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Gerald H. Krockover
Purdue University

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CAREER OPPORTUNITIES AWAIT QUALIFIED STUDENTS IN THE GEOSCIENCES

Gerald H. Krockover
Associate Professor of Education
& Geosciences
Purdue University
West Lafayette, Indiana 47907

Introduction

Even though we like to equate a college education with a good job, we are finding that while this was once true, it is not true for the graduates of the mid 1970's. In 1973, for example, 18 percent of the graduates of the College of Arts and Sciences at one Big Ten university who did not go on to graduate school were still unemployed six months after graduation and almost as many were working as secretaries, clerks, laborers, factory workers, and janitors. Ten years ago fewer than 500,000 bachelor's degrees were awarded in the United States and there were more job openings than there were new college graduates to fill them. In June, 1974, more than 1.3 million graduates received baccalaureate degrees and there weren't enough jobs to go around. Not all college graduates are having employment problems, however. Demand for graduates in engineering continues to be heavy along with the demand for graduates in business administration, marketing, and accounting. There are many openings in the health professions and in the field of computer science. And, the number one area of demand in the sciences is for geoscientists; including geophysicists, geologists, and graduates associated with the energy-related fields.

Opportunities in the Geosciences

Graduates from Purdue University in the geosciences, including the areas of meteorology, geochemistry, earth science teaching, petrology, engineering geology, mineralogy, geophysics, marine science, earth resources, paleontology, paleoecology, geotechnology, and general geology, have found excellent employment opportunities despite our nation's present economic conditions. Many students can still expect to receive two or three job offers with starting salaries as high as \$15,000 per year for graduates with a B.S. degree to \$19,000 per year for graduates with an M.S. degree. Companies are particularly interested in well qualified students from minority groups, including women. In the areas of geophysics and earth resources the M.S. degree has been considered to be the needed degree, but with the increase in employment opportunities, increased hiring at the B.S. level has been indicated.

Presently, the petroleum industry offers the best opportunities for students in solid earth areas at all degree levels. Oil and mining companies are hiring engineering, geology and geochemistry graduates to work specifically on coal, uranium and environmental projects. Employment with the federal government for engineering geologists is currently limited to environmental and energy related specialties. Students in geochemistry (including mineralogy and petrology) anticipate a favorable employment outlook with mineral exploration and attention to the development of geothermal energy both increasing. Many of the tools and concepts learned in geochemistry are important in materials research and can prepare a student for jobs in glass and ceramics, metals or cement industries. Job opportunities in mineralogy also exist as museum curators and with companies that deal in minerals and gems for collectors. The most promising areas for students in paleontology are in the petroleum industry where they work on age-dating and the environmental reconstruction of oil-bearing sedimentary sections and in oceanography where they can apply paleontologic principles to a relatively new and developing field.

The outlook for professional meteorologists is fairly optimistic, with most disciplines remaining stable and the possibility of moderate growth in the area of environmental related problems. Approximately 25% of the graduates in atmospheric science obtain employment with the federal government, 30% are university related (as faculty, staff or graduate students), 15% enter military service and 10% are employed by private industry. The M.S. degree offers better opportunities and alternatives than the less qualified B.S. degree or the highly specialized Ph.D. degree.

Consistent with the trend in the employment of marine science majors, our department concentrates on a graduate rather than an undergraduate program. Graduate marine science majors find employment with state and federal governmental agencies, private corporations, research laboratories and academic institutions. Recent interest in the living and mineral resources on the continental shelf has resulted in numerous private corporations either expanding or initiating marine research and development divisions. The diversity of research interests within the various public and private groups provides equally diverse opportunities for marine science employment.

In addition to positions in government and private industry, students from the Department of Geosciences with an M.S. (occasionally a B.S.) are qualified to teach beginning courses in their area at the many junior colleges and community colleges throughout the nation. The employment of Ph.D. students in research remains fairly good, but teaching-research positions at major universities are limited and probably will remain in short supply for the immediate future.

The employment outlook for students in the two newest programs in our

department, Earth Science Teaching and the Geosciences Technician Program, is very promising. While many areas of teaching are experiencing a surplus, certified teachers in earth science can look forward to a need for their skills for some time in the future. There is a national shortage of over 16,000 earth sciences instructors and in many states the majority of teachers teaching earth science courses are not certified. One study conducted in Virginia found that only 18% of the earth science teachers were qualified to teach that subject.

We have just begun our Geosciences Technician program but several industries have shown an interest in hiring students from this program. Geology and geosciences departments in colleges and universities and state geological surveys are enthusiastic about the program and could hire more than our present supply, even in the face of tightened budgets. Starting salaries are in the \$7-10,000 a year range and salaries for master technicians with experience and talent would be twice that amount.

Conclusion

The geosciences are emerging as the growth employment field for the remaining 70's and well into the 1980's. The prospects for our graduates are virtually limitless and yet a nationwide drop in enrollment in the earth sciences is being experienced. By contrast, 62 per cent of our nation's college students graduate in the humanities, social sciences, and education where the rate of unemployment is the highest and the starting salaries are the lowest.

This inconsistency, I believe, can be traced to a lack of relevant career advice that students receive in high school and in the early years of college. How many high school students ever get a chance to meet a geophysicist, a meteorologist, an oceanographer, or an engineering geologist? Maybe high school science teachers can help encourage students to pursue college careers that will result in a greater range of employment opportunities for them.

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