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Cases and Guidelines in Genetics

Roger B. Dworkin*

The human genome has been mapped. Pre-symptomatic diagnosis for an ever-increasing number of genetic diseases is a reality. Gene therapy is in the early stages of development. Mammalian cloning has been performed, and human cloning seems inevitable. Embryonic stem cell research promises important new weapons in the war against disease. Humanity's genetic future is bright indeed.

Nonetheless, as I have noted before, every silver lining has a cloud. A genetic map may teach us things we do not wish to know about ourselves and may lead to an inaccurate sense of genetic determinism or (more frightening) to an accurate recognition that life is far more determined than we choose to believe or than our legal systems presuppose. Pre-symptomatic diagnosis can be a curse as well as a blessing if it leads to knowledge of an adverse genetic fate that cannot be avoided or mitigated. Advance knowledge can also lead to advance labeling and the discrimination that may accompany it. Gene therapy may lead to genetic enhancement, the creation of a permanent genetic underclass, or permanent damage to humanity's gene pool. So too, cloning can be used for stupid or evil purposes to modify and commodify human beings. Stem cell research can lead to the creation of abortion factories and a market in embryos.

When science and technology promise as much good and threaten as much potential harm as genetic developments do, the desire to regulate the developments is easy to understand. Accomplishing sound regulation is much more difficult. Those who are fearful and pessimistic about genetic developments, but trusting and optimistic about the law will advocate bans on genetic developments and prohibitions on certain uses of genetic information and will advocate serious penalties to support the bans and prohibitions. Genetic optimists and those who have less faith in law will advocate unrestrained technological growth and see little room for bans and prohibitions. Sound policy will reject both extremes and attempt to devise ap-

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approaches that permit society to reap maximum benefit from new genetic technologies while minimizing their risks and costs. Sound policy will advert to the real strengths and weaknesses of legal approaches to rapid scientific and technological change rather than rely on unexamined optimism or pessimism.

Two obvious, but quite different approaches to policy formulation suggest themselves: the enactment in advance of provisions, whether they be called rules, regulations, or guidelines, that are designed to control conduct; and the resolution of particular cases as they arise. To some extent the appeal of these approaches may depend on the legal tradition with which one is most familiar. Decision making in advance may be more attractive to civil lawyers, while case by case adjudication has a prima facie appeal to common lawyers. However, civil law has room and obvious need for case resolution, and common law countries rely increasingly on legislation and administrative regulation to supplement the system of case by case adjudication. Moreover, if legal decisions about genetic developments are to have global application, some accommodation among legal approaches will be necessary.

Whether global application is desirable is an important and difficult question. It can only be answered after general consideration of the nature of genetic developments and the legal tools that are available to deal with them.2

I. Genetic Developments

The most striking feature of genetic developments is the breathtaking speed with which they are occurring. It is still less than half a century since Watson and Crick discovered the double helix structure of DNA,3 and only a quarter of a century since the development of recombinant DNA technology and the fears it spawned,4 all of which have turned out to be unfounded. The human genome was mapped several years more quickly than anticipated.5 Scarcely a day passes without ordinary news media, let alone scientific journals, reporting some mind boggling new genetic development.

A second characteristic of genetic developments is that there are many of them and that the facts relevant to each development and the issues it poses are different.

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2 See section IV. Cases and Guidelines.


5 See generally, Genome Announcement a Milestone, but Only a Beginning, CNN.com-health (June 26, 2000).
Even a "single" issue, like whether to permit presymptomatic diagnosis of children, may require different analysis depending on whether there is a medical treatment for the condition one is thinking about diagnosing. How effective the treatment is, its costs, risks, etc. may also be relevant. And, of course, as noted above, all of those facts will change very quickly. Obviously, other issues—whether to permit germ-line therapy, how much to protect genetic privacy, which research to promote, and so forth—involve different factual considerations. Some of the relevant facts, like those involved in protecting privacy, require understanding an additional, rapidly changing scientific field, computer science.

Third, many of the facts that must be understood to deal with developments in genetics are scientific facts. This obvious observation is very important because it suggests that potential lawmakers are unlikely to have a good understanding of the facts. The rapidly changing nature of the scientific facts exacerbates this problem.

Fourth, genetic developments are characterized by uncertainty and by human ignorance about what they portend. As I have noted previously, acting in the face of ignorance is fraught with difficulties and suggests modesty and efforts to overcome one's natural optimism or pessimism unrooted, as they often are, in information.

Fifth, the implications of genetic developments and of efforts to regulate them are enormous. Many of them are probably beyond our imagination. Genetics may contain the power to reshape our lives and our societies and to require rethinking our most cherished beliefs as we confront anew the old nature-nurture and free will debates. The implications of regulatory developments are scarcely less far reaching. The legal steps we take in the next decade may either deprive humanity of spectacular benefits to health, food production, self-understanding, and reformulated societies, or may let loose upon us forces that will destroy much of what we cherish about human beings. One ignores legal consequences at his peril, just as much as one ignores genetic developments at his peril. Law is not cost free. Each legal approach has different costs and different benefits. Potential lawmakers and their consultants must be ever vigilant to avoid allowing enthusiasm for substance to cause them to forget that in areas of regulation and law what one does is seldom, if ever, as important as how one does it.

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9 Ibid., p. 6.
Finally, genetic developments raise issues as to which there is no moral consen-
sus but much heartfelt moral belief. Many genetic-social issues have power to po-
larize not unlike the abortion issue. Lawmakers must be vigilant to avoid adopting
one of several legitimate competing moral views and imposing it on those who do
not share it.

How then ought societies to respond to a collection of issues that are character-
ized by rapidly changing, scientific facts; a high level of uncertainty or ignorance;
extraordinary and only partly foreseeable permutations; and deep moral convic-
tions but no moral consensus? When dealing with such an area the likelihood of
error is great, and the costs of errors can be enormous. The goal should be to at-
ttempt to devise approaches that reduce both the number and size of the errors and
that leave opportunities for errors to be corrected. In devising such approaches one
must remember that two types of errors are possible — excessive permissiveness
and excessive restrictiveness. Eagerness to avoid one kind of error should not be
allowed to lead to the other. Are guidelines or case resolutions more likely to re-
duce the number and costs of errors?

II. Guidelines

There is an obvious attractiveness to being able to deal with problems in ad-
vance. Doing so makes us feel that we are in control of our fate, and it offers the
prospect of avoiding harm rather than cleaning up after harm has already occurred.
Advance decision making may be assigned to a wide variety of decision makers. It
can be democratic, it can cede control to experts, or it can adopt some combination
of popular and expert control. Advance decision making can also take many differ-
et forms — criminal legislation, administrative controls, tax and/or spending poli-
cies, government recommendations, recommendations and/or ethical mandates
from private groups, and so forth. Sound decisions about whether to rely on ad-
vance decision making instead of case by case decision making require attention
both to the general characteristics of advance decision making and to specific char-
acteristics of particular methods of dealing with issues in advance.

All forms of advance decision making assume that the decision makers under-
stand enough about the subject they are addressing to make sensible decisions
about it. This does not necessarily mean that the decision makers must themselves
be experts in the field. Experts usually gain their expertise by working in a field.
Therefore, regulation by experts is likely to become regulation by the regulated.
That is, the group to be regulated will capture the regulatory process, and the law
will have a fox-guarding-the-chicken-coop quality. Rather than require regulation
by experts, sound decision making requires (1) that an area be sufficiently devel-
oped so that experts can know a reasonable amount about its promises and pitfalls
and can communicate that information to laypersons; and (2) that lay decision ma-
kers have the benefit of expert information and consultation. Most genetic devel-
opments do not meet this requirement. Both the fears and the enthusiasms surrounding gene therapy, presymptomatic diagnosis, stem cell research, human cloning, etc. are largely hypothetical.

Genetic ignorance is only part of the problem. Other forms of ignorance are relevant too. For example, how to deal with workplace genetic screening and concerns about employment discrimination and invasions of privacy in the workplace requires knowledge about the actual practices of employers. First, potential regulators must know the extent to which screening, diagnosis, etc. are feasible and how much they cost. Second, they must know the extent to which employers and insurers use genetic information or what scientific and technological advances might move them to use it. Then they must know the likely outcome of such use on individuals and on society as a whole. For example, in a full-employment society fears of genetic discrimination in employment are probably overblown. In recessionary times they may be a cause for greater concern.

Advance decision making tends to be abstract and general. As it is not restricted to specific cases, it necessarily paints with a broad brush. This makes it useful for dealing with problems that are susceptible to comprehensive resolutions and that are not characterized by factual differences. As discussed above, genetic developments do not meet this criterion.

Advance decisions assume a fair level of certainty and a willingness to bind the future. Thus they are ill-suited for dealing with issues like those posed by genetics, which are characterized by rapid change and both factual and moral uncertainty.

Thus, advance decision making seems ill suited for dealing with developments in genetics. Nonetheless, some kinds of advance decision making are less ill suited than others.

Criminal legislation is almost surely the worst way to deal with genetic developments. As Herbert Packer pointed out more than thirty years ago, criminal sanctions, which, by definition, involve the intentional infliction of suffering by the state, are morally ambiguous and require substantial justification. They are inappropriate in the face of legitimate debate about the morality of the conduct they propose to regulate. They also cannot be justified unless they will serve the goal of crime prevention and impose relatively minor costs in terms of enforcement, unequal application, and benefits foregone. Criminalizing genetic research or applications would serve none of these goals. It would inflict punishment on conduct that many persons do not oppose and that some may find morally required. It would run the risk of depriving humanity of great benefits. It would be largely unenforceable, given the worldwide nature of the scientific enterprise. Demand for


3 Jahrbuch für Recht und Ethik, Bd. 10 (2002)
the good that genetic research promises would preclude strict enforcement. Rather than eliminate genetic research, criminalizing it would force it underground and create a "crime tariff,"¹² under which the price of genetic research and services would increase and be funneled to the least savory members of society, those who are willing to break its laws. Moreover, criminal legislation, like all legislation, is hard to write narrowly. It is difficult to imagine statutes that would be fact sensitive and avoid painting with too broad a brush. Some genetic research and applications may be undesirable, but it is hard to believe that all of them are. An approach that prohibits all, or even one that prohibits enough to be threatening to all is too sweeping to be desirable. Finally, criminal legislation, like all legislation, is difficult to change. Once enacted, it is likely to remain on the books for many years. Thus, if it turns out to be ill-considered or undesirable legislation, a society will probably be stuck with its mistakes for quite a long time.

Administrative regulations are more attractive. They are easier to tailor to specific concerns and specific factual situations than criminal legislation; they are likely to be developed with the participation of persons with more expertise than most members of legislatures have; they need not involve the moral condemnation and punishments that characterize the criminal law; and they may be easier to change in response to new information and insights than legislation is.

Nonetheless, administrative regulations are far from a perfect response. They are often difficult, expensive, and slow to enact. They may unduly represent the perspectives of those who are involved in the field and therefore in a position to have expertise to share. They can only be enacted after legislatures have authorized an agency to act. This means that they may become caught up in the quagmire of politics. And, of course, they need some enforcement mechanism. That means that persons not subject to their jurisdiction may escape their thrust, as private researchers may be able to avoid some of the strictures of American stem cell research policy.¹³ And it means that they are unlikely to be effective in the international arena.

Specific governmental policies, such as deciding to promote certain kinds of genetic research by funding it or to discourage it by taxation require the enactment of legislation, which probably would have to be supported by administrative regulations. Thus, the basic question of whether to deal with specific conduct in advance or after the fact has to be resolved before specific fiscal policy issues can be addressed.

Recommendations are unenforceable, and ethical proscriptions are enforceable, if at all, only against limited groups of persons. This is both their greatest benefit and their greatest drawback. The fact that they affect few people and are relatively undraconian means that they are unlikely to cause much loss of progress; the cost of relying on them in terms of benefits foregone will be low. Conversely, the costs


in terms of dangers unprevented will be high. Ethical pronouncements are unlikely to persuade the unpersuaded or to control persons not subject to the authority of their authors. Moreover, ethical pronouncements are likely to be the products of particular, interested groups. Therefore, they are unlikely to represent a broad enough set of considerations to end up representing the best social policy.

Thus, at first blush advance regulation of developments in genetics seems to be a mistake. Is after-the-fact case by case adjudication likely to be more satisfactory?

III. Cases

Case by case decision making is premised on the ideas that (1) the best decisions are those that are rooted firmly in facts that are known at the time the decision is made; (2) narrow decisions are better than broad ones; and (3) decisions should be relatively easy to change. In case by case decision making consistency is to be achieved through careful comparison of facts rather than through the application of pre-determined principles, and some inconsistency is considered to be tolerable in the name of practicality. Cases, like advance decisions, can be resolved by a variety of different decision makers. While common law judges are the paradigmatic case deciders, administrative agencies can also decide cases one at a time; IRBs and peer review committees decide individual cases with varying degrees of guidance from preexisting regulations. Professional scientific groups, interest groups, and those who offer ethical guidance can do so by deciding cases instead of or in addition to adopting codes of conduct. How suitable are genetic developments to resolution through case by case decision making?

To the extent that genetic developments offer largely unknown benefits and pose largely unknown threats, case resolution is an attractive response because it can avoid adopting far-reaching decisions that will bind the future. The power of a case is confined to its facts and to analogous situations that develop after it was decided.

Individual decisions are more likely to end up being sound than are individual advance pronouncements. That is because being tied to facts often gives the decision maker enough information to resolve problems correctly. They are unlikely to go off on flights of fancy. To put it another way, case by case decision making in genetics is unlikely to commit the sin of science fiction. If cases are wrongly decided, they offer another benefit: They are easy to change. The very fact that

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15 For a thorough analysis of common law methodology, see, Melvin Aron Eisenberg, The Nature of the Common Law, Cambridge, MA: Harvard University Press, 1988; see also Dworkin, (op. cit. fn. 8) pp. 7-10.

16 This is not true of decisions that are made by some judicial bodies, like the United States Supreme Court. That court is a hybrid body that decides cases, but that does so on the basis of a preexisting set of principles (the United States Constitution) and that purposely
the implications of cases are not very far reaching means that the costs of changing them are relatively small in terms of upset expectations and disruption of people's lives. Moreover, wrongly decided cases often do not have to be changed. Rather than overruling a previous decision, the decision maker can often distinguish the decided case from the pending one. Eventually, so many distinctions can be drawn that the wrongly decided case will in essence have been distinguished out of existence.

Sound case decision making requires the decision maker to provide reasons for the result that is reached. This process of reasoned elaboration is a valuable feature of a casuistical approach. It allows others to evaluate decisions to consider whether they should be changed. It facilitates careful distinctions among cases as persons deciding cases after the first one has been resolved can apply the fundamental principle that if the reason(s) for a rule do not apply, the rule does not apply. Moreover, the reasons elaborated in the decision of a case can be treated like entries in an intellectual discussion of a topic, much like journal articles. Thus case resolutions contribute to an understanding of social problems and their possible solutions. Most importantly, the requirement that a decision maker provide reasons to support a decision guarantees that there are reasons to support the decision. It is an important check against arbitrariness and prejudice.

Guidelines and other forms of advance decision making do not normally require that reasons be provided. For example, a statute need not explain its rationale. Legislative history may or may not exist. Even when it does exist, it has little authority and is unreliable, reflecting, as it does, only what those members of the legislature who chose to speak, chose to say. In case by case decision making, however, the reasoning of the decision maker is the essence of the decision.

A related point is that statutes and other forms of advance decision making mean what they say, and no more. There are many theories about how to discern what a statute means. However, a statute is always limited by some understanding of its words. That is all it has. Since statutes and other advance decisions have no facts, they have no analogies. They cannot legitimately be applied to instances they do not address. This makes them less useful than cases, which do have facts. Facts and reasoning permit analysis of which future cases are analogous to those that have already been decided. This permits the development over time of a richly nuanced, highly particularized set of decisions that can never be matched by a set of decisions made in advance.

Of course, none of this is to say that cases are perfect. Case by case decision making is slow, backward looking, poor at controlling conduct, and likely to be shot through with inconsistencies.

attempts to develop long range, widely applicable, nationwide, hard to change solutions to problems. A better model of case by case decision making is a state appellate court resolving a common law dispute. For a fuller explanation of the difference between common law and constitutional adjudication, see, Dworkin (op. cit. fn. 8) pp. 7–10, 15–18.
Deciding cases is a slow way to deal with problems. Before a case can arise a technology must exist and have operated to somebody's perceived detriment so that the aggrieved person brings a case for relief. The decision rendered will resolve one dilemma, but the next problem will not be solved until the next case arises. Developing a substantial body of precedent may take years, decades, or even centuries.

The process may be speeded up considerably if a group of decision makers seeks out cases to resolve without waiting for litigation to arise. For example, a group of scholars may find cases (incidents) that raise genetic ethical dilemmas in various genetics clinics and laboratories. They can then attempt to resolve the cases even if no one has sought relief for a grievance. The problem with this approach, as with all approaches that do not have the force of law, is that nobody will be bound by the group's case resolutions. Speed will be offset by unenforceability.

Cases may be poor vehicles for dealing with rapidly changing issues like those posed by genetic developments not only because the developments must exist and appear to harm someone before a case can be decided, but also because casuistry is based on allegiance to the past. The decision maker must look for wisdom in precedent and analogy, which is likely to have little to contribute to a debate about cutting edge scientific and technological developments.

A system that is dependent on cases is necessarily dependent on the order in which cases arise. That means that cases are unlikely to be decided in a logical order, that resort to first principles is unlikely, and that there will always be gaps and inconsistencies in the body of case determinations.

Finally, conduct control requires that people be told clearly, in advance, what they are supposed to do and refrain from doing. Cases, which are decided after conduct has already occurred, and which are in a very real sense only authoritative for their own facts, are poor tools for controlling people's conduct. How is actor #2 supposed to know whether the decision maker will find his case enough like that of actor #1 to reach the same result? His uncertainty may lead either to timidity, an unwillingness to act because of fear that unwelcome law may apply, or boldness because of the hope that it will not. What uncertainty will not do is lead to behavior that follows a policy preference that society has predetermined.

IV. Cases and Guidelines

Neither case by case decision making, nor advance decision making seems ideally suited to dealing with issues posed by genetic developments. This is hardly surprising. Existing legal mechanisms are not very well suited to deal with many of the social issues posed by biomedical advance. Issues from abortion to death

17 See, e.g., Smith, et al. (op. cit. fn.6).
18 See generally, Dworkin (op. cit. fn. 8).
facilitation demonstrate the limits of the law's ability to deal with rapid change. As usual, this leaves us in the uncomfortable position of choosing how to do the least harm.

Recognizing that one's goal is to do the least harm, rather than to reach the ideal solution to a problem, is very important. Changed aspirations change the weight of arguments. If one believes that there is a perfect solution to a problem, then one will always be bedeviled by loose ends and the second best. An argument that one's solution leaves some undesirable result or possibility in place will be a powerful critique. If, however, one is attempting to do as little harm as possible, unsolved problems are a minor annoyance. This is especially true of unsolved hypothetical problems. Lawyers and ethicists yield to no one in their ability to make up problems. Hypothetical problems do not have to be solved. Real problems are hard enough to deal with. Moreover, excessively enthusiastic efforts to deal with hypothetical problems can create entirely new problems. An example should make the point.

Anyone who thinks in the abstract about artificial insemination by "donor" (AID) of a married woman, can anticipate a large range of issues that will arise: What is to be the relationship between the donor and the resulting child? between the mother's husband and the resulting child? Who has to support the child? From whom may the child inherit? Who may visit the child if there is/isn't a divorce? Who must sign off before the child can be adopted? Who may consent to the child's medical care? Etc., etc.

In fact, these problems hardly ever arise. While artificial insemination by donor has been practiced in human beings for at least 80 years, there are only a handful of reported disputes about these issues. At least in the United States each of them has been resolved satisfactorily, which is to say that every decision has treated parenthood as a social relationship, has maximized the child's chance of being privately supported, has minimized the likelihood that the state will have to raise the child, has given the child a chance to have a parental relationship with both a mother and a father figure, has encouraged husbands to behave responsibly while refraining from inflicting emotional pain upon them, has provided wives with a source of support for their child, while discouraging them from acting cruelly, and has refrained from foisting unwanted obligations onto "donors" and their wives. Nonetheless, opponents of the second best were disturbed by the uncertainty that judicial decisions left and thought that all issues of AID had to be resolved immediately. In the United States this led to passage of § 5 of the Uniform Parentage Act and eventually to the Uniform Status of Children of Assisted Conception

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Act\textsuperscript{22} as well as to several state statutes.\textsuperscript{23} The first Act created problems where none existed before, arguably rendering children illegitimate if sperm "donors" charged for their sperm, and opening up questions about how to treat husbands of surrogate mothers as well as other difficulties. USCACA solved some of those problems, but created others. The state statutes were particularly absurd, creating legitimacy issues where none had existed before, sometimes making felons of women who performed AID on themselves, etc.\textsuperscript{24} The insistence on getting things right instead of the more modest goal of not getting them too wrong, led to the creation of problems that did not have to arise and getting things farther from right than a willingness to tolerate the second best would have.

The lesson for dealing with genetic developments is plain: given the inadequacy of legal institutions to deal with the issues, we should choose the approach that will do the least harm. In the genetics context that means that we should refrain from enacting guidelines or other forms of advance controls until enough cases have been decided to provide a base from which guidelines can be extrapolated.\textsuperscript{25} This does not mean that guidelines should be permanently eschewed. It only recognizes that guidelines that are not rooted firmly in reality are likely to be ill-advised.

Initial reliance on case by case decision making will offer the advantages of being tied to facts; of being narrowly tailored; of being easy to change; of resting on reasons that can and should be made apparent; and of providing some guidance for the future in the sense that they invite analogical reasoning and efforts to tease out exactly what the relevant aspects of an issue are. It has the disadvantages of being slow, backward looking, noncomprehensive, and poorly equipped to control conduct. Why is this tradeoff of advantages and drawbacks the least bad tradeoff to accept?

First, controlling conduct only makes sense if one is sure what one wants people to do. Laws that prohibit premeditated murder make sense because there is nearly universal agreement that premeditated murder is a bad thing. Even with such a clear example, however, room for debate exists if one begins to think about euthanasia rather than murder for hire. When the desired course of conduct is less clear, then the ability to control conduct may be a curse rather than a blessing. Advance decision making could prohibit stem cell research or use, human cloning, presymptomatic genetic testing of children, or the consideration of genetic predispositions.

\textsuperscript{24} For a discussion of the state and Uniform Acts, see, Dworkin (op. cit. fn. 8) pp. 65 – 69.
\textsuperscript{25} As suggested above (see, section III. Cases), at least one group of scholars has attempted to accelerate the process by resolving a number of cases quickly and then preparing guidelines that emerged from the case analyses. See, Smith, et al. (op. cit. fn. 6). The authors were able to proceed fairly quickly because they were an unofficial group that did not have to obtain agreement from any of the various relevant constituencies and because they dealt only with one set of problems: those posed by presymptomatic diagnosis of autosomal dominant disorders.
in setting insurance rates. But in each of those cases whether prohibiting the con-
duct is desirable is open to serious question.

Enormous potential benefits may flow from stem cell research. Cloning too may
contribute to the amelioration of human misery. Presymptomatic testing of chil-
dren, even if no medical options are available for them, may lead to better parent-
ing decisions, making needed resources available to children who will develop a
disease, directing such children into the most suitable careers for them, etc. Allowing
what many like to call genetic discrimination in insurance may keep insurance
premiums lower than they would otherwise be for the rest of the population, thus
permitting persons at the margin to obtain health insurance they could not other-
wise afford. Conduct control is a mixed blessing. When values are in doubt and in
flux, it is probably no blessing at all.

Similarly, slowness of response is only an evil if one is so sure about the right
course to take and the urgency of taking it that speed is necessary to avert serious
harm. In an area like genetics where we do not know what harm we are talking
about and where rapid response may prevent the achievement of good, slow re-
sponse is the more prudent course.

A lack of comprehensiveness is also a virtue rather than a vice when the best
course of conduct is in doubt. Painting with a narrow brush avoids sweeping mis-
takes. It offers an easy way to correct the mistakes that it does make. And it offers
hints of future lines of development that are likely to be sound.

The one real drawback of case by case decision making is that it is backward
looking. To the extent that it is rooted in precedent and analogical reasoning, it
seeks today’s solutions in answers to yesterday’s problems. If issues posed by ge-
etic advance are qualitatively different than issues that have arisen in the past, that
suggests a limit on our imagination that is undesirable. However, even this draw-
back is not as bad as it first appears to be. First, only some of the issues posed by
genetics are qualitatively different than issues that have arisen before. Insurance
discrimination, medical decision making for children, and control of research are
old issues that simply arise in new contexts as genetics develops. Second, really
different questions, such as whether we should reformulate the entire criminal law
to reflect advancing knowledge about genetic effects on behavior, have similarities
to old issues, like the proper role of the insanity defense, but also raise such pro-
found issues about the nature of humanity that any great leap forward in approach
will depend on a quantum leap in human imagination and ingenuity. Whether free-
ing decision makers from the chains of precedent will produce such extraordinary
ingenuity is an open question.

Thus, the costs of relying on cases in the short run seem relatively small. None-
theless, they are costs. That is why they should only be tolerated for a reasonable
amount of time. Eventually enough cases will have been decided about each ques-
tion posed by genetic developments to illuminate the issues involved sufficiently
to permit the drafting of guidelines or other forms of advance regulation that will
make sense. If the case resolution process has worked optimally, the guidelines will simply be a generalized extrapolation from the case decisions. If the case resolution process has worked less well, the guideline drafters may use the case resolutions as examples of erroneous or misguided approaches to problems and draft guidelines that take different approaches. Either way, the post-cases "advance decisions" will be much more likely to be sound than they would be if they were written before cases had been resolved. Informed by the cases the guidelines will be fact-based, responsive to real, rather than hypothetical social problems, and addressed to specific problems, rather than scatter gun attacks on the field of genetics as a whole. They will come after a period of relatively little regulation. That means that we will have had a chance to see whether either the fears or the promises of genetic developments are realistic. Once the guidelines are enacted, they will provide the advantages that advance decision making offers: conduct control, certainty, and as much comprehensiveness as seems warranted. All that will have been lost is speed.

Two obvious questions remain: (1) How much speed is it tolerable to lose? That is, how long should the period of case by case decision making that precedes guideline drafting be? (2) What does the recommended approach suggest about the desirability of efforts to deal internationally or globally with social issues posed by genetics?

The first question is impossible to answer with any degree of specificity. If case resolution has revealed that no real problem exists, then no guidelines should be drafted. Otherwise, guidelines should not be drafted until enough cases have been decided so that we can be sure that a problem does exist; that we understand its parameters; that we understand the relevant facts; and that the issues to be resolved and the consequences of the different possible resolutions are known. The more severe the problem, the more tolerable it will be to err on the side of premature drafting of guidelines. As always, the risks of overreacting must be balanced against the risks of inaction. In general, however, I would expect the pre-guideline period to last for a number of years.

The costs of advance decision making are exacerbated if the decisions are applicable in more than one country. Therefore, adopting the proposed approach necessarily commits one to eschewing international or global approaches to genetic developments at this time.26 Justice Brandeis made the point that one of the great benefits of American federalism is that the states can serve as laboratories, each trying out different approaches to dealing with problems, so that ultimately we will have some idea what the best (or least bad) solution may be.27 The same point can be made about the countries of the world. International experimentation regarding


regulation should eventually lead to sounder world-wide responses than premature international cooperation would.\textsuperscript{28}

Thus, consideration of the relative advantages and drawbacks of cases and guidelines leads to the conclusion that we should pursue a period of case by case resolution of social issues posed by genetics as a necessary precursor to the development of guidelines.

\textit{Zusammenfassung}

Die Entwicklungen der Genetik versprechen einerseits enorme Vorteile für die Gesellschaft, bedrohen sie andererseits aber auch mit substantiellen Nachteilen. Eine auf der Hand liegende Frage, die sich daraus ergibt, ist die, wie man diese Entwicklungen steuern und die Vorteile maximieren, die Risiken aber minimieren kann. Im vorliegenden Artikel werden die relativen Vorzüge von Richtlinien und anderen Arten der Vorabentscheidung auf der einen Seite und von Entscheidungen von Fall zu Fall, wie sie insbesondere von Gerichten getroffen werden, auf der anderen Seite untersucht, und zwar im Hinblick auf ihre Eignung, die Herausforderung einer Regulierung der genetischen Entwicklungen zu beantworten.

Dabei werden zunächst die Charakteristika der gentechnologischen Entwicklung diskutiert: die Geschwindigkeit der Entwicklung, die Wichtigkeit der Fakten, die wissenschaftliche Natur der relevanten Fakten, die Unsicherheit im Hinblick auf die Signifikanz der Entwicklungen, die weitreichenden Implikationen sowohl der Entwicklungen als auch der Versuche, sie zu regulieren, und schließlich das Fehlen eines moralischen Konsenses darüber trotz an sich tiefer moralischer Überzeugungen. Danach werden die Eigenschaften von Mechanismen diskutiert, Entscheidungen vorab zu treffen, und zwar sowohl allgemein als auch im Hinblick auf spezielle Weisen der vorausgehenden Entscheidungsfindung, um herauszufinden, ob sie geeignet sind, mit gesellschaftlichen Problemen der Genetik umzugehen. Dasselbe wird sodann im Hinblick auf Entscheidungsmechanismen untersucht, die von Fall zu Fall vorgehen.


\textsuperscript{28} Theoretically, this point leads to the conclusion that it may be desirable for some country to reject the proposed approach and adopt guidelines now. That may well be a useful experiment. However, a country that adopted guidelines that restricted its physicians and scientists more stringently than other countries did, might well find itself at an unacceptable competitive disadvantage.
Es wird ein Verfahren vorgeschlagen, das nach einer Phase der Entscheidungsfindung von Fall zu Fall einen Zeitabschnitt vorsieht, in dem Richtlinien aus den vorangegenden Von-Fall-zu-Fall-Entscheidungen abgeleitet werden. Dieses Verfahren wird wahrscheinlich dem am nächsten kommen, was realistischer Weise am ehesten (bei minimalen Kosten) eine zufriedenstellende Lösung beim gesellschaftlichen und rechtlichen Umgang mit den Problemen gewährleistet, vor die uns die gentechnologische Entwicklung gestellt hat.