

ESSAI

Volume 6

2008

Article 19

Let There Be Utility

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<http://dc.cod.edu/essai>

Let There Be Utility

by Michael Davis

(English 1102)

The history of the world is full of wars over resources. People die all over the world everyday because one person wants what the other person has. Although it is hard to imagine in this county, many wars have been and continue to be fought over one of the seemingly most simple of resources: water. It is a tragedy that despite all the advances in science and technology over the past century, people are still dying from lack of clean water. Either directly from dehydration or indirectly from the conflicts caused by this lack. I feel that one of the main purposes of science is to help people. With this concept of scientific use as our backdrop, I would like to examine in greater detail the profession of geology, determining how close it is fundamentally with the previously mentioned concept.

My hope in researching the profession of geology is that it will not only prove to be personally fulfilling and socially edifying but also will contain what I am looking for in a career: namely, relevant, practical, interesting, and innovative work. The work of Dr. Farouk El-Baz, director of Boston University's Center for Remote Sensing, whose work is particularly interesting and potentially world-changing, has encouraged this hope. His recent discovery of an underground lakebed in northern Sudan has raised expectations for its possible use in easing the crisis in that region by supplying water to that country's people. This potential development is great news to many because "[t]hese conflicts are partly due to disputes over water and other natural resources" (Nielsen). It is uncertain as to whether there is a substantial reservoir of water in this old lakebed, but if Dr. El-Baz's estimates are correct, there could be an underground body of water the size of Lake Erie under northern Sudan.

The work of Dr. El-Baz has shown me that a geologist's job does not have to be boring and, when applied correctly, can have a very real and positive effect on the world we live in. It can also be personally fulfilling to the person involved in the work. There are many beneficial uses open to a person with a geology degree, such as battling "practical problems" that include "[f]inding and developing water...Evaluating, monitoring, and mitigating environmental cleanup sites...[p]redicting the possibility of natural disasters such as floods, landslides, earthquakes, volcanoes, coastal erosion, and climate change" (Ransom 235). Saving lives through a better understanding of the world around us is a worthy goal for any field of science and just one of the many potential uses of geology.

The type of practical and beneficial application of geology as demonstrated by Dr. El-Baz fits well into the category of life-saving and world-changing. Understanding these possibilities has encouraged my own interest in the field of geology for several reasons. One of them is because Dr. El-Baz's work shows, as A. J. van Loon states, that "the natural sciences are...the 'hard sciences'" (247). These hard sciences are "characterized by the fact that processes and phenomena are ruled by 'laws' that have...been recognized by Man" (van Loon 247). Such laws are observable and tend to be relatively predictable. This brings great hope to me for the redemption of science from merely ivory tower intelligence back to the figuring-things-out wisdom of invention in the face of necessity often lost in today's pursuit of knowledge.

The profession of "geoscientist," as the Bureau of Labor Statistics (BLS) calls a geologist, can be applied to numerous specialized activities, both in the laboratory and on the field. In general, a geologist is someone who studies "the composition, structure, and other physical aspects of the

Earth” (US, OOH). However, a person seeking a career in geology has many options in front of them; they do not need to merely look at a rock and ponder its importance all their life. In Barbara Ransom and Sonya Wainwright’s book, *Recent Advances and Issues in the Geological Sciences*, they portray a geology degree as having enormous benefits to those who go into various fields, not just geology.

Throughout all the diversity of work available to a geologist, any branch will likely include some form of fieldwork mixed with laboratory work. In a recent entry in *Earth-Science Reviews*, A.J. van Loon writes, “geology is less easily learned from textbooks than the other natural sciences. Education of students in the field is therefore essential” (248). The field of geology holds many opportunities to exercise practical skills in the real world. This fits well with those who like to work with their hands but desire a more scientific use for them.

The notion that the nature of the job typically takes a more academic route, such as becoming a teacher or professor, is still true for many geologists, but is becoming increasingly challenged by recruitment from other industries. Looking at education requirements in academia, Ransom and Wainwright write that “[a]t most colleges and universities, a Ph.D. in a specific subdiscipline [sic] of geology is required to get the job” (241). The BLS handbook, while allowing that “[a] bachelor’s degree is adequate for a few entry-level positions,” stresses the need for a high level of education, preferably a master’s degree, as well as proficiency in data analysis, computer modeling, and Geographic Information Systems for the aspiring geologist (OOH).

As for salaries, the BLS estimates the mean annual wage of for this occupation to be approximately \$80,000, which is quite respectable (US, OEW). Barbara Ransom tempers this figure, however, with the fact that while the salaries of geoscientists are quite good, “they are still lower, and sometimes significantly, than those offered to professionals in the other physical and natural sciences” (247).

Of course, as with many professions, achieving a higher level of education usually enables a higher level of income. A bachelor’s degree seems to be the minimum degree needed to get any sort of serious geology-related job. But according to data presented in Ransom and Wainwright’s book, the experience of a person is of a similarly significant importance, at least for those in the energy industry. For those people with 0-2 years experience and a bachelor’s degree the average annual salary is \$48,600; for those with 6-9 years experience, the average jumps to \$68,000 (Ransom 227). Granted, the salaries for those holding a master’s degree with comparable levels of experience is \$62,000 and \$73,000, respectively (Ransom 227). However, the difference between experience-related and degree-related salaries is not pronounced, and shows the importance of not only a high level of education in the profession of geology but also experience in the industry.

A newly graduated geologist can expect a job market open to, and in many cases, seeking out the addition of new members, sometimes even before they have completed their BA. The private sector is the one with the most potential growth and advancement opportunities, but government, federal and local, adds a significant amount of opportunities to the job market. Ransom and Wainwright recite the myriad occupations relevant to the job of geologist, many of which are found in the petroleum and mining industries. In fact, according to a recent broadcast on National Public Radio, the aggressiveness of employers in courting prospective employees is so pronounced that “mining and drilling companies are tripping over each other to recruit” college students studying to be geologists and engineers (Brady).

The job of “[f]inding oil is perceived by many in the field as fun and exciting, a challenge that can best be met by people who...can apply a broad knowledge of the earth to solve problems creatively” (Ransom 238). Judging by the proliferation of petroleum geologists’ professional associations, there are many who agree with this statement. The American Association of Petroleum Geologists is one of the largest of these geological societies, serving primarily “those interested in all geological facets of the petroleum industry” (Ransom 275). Its membership is both large and broad,

containing both students and petroleum professionals, “with the largest group consisting of consultants and independent geologists” (Ransom 275). Their website includes a large amount of information relating to the petroleum side of geology, as well as featuring new research and developments in its monthly magazine *Explorer*.

Geologists of various kinds are already keeping the current energy source providers on their feet, and newer avenues appear to hold even more potential for the geologist to assume a role of cutting-edge research and development. In a recent article in *New Scientist*, the phenomena of “methane-making microbes” is said to create natural-gas deposits deep within the earth in thousands of years instead of the much longer time necessary for conventional, thermogenic (having to do with heat caused by very extreme pressure) means (Mckenna 17). These microbes could hold the key to our ability to produce natural gas artificially and sustainably.

Another source of future research and development is found in an article in *Geotimes* written by Carolyn Gramling, which introduces geothermal energy as being a viable source of alternative-energy. She writes, “Substantial scientific evidence suggests that far more extensive geothermal resources exist in the United States” than are being utilized, according to a U. S. Geological Survey study in 1979 “that estimated the potential resource” (Gramling). In some areas, such as Idaho, Nevada, California and Utah, the distance needed to reach thermally useful regions is substantially less than the Midwest or East, thus making the use of geothermal energy more feasible (Gramling).

Because of rising prices in oil, gold, and other precious resources, and the relative shortage in geologists, the job market for geologists, petroleum engineers, and others in that line of work is increasingly favorable. This estimation is supported by the Bureau of Labor Statistics’ report that states “[e]mployment growth of 22 percent for geoscientists is expected between 2006 and 2016” (US, OOH). However, as with most jobs, the hiring trends for geologists are tied to the economy. For instance, if the economy is doing well, then it is reasonable to expect more investment by petroleum companies, “which employ more geoscientists than all other sectors combined,” in further prospecting and exploration for harder-to-get or at this time unknown sources of oil and gas reserves (Ransom 247).

The practicality imbedded into this profession and demonstrated by the work of Dr. El-Baz appeals deeply to my own idea of work. Finding meaningful work in the culture we live in is difficult, especially for those of us who prefer working with our hands. There are of course plenty of menial jobs available, but there is little meaning or future in most of them. This is one of the reasons I am interested in geology. It combines hands-on, dirt-under-the-fingernails work with analytical thinking and real-world outcomes.

Along with these considerations, an important aspect of my research on this subject concerns the perceived conflict between science and Christianity in general and geology and contemporary creationism in particular. This is significant to my continued research in the area of geology because of my own Christian faith. Searching for expressions on this subject, I found within the Affiliation of Christian Geologists’ website an essay written by Roger C. Wiens that advocates the need for serious, scientific Christians to engage not only their scientific community but also their own fellow Christians in discussing the role of science. He implies that the polarization of issues brought about by the lay-Christians’ easy acceptance of young-earth creationism, often taught by men who have little experience in any of the fields pertaining to the discussion, is a serious concern. Wiens is convinced that those “who have in-depth scientific backgrounds need to make a more concerted effort to inform [every] level of society,” not just the students who come to them (Wiens). The Christian public, he feels, is woefully under-informed when it comes to basic scientific literacy. When asked about how he can live and work with his faith and profession, a Christian geophysicist named John Baumgardner is quoted in an interview in the *New Scientist* as saying “I believe God has called me to participate in the scientific community, not to be a Lone Ranger” (qtd. in Aldhous 55). I think that Wiens is on the right track and I agree with his assessment of Christian culture, and I

applaud Baumgardner's active involvement in the scientific community.

This affects my research because one of the main reasons I thought of geology as a profession was to use it in the mission field, perhaps as way to provide basic needs, such as water, to people in need for the glory of God. I have had this idea for a while, but only recently have I considered geology as a means of going about it. From my experience in short-term missions work in El Salvador, I have concluded that what most impoverished regions need is not more labor, but rather more knowledge, equipment, and expertise. In the instance of water, there are plenty of people available to dig if necessary, but little resources for finding or developing sustainable sources. With this in mind, I decided that the most help I could give would be in the form of some sort of expertise that I could give to the people, even teaching them what I know if possible. This is why I am looking into geology as a profession.

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