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UNIT ONE

FOUNDATIONAL PRINCIPLES

"The unexamined life is not worth living."
SOCRATES (C. 470–399 B.C.), QUOTED IN PLATO'S *APOLOGY*, 38

"The happy life is thought to be virtuous; now a virtuous life requires exertion, and does not consist in amusement."
ARISTOTLE (384–322 B.C.), *NICOMACHEAN ETHICS*, BOOK X, CH. 6, 1177A

1

APPROACHING THE SUBJECT OF ETHICS

"Virtue is its own reward."
MARCUS TULLIUS CICERO (106–143 B.C.), *DE FINIBUS*

An Example

Consider the following fictional situation:

CASE 1.0 Truth in Writing a Resume

"Martin, can you take a look at this for me?" asked Myra Weltschmerz as she handed a copy of her resume to her boyfriend Martin Diesirae. "I want to turn this in to the engineering placement office tomorrow."

Martin sat back in his chair scanning the document while Myra stood waiting in front of him. Both were seniors at Penseroso University, he in computer science and she in environmental engineering. They had been together for two years. After a few moments, he raised his eyebrows and declared, "I don't know how you can put some of this stuff on here. You're basically lying!"

Myra cowered noticeably. "Martin, what do you mean? I'm not a liar."

"Come on! You are so! Look at this, under 'Work Experience.'" He leaned forward and held the paper about 6 inches from her face. "It says 'Accountancy Consultant to Baxter Brothers, Bakers.' That's garbage!"

"But I was—,"sputtered Myra, drawing back.

"You were nothing!" Martin broke in. "Mr. Baxter was your next door neighbor. All you did was come in once on a lark and teach his daughter how to use a spreadsheet. She was a part-time clerk! Then she entered stuff she got from the real accountant. You didn't even get paid!"

"Y-yes I did," stammered Myra timidly. "Mr. Baxter slipped me a twenty and told me and Karen to use it on a pizza."

"That's pathetic," Martin snorted. "No recruiter will take it seriously. Or what about this, under 'Extracurricular Activities'? You put 'Dixieland Jazz Band Ensemble.'" Martin jabbed his finger into the air at her. "You went to one meeting before you dropped out."

"But I paid the dues," Myra offered lamely.

"Hah! I could pad my resume like crazy just by paying dues," Martin snapped.

"But I'm a senior looking for a permanent job. A lot of other students have stuff like this on their resumes. The woman at the placement office said I should try to make my background look special."

"Your background isn't special. That's just the breaks," sniffed Martin. "I've told you for a long time to quit all your baby-sitting and do something more impressive. You must spend eight hours a week for that woman . . . Dolores or whatever. And she doesn't even pay you that much because she's always broke." Martin threw up his hands. "But you never listen."

"But Dolores needs help, and I like children. That should count for something."

"Hey, it doesn't count for much on a resume. You don't even have it on here!" He tossed the paper on the desk. "You can be so stupid, sometimes."

- Is Myra's representation of the consultancy acceptable? Why or why not?
- If not, what should she do?
- Is Myra's representation of the jazz band membership acceptable? Why or why not?
- If not, what should she do?
- Did you arrive at your answers immediately, or did you need to think for a while?
- Do you think most people would recommend what you did?

Let's consider in more detail how to approach questions like these.

The Importance of Ethics in Science and Engineering

Broadly speaking, scientists seek a systematic understanding of the physical world. Engineers seek to apply that knowledge for the practical benefit of all people. Most students in these disciplines will readily agree that mastering them requires long hours of grueling effort. Nevertheless, the effort seems worthwhile not only because success can offer a decent living,

but also because the fruits of this work influence life in every corner of the planet. This wide sphere of influence makes working in the technical disciplines very exciting, but should also give us pause. As soon as what we do in our professional lives affects other people, our ethical judgment comes into play as well as our technical judgment. There are three good reasons we should give as much attention to developing our ethical skills as our technical ones.

First, good ethical behavior usually leads to good consequences, both for ourselves and for society at large. Sometimes the good effects show up immediately, as with a reward for returning a lost wallet. Other times the effects come much later, as with trust and respect from our colleagues. Some might argue that unethical behavior sometimes pays big dividends, as with stealing secretly from a cash register. However, the long and bloody trail of human history, running from the wholesale slaughter of the Dark Ages to the recent warfare in Kosovo, suggests that injustice leads mainly to suffering in the end.

Second, scientists and engineers make decisions crucial to society at large, and therefore shoulder an enormous burden of public trust. The complexity of modern technology forces those untrained in its way to depend on scientists and engineers for expert judgments. Unfortunately, the increased specialization of scientists and engineers sometimes leads to a narrow focus that cripples their ability to make and explain these judgments. This handicap carries over into ethics. When important and complex questions of right and wrong confront scientists and engineers in their professional work, they sometimes find themselves inadequately prepared about how to approach the issues or to communicate their advice clearly. Formal study of ethics can help to overcome these problems.

Third, happiness comes from reasoning through a complex moral puzzle, choosing a good course of action, and following through. Of course, people can sometimes do what is good on the basis of gut instinct alone. As thinking beings, however, people tend to find more satisfaction in understanding why they do what they do. Indeed, over two millennia ago Aristotle identified good ethical thought and action as the ultimate source of human happiness.

Unfortunately, education in science and engineering often provides little guidance in how to think about right and wrong. Our society at large knows this, and is sometimes uncomfortably willing to accept the movie clichés of "mad scientists" or engineers who act as unwitting pawns of larger evil forces. Granted, almost all of us receive a great deal of moral training from our parents. Primary and secondary education adds its contribution, and formal religion offers even more to its believers. However, the work place in science and engineering presents a distinct set of ethical problems. These problems often prove quite complex, and we need approaches that rely on more than gut instinct or simple rules learned in childhood. This book attempts to fill the gap in part by introducing the study of ethics applied to science and engineering.

Managing Ethical Discussion

Discussions of what is right or wrong, good or bad, often leave some people feeling ill at ease. There are several reasons.

First, how can we avoid name-calling and bruised egos in ethical discussions? It helps to distinguish between what a person says or does, and who that person is. Each of us represents some mixture of good and bad. Good people sometimes do bad things and vice versa. In other words, the goodness of a particular act or attitude does not determine the ultimate goodness of the individual. Furthermore, growth in the moral life takes time. Some people progress faster than others, at rates that depend not only on personal effort but also on all sorts of uncontrollable environmental factors. We cannot justly criticize someone for being molded in part by forces of culture and upbringing.

Second, how do we deal with the ambiguous, hard-to-define concepts that lie at the heart of ethics? Scientists and engineers, whose training normally deals with precise mathematical relations and sharply defined categories, sometimes experience frustration with reasoning qualitatively. Some may even dismiss the effort as meant for softer minds that can't handle complicated subjects like differential equations, thermodynamics, or quantum theory. This viewpoint ignores the fact that interpersonal relations, management, policy-making, and sales require far more skill in qualitative thinking than in quantitative. Unfortunately, some of the words used in moral discussion do carry many shades of meaning.[1] When unrecognized, such differences in usage often lead to irreconcilable disagreement. However, careful attention to exactly how words are used can help to avoid such problems.

Third, how do we deal with unpleasant memories of earlier wrongdoing? That all depends on what kind of people we hope to be. Errors and mistakes are part of human life. If we hope to grow into wiser people, mistakes can teach us what to avoid. Temporary guilt feelings help to burn these lessons into our minds in the way a hot iron brands a cow. However, there is no point in letting the brand burn for too long. Guilt that refuses to resolve itself becomes destructive and paralyzing, and usually points to deeper parts of the emotional life that need attention. A willingness to accept hard lessons combined with a commitment to continuing improvement can help us avoid falling into a rut.

Philosophy, Religion, and Ethics

Who should pronounce final judgment on right and wrong? Over many millennia people have appealed to judges, kings, and religious leaders for such judgments. The disappointing result has often been grand declarations claiming complete knowledge and eternal truth. History, of course, has usually deflated these claims. Some moral questions seem unanswerable on a purely natural level—that is, a level that appeals only to what people can observe and test in the physical universe. To proceed further seems to require an appeal to the "supernatural" level—that is, a level outside the observable physical universe. Such supernatural appeals have played such an important role in moral thought that we must decide right at the outset how to handle them.

In fact, many systems of thought and action have spoken to questions of morality over the centuries. We can loosely classify these systems as either "philosophy" or "religion." Since disagreements and misunderstandings sometimes arise over what these words actually mean, it seems prudent to offer brief (though incomplete) definitions here:

Philosophy: the rational study of principles governing knowledge, conduct, and the nature of existence.

Religion: a set of beliefs and practices concerning the supernatural, conduct, and the nature of existence. Religion appeals to one or more superhuman beings as governing forces for the physical universe.

Religion differs from philosophy by referring to supernatural beings and to things that must be taken on faith. Philosophy customarily avoids such references. Also, religion prescribes specific practices designed to promote good moral conduct, and may include paradoxes that confound reason. Philosophy, on the other hand, demands no devotional or ritual observances, and lies purely in the realm of reason.

Despite these differences, both philosophy and religion say things about moral conduct based on reason or faith. Not surprisingly, systems of thought and action that appeal to the nonphysical world cannot be checked by systematic experiments. Thus, many philosophies and religions coexist, with no agreement on how to pick the "correct" one, assuming a "correct" one exists. Herein lies an unsolvable problem for ethics. Each system depends upon different ideas about human existence, which in turn lead to significant differences in moral rules.

This book cannot settle such differences. Its description of human existence remains at a purely natural level, staying away from supernatural concepts like "revelation" and "god." Unfortunately, as we have said this perspective proves inadequate for tackling certain ethical problems; we need additional principles. These principles resemble the axioms used in mathematics. For example, classical geometry relies upon certain axioms about how line segments and angles add together, how parallel lines relate to each other, and so on. Given these axioms, we can derive all kinds of consequent theorems (to the agony of many high school students!) that

compose the main body of classical geometry. Other axioms lead to other kinds of geometries.

Similarly, this book invokes a small number of axiomatic ethical principles as they are needed. These principles originated with the philosophers of ancient Greece and are shared by most Western religions and philosophies today. For the Greek thinkers, science formed merely one aspect of a much larger philosophy that also dealt with morality. Aristotle, who lived over 2300 years ago, drew distinctions between science and other branches of philosophy. His thought still maintained a close connection between them, however, as with his development of formal logic. The deep split that developed between experimental science and speculative philosophy originated much later with the Enlightenment of the eighteenth century. That split still exists today. Nevertheless, modern science and the ethical principles asserted here share a commonality that traces back to the cradle of Western civilization. Thus, these principles will not seem surprising, particularly to most scientists and engineers.

In short, this book uses a self-consistent world view that is compatible with both modern scientific thought and most Western philosophy and religion. However, the fundamental principles asserted in this book stand only upon their intuitive reasonableness and their long tradition of use. Further justification requires an appeal to something beyond the observable world. This book makes no such appeals, but points out explicitly where they would prove helpful.

The Existence of Right and Wrong

Interestingly, we must begin our study of ethics by adopting an axiom regarding the most fundamental question one can ask about right and wrong: do they exist in any objective way? Some people argue that all truth is little more than personal opinion—that culture and upbringing completely bias any ultimate judgment. This book avoids such extreme relativism. We will instead adopt a view that meshes better with science and engineering. A scientist or engineer takes for granted that certain laws of physics, such as $E = mc^2$ and $F = ma$, operate under all circumstances. We will assert a related ethical principle. Since we make such assertions so rarely in this book, we will highlight them as they appear.

Principle: *Certain aspects of right and wrong exist objectively, independent of culture or personal opinion.*

This principle does not declare exactly which things in ethics exist objectively, but despite its imprecision the statement still finds its strongest defense through philosophy or religion. This principle has the important

practical consequence of moving ethics closer to discerning an objective reality rather than defining a subjective standard.

The Subject of Moral Analysis

Having proposed that objective morality exists, we might ask which matters lie within the moral domain and which do not. *In classical moral thought, morality concerns the goodness of voluntary human conduct that affects the self or other living beings.* Let's look more closely at what this definition really means.

First, the word "voluntary" holds great importance, implying that we have adequate control over what we're doing. *Assuming we have not deliberately allowed ourselves to remain ignorant, powerless, or indifferent, we have complete moral responsibility for what we do only with adequate knowledge, freedom, and approval.* It seems both unfair and imprudent to hold people responsible for meeting a standard of behavior they cannot reach because of normal human limitations.

Second, the definition restricts the object of moral behavior to living things. That is, you cannot behave morally toward a rock, except when that behavior indirectly affects some other living thing (like throwing the rock at your next-door neighbor).

Third, the definition uses the word "moral" rather than "ethical." What is the difference? In fact, the two overlap heavily. "Moral" generally refers to any aspect of human action. "Ethical," on the other hand, commonly refers only to professional behavior. Since this book concerns itself principally with situations encountered in professional life, "moral" and "ethical" will often appear interchangeably.

The Role of Codes of Ethics

Many professional and scholarly societies maintain formal codes of ethics. Such codes seem to find more use in engineering than in science, probably because engineers tend more often to view themselves as members of a profession like medicine or law. Such codes remind society members of the high ethical standards expected in the work place. Also, codes lay out those standards to new workers who have little experience. Finally, as public documents, codes can help professional societies take formal or legal disciplinary action against flagrant violators.

However, codes suffer from severe limitations in the rough-and-tumble of the real world. Codes lay out general ideals of ethical behavior, and often establish specific rules for commonly encountered situations. However, no list of ideals and rules can possibly give adequate guidance in all the complex situations that can arise. Shades of gray abound, and

the best way to apply ideals and norms may not be obvious. Moreover, focusing only on the specific rules in codes sometimes leads to ethical minimalism, which is the idea: "If it's not specifically forbidden, it must be allowed." In addition, some situations call for quick decisions, with no time to consult a "rule book" of any sort. Worse yet, often no "traffic cop" is around to blow the whistle on code violations. Finally, certain formal ethical standards can change with time, sometimes in response to legal decisions.

All these shortcomings point to a need to develop ethics that spring habitually from the inside, and do not depend on some external list of rules. Strong ethical character makes it easier to rapidly and consistently handle messy situations not listed in a code.

A Real-life Case: Destruction of the Spaceship *Challenger*

Shortly before noon on January 28, 1986, the U.S. space shuttle *Challenger* lifted off from its launching pad at Cape Canaveral, carrying several astronauts and a schoolteacher. Seventy-two seconds later the spaceship disintegrated in a fireball. A subsequent investigation showed that cold temperatures on the morning of the launch reduced the resiliency of the O-rings that sealed joints in the solid rocket boosters. Both the primary and secondary O-rings failed to make sealing contacts, permitting hot exhaust gases to escape and penetrate the adjoining fuel tank filled with liquid hydrogen and oxygen.

The problem proved to be no surprise to the booster manufacturer, Morton Thiokol. Indeed, engineer Roger Boisjoly had completed bench tests nearly a year earlier showing that O-ring sealing properties were lost for several minutes below 50 degrees Fahrenheit. However, under pressure from Congress to keep costs down and an aggressive launch schedule intact, neither Thiokol management nor NASA officials showed any interest in redesigning the joint. Because of the 18-degree temperature on the night preceding the launch, Boisjoly and other Thiokol engineers recommended strongly that the launch of January 28 be aborted. However, this recommendation was overruled by Thiokol management and NASA.

Clearly this case illustrates some serious lapses in judgment. The seals have since been redesigned. Nevertheless, current estimates of the chance that a given shuttle launch will fail catastrophically from some cause lie at 1 in 248. Given the large number of shuttle launches anticipated for scientific purposes and for construction of the new space station *Freedom*, the cumulative probability of disaster becomes significant. Furthermore, observers point out that some engineers at NASA have become so obsessed with avoiding blame for future trouble that they demand endless reports and studies that actually wind up increasing risk.

- How safe should the shuttle be before it is allowed to fly?
- What kind of management system might avoid both carelessness and paralysis?

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"It is proof of a base and low mind for one to wish to think with the masses or majority, simply because the majority is the majority. Truth does not change because it is, or is not, believed by a majority of the people."

Giordano Bruno (1548–burned at stake 1600)

Note

1. Take the word "good," for example. Suppose you heard someone say, "John deserves a real pat on the back—he stood his ground in the face of bitter opposition and did some good!" What image springs to your mind in response to this compliment? Maybe John is a saint-in-waiting fighting for the downtrodden. On the other hand, maybe John has merely argued for an attractive color of paint on the office walls. Who can argue that aesthetics is not a "good" of sorts? So "good" may refer to nonmoral as well as moral considerations.

Problems

1. Write a page or two describing an ethical dilemma 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. Begin to put together your answer by writing down a brief list of options available to the main character who has to make a decision.
   b. Under each option, write a bulleted list of reasons for and against that course of action. The reasons should be short—no more than a phrase or sentence per point.
   c. Recommend what you think the character should do.

"But Waldo still has this slush fund on the side?" asked Emily. "And why would you want to be vice-president?"

"Waldo mainly uses the profits to get good food at meetings and pay for member parties," responded Todd. "I'm thinking of taking the job because it would look good on my resume. Also, Waldo will graduate at the end of the year. He'll take all his connections with him, so the organization will probably die. Then he'll have to do something with the war chest he's built. My guess is that he'll probably just divide it among the officers."

"That's larceny! You'll get in trouble!"

"I don't think so. The university doesn't know about the money, and even if it did, Waldo has followed the letter of the codes. If the NCS dies, the money has to go somewhere, and that's at officer discretion. Anyway, no one will complain, since the rank and file has no idea what's in the kitty."

"You shouldn't take that money!"

"OK, OK! I don't know for sure if there'll be any dividing of spoils anyway. But if it makes you feel better, I can reject my portion if I want. I'm still thinking of taking the vice-presidency, though, for my resume."

- Should Todd accept the vice-presidency?
- Should Todd accept any money?

2

THE PERSON AND THE VIRTUES

"To live in accordance with nature is to live in accordance with virtue."

ZENO THE STOIC (C. 335–C. 263 B.C.), QUOTED BY PAUL MORE IN *HELLENISTIC PHILOSOPHIES*

To rate the morality of an action, we must keep in mind how we are constructed as human beings. Put another way, we must describe an anthropology and understand how it influences human behavior. Only then can we begin to examine moral principles and methods. Accordingly, this chapter develops a simple but useful anthropology and examines how it affects moral behavior through habits called "virtues."

Developing a Model for the Person

Given the complexity of the human person, we cannot expect our anthropology to reproduce every aspect of how people behave. Instead, we must develop a simplified model, focusing entirely on morality. As with any model in science and engineering, we have first to decide to what degree of accuracy we want to represent our subject. Greater accuracy usually requires more complexity in the model. For example, at low speeds, classical Newtonian equations like $F = ma$ represent the motion of objects quite well. However, near the speed of light this model breaks down and must be generalized to include the complicated effects of special relativity. Does this breakdown mean that Newtonian mechanics is a bad model? Not at all! Newton's equations are fairly straightforward to use and provide results that are extremely accurate in most cases. Such features distinguish good models in general: good correspondence to reality under most circumstances with modest effort. Other examples of such models include the ideal gas law ($PV = nRT$) and the "lock-and-key" model for enzyme action.

This book offers merely an introduction to ethical thought, so it makes sense to employ a fairly simple model. Our model will focus only on moral

behavior in typical adults. (Most scientists and engineers should qualify as "typical adults"!) We will not expect this model to make quantitative predictions, as might social scientists who perform statistical analyses of large populations.

Components of the Psyche

The anthropology we will employ was originally developed by the ancient Greeks. It views the person as composed of the senses and the psyche. The five senses of sight, hearing, taste, smell, and touch provide raw data about the outside world. The psyche puts these data together into a coherent perception and understanding that we commonly call "consciousness." As illustrated in Figure 2.1, the psyche comprises three parts:

Mind: The mind corresponds in many ways to a computer; both maintain memory and logic functions.[1] The mind classifies abstract concepts in a coherent way and uses them according to logical rules. In moral decision-making, the mind puts together sensory data from the present with memories from the past to predict what will happen in the future.

Emotions: The emotions are conscious, nonrational psychic responses to data from our senses and to certain kinds of internally driven neurochemistry (sickness, hormonal swings, various drugs, and the like). Emotions form the clearest link between the psyche and the body. Indeed, many emotions carry physical responses with them. For example, the heart beats faster with anger, and the face flushes with embarrassment. This connection explains why we often refer to emotions as "feelings."

Will: The will decides among alternatives presented to it by the mind in a way colored by the emotions. Exercising the will generally involves rational thought, and so at first glance the will might seem to be part of the mind. However, emotions make the decision-making process in humans very different from that in computers. Computers make decisions on the basis of cold logic. In humans the emotions also enter into play, not only coloring the process of deciding but also providing a crucial push to really act on the decision. Thus, most moral writers consider the will to be distinct from the mind.

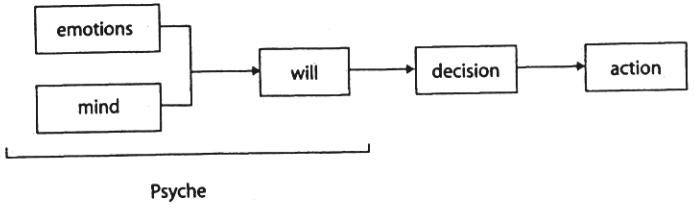

FIGURE 2.1 A simple model for the origin of moral action

In reality, it's difficult to dissect the psyche into distinct elements. All three flow into each other in the same way that the primary colors flow into each other to produce all the colors on a painting palette. The human brain is wired in a vastly more complex fashion than a digital computer, in which logic, memory, and decision functions can be readily identified and separated.

Limitations of the Model

Notice that this model says nothing about the unconscious mind, something for which modern psychology has accumulated overwhelming evidence. However, moral action requires action of the conscious will. The unconscious mind may push us toward certain kinds of behavior; psychological addiction, irrational compulsions, and explosive rages are obvious examples. Our model cannot account for all the behavioral problems that people have.

Notice also that this model says nothing about moral development. It leaves aside questions of how infants, who are not capable of moral behavior, develop into adults who are. Several developmental theories of psychology shed light on this subject, however.[2–4] Moreover, the model says little about the stages of moral development commonly observed even in adulthood. Once again, moral psychology and philosophy have much to say in this arena,[5–14] although the earliest theories for stages of interior growth date back nearly five centuries.[15]

Finally, this model says little about human community. A person is not an island; in fact, solitary confinement is a mode of punishment in many prisons. Communities from families to sports teams to church congregations to countries represent wholes that are greater than the sum of their parts. Thus, morality carries not merely a personal dimension but also a social dimension. Ethicists often discuss the social aspect in terms of "the common good," which simply means that the good of the community as well as the good of particular individuals enters into moral decision-making.

Habits and Morals

Our anthropology describes the person as a unity of mind, emotions, and will. How does this unity function morally? Many moral philosophers over several millennia have recognized the unique ability of the person to choose between good and bad. Just as important, these philosophers have recognized that this ability often does not involve a lengthy, drawn-out mental process for each choice. Rather, many simple moral choices occur with little thought because they have become habitual. That is, the mind, emotions, and will routinely combine forces to give nearly effortless moral action.

Of course, the goodness of that action depends on how the person has been trained. This training begins early in life, when for example toddlers are taught to avoid hurting others. Later, many children begin to regularly say "please" and "thank you." These actions do not come preprogrammed; they come from external training. As children grow older and become adults, they habituate themselves to behaviors of their own choice: holding doors open for companions, for example. These simple deeds smooth human interactions and are therefore good. While people not habituated to such actions may choose to do them at times, that practice often remains the exception rather than the rule.

Such habits govern more complex aspects of moral decision-making as well. In Aristotle's view, a class of good habits exists for each of the three parts of the psyche. Each class represents a *virtue*. Put another way, a virtue is the customary direction of one part of the psyche toward moral good. In simple situations, a virtue makes good moral action almost effortless. In more complex situations where the best choice may not be obvious, a virtue makes finding a good solution easier.

Mountain climbing represents a good analogy to using virtues. A mountain climber draws upon many simple skills that almost everyone has, like walking, pushing, and even breathing. However, reaching the top requires coordinating these skills precisely for the duration of a lengthy climb. Success demands that the muscles and lungs be well conditioned and practiced. Not surprisingly, a trained athlete reaches the top better than a couch potato of equal size and weight. The couch potato might be able to handle simple day-to-day living, but not the complex rigors of mountain climbing.

The Four Main Virtues

Because of the complicated interplay between the mind, will, and emotions, good actions depend upon all the virtues. Nevertheless, classical moral thought distinguishes four main virtues. Each one is rooted in a particular part of the psyche. These four typically bear the name "cardinal virtues" or "natural virtues." The discipline of theology has over the centuries defined additional virtues,[16] but we will not treat them here. The ancient Greeks observed that each of the natural virtues promotes behavior lying midway between excess and deficiency. Let's list what the virtues are:

Prudence: Prudence concerns the mind. A prudent mind thinks about a moral problem clearly and completely. Obviously, intelligence plays a role. However, the mind must also give itself enough time to work and must apply itself at the right level of detail. Hence, prudence involves not only intelligence but also forethought and practicality. The latter two distinguish this virtue as a mean. Forethought finds the balance between a snap decision and endless calculation, while practicality avoids both airy theorizing and drowning in details.

Temperance and Fortitude: Temperance and fortitude complement each other; both concern the emotions. In fact, these virtues deal with the opposite sides of emotional experience. Positive emotions (like happiness, affection, and amusement) draw us toward their cause, while negative ones (like fear, pain, and grief) push us away. Temperance controls our attraction, putting a brake on our impulse to move blindly toward something we like. As a mean, temperance avoids rashness, which gives in to a feeling completely. Temperance also avoids suppressing feelings altogether, which sometimes proves disastrous in the long run. Fortitude controls our aversion, putting a brake on our impulse to move blindly away from something we don't like. As a mean, fortitude falls between desperate evasion (again giving in to the feeling completely) and suppressing feelings altogether.

Justice: Justice concerns the will and has two aspects: truth and fairness. A will acting in truth chooses according to things as they actually are and not to illusions. A will acting with fairness seeks to give what is due to all concerned. Fairness distinguishes justice as a mean. In our relations with others, fairness sits between selfishness and complete neglect of self. In matters affecting others but not ourselves, fairness finds a balance among interests without showing bias toward anyone.

In describing the virtues, we need to keep a balance between their elements of choice and habit. Exercising the virtues resembles breathing the air; both processes can take place largely unconsciously. Nevertheless, breathing can come under conscious control if we choose. For example, weight lifters, swimmers, and mothers in labor consciously regulate their breathing. In the same way, humans often act habitually, but keep the abil-

ity to consciously regulate their moral behavior. That is, while we might customarily act with prudence, temperance, fortitude, and justice, we can also choose to do so.

Whether by choice or by habit, we should ultimately seek to do good things. How do the virtues fit into this goal? We invoke a principle that is important enough to highlight:

Principle: *People should always decide and act according to the virtues insofar as possible.*

This statement may seem obvious, but its complete defense probably needs philosophical or religious backing that we will not give here.

An Example

Let's look at a fictional case to observe the interplay of virtues.

Case 2.0 Occult Compensation: Fairness to Employers

"I heard this play is pretty decent," Emily Laborvincet said to Todd Cuibono as they drove to the theater.

"Mmm," he responded as he glanced into the rearview mirror of his car.

She reached over and stroked his neck. "I'm glad you could get the night off work."

"Mmm," he said again. After a moment he continued, "I'm not losing that much anyway, the pay is so rotten. You know what? I've been asking around, and found that Pandarus Pizza pays a dollar less per hour than most of the other pizza places in town. And that factors in experience, type of work . . . all that stuff."

"So why not switch jobs?"

"The other places are further away from the dorm, and the hours don't fit my schedule as well. I checked."

"I guess life isn't fair," sighed Emily.

"You can say that again," he snorted. "But this time I'm evening the score."

"What do you mean?"

He strained to turn around while holding the car straight, and nodded toward the back seat. "You see that?"

Emily turned and saw a small bag full of breadsticks together with some desserts. All had come from Pandarus Pizza.

He continued, "I got that from Pandarus. Every two weeks I multiply a dollar by the number of hours I've worked. That's how much I figure I've been underpaid. Then I take food equal in cash value to that number. It's mostly stuff that we prepared but couldn't sell. Or sometimes it got old, or came from cartons that have been damaged at the restaurant, and aren't salable or returnable."

"Todd, that's stealing!" Emily gasped.

"No it's not, it's getting my fair due. The way I look at it, Pandarus has been ripping me off by not paying a fair wage. They can't use the stuff I take anyway."

"But . . . maybe some of it could go to a homeless shelter or something."

"Emily, I don't like to be called a thief," Todd snapped. "I didn't think this would bother you, or I wouldn't have told you. It's just like when I told you about taking the vice-presidency of the National Chemical Society, and you got upset. I finally turned it down to get you off my back. Let's not start all over again." He turned away and stared down the road in a way Emily knew well; further discussion would just spoil the evening she had looked forward to.

"He's getting really difficult in these conversations," she thought to herself. "I'm never going to bring this subject up again."

- Should Todd continue to take the food? Why or why not?
- Are there any situations in which the kind of thing Todd did could be justified?
- What should Emily do? Why?

The virtues (or lack of them) reveal themselves in several parts of this story. Consider first the pay scale of the restaurant. The virtue of justice requires fairness in the way employers pay their employees, so that $2.25 below the local average indeed raises suspicions of unfairness. Now consider what Todd was doing in response—he was stealing food to "make up" for the low wages. Secretly taking company property to make up for poor pay occurs commonly in the work place, so commonly that moralists give it a special name: "occult compensation." ("Occult" here means "hidden from view," not "mysterious" or "magical.") Occult compensation offends against the virtue of justice, both in fairness and truth. Occult compensation offends against fairness because an employee agrees voluntarily to work for specified wages, and fairness requires that the terms of the agreement be honored. With occult compensation, the employee in effect claims a larger wage without agreement of the employer. If the wages are unfair, the employee should try other ways to change them, like pushing for higher pay, participating in a strike, or ultimately quitting the job. Occult compensation offends against truth because the employee pretends that he or she is abiding by the agreement when the opposite is true.

What about the way Todd interacted with Emily in the car? Initially he practiced the virtue of justice by telling her the truth about what he was doing. However, she pointed out the injustice of his action. Todd then offended against temperance; he became too angry too quickly, and the conversation went downhill. However, he did finally catch himself by not letting the argument get completely out of control.

What about Emily's behavior? She acted with truth and fortitude by honestly calling Todd's behavior stealing, and by not backing away in the face of his protests. She acted prudently by following Todd's lead in not letting the argument escalate out of control. However, by resolving to never bring the subject up again, she acted contrary to fortitude. Fortitude requires that, in times and ways dictated by prudence, she continue to encourage and prod Todd to turn away from ways that are clearly wrong.

A Real-Life Case: Toxic Waste at Love Canal

In 1947, Hooker Chemicals and Plastics Company bought a parcel of land called Love Canal near Niagara Falls, New York, as a landfill for waste chemicals. By the time the landfill closed in the early 1950s, nearly 22,000 tons of wastes consisting of 248 different kinds of chemicals had been dumped there. Some of these wastes were exceedingly caustic, carcinogenic, or toxic, and included chlorobenzenes, polychlorinated biphenyls, and dioxin. During this time, Hooker did little to contain the waste, and contamination spread throughout the canal area. Children played in the polluted water, as no fences existed to keep them out. However, at the time relatively little was known about the harmful properties of many of the chemicals, and the local residents raised few complaints. Indeed, Hooker was a major employer in the area.

After the landfill closed, Hooker worked more diligently to contain the wastes. It lined the canal with impenetrable concrete, and placed a waterproof ceramic cap over the chemicals to prevent rainwater from entering. These precautions far exceeded common practice at the time. Shortly thereafter, the Niagara Falls Board of Education demanded the land to build an elementary school for the growing local population. In the face of eminent domain proceedings, Hooker reluctantly sold the land to the school board for one dollar, protesting that the land should not be excavated. Hooker inserted a clause into the contract absolving the company of any further liability for the land. However, the company did not disclose the details of what it had dumped or how much. For its part, the local government removed some of the ceramic cap when constructing the school, thereby permitting rainwater to seep into the canal. The government then sold some of the land for residential development, profiting handsomely. During the development, the concrete containment walls were breached several times with sewers and a storm drain.

Throughout the 1960s and early 1970s, there were scattered complaints from the residents about chemical odors. However, heavy rains during 1975 and 1976 raised the water table and caused some of the land to subside, creating cesspools of toxic, fuming wastewater that ultimately leaked into homeowner basements. Subsequent investigation revealed health problems that had developed among the residents over time, ranging from low birth weight to chromosomal damage. By 1978 the state of New York had relocated 238 residents, offering full financial compensation for their homes. A Presidential State of Emergency was declared for the area, and the federal government sued Hooker, by then a subsidiary of Occidental Chemical, for damages. In 1994, Occidental agreed to pay $120 million for a new containment facility plus continuing operation and maintenance costs. Litigation with the city did not finally end until 1998.

- Who was responsible for the environmental damage? To what degree?
- Which of the virtues were ignored, and by whom?

References

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Hoffman, Andrew J. "An Uneasy Rebirth at Love Canal." *Environment* 37 (1995):4–9.

"Habits change into character."

Ovid (43 B.C.–A.D. 18), *Heriodes*

Notes

1. As useful as this analogy might be, we should avoid carrying it too far, since computers possess no true consciousness or insight.

2. Jean Piaget, *The Origins of Intelligence in Children* (New York: Norton Library, 1963, originally published in 1936).

3. Jean Piaget, *The Moral Judgment of the Child* (New York: The Free Press, 1965, originally published in 1929).

4. Lawrence Kohlberg, "The Child as Moral Philosopher," *Psychology Today*, September 1968, 25–30; "Stages and Sequence: The Cognitive-Developmental Approach to Socialization," in *Handbook of Socialization Theory and Research*, D. A. Goslin, ed. (Chicago: Rand McNally, 1969).