

Technology, Transgenics and a Practical Moral Code

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Technology, Transgenics and a Practical Moral Code

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Introduction

Most philosophers still like to feel that they have a special subject matter, well insulated from anything that the social scientists, and scientists in general, have to tell them. That is not healthy for philosophy; and it is all too likely to lead to an ethics that continues, as of old, to plead for its ultimates—the fact that one is totally ineffectual being decently concealed by an impressive terminology. (Stevenson 1963, pp. 114–5)

Many so-called moral theories do not even attempt to explain or justify common morality but are used to generate guides to conduct intended to replace common morality. These proposed moral guides, those generated by all of the standard consequentialist, contractarian, and deontological theories, are far simpler than the common moral system and sometimes yield totally unacceptable answers to moral problems. Since these philosophers who put forward these theories have usually dismissed common morality as confused, they are completely unaware of the complexity involved in making moral decisions and judgments. It is not surprising that many who take morality seriously and try to apply it to real problems faced by actual people are so critical of moral theory. (Bernard Gert 1998, p. 6)

As both Stevenson and Gert note, ethics requires social and other sciences for by its very nature, ethics is a practical enterprise. In addition, the study of morality was intended to explain ethics to all thoughtful people so that each had the best tools to make decisions affecting not only themselves but the societies in which they live.

To ethics' detriment, those who study the field have sometimes attempted to sever the intimate connection between theory and application. Although morality's main goal has always been to produce useful results for society and its members, some academic ethics have become more and more limited to university preserves than being something all citizens can apply in their everyday lives.¹ The only common feature in the range of simple to complex, multi-tiered theories appears to be their implausibility to anyone other than their inventors and adherents to employ them in decision processes and defend the results.

The trend from usefulness to impractical abstraction has caused ethics as a discipline a degree of schizophrenia. Pure theorists tend to worry more about developing a clear and consistent theory, a set of normative principles, and a value theory than they do about whether any person in society will be able to apply their work. Their primary goal is to create a theory unassailable from all criticism, regardless of

¹I am not claiming that no philosopher today is interested in the practical, only that many of the most influential ones seem to have misplaced the purpose of ethics.

whether the attack is reasonable. Applied ethical issues, such as stem cell research, bribery in the Developing World, and genetically modified or transgenic organisms, are considered to be philosophically unimportant and uninteresting. Since applied ethics' nature entails that purely rational arguments are impossible, many times it is dismissed with contempt (Callicott 1999, p. 28).² At best, it is considered to be a "soft" alternative to real philosophy. Making matters worse are a number of applied ethicists who have helped foster this opinion by appearing to know only the simplest versions of ethical theory and principles, e.g. equating Mill's nuanced normative principle with simplistic standard act-utilitarianism. Classes and research in applied philosophy are tolerated in many departments because the university demands them, but if some department members had their way, they would be eliminated for more sections of pure metaphysics and epistemology.³

So how did this sorry state of affairs come about? Over the last 2,500 years, the change from practical to abstract was slow and subtle. Although sexist and elitist – only wealthy men could rule in his view – Aristotle still understood that all citizens in every society need practical ethics in their lives. States are creations of nature, and since states are comprised of human persons, all persons are political animals (Aristotle 1941d, 1253a). Furthermore, each state is a community whose end is the highest good (Aristotle 1941d, 1252a). The best state is one ruled by the ethical principle of justice for "justice is the bond of men in states for the administration of justice, which is the determination of what is just, is the principle of order in political society" (Aristotle 1941d, 1253a). Without justice, there cannot be order. Without order, the best state is impossible. Hence, in order to achieve the highest good, citizens have to know how to be ethical. Ethics is not only practical; it *must* be practical so that the state and its citizens can survive.

Moving ahead to the 18th century, David Hume defends practical morality by rejecting attempts to create an ethics based upon pure reason alone. If moral principles could only be used correctly by abstract theorists, then few others would be able to make decisions with the actual principles. At best, they would be lucky guessers or have to make do with a simpler procedure method based upon the actual principle(s), which generally classifies correctly but is not guaranteed always to do so. The result is that no one other than pure reasoners could be certain about their duties (Hume 1948a, p. 177).

For Hume, however, true ethics is obvious and practical to most people. He states that the mental qualities we should pursue and foster are those that are useful to us and others. Anyone using the general sentiment all normal persons have can evaluate alternative actions and select one that is correct, while also knowing which things are good or bad and why they have that status (Hume 1948a, p. 251). Not only are all persons possessing the requisite emotional and reasoning capacities competent

²Social and political philosophy often faces the same problem.

³Some years ago at a university that will have to remain nameless, an interviewer was incredulous at my assertion that "real" philosophers could be interested in business ethics research. For those of us in applied ethics, this is an all too common occurrence.

of moral reasoning, ethics itself is not as difficult as many would have us believe. Where we go astray is by doing too much theory and too little social science. Hume states that “it seems a reasonable presumption that systems and hypothesis have perverted our natural understanding when a theory so simple and obvious could so long have escaped the most elaborate examination”(Hume 1948a, p. 249). In other words, the obfuscation problem lies with well meaning academicians who have made the practical impractical.

The Father of Modern Philosophy, Immanuel Kant, bears part of the blame for the severing of the practical from the theoretical. Unlike Hume, Kant rejects natural sentiments or desires as being part of morality’s basis (Kant 1956, pp. 68–71; Callicott 1999, p. 102). According to Kant, right action in a particular set of circumstances is always what a purely rational person would do in that situation. In fact,

All moral concepts have their seat and origin in reason completely a priori. . . . In this purity of their origin is to be found their very worthiness to serve as supreme practical principles, and everything empirical added to them is just so much taken away from their genuine influence and from the absolute value of the corresponding actions. (Kant 1956, p. 79)

In other words, if morality’s concepts were even partly the result of real world experiences, they would not be as good or as useful to those making difficult moral decisions. Moreover, the only way they can be fully understood is a priori, that is, through pure reason alone. Hence, those who can be truly moral are limited to the few individuals in society who have the resources, such as time and proper education, and an intellect capable of this type of reasoning.

Although Kant claims his theory to be practical, it is not. Kant’s ethical framework creates a situation in which it is impossible to decide what to do because, as Hume correctly pointed out, reason alone cannot give any moral agent the power to make decisions. Suppose, for instance, a person is faced with an unlikely choice between the destruction of the world and the pricking of her finger. Reason tells us that many people would die if the first alternative is chosen, while little is lost if the second one occurs. If applying cost/benefit analysis to the situation, then the latter would be preferred over the latter. After all, a little pain for one person is much less a loss than the destruction of all things on the earth. However, if desire is not included in the decision process, the person trying to figure out what she is supposed to do will never be able to choose one thing over another. Even though she knows the outcomes of the two distinct alternatives, without being able to care about either one, she neither understands nor appreciates the differences. Much like Buridan’s ass, she will be unable to do anything at all to her own peril. This absurd result shows that in order to choose, that agent must be motivated to choose, and motives by definition incorporate emotions or desires. Hence, emotions and desire are essential to ethics, which Kant’s theory, because it so heavily depends on the theoretical, abstract reasoning of the purely rational person fails to understand.

Even John Stuart Mill, an advocate of women’s suffrage, the elimination of slavery and other useful democratic ideas, produced an extremely impractical theory. Mill’s consequentialism would seem initially to be more useful because it relies on

observable results and is merely a formulation of the intuitively appealing prescription to do the best one can in all one's actions. According to Mill, "actions are right in proportion as they tend to promote happiness, wrong as they tend to produce the reverse to happiness. By happiness is intended pleasure, and the absence of pain; by unhappiness, pain, and the privation of pleasure" (Mill 1988b, p. 7). Since everyone knows what pleasure and pain is, and can do basic cost/benefit analysis, Mill's theory appears useful on its surface.

But relying on the unknowable consequences of actions destroys any theory's practicality. We should begin to worry about how useful Mill's theory is when he argues there are types of pleasure and pain that can be adequately evaluated only by those who have experienced both; thereby eliminating the input of those who have not experienced intellectual pleasures (Mill 1988b, pp. 10–11). Mill further obscures the principle by claiming that even those who have experienced both will not come to unanimous agreement on their value rankings. In fact, he writes the best result we can get is pleasure and pain types' values will be recognized by the majority. The majority will select high quality, intellectual pleasures over low quality physical pleasures (Mill 1988b, p. 12). What should concern us is that already, there is an elitism problem that precludes those lacking a higher education from being able to recognize true value, which might omit them from full membership in society's moral community.

Of even greater concern is Mill's claim that utilitarianism is not action guiding. In order to figure out what to do, we rely on rules-of-thumb, which generally maximize utility, but need not do so in all particular circumstances. Average citizens who are not philosophers are obliged to use these general principles as their best tools, while philosophers apply them only until they find better (Mill 1988b, p. 25). In other words, the majority of people use the rules to make their ethical decisions, while enlightened philosophers are able to understand and apply the actual moral code as it should be. Since most people will not be able to study ethics to the degree required to enable them to use the theory correctly, they must make do with second best rules of conduct. Once again, morality is beyond the grasp of the majority of thoughtful people.

The 20th century philosopher, R. M. Hare, continued the tradition of making ethics too abstract and theoretical. To deal with moral conflicts, Hare proposed that two levels of ethical reasoning exist. In the lower level, conflicts occur because people are applying principles too general and broad to guide their actions rather than reasoning at the consistent higher level. The higher second level excludes moral conflicts because there is always at least one clearly right action to those with enough cognitive capacity to grasp it. Hare characterizes the two thinker types as Archangels and Proles. An Archangel makes his decisions based upon pure critical reasoning incorporating all the moral elements of any situation confronting him. On the other hand, Proles "like most of us, have to rely on intuitions and sound *prima facie* principles and good dispositions for most of the time; he is totally incapable of critical thinking" (Hare 1992, pp. 44–5). In other words, most people using their rules-of-thumb can get common day morality right much of the time, but they do not actually grasp the true nature of morality as the Archangel does. Under Hare's theory, the

difficulty for the Proles is they have to utilize clunky, ill fitting rules different from those of the Archangels. If moral principles were tools, then Proles use the side of a crescent wrench to hammer a nail into the wall, while the Archangels use hammers. Hence, in this theory, real morality is impossible for the very people it is intended to help.

The unreal abstraction of ethics' absurdity is characterized by a passage from Richard Taylor's memorial minutes. "[Taylor] marveled at how some philosophers could discuss seriously whether earthworms have souls but scoff at an examination of love and marriage" (Holmes 2004, p. 170). In the honorable pursuit of discovering reality's nature, many have lost sight of it, including why morality is needed, i.e., to help us lead good lives in the actual world. Abstract theory addressing non-existent worlds has replaced the common moral sense of what ethics is and why it is needed in our lives.

The impracticality of Hare's theory and others like it should give us pause. We can acknowledge that ethics might be difficult to do because it takes professionals to carefully examine and recognize many or most of the moral factors and principles involved, and then apply the principles correctly using both. However, there is no reason to assume that professionals do not use the same principles as everyone else to make their decisions. Instead of asserting multiple tiers of rules that are inaccessible to few other than the elite, the simpler hypothesis is that there is only one moral theory and code applying to all persons. Everyone's moral tools are identical in this view. The difference between professionals and nonprofessionals is how well each applies theory and code, not that they have different rules. One group has less skill at their exercise than the other, in much the same way a journeyman can utilize carpentry tools, but not as well as the master craftsman.

The deficit in academic ethicists' outreach to a community demanding more ethics training and information has not gone unfilled. Applied ethics in medicine, business, research, technology and a large variety of other fields have seen rapid expansion, especially after the unethical, illegal activities of Enron, Worldcom, Adelphia, and other businesses.

The trend's unfortunate part is a number of those teaching, writing, or talking about these issues seem to know little ethical theory. Ethics is an extremely difficult subject area because it affects so many people in so many different, important ways. It requires master craftspeople to teach others how to become their own masters. Since academic philosophy departments have not been producing as many adequately trained applied ethicists as they should, many who style themselves as practical ethicists have been exposed to only shallow introductions to classical philosophers and their work. In fact, some applied ethicists have advanced degrees in related associated areas, such as medicine, that, do not provide the skills needed to examine an ethical issue fully. Without teachers fully cognizant of the field, students fail to obtain the required skills to make good decisions, but rather receive material characterized by its weak grasp of the underlying ideas. Instead of the richness of over 2,500 years of development by some of the best minds in humanity, thoughtful people are offered information or advice based upon one or two page characterizations of a person's lifetime work. The result is that too many applied ethicists are

trying to teach on the cheap, which makes it impossible for thoughtful individuals to have the best tools they need to make good decisions for themselves and their communities.

Of course the problem's answer is to guarantee that applied and theoretical ethicists are fully trained both in theory and application. They will then have a balance allowing them to provide adequate tools for people to use in their lives. Fortunately, there are those such as Loretta Kopelman and Tristram Engelhardt, who fulfill this goal, but there need to be many more as ethics becomes more recognized as vital to a thriving society and integrated into professional and private lives.

Until ethics can be worked out completely and practically, the best course of action is to create a moral code that everyone can use in all her decision making, including those touching upon technology and transgenic organisms. In developing the practical moral code used in this book, I will incorporate not only the ideas of Stevenson and Gert beginning this introduction, but those from others such as Gary Comstock, Bernard Rollin, Lilly Marlene Russow, and others as well. Paul B. Thompson, for example, reminds us that regardless of their origins, the framework of applicability of ideas must be global (Thompson 1995, p. 13). Why? Because people all over the world have to use it to make decisions that affect other people from all over the world. J. Baird Callicott argues that philosophy – and I take it that he includes ethics under that umbrella term – should avoid being a socially irrelevant, academic ivory-tower endeavor by pursuing its original purpose as one of the most potent forces of social change (Callicott 1999, p. 27). New technology, for example, will have enormous impact on what our society will be, and we have to be able to understand and deal with the inherent changes in such a way that we leave society better off than it otherwise would have been.

As Gert pointed out, people utilize complex moral codes in their everyday lives, however, just because a moral code is used does not entail it is a simple matter to discover and explain it (Gert 1998, p. 6). This fact should not surprise us. Our brains are in use all the time that we are alive, but neuroscience is still in a relatively early stage of informing us about how brains actually function. Ethics is no different, although it does not lend itself to physical science the way the brain does. Neuroscientists can stimulate or suppress brain activity in certain sections, and then record the responses in a variety of ways, including but not limited to MRI's. Morality, on the other hand, is not a physical entity or reading. Rather it is a set of beliefs, rules, and emotions un-examinable in the same way "hard" science employs. Hence, although the following practical moral code might be true in that it captures one part of what ethics really are, it cannot be established in the same manner as showing scientifically the light is on in a room.

What I intend to do in this work is to capture as much of what people actually think about morality in the moral code as can be done without making the code inconsistent, such as classifying the same action as morally right and morally wrong. I will attempt to create and defend a practical moral code that can be used by any thoughtful person anywhere in the world to solve moral problems caused by technological advances in all areas of their lives. The code might have a vagueness problem because it will not classify all morally right actions, but it is guaranteed

to provide a useful tool to discover and defend at least one morally right action in every situation.

Before beginning the difficult task of creating a practical moral code, I first want to introduce the topic of transgenic organisms, which will serve both to help develop the code and as a way to test its usefulness.

Genetically Modified Organisms (GMOs) and Transgenic Organisms (TOs)

Bioethics, technology ethics, and agricultural ethics are extremely diverse subject matters dealing with some fundamental needs of human beings, animals and the environment. The three disciplines cover everything pertinent to technological innovations in biology, technological progress, and more narrowly, the production of crops and animals generally used for food consumption by humans and other animals, as well as clothing, shelter, fuel, and a variety of other needs. In addition, there are overlaps in the ethical issues each area faces. Pesticides, transgenic organisms, bovine growth hormones, animals for food production and their treatment, and human/non-human chimeras are but a few of the moral controversies encountered by the three.

The main ethical controversy addressed in this work is technology and transgenic organisms. More specifically, the morality of the creation, production and marketing of transgenic organisms are examined in light of a practical moral code, which itself forms the larger share of this work.

But what are transgenic organisms? Roughly, TOs are created by splicing parts of one organism's DNA into that of another organism to produce desired traits that the recipient organism did not previously possess. Generally, the two organisms are from different species, and sometimes from different kingdoms, such as bacterium and corn. The traits are selected on the grounds of how they will improve the recipient's characteristics. For example, golden rice was developed using bacteria and daffodil genetic material spliced into the recipient rice's DNA. The resultant rice can provide consumers with a percentage of the daily Vitamin A needed to prevent blindness and death. What makes this such an intriguing discovery is that no variation in the rice species could produce any Vitamin A prior to Golden Rice's creation.

The term "transgenic organism" is used in place of the more popular, but misleading "genetically modified organisms" or "GMOs." This nomenclature justification is that the first term more accurately captures the process' essence than does the more general GMO. After all, humans have been modifying organisms ever since the former first had an impact on the environment. Animals have been domesticated, and bred to be more productive and easier to care for than their ancestors. Crops have been drastically altered to produce more of what humans need and want than were found in their non-artificial ancestors. For example, natural teosinte has considerably fewer kernels than does its modern corn descendants, which are the result of human organized breeding. To facilitate clarity, I will use "transgenic organisms"

to help develop the practical moral code and to talk about bioethics, biofood, and making ethical decisions about new technology.

A Groundwork for Ethical Decision Making and Civil Discussion

Before analyzing the ethics of transgenic organisms in general, it is necessary to set the groundwork for fair, civil ethical discussions. Ethical debates, as all other types, require that certain parameters be scrupulously maintained by those discussing the issue at hand. All debates are supposed to be useful in that they are intended to advance the amount of information available, allow people to participate in the marketplace of ideas, and eventually to help find ethical solutions to problems. The solutions, of course, will be unlikely to be approved unanimously, but should be acceptable to the majority of reasonable people using reasonable decision procedures to come to reasonable beliefs. To achieve the ethical debates' ends, several guiding principles must be adopted by all involved, including but not limited to, the realization that reasonable people can reasonably disagree on issues and both still be correct in their beliefs. As long as the available evidence supports them, contradictory beliefs held by different people about what is ethical are legitimate because there is often more than one answer to a moral dilemma, such as to what is the best life or what should a person do in a particular situation.⁴

The Principle of Charity is designed to advance discussions as efficiently and respectfully as possible. The principle first requires all debaters to assume that every participant is a reasonable person who is trying to say something important to everyone else. Of course, sufficient evidence might arise to show the person need not be listened to, but merely not liking what he has to say is insufficient to justify disregarding his input. The principle's second step is to strengthen, if necessary, what the person said by adding more evidence, reformulating it, or otherwise improving it. Many people are unable to present their ideas and arguments as efficiently as the most skilled debaters. However, if we are serious about finding the best solutions to problems and respecting individuals as persons, then we are obligated to help them make their best case, even if we vehemently disagree with it. If we do not, we waste valuable resources having to debate weaker arguments, when better ones are available. Analogously, we would disarm a person with a handgun before we expend effort addressing a person with a pea-shooter. The charity principle is therefore practical. The principle of charity's third step is to evaluate the improved idea, position, or argument to find its strengths and weaknesses. In current conditions of political and social polarization, many people have forgotten that criticism is supposed to be useful. In order to fulfill its true purpose of advancing knowledge, both reparable and fatal flaws have to be identified in conjunction with the positive components. How else would someone know if a defect is so severe that it renders the argument unusable? The principle's fourth and final step is to put aside unreasonable bias and draw a conclusion based upon the evidence available. If the argument goes against

⁴All philosophers will be familiar with these principles.

one of our most cherished beliefs, then it is time to rethink our justification for holding that belief and all other beliefs, principles, rules, etc. the belief has supported or caused us to adopt. For example, in the fourth chapter, it will be argued that the eastern world's assumption that intrinsic value exists in all things is a better starting point for developing a theory of value than the western world's requirement to prove something is valuable in and of itself before it can be ascribed that worth.

The principle of charity is consistent with moral duties to create better societies. By implicitly demanding efficient discourse and respect for all individuals' input, the principle fosters the best atmosphere for problem solving. For example, instead of focusing on primarily emotion driven arguments, as happened when transgenics were attacked using the "Frankenstein myth" fears, the best real arguments can be developed for decision making (Rollin 2006, pp. 131, 135). In addition, even if a problem's solution is not one championed by an individual, he is more likely to understand and acquiesce to its implementation if he knows his view has been understood and adequately incorporated into the debate. Furthermore, by using the principle on his opponents' views, he is more likely to see that they are as reasonable as his. This perception will allow him and others to work together in solving problems facing their community better than if he had merely rejected his opposition's arguments as being the result of a stupid or unthinking mind.

Another requirement of adequate ethical debate is the old rule to answer questions of meaning before tackling questions of truth. That is, it is impossible to know if someone is saying something true or false before understanding what the person actually means by her statements. For example, going into a restaurant, one might hear the assertion, "That man is hot." However, it is not clear what the sentence means. It could mean what old timers, such as myself, would immediately think, viz. the speaker believes that the man feels the room's high temperature exceeds his comfort level. The statement could also mean that the man is attractive to the individual making the assertion. Without knowing which interpretation is accurate, it is impossible to state the truth value of the proposition.

Although this example is not important to ethical debates as such, it does illustrate the need to clearly define terms so that everyone understands what is being said. In many scientific and public debates people simply talk past each other (Zimdahl 2006, p. 13). That is, they use the same terms, but never realize that different definitions are intended. Since it is a waste of time for people not to understand what everyone else is saying when we are trying to find solutions to vital problems affecting society, it is never legitimate to assume that everyone knows what is meant by words such as "good," "bad," "right," "wrong," "permissible," "forbidden," and so on. These ideas can denote vastly different things at different times for different people. In order to have our ideas understood, the burden is on us to ensure we make the effort to explain how we define our terms. We cannot complain that someone has misunderstood us if we have not provided adequate information for her to use.

It would be helpful to see how the principle of charity and requirement for clear definitions of terms works in the transgenic organisms' context. There have already been heated discussions about what to label the result of mixing TOs with non-TOs which can serve as a case study.

Ethical Reasoning and Use of Terminology

In any relatively young⁵ ethical debate over an emerging technology, the first problem to surmount is agreeing to the terminology used in the discussion. One of the transgenic nomenclature difficulties is agreeing upon what to call the mingling of transgenic and non-transgenic organisms, especially for seed crops. To date, no mutually satisfactory term has been adopted because of the seemingly intractable nature of the various concerned parties' positions. As a result, progress on the moral issues of the debate, such as whether or not transgenic organisms are morally bad in and of themselves, has been hindered. Before supporting my suggestions of "mixed" and "unmixed," I want first to mention and examine the current terms used by either side of the debate and show why they are inadequate.

Defective Terms

The test of an adequate term is how practical the term is for the circumstances in which it is used. More precisely, an adequate term captures, as much as it can be captured, the essence of what is being referred to, is readily understandable by those intimately involved in the debate -and hopefully the general public as well- and does not have an illicit positive or negative emotive impact on the listener.⁶ For example, in order to advance the abortion debate, emotive and unrepresentative terms such as "babies" and "fetuses" have to be given up for a more neutral term such as "unborn." One benefit of the latter word is it requires debate participants to present their best arguments and evidence, instead of primarily making appeals to emotion. I will use the pragmatic test to evaluate the terms currently utilized by both sides of the controversy over transgenic organisms.

"Contamination" and "Pollution"

First, opponents of TOs have been employing the terms "contamination" and "pollution" to describe the state which results from the mixing together of transgenics and non-transgenics (Davies 2004, p. 71).^{7,8} One of Greenpeace's background papers, for example, states that, "Spring planting in the Northern hemisphere has started, and with it numerous seed contamination scandals have broken loose in the United

⁵In comparison with issues such as racial equality and abortion, the transgenic organism debate is in its infancy.

⁶Defining terms and concepts using Conceptualistic Pragmatism will be discussed in more length in Chapter 3.

⁷For example, see the G.M.O. ALERT at <http://www.organicvalley.com/member/forum-gmo1.html>

⁸A Netscape search on the terms "transgenic" and "contamination" yielded 13,900 hits, and "transgenic" and "pollution" yielded 14,801 hits. Most of the sites were against transgenic organisms.

States. . ., Canada and in Europe” (Greenpeace 2007). Moreover, when responding to France’s refusal to tear out 4,500 hectares of “polluted” corn, Dominique Voynet, French Minister for Land and Environment, said France should “show that she doesn’t spread GMO contaminated seeds, whether authorized or not” (Walgate 2000, p. 1). Finally, on the Friends of the Earth Europe’s website, the section headings include “Contamination in the field”, “Contamination of our food”, and “Contamination around the world” (FoEE 2006). Generally, when the opponents of transgenics employ words such as “contamination” and “pollution,” they want to imply the negative, i.e., transgenics are contaminating or polluting the non-transgenics, rather than the reverse.

Both “contamination” and “pollution” should be rejected because they have immediate, negative emotive connotations, which may illicitly influence people to be biased against transgenics.⁹ There seems to be something bad about an organism contaminating another, much like a paper mill willfully dumping untreated waste water into a pristine stream. What is emotively entailed by opponents’ terms is that there is something morally bad in and of itself about TOs, even though no rational evidence has been provided to support such a conclusion.

Emotive terms tend to lower the evidentiary standard required for fair moral debate. Consider the impact the word “contamination” has on the following argument of David Vetter, an organic farmer from Nebraska.

The bill for tests that revealed the contamination of [Vetter’s] corn crop ran to \$450, including a scan for StarLink that turned up negative, he says. It cost him \$1,500 to evaluate a load of corn worth \$4,000. . . . At the very least, he says, Monsanto, Aventis and others in the biotechnology industry should pay these costs. (Schubert 2001)

If the transgenics are contaminating non-transgenics, then it follows in this argument that TOs are not pure or good. They wrongly destroy the “genetic integrity” of the organic seeds (Schubert 2001). In other words, there is something morally bad in and of itself about transgenic organisms. Of course, it is still an open question as to whether transgenics really are morally bad, but the emotive terms make the

⁹Many opponents to transgenic technology fall into the trap of using value laden language. Richard Hindmarsh and Geoffrey Lawrence, for example, state “And what about the public: does it have a say about the genetic manipulation of life, or is this just a scientific enterprise that we should leave to the elites?” (Hindmarsh and Lawrence 2004, p. 26) The last line introduces the idea of class warfare that is unsupported by any evidence. John Gray uses Fidel Castro’s advocacy of biotechnology and the poor regulation of nuclear weapons as indicative of biotechnology regulation to generate an argument from fear (Gray 2005, pp. 27, 30). Sonja Schmitz likens biotechnology to colonization and invasion (Schmitz 2005, p. 59). Although it might be convincing to people who already believe in this type of conspiracy, it will do nothing but stop those who the authors most need to convince from listening to them. Proponents of transgenics have also been known to use the same tactic. Ronald Bailey states that the actions and statements of Vandana Shiva, Mae-Wan Ho, and Benedikt Haerlin of Greenpeace’s European anti-biotech campaign are part of their disdain for the poor (Bailey 2002, pp. 34–8). The problem is that the instances cited do not establish these three people have any such feeling. Making matters worse is that by focusing on extreme positions, Bailey does not address many thoughtful people’s real concerns.

less-than-careful reader much more likely to accept Vetter's conclusions about the existence of an injury.

Furthermore, Vetter's assertion that the seed companies should pay for testing is emotively, not rationally, supported by the terminology he employs. On the average, people do not like polluters or those who contaminate what was once pure. If a company enables its bad seeds to pollute others' good seeds, then most people would agree those who suffer from the corruption must be compensated by the polluter. Hence, many people would be inclined to agree with Mr. Vetter's demand for reimbursement based solely on the grounds of his labeling the seed companies as polluters.

However, the use of "contamination" and "pollution" begs three central questions. First, are transgenics morally bad in and of themselves or less valuable than non-transgenics? Second, is the mixture of transgenics and non-transgenics bad, and do transgenics actually pollute the non-transgenics or is it the reverse? Third, if the mixture is bad, then who should bear the costs of testing, maintaining separation of TOs and non-TOs, or compensation for mixing the two types of seeds, and why? Rather than merely taking the expedient route of appealing to the listener's non-rationality by utilizing emotionally charged terms, what is required to further the debate, and possibly reach some sort of consensus, is to answer the begged questions, and then provide adequate justification for the responses, as will be done in Chapters 2, 4 and 5. If it is shown that transgenics actually are detrimental in all the relevant ways, which I do not believe they can be, then they may be labeled as contaminants -but not before. Hence, until use of the terms is adequately justified, the emotionally charged terms "pollution" and "contamination" should not be employed.

“Adventitious Commingling”

From looking at available sources, it is clear that the terms, such as “adventitious commingling” and “adventitious presence,” employed by those who favor transgenics are not as popular as “contamination” or “pollution.” For example, a simple Netscape search on “GMO” and “adventitious commingling” only produced 64 hits, while “GMO” and “pollution” yielded 11,902. However, since the agencies employing the former are powerful policy makers, including The European Parliament and the United States Department of Agriculture which heavily influence the debate, their terms should be evaluated for their usefulness.¹⁰

While “adventitious commingling” does not appeal immediately to emotions as do those from the other side, the term is defective on two other grounds. First, “adventitious commingling” is a mastery of confusion for many people. In order

¹⁰For examples, see the; the meeting summary of the Fifth Plenary Meeting of the Advisory Committee of Agricultural Biotechnology at http://www.usda.gov/agencies/biotech/acab/meetings/mtg_8-01/su..., and FY03-NDSU Extension Service Program #203-Cropping Systems in the 21st Century at <http://www.ext.nodak.edu/progplan/203%20FY%2003.htm>

to understand what adventitious commingling is, even those most knowledgeable about the debate have been forced to turn to a dictionary. Although requiring people to use a dictionary is not wrong in and of itself, it does show a certain rhetorical clumsiness on the part of those who coined the term. Due to the expression's relative obscurity, many members of the public probably would not bother to learn more about the issue's complexities because they feel the debate is beyond their grasp. If our goal is to usefully educate citizens and advance the debate on TOs, then it is our duty to provide clear and understandable terms and arguments for them.

A more important defect is the fact that "adventitious commingling" fails to capture the referent's essence. "Adventitious" means unintentional or accidental, which renders the whole term unable to perform the function for which it was intended. By explicitly limiting it to incorporate only unintentional commingling, all intentional or negligent commingling has been excluded. Perhaps, for example, a farmer or grain elevator operator *intends* to commingle the two organism types because he is tired of what he believes is organic farmers' unjustified complaining. The result cannot be an adventitious commingling, even though the resulting state is identical to the one which would have arisen if the commingling had been unintentional. In order to refer to the second type of commingling, we will have to make matters needlessly more complex by coining the term "intentional commingling."

Moreover, negligent commingling, which also results in the same states of affairs as the unintentional and intentional, would not be an adventitious commingling. Suppose there is a lazy grain elevator operator, who inadequately cleans his elevators and machines, even though it is foreseeable there will be mixing of the different seed types. The result, according to the definition, is not an adventitious commingling, but negligent commingling. Now we have three terms referring to the same resulting state of affairs, *viz.* the mixture of TOs with non-TOs, when one would better serve the interest to include more of the public in the ethical discussion.

Furthermore, the real dissimilarity between intentional, unintentional, and negligent commingling is an unhelpful moral difference rather than a descriptive one. When we talk about intentional, negligent, or unintentional, then we are actually focusing on moral responsibility, the morality of an action, situation, or something similar rather than the mere fact that two types of things have mixed together. Unintentional may mean no culpability on the part of the agent, for example, while intentional mixing might entail the agent is responsible for the results of his action. However, what matters in the ethical debate over TOs is the fact that transgenics and non-transgenics have been mixed, not what the mental states of the person or persons who did the mixing were. The latter is a different moral issue which should be addressed on its own.

For the sake of usefulness, since all we want to do is to talk about the states of affairs in which transgenic and non-transgenic products are mixed, we should use only one, non-emotive, publically accessible term rather than three.¹¹

¹¹On the same grounds, "unintentional presence" must be rejected as inadequate. A second sufficient ground for rejection is the fact that the term seems to be able to equally refer to a mugger on a dark street or any person we do not want to meet.

Unmixed and Mixed

In place of the less useful terms, my suggestion is to adopt the perfectly workable adjectives of “mixed” and “unmixed” to describe the state of mixed transgenic and non-transgenic organisms and the states of unmixed transgenic or non-transgenic organisms, respectively.

My suggested words satisfy the three conditions for an adequate term from above, *viz.* they are emotionally neutral, understandable and accurate. First, the terms have no illicit emotive impact. If a group of seeds is unmixed, it merely means that the seeds are all of the same type, regardless of whether or not they are non-transgenic or transgenic. Seeds being mixed entails solely that there are at least two types of seeds in the group. In addition, neither “mixed” nor “unmixed” implies a mixture or uniformity of seed is somehow better or worse on mere emotive grounds.

One beneficial result of using emotively neutral terms is that people who oppose transgenics or non-transgenics must now focus on better arguments to justify their positions, rather than relying too heavily on the listener’s emotion. For instance, a person must present a proof showing that the existence of transgenics is bad, instead of letting the labeling of it as a contaminant perform too much work. As the arguments are developed, it will become clearer that many of the assumptions made so far in the debate are unjustified, which will call for a re-evaluation of beliefs. For example, by eliminating “adventitious commingling” from the discussion, then the assumption which some make that mixing transgenic and non-transgenic organism is innocuous would not be accepted as a given. Proof is required that any thoughtful person can understand. Perhaps, in the long term, what now seems to be a fight between individuals with intractable positions will progress into a consensus-at least on some points such as on terminology.¹²

Since the suggested words are readily understandable, the second condition of an adequate term is satisfied. Mixed is a combination of different types of things, while unmixed means all the parts are homogenous, for example. Anyone conversant with the transgenic debate, as well as the general public, will be able to immediately understand the terms.

Finally, by capturing the essence of the referent, the suggested terms satisfy the third condition of an adequate expression. In order to be as clear as possible so that everyone understands what claims and arguments are being made, we are trying to find terms accurately describing only the states of affairs in which transgenic organisms are mixed with non-transgenics. “Mixed seeds” means there is a mixture of the two seed types, while “unmixed seeds” merely means there is only one type of seed in the group. If organic farmers want to maintain purity, for example, then they want to keep their seeds from mingling with transgenic or non-organic seeds. If proponents of TOs are not concerned with mixed seeds, then they are not concerned with

¹²From my experiences at workshops and focus groups, the first likely consensus will be that transgenics are not morally bad in and of themselves.

a commingling of seed types, although they might be worried about the percentage of seed types in the mixture.

Furthermore, there are two benefits in making the mental states of the agents who mingled the two types of seed irrelevant to the terms. First, the referent is more accurately captured by the term. Since all that was under discussion was the actual state of affairs of the mixed seeds, it does not matter what the agent intended, should have foreseen, or did not intend. Second, the terms are more efficient. We are only concerned at this stage of the debate with the morality of the mixture of the two types of seeds, not the different issue of the morality of the agent who did the mixing. By making the mental states of the agents irrelevant, we are freed from the duty of actually discovering whether the mixing was unintentional or not, which allows us to focus solely on the relevant matter, *viz.*, the mixed seed. Hence, for both of these two reasons “mixed seed” is a far better term to use than “adventitious commingling.”

From this point onwards, the same care needs to be taken with any word or term used to discuss transgenic organisms or any type of technology. It is only when this is done that the public will be able to solve its problems efficaciously and avoid pointless strife.

A Very Brief Book Overview

The purpose of this work is twofold. First, some of the most important legal and moral issues in the transgenic organism debate, such as labeling, market concerns, and trade agreements, will be addressed and some solutions formulated and defended. Second, and more importantly, a practical moral code will be developed for use in transgenic debates and for any controversial issue facing society, especially for technology. The code is not intended to nor can it identify all morally right and wrong actions facing individuals, but it can find at least one morally right alternative in any situation. Moreover, it will be based upon how people actually do their moral reasoning.

The first chapter begins the work of identifying moral principles and values people from all walks of life have used to make their ethical decisions. The groundwork is based upon sociological principles and USDA sponsored surveys as well as five of the most influential moral codes some professional groups have adopted, including the National Commission that wrote the Belmont Report, and four professional organizations. The first chapter also starts turning the raw data and ideas into a consistent decision making procedure with consistent moral principles. The second chapter develops and refines the code's – the Practical Moral Code (PMC) – two normative principles – Reasonable Person Utilitarianism (RPU) and a Quasi-Categorical Imperative (QCI). Chapters 3 and 4 develop PMC's complex, hierarchical axiology to be used in transgenic and other technology debates. Much of the disagreement in various moral issues does not stem from the use of different normative principles of right or wrong action but from the values people attribute to

various things, e.g. people, animals, plants, and the environment. If we are clearer on both principles and values, then the controversies are not guaranteed to vanish, or at least, be more manageable. However, those engaged in the debate should be able to understand and respect other viewpoints better, and perhaps, know more about their own. To develop an axiology, I will first reject the simplistic definitions of the unnatural and the misuse of evolution, and then in Chapter 4, formulate a complex, hierarchical value system. The fifth and final chapter provides an overview of some of the arguments for and against transgenic organisms and the first applied uses of PMC. Included in the final chapter are the applied moral issues of whether to create transgenics, labeling, traceability, and market access levels. These four issues I contend are among the most contentious in the transgenic debate, but reasonable solutions that every thoughtful person can appreciate can be found. That is, the conclusions I derive will be acceptable to some and anathema to others, but every rational person on both sides of the debate should, at bare minimum, understand why another reasonable person can justifiably arrive at those conclusions.

Chapter 1

Applied Groundwork for a Practical Moral Code

1.1 Introduction

We should take seriously Gert and Stevenson’s claim that philosophers in blind pursuit of their theories and principles are at risk of becoming ineffectual. For example, many ethics articles are too theoretically academic rather than practical. Generally, the author chooses a controversial moral topic, and then applies one or more principles to which she is particularly drawn. As a result, the issue is evaluated in light of the moral codes that academics, for the most part, have adopted, rather than those the people more directly involved in the situation would use. Although the articles tend to be well written, they carry little weight where people are making real world decisions about what to do.

A practical moral code based upon the work of ethicists, philosophers, sociologists, and other social scientists, as well as what thoughtful people believe in and apply in their lives is a necessity for three important reasons. First, it will be practical in legitimate decision making that is understandable and justifiable to all reasonable people. Second, it will be something people are more likely to use. Third, because of its universal acceptability, it can help lead to social decisions and a better society. I will address each below.

Moral codes based on how ethics is actually done by individuals and communities must be practical because they are intended for applied individual decision making. That is, people use them to figure out what actions they are morally required to perform or refrain from doing, what type of people they should be, what thoughts they should have and so on. Impractical theories and principles such as many forms of consequentialism are impossible for people to utilize. If they are unsure of how to apply the theory or principle correctly, then it does not help them to choose, much less justify their choices to others.

Impractical codes also pose a danger to individuals and society. If agents cannot know with some level of acceptable certainty what is right or wrong in real world

An earlier version of the practical moral code based on USDA survey results appeared in Gary Goreham, George Youngs and my “Practical Moral Codes in the Transgenic Organism Debate.” It has been extensively updated since that time.

situations, then they might begin asking if there is anything to know in the first place? In other words, without being able to recognize our actual duties, which actions are right or wrong, what it is to be a good person, then why should we assume there are any moral truths of any kind? It is a fundamental fact that rational belief in a proposition requires some sort of adequate evidence; otherwise belief in something's existence seems to be merely an article of faith, or a non-rational or irrational belief. If someone proposes an impractical moral code that does not allow people to know what to do, then he will be unable to prove rationally that the moral code classifies one way or another in any situation. If we want to establish that there is a morally right path in any particular situation, then we must accept that codes producing unknowable classifications must not be impractical.

Second, moral codes should be practical because moral debates need resolution for their own sake and those of the community. Practical codes allow us to use the moral ideals and reasoning processes all of us share universally to discuss the issue and try to find consensus at least an understanding that reasonable people can reasonably disagree will help people live their lives well and create a better society. Issues such as abortion, euthanasia, technology and transgenic organisms cause a great deal of strife in people's lives, groups, and communities. After rigorous discussion, there must be solutions that can heal and move us to new issues needing the community members' attention and energies, otherwise nothing will get done and the community and its citizens cannot pursue their highest good of flourishing.

Mark Sagoff's work on local civic engagement in environmental problem solving as illustrated in his Quincy Library case study serves as one justification for why a "bottom up" rather than "top down" approach is more appropriate in developing both an axiology and practical moral code. In Quincy, California, there was a dispute between environmentalists, local officials, and the timber industry over the dispensation of three national forests. A desperate deadlocked situation resulted in which each local faction was fruitlessly expending its resources while tearing apart the community. Resolution through consensus was achieved only when local citizens realized how bad things had become, and then worked together without outside provocateurs to find an ethical solution to their dilemma. The democratic result was a plan in which each side sacrificed part of its goals at the same time its primary desire was satisfied. Using arguments and this example, Sagoff proves that a democratic approach to problem resolution, especially if those engaged are the same individuals who will be directly affected by the decision, is more practical than having outside agents/experts intervene (Sagoff 2004, Chapter 9). In fact, when outside factions, such as the Forest Service, environmental groups, and logging businesses interfered in Quincy's process to pursue their own interests, many of which were benefitted by keeping the problem alive, the community plan was derailed (Sagoff 2004, pp. 225–7). Although external agents and entities are not always harmful, the damage and distraction they can cause should make us look for more practical, local venues through which people solve their own problems using moral codes based upon their universal and local ethical beliefs, values, and principles.

Many bioethicists promulgate a democratic decision procedure for technology issues (Korthals 2002 and 2004; Light 1996 and 2002; Rollin 1996; Thompson 2007). Rollin argues that governments have an obligation to poll the public for any risks it perceives, no matter how farfetched the concerns are, which are then addressed by scientists in terms any layperson can comprehend (Rollin 1996, p. 93). Michiel Korthals' applicationism or deliberative ethics, which seems very similar to Andrew Light's methodological pragmatism, requires that "all sorts of consultation between consumers and producers (and other parties, such as governments)" (Korthals 2004, p. 52). The justification for deliberative ethics is the fact that consumers and producers are manifestly unable to acquire adequate information or power necessary to protect autonomously their own interests, while there is a dearth of entities that will do a proper job of it for them. From being involved in the various decision processes, consumers can guide technology to a state more conducive to their well-being. By adopting Korthals' approach, two chasms can be bridged. The first is the epistemological distance that has grown between consumers and producers as food production became more specialized and divorced from the everyday experiences of most consumers (Ibid., p. 153). In developed societies, very small numbers of the populace grow or raise the foodstuffs used by the rest; hence, both have a poor understanding of what the others do or think. Deliberative ethics overcomes the estrangement by integrating each group into decision making bodies. The second chasm is a schizophrenic division between consumers and citizens (Ibid., p. 155). Consumers are defined as individuals active in markets who act according to their personal preferences, while citizens are individuals participating in the political arena who act with others according to their common preferences (Ibid.). Obviously, these disparate foci are incompatible unless sensitively overcome. Deliberative ethics empowers consumers by allowing them to have greater control in the market besides merely whether or not to buy a product that is produced by what can sometimes be viewed as Others.

Deliberative ethics is one aspect of a current revival of pragmatism in technology and ethics circles. Instead of being concerned about the end results of ethical decision making, pragmatic ethics focuses upon the decision making itself. In other words, it is "more process than product oriented" (Keulartz et al. 2002, p. 15). Deliberative ethics ensures that all affected stakeholders have input in the final result, whatever it may be. Pragmatic ethics also involves "substantive interventions" that break stagnation and entrenchment in ethical debates by creating new moral vocabularies, bringing novel perspectives or ideas, or otherwise moving the process forward through the introduction of some new element into the debate (Ibid., pp. 15–16). In a partial justification for his methodological pragmatism, Andrew Light claims that one must be a pragmatist in order to function well in bioethics – and by extension – technoethics. The reason why is based upon the assertions that:

1. bioethics is a social activity,
2. the value of ideas is ultimately weighed in terms of their value in practice,
3. the reliance in all approaches on past experience, and
4. bioethics is always aimed ultimately at influencing policy (Light 2002, p. 85).

Using principles or codes that fail to recognize these fundamental facts result in possibly impressive abstract arguments and conclusions, but does not guarantee that any problems will be solved in the real world (Gremmen 2002, p. 101). Laying the groundwork for one way to discover defensible, reasonable solutions to actual problems – the next chapter’s PMC – is what this work is striving to achieve.

Although I am not at the moment, nor might ever be, ready to adopt a form of academic pragmatism, it is important to acknowledge its usefulness in various ways. First, it focuses on solutions to problems using what is real in the world rather than taking flights of philosophical fancy to complex, non-existent realms. Second, it frames ethical discussions in more inclusive terms than merely having battles between two or more conflicting moral principles. “The moral arguments that are used [in academia] belong to a specific practice and may lead to problems in understanding members of other practices” (Gremmen 2002, p. 101). The major disagreements between those opposed or in favor of transgenic organisms, for example, organic and transgenic producers, can be understood in terms of how each group practices animal husbandry or farming. Once the various involved practices are appreciated, then it will be easier to obtain some form of consensus on fitting solutions. These two benefits of pragmatism are considerable and cannot be readily dismissed or minimized.

There are several severe drawbacks to pragmatism that will give anyone pause. First, without some sort of fundamental principle to evaluate a practice’s moral legitimacy, then how can one practice be set aside in favor of another? The issue is not generally clear in the pragmatists’ writings for the examples they use to support pragmatism tend to be all morally legitimate. Gremmen talks about clashing views over how horses are treated as a conflict between practices people have for pets and those they have for natural resource management (Gremmen 2002, p. 101). Either practice is acceptable to reasonable people because we as reasonable people allow either in our societies. Since both views are morally permissible to hold, it does not ethically matter which one a person adopts.

However, in more difficult dilemma cases, the inherent defect with pragmatism becomes apparent. Suppose the incompatible practices have different moral statuses. In the case of societies that condone women’s abuse, reasonable people want to adopt an ethical practice, and reject and condemn an unethical practice, but there is neither incentive nor justification for doing so. For example, in May 2008, 15 women in western Kenya were burned to death by a rampaging mob on the grounds that the women were witches. Although the conflict between the mob’s superstition based practice and the evidence and equality practices of any reasonable person should be resolved in favor of the latter, with pragmatism, there is no mechanism that can be used to support such a decision as there is in consequentialism, Kantianism, or another Realist theory. They are merely conflicts of practices. The result is rampant relativism unless pragmatism can go against its central foundation and incorporate some essential principle that allows for conflict resolutions for these situations.

Of more practical concern is how are we to do what those who want a more democratic or pragmatic approach to decision making want us to do without becoming too

counter-intuitive? Decisions about technology development and deployment affect many different people in many different communities; thereby, making each person a stakeholder. If everyone must be consulted for their concerns and have each of them addressed by the proper authorities, no matter how unlikely these consequences are, then a great deal of technological innovation will be delayed if not prevented by the task's sheer magnitude.¹ No company would ever develop new technology because it would be unlikely to have a net profit. Second, there is the danger posed by the tyranny of the majority. If all stakeholders have to be consulted, and the stakeholders are uniformly technologically and scientifically ignorant, then they will stifle innovation in thought and deed (de Tocqueville 1966, p. 235). Many times, the stakeholders as a whole are against innovations because it frightens them, they do not believe it is in their interests, or for some other irrational reason, assuming adequate evidence is being ignored by them. In these situations, those in the minority have no avenue of appeal since democracy is the final arbiter. But this cannot represent what ethics is all about. It offends us to think that minorities' interests have to be sacrificed to the majority's sometimes irrational will. In order to reign in tyranny, there must be some objective principle, such as justice and flourishing, that takes priority over democracy.

Given the unwieldy requirement to consult all affected stakeholders, it might be reasonable to limit information gathering to representatives of the populace as a whole. At the very least, the costs involved would decrease dramatically if some smaller set would be consulted.

This approach's benefits are enticing, but its difficulties arise when considering who should be selected to represent the stakeholders. If the stakeholders as a whole are ignorant of science, then should the representatives represent the majority or those know enough about science to make more informed decisions? If the latter, then they might not represent the majority of the society; hence, there is none of the empowerment desired by pragmatists and others. It is merely doing what a small group believes to be right or listening to what they think is important rather than allowing the community as a whole significantly to affect negotiations and decisions. Although it might be a bit better to make decisions this way than merely allowing scientists, producers or similarly conflicted parties do it, there still might be a bias toward science that the community as a whole rejects. If the more democratic representation is adopted, then decisions can be made based on ignorance rather than evidence. Given that governments are supposed to be pursuing the best interests of the society and its citizens by promoting and maintaining the flourishing of each, decisions of this type will tend to retard government efforts to achieve its goals. In addition, there is the problem of the tyranny of the majority here as well. The only change between asking all stakeholders and representatives who mirror the views of all the stakeholders is merely a difference in the group's size; not its practices, ideas, and beliefs. Hence the result will be the same.

¹How would future generations, who will be impacted by the technology, be consulted?

A practical way out of this conundrum is for reasonable people to utilize a practical moral code such as the one developed in this work, which incorporates RPU and QCI or similar principles. RPU examines what is best overall, which will tend to be identical to society's interests, while QCI requires proper respect for all people involved. To fulfill the latter duty, those affected should be consulted as long as so doing satisfies PMC. Therefore, the benefits of pragmatism and democratic consultation can be achieved with PMC without simultaneously being required to take on pragmatism's drawbacks.

To begin developing the practical moral code for all forms of technology and ethics, the central focus is on the sets of theories and rules governing ethical conduct gleaned from surveys conducted under a United States Department of Agriculture grant for the study of the social, economic, and ethical impact of biotechnology, especially transgenic organisms. In depth, structured interviews were conducted with a range of individuals, including farmers, legislators, clergy, government officials, scientists, agriculture school administrators, and agribusiness officials. Their responses to the interviewer's questions not only indicate that versions of the standard moral principles of consequentialism, Kantianism, and justice are used in decision making procedures, but in certain cases, environmental ethics as well. Moreover, the principles employed in biotechnology discussions are general enough to be utilized by the human subjects for other moral issues as well.²

This chapter's structure is broken into six main sections. First, the definition of terms employed in the arguments and discussion are stipulated. Second, several professional ethical codes, including the Belmont Report's code for physiological and behavioral research on human subjects, are examined. They will later prove a valuable comparison to those adopted by the individuals involved in the transgenic organism debate. Third, the results from the USDA study are stated and formulated into the most plausible moral principles. Fourth, the most reasonable versions of transgenic moral codes are compiled, and then examined for internal and external consistency. Fifth, in an attempt to be as inclusive as practical, the Common Moral Code is devised from combining portions of the professional and survey participants' moral codes. Finally, it will be shown that although it provides insight into necessary moral factors in any adequate moral decision procedure, the Common Moral Code is evaluated and found wanting. The code's lack of clarity poses serious problems for interpreting it, much less employing it to help resolve moral dilemmas. In the end, it is obvious that if applied ethicists are concerned with settling controversies, such as the transgenic organism issue, then one of their tasks is to formulate a clear, practical moral code that appropriately incorporates the ethical principles people use in their moral decision procedures. However, before proceeding further, it is important to first stipulate definitions for the terminology that will be employed in the later discussions.

²Gary Goreham's "Ethical Perspectives on the Transgenic Organism Debate" unpublished Power-Point presentation of research data at North Dakota State University, 2002: 1-10.

1.2 Definitions

Since the USDA survey's respondents used principles in their codes which rely upon more basic moral theories, it is vital to start with the latter and progress to the former. Moral theories are the most fundamental level of ethics. For the purposes of this work, a moral theory "provides an overall framework for specifying ethical norms and interpreting ethical concepts" (Shamoo and Resnik 2002, p. 12). For example, consequentialist theories are fundamentally about the consequences of actions, which can be spelled out in terms of doing the best one can or producing good and avoiding evil (Holmes 2003, p. 125). Therefore, all principles derived from the theory will evaluate only the consequences of actions, rather than the action's antecedents or the action itself. Furthermore, meta-ethical definitions of moral terms, such as good and evil, will be based upon the framework of consequentialism, e.g., evil is defined as pain for hedonic consequentialism.

On the second level of ethics are normative principles, which evaluate the morality of actions, people, or things (Shamoo and Resnik 2002, p. 12). Among the other possibilities, a moral principle could be a rule of right behavior. An action rule can incorporate the necessary or sufficient conditions for a right action. For instance, a utilitarian principle asserting that an action is morally right if and only if the action maximizes utility³ states both the necessary and sufficient conditions of permissible actions. However, a moral principle can also be more limited in scope. The rule asserting that an action is morally right only if the action maximizes utility is just as much of a moral principle as the former. The only difference between the two is that the latter states a necessary requirement of morality rather than both necessary and sufficient conditions. Further moral principles evaluating goodness or badness apply to classifying mental states, individual characteristics, and other states of affairs.

Finally, the set of moral principles that a person uses in her decision making procedures is her moral code. Although it is possible that all of her principles fall under one moral theory, such as consequentialism, there is no reason that they must. It is perhaps likely that people use multiple moral theories to support their moral principles (Shamoo and Resnik 2002, p. 20). For example, a consequentialist moral theory can help justify the moral principle to maximize utility. Kantian moral theory can be used to support a principle to never treat anyone as a mere means. Justice moral theories validate justice principles, and so on. It is helpful to see how different groups of people developed their moral codes from several different moral theories.⁴

³Utility is defined as the result of subtracting the value of all of the evil consequences produced by an action from the value of all of the good consequences produced by the action.

⁴Audrey Richards' work on primitive human societies supports the idea that there are basic universal characteristics to ethical systems (Richards 1969, pp. 23–32).