The Very Old, the Nearly New and the Really New: "To Bt or not to Bt"*[1]

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[1] *"To Bt or not to Bt" refers to the debate over whether or not to introduce corn with an insecticidal protein from the bacterium* Bacillus thuringiensis. *(Science, October 1999)*

[2] A Presidential advisory commission that often deals with recommending public policy in morally contested areas. As such, the Commission is often faced with the challenge of distinguishing between what society can do and what it should do.

I. Introduction

The issue of how a monarch or representative assembly sets public policy in situations where the resulting rules and regulations are bound to offend the moral commitments of some proportion of the polity is not a new challenge. It is, however, a more complex challenge in a jurisdiction committed to a form of pluralistic political liberalism that not only invests much more moral authority and responsibility in the individual, but places certain limits on the authority of the state. In these latter circumstances, locating public policies that are considered legitimate and are broadly accepted, if not fully acceptable, by groups with sharply different perspectives on some fundamental issues can be very difficult.

Political philosophers of various stripes have worried about this matter for some time. John Locke, for example, suggested that despite some disagreements on important moral issues, peoples in pluralistic liberal democracies would share enough common "civil interests" (i.e., interests in maintaining the existing political order) to be able to co-exist in a mutually empathetic and peaceful manner.

What is somewhat new, however, is that scientists, especially biomedical scientists, are now concerned about these matters. Some of their attention has been diverted from the laboratory not only to the rarefied air of moral and political philosophy but to the political struggles that surround the adoption of public policies. They have been drawn into these less familiar arenas not only because the scientific enterprise is so dependent on public support, but because of the special nature of certain contemporary discoveries on the biomedical frontier.

The biomedical frontier itself is expanding at an exhilarating and unprecedented pace and this avalanche of new discoveries fills us with hope as we contemplate the many remaining challenges in the area of human health and nutrition. For example, it is quite clear that these new innovations are a necessary component in meeting the food supply required in the next few generations. Future generations undoubtedly will owe a great debt to all those involved in bringing about these stunning new developments.

In the context of all these exciting discoveries, however, we must also acknowledge that these advances have been accompanied by a certain level of anxiety regarding the full implications of all this new knowledge for the lives we live together. That is, some are concerned about the impact of this new knowledge on those customs and belief systems that provide a framework for our relationships with one another and give ultimate meaning to our efforts and to our lives. As a result, these exciting discoveries also raise both anxieties and some serious ethical issues.

With respect to the many ethical matters raised by developments on the biomedical frontier, I would note the following as raising some of the most serious ethical issues:

a) Developments that raise issues of international distributive justice. The startling developments in biomedicine put into ever-sharper relief the difference in access to the benefits of all these developments as between the wealthy developed countries and many of the poorer developing countries. While the contemporary pace of innovation is almost overwhelming, it has had a relatively limited impact on developing countries. For many, this raises the question of whether the level of resources being poured into this type of scientific research should, as an ethical matter, be reallocated to meet the much more basic health and nutrition needs of those peoples in greatest need. This matter relates, of course, to our much broader and more general ethical obligation to assist those less fortunate then ourselves, perhaps because our relative wealth is undeserved and unearned, or perhaps because of the simpler ethical obligation for the wealthy to help the poor. However, since the biomedical enterprise is focused on nutrition and health, events in this arena lead us to consider our related ethical obligations.

b) Developments that impact those human narratives and/or belief systems that are central to giving meaning to our lives and our efforts. This includes a whole class of new discoveries that seem to threaten our "old" ideas of what is unique about the human species, our moral relationship to other forms of life, and the

> relationship between the generations. It also includes issues surrounding our radically new capacity, both actual and potential, to modify all forms of life including the entire range of plants and animals.

With respect to the anxiety, uneasiness or confusion regarding the meaning of events on the biomedical frontier, there seems to be a special concern in relation to discoveries in the area of human genetics, since they seem to present some very unsettling moral dilemmas. First, to many these new discoveries threaten, at least at first blush, to disrupt important human narratives, or belief systems, that inform us of the nature and uniqueness of what it means to be human. After all, it took some time for human belief systems to accommodate to the discovery that we were not located at the center of the universe, or that we were, along with all the other animals, part of the same vast evolutionary scheme. It would seem reasonable to expect, therefore, that it would take time to socially and morally accommodate, for example, the discovery that we share a common genetic code and many genes with all other living things. In the interim, therefore, we can expect a certain amount of anxiety to be widespread.

Second, and perhaps even more unsettling, has been the realization that we may soon possess radically enhanced abilities to control the genetic inheritance of future generations. This prospective ability, however exciting to some, requires us to come face to face again with such profound issues as what it means to be human; what is distinctive about human beings; and in particular what are the moral limits, if any, to the scope of human activity and what moral rights we have to sculpt the genetic nature of future generations.

These issues are not only of the deepest moral significance, but they challenge the structure of many of the belief systems or human narratives that themselves are, at the very least, enormous feats of the human imagination and, in any case, critical in giving meaning to our lives and to our relationships with one another. This being the case, it should not surprise anyone that these developments, with their potentially radical implications for the human story, are perplexing and anxiety provoking to many, fearsome to others, and offensive to some. It is, therefore, incumbent on us all, particularly those most deeply engaged in advancing the biomedical frontier to seriously engage these issues.

Dismissing or ignoring such concerns is not only a serious intellectual error, but will only serve to undermine the public trust and support on which the biomedical enterprise is dependent. What I hope to do in this essay, therefore, is to begin constructing a tentative framework that might help us understand and, therefore, deal with these anxieties so that our new knowledge will not only be more welcome, but will be deployed in a manner that will have its greatest human meaning.

It is always important to recall that science is a social institution and as such is heavily influenced by social attitudes and mores. As a result, science has never been a closed-off world sufficient unto itself. For example, it was not merely the logic of the scientific agenda that produced the enormous acceleration in scientific activity of the last few centuries, but a significant change in social and moral commitments. Of particular significance in this latter respect, for both science and society, was the adoption of a set of social and political attitudes that, as I have already noted, vested much greater authority and responsibility in each individual. These new attitudes were a key factor in enabling so many novel experiments in science (and society) and the resulting explosion of scientific (and political) activity.

Moreover, many important issues of health (i.e., morbidity and mortality) lie at the intersection of the social, behavioral, and biological. That is, both the prevention and amelioration of many significant diseases require attention to the interface between molecular and cellular matters and psychosocial matters. There is strong evidence, for example, that personal psychological resources such as optimism, purpose, and meaning have significant impacts on survival rates and recovery. Further, there seems to be accumulating evidence that one's position in the social hierarchy is also related to morbidity and mortality. Finally, even gene expression may depend on the general environmental conditions experienced by an organism. Despite the promise of further biomedical research there are psychological, environmental, and societal barriers that must be dealt with in order that scientific developments can fulfill their potential. Thus, the world of science, scientific investigation and scientific discovery is intimately related to the world of meaning and, as we shall see, the province of myth.

II. A Tentative Framework

In any case, as I began to try to understand the nature and source of the anxiety, unease and moral bewilderment that seem to surround some of the most exciting new scientific and technological developments, I focused my attention on a set of factors that was especially characteristic of contemporary society. I thought first of the unprecedented pace of scientific discovery. Since new knowledge always creates new moral responsibilities, and, therefore, new anxieties, I reasoned that a great deal of new knowledge will be accompanied by a great deal of moral anxiety regarding its use. Second, I even thought there might be some chance that the current renaissance in serious work in moral philosophy might have had a positive impact on the evolution of our moral sensibilities. While I would not want to argue that we are living more moral lives as we enter the twenty-first century, I do think that our increasingly globalized society has generated a growing concern regarding our relationships with others and a variety of new ideas regarding the philosophical foundation of our obligations to others. In this latter respect, perhaps, we are at least thinking more often and more deeply about how to achieve a kind of moral peace of mind.

As I thought more carefully about these various matters, however, I decided a longer-term, more historical perspective would be a more rewarding basis for understanding these issues. In this respect I developed a framework which had three principal foci: The first centered around a very old problem, one that has been deeply incorporated in western literary and cultural tradition for over two millennia; namely, how our basic belief systems evolve in order to incorporate our ever increasing knowledge of the natural world. The second centered on the relatively new problem already noted above of dealing with morally contested issues within pluralistic liberal democracies. This is a challenge that has only been with us in an operationally serious way for the last few centuries. Finally, I completed my initial framework by addressing a really new problem; namely, how we should incorporate the radical implications of our enhanced understanding of human biology into the belief systems and human narratives that give meaning to our lives.

III. The Very Old Problem

The concern or anxiety over the impact of new knowledge on the human condition is a very old problem. Indeed, the very natural human concerns regarding both how to deal with the threat new knowledge may represent to valued cultural norms and institutions and/or how to modify existing social and cultural traditions to accommodate new knowledge is as old as recorded history. Since the earliest moments of western civilization, a key issue has been how we are to understand the nature of what it means to be human within the context of a rapidly expanding knowledge base concerning the natural world. Recall, for example, Sophocles' choral "Ode to Man" in Antigone:

> "Many things are formidable, and none more formidable than man…. And he wears away the highest of the gods, Earth, immortal and unwearyingly, as his ploughs go back and forth from year to year…. Skillful beyond hope is the contrivance of his art; he advances sometimes to evil and other times to good…. May he who does such things never sit by my hearth or share my thoughts."

This verse, and countless others that have become part of the Western literary tradition, reflect the deep ambiguity that often accompanies technological progress. On the one hand, the development of new knowledge is formidable. That is, such efforts are a genuinely admired form of human creativity. Nevertheless, as the above words of Sophocles reflect, there is always a period of uncertainty regarding the impact of this new knowledge on a wide variety of honored practices, important values, and other longstanding cultural commitments. As developments in the twentieth century have taught us once again, new knowledge solves some problems, creates others, and has potential for both great good and vast evil. The ultimate anxiety is how to achieve the promise and hope of new knowledge and to avoid its perils.

Thus, although crass self-interest and/or unexamined fears may cause some to oppose the development and/or use of certain new technologies, such opposition may also stem from a desire to understand the moral content of what seems about to happen. One needs to acknowledge, therefore, that many persons with a great respect and genuine enthusiasm for the

continuing contributions of science and technology also may have serious concerns about the on-going capacity of particular human institutions (and nature itself) to survive both advancing science and technology and the associated desires to control all and possess all. Indeed, while almost everyone acknowledges that we should never confuse what we could do with what we should do and that new technologies can be misused, few agree on what constitutes such misuse.

As knowledge has accumulated over the years and as humankind has increased both its understanding of and its ability to control its environment, there is, with every major series of advances, a new anxiety concerning how best to use these new abilities and how to avoid what some would term "human overreaching."

Despite these anxieties and concerns, boycotting new knowledge is not a serious option, but neither is a studied attempt to avoid acknowledging its serious implications for the structure of beliefs that gives our lives meaning and, indeed, impacts our health. We are left therefore with both an accumulating knowledge base and a level of anxiety and unease that can only be relieved by negotiating new understandings of how this new knowledge will be used.

We should therefore not only expect, but welcome, the continuing controversy over the legitimate uses of our new powers. Indeed, it is precisely these disagreements and controversies that not only generate the anxiety, confusion or uncertainty that is one principal characteristic of our civilization, but create the potential to use our new powers in a manner that gives greatest meaning to the on-going human narrative. It is through these discussions that new science becomes a social fact and, more importantly, gains its moral relevance.

IV. Conversations and the Province of Myth

While there always seems, as St. Augustine notes in his Confessions, to be a human appetite or desire for new knowledge (i.e., many of us seem addicted to the Promethean complex), there is a much more basic and more pervasive human need and/or desire; namely, the need to impart meaning to our lives, our efforts and our relationships with each other. After all, only some communities exhibit the Promethean complex, but all communities develop narratives

and/or myths to give their efforts shape and meaning. As William James noted, we seem to have an "…. indomitable desire to cast the world into a more rational shape in our minds than the crude order of our experience." Above all, we want to understand how we should act, why we should act in that way, and whose interests are being served by particular actions. Unfortunately, science has nothing interesting to say either about the meaning of our individual actions or of the social customs and traditions that shape the lives we live together.

It is the province of myth, or other constructed and/or revealed narratives, to define our place in nature, to give us a sense of purpose, and to provide us some moral guidance. Indeed, it is these myths and/or narratives that make a meaningful life possible. In deciding what we should do, or how we should act, therefore, we must do so through a negotiated social decision that necessarily involves resources outside of science such as our cultural traditions and practices and other historical contingencies.

In particular, however, it requires serious conversations about things that really matter (i.e., conversations where all parties leave open the possibility of changing their minds on the appropriate use of our new power) between those driving the biomedical frontier ahead and other thoughtful citizens who are most concerned with finding a way to deploy this new knowledge in a manner that not only gives it moral content and human meaning, but relieves certain anxieties about the future. After all, what makes humans special, if not unique, is our capacity to put ourselves in the minds of others and to understand what they believe and desire. Scientists, therefore, can put themselves in the minds of non-scientists and vice-versa so that we can understand each other's needs and beliefs better. This is what ethics is all about, and this remains central to our ability to adapt our narratives and/or belief systems to our increased understanding of the natural world. Let me now turn to the relatively new problem.

V. The Relatively New Problem

The development in the West during the last few centuries of a political liberalism built on individual liberty and political equality created a relatively new type of challenge to the evolution of public policy in morally contested areas. The challenge for liberal democracies in

setting public policy in a morally contested area is to decide which or whose moral imperatives should be reflected in public policies that, by definition, govern everyone within a particular jurisdiction. The challenge of living together peacefully despite fundamentally differing views on some moral issues is entirely different and a much more complex matter when we are committed to the freedom of individuals to hold quite different beliefs on rather fundamental matters. Moreover, in recent centuries we have become focused on not only who shall govern us, but how much government is morally legitimate, whether expressed by a monarch, or the majority, or the law. In other words, public policy is now faced with both the challenge of mediating differences on important moral issues and the requirement to do so within an environment where we believe there is a province of our lives, namely "private life," with which we believe it is highly undesirable for any public authority to intervene. In such an environment, we are presented with the daunting task of deciding not only how but when the state's power can be exercised in arenas where considerable controversy reigns regarding what is morally worthy. The difficulty in creating public policy in such an environment cannot be exaggerated.

Perhaps the two principal cultural commitments of modern times are the active pursuit of our mastery over nature (now including human nature) and the construction of a cultural framework that anxiously seeks to accommodate the multiplicity of interests that arise from a wide diversity of individual circumstances, beliefs, and historical contexts. A continued commitment to the pace of scientific discovery and such moral flexibility, however admirable, is bound to raise the level of moral anxiety among all thinking persons.

In addition, despite the renaissance in moral philosophy in the last number of decades, there remains a wide range of reasonable ethical themes that compete for our allegiance. These themes exist side by side with little prospect that one will decisively (i.e., logically and compellingly) displace another. This is the nature of things as long as we reject the idea of any moral dictatorship. Simply put, in a pluralistic society no one set of ideas can occupy the moral high ground alone.

In such a context, it is less clear just what issues can serve to create bonds of affection and responsibility among us and between other peoples and us. The question for many is where can we locate the non-scientific and non-market resources to respond more adequately to the full

human implications of what drives us forward. Moreover, if we are to live together in a mutually supportive manner, we must learn to respect others without expecting full consensus on all moral issues.

America, for example, is a fascinating and complex nation of religious believers and non-believers of various stripes, with deep commitments to freedom of thought, speech and belief, and firm traditions regarding the non-interference of government in these matters. As a result, when new science and technology raise moral issues, as they always do, it is often difficult to construct the right moral or public policy space for science and technology to operate within Let me now turn, however, to the really new problem.

VI. The Really New Problem

History has taught us that new knowledge is neither good nor evil. Rather it gains its moral relevance and ethical status through the very human decisions regarding how new knowledge is used. This very old challenge has become dramatically more salient at this turn of the century moment when developments in human genetics are threatening to erase the time-honored boundaries between the social and biological, and between the "natural" and the man-made. This is a genuinely traumatic and new development, since we have used these boundaries to tell us, for example, what aspects of the world we experience are potentially under our control and which are not. They define, if you like, our sense of mortality and the ultimate boundaries of the human condition. Little wonder, therefore, that the threatened losses of these "guidelines" make many thoughtful persons somewhat anxious. Indeed, many are alternatively awestruck and anxious about these developments.

There is a wonderful image on the roof of the Vatican's Sistine Chapel where a force beyond human understanding (say, God) reaches out to create humankind (say, Adam). This basic idea has been central to the creation myths of all societies. Moreover, what many have called the "Genesis problem," namely, how to decide the genetic makeup of future generations, was a matter to be decided by largely non-human forces. With the dawn of the genetic age, however, we are about to have the capacity to extend human control in a radically new way.

This ability raises the question of whether such powers will alter, in a fundamentally unattractive way, the ultimate meaning of being human. Clearly, there are those who believe this new capacity extends and deepens what is a critical aspect of our humanity; namely, the ability to control and shape not only our world, but the world that will be inherited by future generations. Others, however, see the demise of those aspects of the human condition that, for them, defines the most precious aspect of the human species.

V. In Place of a Conclusion

One of the great responsibilities facing us in the twenty-first century is, as I have noted, to consider the social and human repercussions of our rapidly accumulating new knowledge and the appropriate stance of public policy in this respect. This responsibility is, however, especially acute in the areas touched by genetics, given our enhanced capacity to transform the lives of all manner of plants and animals, including ourselves. Irrespective of one's views on the ultimate impact of advances in bio-medical science on the evolving human condition, there seems to be a clear need for all thoughtful citizens to consider the ongoing impact of these developments on those institutions, values and other cultural commitments that sustain our individual and common life, since it is in these areas that science and technology gain moral relevance.

Moreover, since science is a social institution, the world of science and the world of meaning are inextricably linked. Indeed, the scientist, poet, and philosopher share, in some sense, closely related goals. In many ways, the scientist's search for ultimate causes, and the creative artist's search for the ultimate realities of our experience are, at least emotionally, similar quests. For the scientist, the best theories not only explain a lot, but they are unexpectedly simple, they draw things together in a harmonious way, and they often generate considerable wonderment. The same characteristics are found in all thoughtful accounts of the human condition whether generated in the laboratory, the library or the scholar's study, or the narratives that give meaning to all that we do.

However, we face a significant quandary in this respect. Even among thoughtful observers, there is little agreement on the relative importance of the various ethical and

theological issues raised by many new scientific developments. In addition, there is no agreement on which philosophical approach is most relevant or how any particular approach might inform public policy or private action in various arenas. Indeed, there seems to be little convergence on either the right questions or the right answers. Thus, while the various philosophical approaches provide substantial inspiration and guidance to our on-going discussions and concerns, we are often unable to arrive at a consensus solely through a process of philosophical reasoning and deliberation. We have to reach actual decisions in some other way – using supplementary resources – and we have to accept the fact that we will not be able fully to resolve some of the more contested, nuanced, and difficult issues. Anxiety and ethical controversy, therefore, will continue to accompany us on this journey.

VII. Lesson and Conclusions

Perhaps the principal lessons of all this are the following:

a) The expressed anxieties we hear about are real and we need not only to educate others about the potential of science, but to listen to their deeper voices and consider the limitations of science alone in dealing with certain important issues.

b) We should not confuse what we can do with what we should do.

c) The special public policy challenge in liberal societies may be summarized by the following questions: Who decides and for whom and on what issues may the government act?

d) The world of science and the world of meaning are so closely connected that realizing the potential of one requires dealing with the other.

Most importantly, however, it has once again become clear that those engaged in thinking carefully about the future of the human condition, like artists, cannot escape the anguish and uncertainty involved in trying to create a better future especially when the ethical questions go to

the heart of what it means to be human. If those advancing the scientific frontier wish to reach out to the public for support, understanding and trust, they will have to understand and address directly the anxieties that are certain to continue to characterize public concerns and, therefore, public policy. It is difficult enough to understand who we humans really are let alone who we might, or should, become.

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