proc and Envir**	**Geology**							
~~22501 0~~	~~A~~	~~3.0 - 3.0~~	~~T R~~	~~11:00 am-12:15 pm~~	~~1002~~	~~0327~~	~~Wright~~		~~20~~	~~0~~
GEOL	**1122**	**Earth's History Global Change**	**Geology**							
43857 0	A	3.0 - 3.0	T R	11:00 am-12:15 pm	1002	0200A	Goldstein		87	62
GEOL	**1250**	**Physical Geology**	**Geology**							
22289 0	A	4.0 - 4.0	T R	09:30 am-10:45 am	1002	0142	Patino-Douce		25	12
GEOL	**1260**	**Historical Geology**	**Geology**							
22344 0	A	4.0 - 4.0	T R	12:30 pm-01:45 pm	1002	0218	Walker		24	18
GEOL	**1121**	**Earth Proc and Envir**	**Geology**							
13782 0	A	3.0 - 3.0	T R	12:30 pm-01:45 pm	0056	0265	Darling		88	3
~~13797 0~~	~~A~~	~~3.0 - 3.0~~	~~T R~~	~~11:00 am-12:15 pm~~	~~1011~~	~~0104~~	~~Klimczak~~		~~100~~	~~0~~
34502 0	A	3.0 - 3.0	T R	02:00 pm-03:15 pm	1002	0200A	Patino-Douce		87	4
38889 0	A	3.0 - 3.0	T R	03:30 pm-04:45 pm	1002	0200A	Darling		88	49
GEOL	**1121H**	**Earth Proc and Envir**	**Geology**							
~~14146 0~~	~~A~~	~~3.0 - 3.0~~	~~T R~~	~~11:00 am-12:15 pm~~	~~1002~~	~~0325~~	~~Wright~~		~~26~~	~~0~~
GEOL	**1122**	**Earth's History Global Change**	**Geology**							
~~13799 0~~	~~A~~	~~3.0 - 3.0~~	~~T R~~	~~11:00 am-12:15 pm~~	~~1002~~	~~0200A~~	~~Railsback~~		~~88~~	~~0~~
35645 0	A	3.0 - 3.0	T R	09:30 am-10:45 am	1002	0200A	Railsback		88	37
GEOL	**1250**	**Physical Geology**	**Geology**							
13842 0	A	4.0 - 4.0	M W F	10:10 am-11:00 am	1002	0143	Hawman		36	1
GEOL	**3010**	**Earth Materials**	**Geology**							
14138 0	A	4.0 - 4.0	M W	12:20 pm-01:10 pm	1002	0325	Crowe		24	11
GEOL	**3020**	**Surficial Near-Surficial Proc**	**Geology**							
13396 0	A	4.0 - 4.0	MTWR	09:30 am-10:45 am	1002	0325	Garing		24	7
GEOL	**3090**	**Gems/gem Materials**	**Geology**							
29575 0	A	3.0 - 3.0	T R	09:30 am-10:45 am	1002	0327	Patino-Douce		18	7
GEOL	**3030**	**Elem Oceanography**	**Geology**							
22475 0	A	3.0 - 3.0	M W F	01:25 pm-02:15 pm	1002	0200A	Railsback		87	66

Above and on the next page: courses listed in the schedule of classes in Fall Semester 2019 and Spring Semester 2020). Courses are sorted by number here only at the level of thousands. Lab sections and readings or research courses are not included. 6000-level analogs of 4000-level courses are not included (and thus enrollments may have been greater than as listed here). "Class size" is the number of seats offered and "Seats available" is the number of seats unfilled, so that one must subtract the latter from the former to get the number of students enrolled. Schroeder was Head and Milewski was Associate Head. The number of classes shown on these two pages is forty-four.

Changes evident from the 2002-2003 list to this one are in faculty members (Dallmeyer, Dowd, Freeman-Lynde, Roden, and Wyld disappear; Darling, Garing, Klimczak, Milewski, and Pistone appear), numbers of courses taught (the number of courses per years expected of Geology tenure-track faculty members decreased from three to two), and buildings in which courses were taught (as Room 200A GG increasingly looked small). Many courses disappeared as faculty members disappeared, and other courses appeared as new faculty members arrived.

SUBJECT CRN	SEC	COURSE NO STAT	CREDIT HRS	TITLE DAYS	TIME	DEPARTMENT BLDG	ROOM	INSTRUCTOR	CLS SIZE	SEATS AVL
GEOL		**4010**		**Life and Ecol Past**		**Geology**				
14142	0	A	3.0 - 3.0	T R	11:00 am-12:15 pm	1002	0218	Walker	24	6
GEOL		**4360**		**Introduction to Rock Mechanics**		**Geology**				
42815	0	A	3.0 - 3.0	M	01:25 pm-02:15 pm	1002	0144	Klimczak	20	3
	0	A	3.0 - 3.0	W	01:25 pm-03:20 pm	1002	0144	Klimczak	20	3
GEOL		**4510**		**Marine Micropaleo**		**Geology**				
42811	0	A	3.0 - 3.0	M	09:05 am-12:05 pm	1002	0327	Goldstein	19	17
	0	A	3.0 - 3.0	W	09:05 am-09:55 am	1002	0327	Goldstein	19	17
GEOL		**4660**		**Shallow Geophysics**		**Geology**				
42797	0	A	3.0 - 3.0	W	01:25 pm-04:25 pm	1002	0200A	Garrison	40	36
GEOL		**4750**		**Earth Sci Mid School Teachers**		**Geology**				
29571	0	A	3.0 - 3.0	T	09:30 am-12:15 pm	1002	0144	Darling	20	6
GEOL		**4950**		**Geology Seminar**		**Geology**				
11305	0	A	1.0 - 1.0	F	03:35 pm-04:25 pm	1002	0200A	Schroeder	25	22
GEOL		**4020**		**Internal Processes**		**Geology**				
22495	0	A	3.0 - 3.0	M W F	11:15 am-12:05 pm	1002	0327	Pistone	24	10
GEOL		**4060**		**Structural Geology**		**Geology**				
49318	0	A	4.0 - 4.0	T R	11:00 am-12:15 pm	1002	0325	Klimczak	20	1
GEOL		**4130**		**Aqueous Env Geochem**		**Geology**				
54620	0	A	3.0 - 3.0	T R	03:30 pm-04:45 pm	1002	0144	Nzengung	20	19
GEOL		**4220**		**Hydrogeology**		**Geology**				
49321	0	A	3.0 - 3.0	T R	12:30 pm-01:45 pm	1002	0200A	Garing	60	53
GEOL		**4500**		**Sedimentary Geology**		**Geology**				
49312	0	A	3.0 - 3.0	M W	10:10 am-11:00 am	1002	0200A	Holland	20	6
GEOL		**4530**		**Environmental GIS**		**Geology**				
52965	0	A	3.0 - 3.0	W	11:15 am-12:05 pm	1002	0143	Milewski	15	7
GEOL		**4530L**		**Environmental GIS Lab**		**Geology**				
52967	0	A	0.0 - 0.0	W	12:20 pm-02:15 pm	1002	0B27	Milewski	15	7
GEOL		**4620**		**Exploration Geophys**		**Geology**				
~~52963~~	~~0~~	~~A~~	~~3.0 - 3.0~~	~~T R~~	~~09:30 am-10:45 am~~	~~1002~~	~~0144~~	~~Hawman~~	~~15~~	~~0~~
GEOL		**4700**		**Archaeo Geology**		**Geology**				
49307	0	A	3.0 - 3.0	T R	03:30 pm-04:45 pm	1002	0143	Garrison	30	24
GEOL		**4950**		**Geology Seminar**		**Geology**				
22327	0	A	1.0 - 1.0	F	03:35 pm-04:25 pm	1002	0200A	Schroeder	40	32
GEOL		**8040**		**Adv Top Hydrogeol**		**Geology**				
~~33098~~	~~0~~	~~A~~	~~1.0 - 3.0~~		~~12:01 am-11:59 pm~~	~~NCRR~~	~~NCRR~~	~~Milewski~~	~~4~~	~~0~~
GEOL		**8090**		**Adv Top Struc Geol**		**Geology**				
~~32024~~	~~0~~	~~A~~	~~1.0 - 3.0~~		~~12:01 am-11:59 pm~~	~~NCRR~~	~~NCRR~~	~~Klimczak~~	~~2~~	~~0~~
GEOL		**8370**		**Data Analysis in Geosciences**		**Geology**				
~~42820~~	~~0~~	~~A~~	~~3.0 - 3.0~~	~~T R~~	~~09:30 am-10:45 am~~	~~1002~~	~~0142~~	~~Holland~~	~~25~~	~~0~~
GEOL		**8790**		**Proj in Env Geol**		**Geology**				
~~44268~~	~~0~~	~~A~~	~~3.0 - 3.0~~		~~12:01 am-11:59 pm~~	~~NCRR~~	~~NCRR~~	~~Milewski~~	~~3~~	~~0~~
GEOL		**8120**		**Paleobiodiversity**		**Geology**				
43864	0	A	3.0 - 3.0	T R	09:30 am-10:45 am	1002	0218	Walker	24	22
GEOL		**8550**		**Clay Mineralogy**		**Geology**				
53499	0	A	3.0 - 3.0	M W	08:00 am-08:50 am	1002	0325	Schroeder	25	18

See explanation on previous page.

PART V. BIOGRAPHIES OF SELECTED PROFESSORS OF GEOLOGY

James Wayne Delton Jackson,
first professor of Geology at the University of Georgia

James Wayne Delton Jackson, also known variously as James D. Jackson and James Jackson, was a professor of Chemistry and Geology in the Franklin College (i.e., the University of Georgia) from 1823 to 1850, as well as Professor of Natural Philosophy (i.e., physics) from 1827 to 1842. He was also a member of a famous family of Jacksons with many ties to the University of Georgia and to Georgia politics.

Jackson's family, and its ties to the University of Georgia

James Wayne Delton Jackson was born on December 20, 1787 in Savannah. He was the son of James Jackson (1757-1806) and Mary Charlotte Young. James Jackson, the father, was a hero of the Revolutionary War and served under Anthony Wayne (hence the second of James Wayne Delton Jackson's four names) (Lamplugh). James Jackson was Governor of Georgia (1788 and 1798-1801), a member from Georgia of the U.S. House of Representatives (1789-1791) and a U.S. senator from Georgia (1793-1795 and 1801-1806) (Lamplugh). He was an early trustee of the University of Georgia (Reed, Chapter II, p.2-3/151-152). As senator in 1795, James Jackson resigned his seat and returned home to attack the perpetrators of the Yazoo Land Fraud, a bribery scandal regarding lands claimed by the State of Georgia but in present day Alabama and Mississippi (hence the name "Yazoo"). He famously stood in front of the Georgia statehouse in Louisville and used a magnifying glass to set fire to the deeds and other papers filed in connection with the Yazoo fraud. Throughout his career he was known for dueling and brawling, and he is remembered as " the 'colossus' of Georgia politics" of his times (Lamplugh). Jackson County, Georgia, is named after him(Wikipedia).

Other noteworthy members of the family of James Wayne Delton Jackson include

→ his uncle Henry Jackson (1778-1840), U.S. Charge d'Affaires to France until 1817 and Professor of Natural Philosophy at the University of Georgia from 1811 to 1814 and 1817 to 1828.

→ his cousin, Henry's son Henry Rootes Jackson (1820-1898), who was a U.S. district attorney, judge, minister resident (ambassador) to the court of Austria from 1854 to 1858, briefly Chancellor of the University of Georgia in 1858, a Confederate brigadier general in the U.S. Civil War, and U.S. Minister to Mexico in 1885 (VAB).

→ his brother William Henry Jackson, a member of the Board of Trustees of the University of Georgia from 1822 to 1864, a long-time resident of Athens, and the homeowner who deeded the land for Athens's famous "Tree that owns itself" (Reed, Chapter II, p. 71/95).

→ his brother Jabez Young Jackson, was a member of the U.S. House of Representatives from 1835 to 1839 (Wikipedia).

→ his nephew, another James Jackson (born in 1819 or 1820 and died in 1887) who was Chief Justice of the Georgia Supreme Court from 1879 to 1887, and who was for many years a trustee of the University of Georgia (VAB; Reed Chapter IV p. 348/393).

Jackson and the University of Georgia, and its ties to his family

James Wayne Delton Jackson entered the University of Georgia at the age of 14 in 1801, the first year that the University, as Franklin College, held classes. He and his brother, William Henry Jackson, graduated in 1804 in the University's first graduating class. James Wayne Delton Jackson was thus one of the first students of Josiah Meigs, and he graduated at the age of 17. He went on to be a member of Georgia House of Representatives in 1810 and 1811, and he served in the War of 1812 as captain of the Jefferson Huzzars of the 1st cavalry of the Georgia Militia (Reed, Chapter II, p. 72/96). Historian Thomas Walter Reed speculates that James Wayne Delton Jackson "must have entered the teaching profession about that time", but no evidence seems to be available (Reed, Chapter II, p. 72/96).

James Wayne Delton Jackson became the University of Georgia's professor of Chemistry and Geology in 1823, the year after his brother became one of the University's trustees. The position emerged as the professorship of Chemistry and Natural Philosophy held by his uncle Henry Jackson was divided, with Henry retaining the professorship of Natural History until 1827. James Wayne Delton Jackson thus became the first professor of anything called "Geology" at the University of Georgia in 1823 (Reed, Chapter III, p. 33/202).

On his appointment in 1823, James Wayne Delton Jackson was also expected to teach French on the side. When Henry Jackson resigned the professorship of Natural History in 1827, James Wayne Delton Jackson became Professor of Chemistry, Geology, and Natural Philosophy, and he held the professorship of Natural Philosophy (i.e., physics) until 1841 or 1842. Until 1841, the University had received an allocation of $6000 per year from the state, but that allocation was cut or eliminated that year. As a result, the faculty was cut from six professors to four, and the responsibilities of the survivors were redistributed (Reed, Chapter IV, p. 399/445). In this redistribution, Jackson was no longer Professor of Natural Philosophy, but he remained professor of Chemistry and Geology (or "Chemistry and Natural History"). The probability of his survival in the downsizing of 1841 may have been enhanced by the presence of his brother on the University's Board of Trustees.

James Wayne Delton Jackson remained professor of Chemistry and Geology until 1850. Among his students would have been Joseph Le Conte (Class of 1841) and William Louis Jones (Class of 1845), the next generation of professors of geology at the University. Reed preserved this anecdote about James Wayne Delton Jackson (Reed, Chapter III, p. 33/202):

> He was greatly respected by both students and faculty members. . . . Naturally he was very fond of his father's [James Jackson's] reputation as an uncompromising foe of corrupt government, and it is said that when some student hadn't prepared his recitation and feared being called on in class, [that student] would suggest to Professor Jackson that he tell the class all about his father's taking that sun-glass on the capitol square in Louisville and drawing fire from heaven with which to destroy the papers of the Yazoo fraud. The professor never tired of relating that story, and the class would escape further questioning on the lesson.

At his resignation in 1850, James Wayne Delton Jackson's twenty-seven years of service constituted the longest term of service of any University of Georgia faculty member to that date. He was remembered as having "been faithful, accomodating, scholarly, [and] popular with both faculty and students" and at his retirement the Board of Trustees wished him a retirement "congenial to enjoyment and repose"(Reed, Chapter V, p. 487/541). He died in 1857. His name, or at least that of his family, survives in Athens with Jackson Street, which passes through the University of Georgia campus.

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Sources:
Thomas Walter Reed 's History of the University of Georgia, (~1949).
The Virtual American Biographies entry on James Jackson.
George R. Lamplugh, New Georgia Encyclopedia entries on the Yazoo Land Fraud and James Jackson.

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Joseph Le Conte,
Third Professor of Geology at the University of Georgia
from 1852 to 1856

Joseph Le Conte was Professor of Chemistry and Geology at the University of Georgia from 1852 to 1856, succeeding William Louis Jones and preceding Joseph Jones.

Joseph Le Conte's Early Years

Joseph Le Conte was the son of Louis Le Conte (1782-1838) and Ann Quarterman, and he was born in 1823. Louis Le Conte was the owner of Woodmanstan Plantation, an estate of more than 3000 acres in Liberty County, and thus in the county from which William Louis Jones and Joseph Jones came. Louis Le Conte maintained a noted botanical garden at Woodmanstan and had a chemical laboratory on the premises. Joseph Le Conte's brother John (1818-1891) would go on to be a physicist and President of the University of California, as discussed below. Their cousin John Lawrence Le Conte (1825-1883) was a famous entomologist.

Joseph and John Le Conte were also cousins of Wiliam Louis Jones (Reed, Chapter IV, p. 357/403), in that their mother and Jones's mother were half-sisters (Stephens, p. 23). Jones's father owned a plantation near Woodmanstan, and "Joseph was a frequent visitor in his Uncle William's home" (Stephens, p. 23). The Le Contes also had a summer retreat at Jonesville, the town where William Louis Jones's grandfather had provided 'lots on which his children and neighbors could build gracious homes on high ground" (Armes, p. 9 and 23; MacKethan, p. xi).

Joseph Le Conte attended the University of Georgia and graduated in 1841, and so he would have taken classes from James Wayne Delton Jackson. He then attended the College of Physicians and Surgeons in New York (an institution that later became the Columbia University Medical School), receiving his M.D. degree in 1845. He then came home to Georgia and set up a practice as a physician in Macon.

Joseph Leconte, William Louis Jones, and Louis Agassiz

Joseph Le Conte was thus a settled, if not entirely satisfied, physician when, as he told it (Armes, p. 126):

> . . . in the spring of 1850, my cousin Lewis Jones, who had come to Macon to attend the meeting of the State Medical Society and stayed at my house, told me of his purpose of becoming a pupil of Agassiz, who had been made professor of geology and zoology at Harvard. I heartily joined in his plan, our object being special preparation for the teaching of these subjects.
>
> About this time Dr. Nottingham, and old and distinguished physician who had just settled in Macon, made me an offer of partnership. It was undoubtedly a tempting offer . . . we should certainly have been successful. It was now or never, if I was to make medicine my life work. I decided not to accept. I had found my vocation. I broke up, sold out, left Macon, and went to Cambridge in August 1850.

It is interesting to consider that Joseph Le Conte might have remained a physician in Macon the rest of his life, and not a famous scientist, if William Louis Jones had not come up with the idea of going to Harvard and enticed his cousin to come along. However, off to Harvard's Lawrence Scientific School they went, and they immediately plunged into studies with Louis Agassiz as two of the four students in his first class (Lurie, 177 & 179). Again in Joseph's Le Conte's telling (Armes, p. 128-129):

> ". . . [Agassiz] was in Cambridge, and Dr. Jones and I went right to work. The first task Agassiz set us was very characteristic of the man. He thought a while, then pulled out a drawer containing from five hundred to a thousand separated valves of Unios, of from fifty to a hundred different species, all mixed together, and said, "Pair these valves and classify into species; names no matter; separate the species." He left us alone, very severely alone. We worked on those shells for one whole week, the professor looking at our work from time to time but making no remark. Finally we told him that we had done the best we could; he examined the results carefully and was much pleased. It so happened that just then there entered the room a friend of his from Europe, Ampère, the son of the great electrician. He introduced us and remarked that these pupils had just amended correctly the [flawed] classification of Lea, the great authority on Unios.

Jones and Le Conte went on in 1851 to earn Bachelor of Science degrees. Le Conte reports that "Thus it happened the Lewis Jones and I, and two others, David A. Wells and John D. Runkle, formed the first graduating class of the Lawrence Scientific School. The courses of all of us had, however, been strictly post-graduate, and I believe we were the very beginnings of a post-graduate class in Harvard, if not in the United States (Armes, p. 142)." Jones went on to be a professor of geology at the University of Georgia and so is discussed elsewhere in these pages, Wells went on to be a famous economist and confidant of U.S. presidents James Garfield and Grover Cleveland, and Runkle went on to be a mathematician and president of the Massachusetts Institute of Technology.

Professor Joseph Le Conte

Joseph Le Conte taught for a year at Oglethorpe University in Milledgeville. He wished, however, that he were elsewhere, and soon he was (Armes, p. 156-157):

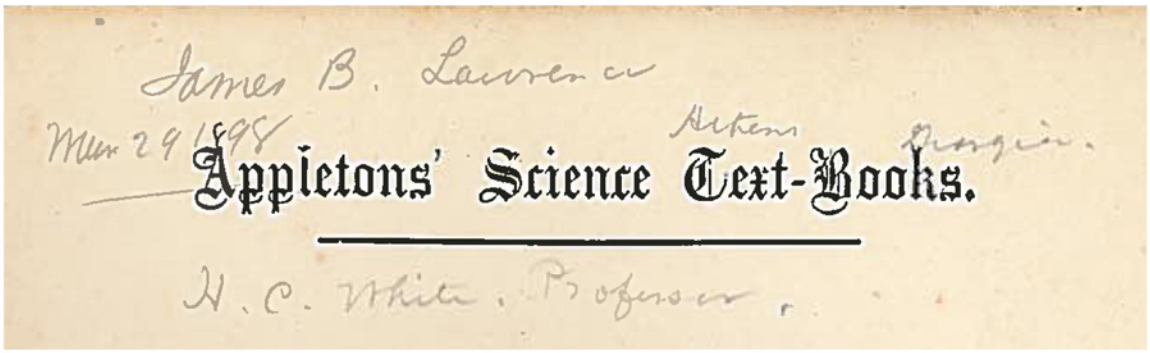
> The previous August Lewis Jones had been elected professor of geology and natural history in the University of Georgia, a much better position than mine, paying twice the salary, and one for which I certainly should have made application had he not repeatedly told me of his intention of applying, so that I could not be an applicant without seeming to violate confidence and friendship. But he got on badly with the president, who had the reputation of being a bigoted, dogmatic, and imperious old man, and holding the chair only a year resigned in anger and disgust. I at once determined to apply for the place, and wrote to my brother Johm who was a professor in the institution. . . . I was elected in December,

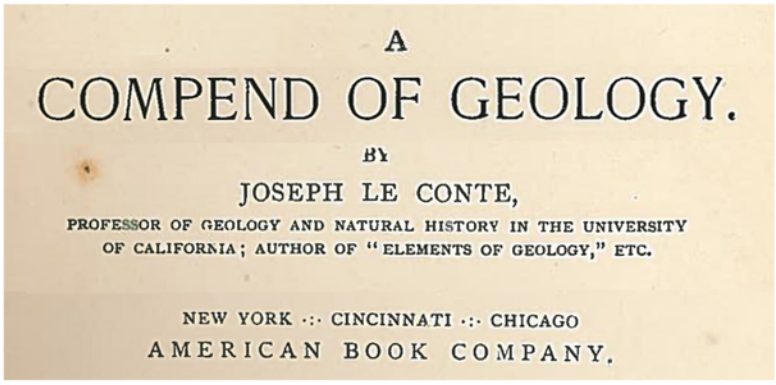
1852, and moved to Athens in the following month. . . . . My duties were . . . the teaching of botany, geology, and French.

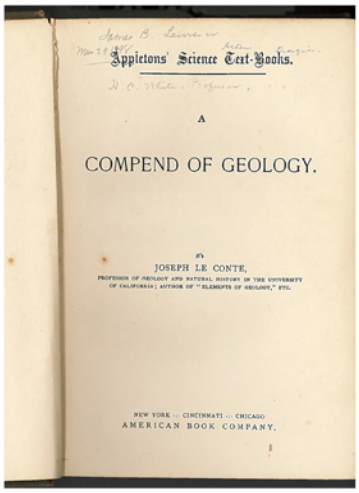
A picture of Joseph Le Conte that hung in the foyer of Le Conte Hall for many years before its removal in 2018.

The frustrations that William Louis Jones had experienced with University President Alonzo Church were a harbinger of what was to come for the Le Conte brothers. John became embroiled in a bitter dispute with Church and left the University in 1855; their accusations at each other were published in public letters in the local newspaper as part of a larger row between Church and the faculty. It was in this context that Joseph Le Conte left the University in 1856, and in which his successors, Joseph Jones and Harry Hammond, would each stay only one year in Athens.

The Le Conte brothers moved on to the University of South Carolina and, after the Civil War, they went on in 1869 to the University of California (Berkeley), where John was President of that university from 1876 to 1881. Joseph Leconte was Professor of Geology at the University of California from 1869 to 1901, author of several books including his *Elements of Geology*, a member of the National Academy of Sciences, a president of the American Association for the Advancement of Science and of the Geological Society of America, one of the founding members of the Sierra Club, and an early teacher of biological evolution. His *Compend of Geology* was used as a textbook at the University of Georgia in 1898 (see below), and likely in many other years as well.


James B. Lawrence
Athens Georgia.
Mar 29 1898
Appletons' Science Text-Books.
H. C. White, Professor.


A
COMPEND OF GEOLOGY.
BY
JOSEPH LE CONTE,
PROFESSOR OF GEOLOGY AND NATURAL HISTORY IN THE UNIVERSITY OF CALIFORNIA; AUTHOR OF "ELEMENTS OF GEOLOGY," ETC.
NEW YORK ·:· CINCINNATI ·:· CHICAGO
AMERICAN BOOK COMPANY.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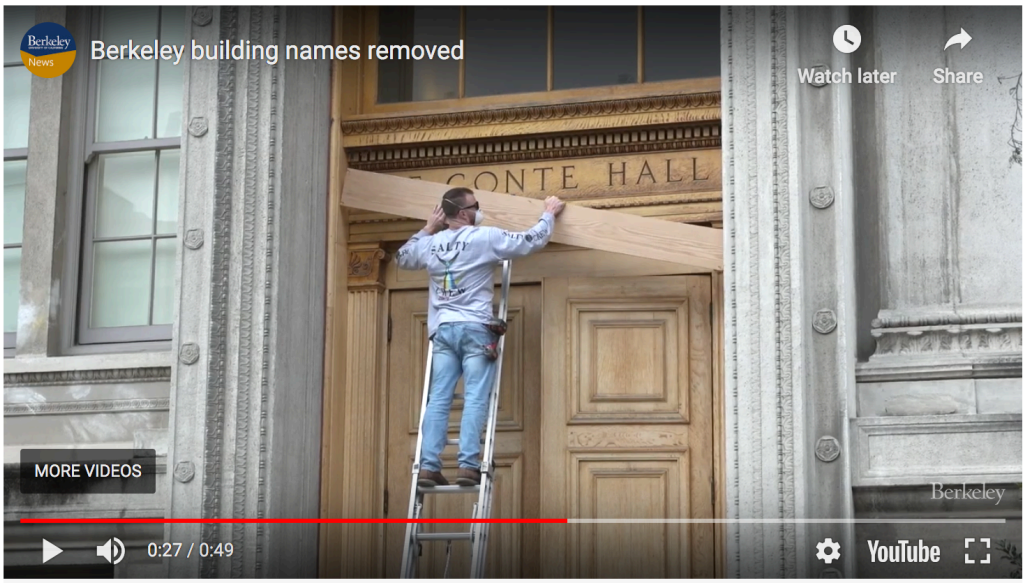
A bookstore find by UGA Geology grad Joe McKinney in 2014: a copy of Joseph Le Conte's Compend of Geology used by student James B. Lawrence in the University of Georgia geology class taught by Henry Clay White, the professor of chemistry who taught the University's geology class from about 1890 to about 1920.

Le Conte Hall, home of the Department of Geography and Geology in the 1940s to early 1960s, on the campus of the University of Georgia. It was the second LeConte Hall; the first was on South Campus.

Joseph Le Conte died in 1901 on a Sierra Club camping trip in Yosemite National Park. Le Conte Hall at UGA is named after the Le Conte Brothers, the University of California at Berkeley has a Le Conte Hall, and the Le Conte Glacier in Alaska was named after Joseph Le Conte. However, Joseph Le Conte was by 2018 reviled as "a slave owner and Confederate scientist, a bitter opponent of Reconstruction, and a multi-decade peddler of 'scientific' racism", a

"white supremacist" who "repeatedly advocate[d] for the disenfranchisement and repression of communities of color" and who "rationalized the use of racial violence". As a result, "U.C. Berkeley's Black Student Union called on the school to change the name of [that university's] Le Conte Hall" (Warma, 2018), and the name "Le Conte" was indeed covered over on lintels and scratched off windows in November, 2020 (Kell, 2020). Le Conte Hall on the University of Georgia campus received similar attention (Posey, 2020), and in 2018 Le Conte's portrait was removed from the building that then still bore his name.



On Wednesday, UC Berkeley work crews removed or covered lettering on LeConte Hall and Barrows Hall following a campus announcement that the academic buildings had been unnamed. (Cover image by Irene Yi/Video by Roxanne Makasdjian and Clare Major)

Screengrab from https://news.berkeley.edu/2020/11/18/uc-berkeleys-leconte-and-barrows-halls-lose-their-names/

Sources:
William Dallam Armes, editor, The Autobiography of Joseph Le Conte: New York, D. Appleton and Company, 1903. William Louis Jones, "Joseph Le Conte", Transactions of the Medical Association of Georgia, 1902, p. 42.
Gretchen Kell, UC Berkeley's LeConte and Barrows halls lose their names: Berkeley News, November 19, 2020.
Edward Lurie's Louis Agassiz: A Life in Science Baltimore, Johns Hopkins University Press, 1988.
Lucinda H. MacKethan, editor, Recollections of a Southern Daughter: a Memoir by Cornelia Jones Pond of Liberty County: Athens : University of Georgia Press, 1998.
Kyra Posey, 5 UGA buildings and colleges named after controversial figures: The Red & Black, June 13/28, 2020.
Thomas Walter Reed 's History of the University of Georgia, (~1949).
Lester D. Stephens, Joseph Le Conte, Gentle Prophet of Evolution:Baton Rouge: Louisiana State University Press, 1982.
Lester D. Stephens's New Georgia Encyclopedia entry on the Le Conte family.
Zachary Warma's "The Golden State's Scientific White Supremacist" on Joseph Le Conte (~2018).

William Louis Jones ("Old Ichthy"),
second Professor of Geology at the University of Georgia

William Louis Jones was the second person to serve as Professor of Geology at the University of Georgia. He in fact came and went from the University a number of times, so that his service enveloped in time that of Joseph Le Conte, who is considered the University's third Professor of Geology, and the appointment of James Woodrow, who would have been its fourth had he ever arrived on campus.

Origins and early education

William Louis Jones was born in Liberty County, Georgia, in 1827 and was the son of William Jones and Mary Robarts. His father was a well-to-do planter whose father Samuel Jones II "gained so much land that he founded the summer retreat of Jonesville, Georgia, providing lots on which his children and neighbors could build gracious homes on high ground safely removed about four miles west of their swampy plantations" (MacKethan, p. xi). The children of WIlliam and Mary Jones, including young "Louis", "were spared no luxury or advantage" as they grew up (MacKethan, p. xii).

The family lived in the same county as, but were "not related by blood" to, the family of Charles Colcock Jones, father of the Joseph Jones who would also be a Professor of Chemistry and Geology at the University of Georgia (MacKethan, p. xi). William Louis Jones was, however, a cousin of Joseph Le Conte (Reed, Chapter IV, p. 357/403), another young man from Liberty County, Georgia, who would become a Professor of Geology at the University. Lester B. Stephens's biography of Joseph Le Conte explains that they were half first cousins, in that "Louis, as he was known to Joseph and other close acquaintances, was the son of William Jones, who was married to a half-sister of Joseph's mother." One has to suspect that, with regard to his middle name, William Louis Jones was named after his uncle-by-marriage, Louis Le Conte, who was Joseph Le Conte's father. Joseph Le Conte's consistent reference to his cousin as "Lewis" seemingly tells us that William Louis Jones's middle name was pronounced in the English, rather than French, style.

William Louis Jones enrolled in the University of Georgia in 1842 at the age of 15 and graduated first in his class with a Bachelor of Arts in 1845. Among his teachers at the University would have been James Wayne Delton Jackson, the University's first professor of geology. Jones attended the College of Physicians and Surgeons in New York (an institution that later became the Columbia University Medical School), where he earned an M.D. degree in 1848.

William Louis Jones, Joseph Le Conte, and Louis Agassiz

In 1850, William Louis Jones went to Harvard with his cousin Joseph Le Conte to study under Louis Agassiz. In his autobiography, Le Conte reports that "in the spring of 1850, my cousin Lewis Jones . . . told me of his purpose of becoming a pupil of Agassiz, who had been made professor of geology and zoology at Harvard. I heartily joined in his plan, our object being special preparation for the teaching of these subjects (Armes, p. 126). From his side, Jones told much the same story in his 1902 memorial of Joseph Le Conte, where he related that Le Conte

"practiced medicine until 1850, when at the solicitation of a friend he accompanied him to Cambridge, Mass.". In that version, of course, Jones was the friend who did the soliciting.

At Harvard's Lawrence Scientific School, they quickly began their studies. Le Conte's autobiography (Armes, p. 128-129) says

> ". . . [Agassiz] was in Cambridge, and Dr. Jones and I went right to work. The first task Agassiz set us was very characteristic of the man. He thought a while, then pulled out a drawer containing from five hundred to a thousand separated valves of Unios, of from fifty to a hundred different species, all mixed together, and said, "Pair these valves and classify into species; names no matter; separate the species." He left us alone, very severely alone. We worked on those shells for one whole week, the professor looking at our work from time to time but making no remark. Finally we told him that we had done the best we could; he examined the results carefully and was much pleased. It so happened that just then there entered the room a friend of his from Europe, Ampère, the son of the great electrician. He introduced us and remarked that these pupils had just amended correctly the [flawed] classification of Lea, the great authority on Unios.

Jones and Le Conte went on in 1851 to earn Bachelor of Science degrees under Louis Agassiz in the latter's first class there (Lurie, 177 & 179). Le Conte reports that "Thus it happened the Lewis Jones and I, and two others, David A. Wells and John D. Runkle, formed the first graduating class of the Lawrence Scientific School. The courses of all of us had, however, been strictly post-graduate, and I believe we were the very beginnings of a post-graduate class in Harvard, if not in the United States (Armes, p. 142). Reed (Chapter IX, p. 2/1094) says of Jones that "for several years he was a research collaborator with the renowned scientist Louis Agassiz". One of Dr. Jones's sons was given the middle name "Agassiz".

Jones practiced medicine several years, but he devoted more of his life to teaching and research (Reed, Chapter IX, p. 2/1094). Reed goes on to report that "Dr. Jones was well known in the leading scientific circles of America. He was a member of the Academy of Natural Sciences of Philadelphia, the Boston Society of Natural History, the Lyceum of Natural History, and the American Association for Advanced [sic] Science".

Professor William Louis Jones

The career of William Louis Jones went something like this, with the professorial appointments all at the University of Georgia:

1851-1852
- Professor of Chemistry and Geology
- (but also teaching French (Reed, V, p. 494/554))
- (leaving in a dispute with the University's president, Alonzo Church) (Armes, p. 156) .

1852-1860s
- Farmer (and presumably doctor) in Morgan County
- (of which Madison is the county seat, and so not far from Athens).

1861-1866
Professor of Chemistry and Geology and of Natural Philosophy and Physics.
(but for much of this period the University was closed)
1864 Chemist in the Confederate gunpowder works in Augusta.
1866-1872
Professor of Chemistry and Geology and/or of Agriculture.
(leaving when he was assigned to the Georgia State
College of Agriculture and the Mechanic Arts)
~1866-1885
Owner and/or editor and/or contributor to the Southern Cultivator
1883-1892(1886?-92)
Professor of (Natural History and?) Agriculture,
and teaching Botany, Zoology, and Geology.
1888-1890?
Director of the Georgia Agricultural Experiment Station.
(leaving when he was assigned to work in Griffin)

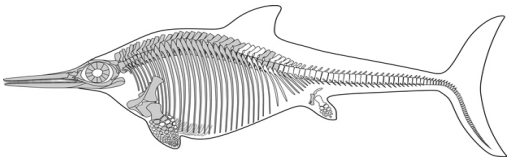
Thomas Walter Reed, a graduate and then long-time official of the University of Georgia, called Dr. Jones one of his "beloved professors" (Reed, Chapter V, p. 494/554) , and he wrote the following about Dr. Jones late in his teaching career, thirty-six years after his first appointment as professor: (Reed, Chapter IX, p. 1093)

> Dr William Louis Jones had reached the three-score milepost on life's journey when I first met him in his classroom in 1887. . . . He was of average height, rather thin, [with a] large, well-shaped head, [with] big blue eyes [that were] somewhat watery with a tendency of the lids to droop slightly, giving him a somewhat sleepy look, clear, florid complexion, his skin apparently as soft as a woman's with tiny, blue veins visible in his temples, a slight mustache and thin beard, close cut, his hair and beard as white as the driven snow.
>
> He held the position [then] of Professor of Natural History and Agriculture, but he did not teach us anything about farming. He taught us botany, zoology, and geology. The text-book that he used had been written by Joseph Leconte, of the class if 1841, who was graduated from the University of Georgia just two years before young Jones had entered as a student.
>
> Though he in no way resembled that pre-historic animal, we boys attached to him the name of Ichthyosauros and shortened it to "Old Ichthy". That was his favorite name with the boys, though at times we would call him "Old Sleepy". He must have suffered from hay fever or some nasal trouble for he was eternally sniffling.
>
> Dr. Jones was a quiet, unassuming gentleman, but he had the courage of his convictions and at times plenty of temper. And when he got mad he was mad all the way through. In 1892 I was editor of the Athens Banner and was out looking for any news that might come out of a faculty meeting that was being held that afternoon. I met Dr. Jones just as he was coming out of the campus [he taught in the Academic Building adjacent Broad Street] and

> we stood and talked for a few minutes under the arch. "Old Ichthy" didn't look like himself. His face was white and his lips were quivering. I could see that he was mad all the way through. "I'm through with the whole business, Tom. I've just told Boggs he can have my resignation. I will not stand his dictating any further. I can get along with anybody who will treat me right, but I will not be run over. I love the University, but it can get along without me."
>
> The teaching of science now is much more thorough than in those days, when there was but little laboratory equipment with which to conduct experiments and when the vast number of discoveries had not been made, but judged by the times in which he lived "Old Ichthy" was a teacher of great knowledge and ability and he gave us an interesting insight into a marvelous world, of which we learn more and more each passing year.

Dr. Jones's enthusiasm for his subject must have been reflected in the painting of the history of life on the ceiling of his recitation room in the Academic Building, for which either Dr. Jones or Henry Clay White must have been in some way responsible. The fact that he was re-hired twice by the University, despite his contentious personality, further suggests that he was thought well of as a teacher and scholar. However, the day in 1892 when Tom Reed found Dr. Jones "mad all the way through" with Chancellor William E. Boggs may have been the effective end of his teaching career, because Jones left the University for good in 1892 and never taught again (Reed, Chapter IX, p. 5/1097). He thus retired forty-one years after first joining the faculty of the University, and with twenty-one years of service scattered across those forty-one years.

Dr. Jones spent his last years on his farm. He died in Atlanta on August 22, 1914, but his remains were interred in Oconee Hill Cemetery in Athens, across East Campus Road from the UGA campus.



Sources:
Wiliam Dallam Armes, editor, The Autobiography of Joseph Le Conte: New York, D. Appleton and Company, 1903.
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George Little

Professor of Geology at the University of Georgia from 1876 to 1878

George Little was a Professor of Geology at the University of Georgia from 1876 to 1878, in one of the periods when William Louis Jones was away from the University. He was seemingly the first professor of geology at UGA to hold a Ph.D. degree, even though it was in chemistry.

George Little was born in 1838 in Tuscaloosa, Alabama, and was the son of Scottish ancestors. Both of his mother's parents were teachers, and his father was at least once a teacher.

George Little attended the University of Alabama from 1851 to 1855 and earned an A.B. degree. In 1857 and 1858 he attended the University of Berlin, where he took several courses in the natural sciences, including a geology course from Gustav Rose, a mineralogist who was for ten years the president of the German Geological Society. In 1858 and 1859 he studied in the laboratories of Dr. Friedrich Wöhler at the University of Göttingen and earned his Ph.D. degree there in chemistry with a dissertation on selenium. During the Civil War, he rose from private to the rank of Lieutenant Colonel in the Confederate Army.

After teaching at Oakland College in Mississippi and serving as the State Geologist of Mississippi, George Little became State Geologist of Georgia in 1874. Among his assistants was David C. Barrow, who would go on to be Chancellor (i.e., president) of the University of Georgia from 1906 to 1925 and after whom Barrow Hall, one partial home of the UGA Geology Department, was named.

While State Geologist of Georgia, George Little was soon pressured to teach at the University of Georgia too. From 1876 to 1878 he was a professor of mineralogy and geology and agriculture at the University, traveling to Athens two days each week to teach (a comment on what was possible in the age of trains). He was considered as President of the University, but he declined because he could not hope to hold that office and carry on his work as State Geologist. When he was pressured to take on even more teaching responsibilities, he objected that he could not do so and maintain his work as State Geologist, and so his position at the University was given to someone else.

The irony was not lost on him when the State of Georgia quit funding the position of State Geologist a year or two later, so that he had given up one job to do a better one that he then lost. He went on to support himself in private practice as a geologist in Chattanooga and Tuscaloosa, and he died in 1924.

Sources:

A biography of George Little accompanying the Little Family Papers in the W.S. Hoole Special Collections Library of The University of Alabama.
George Little, 1924, Memoirs of George Little: Tuscaloosa, Weatherford Printing Company.
Wikipedia's entries on Gustav Rose and Friedrich Wöhler.

J.W. Spencer

Professor of Geology at the University of Georgia from 1888 to 1890

J.W. Spencer was Professor of Geology at the University of Georgia from 1888 to 1890. He was the first person to teach geology at the University who had a Ph.D. in Geology, the first person to hold a position with teaching duties solely in Geology (and thus not in chemistry, botany, agriculture, or French), and the first person to teach Geology at the University who was not from the South. As a Canadian, he was the first of three professors in UGA's "Canadian Connection" in geology, in that he was followed forty years later by Geoffrey Crickmay and eighty years later by Gilles Allard.

Joseph Winthrop Spencer, christened as Joseph William Spencer but known generally as J.W. Spencer or J. Winthrop Spencer, was born in Dundas, Ontario, in 1851. He earned a B.A.Sc. "with First Rank in Geology and Mineralogy" from McGill University in Montreal in 1874. His professors there included the famous Canadian geologist William Dawson.

Over the next few years Spencer worked as a geologist in the copper mines of the Upper Peninsula of Michigan and taught in Hamilton, Ontario. In 1877, having written up his research in Michigan as a dissertation, he passed the qualifying examinations of the University of Göttingen and soon was awarded a Ph.D. in Geology, becoming the second Canadian to earn a Ph.D. in Geology.

In 1880 Spencer took a position as Professor of Geology at King's College in Windsor, Nova Scotia. His research in this period increasingly turned to the glacial geology of southern Ontario. In 1882 he became Professor of Geology and Mineralogy and Director of the Natural History Museum at the University of Missouri. He left that position in 1887.

Spencer became a Professor of Geology at the University of Georgia in 1888. He took the position in part because a previous position in biology and geology was divided, and thus he could take a position solely in Geology, the first time there was such a position at the University. As Reed (Chapter X, p. 1/1503) puts it, "While considerable attention was given to the teaching of Geology during the earlier years of the University, it was not until 1888 that a professor was employed to devote his entire time and attention to the teaching of that subject."

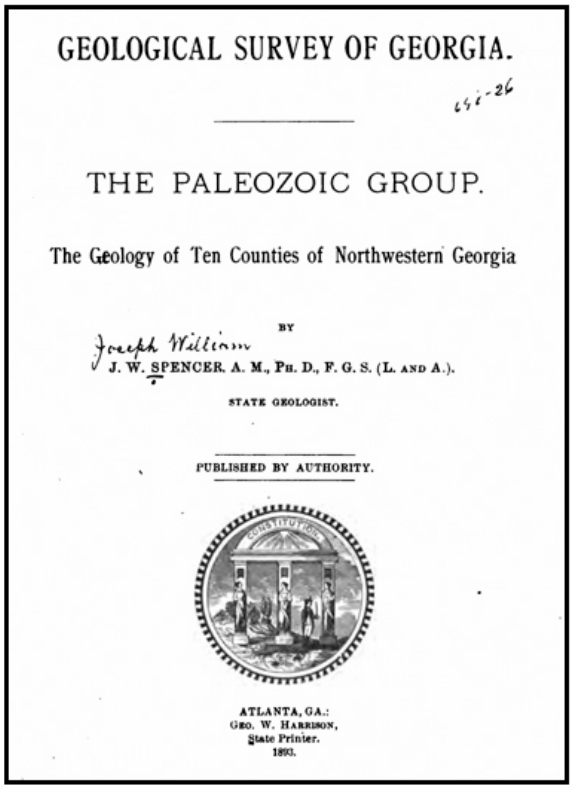
Spencer seems to have liked the move to Georgia, and he wrote to his old teacher Dawson that "I like my change . . . with Athens and with the people I am very much pleased. I somewhat dread the long summer although the heat is not excessive as we are (topographically) high". However, at the end of 1889 he was appointed State Geologist of Georgia and, unlike George Little, was not allowed to hold two state positions simultaneously. He therefore resigned from the University in 1890.

Reed (Chapter 10, p. 2/1504 to 3/1505) has somewhat different account of why Spencer left:

> Dr. Spencer was a Northern man with a splendid educational background. He had earned the degree of Doctor of Philosophy with a major in Geology. He unquestionably knew his subject, but that was nearly all that could be said of him. At first he got along very well with the students, but he did not have the knack of putting things over. The boys

> got an idea that he didn't know exactly what he was talking about. They even got to making fun of him. They dubbed him "Old Rocks" [vs. William Louis Jones's nickname "Old Ichthy"] and that name stuck to him for the two years that he remained before he left for other fields. He came to the conclusion that he was a misfit in the position he held and in 1890 resigned. . . . Dr. Spencer was a scholarly gentleman, but he did not suit the Georgia boys.

As State Geologist of Georgia, Spencer focused mostly on the stratigraphy of Paleozoic sedimentary rocks of northwest Georgia. This displeased a government more interested in mining, and he gave up the position in 1893. He went on to establish himself as an independent consulting geologist in Washington, D.C. from 1894 to 1914, working on projects in the Gulf of Mexico, the Caribbean, Mexico and Central America. He died in 1921 and was buried in his hometown of Dundas, Ontario. His widow later established a scholarship bearing his name at the University of Manitoba, and in 1944 that scholarship was transformed into the Winthrop Spencer Gold Medal to be awarded "for outstanding achievement in geological research by a student or graduate".



GEOLOGICAL SURVEY OF GEORGIA.

THE PALEOZOIC GROUP.

The Geology of Ten Counties of Northwestern Georgia

BY

J. W. SPENCER. A. M., PH. D., F. G. S. (L. AND A.).

STATE GEOLOGIST.

PUBLISHED BY AUTHORITY.

ATLANTA, GA.:
GEO. W. HARRISON,
State Printer.
1893.

Sources:
The material above is almost entirely from the following two articles:
Gerard V. Middleton., 2004, J.W. Spencer: his life in Missouri and Georgia, and work on proglacial lakes: Geoscience Canada, v. 31, p. 147-
Gerard V. Middleton., 2004, J. W. Spencer (1851-1921): his life in Canada, and work on preglacial river valleys: Geoscience Canada, v. 31, p. 49-56.
except where material is specifically attributed to
Thomas Walter Reed 's History of the University of Georgia, (~1949).

The image of a painting of J.W. Spencer above is from a webpage of the Robert B. Ferguson Museum of Mineralogy at the University of Manitoba. The image of the title page of Spencer's report on northwestern Georgia is from Google Books.

Sten Ragner Eyolf Cullin,
Associate Professor of Geology at the University of Georgia in 1923

Sten Ragner Eyolf Cullin was an Associate Professor of Geology at the University of Georgia in 1923. He was a native of Denmark, but he had earned his Ph.D. at the University of Pittsburgh, where he completed a dissertation on "Comparison of Formations Overlying and Underlying Oil Sands" in 1923.

Reed (Chapter X p. 3/1505) tells this story of how Cullin came to the University:

> . . . the Prudential Committee of the trustees began to look around for another teacher of Geology, and this time they selected a Dane, Dr. Eyolf Cullen. Dr. Cullen appeared before the Prudential Committee for a personal interview. As he could not speak English very fluently, he brought his wife along with him as a kind of interpreter. Mrs. Cullen was a very attractive and cultured young woman. She naturally did most of the talking and made out a good case for her husband. The committee took that matter under consideration and as a result Dr. Collen was elected. He got the position, but it was generally considered that Mrs. Cullen made the sale.

In a later chapter, Reed finishes the story (Chapter XIII, p. 9/2509):

> . . . Dr. Eyolf Cullen, a native of Denmark, . . . for a while taught the classes in geology. He did not, however, possess enough knowledge of the use of the English language to enable him to successfully teach his subject and remained in the faculty for only one year.

_____

Sources:
Thomas Walter Reed 's History of the University of Georgia, (~1949).

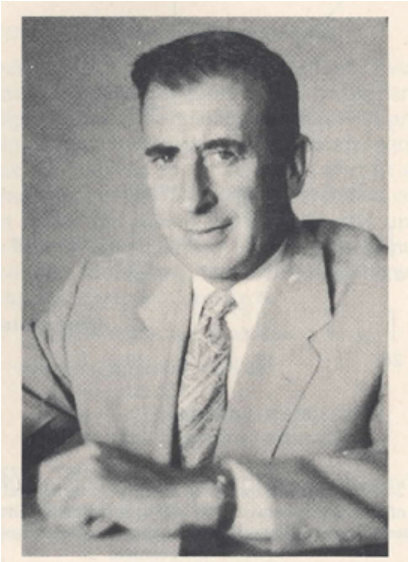
Geoffrey W. Crickmay
Associate Professor of Geology at the University of Georgia 1937-1945

Geoffrey W. Crickmay was born in 1905 in Vancouver, British Columbia. He attended the University of British Columbia and graduated with a B.A. degree in Geology in 1927. He went on to the Graduate School of Geology at Yale, where he earned a Ph.D. in 1930. His Ph.D. dissertation was on the Taconic Orogeny in Quebec, and it was published in the American Journal of Science. At Yale he would have studied under the likes of Chester Longwell, Adolph Knopf, Richard Flint, and Carl Dunbar

After graduating from Yale, Crickmay worked with the U.S. Geological Survey and then the Georgia State Department of Mines. However, his enthusiasm for teaching led him take a position as an associate professor of Geology at the University of Georgia. Among his students there was the young Vernon J. Hurst, who would go on to be the first head the of the modern Department of Geology of the University of Georgia in 1961.

Crickmay was at the University for at least four years: Dow Hamm's memorial says he stayed for four years, whereas Tom Reed's History of the University of Georgia says he was a faculty member from 1937 to 1945. The conflict seemingly lies in Crickmay's service in the United States Navy in World War II, a time in which he may have remained nominally on the faculty. Reed (Chapter X, p. 3/1505) says of Crickmay "He made a good impression from the beginning and was just hitting his stride when along came World War II with all the disruption of University faculties throughout the land. He is now absent on leave. When he returns he will find plenty to do . . .".

However, if Crickmay returned after the war at all, it was only briefly. After World War II he worked for Atlantic Refining Company (later Atlantic Richfield and then ARCO). His work for Atlantic took him first to Venezuela, then to Calgary, and finally to Brisbane, Australia. He retired in 1967, and he died in Laguna Hills, California, in 1971.



GEOFFREY W. CRICKMAY
(1905–1971)

Sources:
Thomas Walter Reed 's History of the University of Georgia, (~1949).
W. Dow Hamm's Memorial of Geoffrey W. Crickmay: American Association of Petroleum Geologist Bulletin, v. 57, p. 946-948 (1973).

Eldon J. Parizek

Eldon Parizek was born in Iowa City, Iowa, in 1920 and grew up there. He played football, baseball, and basketball and was an all-state running back in 1938, and he played the trumpet well enough to win several awards. By 1942 he had completed a bachelor's degree in Geology and soon entered the United States Navy, where his skills with the trumpet led to his service in the Admirals Band in the Pacific Theater, one of the safer forms of service in World War II. Parizek returned from the war to resume his studies at the University of Iowa, where he earned an M.S. degree in 1947 with a thesis on "A lower Permian ammonoid fauna from southeast New Mexico". In 1949 he earned his Ph.D. with a dissertation titled "The geology of the Tiff and Vineland quadrangles of southeast Missouri".

Parizek served as an assistant professor and then associate professor of geology in the University of Georgia Department of Geography and Geology from 1949 to 1956. Among that department's six faculty members, he was the lone geologist. As a result, Parizek faced a challenge unlike that of any other Professor of Geology in the University's history: he was in a department that offered the full twentieth-century geology curriculum, but he was the only geologist. He therefore taught full courses on each of the following: physical geology, historical geology, mineralogy, petrology, sedimentology, stratigraphy, paleontology, and structural geology (and an advanced historical geology course to boot). By the 1980s if not earlier, hardly any tenure-track faculty member was asked to teach both physical geology and historical geology, and none was asked to teach more than one of the courses in the core of the undergraduate major – but Parizek taught six of them.

Despite his teaching load, Parizek produced research. His most noteworthy paper was "Description and origin of stone layers in soils of the southeastern states" by Parizek and his colleague Jim Woodruff published in *Journal of Geology* v. 65, p. 24-34, in 1957. That paper was cited twenty times, a large number for its times, and it was still being cited in the 2020s. A different sort of publication, one in keeping with University's claim to promote the state's economic development, was Parizek's "Does Georgia Have Any Tidelands Oil?" in the *Georgia Review*, v. 7, p.309-318, in 1953.

In 1956, Parizek left the University of Georgia to become an Associate Professor of Geology at the University of Kansas City, now the University of Missouri at Kansas City. In 1964 he led a group of thirty science teachers on a 10-week science trip around the world via ship, air and bus, traveling to Hawaii, Japan, the Philippines, Singapore, Burma, India, Yemen, Egypt, Greece, Italy, Germany, France and the British Isles – shades of the retirement career of Gilles Allard. He went on to be a department head and then the dean of the College of Arts and Sciences at UMKC. He retired in 1985 and died in 2016.

Sources:
Obituary in the *Kansas City Star* in 2016.

Vernon J. Hurst
First Head of the Department of Geology of the University of Georgia

Vernon James Hurst was born in 1923 in Glenmore, Georgia, in Ware County in the Atlantic Coastal Plain. During World War II, he served in the 97th U.S. Infantry Division, seeing combat in Europe and serving in the occupation of Japan. After the war, he received his B.S. in Geology from the University of Georgia and an M.S. from Emory University in Atlanta. He then went on to The Johns Hopkins University in Baltimore, where he studied under Ernst Cloos and worked with Hatten S. Yoder Jr. at the Geophysical Laboratory of the Carnegie Institution of Washington. His dissertation, submitted in 1955, was on "The Stratigraphy and Structure of the Mineral Bluff Quadrangle" and thus dealt with the area where Georgia, Tennessee, and North Carolina meet near the Ducktown copper mine.

Dr. Hurst was hired by the University of Georgia in 1961 to be head of its new Department of Geology, which was split off from the Department of Geography that year. At his arrival, he was not the most senior professor in the new Department of Geology; Charles Salloti, John Hoyt, and perhaps others had served in the Department of Geography prior to the split. One might thus ask why an outsider with regard to University experience was brought in to be head of the new department. One answer might be that the University wanted a head with strong ties to Georgia: Dr. Hurst was a native of Georgia, he was a graduate of the University of Georgia, he had worked with and/or published with the Geological Survey of Georgia, and he had a strong commitment to the study of the geology of Georgia.

With regard to Georgia geology, Dr. Hurst was author or co-author of the following diverse but incomplete sampling of publications on the geology of Georgia and the surrounding region:

Gold in east-central Georgia
Significance of crystallite size and habit determining origin
and industrial applications of Georgia kaolins
Commercial kaolins in Georgia; occurrence, mineralogy, origin, use

Manganese deposits of the Cartersville and Cave Springs districts, Georgia
Unusual minerals in Georgia
Geology of the southern Blue Ridge belt
Origin of Amphibolites in the Cartersville-Villa Rica Area, Georgia
Geochemical Study of Alluvium in the Chattahoochee-Flint Area, Georgia
Subsurface 'basement' rocks of Georgia
Lithiophorite from Hall County, Georgia
Metamorphism and structure of Ocoee rocks along Ocoee Gorge in Southeastern Tennessee
Strontium-barium content of Georgia carbonates
Monazite-bearing pegmatites in the South Georgia Piedmont
Oil tests in Georgia

Dr. Hurst was also author or co-author on more general papers with titles like

Staurolite twinning, in Mineralogical Magazine in 1956
Phosphorus in granitic rocks of North America,
in the Geological Society of America Bulletin in 1964
Brazil-Gabon link supports continental drift, in Science in 1969
Regional variation in the cell dimensions of metamorphic quartz,
in American Mineralogist in 1981
Effects of secondary iron phases on kaolinite 27Al MAS NMR spectra,
in Clays and Clay Minerals in 1998

Dr. Hurst's perspective on geologic problems extended from the large scale (as his paper with Gilles Allard on plate tectonics in Science indicates) to field scale (as his book on Saprolite mapping and his geologic mapping in Georgia attest) to the microscopic. With regard to the latter, he was an early advocate of transmission electron microscopy, especially in clay mineralogy. Even after his retirement, he pushed new electron microscopes to their limits, and his office as an emeritus professor was strategically located in Barrow Hall near the electron microscopes of UGA's Center for Advanced Ultrastructural Research. His ground-breaking research in clay mineralogy led the Clays Minerals Society to name him one of their Pioneers in Clay Science in 2003.

PAGE SIX The Red and Black FRIDAY, MARCH 23, 1962

Hurst Makes Ceramic Study

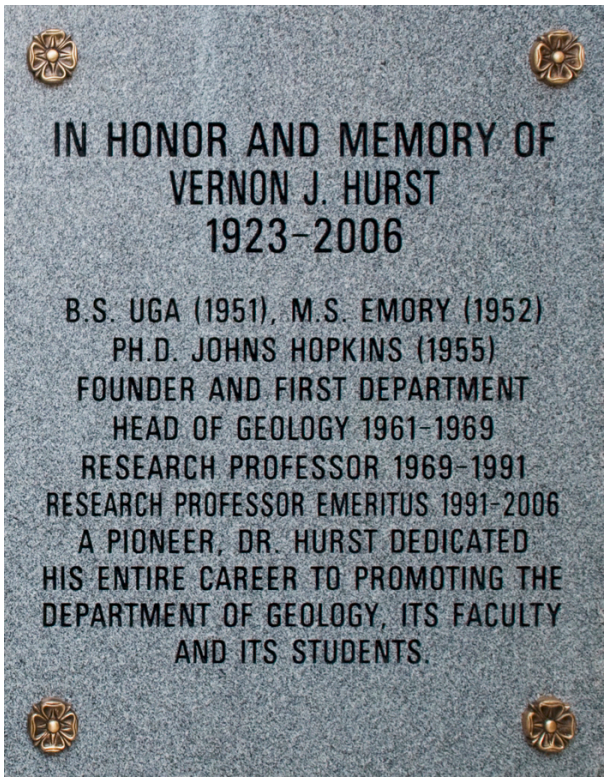
A new area of research has been opened at the University of Georgia with the granting of a contract with Clowes Ceramic Corporation to Dr. Vernon J. Hurst.

Dr. Hurst, who is the new head of the University's geology department, will do experimental work on the development of a special ceramic body to be used at high temperatures. A special ceramic body is a compound which may be fashioned into parts.

This work will be conducted in the new laboratory facilities being constructed in the University's Science Center. The only one of its kind in the Southeast, the laboratory is designed for the study and research of single crystal growth.

Dr. Hurst working at an electron microscope in Barrow Hall on the UGA campus in the late 1980s.

Dr. Hurst was Head of the Department of Geology from its founding in 1961 until 1969, when he handed off the headship to fellow Johns Hopkins Ph.D. Gilles Allard. He was also Chairman of the Physical Sciences Division of the Franklin College of Arts and Sciences for five years and a University Research Professor for twenty-two years. Despite his retirement in about 1991, he was active in the Department for more than a decade thereafter, in part working on a book about weathering, and he was a regular figure in the front row of Room 200A GG at the Department's "Journal Club" seminar series. He died in July, 2006, just a few days after his eighty-third birthday. In 2010, a stone monument to Dr. Hurst was mounted on the wall outside the office of the Department of Geology.



The monument to Dr. Hurst mounted outside the office of the Department of Geology of the University of Georgia in Spring 2010.

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Sources:

W.W. (Bill) Barker's obituary of Vernon James Hurst *in Elements,* vol. 2, no. 6, in December 2006.

Gilles O. Allard
Professor of Economic Geology
and Second Head of the Department of Geology of the University of Georgia

Dr. Gilles O. Allard is Professor Emeritus of Geology at the University of Georgia, having served on the faculty of the Department of Geology from 1965 to 1991. He is the Department's most beloved professor of all time, treasured for his rare combination of expertise, intensity, wisdom, generosity, and humor.

From Quebec to Brazil

Dr. Allard was born in a small town in southern Quebec in the late 1920s, and thus his native language was the French of the Quebecois. He was born to a family with little money and raised during the hard years of the Great Depression. His family nonetheless was dedicated to the education of its children, setting the stage for his successful career and life.

Dr. Allard studied at the University of Montreal and earned a B.A. in Languages in 1948, winning first prize in French composition. He then embarked on a different study of a different language, joining the Canadian Officers Training Corps with part of the goal being to learn English. However, he soon found that the English that one learned in the military had many words not appropriate in polite conversation. He did this in a nation and army in which there was considerable discrimination, not wherein people of one skin color discriminated against those of another but in which English speakers discriminated against those who spoke French.

In his early studies at the University of Montreal, science had mostly meant hours in smelly chemistry labs. One course revealed the glory of science outdoors as geology, and he turned to this immediately. He earned a B.S. in Geology from the University of Montreal in 1951, winning the Retty Prize in Economic Geology, a sign of things to come. He spent the summer of 1950 as a field assistant in Labrador to James Harrison, who would go on to be Director of the Geological Survey of Canada. Harrison had earned his graduate degrees at Queens University in Ontario, and he insisted that Gilles go there for his M.S. The faculty at Queens included some of the giants of Canadian geology, including J. Willis Ambrose, a graduate of Stanford and Yale who had been president of the Geological Association of Canada in 1947, and whose name would later be given to the GAC's Ambrose Medal. Also at Queens was James Edwin Hawley, who earned his Ph.D. at the University of Wisconsin and who went on to win the Willet G. Miller Medal, the Logan Medal, and the Barlow Memorial Prize. Ambrose and Hawley were Gilles's advisors for his M.S. research.

While still a student at Queens, Gilles's work for the Quebec Department of Natural Resources took him to Chibougamau in central Quebec, a remote site at which he would make mining history over the succeeding decades. In his first summer, in 1952, he discovered a copper deposit at Siderite Hill, while the prospectors hired by the claim's owner spent their advance money drinking in town. That year he laid claim to another great resource when he married Bernadette Martineau.

Gilles finished his M.S. at Queens in 1953, with his thesis on Chibougamau. Ambrose directed him onward to work on a Ph.D. at Johns Hopkins, where a remarkable faculty including

Aaron Waters, Ernst Cloos, Joseph Donnay, and Francis Pettijohn had recently been assembled. However, Gilles and Bern soon found that they could not afford the tuition at Hopkins, and Gilles told his professors he would have to give up and go home. At this point Ernst Cloos arranged a tuition remission for the outstanding young student, and Gilles was able to continue his studies, holding a fellowship in 1954 and 1955. Among his fellow students at Hopkins was a young Georgian named Vernon Hurst, who would go on to be the first head of the Department of Geology of the University of Georgia.

In the summers, Gilles continued his work at Chibougamau, with Bern accompanying him to live in the leaky rotten log cabins abandoned years earlier by diamond drillers. Gilles' hard work led to the discovery in those summers of the Dore Lake Complex, an Archean layered intrusion that had been folded and metamorphosed to greenschist facies. In 1955, he began work as Exploration Manager for Chibougamau Mining and Smelting (CMS). This meant that he had left Hopkins without finishing his dissertation, and Aaron Waters was soon sending him threatening letters. With much coloring of maps by Bern, Gilles defended his dissertation about Chibougamau in the fall of 1956 and became Dr. Allard.

Bern and Gilles in Chibougamau in 1953

Life at Chibougamau was hard. Gilles and Bern lived in a company house, with their only power from a diesel generator that failed periodically. The town was on a Pleistocene lake bed, so that conditions alternated between duststorms and snowstorms. One of the hardships of Chibougamau was of course the cold. Once, flying back to Chibougamau with one of their

babies, Bern wisely packed a full baby-bottle. The flight was in a very small plane, with the pilot just behind the engine. When the baby started to cry, Bern pulled out the bottle from her luggage - and the plane was so cold that the bottle had frozen. However, the pilot put the bottle close enough to the engine to warm it back to the milk's liquid state, and soon the crying baby was happy again.

Gilles's work soon involved an unprecedented exploration effort, with twenty-one drills operating on the ice of Chibougamau Lake to drill 168,000 feet of core, during winters in which the temperature would drop to -68°F, or -55°C. This led to the discovery of the Henderson Mines I and II, which over the subsequent thirty years would yield 271 million pounds of copper and 347,677 ounces of gold.

In 1958, Gilles was offered a job at the University of Virginia, and Bern and Gilles decided that it was time to raise their children in a more hospitable environment than the frigid cold and remote setting of central Quebec. However, UVA had a poorly administered department then, and the job was a disaster. At about the same time, Aaron Waters was offered a teaching position with Petrobras, the Brazilian national oil company. Waters had other commitments, and he passed the offer along to Gilles, and in 1959 the Allards were on their way to Brazil for a two-year excursion that lasted for five years.

The Allards in Brazil: 1959 to 1964

Gilles's work for Petrobras involved a heavy teaching load at the company's school and mapping projects in the deserts of the state of Sergipe. This work led to the discovery of the Propria Geosyncline, a previously unrecognized Precambrian province in the Brazilian Shield.

The Allards lived in Salvador, the capital of the Brazilian coastal state of Bahia. One of Bern's most memorable surprises about life in Brazil came when Gilles's was on his first field trip. In the evening, a man came to say that her husband had sent a package that the man had placed in her back yard. The next morning, Bern looked in her back yard and found a dead anaconda. She had no idea what to do with it, but a neighbor indicated that he knew exactly what to do and disappeared with the snake. A week later, the neighbor delivered the anaconda's skin, on one side the scaly skin expected of a snake and on the other a beautiful soft white leather. When the Allards came to Athens, the anaconda's white leather became a wall-covering in their home, and eventually it was passed on to their son Mitch.

As the political situation in Brazil evolved, the Allards were advised to leave, but they stayed until the military coup d'état of April 1, 1964. With their children already out of the country with Bern's sisters in Quebec, Gilles and Bern set of on a trip up the Amazon. When a planned plane trip to the Andes failed because the plane on which they would have ridden crashed, they instead took a freighter up the Amazon, the only passengers on a ship on which the captain was English and the crew Brazilian - and Gilles and Bern the translators. The goal was of course to visit and sample famous mines in Chile and Peru, which was accomplished with daring trips across spectacular Andean roads in jeeps carrying dynamite to the mines.

After returning to the Northern Hemisphere, Gilles took a temporary position at the University of California at Riverside. This gave Gilles the opportunity to visit and sample famous mines in the southwestern United States. However, when Vernon Hurst came out for a

meeting in California, Vernon asked his old Hopkins officemate Gilles what he was doing, and Gilles replied that he was looking for a job - and Vernon said he had a job to offer. Soon the Allards were on their way to Athens for the beginning of classes there in the fall of 1965.

Gilles Allard at the University of Georgia: 1965 to present

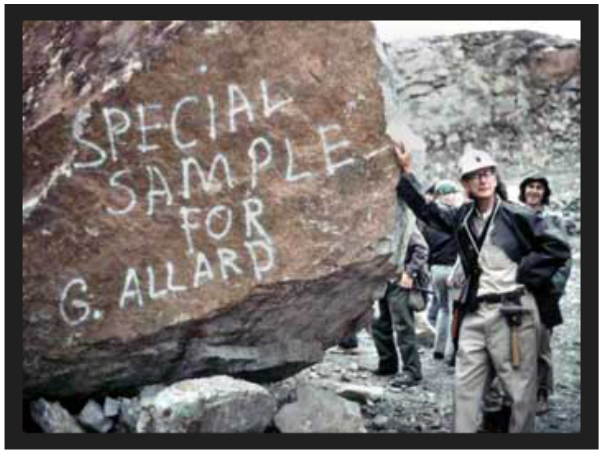
At UGA, Gilles soon earned a grant from the National Science Foundation to test the then-remarkable hypothesis that geological features in South America could be traced in western Africa. Specifically, this project was for research in Cameroon and Gabon to find a continuation of the Propria Geosyncline that Gilles and Fred Humphrey had discovered in Brazil. Despite the challenge of field work in the west African jungles, the continuity was confirmed, and Gilles went on to present his work at the Third Gondwana Symposium in Montevideo, Uruguay, in 1967 and to publish his results in the prestigious journal *Science*.

Dr. Allard in Cameroon in 1967

After Gilles came to UGA, his research in Chibougamau continued from 1966 to 1987 with a huge mapping project for the Quebec Department of Natural Resources. Many students were trained in this program and then went on to careers as economic geologists. These years of work led to the discovery of a world-class vanadium deposit in the Lake Dore Complex. Today, Parc Allard in Chibougamau stands as public testimony to Gilles's many years of work there.

At UGA, Gilles was joined by Robert Carpenter to form a remarkable program and partnership in Economic Geology that became the principal focus of the Department of Geology. In 1969, Gilles was asked to take over as head of the Department, a challenging position because

of the combative personalities in the Department. Always one with a plan, Gilles spent an evening at a GSA meeting persuading Norman Herz, another Johns Hopkins Ph.D., to come to UGA to take over as head.



A sign of Dr. Allard's enthusiasm for collecting samples

The years of 1987 and 1988 were a transition in Gilles's work, as he concluded his research in Quebec and began a large mapping project in east-central Georgia that extended from 1988 to 1992. This project involved geologic mapping of twenty-three quadrangles east from Athens and from Lexington to the Savannah River, and from Thomson to Woodville. As before, many students were trained in this effort, which Gilles finished after he retired.

In his career at UGA, Gilles became the Department's best-loved professor. Eleven times he won the Professor of the Year Award given by the department's graduate students each year. Three times he won the Teacher of the Year Award given by the department's undergraduate students each year. He won the University of Georgia's Silver Bowl for Excellence in Teaching in 1968, and was the Sandy Beaver Teaching Chair of Geology from 1978 to 1982. He supervised twenty-six students completing master's degrees and six doctoral students.

Gilles's popularity with students was not because his courses were easy, but in fact because they were so challenging. Students who weren't paying attention were commonly pelted with erasers or chalk thrown by Dr. Allard. In about 2013, more than two decades after Dr. Allard's retirement, an alumnus rose during the Geosciences Colloquium in Room 200A to point to a spot in the middle of the room saying "that's where the piece of chalk was when I first saw it coming at me."

Dr. Allard in about 1990

Dr. Allard leading a UGA field trip at Watson Mill State Park in 1989

Dr. Allard's awards for teaching are all the more remarkable because he also won so many awards for his research too. The four most prestigious awards, any one of which would be a capstone of a great career, were the Duncan Derry Medal of the Geological Association of Canada in 1989, the Grand Prix de Mérite Géoscientifique de l'Association des Géologues et Géophysiciens du Québec in 1996, the A.O. Dufresne Exploration Achievement Award of the Canadian Institute of Mining, Metallurgy and Petroleum in 1998, and the Jean Descarreaux Prize of the Association de l'Exploration Minière du Québec in 2003. The citation for the Dufresne Award read

> In recognition of his major contributions to the understanding, exploration, and development of the Chibougamau mining camp and for his skill in disseminating information to the geological community and inspiring future geologists.

With regard to the Duncan Derry Medal,

> The medal honors outstanding economic geologists who have made major contributions to economic geology in Canada and have exhibited skill and stature in disseminating information to the geologic community and in inspiring future geologists,

and with regard to the Jean Descarreaux Prize,

> This prize is awarded to recognize the career of an entrepreneur who, by his work over many years, has contributed in a significant manner to the development of mining entrepreneurship in Quebec.

A different sort of honor is to be invited to speak at universities and meetings. In 1984 to 1985, Gilles the Distinguished Lecturer of the Canadian Institute of Mining, giving nineteen lectures across Canada. In 1992-1993, he was the Thayer Lindsley Visiting Lecturer of the Society of Economic Geologists, similarly touring to lecture at numerous universities. In 1981 he was invited by the Canadian Institute of Mining for a lecture tour to three Quebec universities, and in 1984 he was invited by the Canadian Institute of Mining for a lecture tour to five universities in Ontario. In 1975 he was invited by the University of Geneva in Switzerland to give an entire course, and among the many universities at which he has been invited to lecture are the Universities of Heidelberg, London, and Durham, and the Ecole Nationale des Mines in Paris. His invitations to speak at conferences included meetings in China, Peru, and South Africa.

The thirty-four papers published by Gilles spanned the years from 1960 to 1995. They include papers in Science, the Geological Society of America Bulletin, and the Canadian Journal of Earth Sciences. They were accompanied by innumerable technical reports, as well as laboratory manuals used both at UGA and published nationally.

Gilles in retirement

With Gilles' retirement, Doug Crowe joined the Department to continue the tradition of Economic Geology at UGA. Gilles was soon leading Doug on impossible treks through the briars and brush of the Piedmont to see obscure exposure of gneiss and saprolite. Gilles also taught Doug how to garden in the clay soils of Georgia. Doug encouraged Gilles to catalog his huge collection of ore samples, leading to the Allard Collection now accessible on the World-Wide Web. Gilles generously donated his spectacular collection to the UGA Museum of Natural History.

Gilles' retirement was of course active. His new career involved lecturing on cruse ships, participated in thirty-six cruises, several of which went to Antarctica. In the process, Gilles became an expert on the history of the exploration of Antarctica, as well as on that continent's geology. He also lectured on continental-scale and round-the-world jet trips. These travels took him to the Arctic, Greenland, Alaska, the Caribbean, Chilean fjords, and the Dalmatian coast, as well as twenty trips to Antarctica.

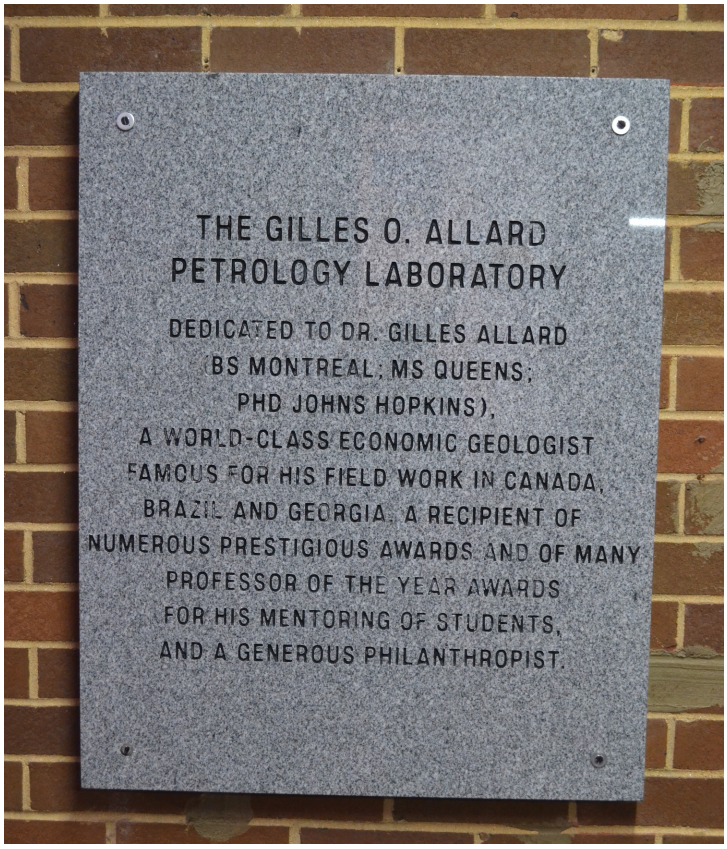
Dr. Allard in Antarctica in his career as a tour guide

Dr. Allard leading his building-stone tour of the UGA campus in 2011

At the time of his retirement, Dr. Allard's former doctoral advisee Jeff Reid led the establishment of the Bernadette and Gilles Allard Fund to support the field research of the Department's graduate students. Thus Gilles made the transition to a new career as fund-raiser for the Department. It is a testimony to how Gilles inspired generations of students that the Allard Fund has been a great success, with a growing endowment that has supported student research in many places for many years.

In his retirement, Gilles remained a fixture in the Department. No longer reminding students to keep busy, he instead greeted male faculty members by asking, "Why aren't you working, you play-boy?" In April 2015, the Department celebrated Gilles' fiftieth year at UGA with a banquet attended by dozens of his former students, as well as by many of his colleagues. The event was punctuated with two standing ovations. The next week, Gilles was back in his office, starting on another fifty years.

In 2020, Gilles was again honored by the Department and University. This time it was with the naming of Room 327, long known to all as the teaching room for courses in all sorts of petrology, as the Allard Petrology Laboratory. It was the first such named laboratory in the Department and resulted from a generous gift to the University by one of Dr. Allard's former students.



Lois M. Jones
Professor of Geochemistry

Lois Jones was an assistant professor in the Department of Geology of the University of Georgia from roughly 1969 to 1977. However, she is most famous for an event that occurred before she came to the University, or perhaps soon thereafter – and one that happened very far from Georgia. She is probably the only faculty member of the modern Department for whom a landscape feature is formally named.

Lois Jones's education consisted of BS and MS degrees in chemistry and a Ph. D. in geology from the Ohio State University, where she worked with Gunter Faure. Her Ph.D. research used Sr isotopes to understand lake waters and soils in the Dry Valleys of Victoria Land, west of McMurdo Sound and thus across the Sound from McMurdo Station.

In the Antarctic field season of 1969, Lois Jones led a team of female researchers and technicians on an expedition to Lake Vanda in the Wright Valley. The U.S. Navy had previously barred women from going to U.S. sites anywhere in Antarctica, but Jones's project was finally approved on the conditions (1) that the research team that she led be entirely female and (2) that they not spend significant time at McMurdo Station. They therefore camped in the dry valleys while they performed several lines of research. The *Antarctic Journal of the United States* (Vol. 4, Issue 6, p. 260) indicates that at least one member of her 1969-1970 Antarctic team was from the University of Georgia.

During the field expedition, Jones wanted an aerial view of the region and was able to get her team on a flight to Amundsen-Scott South Pole Station. Six of her team thus made history as the first women to reach the South Pole, and although they arranged to step out of the plane's cargo bay simultaneously, Jones is commonly cited as the first woman to reach the South Pole.

Lois Jones, second from right, and three members of her Antarctic team.

Lois Jones (second from left), Rear Admiral D.F. Welch (third from left), and Jones's team emerging from their LC-130 transport at the South Pole.

In leading the Antarctic expedition, Jones knew that problems or failure would keep other women from reaching Antarctica. However, in team member Terry Terrell's memory "We were considerably less bother than the men. That was intentional. Dr. Jones was very concerned about being less bother. She had her professional career based on this. She was very concerned about making sure this was a successful field season" (*Antarctic Sun* 2009). By all accounts, the expedition succeeded with very few problems.

Lois Jones was an assistant professor in the Department of Geology of the University of Georgia from roughly 1969 to 1977. She was remembered at UGA as an outstanding teacher. However, her life at UGA cannot have been too pleasant, in that male colleagues from that era subsequently spoke of her dismissively, and the word "bitch" scratched into the door of one of Geology's faculty offices suggests that the environment was not very supportive.

611. Principles of Geochemistry.
Three lectures. Prerequisite: Chemistry 122, Physics 128, and Geology 323. (Mr. Blount or Mr. Jones.)
Composition of the earth. Distribution of elements in minerals and rocks. Principles governing the migration and concentration of elements. Introduction to nuclear geology and geochemical prospecting.

The University of Georgia catalog in the early 1970s listed all faculty members as "Mr.", including Lois Jones.

Jones published sixty papers and abstracts during her career, including papers in the Canadian Journal of Earth Sciences, Chemical Geology, Contributions to Mineralogy and Petrology, Earth and Planetary Science Letters, Economic Geology, the Geological Society of America Bulletin, Geology, Geologische Rundschau, and Nature. Much of her work pertained to Antarctica, but examples relevant to Georgia and UGA include

Lois M. Jones and R.L. Walker, 1973, Rb-Sr whole-rock age of the Siloam Granite, Georgia: A Permian intrusive in the southeastern Appalachians (Geological Society of America Bulletin 84, 3653-3658)

Lois M. Jones, Vernon J. Hurst, and Raymond L. Walker, 1973, Strontium isotope composition of amphibolite of the Cartersville – Villa Rica District, Georgia (Geological Society of America Bulletin 84, 913-918)

Lois M. Jones, Walker, R.L., and Gilles O. Allard, 1974, Rubidium-strontium whole-rock age of major units of Chibougamau Greenstone Belt, Quebec (Canadian Journal of Earth Sciences 11, 1550-1561.

James A. Whitney, Lois M. Jones, and Raymond L. Walker, 1976, Age and origin of the Stone Mountain Granite, Lithonia District, Georgia (Geological Society of America Bulletin 87, 1067-1077).

In another, if more tenuous, connection to UGA, she was the first person to publish on research involving laser ablation of minerals to determine isotope ratios, an area of research later pursued in the UGA Department of Geology's Stable Isotope Laboratory by Dr. Douglas E. Crowe and his students. The paper was Jones, L.M., et al., 1984, Intelligent multichannel data-acquisition system for pulsed laser applications (Review of Scientific Instruments 55, 204-209), on which her affiliation is shown as the Department of Chemistry of Michigan State University.

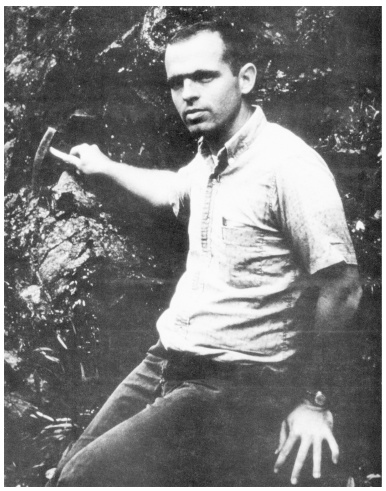
Jones went on from UGA to work for Conoco, where she was a senior research scientist and was employed for sixteen years. Her last academic appointment was as an assistant professor of geology at Kansas State University. After retirement, she moved back to Ohio and served as a volunteer in the English as a Second Language program in Columbus, Ohio. She endowed two fellowships at Ohio State University, the Lois M. Jones Fellowship Fund in Geological Sciences and the Lois M. Jones Endowment for Cancer Research Fellowships. She died in Columbus, Ohio, on March 13, 2000, at the age of 65. Jones Terrace (77.497584S, 162.073715E) in the Antarctic Olympus Range is named after her.

Sources:
The November 30, 2003, Antarctic Sun, a publication of the United States Antarctic Program.
Rejcek, P., 2009, Breaking the Ice. The Antarctic Sun, November 13, 2009.
Celebrating Lois Jones' 50-year legacy in polar research:
https://artsandsciences.osu.edu/news/celebrating-lois-jones-50-year
Pers. comm. with Douglas E. Crowe
Lewandowski, K, 2018, Pioneers in Antarctic research: Lois Jones and her all-woman science team explore the geochemistry of the Dry Valleys, *in* Women and Geology: Who Are We, Where Have We Come From, and Where Are We Going?, Mem. Geol. Soc. Am., 214.
Wikipedia's page on Lois M. Jones.
www.aaus.net/Memorium%20pages/Lois%20M.%20Jones.htm

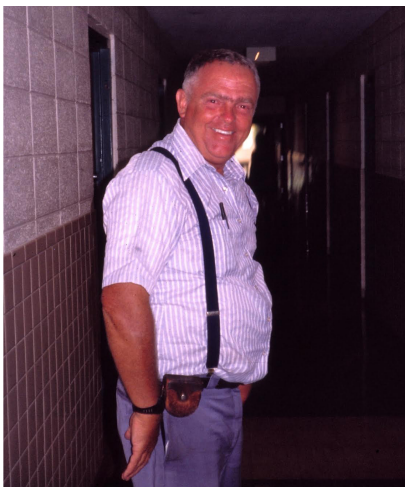
J. Hatten Howard

James Hatten Howard III was born in Jacksonville, Florida, in the summer of 1939. He was one of two sons of Doris and James Hatten Howard, Jr. He received a B.S. in Geology from Duke University in 1961 and then enrolled in graduate studies at the University of North Carolina in Chapel Hill. However, he moved on and earned his Ph.D. in Geology and Geochemistry from Stanford University in 1969. At Stanford, he studied under the famous Konrad Krauskopf, and his dissertation dealt with the geochemistry of selenium.

Hatten joined the faculty at the University of Georgia as an Assistant Professor of Geology in 1967, while still completing his graduate studies at Stanford. He was promoted to the rank of Associate Professor in 1981, the rank that he held until his death in 1992. He was Acting Department Head from 1981 to 1983, stepping into the chaos that developed in the latest 1970s and earliest 1980s. He served as departmental undergraduate advisor from 1976 until his death.



The young James Hatten Howard III



Hatten Howard at the UGA Geology Field School in 1990

Photograph at right by Julia Cox.

Hatten's research efforts at the University of Georgia were directed mainly to the geochemistry of selenium and to planetary geology, with the latter beginning a very discontinuous trajectory leading toward Christian Klimczak by way of Alberto Patino Douce and Mike Roden. He supervised M.S. theses in each of those areas, one on the geochemistry of molybdenum and the other a photogeologic interpretation of a highland terrain on Mars. However, he also published a paper in *Journal of Paleontology* on trace fossils made by butterflies (if anyone thinks "that must have been Jim [James D.] Howard", no – it was Hatten). Hatten thus surely must have become one of the very few people with single-authored papers in both *Geochimica et Cosmochimica Acta* and *Journal of Paleontology*.

Hatten's greatest enthusiasm and contributions were nonetheless in the classroom, where his breadth of knowledge (see above), great enthusiasm, and kind nature made him a much-appreciated instructor. Hatten was General Sandy Beaver Professor (UGA's highest teaching honor) from 1985 to 1988 and again from 1991 until his death. He taught the Honors Program geology courses on a regular basis, and he helped develop the Honors Science sequence that has been taught continuously since 1971. In addition to his Sandy Beaver Professorship, he was

selected as Outstanding Honors Professor four times across an interval spanning nearly two decades. When he died, the UGA Honors Program created the J. Hatten Howard III Award to recognize faculty members who exhibit special promise in teaching Honors courses early in their careers (an award won by Rob Hawman in 2005).

Hatten's most lasting contribution to the Department was his founding of UGA's Geology Field School in Cañon City, Colorado, in 1985. The field school was derived from that of the University of Kansas, based in the same area, which Hatten had attended in the early 1960s and that his first staff member for the UGA field school, Chris Fleisher, had attended in 1980. In the first year or two, Hatten would go to the local soil conservation office and photocopy aerial photographs of areas that he and Chris had mapped, and away they would go to that day's site, to the extent that Chris recalls being asked at breakfast by the students "Where are we going today?" and having to answer "I have no idea". Eventually Hatten and Chris found more projects and developed relationships with an increasing number of landowners, and the program stabilized. At the heart of it all was Hatten's dedication to the students and enthusiasm for teaching, and the school persisted decades after his death, to this writing in 2021.

In white, Hatten Howard addressing Field School students on Skyline Drive west of Cañon City in 1990. Jeff Clippard at lower right. In the distance, eastern North America for scale. Photograph by Chris Fleisher.

In plaid, Hatten Howard at a roadside stop of the UGA Geology Field School in 1990. Photograph by Julia Cox.

Hatten contracted cancer in the early 1980s. A gentleman of great generosity to the end, he organized retirement banquets for Mark Rich, Vernon Hurst, and Gilles Allard in the early 1990s, even though he knew he would not survive to retire and be fêted himself. In 1991, Hatten learned that he had a recurrence of the disease. He did not give in, attending to his teaching and advising duties and coaching his team in youth soccer until just a few days before his death on September 28, 1992. His remains were interred in Oconee Hill Cemetery, where those of William Louis Jones had been interred in 1914 and those of Bob Frey had been interred less than a year before.

Sources:
A funerary biography of J. Hatten Howard III.
Memories of and photographs by Chris Fleisher and Julie Cox.

Robert W. Frey
Professor of Paleobiology and Ichnology

Robert Wayne Frey was born in Cleveland County of southern Arkansas on December 13, 1938, as the only child of Arlie Mae and Robert A. Frey. After a stint in the U.S. Air Force and study at Lower Columbia College in Longview, he and his wife Sharon moved to Missoula where he earned his Bachelor's degree in Geology in 1964. From there they went to Bloomington, where he earned his M.A. in 1967 and Ph.D. in 1969 from Indiana. The title of his dissertation, written under the supervision of Donald Hattin, was "Stratigraphy, Ichnology, and Paleoecology of the Fort Hays Limestone Member of the Niobrara Chalk (Upper Cretaceous) in Trego County, Kansas".

Bob's association with the University of Georgia began in 1968, when he became a Post-Doctoral Research Associate at UGA's Marine Institute on Sapelo Island. That began a long program of research in modern environments on the Georgia coast, one that extended so far that he was co-investigator on an NSF grant with Sue Goldstein to study salt marsh foraminifera funded in 1991, shortly before his death. If living and working on Sapelo sounds fun, Bob once remarked that, although he had spent four winters in Missoula, he was never colder than when it sleeted on Sapelo Island.

In 1970 Bob was appointed as an Assistant Professor in the UGA Department of Geology, was promoted to Associate Professor in 1974, and to Professor in 1978. In 1984, he was Merill W. Haas Distinguished Visiting Professor of Geology at the University of Kansas. New courses for which he wrote applications and/or developed included Elementary Oceanography, History of Life, Applied Oceanography, Introduction to Paleoecology, Introduction to Trace Fossils, Marine Paleoecology and Taphonomy, and Geology for Elementary Teachers (with Gilles Allard). He, Paul Pinet, and Jim Whitney co-authored a textbook on Earth History that went on to four editions. At the graduate level, Bob was Major Professor for twenty-one M.S. Degrees and seven Ph.D. Degrees, and he was elected "Professor of the Year" by Department's graduate students in 1980, an accomplishment in the era when Gilles Allard customarily swept up that award.

Bob Frey

Bob's research followed logically from his dissertation and focused on animal-sediment relationships, and he is remembered a major figure in the field of ichnology, the study of trace fossils. Bob authored or co-authored more than eighty journal articles, and among many other publications he edited the 1975 book *The study of trace fossils : a synthesis of principles, problems, and procedures in ichnology*. He and his former colleague at UGA, George Pemberton, founded the journal *Ichnos – an international journal for animal and plant traces*. His research may have focused most on the Holocene of the Georgia coast, but he also worked on funded projects as far afield as the tidal flats on the coast of Korea, and his publications went as far back in time as the Ordovician.

Bob's prominence in his field is also apparent in the account of at least one faculty colleague who came to UGA to work with him. A memorial tribute to S. George Pemberton on the University of Alberta website, written in the 2010s, explains Pemberton's move from Canada to UGA in 1978 as follows:

> George accepted the offer of a position at the University of Georgia in order to work closely with two of his scientific idols — Dr. Robert W. Frey and Dr. James D. Howard. He regarded his collaboration with Bob Frey to be one of the highlights of his career, and he developed a close friendship with him until Bob's death in 1992.

Students commonly come to specific institutions to study with specific professors, but rarely do young faculty members select their first positions as faculty members in order to work with specific professors.

As is probably apparent from the above, Bob always had a plan for future progress. At the end of his life, he organized lunch meetings of the younger faculty members in his area (among them Sue Goldstein, Liz Gordon, and Bruce Railsback) at UGA's Faculty Center dining room in Memorial Hall – in fact, he kept those meetings moving forward even when he was to ill to attend. In a eulogy at Bob's funeral, George Koch characterized him as "caring" and "authentic", which were certainly accurate, but "determined" and "forward-looking" were appropriate too.

Bob Frey died on New Years Day, 1992, at the age of fifty-three, following a four-year battle with cancer that had its roots in smoking. He did not retire, in either the technical or metaphorical sense, and thus he may have been the first Geology faculty member to die in active service to the Department, perhaps unsurprisingly in light of his young age but entirely in keeping with his approach to work and science. His remains were interred in Oconee Hill Cemetery, where those of his colleague Hatten Howard would be interred later that year.

Sources:
Curriculum Vitae of Robert W. Frey generated in August 1991.
The funerary account of the life of Robert W. Frey
Bruce Railsback's letter to the Frey family of January 5, 1992.
Brodie, H., 2018, Lowering the Flag: Remembering S George Pemberton and Mitchell Ormann. https://blog.ualberta.ca/lowering-the-flag-remembering-s-george-pemberton-and-mitchell-ormann-cc9c7bea7017 accessed 24 December 2020.

Norman Herz

Professor of Economic Geology and Geological Archaeology

Norm Herz in effect had two careers (one that bridged hard-rock petrology and economic geology and the other in geological archaeology), he effectively had full careers in two settings (government and academia), and he was twice head of UGA's Department of Geology (in the 1970s and in the 1990s). He thus in sports terms accomplished a triple-double across his lifetime, and at the end of this essay he will be credited with a triple play executed at the age of 81.

Norm was born in about 1923 in New York City and graduated from the elite Townsend Harris High School in eastern Manhattan. He graduated from the City College of New York in 1943, and soon he enlisted in the army. He served in the Corps of Engineers and the U.S. Army Air Force (in the days before the Air Force became a separate branch of the U.S. armed forces). He enlisted as a private but was commissioned as a 2nd lieutenant in the Air Force in March 1945. His most notable experience in World War II was serving in Operation Alacrity, the top-secret U.S. effort to put a military base in the Azores despite the islands being Portuguese (and thus neutral) territory. His 2004 book *Operation Alacrity: The Azores and the War in the Atlantic* was the first, and is the most authoritative, book on that program.

With the war over, Norm went to John Hopkins University to study with the famous structural geologist Ernst Cloos, and 1950 he was awarded a Ph.D. for a dissertation on "The Petrology of the Baltimore Gabbro and Petrography of the Baltimore-Patapsco Aqueduct". The early 1950s saw brief stints as an instructor at Wesleyan College and geologist with the Connecticut Geological Survey. More significantly, from 1952 to 1970 Norm was a Research Geologist with the United States Geological Survey, and from 1956 to 1962 was assigned to work in Brazil, mapping and otherwise contributing to the development/exploitation of that country's resources. The significance of Norm's work in Brazil is evident from his election in 1981 as a Foreign Associate of the São Paolo State Academy of Science and his election in 1991 as a Foreign Member of the Brazilian Academy of Sciences. He was also a Professor Visitante at the Universidade de São Paulo from 1962 to 1964.

Norm's work with the US.G.S. led to several important papers, including a widely-cited 1969 paper in *Science* on "Anorthosite belts, continental drift, and the anorthosite event" with a succinct abstract:

> Most anorthosites lie in two principal belts when plotted on a predrift continental reconstruction. Anorthosite ages in the belts cluster around 1300 +/- 200 million years and range from 1100 to 1700 million years. This suggests that anorthosites are the product of a unique cataclysmic event or a thermal event that was normal only during the earth's early history.

However, Norm's work for the USGS also involved resources outside Brazil, and in the United States. In a 2013 notice of Norm's death in a USGS publication, a USGS geologist wrote with regard to accord to accolades of Norm's later archaeological work that "The words anorthosite, titanium, and Virginia don't appear in those reminiscences by his archaeological colleagues, but need mention here".

In 1970, Norm was recruited by another Johns Hopkins Ph.D., Gilles Allard, to be head of the Department of Geology of the University of Georgia. Norm and Gilles had not overlapped at Hopkins, but they met on a field trip in Brazil while Gilles worked for Petrobras. In Dr. Allard's telling of the story of Norm's recruitment as head, Gilles (then the reluctant head of the Department) realized that both he and Norm would attend the 1970 Southeastern GSA meeting in Lexington and supplied his motel room with some "liquid convincer" for a meeting with Norm, and by 2:00 or 3:00 a.m. he had persuaded Norm to come to Athens to be the head of the Department. Norm was thus head from 1970 to 1977, years in the Department that seem to have been happier and more peaceful than those before or after. With regard to the curriculum, Norm and Serge Gonzalez created a course on industrial minerals to balance the course that Gilles and Bob Carpenter taught on metallic ore deposits, contributing in the shorter term to the Department's strength in economic geology and in the longer term to its base of alumni and alumnae who could give back to the Department in the decades to follow.

In the 1970s, an earlier archaeological seed began to bloom for Norm. In the early 1950's, his advisor Ernst Cloos had been asked to recommend a geologist to work with archaeologists in Greece. As a result, in 1952 Norm went to Greece as a Fulbright Senior Research Scholar, and in 1953 he co-authored a landmark paper on "Marble in Attic Epigraphy". As Norm put it in his 2007 acceptance speech for the Rip Rapp Award, "This exciting start in classical archaeogeology was quickly cut short, followed by 18 years with the USGS as a hard rock research geologist". However, now freed from being managed by the USGS and able to enjoy the liberties of academic research, Norm resumed his archaeological career. Its main focus was the question of the provenance of the marble from which ancient (largely Greek) artifacts had been made, which had implications both for sources of marble but, more critically to historians of art, for which "artifacts" might in fact be modern copies or outright fakes. This led to a landmark 1978 paper in *Science* co-authored with Dave Wenner (who had been hired by Norm during the latter's first headship) with the title "Assembly of Greek Marble Inscriptions by Isotopic Methods". Norm's database of isotopic compositions of marbles from quarries across the Aegean (if not the Mediterranean) came to be the arbiter of the provenance and authenticity of many ancient (or seemingly ancient) sculptures, and museums and collectors either celebrated or mourned that results of his isotopic and statistical analyses.

The isotopic database was clearly important, but it was part of a growing application of geological method and insight to archaeology. The latter led to a 1998 book published by Oxford University Press and co-authored with Ervan Garrison (who joined the UGA faculty during Norm's second headship) on *Geological Methods for Archaeology.*

Norm's work not only generated new knowledge but moved ahead the community of archaeological scholarship. He was one of two organizers of a 1986 Penrose Conference on "Archaeological Geology: Environmental Siting and Material Use." On 1988, Norm led the organization of the Association for the Study of Marbles and Other Stones used in Antiquity (ASMOSIA), which by the time of his death in 2013 had grown to over 300 scholars from more than 23 countries. At this writing in 2020 ASMOSIA continues to flourish and has a website

hosted by Willamette University, where Norm's doctoral student Scott Pike is now a Professor of Environmental Science and Archaeology and has enlarged on the themes of Norm's research.

As another outgrowth of his research bringing science, or other sciences, to archaeology, Norm found UGA's Center for Archaeological Sciences in 1984 and was its director from 1984 to 1994. The Center's original membership included twenty-eight UGA faculty and staff members from nine university units, with eleven associates from outside UGA.

Norm's work to bring together two fields, archaeology and geology, and success in doing so is evident in two major awards, one from each side. In 1995 he received the Pomerance Award for Scientific Contributions to Archaeology from the Archaeological Institute of America, and in 2007 he received the Rip Rapp Archaeological Geology Award from the Geological Society of America. Internationally, he was at various times an Exchange Scientist between the (US) National Academy of Sciences and the Romanian Academy of Sciences, similarly an Exchange Scientist between the (US) National Academy of Sciences and the Bulgarian Academy of Sciences, a Professor Associé of the Université d'Orléans in France, a research Fellow of the Indo-U.S. Subcommission on Education & Culture, and a Visiting Professor at the Wiener Laboratory for Archaeometry of the American School of Classical Studies in Athens, Greece. He was awarded UGA's Creative Research Medal in 1981.

Norm Herz on the Athenian Acropolis with a spectacular marble artifact (the Parthenon)

and in a UGA classroom

By the early 1990s, Jim Whitney was ready for a break from being head of the Department of Geology, and Norm returned to the headship for 1991 to 1994, technically as acting head and thus subject to reappointment every year or two. Another quirk was that his time of hiring and/or date of birth put him in an odd cohort of University System employees who were required to retire at the age of 70. He therefore retired in about 1993 but nonetheless continued to be employed on a temporary basis so as to serve as head of a department of youngsters until 1994. He therefore oversaw a series of hires, at least from that of Doug Crowe to that of Sally Walker, and he maneuvered the Department through some painful budgetary years during which he once,

with his customary sense of humor, reported at a faculty meeting that for budgetary reasons, "the light at the end of the tunnel has been turned off".

Despite his many accomplishments and prestige in his field, Norm remained "accessible to students, and ready to assist" (to use Erv Garrison's words). In his citation of Norm for the 2007 Rip Rapp Archaeological Geology Award given by the Geological Society of America, Scott Pike recalled

> I remember vividly during my first year in graduate school walking down the sidewalk in front of the UGA Law School and running in to Norm. The conversation went something like this: "Hi Scott. I was wondering. I have a project for you if you're interested. Do you want to go to Greece?"

and Scott went on

> Despite all his achievements Norm is generous and modest. He seeks to involve new scholars and averts seeking credit and accolades for himself.

Norm retired formally in the early 1990s, but he continued to be active, both with geo-archaeological research and with the research and writing for his book on Operation Alacrity. In 2004, ten years after retirement and fifty-four years after earning his Ph.D., he executed a triple play: his book on Operation Alacrity was published *and* his two geological careers both bore fruit: he was sole author of a geoarchaeological paper on "Analysis and identification by paramagnetic resonance spectroscopy" in *Journal of Cultural Heritage* and he was co-author of a hard-rock-geology paper on "Geology and geochemistry of granitic and charnockitic rocks in the central Lovingston massif of the Grenvillian Blue Ridge terrane" in a Geological Society of America Memoir on *Proterozoic tectonic evolution of the Grenville Orogen in North America.* Even that was far from the end of his efforts, which include co-authorship of a 2011 paper on Roman Sarcophagi. His last scholarly publication appeared in 2013, the year of his death at the age of ninety and at the end of a remarkably long and multi-faceted career.

Sources:
Two partial curricula vitae by Norm Herz.
Citation for the 2007 Rip Rapp Award to Norm by Scott Pike and Erv Garrison.
Norm Herz's remarks in accepting the 2007 Rip Rapp Award.
Memorial documents by Erv Garrison, Gilles Allard, Scott Pike, and FrancesVan Keuren.
An obituary published in Midland Reporter-Telegram in June 2013.
USGS Geologic Division Retirees Newsletter No. 71, Fall 2015.

PART VI. AUTOBIOGRAPHIES OF RECENT PROFESSORS IN THE DEPARTMENT OF GEOLOGY

Explanatory note

The biographies in Part V were, with the exception of the biography of Gilles Allard, written after their subjects had passed away. On the other hand, the autobiographies below were solicited from living retired faculty members. Those faculty members were asked to generate accounts of their lives and careers, written in the first person and covering the authors' origins, education, teaching, research, service to the Department, and "any other material that provides context or enlightenment". Sharing of "life lessons" was encouraged.

The Department thanks those retired faculty members who have taken the time and made the effort to contribute an autobiography. It is hoped that this document will be updated in the future with more autobiographies of both present and future retirees.

R. David Dallmeyer

Dr. R. David Dallmeyer joined the staff of the Geology Department at The University of Georgia in the fall of 1972. He retired from the University in the spring of 2010. During his tenure at the University Dr. Dallmeyer was employed as a structural geologist and geochronologist. His research focused on resolution and detailed calibration of the timing of individual tectonothermal events associated with the evolution of many of Earth's most extensive mountain belts. Dr. Dallmeyer carried out research expeditions on all continents and in most major orogenic belts on the planet (see attached map). His work resulted in publication of 206 peer-reviewed publications in international and national journals. Dr. Dallmeyer designed and assembled a high-vacuum, rare-gas mass spectrometer at the University of Georgia for the measurement of incremental $^{40}Ar/^{39}Ar$ mineral and whole-rock ages. University of Georgia graduate and undergraduate students were employed and trained to help with operation of the laboratory. Dr. Dallmeyer hosted a variety of international graduate student and research colleagues in his lab from many countries including Canada, Spain, Portugal, Slovakia, the Czech Republic, Austria, South Korea, Japan, India, France, Germany, Sweden and Norway. Dr. Dallmeyer supervised University of Georgia graduate students during their fieldwork in Quebec, the Southern Appalachians of Georgia, North Carolina and Tennessee, and in the northern Scandinavian Caledonides of Norway and Sweden. Dr. Dallmeyer served as Chief Editor and contributor to a regional geology series produced by the Springer-Verlag publishing company. These included volumes: "Pre-Mesozoic Geology of Iberia", Pre-Mesozoic Geology of the Alps", "The West African Orogens and Circum-Atlantic Correlations" and "Pre-Permian Geology of Central and Eastern Europe". Dr. Dallmeyer initiated a summer geology field school program at The University of Georgia in 1974 and served as its director until 1983. Dr. Dallmeyer served as co-director of a UNESCO Geological Correlation Project for 10 years (Project 233: Terranes in the Circum-Atlantic Orogens). He helped organize associated extensive summer excursions at various localities around the Atlantic.

Michael F. Roden

Dr. Michael Roden arrived at UGA in January, 1984, after completing a PhD under Fred Frey (Rare Earth Element geochemist) at MIT, and a post-doc with V. Rama Murthy (one of the people who determined the age of the earth in collaboration with Clair Paterson). At the time Roden arrived, Jim Whitney was head of Geology, and he believed that new professors should be assigned advanced courses only, and so Roden taught thermodynamics that spring, and advanced igneous petrology in the fall. Eventually he took over the undergraduate igneous petrology class (required) while Gilles Allard continued to teach the undergraduate metamorphic petrology class (also required). With the change from the quarter system to semester system, and the reorganization of the geology curriculum, the two petrology classes were combined into one class, GEOL 4300. Initially, Roden and Alberto Patino team taught the course but after some time Alberto decided to become more focused on planetary geology and Roden took over the metamorphic section of 4300 from him. Roden continued to teach that course, a section of environmental geology (GEOL 1121) and advanced igneous petrology (GEOL 8160) until he retired in 2017. Roden came back when Geoff Howarth unexpectedly left to teach petrology (his favorite class) in 2019.

Roden also participated in the field school for many years, initially under Hatten Howard, and then as director as Hatten became ill with cancer. Roden participated in the field school, primarily as an instructor until 2017. His favorite activity was to lead a field trip, camping the whole time, to Spanish Peaks, Valles Caldera and the San Juan volcanic field. – This activity was fun unless enrollment was more than 35 when the logistics became a nightmare.

Samuel E. Swanson
Prepared Dec. 2020

California Years

I was raised on a ranch in central California, midway between Sacramento and San Francisco. We had a small orchard on the eastern edge of the Coast Range. The trees produced plumbs, apricots and prunes. There were fields that raised grain. In later years irrigation water came to our ranch and we raised a variety of row crops (tomatoes, green beans, sugar beets, corn). I picked fruit every summer for over 20 years. I was convinced I would be a farmer. In one our fields, arrowheads made of obsidian would show up after each rain (or irrigation). I walked the fields in search of arrowheads and wondered how the Native Americans lived. A small travertine-depositing mineral spring in the hills behind our orchard was a frequently visited site. I collected the brightly colored stone and asked my father about the history of this place. In the 1910s and 1920s the carbonated water was bottled and sold in the Bay Area. Some of the stone was quarried for buildings. A crystalline material (aragonite) occurred with the travertine and I wondered why sometimes travertine formed and sometimes aragonite formed.

In high school, I took an earth science class taught by a geology grad student from U. C. Davis. Mr. Court took me into the field with him. He asked if I ever considered geology as a career. He said "you can make a living looking at rocks". That teacher changed my life. I enrolled at U.C. Davis as a freshman geology major.

At Davis I worked as a lab tech for a metamorphic petrologist. My job was to separate micas and feldspars from schists. In the pre-microprobe days, mineral compositions were tracked using XRD. I was a field assistant for the USGS one summer. I worked with two USGS geologists doing regional mapping in the center of the Sierra Nevada Batholith. One field area was in Kings Canyon National Park. I worked with Jim Moore, a renowned volcanologist. My first ride in a helicopter came that summer in Kings Canyon. The second half of the summer was spent in Yosemite National Park working with Ron Kistler. Ron was an isotope person. That summer sparked my interest in granitic rocks.

I graduated from Davis and elected to stay for a Masters degree. I wanted to map a granite pluton. Geology at UCD got its microprobe the year I graduated and I wanted to learn to use this wonderful machine. I mapped my pluton and learned to use the probe. One summer I worked on the probe analyzing moon rocks, that was way cool.

I wanted to learn how to apply experimental petrology to the interpretation of granitic rocks. I enrolled at Stanford the next fall working in the Tuttle-Jahns Laboratory for Experimental Petrology. I met a wonderful group of eccentric, brilliant graduate students in "The Lab". Jim Whitney was one of the group. At Stanford I learned about experimental studies and did some phase equilibria studies. Dynamic crystal growth experiments were the most significant part of my work. I published off this Stanford work for years. My work gave the first experimental explanation of volcanic vs plutonic textures. My results also established idea that nucleation rather than fast growth rate was responsible for large crystals in pegmatites.

While at Stanford, I worked at the USGS in nearby Menlo Park as a lab tech for Ron Kistler. I did mineral separations. I also stayed in touch with Jim Moore and listened to his stories of working on erupting volcanoes. Ron and I later published a paper on a Jurassic volcanic vent in the Sierra Nevada.

I graduated from Stanford. My grad student colleagues took positions at National labs (Oak Ridge, Sandia) doing experimental work. Some went to Corning Glass and worked in the research labs. Jim Whitney went to the University of Georgia.

I took a different path. I wanted to teach. I wanted to inspire students the way Mr. Court inspired me.

North Carolina: Teaching, granites and metadunites

I took a job at the University of North Carolina at Charlotte. This was a small, but growing institution with a small geology faculty in a large geography department. I got introduced to teaching, lots of teaching. I taught an evening class for earth science teachers, among other things. I even taught historical geology !

My first semester at Charlotte I took a trip to the western North Carolina "mountains" to visit an old friend (CA buddy from Davis days) teaching at Appalachian State (Boone, NC). I visited the granite quarries at Spruce Pine. These rocks were in my lore. One of the bulk compositions used by Jahns in his experimental studies was from Spruce Pine. Jahns worked mapping pegmatites at Spruce Pine for the USGS during WWII. I started a research project at Spruce Pine. It was a 4 hour drive from Charlotte to Spruce Pine. I would leave on Friday afternoon and return to Charlotte Sunday night. My buddy at App State kept telling me, "its only 30 minutes from App State to Spruce Pine". Sanity prevailed. I took the first position open at App State. During my time in the North Carolina mountains, Dick Jahns came to visit and we spent a week going to some of his pegmatites in Spruce Pine. I soaked up as much of his wisdom as I could. His thoughts still guide my Spruce Pine work.

I also worked on some metadunites while I was at Boone. These rocks were almost pure olivine and were mined for industrial olivine. These light green rocks were so different from the black, serpentinized ultramafic rocks from California. I mapped one well-exposed olivine quarry at Day Book, NC. A variety of interesting minerals occurred with the olivine. Textures and mineral assemblages made it clear this was a metamorphic rock. I published a paper on Day Book, citing it as a metamorphic rock. This was the first time the metamorphic character of these rocks was fully recognized.

My CA buddy at Boone and I used to talk about relocating back to California. He would look for job ads for some awful place on the west coast and leave it in my mail box. One of the ads was for University of Alaska Fairbanks (UAF). We joked that it was one of the few geology departments colder than App State ! On a lark, I applied for the Fairbanks job. I interviewed in Fairbanks in January. Fairbanks was warmer than Boone ! And the aurora put on quite a display. UAF promised work on active volcanoes, granites, basically anything hard rock. And all in Alaska ! They offered me the job and I moved the next summer.

North to Alaska

I started work in Alaska before my contract officially started on July 1. The field season in Alaska is short and they had a variety of projects that needed a hard rock guy. That was me. That first summer I visited a volcano where the pyroclastic flows were still warm. I flew in lots of helicopters. I walked on a glacier and heard it grown. I soaked in hot springs. I guided graduate students working on skarn and gold deposits (they guided me on how to live with bears). That first summer was a preview of my time in Alaska. Every summer was an adventure.

We did reconnaissance studies of remote Aleutian volcanoes and identified some previously unrecognized volcanic vents. Years later one of these glacier-covered vents showed seismic activity and melted a hole in the glacier. The samples I collected were the only rocks ever collected from this volcano and they helped in the volcanic hazard assessment. Volcanic hazard studies of several volcanoes furnished valuable planning information. One of the hazard studies was "field tested" by an eruption and our model worked ! Some offshore oil and gas lease sales did not proceed because of the volcanic hazards we identified. Field studies of volcanic systems for geothermal development ultimately resulted in some small scale geothermal development that was a tremendous help to the local people. I was the first to determine why volcanic ash melts (but not other dust) when ingested into jet engines.

With graduate students, I studied granite-tin systems in western AK, and gold-hosting granitic plutons in interior Alaska. One of these plutons later was developed as a world-class gold mine.

I was department head at UAF for 6 years. I spearheaded the establishment of the Alaska Volcano Observatory, a joint USGS - University of Alaska - State of Alaska facility responsible for monitoring Alaska's volcanoes. I hired a world-class scientist to lead the UAF volcanology program.

As department head I established in the department a center for characterization of geologic materials in the department. These facilities incorporated instrumentation from local state and university units that were unable to fund their operation. Instruments included an electron microprobe, SEM, and XRF instrumentation. I hired a Ph.D. scientist to run this facility.

Alaska is one of the last places in the United States where the discoveries of large deposits of minerals, oil and gas are still being made. A variety of geologic hazards (volcanoes, permafrost, glaciers, sea ice, earthquakes) are also widespread in Alaska. Alaska needed a traditional geology program to meets the needs of the state. That is what UAF had.

I watched the evolution of the environmental geology discipline and kept thinking this is the future of geology. I wanted to be a part of building an environmental geology program, but Alaska was not the place. I moved to the University of Georgia as head of the department with the aim of building an environmental geology program.

UGA

I joined UGA as Head of the Geology Department in 1994. During my term as department head I renovated space and relocated faculty into more suitable office and research labs. Favorable promotion and tenure decisions for 19 different faculty cases came during my 6 years as department head. A complete review and reorganization of the geology curriculum was done under my leadership during conversion from quarters to semesters. We hired a Valentine Nzengung as part of our environmental geology program. I negotiated a joint appointment with the Savannah River Ecology Laboratory that further enhanced our environmental program. The Wheeler-Watts funds came to the department during my tenure as head. I helped develop guidelines for regular funding of graduate student research using these funds.

I increased the participation of the department in regional geological events. A regular department presence at the Georgia Geological Society field trip was started. Twice during my leadership, we hosted the annual field trip of the Georgia Geological Society. During my term as

Head, the department hosted the Annual Meeting of the Southeastern Section of the Geological Society of America, attend by over 9,000 geologists**.**

My research at UGA involved undergraduate and graduate students. I developed an undergraduate research experience as part of my Earth Materials class. Over 50 students participated in this experience and ended up with their names on a GSA abstract. I coauthored over 40 abstracts with students at UGA.

My work with students involved mineralogic themes in archaeological materials, granitic rocks, and ultramafic metamorphic rocks. UGA was lucky to have a group of gifted graduate students lured by the geoarchaeology program started by Norm Herz and built upon by Erv Garrison. My graduate students worked mainly on mineralogy and petrology projects using archaeological materials. I took the inspiration for many of these projects from the students. I learned something about new cultures and materials in each study. We studied materials from 4 continents, ranging from sandstone to turquoise to ancient glass to soapstone to ceramics to marble to slag to mica to mortar. Results were published in a number of papers and abstracts.

I continued my work on granitic rocks at UGA. I worked at Spruce Pine on the granitic rocks and their crystallization history. A paper on "skeletal quartz" at Spruce Pine used results of my crystal growth studies at Stanford to quantify the undercooling crystallization of the quartz. Abstracts, papers, and I even led a couple of Carolina Geological Society field trip stops at Spruce Pine. I worked on the odd "cats paws" tourmaline at Stone Mountain and published a paper relating this skeletal texture to a disequilibrium undercooling crystallization history. My undergraduate students and I did microprobe work on the minerals in spodumene pegmatites of the Kings Mountain District in North Carolina. Some samples collected by Gilles Allard and curated in the Gilles Allard Economic Geology Collection were used in this study.

Retrospective

I took a different career path than many of my colleagues. I taught at 4 different universities. In each case I took the job because of the opportunities it provided to work on different problems in a different setting with a different group of people. I learned a lot and grew in my professional life from each of these positions. I found the excitement of moving to a new place with different geology and different teaching challenges to be very stimulating. Learning new things was the most exciting part of the job.

My vagabond career path does have its drawbacks; it is difficult to carry a coherent research theme from setting to setting (granite pegmatites to active volcanoes to granite-related ore deposits to metaultramafic rocks to geoarchaeology). Undergraduate programs offer different challenges than graduate programs. Still I would not have changed anything. I saw some wonderful geology, made some good contributions to science and society, met some very interesting people, and enjoyed the experience.

I now live in the Blue Ridge of North Carolina. I have boxes full of data that I am writing for publication. One of my regrets is that my students and I collected data faster than we could get it was published. Getting that data published is my "hobby" in retirement.

My advice to young people: take that path less traveled; when the train stops, get on. Who knows where it will lead.

This pdf file was created on Wednesday, March 16, 2022
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