

12

FAIRNESS: SOCIAL



"In the first place [science] cannot conflict with ethics. . . . Man, then, cannot be happy through science, but today he can much less be happy without it."

HENRI POINCARÉ (1854–1912), *VALUE OF SCIENCE*

At the level of society in general, science and engineering present less of a philosophical split for fairness than they do for truth. Nevertheless, fairness poses some very difficult issues. We will discuss several that concern knowledge and its ownership, care of the environment, and the professional advice of technical experts.

Intellectual Property and the Society

The ability to own intellectual property provides a financial incentive for creating new things. This incentive has a significant weakness, however, because it promotes innovations mainly in areas where money can most likely be made. Lines of research that benefit either very small groups or large groups having no money tend to be neglected. Drug development for very rare diseases serves as a prime example. Regardless of how much the victims of such diseases would benefit, the market often is too small to justify the effort on a financial basis alone. Similar problems have plagued the development of high-efficiency cooking stoves for poverty-stricken countries.¹ Impoverished families simply cannot afford to buy better products, no matter how much deforestation and other environmental degradation would be prevented in the long term. Where needs like these become severe enough, governments sometimes need to step in to encourage that needed research happens. Incentives include stronger monopoly rights or direct financial payments or credits. Of course, these arrangements require a case-by-case evaluation that balances the needs of the targeted group with the needs of the society at large (which is affected by the subsidies the government offers or the rights it gives away).

Related issues arise when a company develops a patentable idea but then decides not to pursue production. Sometimes the company will obtain a patent on the idea anyway simply to prevent competitors from using it (or to generate licensing fees in the future). Such a strategy is called "strategic patenting." The morality of this practice depends on what the idea is. Strategic patents on innovations that many people might need seem inappropriate. Fortunately, however, great needs usually translate into lucrative markets. Because of this fact, the government has not felt strong pressure to step in and regulate the practice. Hence, provisions for "fair use" for scholarly and other limited purposes do not exist for patent law as they do for copyright law.

Fairness in handling intellectual property becomes especially difficult in university research.² Competition for government research funds has become extremely keen. Thus, financially squeezed universities have turned increasingly to private companies for funding. Although companies sometimes donate money for philanthropy, more commonly they view donations as investments in research that should generate a monetary return. Thus, contracts are written covering who will own the intellectual property and the licensing rights. When two companies enter into a contract like this, the ethical issues usually remain straightforward because there are only two parties, and both operate for profit. Much greater complexity arises when one contractor is a university, for two reasons. First, more parties are involved on the university side, each having its own interests. Graduate students and postdoctoral associates want education. Faculty researchers want to publish their discoveries before competitors and possibly to collect a fraction of patent royalties. Second, the university wants to preserve an atmosphere that is good for education and scholarship while keeping finances in order.

On the level of the individual contract, corporately sponsored university research is governed by complex, individually tailored agreements over publication rights, patent rights, licensing rights, and the like to ensure fairness. However, broader societal issues of fairness relating to the pursuit of knowledge can remain unresolved. We pointed out earlier how the chance to obtain intellectual property can lure companies into areas where money can be made. Individual faculty are not immune from these pressures. The neglect of less lucrative areas of research can pose serious long-term problems for society; this issue has begun to receive attention only recently.

Environmental Issues

Certain features of our environment are held in common, including air, water, space, and appearance. Environmental degradation can include destruction of existing resources, such as loss of biodiversity through destruction of jungles, agricultural land through urbanization, and aesthetics

through clear-cutting of forests. Degradation can also include introduction of new pollutants—not only chemicals but also noise and light (that obscures the stars at night). Ethical issues of fairness therefore enter in unavoidably, since degradation by a few lowers the quality of life for the many.

It is commonly supposed that serious environmental concerns have arisen only in the past few decades. Indeed, the federal government in the United States began to regulate environmental issues seriously only in the late 1960s. The “energy crisis” of the early 1970s, the numerous toxic waste disasters of the late 1970s, the Three Mile Island nuclear power plant incident of the 1980s, and the Antarctic “ozone hole” of the 1990s have heightened public awareness of how vulnerable the environment is like never before. Nevertheless, people have contended with environmental degradation for centuries, particularly near fragile habitats like deserts. Overuse of land for agriculture undoubtedly contributed to the decline of advanced Indian culture in the southwestern United States five to six hundred years ago, and of certain peoples on the Arabian peninsula even earlier. The Industrial Revolution of the 1800s in western Europe caused unprecedented overcrowding and severe air pollution.

Yet it remains true that continual increases in the Earth’s population, average human life span, and the technological capacity for degradation have magnified potential environmental problems to a truly global scale. Widespread deforestation, ozone depletion, and global warming are only a few examples. Such issues have ethical dimensions that are extremely complex; the brief space we have here can highlight only a few of them.

For example, let’s consider what it means for the environment to be “clean” of harmful substances. For a given substance, we first need to decide at what level pollution begins to have significant moral importance. Depending on the hierarchy of values we choose, we can define several thresholds. The threshold could occur at the level at which:

1. the pollutant becomes detectable by the best methods
2. the pollutant is present in nature
3. the pollutant begins to pose significant risk for human health
4. the risk for harm exceeds that for other risks people commonly accept
5. the cost of eliminating the pollutant becomes prohibitive

These thresholds have been loosely ranked in decreasing order of strictness. The first two represent concrete numbers that include no consideration of probability or risk and require no balancing against other considerations. However, the third and fourth thresholds do include probability and implicitly balance health against other things. The balancing enters in through the words “significant” and “commonly accept,” where

someone must weigh the likelihood of harm against factors like inconvenience and cost. The fifth threshold makes this balancing against financial cost explicit, and is listed separately mainly because of its common usage.

Not surprisingly, the last three thresholds tend to generate far more controversy than the first two by requiring a balancing process that different people do in different ways. Interestingly, the first two thresholds seem to avoid this problem, but in fact they do not. Their relative strictness usually requires considerable effort and financial cost to satisfy. Since all societies have limited resources, the time and money devoted to environmental preservation cannot be used for other purposes—to feed the hungry, for example.

Experts and Paternalism

Chapter 11 has already examined the idea of paternalism in business contracts. In a paternalistic contract between a client with little technical expertise and a professional advisor, most decision-making is done by the professional, following the model of a parent and child. Unfortunately, a paternalistic contract tends to substitute the professional's value system for that of the client—often with very negative consequences. Actually, this problem has a much broader social dimension. We have often said in this book that the increasing technical complexity and specialization of our society place ever-greater burdens of public trust on scientists and engineers. Indeed, Western culture is rapidly transforming into a culture of experts, where key policy decisions are made and explained by highly trained specialists. Although this trend often squares with the demands of prudence, dangers lurk under the surface. Experts can easily fall into a mindset that assumes unlimited knowledge and wisdom and look down on those who are not “in the know.”

Against this kind of arrogance one wit has cynically retorted, “An expert is someone who carefully avoids minor errors while sweeping on to the grand fallacy.” While such sarcasm undoubtedly goes too far, the history of science is full of reports by reputable researchers that turned out to be nonsense, for example, n-rays, polywater, cold fusion, and solute “imprinting” of water at zero concentration.³ More common and less obviously wrong have been the passing fads in research that started with discoveries that were supposed to bring grand new opportunities for human advancement. Such claims have been encouraged in the United States by a funding system that often values newness over depth. Unfortunately, technology is no more immune to these pressures than is science. Continued growth of the nuclear power industry and widespread replacement in integrated circuits of silicon by gallium arsenide were once trumpeted as waves of a future that never arrived.

Compounding these problems is the fact that scientists and engineers

work in a society that sometimes seems superstitious or paranoid. Recent controversies over “alternative medicine” and the health effects of low-frequency electromagnetic fields (EMFs) offer just two examples of debates where logic seems to take a holiday. In response, scientists and engineers can be tempted to think, “we know what we’re talking about and you obviously don’t, so you should just keep quiet and listen to us.” Such paternalism offends against fairness by not giving others the respect due to them, and stands in the way of what the common good really requires—clearer and more patient explanation of facts and physical principles. This attitude can also lead to the pursuit of lines of research that are out of touch with human needs.

Social Aspects of Employment

Although some scientists and engineers run sole proprietorships or partnerships, most work for corporations as employees. We discussed some of the person-to-person aspects of the employer-employee relationship in Chapter 11. However, this relationship has important social aspects as well. Here we will touch on just a few of them.

One concerns the long-term relationship between employers and their employees. Many workers, particularly those with highly developed skills, view their jobs as more than merely sources of income. They look to their work as a source of personal fulfillment as well. This fulfillment may have many origins, but chief among them is often the successful completion of tasks as part of a team. For such efforts to work well, employees must develop a sense of trust and loyalty toward the team and the team toward them. Both trust and loyalty draw on all the classical virtues, but loyalty draws especially heavily on fairness and fortitude. Fairness requires that a bond forged with careful effort over time not be cast aside lightly, while fortitude provides the means for sustaining that effort in the face of difficulty. Many observers have criticized the recent trend toward a loosening of those bonds, as shown by the increasing tendency of corporations to lay off “excess” employees as well as by the increasing rate of “job-hopping” by workers. Few people question the acceptability of these practices if the reasons are sufficiently good. However, employment statistics as well as a great deal of anecdotal evidence suggest that more and more often, the reasons for layoffs or job-hopping are not sufficiently good. This phenomenon comes from a widespread rootlessness and lack of commitment, and leads to a decay in the social bonds that keep a society from flying apart.

A second aspect of employer-employee relations concerns the increasing tension between the demands of work and personal life. Statistics and anecdotal evidence over recent years suggest that average worker satisfaction has declined and stress has risen. Social scientists are still try-

ing to quantify exactly how bad the tensions are and where they come from. No doubt the rise of two-working-parent families, increased commuting times, and longer hours demanded by a more competitive work environment all play a role. As bearers of responsibility for a great deal of research, design, production, and management, scientists and engineers seem particularly vulnerable to these stresses. Fairness helps keep the balance between the legitimate production needs of employers and the legitimate personal aspirations of employees, and has led to flexible working hours, work-at-home arrangements, job sharing, and company-provided daycare. Nevertheless, some companies and lines of work offer more such opportunities than others. Moreover, in the end a day still contains only twenty-four hours into which people can cram only so much activity.

A third aspect of employer-employee relations concerns the continuing underrepresentation of women and certain racial or ethnic groups in some segments of the work place. Science and engineering have proven unusually resistant to penetration by these groups. This issue has led to a continuing and often nasty debate that we will not reproduce here. Clearly fairness requires that opportunities for employment and advancement should be equal regardless of gender, race, or ethnic background. The more difficult questions revolve around how equal opportunity can be ensured and whether equal opportunity necessarily implies equal results. Other questions focus on the injustices that created inequalities, who perpetrated them, whether restitution is due, and over what length of time.

A REAL-LIFE CASE: Environmental Cleanup— Problems with the Superfund

In response to several notorious incidents of toxic waste dumping during the 1970s, the U.S. Congress enacted in 1980 the Comprehensive Environmental Response, Compensation, and Liability Act—known more commonly as the Superfund Act. The law was intended to begin rapid cleanup action at hazardous sites while forcing polluters to foot the bill. To accomplish this purpose, the law created a “superfund” financed by a tax on the chemical industry. This fund served two functions: to bankroll early stages of site cleanup while those responsible were being sued for compensation, and to finance cleanup of “orphan” sites where no guilty party could be found.

Unfortunately, most observers agree that the Superfund Act has not served its intended purpose. Faced with huge cleanup costs, many companies accused of bearing responsibility first deny it, and then sue their insurance company. The legal proceedings become extraordinarily drawn out. To compound the problem, the Superfund Act employed a “joint and several liability” approach, meaning that any party to the dumping, no matter how insignificant, could be held

legally responsible for the entire cost of the cleanup. In the face of such potentially crippling penalties, joint contributors to pollution at a given site often engage in lengthy legal battles with each other. Finally, orphan sites have often lain untouched because most of the superfund's resources have been consumed by legal costs.

Although there is widespread recognition that the law is not working well (except for attorneys), there is little agreement about how to fix it. The American landscape is still marred by many untouched waste dumps. Congress is continuing to look at the problem, but a solution does not appear to be coming soon.

- ◆ What do you think is the most important problem with the Superfund Act?
- ◆ How would you fix the law?

References

- Koshland, D. E. "Toxic Chemicals and Toxic Laws." *Science* 253 (1991):949.
- Voorst, B. V. "Toxic Dumps: The Lawyers' Money Pit." *Time*, 13 September 1993, 63-64.



"I want no money raised by injustice."

CANUTE THE GREAT, KING OF ENGLAND AND DENMARK (995-1035), "LETTER OF STATE"

Notes

1. Amulya K. N. Reddy and Josy Goldemberg, "Energy for the Developing World," *Scientific American*, September 1990, 111.
2. A different situation than described by Vannevar Bush, director of the U.S. Office of Scientific Research and Development, in the report *Science: The Endless Frontier* (Washington, D.C.: U.S. Government Printing Office, 1945).
3. See *Pathological Science* by Irving Langmuir (Schenectady, N.Y.: General Electric Co., 1968).

Problems

1. Write a page or two describing an ethical dilemma that involves some aspect of fairness on a social level that you have encountered in a job you've had. (If you've been lucky enough never to have been confronted with a problem like this, describe one that a friend or relative of yours has had.) Recommend what action you think you (or your friend/relative) should have taken, and give reasons for and

- against that recommendation. Note: you don't have to say what was actually done in real life (unless you want to)!
2. Each case below has a question after it.
 - a. List the options/suboptions available to the main character who has to make a decision, together with the event tree flowing from each option.
 - b. Recommend what you think the character should do.

CASE 12.1 Deciding the Layoff Target

Although the workday had ended, Martin Diesirae and Emily Laborvincet found themselves still sitting in the manager's office of Tripos Metal Polish, trying to finish the day's tasks. Suddenly, in frustration Martin disgustedly threw his pencil down on the desk in front of him. "Whew!" he exclaimed. "My brain is dead. I don't want to do anything else today."

"Mmm," grunted Emily faintly as she continued to tap on her computer keyboard.

Martin sat pondering for a moment. He turned for a few moments to watch Emily, who had her back to him. "You know, Emily," he ventured with hesitation, "it's been a couple of weeks since the fire here. You and I have just gone about our business, trying to get things back in shape. But . . . well . . . I wanted to apologize. You know, during the fire, for trying to drag you out of here when you were trying to save the company files."

Emily turned to face him, peering intently into his face. "Oh, I guess it wasn't totally your fault. You were scared that I wouldn't make it out."

"Yeah," Martin agreed. Then he rubbed his jaw. "But I didn't count on your right hook. It hit me like a sack of bricks! With dead aim! Where did you get it?"

"My brothers taught me," Emily laughed. "It doesn't still hurt, does it?"

Martin shook his head. "Nah. Only for a day or two. I'm sure glad you saved the files and got out! You're fearless!"

Emily raised her eyebrows. "Hardly. Just after the fire, Rolf—from production—gave me quite a scare."

"Rolf? The big guy? What did he do?"

Emily stopped short and glanced away nervously. "It doesn't matter," she mumbled. "It's over now."

Martin paused for a moment, puzzled. Then he sat up with renewed enthusiasm. "Hey, Emily, I'm hungry. Let's go to that Chinese

place across the street again." Emily continued to look away, and said nothing. "Well?" Martin inquired.

"Martin, I can't. I'm sorry." Emily responded, glancing at him and sitting back in her chair.

"Can't? What's that supposed to mean?" Martin demanded.

"I've decided I can't go out with you any more. I finally figured it out after you refused to pay for any of the stuff we dropped by accident in the curio shop. You're a nice guy, and I like you. I want to be friends. I just don't want to date anymore. You . . ."

"Ah! The old 'just friends' line," Martin Diesirae interrupted with a hint of sarcasm. "The standard procedure for 'politely' dumping some poor guy."

"Don't be like that Martin," chided Emily. "Technically there can't be a 'dump' because technically we were never an item. I still have a boyfriend, remember."

"So that's really it . . . you've decided to stick it out with him."

"No, I haven't," Emily contended. "I told you, I still don't know where that's going. But that's not the issue here. You just have too many rough edges for me. Your temper is too quick. Your opinion of yourself is a little too high. And in your heart, I'm not sure you respect *any* woman very much, not just me. When I add it all up, I'm looking for a different kind of man."

A long silence ensued. Finally Martin sat up in his chair and observed, "OK. I see now. There's no use talking about it anymore." He glanced up at the office clock. "It's late. We should be going home. You said earlier you had some other business to talk about. Let's get it over with."

"Martin, I'm serious when I say I still want to be friends," she entreated.

"We'll be friends, don't worry," he replied stiffly. "Let's start by getting today's business over with."

"OK, if that's what you want," Emily responded reluctantly. "We have a big problem. I already talked it over with Monica as much as I could with her lying in the hospital. I do all the balance sheets and personnel stuff, but she owns this business, so I needed to get her OK. Tripos has a cash flow problem. That fire hit our plant a couple of weeks ago now, and knocked out about half our production capacity, as you know. We haven't been able to fill a lot of orders, but we're still paying all our employees. We can't do it anymore. There's not enough cash, if we want to pay all the contractors to get our plant back in shape."

"Can't we get a loan?" asked Martin.

"I tried, with as much help as I could get from Monica. We can get some, but not enough. The banks are worried about the ability of Tri-

pos to get back on its feet. After all, both our owner and our chief sales manager are laid up in the hospital for months from a car accident, and then half of our only plant burns up. We're not a good risk."

"So, what now?"

"We employ fifty-one people now," continued Emily. "I did the numbers. Roughly ten will have to go on temporary layoff within two weeks. If things don't improve, we'll have to lose another ten a month after that. Until our plant is fit for full production again."

"So who gets the ax? And who decides?" asked Martin.

"Ultimately Monica decides. But she hasn't been here for a while, and her mind is still too fuzzy to deal with the details of balance sheets. Remember, she got pneumonia again last week. So she asked me to consult with some people—mainly you, as temporary sales manager; Conrad, as head lab chemist; and Selma, as head of production. Then I'll prepare a plan and present it to Monica. I think she'll approve whatever I recommend."

Martin's face showed concern. "How are you going to decide? Seniority? We have some young people who are really good, and could leave the company if they're laid off. And some of our newer workers are living hand-to-mouth, with kids and mortgages. Layoff would be a disaster for them. Maybe it's just fairest to drop the people who work on the lines that are knocked out."

"Yeah, Martin, but like you said—some of those have seniority and are really good. Actually, probably most of the people in Conrad's chemistry lab should go. We don't need new product development right now. Maybe just a quality control chemist."

"You mean lay off Conrad before one of his junior chemists? That won't sit well! What if he goes? He's good enough to get a job anywhere! We have to think long term, not just short term."

◆ What should Emily recommend?

CASE 12.2 Publishing in Widely Accessed Journals

"I reviewed this paper like you asked," said Leah Nonlibet as she placed a packet on Professor Warren Clark's desk. "I worked through the analytical method the authors outline. I can't find any mistakes. Actually, it works pretty well once you wade through the bad English to figure out what they're saying."

"Thanks for helping me with the review," responded Clark. "Sometimes I get a whole bunch of journal articles to review at once. I just can't keep up without help. And I didn't feel I could ask Marcus to help. He's busy trying to get data for his thesis so he can graduate in December. And he's still fuming that I made you first author over him on that one paper."

Leah nodded. "Yeah. He'll hardly talk to me these days. I didn't know it would be such a big deal for him."

"It was a big deal for you," Clark pointed out quickly. "Enough that you were willing to become a little more accommodating when it came to dropping those data points you were defending with such passion."

Leah flashed a faint smile. "Well, I still don't like the idea. But the whole situation was just getting too messy, and I could tell you needed help to solve it. I'm glad it's behind us now."

"Me too," Clark agreed. "Now I have a new problem, although thankfully smaller. It's about this paper you just reviewed. The authors are from Antipodea. The country is poor, and they have hardly any resources. As you saw, the whole paper just outlines a method for analyzing data from optical measurements on minerals. The method is intended for a hand calculator. Leah, I would never use this. Neither would any colleague I rub shoulders with. We all have personal computers to do this kind of thing, in about 1 percent of the time."

"Yeah, but they don't have many personal computers in Antipodea, or in a lot of other countries. So the method could be useful there," Leah observed.

"I know. I wanted you to check whether the method was valid first," said Clark. "If it was invalid, the review would be simple to write. But now I have to make a tough choice."

"What's so hard? The method is OK. You can just recommend its publication, right?"

Clark shook his head. "It's not so simple. They've submitted to the *Journal of Geological Measurements*. It's not the best journal in the world, but it's respectable and has wide readership. This paper has a lot less substance than most papers in *JGM*. The reference section is very thin. From what I saw, the paper's style isn't good. The papers in *JGM* are almost all much better than what we have here. And the big thing is that most of the readership won't care about doing analysis by a hand calculator. If it weren't for its possible relevance to scientists in poor countries, I'd reject this paper in a minute. The journal has only so much space. So if this paper is accepted, a better paper will be rejected somewhere to compensate." Clark paused, shifted in his chair, and continued. "On the other hand, if the authors go to a small regional journal, published in the area of Antipodea, the paper may get lost. The libraries in undeveloped countries like Antipodea usually get only major journals like *JGM* and their own regional journals. And the databases for literature searches sometimes don't include obscure local journals. So many of the very people who need to see an article like this might not get access to it—because they might not learn about it or get it in their library."

"Why don't you just let the editor decide?" asked Leah.

"Well, she will decide, Leah. But she's a human too. If a reviewer takes a strong position, that can sometimes tip the balance on an issue like this."

◆ What should Professor Clark recommend?

CASE 12.3 Photocopying in Violation of Copyright

"Yes, Celia?" said Terence Nonliquet as he erased the board after finishing his quiz section for Comp Sci 110.

"Hi," responded Celia with slightly exaggerated enthusiasm. "I just wanted to thank you for not taking off any points on my term paper. You know, for plagiarism."

"I don't want to talk about that anymore, Celia," Terence retorted gravely.

Celia glanced around to ensure that everyone else had left the room. Then she smiled seductively at Terence. "Do you want to talk about our date?"

Terence glared at her. "There's nothing to talk about. I don't understand why you don't get it. I don't want to go out with you."

Celia hopped up to sit on the instructor's desk that separated them. "You keep saying that, Terence, but you're not very convincing. You try to hide what you're thinking, but I'm not fooled. I can tell by the way you look at me during class." She paused and adjusted her short skirt. "Especially when I wear something like this." Terence could not hold her gaze. He returned to erasing in silence.

Having gained the upper hand, Celia continued, "So I hear through the grapevine that things aren't going well between you and your girlfriend. Somebody in class said they heard the two of you arguing in your TA office." Terence tensed visibly. "Was it about me?" she teased.

"It's none of your business," Terence muttered angrily.

Celia shivered at the power she knew she was holding over him. "Really, Terence, I'm not so bad. Remember my offer. Just one date with me, and I drop your class." He continued to erase silently, eyes glued to the board. Her voice turned malicious. "Ignoring me? Well, then let's change the subject. I noticed last week you handed out a chapter photocopied from one of the texts on reserve for this class in the library. That was very kind."

Terence finished and turned around. "Oh . . . I'm glad you liked it," he deadpanned.

"You didn't happen to get the publisher's permission, did you?" Celia asked, voice dripping with poison.

"What do you care?" Terence asked guardedly.

"Well, Terence," Celia began in an exaggerated singsong. "We both know you're a man of high principle. I've always respected that! That's why you were so concerned about my copying homework from other students, and plagiarizing books, right? It just stands to reason that you got the permission you were supposed to have. I mean, publishers have a right to their royalties, right?"

"Celia, I was trying to help the class. There's a fair-use clause in the law that permits photocopying copyrighted materials."

"Yes, I've read about that," purred Celia. "People can make a few photocopies for scholarly or educational purposes. But there's no way making thirty copies of an entire chapter and distributing it free to a college class is fair use under the law." She paused and giggled mischievously. "You didn't happen to pay the royalties out of your own pocket, did you?"

"Celia, I don't see any point in talking about this."

Celia suddenly grew stern. "Oh, I do. You broke the law. And I consider it my duty to secure the legitimate rights of the publisher. I'll be writing them about what you did. . . ." She paused for effect as his face turned ashen. "Unless, of course, you can persuade me not to on that date I asked for."

"I can't believe this . . ." Terence sputtered weakly.

◆ What should Terence do?

CASE 12.4 Research Having Large Benefit for a Small but Needy Group

"There, I hope you like it," said Myra Weltschmerz hopefully as she set the freshly baked lasagna on the table in front of Martin Diesirae.

He licked his lips and rubbed his stomach. "You can count on it!" he exclaimed with exaggerated eagerness. "Your cooking is great! I really missed it since we—you know—fought. It's been about two months now. I was so happy when you offered to come over to my place and do it again."

Myra sat down with a slightly embarrassed smile. "I'm glad too." Then she paused and glanced around tensely. "I assume you've been eating out a lot," she ventured.

"Not that much. Here and there," grunted Martin between mouthfuls.

"You mean 'here and there' with Emily. . . ."

Martin paused and put his fork down. "Oh, so you heard about that. I didn't realize you knew. I mean, we haven't talked much since the fight. But you should know Emily and I aren't seeing each other anymore. Romantically, I mean."

Myra bolted up in surprise. "You're not?" she asked hopefully.

"No, we decided to cash it in. We're still working together at Tripos, and we're good friends. . . ." Martin looked intently into Myra's eyes. "But as for dating, I can see now where I've had it better all along."

Myra beamed with a radiant smile. "Martin, I'm so glad!"

Martin started to fidget at the intense emotion. "Yeah, me too." He paused, and his voice grew more businesslike. "But let's talk about the serious stuff after supper. I can't do relationship on an empty stomach."

Still ecstatic, Myra felt content to wait. "So what happened at work?" she asked dreamily.

"Busy, like always. There was something new today, though. I was talking to the chief lab chemist, Conrad. He said that a while back one of the lab team accidentally stumbled on a formulation for a metal-polishing dip that is slow, gentle, and very selective for oxide corrosion. It leaves the underlying metal intact. I had seen a magazine article last week talking about how museums clean up and preserve old artifacts. The article said that current technology still has some problems. So I showed it to Conrad, and now we think the stuff we found could be an improvement."

"Then you could sell it as a new product?" asked Myra.

"Yeah. There's a problem, though. It works only with certain alloys, so the market isn't very big. I mean, how many museums are there that do this kind of thing? The process would be complicated. It would take time and expense to scale it up to actual production, even for a small market. And our production lines were crippled by the fire a while back. Plus, we were running out of spare floor space anyway. A new production apparatus, even a small one, would need an addition to our building. That means all kinds of permits, contractors—you know, a lot of fuss and money. Tripos probably wouldn't make much profit off this stuff."

"So you have something that the museums might really be able to use, but you can't make much money from," remarked Myra. "Why don't you just sell the technology to someone else?"

"Actually, the process uses some steps that we protect with trade secrets. Even if a company agrees in a licensing contract not to use those steps for anything else, the incentive would be strong. It would be hard to police whether they adhered to the agreement."

"What are you guys going to do?"

"Good question, Myra."

◆ What should Tripos do?