Contribution to an ON-LINE CONFERENCE on CHEMICAL EDUCATION
January 16 to May 1, 1998

First, Do No Harm...
The (Moral) Obligation of the Faculty

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The Division of Chemical Education is sponsoring this Conference.

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I will follow that system of regimen which, according to my ability and judgment, I consider for the benefit of my patients, and abstain from whatever is deleterious and mischievious.

I. INTRODUCTION

A Brief Historical Perspective on the Role of Moral Development in Higher Education.

Formal education in the physical sciences shares traditions with medical education. In the late nineteenth century, substantial progress in highly technical areas emerged all over the industrialized world, including medicine and the physical sciences. This progress was accompanied by a corresponding increase in sophistication in the educational training programs of these areas. After a century, for example, medical education has come a long way from admissions standards that were often not much more than a passing literacy in Greek and Latin and a good bedside manner. Regardless of how the technical aspects of medical education have developed, training physicians has also been dominated for over two millennia by the same, simple moral imperative: The Hippocratic Oath. Interpreting and analyzing the Oath is its own scholarly domain. I favor the clear and direct lay version of its moral meaning: this above all else...first, do no harm.

Most colleges in the United States grew out of an ecclesiastical tradition. The primary goal of the liberal arts education was the development of character. Most of the faculty were not scholars and the education was at a somewhat low level. The capstone course on moral philosophy or ethics, usually taught by the president, was concerned with how a "Christian gentleman" should conduct himself in a sinful world. Even without a Hippocratic Oath, the notion of moral development was the tradition in the rest of higher education.

Changes in American Higher Education in the Twentieth Century

In the twentieth century, the demands of an increasingly industrial and technological society dramatically changed the intrinsic nature of American higher education. The need for technical and professional training took precedence over the cultivation of virtue. The German model was adopted and colleges and universities became places to receive a specialized education leading to a career in such fields as engineering and science. Faculties became populated by scholars rather than young college graduates aspiring to be clergymen. The teaching of the important human virtue of character, once thought to be the hallmark of the educated gentleman, was largely left to others: parents or religious institutions.

We all recognize the rapid rate of advancement that has occurred in the technical and scientific disciplines. This century opened fresh on the heels of the Industrial Revolution and with the emergence of the engineering and physical science disciplines. In the United States, two World Wars, a space race imbedded in a Cold War, and the institution of federal public funding only further accelerated the rate of direct and indirect (spin-off) technological developments. Scientists receive a highly technocratic education, where attention to notions such as character and virtue are significantly decreased or altogether absent. In this essay, I argue that the "scientific education" has resulted in a faculty who, while hardly a group of immoral hooligans, show signs of deficiency in their overall development. This has had a global impact on the science education of undergraduate and graduate students, and ultimately on the faculty itself. As the century closes, our colleges and universities are populated by the first generations of faculty who were trained by mentors who were in turn the first products of our twentieth century technocratic milieu.

Why Scientific Integrity Does Not Serve as Our Hippocratic Oath

Unlike our colleagues in the medical school, no simple moral rejoinder pervades our work in a way that is meant to guide our behavior as scientists. I have not overlooked scientific integrity, which would certainly be the argument advanced to contradict my assertion. Scientific integrity, what Feynman called "utter honesty", is indeed the legacy we scientists carry from Aristotle, but it is not a moral code for our behavior as citizens in the scientific and science education communities. Scientific integrity is an important technical practice that is being increasingly overwritten by unethical and even immoral choices on the part of some scientists. One of the reasons for these bad choices is that academic scientists face an increasing number of high-risk dilemmas. The need to raise funding to sustain a modern research program has gone up as the actual pool of funding has gone down, and a great deal of value is assigned to dollars and cents. The decisions made by a faculty member who is acting as the "CEO" of a research group are not necessarily the same ones that would be made by a research mentor overseeing the education of graduate and undergraduate students. Productive students are needed by faculty to help advance a research program, yet this can pit the demands for a faculty member's own professional advancement (including tenure) up against the needs of the student for an independent education. Even the value of a research area is measured by its ability to attract funds and citations rather than what might now be the quaint and unjustifiable intrinsic merit of an area of basic research. Cases of scientific misconduct are increasing. In part, this is due to the perceived (and actual) advantages to cheating that can overwhelm the moral choice. Efforts to address these issues have begun, but they cannot impact behavior if they are only marginal. There are programs and centers on most campuses that are now trying to educate graduate students in the carefully compartmentalized categories of bad research and mentorship practices. There is also an inevitable backlash from faculty who think that these lessons only belong in the authentic context of the laboratory or field experience. After all, one does not learn moral behavior by only taking a course any more than one learns how to do research by only reading journals. Yet some of these same faculty are unwilling to actually provide these lessons as an explicit component of the graduate education, preferring the wholly inefficient and tacit approach of trial and error. Worse than that are faculty who present themselves with the contradictory "do as a say, not as I do" philosophy. The most powerful lessons we learn are "by example" as opposed to simply studying "the example", and the education of our future faculty has not been attended to within a broader moral context.

The obligations for educating undergraduate and graduate students in science is wholly owned by the science faculty. Every precollege science teacher and all future faculty members are in our introductory science courses. Some of these individuals take advanced courses, and fewer still join our research groups. Science faculty are the sole caretakers for what constitutes acceptable practice in the educational and professional development of students in science courses, regardless of whether they are the minority who become scientists or the majority whose formative understanding and attitudes about science rest on these classroom experiences. Education is not a neutral activity. Since it is designed to affect the way students look at the world, education will have some effect on their character. Even those students who end up poorly educated in the subject matter learn many things from their instructors that transcend the lessons found on a syllabus. Every decision we make and every action we take as educators contains an ethical lesson. Decisions about course content, pedagogy, even scheduling, involve a choice of competing priorities and therefore communicate a sense of values. How we relate to the students in class, how we relate to the subject matter, how we respond to issues from other disciplines, and how we respond to questions in class, all provide lessons that are powerful insights into our own character because we are providing them "by example" rather than "as examples." As heretical as it may sound, we can learn a great deal from the moral development of our medical school colleagues when it comes to "treating" all of our students: this above all else...first, do no harm.

II. EXTENDING THE METAPHOR TO SCIENCE EDUCATION

Here I will suggest three obligations of moral medical practice that can be metaphorically elaborated to lessons which can inform the behavior of faculty. In each case, I will describe a problem (call it a "harm" if you will) and then the way in which the generic medical ethic might provide a recommendation for instructional practice.

A. Informed Consent: The Interaction between Scientists and Students

Our colleagues in the arts, humanities and social sciences have retained an understanding that education automatically includes the affective dimensions of learning. Even though much introductory science instruction has ended up emphasizing factual subject matter, lessons that we do not attend to are still inferred by our students. We instructors do change the worldview of our students, including their beliefs about science. We intend to help them learn how to critically examine and, in most cases, broaden their beliefs. We expect them to develop an appreciation and respect for things outside of their immediate experience. We want to modify their motivations and, quite literally, to change their minds. Physical scientists are not trained in this tradition, while nearly all of our non-science colleagues address these aspects in their educational programs in a fully integrated manner. The lessons of science exist within the imaginary boundaries of non-affective rationality and objectivity, or at least our instructors would have us infer this...and so when we get the chance we dutifully pass on the implication. The harm here is two-fold. First, we learn to pretend that we operate in a way that is different from how we actually operate, and second, we learn to tell others this fiction. This means that we are not accustomed to giving out the rules of the game even as we appear to openly invite others to play. So we have a no-win situation for people who are educated in science classes, who can end up not understanding science even if though they end up with a wealth of scientific information. We have non-scientists who do not understand the actual basis of science, we train scientists who buy into and propagate a public view of science that is at best naive, and then we end up with scientists who sometimes have a good deal of unlearning to do if they are reflective enough to see past the contradictions in their education.

For science instruction, informed consent has two meanings. As with all disciplines, we must acknowledge that science also relies on affective and social dimensions. This is not to say that I agree with those who argue that all scientific knowledge is socially constructed, because I do not. We do conduct procedures that can be replicated and we create objective information, especially measurements, that can be reproduced. These measurements are assessments. Evaluation of these data, on the other hand, is strictly interpretive. In fact, progress in science relies on the debate between interpretations. Experimental design typically hinges on discriminating between different understandings that arise from the same objective information. Science advances more slowly, however, when scientists only seek to prove their interpretation of some phenomena, when (I argue) the inability to differentiate between the objective and subjective has not been appropriately learned. The first aspect of informed consent, then, is to ensure that students understand that their scientific understanding is not solely a consequence of objective rationality, and this means the faculty must both understand and demonstrate this principle. If we give out the actual rules of science, after all, then others will understand science better. The second aspect of informed consent is for science instructors to understand and make clear the full range of educational goals for students in science classes as well as how the instructional plan seeks to achieve these goals. If learning how to do anything from solving a synthesis problem to solving the Schrödinger equation has value beyond their specific disciplinary applications, then these must become an explicit part of instruction in the subject matter of chemistry. After all, only chemists understand chemistry well enough to be able to answer these questions of value. Furthermore, if we intend for students to respect the motivations and operations of science, especially if we want them to change their beliefs and their existing learning skills in order to be successful, then we must make this an explicit part of the subject matter. We must also behave in ways that signify these principles as our own underlying beliefs. Scientists have the bad habit of circular reasoning when it comes to respecting any other part of the academic community: scientists readily accept and see science as a superior form of scholarship because they have already made the decision to do so, and students, it seems, must simply buy into the self-evidence of this value system.

Testing as a Mode for Diagnosis

We use tests, just as physicians do. Faculty use them to diagnose the cognitive development of our students in our courses after we have provided a treatment program. Expressing ideas about teaching and learning in these terms sounds unusual, and this is symptomatic of the non-reflective tradition that characterizes the scientific education. Another aspect of informed consent is to ensure that treatment and testing are congruent, and that the classroom discourse makes this understanding clear. The rhetoric of introductory science classrooms is filled with notions of higher level learning and broad benefits for the educated citizen. Unfortunately, these words too often do not match the clear message students learn from the examinations themselves: success is constituted by accumulating and organizing retrieval strategies for patterns of objective facts and decontextualized algorithms. Sheila Tobias has recently turned her attention to testing, what she calls "the hidden curriculum". This is a version of an another less-familiar aphorism: if you want to understand a class, look at the exams and not the syllabus. Tobias observes that unless testing (and, by implication, other assignments) accurately reflect the goals of the course, students will learn what the exams expect and ignore everything else. Put another way, changing the content and the pedagogy of the course will not be effective unless the exams and other assignments are also changed. Students are not stupid; they know what matters. Tobias describes the story, for example, of a physics professor who made significant changes in the content of his course, emphasizing broader issues, but soon found his students ignoring all the interesting historical, philosophical and societal issues that he raised. Since he had not changed the problem assignments or the tests, the students focused on the "old fashioned" material on the exams, judging that everything else was window dressing. In hundreds of general chemistry classrooms, faculty conduct demonstrations in order to link observable phenomena to the chemistry lesson. It is not surprising that students tend to only acknowledge the entertainment value of these demonstrations after the faculty neglect to roll their demonstration tables into the examination. If you do not test whether students have learned to link the chemistry with the phenomena, and you do test other things, then the value of demonstrations is made clear. If development of critical thinking and expert problem solving skills are important objectives, then the exams should not only test those skills but also anticipate and preclude undesirable strategies such as the solitary reliance on memorization.

B. Private Health: The Intrapersonal Effects of Scientific Training

The vast majority of faculty earn their salaries by receiving a teaching assignment from their institution. On the other hand, even the appearance of excellence in undergraduate instruction can be automatically (and rather irrationally) attributed to inattention to one's research program. Do good teaching but do not do too well, and whatever happens do not get a teaching award. This is one of many conundra facing young science faculty, in particular. The most successful, independent and self-motivated graduate students from the most active research groups in the top-20 institutions become faculty, and the situation of their graduate department hardly ever matches that in which they find themselves. Some fraction of new faculty, I suspect, are selected precisely because they lacked any need for mentoring or education in the broader aspects of a life in science: they matched perfectly the prevailing culture in their graduate program. No wonder there is such a dramatic period of adjustment, something one of my colleagues calls the "assistant professor syndrome", where organizing and motivating the behavior of young scientists who are quite unlike the new research director becomes the task. The challenge of mastering these significant responsibilities comes as a surprise to new faculty members, and takes place alongside the formidable task of developing an independent, international identity within a five or six-year time period. The scientific training of future faculty neglects most of these broader professional development issues. A new faculty member should not have to invest so much time simply learning how to do these things because it automatically reduces the available time for actually getting the work done. On top of these demands, this new faculty member will also be assigned to organize and carry out instruction in undergraduate and graduate courses, the preparation for which is an area nearly neglected during graduate school. Graduate student teaching assistantships in science are remarkably different from those in the rest of the university. Unlike many disciplines, we use our students when they are least experienced, we do not invest them with decision-making responsibilities about what they are teaching, and the majority of programs provide little in the way of guidance beyond survival strategies for being in the classroom. Whether it is the first time these individuals are assigned to an introductory graduate course or to an undergraduate course, as new faculty members their most common teaching strategy is not at all surprising: "Who has a good set of notes for this course?" Perhaps there is also another issue of informed consent here, too. If we do not provide as much training as we can for the demands of a professional life in higher education, then we put our young faculty into situations where they must make choices that would not be necessary with more appropriate preparation.

Concerning the Future Faculty

The education of Ph.D. students who will ultimately be responsible for training future teachers and future scientists has become more and more distanced from the instructional (and practically all other non-research) aspects of their professional development. An implied question remains unanswered: how can we attend to the broad educational needs of future faculty in a meaningful way? Our current system is highly inefficient and its cost (in poorly educated students and frustrated faculty) is unacceptably high. In every aspect of the scholarly development of our students to conduct research, we have created an infrastructure of experiences from coursework to research, from the undergraduate to the postdoctoral level, that produces individuals capable of creative and independent thought. The usual answer to how this training affects the development of other skills is either woefully naive ("it transfers"), merely ignored ("they just pick it up") or outright discouraging ("it does not matter"). The unanswered question becomes refined: where is the infrastructure to support the scholarship of teaching (and other non-research aspects) in a student's professional development? Graduate students in our programs are first and foremost studying for the Ph.D. in chemistry. My philosophical position is clear: pedagogical strength comes from depth of knowledge and experience. Our students are not studying for a "Ph.D. in Chemical Education" nor do I support that model. My vision is that discipline-centered scholarship in instruction and learning is an area that emerges from the discipline itself, and it requires the greatest understanding of science to be coupled with additional literacy in areas of education science. This literacy could take the form of meaningful cognate courses in appropriate areas outside of the chemical sciences along with a departmental program that allows future faculty to link their learning outside and inside of chemistry. Consequently, we must begin to think about the training of our future faculty in the same way we have been treating the intersection between chemistry and either biological chemistry or materials science: as an emergent area. In addition to curriculum development, there are many other components to the non-research arena that are significant topics for future faculty to consider. Topics that represent a fraction of what should comprise an explicit discussion include such things as proposal writing and review, mentoring research students, departmental and university citizenship as well as participation in the professional organizations. What I have described here is part of a program that my institution plans to institute in 1998. We are not alone. The University of New Hampshire has had a campus-wide certification program in place for 3 years, and the University of Wisconsin-Madison is organizing an internal proposal to its Chancellor for a similar campus-wide effort.

Concerning the Current Faculty

University faculty, outside of schools of education, are notorious for their disdain of pedagogy. As scholars we seem to feel that knowledge of content is all that matters. If we provide a good course, full of the latest developments in our field, students will learn. We focus on teaching rather than learning, often with disastrous results. Lunch table conversations about how our courses are going are filled with destructive nostalgia about how much better students were "in the old days." Facilitating a broad-scale conversation about pedagogy is a difficult task, particularly in a research university where faculty are engaged in exciting scholarship, but a morally reflective educational practice (which is a type of content) demands that pedagogy be taken as seriously as factual content. At least in the public eye, students are the reason for the existence of the university. Their interests in a high-quality education that prepares them to be effective participants in the society are paramount. We must move beyond the views that (1) teaching is merely the organization and delivery of content, and (2) the primary goal of pedagogical innovation is the production of "artifacts" such as textbooks or, currently, interactive computer programs. Pedagogical innovation requires changes in faculty behavior, the most difficult change of all. It is the difference between knowing (intellectually) that a good diet and regular program of exercise are truly the right things to do and observing that the world has plenty of overweight, sedentary physicians who also smoke. Behavioral changes are more complex and difficult than just changing one's mind. Because they require a change at the core, the process is slow. The first step is to facilitate a public discussion of pedagogy among university faculty, initially at the department level, and eventually broadening so that ideas can be shared across disciplines. Such a discussion has begun among chemistry faculty nationwide. While the current discussion is stimulated in part by the systemic initiatives program for curriculum reform, the core problems of sustained reform will not be solved unless the behaviors persist after the funding is removed.

The Interaction Between Teachers and Students, Including When Students are Teachers

A core issue in education is the perspective that anyone in the "teacher" role takes with respect to anyone in the "student" role, regardless of whether the teacher is a faculty member, a graduate student instructor, or a peer collaborator.   The point of view of the "student" must either be respected (as I recommend) or not. I have suggested that anyone who is a "teacher" must learn to "teach with trust." We must default to one of two positions when we examine the work of "students": they act with consistency or they do not. We use the products of student work (their answers) to infer how the students produced them. By taking an inventory of what looks right versus what looks wrong, from out perspective, we assume we gain insight into the student's perspective. This assumes that a mixture of what appear to be correct and incorrect answers follows from an inconsistent (right and wrong) application of the proper rules. I have used the following as a training exercise to get faculty and students to realize that there is a benefit to trying to better understand the student's perspective when looking a student's work. Imagine that you have asked a student to generate six examples of multiplication. What advice do you give to the student who presents the following examples to you?

2 x 2 = 4
-1 x 0.5 = -0.5
1.1 x 11 = 12.1
3.5 x 1.4 = 4.9
2 x 4 = 6
-3 x 0.75 = -2.25

At first glance, the student's error appears to be not knowing that 2 x 4 = 8. Many faculty and graduate students, coming from the perspective that such a student has done most everything correctly, will recommend that support and encouragement are the best advice. The more prickly respondents take a more condescending attitude, remarking that the "silly student" has gotten the hard ones correct and easy one wrong. [Author's note: if these answers are what occurred to you, look again. By shifting your "teacher's" perspective to becoming a problem-solver for understanding a student's perspective, you will realize an indication that our student has acted inconsistently may be the worse advice to give. It is a bit more work, but it is also an intrinsically more interesting task for a teacher to treat student work as a puzzle, an artifact that will give insight into the rules being used by the student, even for how the rules you think you are teaching are being learned. In this case, our student has mastered addition consistently and perfectly well, and may not understand multiplication, or what the multiplication sign triggers, at all. Teaching with trust means really listening to students, taking them and their understanding seriously and then using their understanding as a starting point for instruction.

C. Public Health: Scientists in the Community of Higher Education

The public health of science encompasses many dimensions, including the nature of scientific understanding, the role of faculty in the university, and the education of students in science.

The Obligations of Teaching and Research

After dinner, over coffee and dessert on a recent seminar trip to a large university on the East Coast, one of my hosts asked an intriguing question: "Fundamentally, what business does a research university have being concerned with undergraduate instruction, anyway?" The conversation, you might infer, related to the typical conflict between the "teaching" and "research" missions in the modern academy. Regardless of its origins, the debate about the relative roles of "research" and "teaching" within the professoriate has taken on a "good versus evil" fundamentalism. Over the last 40 years, a second generation of faculty has been raised against this epic backdrop of warring Titans. My reply, which follows, reveals my prejudice. As sternly as possible, I asked my host: "How can any institution that calls itself a university NOT be concerned with undergraduate instruction?"

The character of the faculty impacts the education of undergraduates in science. This aspect of education has been overlooked during each cycle of curriculum reform and development. All characteristics of the science faculty impact instruction, and these characteristics are direct translations from the scientific training received, that is, learned. Science faculty, for example, identify external problems to solve. In instruction, this external problem usually ends up being the student. We know for a fact that the character of the student body in higher education today is different than it was after the second World War, and that that these differences are significant. Concluding that the good old days were simply better is hardly a strategic response. The ways things were (especially the way we learned them) is always perceived (or at least recalled) as the best and most rigorous way to learn or teach. Changing instructional strategies is incorrectly equated with reducing the level of instructional goals and decreasing the demands on students. I do not think that a simple comparison of what we ask of the students who are in higher education today, in both their academic and social development, upholds this conclusion. Setting goals is only the beginning of instruction, not the end. We are obliged, whether we do it or not, to understand our students in order to help plot a course for them to follow. Faculty often criticize this by reflecting on the fact that they were able to succeed without this kind of assistance. How naive! It is much more likely that others were indeed looking out for them and simply did not waste time demanding credit for having done so; or, and this is likely more true in recent times, future faculty succeeded in spite of the system in which they were educated. The body count of failed and disillusioned peers grew at each step, but the future faculty member was finally deemed tough enough to survive. This is not responsible education, it is an obstacle course. Interestingly, we do not examine the character of the faculty, as though they are an immutable baseline against which valid measurements can be made. I question this assumption. Just as for our students, the academic and social milieu in which all faculty find themselves continues to change over time. Over this century, the situation for science faculty has changed greatly, and particularly in how they assign values to their roles as researcher and educator. Another characteristic of science faculty that can impact instruction is standing behind the unbearable rightness of scientific truth. Rather than providing an education of operational utility and a framework for building future learning, these faculty have only one audience: themselves. Speaking with a group of undergraduate first-year students is the same as giving a seminar, and both of these are treated like a proposal defense in graduate school: our scientific culture is one of brinkmanship and "defense", and the worst thing that can happen is to be revealed to be wrong (the "loser" in the game). I argue that the extraordinary benefits of scientific progress in the twentieth century have come with a unacceptable price that was exacted in the character of scientists. I should say clearly that I am not talking about the majority of scientists, but rather an emerging sub-class who have begun and will continue to come into the stewardship of the next generations of academic science.

The Obligations of Self-Governance and Self-Regulation

To bring the moral dimension back into balance with the sophisticated intellectual training of the modern university we need to once again address the questions of character and virtue. The most prized privileges of the professoriate are self-governance and self-regulation, and these represent responsibilities and obligations that are only mediated by the character of the faculty. These responsibilities and obligations can also represent power. My concern is that our privileges have been reinterpreted as rights, which then opens them up to the dual specters of the culture of entitlement ("I am owed...", "I deserve...") and the opportunity for abuse ("...and at any cost..."). I worry about what looks like the loss of conscience in many young faculty in their need to achieve their entitled positions in the university. Professional training, what constitutes acceptable behavior, and the adoption of values are all oral traditions in the professoriate; they are all learned. In addition to self-governance and self-regulation, the other "self" that we are privileged to hold is self-propagation. Our students are always ourselves, once removed. Scholarly competition and the drive for intellectual ownership have always been a positive part of academy, so before I am accused of being simply naive of the past it is indeed the moral context in which the faculty operate that is at issue. The decisions made by young faculty are always a reflection of what they learn to be necessary, important, and acceptable. Therefore, their behavior reveals important lessons about ourselves.

In my own career, I have observed first hand or heard from authoritative sources too many examples of behaviors that we should not only not allow, but that we should not have allowed as options for those who do these things in the first place. It should not be inevitable that some assistant professors will have a "body count" of failed graduate students whose careers are cut short as new faculty members learn how to manage their programs. It may be inevitable that some graduate and undergraduate students will be driven to tears, but it is not acceptable to set out to do this so that "the message" will get out, and it is not appropriate to brag about having deliberately done so. It is not right for a graduate advisor to create and invoke false rules of authorship, in the name of the professional society, in order to remove the name of a graduate student collaborator from a publication after the student has changed mentors. Responsible teaching in any course does not mean releasing texts of information at what students call "the speed of light" and providing condescending "you mean you don't know that" sneers to disinvite classroom discourse. The content and direction of an undergraduate course should not be unilaterally changed because a faculty member, acting alone, prefers to offer his or her graduate specialty instead because less preparation time is required. These are uncomplicated issues of right and wrong. If we remain silent when we see or hear of these incidents then we are as guilty of abandoning our responsibilities as are the perpetrators. If we demonstrate our hypocrisy with "do as I say, not as I do" then we are as guilty as they. We must have the moral courage to simply go to our intellectual offspring as say "no, what you are doing is wrong" instead of meeting behind closed doors and making whatever decision about these individuals fits our local custom.

In 1997, a small group of administrators at a large, mid-western university (not mine) were found to be guilty of misconduct. After these faculty were removed from their administrative posts (but not from their faculty positions, and retaining most of their administrator's salary), the Chancellor explained that these individuals needed to be "rehabilitated." This rehabilitation was to come in the form of returning to mentoring graduate students, all of whom were relying on their advisor, after all, and getting back to their research labs. This particular road to salvation is remarkable if, as I have argued, it is the place where the behaviors and attitudes that led to the misconduct were learned in the first place.

A provocative exchange of letters about faculty behavior was published in a weekly news magazine last year between two faculty colleagues from a university on the west coast.

> I would like to take exception to Professor X’s depiction of the "tribal culture of research scientists" as "overwhelming desire for name recognition...brutal competition...Nobel Prize lust," and so on. As a research scientist most of my adult life, I have never belonged to that tribe, nor subscribed to that culture. The same is true regarding most of the research scientists I have met.
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> The described behavior is rather more likely due to the cult of unremitting self-centered egoism, which in the adult is the hallmark of an arrested, juvenile personality. Science, like all human endeavors, is infected with personalities of that type. In the professions, this failing is often conceived to be synonymous with ambition. The studied observation of such people, mimicking astronomical practice, is an empirical indicator that high analytical intelligence does not guarantee global intelligence.

What is the acceptable level that constitutes "most...research scientists"? Is it 95% or 85%? What if it is 75% Not all cultural changes are revolutions. Some move by the slow march of generational turnover. What is the location of the line that divides indiscretion from unacceptable or even immoral behavior? Wherever it is, one of the additional problems is that it is less a thin and defined line and more a murky gray area five meters wide. Solutions that only focus on young faculty miss the point. We are the creators and caretakers of the values that are learned and guide their actions. If we do not live by whatever guidelines we create, then we are like the overweight physician who smokes and drinks too much: we cannot be taken seriously.

The debate about teaching and research, where I began, is distracting and not meaningful. The conditions under which such a conflict could arise are important to understand, however. Our obligations as members of the professoriate are at issue, and our moral obligations derived from self-governance are at stake. Like it or not, the behavior of our academic progeny is learned, as much of a reflection of us as of them. Our tenured positions in higher education carry the responsibility for stewardship of the public health of science as well as the professional development of all scientists.

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