Notes on "Social Policy Implications" for the panel discussion
on Biotechnology and the Courts, "To Be or Not To Be"

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It is highly likely that the forecasts of the kinds and effects of biotechnology that you have heard so far, as startling as they may seem, are too conservative. As Arthur C. Clarke said in his old book, Profiles of the Future: "When an eminent but elderly scientist says something is possible, he is probably right, but when an eminent but elderly scientist says something is impossible, he is probably wrong."

Most of you also may discount and disbelieve what you have heard, thinking that we are talking about some far distant world of science fiction. I have often found this to be the reaction when I have spoken to judicial groups about what I call the Biological Revolution. It is so far removed from our experiences and beliefs that we just can't believe--maybe don't want to believe--that it might come true. But, to quote Arthur C. Clarke again, "The future isn't what it used to be."

Nonetheless, I know that there are many of you who know better; you know this is not some remote science fiction possibility. Much of it is already here, and more in on the way. As lawyers, you have had to deal with clients, or as judges, you have had to settle disputes, on matters of genetic engineering well beyond those we have discussed here. And if that is not your own personal experience, as a lawyer or a judge, let me assure that it soon will be. You are going to have to deal as reality what you, and most others, consider only to be a wild and crazy dream.

The main aspect of the biological revolution that we have talked about today is human genetic screening and the possibility eventually of human genetic engineering. This is clearly one of the most emotional, exciting, and powerful aspects of the biological revolution. But there are also many other things we have barely touched on here which are all part of the same process.

For example, there are extremely important issues dealing with genetically engineered organisms--from microorganisms, through new kinds of plants and trees, to modified old, or completely new, species of animals, all for many varied personal, commercial, political, legal, or criminal purposes. Among those forms coming on board now are those involved in genetically engineered food (which has recently been in the news but is actually still only an Emerging Issue and not a fullblown problem yet).

There have been and will be innumerable issues concerning torts, copyrights, and the patentability of genetically engineered organisms, as well as who should own the material from which certain genes will then be modified or engineered. This latter is a big and growing source of controversy between industrial countries, which have the knowhow for genetic engineering, and developing countries which have--or at one time had before they were stolen from them--the flora and fauna which contain the genes the developed nations want.

And there is also a growing industry in new, genetically-engineered materials potentially useful for all kinds of future production and construction.

Indeed, the genetic revolution is occurring in all aspects of life--it is, for example, giving new meaning to the saying that we live in an information society, and no longer a merely industrial society. The human genome project is about nothing if it is not about information: its meaning, manipulation, and control, and in fact, it is the boys doing the informatics for the human genome project who may hold more of the keys to the future than do the molecular biologists themselves.

And that is another important point: the biological revolution is happening in company with many other technological developments. For example, I believe that the biotechnological revolution must be viewed within developments in robotics, automation and cybernation which appear to be leading to the emergence of true artificical intelligence and artificial life by the early 21st century, and then shortly thereafter, along with developments in nanotechnology, or molecular engineering, which involves the manipulation of the basic building blocks of all substances and not just those imbedded in genes. In fact in some ways, the biotechnological revolution is just a part of the wider nanotechnological revolution although there is scant recognition of this in the vast biotechnological literature. But Eric Drexler, first in his book, Engines of Creation, and more recently in Unbounding the Future: The Nanotechnology Revolution, has laid out very clearly the truly awesome, but also quiet and subtle, power of molecular engineering for our future.

One of my favorite quotes, capturing the magnitude of one of the challenges which I believe lie immediately before us through this combination of electronic, genetic, and molecular engineering technologies is this one from a book entitled Artificial Life. ("Artificial Life" itself is defined as "the study of man-made systems that exhibit behaviors characteristic of natural living systems. It complements the traditional biological sciences concerned with the analysis of living organisms by attempting to synthesize life-like behaviors within computers and other artificial media. By extending the empirical foundation upon which biology is based beyond the carbon-chain life that has evolved on Earth, Artificial Life can contribute to theoretical biology by locating life-as-we-know-it within the larger picture of life-as-it-could-be" [Quote from p. l])

Anyway, in the book Artificial Life, Hans Moravec says:

"In the late 20th century, the barriers of complexity that divided the engineers of inanimate matter from the breeders of living things have been crumbling. We are very near to the time

when no essential human function will lack an artificial counterpart. In the future..., the human race itself [will be] swept away by the tide of cultural change, not to oblivion, but to a future that, from our vantage point, is best described by the word, 'supernatural.' ...[O]ur machines [will mature] from the simple devices they still are, to entitites as complex as ourselves, to something transcending everything we know, in whom we can take pride [and this is the part I want you to contemplate seriously:] when they refer to themselves as our descendants" [p. 167ff].

But there is even more to it that this. I believe that it is equally important that the bio-nanotechnological revolution itself be understood within the framework of the "Environmental Tsunami" I talked briefly about earlier this morning: the rapidly emerging world of global warming, sea-level rise, ozone depletion, rapid weather, and indeed climate, modification, and all the rest.

If what presently might be considered to be a "worst-case environmental scenario" becomes reality, as I tend to believe it will, then the products of genetic and molecular engineering technologies may be coming online just in the nick of time. If global change is as rapid and unpreventable as many people, including myself, believe, then it will not be possible for nature "naturally" to evolve to respond to the changes in such a way that the continuity of human life, or most other kinds of life, can be assumed. The rates and kinds of environmental change caused by 3,000 years of agricultural, and especially 200 years of industrial, processes may be just too rapid over the next century and beyond for humans, human crops, human supporting animals and life stock, and all the rest to keep up. It may be that the only way human life, or the decendants of human life, may exist beyond the 21st Century on earth is through extensive crash programs of electronic, genetic, and molecular engineering.

In other words, I agree entirely with the argument made by Walter Truett Anderson in his book, To Govern Evolution (which I subsequently enlarged upon in my article, "It's Only a Paper Moon"), that if human-like life is to have any future, whether on earth or elsewhere in space, the number one social policy question facing humans is how to govern evolution.

Anderson makes it clear that it is no good for us to say that we don't know enough about how nature works now to govern it. That is too bad. We should have thought of that before we began messing around, and messing her up.

Probably the most important point I can make for you to contemplate today is this: "Nature" does not exist any more, in the sense of processes uninfluenced by human activities. Strictly speaking, in that sense, there are no "natural processes" operating anywhere any more. As the old saying goes, "there is no place on earth where the hand of man has not set foot."

So, if we want "nature" to exist, then we must act quickly and surely to manage, and, indeed, to invent, it. If we continue on the present path of irresponsible environmental destruction, then it probably is all over for humanity. And Mother Nature will probably say, "good riddance to bad rubbish."

As you can tell, while I was assigned the task of discussing the social policy implications of what the rest of the panel presented, I feel that the concept "social policy" may be too restrictive a way of looking at what is required.

For example, the prestigious American Academy of Arts and Sciences recently published a definitive volume on, and titled, The Genetic Revolution. The Academy invited one of the most respected, and, I might add, politically conservative, social policy theorists and analysts, Aaron Wildavsky, to discuss the social policy implications of the scientific information contained in the book. Wildavsky focussed almost entirely on the policy issue of whether genetically engineered organisms should be introduced into the environment or not. Will they turn into runaway monsters with no natural predators to control them, as some people fear. Or is it impossible to engineer such fearful creatures, as others maintain?

This issue, scarcely touched by us today, thereby further indicating how all embracing is the genetic revolution, boils down to a difference in "ways of life, or cultures," Wildavsky maintains. Moreover, although "cultural conflict is hardball", says Wildavsky, he strongly believes that "the resilient path will prevail, but not by persuading the proponents of prevention; it will prevail, I expect, because prevention either proves infeasible or is overtaken by new circumstances requiring solutions that only biotechnology can provide" [all quotes p. 99ff].

Although I disagree with many of the arguments and much of the reasoning in his article--for example, he fails to see that many of the so-called "Greens"--the environmentalists whose views he dismisses--are coming to favor biotechnology as an appropriate technology (indeed, perhaps a "green" technology) which is superior in any event to chemical-intensive industrial agriculture of today--I do agree with Wildavsky's conclusions which are that although we can expect a tremendous public fight over this issue which will be similar to, but make the current struggle over abortion seem pale in comparison, biotechnologies will continue and expand.

They will do so because many biotechnologies do not require massive collections of energy, raw materials, labor, or even scientific and technical knowhow. Many, though not all, are (or may soon become) truly test-tube, desk-top technologies which can be carried out in the privacy of one's own home. Indeed, the futility and pernicious evil of the War on Drugs might be as instructive an analogy of the future conflict over this issue as is the analogy to abortion.

In my view, it is highly unlikely that the genetic revolution will proceed in some kind of a Brave New World/1984 way, imposed from on high by a malicious, or even benevolent, central government. Rather it more likely will be largely driven by personal and private factors: a mother who desires to engineer to normalcy a fetus diagnosed in the womb as having Downs Syndrome; a mother who desires to improve the intelligence of her fetus by engineering beyond normalcy by prenatal genetic engineering, or even preconceptual genetic engineering; or who, seeing other mothers do so for their children, does not want her child to be stigmatized as being merely "normal" if everyone else in the neighborhood is of superior intelligence, or height, or beauty, or, well, you name it.

Moreover, it is not too far fetched to imagine that in the future "normal" children, that is to say, genetically unmodified children, may bring suit against their parents on the basis that being normal is wrongful birth. Or that welfare children will sue the state if economically-privileged children are being genetically enhanced, while poor people must continue to play Vatican Roulette.

As yes, the Vatican. As many of you know, the Vatican has already issued a statement in opposition to most aspects of the biological revolution. Some other church groups are opposed from their own perspective, while yet other religious organizations either are not opposed, or have taken positions that more or less favor, or at least permit, many of the techniques.

Indeed, if we had time, I would here like to share with you several different scenarios--alternative futures, with alternative social policy issues--which have been developed by Robert Blank in several books and articles. I especially call your attention to chapters 7 and 8 in his book, Regulating Reproduction. Chapter 7 is titled "The national policy context, options and problems," while Chapter 8 is "Toward a rational reproductive policy". They are very useful discussions on this one aspect of the biological revolution, but certainly not for all aspects.

Simiarly, Robert Bohrer prepared outlines of four alternative scenarios of the future of genetic screening and genetic engineering for the 1990 national conference in San Antonio, Texas, on the Future and the Courts sponsored by the State Justice Institute and the American Judicature Society. which are appended to the bibliography which I prepared on biotechnology and which you all received. We also wove some of the issues Bohrer and others presented into the scenarios we felt emerged out of the San Antonio conference in a book which Sharon Rodgers and I wrote.

While I am at it, I also call your attention to the articles, and especially the bibliography, in the Summer 1990 issue of the Emory Law Journal, which is the most current and complete discussion of the various issues concerning "Genetics and the Law" I am familiar with. It, and some more recent (as well as some earlier) publications on the matter are also contained in the little bibliography which I have prepared for those of you who may be interested in coming to your own conclusions about the social policy issues involved.

I especially would like to point out one journal whose articles are usually not referenced in the legal, ethical, philosophical, political, and certainly technical discussions of the genetic revolution. And that is the journal Issues in Reproductive and Genetic Engineering: a Journal of International Feminist Analysis. A social issue of enormous importance, which is the main focus of this journal, is whether human genetic engineering is largely a male project aimed at, or at least enabling, the further subjection and commodification of women, and children, or whether it can and should be captured by women and feminist supporters in order to liberate women, children, and men as well from the blinders and chains of patriarchy. I did not include articles from that journal in my bibliography because I urge you all to access the journal itself to discover, if you do not already know, the richness of this issue which is generally ignored, trivialized, or marginalized.

In sum, I believe that what is required in order to consider, much less develop, social policies appropriate for the challenges of the many facets of the biological revolution is the willingness to engage in full and frank reconsideration of what it means to be human, and what the purpose and focus of life, individually and collectively, is. But there is more. I believe it is essential that we strive to grow beyond all of our confining ethnocentric perspectives of whatever kind, culture, gender, or antiquity. The narrowness of "humanism" has been rightly challenged recently from many religious viewpoints. Now "humanism" is also being called to question by our sibling/children robots, androids, cyborgs, chimeras, clones and all the other brave new beings emerging from the future who will--soon?--demand the right to see and do things their way, and not only humans' way.

I believe that in time, ethnocentrism--humanism--will rightly be as illegal--as unconstitutional--as racism, sexism, and all the other bigoted beliefs of self-centered cultures and people are now.

As I said in my remarks earlier today, in the United States for the past several decades, and increasingly so into the immediate future, it is the judiciary, especially now, the state judiciaries, that are asked first to decide issues of tremendous personal and public importance. Judges must deal with issues about which the public, and its so-called representatives, are largely ignorant, but which are of enormous and real importance to the parties at dispute. Judges are being called upon even more than before to be not mere legal experts or skilled dispute resolvers, but public philosophers and, indeed, public futurists.

In no area are the social policy issues more real, growing, controversial, and of revolutionary--indeed, one should say "evolutionary"--impact than in the area of electronic, genetic, and molecular engineering. Like it or not, while genetically we still remain only a few chromosomes different from monkeys, and emotionally on the level of lizards, what is required of us now is almost god-like knowledge, compassion, and perserverance as we pass the torch of life from homosapiens to our post-homosapiential children, brothers, and sisters.

Are you ready and able to face this future? I hope you are, because ready or not, here it comes. In fact, as I said, I am sure that many of you have already had to deal with issues even more dramatic than those we have discussed so far. I hope you will share your experiences with us here.

But if you are not ready for this, and many more alternative futures not so far even discussed, then not only more conferences like this one, but also more adequately future-oriented strategic judicial plans are absolutely necessary for you, and for all judiciaries. These plans must, of course, include environmental scanning for emerging future issues the information from which is then provided to judges, lawyers, law professors, and the general public for their edification, discussion, and anticipatory action.

It is vital, I believe, that your assessment of and preparation for the future not end with this conference this week. This conference will, I fervently hope, be but a new beginning of the fuller future-orientation of the bar and bench of Kansas.

I know you can do it! But when I listen to the level of most social policy discussion in the US, what overwhelms everything else are not reasoned, if heated, debates about the meanings of the genetic revolution and other approaching tsunamis, but instead such things as the future of the virtually non-existent nuclear family as debated by that epic defender of family values, Dan Quayle, vs. that mythic slut and single parent, Murphry Brown. At least Nero fiddled while Rome burned. Many of us seem content to sit before our TV sets and fret about things that never were, are not now, and never will be again.

The whole world's in your hands. Don't drop it.