If Geoscientists Went on Strike, Would Anybody Notice?

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When it was obvious a year ago that the eminently fair GSA system of electing officers would ensure my ascendancy to the presidency, I began planning what my Presidential Address should focus on as a theme. It was my intent to develop a scientific debate on the concept of "connate water." I planned to structure for you the role of ground-water flow systems in creation of saline-water environments in deep sedimentary basins. I also considered speaking about the "science" of water-witching, using ample demonstrations that would have included audience participation.

These thoughts became academic, for I was soon immersed in the geopolitical issues that dominated much of this year. It became obvious that we in the geosciences have a monumental void; one that should receive our utmost attention. In January, the outlook for a healthy community was rather dismal. There was much concern for the survival of a number of key activities, including the U.S. Geological Survey. There was frenzied activity to promote the geosciences, and the outlook brightened.

However, a postmortem on 1995 would reveal a number of unresolved issues: even though representatives of this Society joined others to exert damage control in meetings with Congress and other public representatives, the fateful hour is not the time to educate Congress or any other portion of the public.

Questions remain. Can we identify the right question and implement solutions so that our community does not continue in a crisis mode? I believe an appropriate question is: "If geoscientists went on strike, would anyone notice?"

Unfortunately, we do not have the luxury of geologic time on our side on this issue. It would be a fair conclusion to state and accept that the "public" has precious little knowledge of what we do, how we do it, and why we do it. I'm afraid that few would notice were we to strike.

The void that I mentioned deserves our attention. It has to do with our relationship to the public. It is this void that I wish to emphasize, recognizing that there is not universal acceptance of GSA's role relative to addressing the void. The public is not particularly friendly to the sciences at this time. In fact, the geosciences community is the recipient of a disproportionate share of this unfriendliness.

Part of the problem is that we hold a time-honored belief that the search for geologic understanding deserves a high-priority position relative to political attractiveness. We haven't paid a whole lot of attention to a politician's viewpoint. We have not paid much attention to a premise that we are citizens with a special responsibility to the public.

How am I using this word "public"? Hopefully, not as "a public nuisance," but more as "conducted in public" or "to make public" (to cause to become generally known).

It was decided to look to history for what other GSA presidents have said. A surprising number of the 106 previous presidents have implored this Society to be involved with the public. The first to do so was John Stevenson, president #10.

"To retain the respect of the community and to retain influence for good, we must be able to justify the existence of a society devoted to investigation…. The question '*Cui bono*?' [to whose benefit] will be asked, and the answer cannot be avoided."

"… the Society must have more to do with the outside world … if the outcome for science is to be what it should be."

John J. Stevenson
1898 GSA Presidential Address:
"Our Society"

What is striking to me about Stevenson's words is they came just 10 years after GSA was founded for the promotion of pure science. "We must justify our existence … *Cui bono* … the answer *cannot be avoided.*" Let us look quickly at what others have said:

"The support of the geologist depends on public appreciation of the value of his services."

Charles D. Walcott
1901 GSA Presidential Address:
"Outlook of the Geologist in America"

"The spirit of the hour seems to impel me to … portray … some part of the obligation of the State to our science and the responsibility of this science to the State."

John M. Clarke
1916 GSA Presidential Address:
"The Philosophy of Geology and the Order of the State"

"More clearly than ever before, is it necessary for us to view world affairs, and in them our own connections…."

John C. Merriam
1919 GSA Presidential Address:
"Earth Sciences as the Background of History"

"Those who have a knowledge of geology have a vast educational advantage over those who have none."

"As geology becomes rounded out, … it will have surpassing value in the education of mankind."

R. A. F. Penrose, Jr.
1930 GSA Presidential Address:
"Geology as an Agent in Human Welfare"

"If we are not skilled in literary arts—at least we can be brief. How often in plodding through elaborate introductory passages, petrographic descriptions, and the like, do we feel like exhorting with Petruchio 'Come on, O God's Sake!'"

"We derive our livelihood from a society of non-geologists, and our moral strength is sustained by serving that society."

"Geologists must convey more to society…. When the interval between intellectual classes and the practical classes is too great, the former will possess no influence, the latter will reap no benefit. The interval is widening."

"In the mid-1850s, leaders of geology were physicians, lawyers, clergymen … now leaders are a group of highly-specialized scientists barricaded to the public by technique and learned jargon."

W. H. Collins
1934 GSA Presidential Address:
"Geology and Literature"

[An opposing viewpoint] "… in the sense of acceptance of [geology's] relation to life, to society, and to the problems of civilization, its pioneering days are over."

"[Geology] has no responsibility to an impatient public…. It has no obligations other than to geologic science itself."

W. C. Mendenhall
1936 GSA Presidential Address:
"Development and Present Status of Geology in North America"

"… the expert scientist is under great obligation to deserve the confidence of the public."

"To insure a well-informed and intelligent people is a most difficult task…. It means educating more people and educating most of them longer…."

"… the great majority should understand what Science is, what it stands for, and its value to society."

"… part of the general public has a rather confused impression about Science…."

Eliot Blackwelder
1940 GSA Presidential Address:
"Science and Human Prospects"

"There is a scarcity of geologists among the scientific advisors to Congress … on matters of national policy."

"… by 'role' I do not mean simply the normal day-to-day activities of the geologist (no matter how important these may be to the institution or industry with which he or she may be connected), but rather the active advisory and consultative function that can be performed only by one with the perspective and range of knowledge possessed by the geologist." (Nolan was the first GSA president to use the word "she" in a presidential address.)

"… the profession can contribute to … public service by … emphasis on interpretation and prediction in our geologic thinking. The Geological Society of America … might well seek ways by which it could take the lead in this endeavor."

Thomas B. Nolan
1961 GSA Presidential Address:
"Role of the Geologist in the National Economy"

"… this public disinterest in scientific questions is in considerable measure the consequence of the deplorable state into which instruction in mathematics and science in our … public schools has been allowed to degenerate…."

M. King Hubbert
1962 GSA Presidential Address:
"Are We Retrogressing in Science?"

"… there is the urgent need to carry our science and our message to the people…."

"If our science is to stay fully solvent, geologists must find out how to present their research and … its values in terms that John D. Citizen can appreciate. To a greater degree … we must become … more people-oriented."

"… it becomes most important that we should strive for public understanding … or our science will neither get support nor merit support."

"… such a goal should become part of GSA's manifest destiny, however much it might cause some of our founding fathers … to shudder at the thought that we might risk getting our feet a little bit muddy in the political arenas…"

Ian Campbell
1968 GSA Presidential Address:
"Mene, Mene, Tekel, Upharsin"

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"Let us … lend our knowledge of the earth to those public and private men whose responsibility it is to use the earth more wisely…."

"We should never become so preoccupied with our science … that we neglect the one activity that … will do the most to assure us unquestioned, professional respect: service to our communities, our schools, our cities, our states, and our nation."

"… we must embrace change."

Morgan J. Davis
1969 GSA Presidential Address:
"The New Geology"

"… there is need, also, for GSA to involve itself more outwardly in national and public affairs, where geology has an important role to play. "

Howard R. Gould
1981 GSA Presidential Address:
"GSA—A Legacy and a New Era"

"If we want the world to pay greater attention to geology, and if we want decision makers to allocate more resources for geology, then we need to demonstrate the importance of geology in public affairs, and we must accept our public obligation to be good citizen-geologists."

E-an Zen
1992 GSA Presidential Address:
"The Citizen Geologist"

"We must become part of the decision-making process in the policy arena, not just providers of data."

Robert D. Hatcher, Jr.
1993 GSA Presidential Address:
"Is Our Past the Key to Our Future?"

In all of my emphasis on the urgency of *recognizing* and *implementing* our public responsibility, I do not want to detract from the mission or goals of this Society. Our *purpose* is to advance the science of geology. Our goals include public scientific awareness through geoscience education. Good science is equally as important today as it was in 1888 to our founding fathers, but balance is a key concept. With the issue of public awareness before us, some key questions are:

1. What should the geological community hope to achieve through public awareness and outreach? Some achievements could include: creation of an environment of freedom of choice, job continuity, financial support for research, education of the public regarding the role of geology in everyday life, or public appreciation for the application of geology to the wise use of the earth. Radford Byerly Jr. and Roger A. Pielke Jr., in the September 1995 issue of *Science* (v. 269, p. 153), argued that, in addition to meeting its own internal standards, "science must meet two related external conditions: (1) democratic accountability including accountability to social goals, and (2) sustained political support." Whatever the geoscience goal for public interface may be, to achieve that goal requires that we be wise and creative.

2. How can the average geoscientist—either as an individual or within his professional associations—address the public outreach issue? Again, Byerly and Pielke described the scientist's response to those changing expectations: "Some scientists observe that the changing environment [between scientists and society] necessitates fundamental change, others think that science just needs to tell its story better, and others … hunker down, waiting for the storm to pass. "

The main issue, from my perspective, is not *why* geoscientists should become involved with public perceptions. I believe the crux of the problem is *how* the geoscientist should or can become more effective. Among the possible solutions are:

- Consider the value of your geoscience research or projects and actively communicate that value to the public by whatever means is available to you or your institution. Include nongeoscientists among the immediate beneficiaries of knowledge that we garner and disseminate.
- Use jargon-free language: surprisingly few nongeoscientists understand geologic terminology. According to Murphy's Law, "If a [reader] does not understand a particular word in a piece of technical writing, ignore it. The piece will make perfect sense without it. "
- Work with teachers at all grade levels.
- Convey views to your elected representatives; make it a point to introduce yourself and offer your expertise as a reference on geologic or environmental issues that evolve during the course of formatting legislation.

I cannot more eloquently state what other GSA presidents have urged. The need for geologists to interface with the public is no longer simply a philosophical debate. If the value of geosciences is not understood or recognized outside of our own esteemed community, and funding is denied or reduced, then we as a community are in for a different kind of change. Whether we choose to change and become more proactive—or we are forced to act—either way, change is upon the geoscience community. To paraphrase another Murphy's Law: For any situation, the proper course of action is always determined by subsequent events.

I say, enjoy your science in whatever venue most interests you, be it as a purist or a multidisciplined, outreach-oriented person. But share your spirit and discoveries with other than your colleagues. Participate in non-GSA activities.

Consider the change upon us by viewing the differences between a 1968 report to Council and a 1987 report to Council: *1968 Committee for the Promotion of the Science of Geology:* Recommended that the Society should not carry out or inaugurate programs specifically oriented toward geologic education. *1987 Committee on the Path to the Year 2000:* Specifically recommended that GSA establish a public education office. (The expressed belief was that the earth science profession has a responsibility for the education of the general public.)

The year 1968 must have been an exciting year to be on the GSA Council. Campbell was president and Davis was vice-president. Look back on their respective comments in their presidential addresses. Campbell said GSA has a manifest destiny to carry our message to the public (including, presumably, engaging in geologic education). Davis said that we must embrace change. Quite a contrast to the 1968 committee report.

We've come a long way in recent years. We have numerous highly qualified scientists in GSA, as exemplified by the awards presented at the 1995 meeting. We, however, have a fairly low percentage of the membership who are scientists reaching out to the public. Those few need your help. Now!

Starting with at least Bert Bally as GSA president and continuing through Bill Dickinson, there has been an ever-growing support of GSA's involvement in public education and outreach. Let's keep it going and aggressively grow those activities.

In closing, I wish to acknowledge the strong support from GSA headquarters staff in making my term in office so satisfying. In particular, my sincere appreciation goes to Don Davidson, Royann Gardner, Pat Chenworth, and Sue Beggs. To my fellow Officers and Council colleagues, I also say "Thank you." ■