

ETHICS in the GEOSCIENCES:

A CONFERENCE SUMMARY

SPECIAL SECTION

Because of the importance of ethics to the professional practice of geoscience — both in industry and the academy — we offer our readers this special section prepared by the conveners of the Geological Society of America's recent Presidential Conference on "Ethics in the Geosciences." This report summarizes discussions and recommendations from that meeting — recommendations that provide a framework for continued dialogue within the geoscience community.

On July 16-21, 1997, a Geological Society of America (GSA) Presidential Conference on "Ethics in the Geosciences" was held in Welches, Ore. This event was cosponsored by the American Association of Petroleum Geologists (AAPG), the AAPG Division of Professional Affairs, the American Institute of Professional Geologists (AIPG), the AIPG Foundation, the GSA Foundation, and the U.S. Geological Survey. The National Science Foundation awarded a matching grant.

Sixty-nine geoscientists and nongeoscientists convened to explore the complex issue of ethics and its relationship to the practice of geology. This diverse gathering of geologists represented the professional divisions of industry (mining, petroleum, and consulting); academia (teaching and administration); nonprofit institutions; and local, state, and federal agencies. The nongeoscientists included philosophers, a federal judge, attorneys, an urban/regional planner, and representatives of the American Association for the Advancement of Science (AAAS) and the National Science Foundation. Participants came from different geographic regions of the United States; Canada and Europe were also represented.

After five days of discussing the nuances of ethics, the participants debated what would be the most worthwhile product of the conference — one that would be of use to geological societies, educators and administrators, and the diverse community of geoscience professionals, and that would promote further discussions on ethics in the geosciences. The participants agreed unanimously that the most meaningful contribution of the conference would be to identify core values and virtues for the profession — to specify those particular ideals or goals of importance to geoscientists.

As Mark Frankel (AAAS) summarized, "We must understand the core values of the geosciences profession. Core values anchor and trigger the character and conduct of members. Without core values, the public will not give authority or respect to the profession."

CORE VALUES FOR THE GEOSCIENCE COMMUNITY

"The particular ideals or goals of a profession should be specified. These are clearly distinguished from the requirements and duties of a profession."

— BERNARD GERT, DARTMOUTH COLLEGE

Because this gathering was a broad representation of geoscientists, with input from the disciplines of law, philosophy, and education, the participants divided into professional groups (academic, industry, government, nongeologist) to address two questions:

- **Core Values:** What are the *goals of the profession*?
Why does society confer the status of professional on you? What can the public expect of your performance? What does the profession aspire to be?
- **Virtues:** What are the *ideals*, the character traits that the effective geoscientist should have?

The four groups agreed on the following definitions of core values for the geosciences:

- **Science:** Study and understand Earth, the planets, and their processes, and communicate that knowledge to the public.
- **Resources:** Discover, develop, and produce energy, mineral, and water resources needed for society in an environmentally and economically responsible manner.
- **Hazards:** Identify and communicate knowledge about earthquakes, volcanoes, floods, and other geologic hazards.
- **Environment:** Apply geoscientific knowledge to environmental, engineering, and land-use planning issues.
- **Education:** Provide geoscience education to the public, new geoscientists, and the profession.

The groups reached the following consensus on virtues for geoscientists:

The geoscientist accepts uncertainty and integrates information with a unique perspective about time, space, and scale. The geoscientist is:

- Honest
- Open-minded
- Trustworthy
- Curious
- Cooperative
- Creative
- Prudent
- Enthusiastic
- Objective
- Observant
- Competent
- Dedicated
- Collegial
- Clear
- Persevering
- Courageous

Future groups can refine what conduct is expected of a professional geoscientist. The geoscience community (via the various geological societies) is urged to use core values as a basis for developing more involved, detailed codes. Other professional communities have found that identifying core values helps them establish expectations for professional behavior and define the relationship between members and society. At a minimum, the geosciences as a whole should have a code of professional responsibility — a commitment to protect public well-being through the science.

The conveners acknowledged a degree of naiveté and reticence to probe ethical issues within the geoscience community. Nevertheless, the conference became a forum for problem-specific, insightful, and often animated exchange of ideas. The results reflect the participants' newly found or reinforced belief that there is more to our profession than scientific knowledge and skills. Individual integrity is not enough: to be truly ethical, one must have personal integrity as well as an ongoing awareness and insight into the ethical problems that exist throughout the geoscience profession. Awareness and insights do not come naturally but through reading and reflection on ethical issues, discussions with peers, and practice (including mentoring of the young on the nature of ethical behavior).

In other words, geoscientists must become alert to, and active in, the subject of ethics for the practice of geology to be truly ethical. Pride in being a geoscientist generates the moral courage to foster, uphold, and protect the credibility and reputation of the profession.

ETHICAL ISSUES IN THE GEOSCIENCES

Ethics is the art of making good choices and of helping people do the right thing in morally ambiguous situations. In the case of the geosciences, to reflect on ethics is to study how we should conduct our professional lives — to understand what is acceptable behavior and what is not. In short, ethics are a critical component of what it means to be a professional.

The conference participants examined situations that could compromise a geologist's integrity. Speakers explored issues in research and teaching; in industry; in state and fed-

eral agencies; and in licensing, registration, and certification.

Ethical Issues in Research and Teaching Unethical practices in academia include: fabrication and falsification of data; plagiarism; misrepresentation of credentials; deliberate vagueness in the presentation of assumptions underlying hypotheses or methods used to gather or analyze data; turf-guarding; deliberate withholding of information from subordinates; and submittal of manuscripts to more than one journal without proper notice.

Unethical actions in research and teaching go unchecked because: (1) university administrators, faculty, teachers, and students are naive about such matters ("not possible in this department") and/or elect to be blind to wrongdoing (a "don't look, don't find" ostrich approach); (2) peer review is motivated by self-interest and self-protection; (3) the illusion of academia predominates (i.e., "colleges/universities are centers of truth and honor," and unethical practices are not part of that image); and (4) there is a lack of institutional support (i.e., an anti-whistleblower atmosphere).

Ethical Issues in Industry Although geology in industry still involves the scientific approach, the more direct demands of business and profit result in practices that include: falsification of credentials; misrepresentation of company expertise within proposals; misrepresentation or withholding of scientific information during expert testimony; illegal or improper interview practices; misuse of confidential data from previous employment; unregistered geologists signing off on documents; and field kickbacks. Many of these issues can be dealt with administratively through registration boards.

Pete Rose (Telegraph Exploration, Inc.) examined the role of the geologist as employee and independent consultant in the oil and gas exploration industry. Many younger geologists do not think of themselves as professionals. Professionalism, according to Rose, "... is an attitude — the personal endorsement of consistently high standards of knowledge, work performance, and conduct. Professionalism requires capability beyond mere competence, and it requires a willingness to be accountable." Rose also emphasized that the decline of mentoring of young professionals has contributed to a decline of ethical behavior in industry. He urged all professionals to serve as mentors so that professionalism (the heart of ethics) can be instilled in young geologists.

Ethical Issues in State and Federal Agencies The discussion leaders for the government agencies examined what participants expected of local, state, and federal government and looked at questions of accountability. The ethical issues that government agencies and their geoscientists face include: competition with private industry, including use of government and academic facilities for consulting; timely

release or withholding of geoscience information; illegal or preferential contracting practices; unqualified decision-makers; continuance of nonproductive projects; selective enforcement of regulations; willful manipulation of data to achieve policy goals; biased research priorities; and dictation of technical results by elected officials.

Ethical Issues Associated with Licensing, Certification, and Registration Licensing, certification, and registration are the direct approach to endorsing and monitoring professional behavior. Licensing and registration are usually conducted through a state government. Certification occurs through professional societies. More specifically, licensing is the right to practice bestowed by an authority; certification is the right to title; and registration is placement on a list showing license or certification.

Discussions focused on types of unprofessional behavior (including deceit and unscientific reports and investigations) that licensing boards must address; other professional licensing organizations that require continuing education in ethics for license renewal; the pros and cons of state vs. national registration; how licensing and registration are cast as barriers to entry into the profession; the irony that a driver's license has reciprocity throughout the United States and professional licensing does not; and whether licensing exams should include questions on ethics.

Certification issues usually involve misrepresentation of qualifications by the applicant, an inappropriate sponsor, or misrepresentations by a sponsor. Professional societies must determine how to handle violations of certification and confirmed unethical or illegal actions by a certified member.

TEACHING ETHICS

"Of course I worry about the few professionals who violate the obvious standards of conduct, but [I] think the biggest payback would be from assisting those who are of virtuous soul to avoid temptation and to recognize it when it first appears, that 'the best way to get out of trouble is to stay out of trouble.' Education is the logical component. Recognizing the autonomy of individual campuses and academic departments, what can we do to promulgate the inclusion of professional ethics in undergraduate and graduate school education?"

— CLEMENT SHEARER, CARLETON COLLEGE

The subject of ethics has not commonly been taught at any level of geoscience education. As a result, our recognition of the importance of ethical education lags behind that of other disciplines (law, medicine, engineering, urban planning, business), which have included formal courses on professional ethics for some time. Several conference participants speculated on the reasons why professors shy away from teaching ethics:

- They feel uncomfortable with the subject matter.
- They doubt the need for such material (ethics was not

part of his/her education, so why is it necessary now).

- They believe that when an ethical issue arises, there is one right solution and it will be obvious.

For earth-science educators, the common belief has been that students would learn by example from mentors and peers — an *implicit* educational approach. One of the strongest messages to evolve from this conference was the need for *explicit* geoscience education in professional ethics. An effective ethics education program must be interactive; multiple geoscience faculty must be involved; and exposure must continue throughout academic life.

Education on ethical issues presents the abstract idea of "geoscientist" in terms of the concrete choices faced by the practitioner. Students must learn that their activities affect their profession — that they have the personal responsibility to control and monitor their decisions in order to be fully effective scientists.

CODES OF ETHICS

A code of ethics should be an educational document that helps to integrate new geologists into the professional community and to remind those already in the field what is expected of them. A code should not only be compatible with common morality but should emphasize problems specific to geology. Codes should acknowledge that legitimate disagreements can occur and should provide a procedure for settling disputes.

Codes of ethics allow professionals to express their shared beliefs and values and to define their goals. An ethics code specifies the way a professional society wants its members to act. Codes of ethics:

- Serve as a consensus of a community's opinions (that is, an expression of the highest common denominator of values for the profession).
- Serve as an enabling document that provides direction and allows informed choices, helps members resolve moral dilemmas, and reinforces the habit of doing the right thing.
- Reflect ethics of action and of character.
- Reaffirm the professionalism of the group by providing for professional identification.
- Provide a public image of discipline and accountability, serving as a basis for defining expectations and gaining public trust and support.
- Serve as an educational tool to deter unethical behavior and uphold group integrity.
- Provide support against unreasonable demands on individual professionals within a society.
- Serve as a source of public policy.
- Provide a supportive climate for whistleblowers.

Types of Codes The type of code selected by a group

reflects the extent of its consensus, its awareness of how codes work, and its resources. A code can be:

- *Aspirational* — states ideals and highest level of achievement of the profession.
- *Educational* — contains principles and explicit guidelines.
- *Regulatory* — provides rules that guide conduct and includes provisions for monitoring and sanctions.

Concerns Regarding Codes For professional societies that do not yet have a code of ethics — and for those societies that wish to reevaluate their codes — Mark Frankel (AAAS) recommends consideration of these questions:

- Is it necessary or important to have a code?
- What kind of code would fit the need?
- What is the process to be used to develop the code?
- What should the code contain?
- How shall the code be implemented?
- Will there be an enforcement mechanism? What procedures will be followed?

Enforcement is not necessary for a code to be functional, although for enforcement to be effective, both the membership of a professional society and its governing council must recognize certain hard realities. Individual members must be willing to identify ethical violations by colleagues; report these violations in writing; and face adverse consequences such as cross-examination, being viewed as a whistleblower or “not part of the team,” possible loss of job, and possible lawsuit. Professional societies must accept the risk of being sued; devote resources to the investigation of the infraction; and publish annual, generic summaries of complaints received and actions taken, protecting the member as much as possible.

Discussions of these enforcement realities emphasized that people are reluctant to report violations by colleagues if expulsion is the only option. Rehabilitation and letters of reprimand are initial options to correct a course of inappropriate behavior. Some argued that the role of a professional society should not be to police its membership and that a code of ethics would serve best only as a mentoring document.

If enforcement actions are taken, publicity is crucial. Allowing a violator to resign and remaining silent about the case will have negative consequences. Let members know of sanctions taken, the decision made, and the reasoning and process behind the enforcement action. Other affected agencies and societies should also be notified.

CONCLUSIONS

Ethical dilemmas exist throughout the geoscience profession. The onus is on the individual geoscientist to recognize that ethics is part of a geoscientist's professional responsibility, and to become proactive in ethics through discussions, study, teaching, and mentoring.

As Victor Yannacone (Yannacone & Yannacone, P.C.) emphasized, “In choosing to become geologists, you have assumed a burden — one that at the time you may not have fully realized but now must shoulder. That [burden] is the intellectual stewardship of the planet Earth as a dynamic system. No one else is serving or can serve this function.”

The ethical duties of the geologist involve:

- The subject matter of geology: the thorough and appropriate investigation of that body of knowledge from observation and study over time. (Geologists have a unique perspective on the fourth element: time.)
- One's self: what motivates professionals is pride and self-respect, that individual sense of honor which is the cornerstone of ethical behavior.
- The profession: that community of professionals which is a force — the shared commitment of honorable geoscientists who focus on the subject matter and the effective practice of geology. Pride in being a geoscientist generates the moral courage to foster, uphold, and protect the credibility and reputation of the profession. Ethical violations must be denounced immediately by the geoscience community so that the public does not lose confidence in geoscientists.

Because of the pressures of time, tedium, overwhelming self-expectations, and outside demands, professional geoscientists continually encounter situations on the job where acting without full reflection is unavoidable. Well-intentioned actions often create problems. Most professionals and students alike believe that they are ethical and that they act ethically in professional and private life. Sincerity, however, is not enough. To be truly faithful to professional ethical behavior, one must become alert by looking at reality beyond personal perception and by studying and discussing ethical issues. This conference introduced that reality.

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The complete summary report of this conference is available upon request from the conveners.

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