

Current Comments®

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**From Individual to Institutional Integrity
and Back—A Perspective by Walter
Dowdle of the Centers for Disease Control**

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I recently participated in the now annual Alice Hamilton Science Award Symposium on Horizons in Occupational Science at the National Institute for Occupational Safety and Health (NIOSH), in Cincinnati, Ohio. My own talk¹ at the symposium reviewed the similarities in the missions of ISI® and the Centers for Disease Control (CDC)—the former tracing the communication of research in the scientific community and the latter tracing the communication of disease in the general population.

In my review of ISI products, research conducted at CDC provided the starting points for illustrative searches in the *Science Citation Index® (SCI®)*. I also demonstrated, for the first time publicly, ISI's Sci-Map—a software tool for creating maps of core research papers from research front specialties on desktop personal computers in real time. This is a development that I will detail for *Current Contents® (CC®)* readers in a future essay.

Another speaker at this event was Walter R. Dowdle, deputy director of the CDC, and deputy administrator for the Agency for Toxic Substances and Disease Registry (ATSDR). Chaired by J. Donald Millar, assistant surgeon general and director of NIOSH, this event honored both Alice Hamilton and the twentieth anniversary of NIOSH.

Alice Hamilton

Alice Hamilton (1869-1970) was "the first American physician to devote a lifetime to



Walter R. Dowdle

the practice of industrial medicine."² Through her various studies of lead poisoning among enamellers of bathtubs, carbon monoxide poisoning in steelworkers, mercury poisoning in hatters, and "dead fingers" syndrome among laborers using jackhammers, she made occupational health an important scientific pursuit.³

In 1919, she became the first woman appointed to the faculty of Harvard University. From her early work with Jane Addams's Hull House, in Chicago, Illinois, to her efforts to improve the working conditions of an increasingly industrialized society, she spent her professional life in the service of the victims of work-related diseases and injuries. Her pioneering research is still regularly cited in the literature of industrial toxicology.

A remarkable video about her life, entitled *Alice Hamilton: Science, Service, and Compassion*, is available from NIOSH.

Dowdle on Institutional Integrity

Dowdle's address dealt not only with ethics in science but also the ethical climate in which institutions like the CDC must operate. In his talk, he gave numerous examples of misconduct, from bad professional manners to premeditated fraud. He described several realities in science today that could contribute to a rise in this misconduct. And, he asked that the scientific community look within itself to seek the reasons for the apparent increase.

Finally, he reviewed the role of the institution in creating an environment that fosters and promotes integrity. In the case of CDC and NIOSH, he used dioxin as a particular instance to illustrate the difficulties of holding firm in supporting unpopular data in the face of opposed public opinion. Many interested groups would have wished that the latest CDC research results on dioxin had proved different. His remarks follow at the end of this introduction.

Ethics Covered in CC

The subject of integrity and ethics in publications has been well documented in *CC*.⁴⁻⁸ However, it is a subject that needs regular review. Ethical issues should be the daily concern of scientists, especially those in teaching situations. Ethics not only defines the individual, it is one of the few things in life over which we exert ultimate control. This may not be the case in most other aspects of a researcher's career.

As Dowdle notes, scientific ethics has taken a prominent place today on the media stage, with highly visible exposés of prominent scientists. These cases may be notable not only for the poor judgment or arrogance of the individuals involved, but also because of the quasi-judicial forums in which they were aired.

As science increasingly is identified with big money, prestigious awards, and national pride, we are likely to see more instances of science controversy aired publicly. Many of these controversies will be the result of political motivations—attempts by one group to gain advantage at the expense of another. As discussed in an earlier essay, a more productive, and certainly more dignified, forum for scientific disputes would be in a "science court."⁹

Such a court would be established to help settle disputes between scientists. Among the cases handled by this court would be those that involve scientific misconduct and fraud. After a full hearing of the facts by scientific peers, "the press could be brought in to convey the court's findings or conclusions to the public."⁹

Dowdle Biography

Dowdle was appointed deputy director of the CDC and deputy administrator of the ATSDR in 1987 and served as acting director of CDC and acting administrator of ATSDR from 1989 to 1990.

As deputy director of CDC, he assists in leading the agency of the US Public Health Service, which is responsible for promoting health and preventing disease, injury, and premature death. As deputy director of ATSDR, he assists in running the Public Health Service agency created by the Superfund law.

Since joining the CDC in 1960 as a supervisory research microbiologist, Dowdle served as chief of the Respiratory Virology Unit (1964-1973), director of the Virology Division in the Bureau of Laboratories (1973-1979), assistant director for science (1979-1983), director of the Center for Infectious Diseases (1981-1986), and deputy director (AIDS) and coordinator of AIDS activities (1986). In addition, he has served as director of the World Health Organization Collaborating Center for Influenza (1968-1979) and president of the American Society for Microbiology (1989-1990).

Dowdle received his undergraduate and master's degrees from the University of Alabama and his doctoral degree from the University of Maryland.

In view of the widespread attention given to ethical issues in science in the press, I thought it appropriate to publish Dowdle's talk in CC.

I hope that, in reading his remarks, more of us will take a closer look at how our actions and those of our colleagues will be

viewed by the public. Scientists traditionally have been accorded positions of great trust by society. It is a trust we should take pains to preserve by diligent adherence to high ethical standards.

* * * * *

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Science, Politics, and CDC

Speech by Walter R. Dowdle
Centers for Disease Control

Even those who have only a passing interest in science are well aware of the current attacks on biomedical science for alleged lapses in ethical judgment. There have been widely publicized charges of fraud, plagiarism, and conflicts of interest.

The current scandal arose not so much because of the number of such cases, they have been few, but because those accused have been scientists of some renown. Several Congressional investigations are under way and the National Institutes of Health has put the issue of scientific misconduct on the top of its agenda. The aura of objectivity and integrity that science has enjoyed for so long is being

questioned by lawmakers and the public alike. There is an air of disillusionment.

Most biomedical journals now state up front, very clearly, the ethical conduct that is expected of an author. Numerous professional societies have scheduled symposia to examine where we have gone wrong. Last year PHS [Public Health Service] issued its first regulations on misconduct in biomedical science.

Still, the debate continues. It won't go away. Some feel that the whole issue of scientific misconduct has been blown out of proportion by political opportunism and media irresponsibility. Others feel that the

Public Health Service, by bowing to political pressure and forming the Office of Scientific Integrity, succeeded in exacerbating rather than resolving the problem. Still others are equally convinced that science and scientists have sold out to big business, big money—and greed.

Under the PHS rules, misconduct in science is described as “fabrication, falsification, plagiarism, or other practices that seriously deviate from those that are commonly accepted within the scientific community for proposing, conducting, or reporting research.”

‘A Wide Spectrum of Sins’

The term misconduct includes a variety of misbehavior. It can mean theft of intellectual property or a violation of copyrights, patents, trade secrets. It can also mean carelessness, sloppiness, inattention to detail, or disdain for the rules. The PHS definition is a tacit admission that misconduct is not a simple issue. Scientific misconduct, or unethical scientific behavior, includes a wide spectrum of sins—all the way from fraud to just plain bad professional manners, with multiple shades of gray in between. Scientific misconduct is not easy to define.

However, as we as a nation appear to go down the path of regulating the behavior of scientists, we still have not answered three basic questions:

How serious is scientific misconduct?

What safeguards can be put in place?

How will these safeguards affect scientific creativity?

In formulating any regulations or policies designed to police science, we must take care not to penalize the scientist who dares think differently. To demand adherence to preset standards in scientific practice is dangerous and unrealistic. As someone has said, the neatness of one’s laboratory notebook may have determined one’s grade in high school science, but neatness does not and should not determine one’s grades in real-life science.

We could continue to debate the validity of the current debate on rules and regulations to

assure scientific integrity, but in doing so we would omit the most fundamental question of all: How did science get in this mess in the first place? What has happened here? Why in the late Twentieth Century has misconduct in science become such a major issue?

Some have blamed the pressure to obtain research funding as a major contributor to fraud and misconduct—or at least exacerbating the potential.

Some have blamed the publish-or-perish dictum as a major contributor to the potential for fraud and misconduct. Others have blamed accelerated communication for increasing competition—leading to misconduct.

We don’t know, of course, that the ethics or manners of present-day scientists are any better or worse than in the generations that preceded us. I can recall that some scientists in the past were hardly paragons of virtue—and I still know a few who fit that description today. But today, the stakes *may* be higher. Scientists in years past rarely thought of patenting products, materials, or procedures. They rarely considered the commercial potential of their research. That has all changed. Clearly the elements are now present to encourage bad scientific manners—or, at least, that is the public perception.

Shrinking research funding, competition for support, the need to publish, the fear of perishing, and the pressure of commercialization may very well contribute to an environment conducive to scientific misconduct. It is a highly competitive world out there.

But just how much is the individual scientist to blame? Our American heritage places great weight on individual responsibility. We succeed by ourselves or we fail by ourselves—as individuals. Ethics for individuals, standards for individuals, punishment for individuals, all in the name of professional integrity are, of course, important.

But by focusing so heavily on individual responsibility we may have lost sight of other equally important contributing factors.

True, we have heard about the responsibility of professional societies to set standards.

We have heard about the responsibility of universities to teach ethics. But we have heard little about the responsibility of the scientist's institution. Intentionally or unintentionally the institution creates the environment in which the individual's moral or immoral decisions are made. The institution must also accept its share of the responsibility.

The Nature of Institutional Integrity

One may argue that an institution is not a person. It is a collection of individuals. It is the behavior of those individuals that establish the integrity of the institution. However, I would argue along with others that institutions can have personalities, character traits, idiosyncrasies, self-image, pride, and purpose. An institution can have that intangible something that generates a sense of mission, loyalty, and team spirit. Or an institution can have that intangible something that generates a sense of greed, opportunism, and self-preservation. Individual integrity is crucial. But so is institutional integrity.

According to Webster's dictionary an institution is defined as "an organization or establishment for the promotion of a particular object." That is us.

Integrity is defined as "soundness of moral principles and character, uprightness; honesty."

A second definition is "a state of being whole, entire, or undiminished."

An institution cannot meet the second definition without meeting the first.

When we speak of institutional integrity we refer to a force that reaches far beyond the scientists. After all, the scientists constitute only a small fraction of the institution. But institutional integrity is a force that influences all disciplines, all employees, regardless of their positions in the organization.

CDC and NIOSH are fortunate to have a strong sense of institutional integrity. We have been fortunate in having outstanding leaders and outstanding employees.

Some might say that our public health mission makes it easier for us in many re-

spects to develop and maintain a culture of integrity. Perhaps. But integrity is not a given for all nonprofit or public institutions nor can it be considered an exclusive property of such organizations.

Business corporations, despite their often lofty mission statements to serve the public by providing the best possible product or service, really have only one mission: that is, to make a profit. Without a profit their lofty mission statement is meaningless. Without a profit they will no longer exist. Yet, somehow, many businesses have created a sense of institutional integrity. Some businesses have created a unique environment—instilled a sense of pride and purpose in their employees that transcends profit. It is those businesses that seem to survive the longest in this highly competitive world.

No institution as visible as CDC—and NIOSH is a very visible example—can go for very long without having formidable and frequent attacks on its integrity. Assaults through the years have been many, not only on the integrity of the institution, but on the integrity of some of our finest scientists—by industry, members of Congress, and other influential people. But in the end, good science has won out.

The Issue of Dioxin

Still more recently dioxin. As I'm sure everyone in this room knows, Agent Orange, the herbicide used to defoliate large areas in Vietnam, was found to contain an industrial by-product, dioxin, which is always described by the media as the "deadliest chemical known to man."

Neither studies by CDC nor other studies have confirmed a role for Agent Orange in causing the myriad of ills purported to be affecting Vietnam veterans. As a consequence, CDC has borne the brunt of criticism from some veterans groups and their well-intentioned supporters. The media, of course, have dutifully

reported the wild accusations of a CDC cover-up, White House interference, and other totally false charges.

CDC is guilty of one thing—daring to let the science speak for itself, regardless of highly organized campaigns, deep emotions, and public opinion. It is not a comfortable position in which to be. This whole episode has been hard on those who know the science for what it is.

In my opinion we are beginning to put those dark days behind us. To me, the turning point in this unpleasant episode was the publication on January 24 in *The New England Journal of Medicine* [324:212, 1991] by Marilyn Fingerhut and NIOSH coworkers on "Cancer Mortality in Workers Exposed to Dioxin," in which they examined the mortality records of over 5,000 men exposed to dioxin at 12 different plants in the U.S. from 1942 to 1984. Exposure to dioxin was well documented and correlated well with laboratory results. The outcome of the study was consistent with dioxin being a human carcinogen—but only at very high doses.

Some say that this study will only provide support for both sides of the controversy. But I don't think so.

This publication of impeccable science by careful, thoughtful, capable—and above all—objective scientists has already gone a long way in putting the dioxin issue in perspective. Scientific integrity, institutional integrity, will see us through. NIOSH should be proud. Not only of this fine study—but should take great pride in the outstanding science represented by the publications honored at this ceremony today. I am. I am proud to be invited.

A Mistake Can Be Costly

The integrity of the institution—the reputation of the institution—cannot be taken lightly. To maintain it requires work—every hour in the day, regardless of how many years it has taken to build it. One mistake,

no matter the magnitude of the incident, can hurt and hurt deeply.

I would like to use here an example I used in the Mountain Lecture,^[1] simply because it illustrates the problem so well. On [Sunday] August 12, an article appeared in the *Atlanta Journal and Constitution* with large headlines, front page, section B. And I quote "Burner Fails to Destroy CDC Waste." The article contained all of the feared words—count them—incinerator, medical waste, dead animals, needles, and landfills, not to mention a few others.

Our daughter called me at work, very upset, wondering how we could possibly be so callous when we were the ones that were supposed to be setting the community standards. Our own employees had serious questions about our integrity. Many thought, and understandably so, that they had been let down, embarrassed by the failure of some employee to carry out his assigned task, and the institution's failure to supervise that task.

Five days later, there were four articles in the *Atlanta Journal and Constitution* that originated from CDC and reflected well on the institution. No. Our daughter had not read them. She didn't realize they were from CDC.

What is the required ratio? I don't know. But in this case it is clear that one *negative* event can't be canceled by 4 positive ones. I am sure the necessary ratio is many, many times greater than 1 to 4. Fifty times? One hundred times?

In the meantime, a local television station ran a story on the CDC incinerator and concluded there was no problem. On Saturday [August 18, 1990] the [Atlanta] *Journal and Constitution* ran a halfway retraction reporting that State inspectors had found nothing wrong. Few people saw or read those either. How delicate the balance.

Any negative publicity has serious implications for our ability to carry out our mission "to prevent unnecessary disease, disability, and premature death." And indeed, our ability to carry out our mission depends upon the integrity of the institution being

built by all of our employees—no matter what the job. For any outside contact you are CDC. You are the institution's integrity.

Clearly NIOSH—as does all of CDC—takes great pride in institutional integrity. The depth of integrity that we have achieved has taken a long time to develop. I'm not sure that our leaders over the years set out to do it. I doubt that there was a formal strategy to do it. Developing integrity was intuitive. Our institutional culture grew over the years as a reflection of the integrity of our employees who exhibited leadership, regardless of the position they may have held. We have been fortunate.

Integrity is crucial to our mission. Our success is based on trust. People must be able to trust CDC when we state:

- That certain conditions in the workplace are detrimental to health
- That their children be immunized
- That the AIDS virus isn't transmitted by casual contact
- That certain environmental pollutants are or are not harmful
- That smoking is harmful.

Our reputation for integrity is our greatest protection from political interference and our greatest asset in generating support by society for our programs.

Integrity in our contacts with the public. Integrity in our responses to Congress. Integrity in our dealings with the Administration.

Integrity in our relationships with our sister agencies. Integrity in all of our science.

Maybe it is time we should more formally recognize the importance of institutional integrity and the role it plays in how we do our business, every day. At the Mountain Lecture I proposed a code of ethics. Should we have a code of ethics?

Whatever we do all employees must participate. It is not enough that all employees agree with a code of ethics. All employees must believe in it. I proposed that we might consider a plaque at all of our major locations, a copy in every new employee's orientation package, a reminder at selected public events that we have a code of ethics and its importance to the integrity of the institution. You may have already seen the proposed code, but it bears repeating.

CDC pledges to the American people:

- To be a diligent steward of the funds entrusted to it.
- To provide an environment for intellectual and personal growth and integrity.
- To base all public health decisions on the highest quality scientific data, openly and objectively derived.
- To place the benefits to society above the benefits to the institution.
- To treat all persons with dignity, honesty, and respect.

Think about it. Every day.
Thank you.

Footnote

1. The Mountain Lecture is an annual event held in honor of Joseph W. Mountain, the father of the CDC. Held at the CDC in Atlanta each year, the lecture highlights public health efforts and the contributions of the CDC and its employees. The 1990 lecture, held 9 November 1990, was the eleventh in the series.

Editorial Schedule Change

With the first issue of 1991, ISI® implemented a schedule change in the front matter for *Current Contents*®, *Citation Classics*®, and the *ISI® Press Digest*, including *Hot Topics*, now appear every other week. They alternate with either an essay by Eugene Garfield, a reprint with an appropriate introduction, or an essay by an invited guest.