# A BRIEF HISTORY OF ETHICAL THOUGHT

Many books have already been written on this subject. However, it is instructive to give a brief outline of the origins and development of the ethical principles that will be applied to engineering practice. The moral and ethical theories that we will be applying in engineering ethics are derived from a Western cultural tradition. In other words, these ideas originated in the Middle East and Europe. Western moral thought has not come down to us from just a single source. Rather, it is derived both from the thinking of the ancient Greeks and from ancient religious thinking and writing, starting with Judaism and its foundations. Although it is easy to think of these two sources as separate, there was a great deal of influence on ancient religious thought by the Greek philosophers. The written sources of the Jewish moral traditions are the Torah and the Old Testament of the Bible and their enumeration of moral laws, including the Ten Commandments. Greek ethical thought originated with the famous Greek philosophers that are commonly studied in freshman philosophy classes, principally Socrates and Aristotle, who discussed ethics at great length in his *Nichomachean Ethics.* Greek philosophic ideas were melded together with early Christian and Jewish thought and were spread throughout Europe and the Middle East during the height of the Roman Empire.

Ethical ideas were continually refined during the course of history. Many great thinkers have turned their attention to ethics and morals and have tried to provide insight into these issues through their writings. For example, philosophers such as Locke, Kant, and Mill wrote about moral and ethical issues. The thinking of these philosophers is especially important for our study of engineering ethics, since they did not rely on religion to underpin their moral thinking. Rather, they acknowledged that moral principles are universal, regardless of their origin, and are applicable even in secular settings. Many of the moral principles that we will discuss have also been codified and handed down through the law. So, in discussing engineering ethics, there is a large body of thinking—philosophical, legal, and religious—to draw from. However, even





though there are religious and legal origins of many of the moral principles that we will encounter in our study of engineering ethics, it is important to acknowledge that ethical conduct is fundamentally grounded in a concern for other people. It is not just about law or religion. Before proceeding, it is important to acknowledge in a general way the origins of the ethical philosophies. For many individuals, personal ethics are rooted in religious beliefs, this is not true for everyone. Certainly, there are many ethical people who are not religious, and there are numerous examples of people who appear to be religious but who are not ethical.

## PERSONAL VS. PROFESSIONAL ETHICS

In discussing engineering ethics, it is important to make a distinction between personal ethics and professional, or business, ethics, although there isn't always a clear boundary between the two. Personal ethics deals with how we treat others in our day-to-day lives. Many of these principles are applicable to ethical situations that occur in business and engineering. However, professional ethics often involves choices on an organizational level rather than a personal level. Many of the problems will seem different because they involve relationships between two corporations, between a corporation and the government, or between corporations and groups of individuals. Frequently, these types of relationships pose problems that are not encountered in personal ethics.

## ETHICS AND THE LAW

We should also mention the role of law in engineering ethics. The practice of engineering is governed by many laws on the international, federal, state, and local levels. Many of these laws are based on ethical principles, although many are purely of a practical, rather than a philosophical, nature. There is also a distinction between what is legal and what is ethical. Many things that are legal could be considered unethical. For example, designing a process that



releases a known toxic, but unregulated, substance into the environment is probably. Conversely, just because something is illegal doesn't mean that it is unethical. For example, there might be substances that were once thought to be harmful, but have now been shown to be safe, that you wish to incorporate into a product. If the law has not caught up with the latest scientific findings, it might be illegal to release these substances into the environment, even though there is no ethical problem in doing so. As an engineer, you are always minimally safe if you follow the requirements of the applicable laws. But in engineering ethics, we seek to go beyond the dictates of the law. Our interest is in areas where ethical principles conflict and there is no legal guidance for how to resolve the conflict.

## ETHICS PROBLEMS ARE LIKE DESIGN PROBLEMS

At first, many engineering students find the types of problems and discussions that take place in an engineering ethics class a little strange. The problems are more open ended and are not as susceptible to formulaic answers as are problems typically assigned in other engineering classes. Ethics problems rarely have a correct answer that will be arrived at by everyone in the class. The design problem is stated in terms of specifications: A device must be designed that meets criteria for performance, aesthetics, and price. Within the limits of these specifications, there are many correct solutions. There will, of course, be some solutions that are better than others in terms of higher performance or lower cost. Frequently, there will be two (or more) designs that are very different, yet perform identically. For example, competing automobile manufacturers may design a car to meet the same market niche, yet each manufacturer's solution to the problem will be somewhat different. In fact, we will see later that although the Pinto was susceptible to explosion after rear-end impact, other similar subcompact automobiles were not. In engineering design, there is no unique correct answer! Ethical problem solving shares these attributes with engineering design.

Although there will be no unique correct solution to most of the problems we will examine, there will be a range of solutions that are clearly right, some of which are better than others. There will also be a range of solutions that are clearly wrong. There are other similarities between engineering ethics and engineering design. Both apply a large body of knowledge to the solution of a problem, and both involve the use of analytical skills. So, although the nature of the solutions to the problems in ethics will be different from those in most engineering classes, approaches to the problems and the ultimate solution will be very similar to those in engineering practice.

## IS ENGINEERING A PROFESSION?

In order to determine whether engineering is a profession, the nature of professions must first be examined. As a starting point, it will be valuable to distinguish the word "profession" from other words that are sometimes used synonymously with "profession": "job" and "occupation." Any work for hire can be considered a job, regardless of the skill level involved and the responsibility granted. Engineering is certainly a job—engineers are paid for their services—but the skills and responsibilities involved in engineering make it more than just a job. Similarly, the word "occupation" implies employment through which someone makes a living. Engineering, then, is also an occupation. How do the words "job" and "occupation" differ from "profession?" The words "profession" and "professional" have many uses in modern society that go beyond the definition of a job or occupation. One often hears about "professional athletes" or someone referring to himself as a "professional carpenter," for example. In the first case, the word "professional" is being used to distinguish the practitioner from an unpaid amateur. In the second case, it is used to indicate some degree of skill acquired through many years of experience, with an implication that this practitioner will provide quality services. Neither of these senses of the word "professional" is applicable to engineers. There are no amateur engineers who perform engineering work without being paid while they train to

become professional, paid engineers. Likewise, the length of time one works at an engineering-related job, such as an engineering aide or engineering technician, does not confer professional status no matter how skilled a technician one might become. To see what is meant by the term "professional engineer," we will first examine the nature of professions.

## Engineering as a profession own self views versus public views

First of all we can focus on how the engineers view themselves, and the others are how the public at large view them. The engineers view themselves as problem solvers. Engineering is enjoyable, engineering benefits people provides a public service. Engineering provides the most freedom of all professions, and engineering is an honorable profession.

How the public views engineering?

We can see the engineers role is at utilitarian where there is a cost benefit analysis of whatever they are doing, engineers as positivist they have to have a positive orientation towards life, towards the safety and health or issues of the public at large. They cannot say like solution is not possible, they need to have they should believe like every problem it must be having a solution, because they are taken to be as problem solvers.

what we see over here like they are taken to be like applied physical scientists, because they need to work on the design and find out like how it is working. They have a socialist approach engineers and drivers for converting technology to their benefit. And they have to take rational, logical and systematic approaches to problem solving; which tend to alienate engineer from the public because of the technicalities. So, sometimes what happens the general public at large may not understand the in depth technical issues involved in it. But it is a great responsibility and challenge for the engineers to translate that technology into something which is usable and which is in the benefit for the public at large. So, these are 2 viewpoints which the engineers have about themselves and what the public at large have about the engineers.