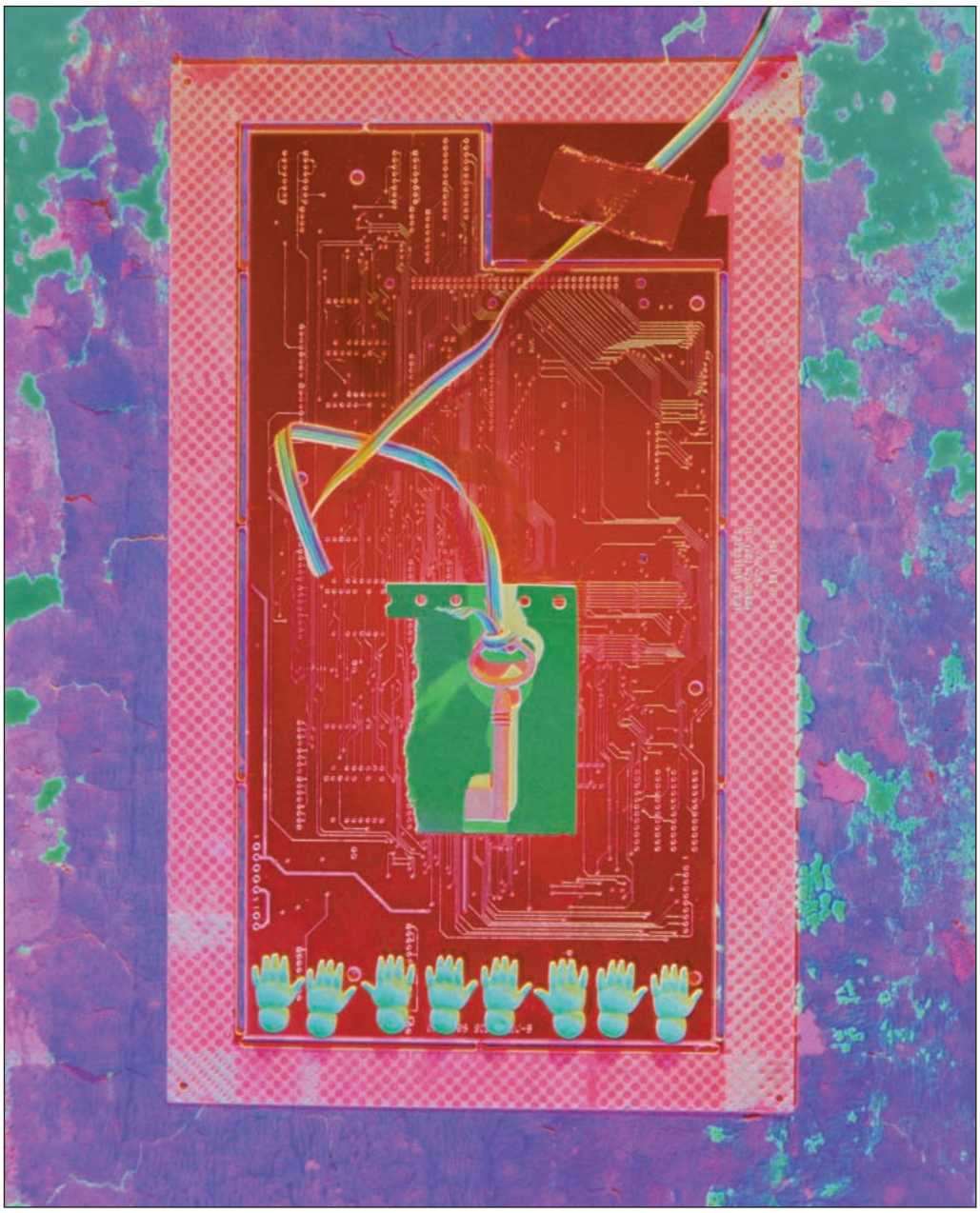

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Three Myths about Codes of Engineering Ethics

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A myth is a story or belief truer to fear or wish than to fact.[1] My subject is three myths common in engineering ethics: a) that the first codes of engineering ethics put loyalty to client or employer ahead of the public interest; b) that engineering codes of ethics should be mere (moral) guides rather than (legalistic) rules; and c) that codes of engineering ethics are too vague to provide much guidance.

Perhaps all that these myths have in common is being too common in discussions of engineering ethics; but I think they have more in common than that. They seem to be mutually enforcing. For example, one way to argue that codes of ethics should be mere guides is to point out how far off the mark they once were or how vague they remain. The three myths also seem to share a common source, a misunderstanding of the role of interpretation in the use of codes —as I shall show here.

What I shall not show is that the myths are common. For each, I merely give one example of a prominent writer in engineering ethics who treated it as (more or less) obviously true. Because readers should have no difficulty confirming that the myths are common (and because space forbids me to offer much evidence here), I am leaving confirmation to them.

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[1]*This is, of course, the ordinary sense of "myth." The social sciences, especially anthropology, use the term in a somewhat broader sense, one ignoring the question of truth even though the "myths" reported (Athena springing from Zeus' head, for example) are generally not true.*

First Codes

The first myth concerns what codes of engineering ethics were originally. One might suppose that the original codes cited would be British (since engineering's first professional societies seem to have been British) [1]. But, in every example of the myth I have come across, the code cited is American. Here, for example, is Carl Mitcham's recent appeal to the myth:

> "the early ethics codes in professional engineering — such as those formulated in 1912 by the American Institute of Electrical Engineers ... and in 1914 by the American Society of Civil Engineers (ASCE) — defined the primary duty of the engineer to be of service as a "faithful agent or trustee" of an employing company" [2].

What is missing from the early codes, according to Mitcham, is any idea that engineers have a responsibility for the public health, safety, and welfare, much less that their responsibility to the public is "primary" (that is, paramount).

The basis of the myth is easy to identify. We need only look at the codes cited. The ASCE code consists of a sentence fragment (a preamble of sorts) —"It shall be considered unprofessional and inconsistent with honorable and dignified bearing for any member of the American Society of Civil Engineers" — and six numbered phrases (each beginning with an infinitive) to complete the sentence. The first of these phrases forbids engineers "To act for his clients in professional matters otherwise than as a faithful agent or trustee, or to accept any remuneration other than his stated charges for services rendered his client" [3]. The very phrase Mitcham puts in quotes — "faithful agent or trustee"— appears in this provision.

There are, however, two significant differences between what Mitcham claims and what we actually find in the code. The first is that the ASCE code says nothing about "employing companies," only "clients." The code seems designed for consulting engineers, not for civil engineers generally. That difference need not concern us here (though it does suggest that the code might have a purpose less general than Mitcham supposes). The other difference does concern us.

The ASCE code does not *explicitly* give priority to acting as a faithful agent or trustee; it merely lists first the rule imposing that duty. Since every code must list some rule first even if all are equal, Mitcham should not simply assume that whatever happens to come first must be "primary." Mitcham's belief that the ASCE put the interests of client (or employer) ahead of everything else depends on an unstated principle of interpretation — something like "first in order means first in importance." Mitcham offers no argument for such a principle of interpretation. I see no reason to assume it.

But (it will be said) the code says nothing about a duty to the public; surely, that is significant. Yes, but the question now is what the significance is. Like the order of duties, silence about any particular duty is open to more than one interpretation. There is nothing in the silence of the ASCE's code to require us to conclude that the public interest is subsidiary to the interests of client (or employer). Indeed, there are at least two arguments for the opposite interpretation.

First, the language in question, "act in professional matters...as a faithful agent or trustee," still appears in most codes of engineer-

ing ethics, but always as part of a provision we now identify as concerned with conflict of interest. Why not interpret the 1914 language as also concerned with conflict of interest? After all, the rest of the first phrase quoted earlier (the part forbidding remuneration other than for stated charges rendered the client) is concerned with a subject closely related to conflict of interest (bribes and kickbacks).

The myths seem to share a common source, a misunderstanding of the role of interpretation in the use of codes.

Since no one today supposes that avoiding conflict of interest is inconsistent with serving the public interest, why read such an inconsistency into the ASCE's 1914 code?

Second, it is easy to imagine a plausible explanation of why silence about a duty to the public in an ASCE code means just the opposite of what Mitcham claims it means. A civil engineer might, in 1914, have explained that there is no need to put a duty to the public into a code of ethics designed for civil engineers. That duty is part of the very meaning of "civil engineering." Since Thredgold first offered his famous definition in 1828, civil engineers have generally agreed that they practice "the art of directing the great sources of power in Nature for the use and convenience of man." In Thredgold's definition, "man" is equivalent to "public." To do anything not for the use or convenience of the public would be to do something other than civil engineering. The duty to the public is so integral to what a civil engineer does that it "goes without saying" that civil engineers have such a duty. Hence (the argument concludes), it is a mistake to move from silence about such a duty to the duty's absence.

I do not claim that these two arguments prove that the civil engineers of 1914 recognized a duty to the public. Indeed, I admit that such a duty would have been controversial (and that generally what people think "should go without saying" is precisely what a code should say). All I claim is that the provision Mitcham cites is, at best, weak evidence for the conclusion he draws from it, and that the interesting question is why he seems to suppose otherwise.

Mitcham does, it is true, cite Layton's *Revolt of the Engineers* (and nothing else) on behalf of his conclusion. But that classic history of American engineers early in the twentieth century has exactly one sentence on the ASCE's code: "First, the society in 1914 adopted a code of ethics [as a concession to the dissidents]" [4]. There is nothing in Layton about how the code was interpreted.[2]

The ASCE's code is an example of one enduring type of professional code, the short; the AIEE's, an example of another, the long.[3] We must read past one unnumbered paragraph (a sort of preamble) to reach the twenty-two numbered paragraphs (numbered from 1 to 22) constituting the body of the code. These are divided into five sections:

A. General Principles;
B. The Engineer's Relations to Client or Employer;
C. Ownership of Engineering Records and Data;
D. The Engineer's Relations to the Public; and
E. The Engineer's Relations to the Engineering Fraternity.

We must pass the two numbered paragraphs under "General Principles" to reach a sentence (B.3) that seems to confirm Mitcham's claim:

> "The engineer should consider the protection of a client's or employer's interests his first professional obligation, and therefore should avoid every act contrary to this duty" [7].

Here "first" seems a mere synonym for Mitcham's "primary." But is it? Again, we must be careful to distinguish what Mitcham assumes from what is actually on the page. The AIEE code declares protecting the client's or employer's interest the first "professional" obligation. That at least allows for other obligations, non-professional ones, that might take precedence. What might these be?

The code gives a double answer to that question. First, the preamble warns: "While the following principles express, generally, the engineer's relations to client, employer, the public, and the engi-

[2] *Layton does have a bit more about AIEE code [4, pp. 70 and 84-85]. But for anything like an adequate description of the context in which the AIEE code was written, one must turn to [5] or [6]. What we can learn from either of these books is that the consulting engineers seemed to want a more demanding code of ethics than did the employed engineers, that the code went through several revisions (weakening some provisions), and that everyone was reasonably happy with the result. Clearly, many hard questions must have been left for interpretation.*

[3] *Ironically, today the ASCE has a long code; the IEEE (the AIEE's successor), a short code.*

neering fraternity, it is not presumed that they define all the engineer's duties and obligations." It is, then, always open to the engineer to argue that he has an obligation in addition to those in the code, one which (though perhaps not "professional") takes precedence.

Second, if we look just above B.3, we find two numbered paragraphs (A.1 and A.2 of the General Principles) that seem to set limits to any merely professional obligation. A.1 says: "In all of his relations the engineer should be guided by the highest principles of honor."Apparently, honor takes precedence over any merely professional obligation. Paragraph A.2 makes clear how important a limit honor is:

> "It is the duty of the engineer to satisfy himself to the best of his ability that the enterprises with which he becomes identified are of legitimate character. If after becoming associated with an enterprise he finds it to be of questionable character, he should sever his connection with it as soon as practicable."

At the start of their relationship, the engineer has an affirmative duty to "satisfy" himself that the client (or employer) is "of legitimate character." If not satisfied of that, the engineer cannot enter the relationship. If, at any time thereafter, a (reasonable) question about the legitimate character of the client arises, the engineer must sever the relationship "as soon as practicable." What "legitimate" means is left open, but A.1 instructs the engineer to be guided in all his relations by "the highest principles of honor." That sounds pretty demanding, demanding enough to require something more than mere legality, *perhaps* demanding enough to include even a duty to protect the public health, safety, and welfare.

The "first professional obligation" of an engineer (loyalty) is, then, "first" only if certain conditions are met. But does "first" mean "primary" (that is, taking precedence over all other professional obligations) once those conditions are met? B.3 has a second sentence: "If any other considerations, such as professional obligations or restrictions, interfere with his meeting the legitimate expectations of a client or employer, the engineer should inform him of the situation." If "first" meant primary, this second sentence would make no sense. How could another professional obligation interfere with an obligation taking precedence over all others? The only way to save B.3 from incoherence, it seems to me, is to understand "first" as (something like) "central" rather than "primary." The engineer should organize his work around serving the client or employer. He should regard anything interfering with so organizing his work as a serious matter, serious enough in some cases to force dissolution of the relationship (that is, when there is evidence that a client or employer is not entirely legitimate), but in other cases (such as conflict with another professional obligation) still serious enough to require notice to the client or employer that there are some things the engineer cannot do. Taken as a whole, the AIEE code makes sense only if "protecting the client's or employer's interests" is *not* the engineer's "primary [that is, paramount] duty".

Lawyers will find what I have been doing familiar. It is what they call "interpreting" or "construing." Part of interpreting any provision of a statute, contract, or other legal document is putting the provision in context. The context includes everything from the surrounding language to the history of the provision, from relevant case law to interpretations given analogous language in other provisions. No lawyer would interpret a provision without a good sense of such context.

Mitcham argued as if each provision of a code stands alone, its meaning obvious without even a close reading — as if, that is, interpretation were trivial. I have elsewhere explained what is wrong with this way of interpreting codes [8]. That a philosopher like Mitcham, learned in many subjects, including codes of engineering ethics, could interpret a code in this way suggests serious intellectual trouble not likely to be his alone.

GUIDES

It is, I think, because they assume that codes do not require interpretation that many who teach engineering ethics want to reject codes. Consider, for example, Heinz Luegenbiehl's classic judgment:

> "codes of engineering ethics, in their present form, should not be utilized as a set of ethical rules...the attempt to provide such a set of rules is not justifiable ... codes of ethics [should] be replaced by a set of "guides for ethical engineering decision making" [9].

What, according to Luegenbiehl, is wrong with ethical rules? Ethical rules set a standard that is "hard and fast" [9, p. 146]. They are (he says) inconsistent with engineers acting as "autonomous moral agents" [9, p. 146]. What engineers need are "guides" because guides

> "indicate what novel situations engineers in a particular field of practice might encounter and thereby forewarn and alert them to these situations; they should also point to the kinds of factors typically considered relevant to such situations" [9, p. 147].

There are, in fact, two ways to read Luegenbiehl's description of guides. Read one way, guides provide almost no guidance. Read the other way, Luegenbiehl is addressing the problem of interpretation Mitcham missed. Let me explain.

One way to read Luegenbiehl's description of guides is as two lists: first, a list of factors suggesting a moral problem; second, a list of factors engineers "typically" use to resolve problems of that sort (whether they should use them or not). Neither list is exhaustive; neither tells an engineer what to do, or even how much weight to give any consideration. There are no "hard and fast rules", indeed no rules at all. The guides provide almost no guidance. All they do is remind engineers to look for some things, leaving each engineer free to do whatever she thinks best, "to use [her] own justified moral foundation...to evaluate a particular situation from the moral point of view" [9, p. 147]. Each engineer stands alone, on her own "moral foundation." The profession has nothing to say about what she should (or should not) do.

The other way to read Luegenbiehl's description of guides is as more than lists of things to think about. The guides "forewarn," that is, include judgments of what the profession thinks engineers (generally) should (or should not) do. The guides also add background information to help the engineer interpret the warning. For example, the guide for conflict of interest would:

> "first define *conflict of interest* and then would enumerate possible *examples* of conflicts of interest. ... The "guides" would further contain a discussion of: the legal status of conflicts of interest; the likely consequences they could have; the implications of proposed courses of action for the individual, the profession, and society; the distinction between actual and potential conflicts [and so on]" [9. pp. 147-148].

On this second reading, a guide is more like an engineering ethics textbook. It has a point of view evident not only in the warnings it issues (the equivalent of a code's prohibitions and requirements) but also in the background it provides for the interpretation of those warnings. On this reading, Luegenbiehl is aware, as Mitcham was not, that context is important for interpretation. But, even on this reading, Luegenbiehl seems naive about interpreting codes. He thinks codes lay down hard and fast rules (requiring no interpretation). He offers his guides as an alternative to those hard and fast rules. In fact, he could instead have pointed out that no rule is "hard and fast," that all need interpretation, and that interpretation requires taking into account a great deal: definitions of relevant terms, examples of application, and so on.

On this second reading, Luegenbiehl has confused the function of codes (to guide conduct) with one method of guiding conduct ("hard and fast" rules). Codes consist of rules, and rules are supposed to guide conduct. They are "binding" (in some sense). They are, however, not therefore "hard and fast," that is, clear and inflexible. They need not turn those who obey them into unthinking automatons. They are, more or less, part of what Luegenbiehl (on this second reading) calls "guides" (that is, the part that forewarns).

Which way should Luegenbiehl be read? I'm not sure. The conclusion of his paper suggests that the first reading is closer to what he actually intended:

> "I have attempted to show that morality should not be legislated in the profession of engineering any more than it can be in our everyday lives. Yet this is what the engineering codes of ethics, as they are presently formulated, attempt to do. Given this and other problems with the codes, I have therefore advocated that for the codes of ethics a set of 'guides for ethical engineering decision making' should be substituted" [9, p. 152].

Luegenbiehl seems to oppose human rule-making as such — or, at least, anything that might count as "legislating morality."

But Luegenbiehl's explanation of what is wrong with legislating morality (that it imposes hard and fast rules) suggests that guides appeal to him precisely because they offer a substitute for "unthinking obedience" to rules rather than a substitute for rules as such. Certainly, the threat to moral autonomy posed by a code of professional ethics (a set of rules humans have legislated) is no greater than that posed by a promise.[4] When we enter a profession, we add to our moral obligations (much as we do when we make a promise). A profession's code of ethics is generally the central statement of those obligations. When we try to follow the code of our profession, we are, in effect, trying to keep a promise. Trying to keep one's promises is part of being an autonomous moral agent, not an activity opposed to such agency.[5] What is opposed to such agency is unthinking obedience to the promise, ignoring the sorts of consideration Luegenbiehl (mistakenly) says codes force us to ignore. Hence, I'm inclined to think that, upon due consideration, Luegenbiehl would prefer the second (interpretative)

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[4]*For an extended defense of this way of thinking about codes, see [10] or [11].*

[5]*For more on the consistency between moral autonomy and following one's professional code, see [12] or [11, ch. 10].*

reading I gave of "guides."[6] If so, then he should accept the defense of codes I make here.

VAGUENESS

Luegenbiehl seems to assume that codes of ethics necessarily lay down hard and fast rules, rules so clear that there is little or no room for interpretation. That clarity is precisely what he objects to. What we must now consider is the opposite objection to codes of ethics, that they are too "vague" to provide much guidance. Here, for example, is what Mike Martin recently said on that subject:

> "Even fully justified codes of mandatory minimum responsibilities contain numerous areas of indeterminacy, vagueness, and lack of clear priorities when duties conflict"[13].

Martin, co-author (with Roland Schinzinger) of a popular text in engineering ethics that reprints four important codes, is not someone to criticize codes lightly. We should take seriously any criticism he makes. What exactly is his criticism of codes?

Martin seems to have identified three distinct failings of codes, that is, indeterminacy, vagueness, and lack of clear priorities when duties conflict. None of these failings is a rarity, he says. Even a fully justified code will include "numerous areas" exhibiting each of these failings. Let us consider these in order, beginning with indeterminacy.

Insofar as codes of ethics are indeterminate, they are open to more than one interpretation ("determination"). Are codes indeterminate in this way? Of course. We can reduce the indeterminacy in a provision by interpreting it in the context of the code as a whole; further reduce indeterminacy by interpreting the code as a whole within the tradition to which it belongs; and so on. But even if we had time to bring in all relevant considerations, we might still end up with several good interpretations of a provision and no decisive reason to choose one over the others. This is, however, not so much a weakness of codes as a fact about language as such. We cannot entirely control how our words will (or should) be understood. All linguistic expression is (somewhat) indeterminate, that is, open to more than one way of being made more determinate. That is not necessarily a bad thing. Like indeterminacy, determinacy has its costs. Generally, the more determinate we wish to be, the more words we will have to use, the more we will have to know about the context in which the words will be used, and the more commitments we will have to make in advance. Often, being brief is better than determining everything in advance (supposing complete determinacy possible). Sometimes, for example, we know so little about what might be at stake in a certain sort of situation that predetermining exactly what will be done would be unwise. Indeterminacy, even in large areas of a code of ethics, may be better than the alternative.

"Vagueness" is different. We often contrast vague language with clear language, assuming clarity is better. Indeed, claiming that phrasing is vague implies that it can be made clearer and that the clarity (the added determinacy) is worth the cost. To object to "vague generalities," for example, is not to object to generalities as such (we cannot do without them) but to claim that we can (and should) be clearer about the generalities in question. My own experience with codes of professional ethics is that they are almost never vague (in this sense). What gets mistaken for vagueness is generally a necessary indeterminacy arising in some such ways as this:

Suppose that I do not like the language of some provision of a code of ethics. While the present language allows me to interpret the provision as I like, it also allows for interpretations I do not like. "It is," I say, "too vague [or ambiguous]. Just change a word here, add a few words there, and the provision will be clear." By "clear", I mean that others will have to agree that the provision means what I want it to mean. The interpretations I do not like will be ruled out. Those who interpret it differently are likely to respond, "Yes, let's clarify it, but our way, not yours." In the end, we leave the provision as it is, hoping for greater consensus later. The code's language is as determinate as possible under the circumstances. It states precisely what we can now agree on, even though it states less than each of us wants. It is *not* vague.

That brings us to Martin's third criticism of codes of ethics, that they lack clear priorities (that is, that they suffer from a certain sort of indeterminacy or vagueness). Martin is certainly right that codes of ethics, including codes of engineering ethics, seldom say that one rule or consideration takes precedence over another.

Martin is also right that any code of ethics likely to be useful will contain rules that may "conflict". We must, however, be careful what "conflict" means here. "Conflict" does not mean "contradict." Rarely will one provision of a code of ethics contradict another, even implicitly (as the two sentences of B.3 of the AIEE code at first *seemed* to). When people speak of rules "conflicting", what they usually mean is that, in partic-

[6] *One reviewer suggested that the present code of ethics of the Association for Computing Machinery (ACM) represents the kind of code that Luegenbiehl had in mind. If the reviewer is right, that is evidence for the second interpretation of Luegenbiehl. The ACM code has a structure so familiar to lawyers (black-letter rule and commentary) that American Bar Association's Model Rules of Professional Conduct, adopted ten years before the ACM's, is organized in the same way.*

ular situations, one rule may *seem* to ask what we cannot do if we do what another rule *seems* to ask. Such a conflict presents a problem of interpretation. We resolve the problem by finding an interpretation allowing us to satisfy both rules (more or less). Where we can find no such interpretation, we conclude that the code should be amended. Irresolvable conflict among rules within a code of ethics is, as far as I can tell, almost as rare as actual contradictions.

Though Martin is right that there is a potential for conflict among rules (in the resolvable sense) and a general lack of priorities to resolve those conflicts, he is wrong that this state of things necessarily amounts to a weakness. Whether it amounts to a weakness depends on what we assume about how codes should work. Martin seems to assume that codes should lay down (what Luegenbiehl calls) "hard and fast rules," a decision procedure even a computer could follow. A decision procedure with rules that can conflict and without clear priorities to resolve those conflicts would certainly be a disaster — *if* those trying to follow the rules were as unthinking as a computer. But why assume that engineers would show no more intelligence when interpreting their own code of ethics than would an unthinking automaton?

The answer, of course, is that there is no reason. If Martin was thinking about interpretation at all, he must have assumed that the only possible sort of interpretation is carrying out a set of clear priorities. It's so simple, so logical, and there are even a few considerations we feel safe giving absolute precedence. Engineers, after a half century of debate, eventually agreed that they could give such precedence to the public health, safety, and welfare. But, in general, we avoid such simple interpretative strategies. The world is too complex. What we want the decision-maker to do when a conflict arises between rules is to interpret them so that the conflict disappears — in a way serving the underlying purpose of the code. The code can provide (what Luegenbiehl calls) "guides," but we do not want a code that pre-empts altogether the judgment of the decision-maker.

What objection could Martin have to writing codes so that they require this more complicated interpretation? The answer, I suppose, is that, *all else equal,* a code requiring such interpretation is harder to use than one that only requires following a set of clear priorities. But, of course, all else is seldom equal. Clear priorities also have costs. Among the costs are rigidity and complexity.

By "rigidity," I mean the tendency to force decision-makers to ignore much of what they know about a specific situation that the code's authors did not know but would have taken into account had they known. The best examples of rigidity tend to occur in large centralized organizations ("bureaucracies") such as the army. We know what to expect when a sensible person in such an organization responds to our sensible criticism of what she is about to do: "The rules are clear."

By "complexity," I mean interrelated detail. A code with enough detail to make every decision more or less routine would have to be a large document indeed. It would need a good index to use quickly and careful editing to avoid the inconsistencies and omissions that creep into most large legal codes. Each part would have to include references to all other relevant parts, long lists of exceptions, and so on. Though (relatively) routine, decisions using such a code might take a long time to make.

Martin has not, I think, thought through what his criticism of codes implies about how they should be written. Here Martin has something to learn from Luegenbiehl. He also has something to learn from the long debate between partisans of short and long codes of ethics. Though even long codes of ethics (a few pages) are short compared to most legal codes (hundreds or thousands of pages), the partisans of short codes argue that long codes are already too rigid and complex. The partisans of long codes respond that short codes do not tell members of the profession everything the profession actually agrees should (or should not) be done. Short codes do not provide as much guidance as they could (and should). Both sides, the partisans of short codes and the partisans of long codes, may be right about the advantages of their own approach and the disadvantages of the other; but, as often happens when designs must be practical, which side has the better argument may depend on particular circumstances, including judgments concerning how much the future will resemble the past.

INTREPRETATION IS CENTRAL

One feature all three myths seem to have in common is a failure to acknowledge how central interpretation is to the use of codes of ethics. Why this failure? The answer, it seems to me, is that those who rely on these myths lack training in a discipline in which interpretation of rules is a central activity, as it is in law and certain religious vocations. They may also have a distaste for "legalism", the sort of careful parsing of rules that we associate with lawyers (and that I have engaged in here). Those who rely on the myths certainly seem to have missed much of the interesting work on interpretation that has been a major focus of philosophy of law over the last half century.[7]

[7]*See, for example, [14] - or any good text on jurisprudence.*

(Continued on p. 22)

managers, users, or those possibly affected by a design — be involved in such decisions?

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(continued from p. 14.)

The basics of interpretation are not hard to learn. I have had no trouble teaching undergraduates to interpret codes of ethics. Indeed, I have had some of these students, those with engineering jobs, point out the similarity between what we were doing with codes in class and what they had to do at work with specifications (and municipal, state, and federal regulations). Engineering is, in fact, a profession in which interpreting rules is important. Why then not explicitly teach the interpretation of rules as part of engineering ethics? Why not understand codes before finding fault with them?

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